What does high frequency identification tell us about the transmission and synchronization of business cycles?*

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Abstract

We study the effect of U.S. macroeconomic news releases on equity markets and exchange rates of 27 countries from 1997 to 2019. Looking at changes in 60-minute windows around announcements, we document the following findings: First, asset prices respond overwhelmingly symmetric across countries to news. Positive news lead to an increase in equity prices and a depreciation of the local currency against the U.S. dollar. Second, there is systematic heterogeneity across countries in the magnitude of the response. Lastly, asset prices of countries with greater trade and financial linkages respond stronger. Overall, our findings support international business cycle models, in which shocks lead to cross-country co-movement of asset prices on impact and in which linkages amplify the transmission of shocks.

JEL Codes: E44, F40, G14, G15

Keywords: Macroeconomic announcement, News, International business cycles, Synchronization

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1 Introduction

How do greater trade and financial linkages affect the synchronization of countries' business cycles? Despite its importance and a large body of work in international macroeconomics, this question has still not been fully answered. Theoretically, the answer is ambiguous and disagreement about the empirical evidence persists.[1] A related literature, which studies the cross-country transmission of shocks, has also found conflicting results.[2] In both cases, identification is notoriously difficult and a likely source for different findings across studies. How countries' business cycles are interlinked thus remains an open and policy-relevant question for research.

In this paper, we use high frequency identification to shed light on this question. We follow a large literature that analyzes asset price changes around U.S. macroeconomic news announcements to inform macroeconomic mechanisms.[3] In the context of our question, this methodology is promising for two reasons. First, if one is willing to pay the price and study asset prices over short time horizons – rather than macroeconomic aggregates – high frequency identification offers a sharp and attractive research design (Gürkaynak and Wright, 2013). As such, we think of our approach as complementary to existing work at lower frequencies. Second, earlier work establishes that U.S. macroeconomic news releases lead to asset price movements in a number of advanced economies (e.g. Andersen et al., 2007; Faust et al., 2007). Hence, these announcements potentially provide a unique source of variation to explore the expectation formation and decision making process of agents in an international dimension.

We begin with developing a framework to interpret international asset price responses to U.S. news releases. Under plausible identification assumptions, systematic changes in foreign asset prices after U.S. news releases reflect either transmission of U.S.-specific shocks to these countries, common global shocks, or both. We further show that heterogeneity in asset price responses across countries is driven by differential transmission of the U.S.-specific shocks or by differential responsiveness to common shocks.

[1] For theoretical ambiguity of financial and trade linkages see Kose, Prasad, and Terrones (2003), Imbs (2004), and Kalemli-Ozcan, Papaioannou, and Peydro (2013). Empirically, there is greater consensus of the positive effects of trade integration on synchronization, whereas the role of financial integration is still debated. With respect to the latter, see the discussions in Kalemli-Ozcan, Papaioannou, and Peydro (2013) and Davis (2014).

[2] For instance, Corsetti, Dedola, and Leduc (2014) find a prominent role for U.S. supply shocks while Levchenko and Pandalai-Nayar (2018) argue that most transmission is driven by sentiment shocks.

[3] For example, Andersen et al. (2003) investigate the exchange rate disconnect hypothesis, Gürkaynak, Sack, and Swanson (2005) inform the long-run behavior of macroeconomic models, and Swanson and Williams (2014) study the effect of the zero lower bound on monetary policy.

With this framework at hand, we the study the responses of equity markets and exchange rates of 27 countries from 1997 to 2019. Relative to prior work, our sample contains more countries – including a number of developing countries. We document that asset prices in these countries systematically react to the release of U.S. macroeconomic news within a 60-minute window. Consistent with earlier work, positive U.S. news lead international equity markets to rise and the U.S. dollar to appreciate in a pooled sample.

Importantly, the stock market response is overwhelmingly symmetric across countries. All countries' stock markets rise after positive surprises about the U.S. macro economy – except for Turkey's, which responds insignificantly. This evidence thus suggests that public information releases generate co-movement in stock markets across countries. Further, since Q-theory implies a tight link between investment and stock prices and since changes in stock market wealth drive consumption responses (Chodorow-Reich, Nenov, and Simsek, 2019), the co-movement of stock prices may also drive output co-movement across countries.

While the direction of responses to U.S. macroeconomic news is essentially identical for all countries, the magnitude of the response is not. For equity markets, we document that a number of countries such as Germany and France systematically respond stronger to surprises about the U.S. economy than countries like Chile or Portugal. As noted above, our empirical framework suggests that this heterogeneity reflects differential transmission of U.S. shocks or differential responsiveness to common global shocks. That is, either the transmission of shocks from the U.S to Germany and France is greater than to Chile and Portugal, or Germany and France respond more to common global shocks (or both).

A similar degree of heterogeneity obtains with regard to exchange rate responses to U.S. macroeconomic news. Developing countries tend to respond strongly to news about U.S. inflation, but not to news about the real economy such as nonfarm payrolls. In contrast, developing countries' exchange rates tend to be unresponsive to news about U.S. inflation, but strongly respond to news about the real economy. These findings suggests that shock transmission or responsiveness to common shocks is fundamentally different for these two groups of countries and provide directions for further exploration.

Lastly, we analyze whether a country's responsiveness to U.S. news systematically depends on its integration into the world economy. Stock markets and exchange rates of countries that are more financially integrated react significantly stronger to U.S. news. Trade integration is also associated with greater responsiveness – mostly of exchange rates. Since correlates of financial and trade integration could drive these results, care must be taken when interpreting these findings.

Our paper contributes to the large literature on international business cycle synchronization and transmission, which aims to understand (1) what type of shocks are transmitted across borders and (2) which mechanisms govern the transmission of these shocks. Prominent suggestions for shocks include TFP shocks (Backus, Kehoe, and Kydland, 1992; Corsetti, Dedola, and Leduc, 2014), preference-driven demand shocks (Stockman and Tesar, 1995), monetary policy shocks (Canova, 2005), sentiment shocks (Levchenko and Pandalai-Nayar, 2018), financial shocks (Peek and Rosengren, 1997, 2000), and others. Transmission may occur, for instance, through trade linkages (Frankel and Rose, 1998; di Giovanni and Levchenko, 2009; Boehm, Flaaen, and Pandalai-Nayar, 2019), financial linkages (Peek and Rosengren, 1997, 2000), technology diffusion, and so forth. An additional possibility – as pointed out by Canova and Marrinan (1998) and Imbs (2004) – is that co-movement may arise from correlated country-specific shocks rather than transmission.

Our paper also relates to the literature on high-frequency event studies in macroeconomics.[4] A number of papers study the effect of U.S. news releases on exchange rates and international equity markets. For example, Andersen et al. (2007) and Faust et al. (2007) analyze the transmission to financial markets in Germany and the United Kingdom. Relatedly, Ehrmann, Fratzscher, and Rigobon (2011) identify shocks through heteroscedasticity and study the interdependence of asset markets between the U.S. and the Euro Area for multiple assets. We extend the existing literature in the following dimensions. First, our sample contains a broader set of countries including developing countries. Second, this not only mitigates concerns about external validity but also allows to systematically analyze cross-country differences in asset price responses. Third, we link the country-specific transmission of the news releases to their trade and financial linkages.

The rest of the paper is structured as follows. Section 2 lays out the empirical framework for our analysis. Section 3 describes the data on the macroeconomic news releases and financial data. Section 4 presents our empirical evidence on the international transmission to equity and forex markets. Section 5 describes our integration measures and presents evidence on the link between the measures and the cross-country transmission. Section 6 discusses the issue of transmission vs. common shocks. Section 7 concludes.

2 Empirical Framework

The following exposition builds on Faust et al. (2007).

[4] See Gürkaynak and Wright (2013) for a survey on high-frequency event studies in macroeconomics.

Setup We study asset price changes within a short time window $[t-\Delta^-, t+\Delta^+]$ around the release of news about a U.S. macroeconomic variable y_τ. Here, t is the release time, Δ^- and Δ^+ are short time periods of less than or equal to 45 minutes, and τ is a generic time index. To give a concrete example, the Bureau of Labor Statistics (BLS) publishes U.S. non-farm payroll employment at 8:30am typically on the first Friday of each month. We are interested in how foreign asset prices (e.g. stock prices) respond around the release time. We defer a detailed discussion of the macroeconomic news and asset prices we study to the next section.

Letting $\mathcal{I}_{t-\Delta^-}$ denote agents' (common) information set prior to the news release, the *surprise* about the U.S. macroeconomic variable is

$$s^y_{US,t} = y_{US,t} - E\left[y_{US,t}|\mathcal{I}_{t-\Delta^-}\right], \tag{1}$$

where $E\left[\cdot|\mathcal{I}_{t-\Delta^-}\right]$ denotes the expectation conditional on information set $\mathcal{I}_{t-\Delta^-}$. For expositional clarity, we assume that $y_{US,t}$ is measured without error, but our econometric framework is easily generalized to include measurement error. We denote the set of news that become available in the time window we study by $\mathcal{N}_{[t-\Delta^-,t+\Delta^+]}$. It includes, in particular, news on the macroeconomic variable $y_{US,t}$, but also other news. Asset prices at time $t+\Delta^+$ are then based on the information set $\mathcal{I}_{t+\Delta^+} = \mathcal{I}_{t-\Delta^-} \cup \mathcal{N}_{[t-\Delta^-,t+\Delta^+]}$.

We assume a log-linear multi-country world with a unique equilibrium. Countries are indexed by i and j and the state variables of the economy are elements of the vectors $x_{i,\tau}$ and x^g_τ. More precisely, state variables specific to country i are included in the vector $x_{i,\tau}$ and global state variables are included in the vector x^g_τ. For instance, a component of total factor productivity (TFP) specific to the U.S. is part of vector $x_{US,\tau}$, while the global TFP component is included in x^g_τ. We are agnostic as to which state variables drive the business cycle and explicitly allow for news shocks in the spirit of Beaudry and Portier (2004). All structural shocks are uncorrelated.

The price of an asset of interest in country i can then be written as

$$q_{i,\tau} = E\left[\sum_j a^q_{i,j} x_{j,\tau} + b^q_i x^g_\tau | \mathcal{I}_\tau\right],$$

where $a^q_{i,j}$ and b^q_i are coefficient vectors that depend on the specification of the model. They capture, respectively, how the asset price $q_{i,\tau}$ is affected by the country-specific state variables in $x_{j,\tau}$ and the global state variables in x^g_τ. Under the assumption that $x_{j,t+\Delta^+} = x_{j,t-\Delta^-}$ for

all j and $x^g_{t+\Delta^+} = x^g_{t-\Delta^-}$ for small Δ^-, Δ^+, we can write the change in asset price $q_{i,\tau}$ over the window we study as

$$\begin{aligned}\Delta q_{i,t} &= q_{i,t+\Delta^+} - q_{i,t-\Delta^-} \\ &= \sum_j a^q_{i,j} \left(E\left[x_{j,t+\Delta^+} | \mathcal{I}_{t+\Delta^+}\right] - E\left[x_{j,t+\Delta^+} | \mathcal{I}_{t-\Delta^-}\right]\right) \\ &\qquad + b^q_i \left(E\left[x^g_{t+\Delta^+} | \mathcal{I}_{t+\Delta^+}\right] - E\left[x^g_{t+\Delta^+} | \mathcal{I}_{t-\Delta^-}\right]\right).\end{aligned} \tag{2}$$

In words, when new information becomes available, market participants change their expectations about the state of the economy, which in turn, changes asset price $q_{i,t}$.

We next use the fact that $\mathcal{I}_{t+\Delta^+} = I_{t-\Delta^-} \cup \mathcal{N}_{[t-\Delta^-, t+\Delta^+]}$, and parameterize the conditional expectations in equation (2),

$$E\left[x_{j,t+\Delta^+} | \mathcal{I}_{t+\Delta^+}\right] - E\left[x_{j,t+\Delta^+} | I_{t-\Delta^-}\right] = \beta_j s^y_{US,t} + \tilde{\varepsilon}_{i,t}, \tag{3}$$

$$E\left[x^g_{t+\Delta^+} | \mathcal{I}_{t+\Delta^+}\right] - E\left[x^g_{t+\Delta^+} | I_{t-\Delta^-}\right] = \beta^g s^y_{US,t} + \varepsilon^g_t. \tag{4}$$

These expressions make explicit that market participants use the surprise about U.S. macroeconomic news, as well as other information that becomes available within the time window (as captured by $\tilde{\varepsilon}_{i,t}$ and ε^g_t), to update their expectations about the state of the world economy. To the extent that the U.S. macroeconomic news release is informative about the state, the vectors β_j and β^g contain nonzero elements. For instance, higher-than-expected U.S. payroll employment may lead market participants to update their expectation of the U.S.-specific component of TFP. In this case, the relevant element in β_{US} is nonzero. If the surprise is not useful for estimating particular state variables, then the relevant entries in β_j and β^g are zero.

Plugging equations (3) and (4) into equation (2) gives

$$\Delta q_{i,t} = \left(\sum_j a^q_{i,j} \beta_j + b^q_i \beta^g \right) s^y_{US,t} + \varepsilon_{i,t}, \tag{5}$$

where $\varepsilon_{i,t} = \tilde{\varepsilon}_{i,t} + \varepsilon^g_t$. This equation is the starting point for our empirical analysis.

Identification assumptions As is common in studies using high frequency identification, we proceed with the assumption that the error $\varepsilon_{i,t}$ is uncorrelated with the surprise $s^y_{US,t}$. As we discuss below, this assumption may require to control for additional news releases that systematically occur within the window $[t - \Delta^-, t + \Delta^+]$. Gürkaynak and Wright (2013)

argue that this assumption is plausible for intra-day analyses.

We also assume—and this assumption is specific to our empirical framework—that surprises in U.S. macroeconomic variables are not used to forecast state variables that are specific to countries other than the U.S. That is, $\beta_j = 0$ for $j \neq US$. To give an example, we assume that it is not the case that market participants use U.S. payroll employment to forecast the country-specific component of Belgian TFP. For commonly used state estimation frameworks (Kalman filter), a sufficient condition for this assumption to hold is that countries other than the U.S. are *small*. Continuing with the earlier example, a change in Belgian TFP has no impact on U.S. macroeconomic variables, and hence, the forecaster would find no useful correlation to predict Belgian TFP when new information about the U.S. macroeconomy becomes available.

Under this second identification assumption, equation (5) becomes

$$\Delta q_{i,t} = \left(\underbrace{a^q_{i,US}\beta_{US}}_{\text{transmission from U.S.}} + \underbrace{b^q_i \beta^g}_{\text{common shock}} \right) s^y_{US,t} + \varepsilon_{i,t}. \tag{6}$$

This estimating equation makes clear that a significant coefficient on the U.S. macroeconomic surprise reflects two different components. First, if the surprise leads to an update of market participants' expectations on U.S. state variables (as captured by nonzero elements in the vector β_{US}), and if changes in U.S. state variables impact the foreign asset price (the vector $a^q_{i,US}$ contains nonzero elements), then the inner product $a^q_{i,US}\beta_{US}$ can be different from zero. This component thus reflects *transmission* of macroeconomic shocks from the U.S. to country i. Second, the surprise $s^y_{US,t}$ may be useful to forecast global state variables (β^g contains nonzero elements). In this case, a significant coefficient on the surprise reflects that country i is impacted by a *common shock*.

It also follows from equation (6) that heterogeneity in countries' asset price responses to U.S. macroeconomic news, reflects heterogeneity in how U.S. country-specific shocks affect country i (as captured by $a^q_{i,US}$), or how country i responds to global shocks (as captured by b^q_i). We explore this heterogeneity in our empirical analysis in section 4. In section 5, we study whether the heterogeneity in transmission and responsiveness to common shocks correlates with observables such as trade and financial openness. Lastly, we explore avenues that allow us to distinguish between transmission and common shocks, but we defer a discussion of this methodology to section 6.

3 Data

3.1 U.S. Macroeconomic News

The data on macroeconomic news come from Bloomberg's U.S. Economic Calendar. For a given macroeconomic release, Bloomberg reports, among other things, release date and time, released value, median market expectation, and a relevance index.[5] Table 1 provides an overview of the macroeconomic news in our sample. Throughout this paper, we only focus on announcements with relevance above 90.[6] Following prior work, we treat different releases for the same macroeconomic variable, for instance, the advanced, second, and third release of GDP, as separate news series.

Table 1: U.S. Macroeconomic News

Event	Relevance	Observations	Frequency	Time (EST)	Weekday
CPI MoM	96	271	Monthly	8:30 am	Tuesday–Friday
Change in Nonfarm Payrolls	99	268	Monthly	8:30 am	Friday
Conf. Board Consumer Confidence	94	268	Monthly	10:00 am	Tuesday
Durable Goods Orders	93	245	Monthly	8:30 am	Monday–Friday
GDP Annualized QoQ A	97	89	Quarterly	8:30 am	Wednesday–Friday
GDP Annualized QoQ S	97	88	Quarterly	8:30 am	Tuesday–Friday
GDP Annualized QoQ T	97	89	Quarterly	8:30 am	Tuesday–Friday
Housing Starts	90	254	Monthly	8:30 am	Monday–Friday
ISM Manufacturing	95	271	Monthly	10:00 am	Monday–Friday
Initial Jobless Claims	98	1140	Weekly	8:30 am	Thursday
New Home Sales	91	261	Monthly	10:00 am	Monday–Friday
Retail Sales Advance MoM	92	217	Monthly	8:30 am	Tuesday–Friday
U. of Mich. Sentiment P	94	241	Monthly	10:00 am	Friday
U. of Mich. Sentiment F	94	242	Monthly	10:00 am	Wednesday/Friday

Notes: This table displays the 14 macroeconomic series analyzed in the paper. The sample ranges from November 1997 to June 2019. *Relevance* indicates the percentage of alerts set for the particular release to total alerts. *Observations* refers to number of observations (surprises) of a macroeconomic series, *Frequency* to the frequency of the data releases, *Time* and *Weekday* to the regular time and weekday of the release, respectively. Abbreviations: EST — Eastern Standard Time; A — advanced; S — second; T — third; P — preliminary; F — final.

Consistent with equation (1) (and with slight abuse of notation), we construct surprises

[5] The relevance index indicates the percentage of alerts set for the particular release to total alerts.

[6] Despite having a relevance index of above 90, *Markit US Manufacturing PMI* is excluded from our analysis due to its small sample number of observations (less than 50). Further, *Durable Goods Orders* is split into a preliminary and final release from 2016 on. Below, *Durable Goods Orders* refers to the preliminary release of this variable from 2016 on since the final release has at a different time and day of the month than the original release.

by subtracting from a given U.S. macroeconomic series its forecast,

$$s^{y}_{US,t} = \frac{y_{US,t} - E\left[y_{US,t}|\mathcal{I}_{t-\Delta^-}\right]}{\hat{\sigma}^{y}_{US}}, \tag{7}$$

where $y_{US,t}$ is the released value and $E\left[y_{US,t}|\mathcal{I}_{t-\Delta^-}\right]$ is the median market expectation of the release. To make the magnitude of surprises comparable across series, we also divide by the sample standard deviation of $y_{US,t} - E\left[y_{US,t}|\mathcal{I}_{t-\Delta^-}\right]$, denoted by $\hat{\sigma}^{y}_{US}$.

Figure 1 shows the resulting time series of standardized surprises for each macroeconomic variable. Reassuringly, all series of surprises are centered at zero. Further, there is no discernible pattern of autocorrelation, and there is no systematic trend in the standard deviation of surprises. Some series such as initial jobless claims and retail sales appear to have somewhat higher volatility during recessions. In contrast, other series such as housing starts and new home sales, appear to have lower volatility during downturns. Overall, there is no indication that using these surprises as our identifying variation is econometrically problematic.

3.2 Financial Data

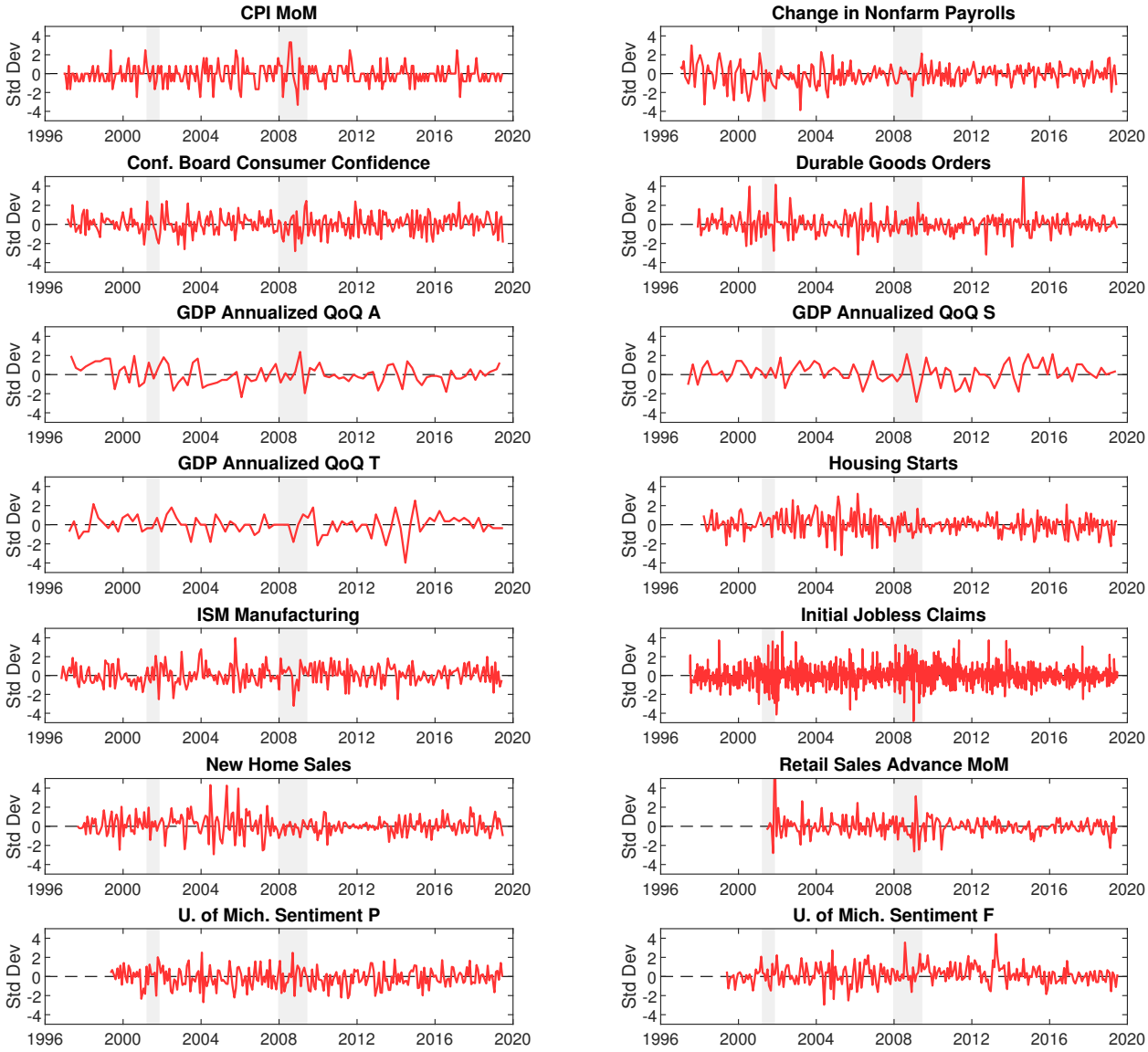
Intraday data on asset prices are from *Thomson Reuters Tick History* and are obtained from *Refinitiv*. For each country we construct minute-by-minute series of its major stock market index and the exchange rate of its currency. Exchange rates are expressed in U.S. dollars so that an increase reflects a depreciation of the U.S. dollar relative to the foreign currency.[7] Table 2 provides an overview of the countries in the sample, the stock market indexes, and the sample periods.

The composition of our sample reflects two sorts of constraints. First, our intra-day analysis requires that the time window around a particular news release lies within the trading hours of the respective stock market index. For instance, Asian and Australian equity markets are closed during typical release times of U.S. macroeconomic variables and are thus not included in our sample. This constraint does not apply to currencies. Forex markets trade 24 hours from Sunday to Friday. Second, we require that the underlying equities of our sample are traded in liquid markets. Appendix Table A1 summarizes, which equity markets in our sample are open for each announcement.

We discuss additional data used in our empirical analysis in section 5.

[7] For given minute, we use the last quoted index level and exchange rate, where the latter is calculated as the middle rate, i.e. the average of the bid and the ask price.

Figure 1: Time Series of Standardized Surprises



Notes: This figure shows the standardized surprises for each macroeconomic series over the sample period. The construction follows equation (7) in the text. Gray bars indicate NBER recession periods.

Table 2: Overview of Cross-Country Financial Data

Country	ISO	Equity		Forex	
		Index	Sample	Currency	Sample
Argentina	ARG	MERVAL	1996–2019	ARS	1996–2019
Brazil	BRA	IBOVESPA	1996–2019	BRL	1996–2019
Canada	CAN	TSX	2000–2019	CAD	1996–2019
Switzerland	CHE	SMI	1996–2019	CHF	1996–2019
Chile	CHL	IPSA	1996–2019	CLP	1996–2019
Czech Republic	CZE	PX	1999–2019	CZE	1996–2019
Denmark	DNK	OMX C 20	2000–2019	DKK	1996–2019
United Kingdom	GBR	FTSE 100	1996–2019	GBP	1996–2019
Hungary	HUN	BUX	1997–2019	HUF	1996–2019
Mexico	MEX	MXX	1996–2019	MXN	1996–2019
Norway	NOR	OBX	1996–2019	NOK	1996–2019
Poland	POL	WIG 20	1997–2019	PLN	1996–2019
Russia	RUS	IMOEX	2001–2019	RUB	1998–2019
Sweden	SWE	OMX S 30	1996–2019	SEK	1996–2019
Turkey	TUR	Bist 30	1997–2019	TRY	2004–2019
South Africa	ZAF	JTOPI	2002–2019	ZAR	1996–2019
Euro Area	EUR			EUR	1999–2019
Austria	AUT	ATX	1996–2019		
Belgium	BEL	BFX	1996–2019		
Germany	DEU	DAX 30	1996–2019		
Spain	ESP	IBEX	1996–2019		
Finland	FIN	OMX H 25	2001–2019		
France	FRA	CAC 40	1996–2019		
Greece	GRC	ATF	1997–2019		
Ireland	IRL	ISEQ	1996–2019		
Italy	ITA	FTSE MIB	1996–2019		
Netherlands	NLD	AEX	1996–2019		
Portugal	PRT	PSI 20	1996–2019		

Notes: This table details the list of countries employed throughout the analysis. For a given country, it provides the stock index and currency with the respective data samples. For members of the Euro Area, we do not use country-specific exchange rates prior to the currency union due to the small sample.

4 The Effect of Macroeconomic News on International Equity Markets and Exchange Rates

4.1 Pooled Effects

We begin our empirical analysis with demonstrating that international stock market indexes and exchange rates respond to the release of news about the U.S. economy. These estimates

largely replicate existing work although our sample covers a broader set of countries. We estimate pooled regressions of the form

$$\Delta_h q_{i,t-15} = \alpha + \gamma_h^y s_{US,t}^y + \sum_{k \neq y} \gamma_h^k s_{US,t}^k + \varepsilon_{i,t}, \tag{8}$$

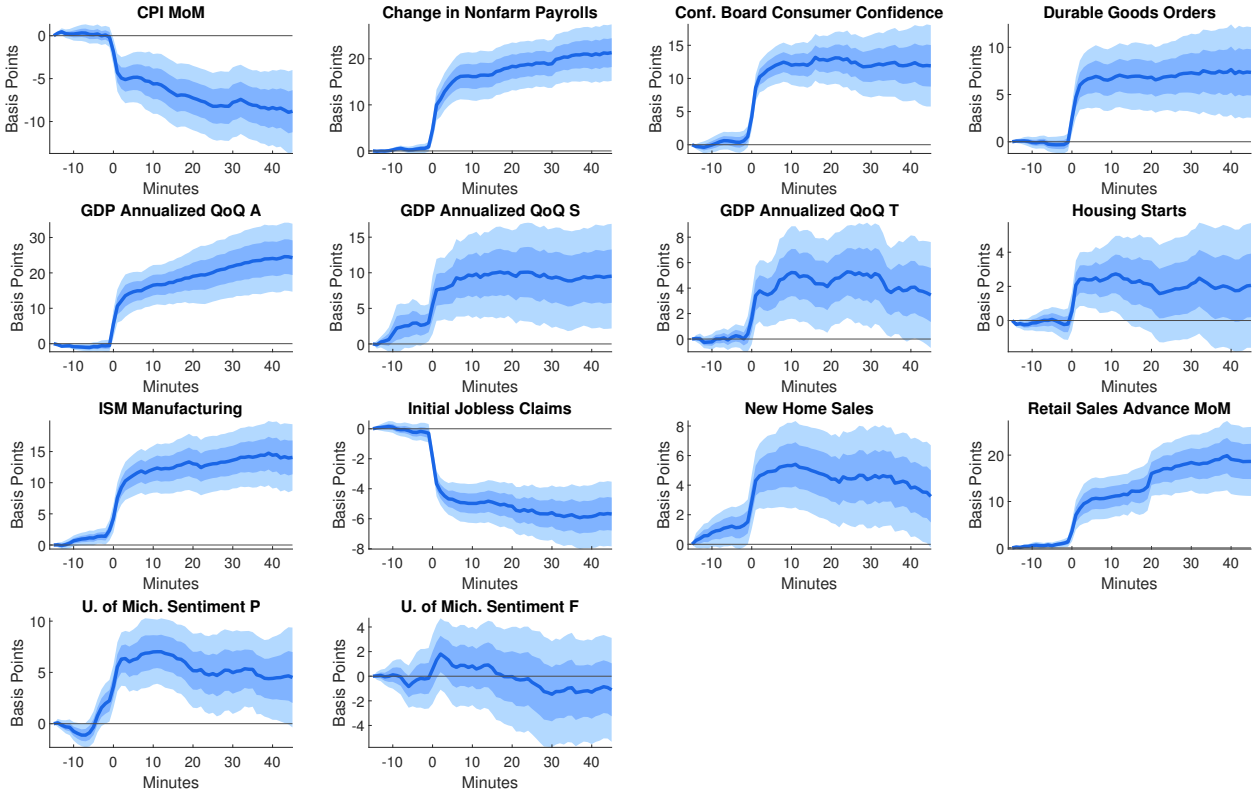
where $\Delta_h q_{i,t-15} = q_{i,t-15+h} - q_{i,t-15}$, $h = 0, 1, ..., 60$ (minutes), and $q_{i,\tau}$ is alternately the log of country i's stock market index or exchange rate. In equation (8), $s_{US,t}^y$ is the surprise of interest. We also include other surprises about U.S. macroeconomic variables, $s_{US,t}^k$, which are published within the time window we study. For instance, the BLS publishes the change in U.S. payroll employment together with the unemployment rate (and other macroeconomic variables) as part of a news release about the *Employment Situation*. Hence, attributing asset price changes solely to the surprise about the change in payroll employment may be misleading. To account for the fact that surprises on the right hand side are U.S.-specific and thus perfectly correlated across countries, we cluster standard errors by announcement.

As Figure 2 demonstrates, equity markets experience a sharp jump around the release time. In all cases, the direction of the response has the anticipated sign. Positive news raise equity prices and negative news (jobless claims) reduce them. The only announcement that does not systematically move international equity prices is the final release of the University of Michigan's Consumer Sentiment index. The size of the response varies by announcement. A one standard deviation positive surprise in nonfarm payroll or GDP A (advanced estimate) raises international stock market indexes by 15 to 20 basis points. Surprises in other variables, notably housing starts, have smaller effects.

A number of previous papers have documented that some asset prices drift prior to certain announcements (Lucca and Moench, 2015; Kurov et al., 2019). Such drifts may reflect information leakage or superior forecasting ability relative to the median forecast and can, in extreme cases, cloud the interpretation of results. With the exception of the second release of GDP and potentially New Home Sales there is little evidence for sizable pre-announcement drifts, in line with earlier work studying pre-announcement drifts of U.S. macroeconomic news.

Figure 3 shows the evolution of exchange rates around U.S. news releases. Consistent with earlier work, the dollar generally appreciates relative to foreign currencies after positive surprises about the U.S. economy, although some macroeconomic news such as the Conference Board Consumer Confidence index and the second GDP release induce no such response. Again, surprises in nonfarm payroll employment and the advanced GDP release have the

Figure 2: Average Equity Market Path within 60-minute Window



Notes: This figure displays the average equity market path within a 60 minute window for a given news release. The changes are relative to the level 15 minutes prior to each release obtained by estimating equation 8. The dark and light blue bands display the 68 percent and 95 percent confidence bands, respectively. Standard errors are clustered at event-level.

largest effects. Pre-announcement drift does not appear to be an important property of these estimates.

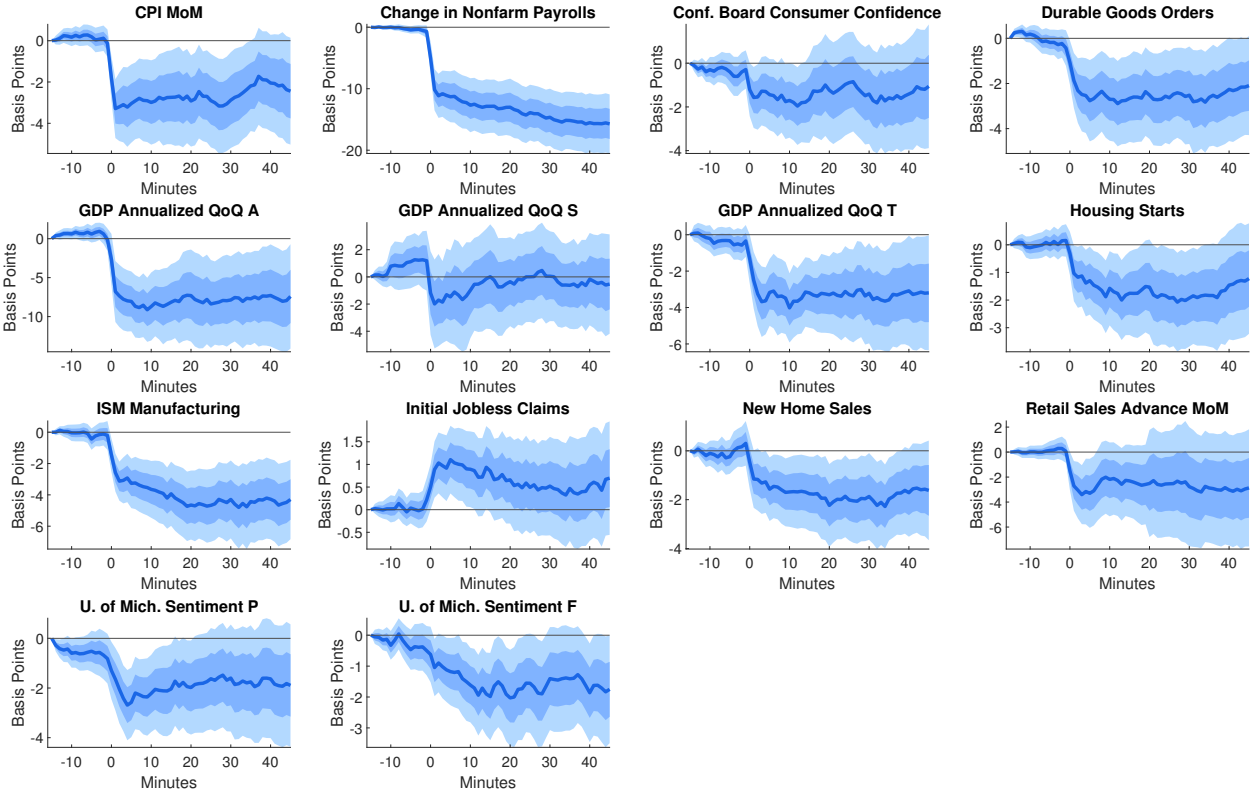
4.2 Cross-country Heterogeneity

We next study heterogeneity in countries' asset price responses to U.S. macroeconomic news releases. In particular, we estimate

$$\Delta q_{i,t} = \alpha_i + \gamma_i^y s_{US,t}^y + \sum_{k \neq y} \gamma_i^k s_{US,t}^k + \varepsilon_{i,t}, \tag{9}$$

where $\Delta q_{i,t} = \bar{q}_{i,t+20} - \bar{q}_{i,t-10}$ with $\bar{q}_{i,t+20} = (q_{i,t+25} + ... + q_{i,t+15})/11$ and $\bar{q}_{i,t-10} = (q_{i,t-15} + ... + q_{i,t-5})/11$. Different from equation (8), the coefficients γ_i^y are now specific to each country. As discussed in Section 2, estimated differences likely reflect heterogeneity in (1) how U.S. shocks are

Figure 3: Average U.S. Dollar Exchange Rate Path within 60-minute Window



Notes: This figure displays the U.S. dollar exchange rate path within a 60 minute window for a given news release. The changes are relative to the level 15 minutes prior to each release obtained by estimating equation 8. The dark and light blue bands display the 68 percent and 95 percent confidence bands, respectively. Standard errors are clustered at event-level.

transmitted to country i and (2) how country i responds to common global shocks (equation 6).

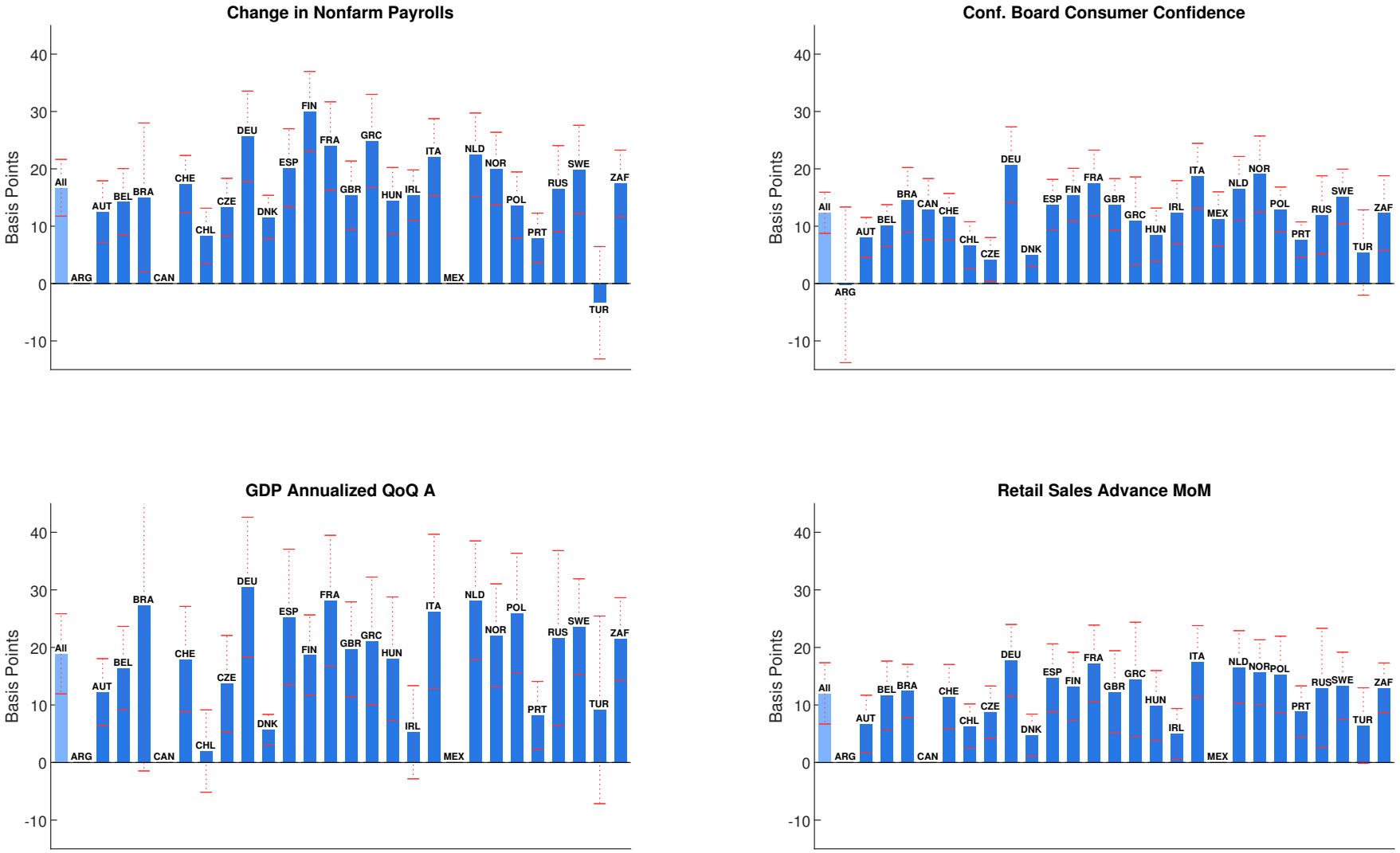
4.2.1 Stock Price Indexes

Figure 4 illustrates heterogeneity in countries' stock index responses for a selected set of announcements. (Appendix Figure B1 shows analogous plots for the remaining announcements.) Two striking features emerge from the figure. First, the sign of the response is the same for all countries (whenever statistically significant). That is, news about the U.S. economy leads market participants to update their view about U.S. and global state variables, as defined in section 2, in such a way, that stock price indexes in essentially all countries move in the same direction. Our evidence therefore does not support mechanisms that imply that changes in certain state variables benefit some countries but not others (as measured

by their equity prices). Thus, changes in U.S. and global state variables appear to drive synchronization of asset prices and potentially the business cycles of the countries in our sample.

Second, Figure 4 hints at a systematic component in countries' responses *across* U.S. macroeconomic news. For news about all four variables, equity prices in countries such as Germany and France consistently respond stronger than the average while equity prices in countries such as Denmark and Portugal consistently respond less than the average. Depending on the announcement, the Danish response is approximately a quarter to a half of the German response. Both responses are reasonably precisely estimated.

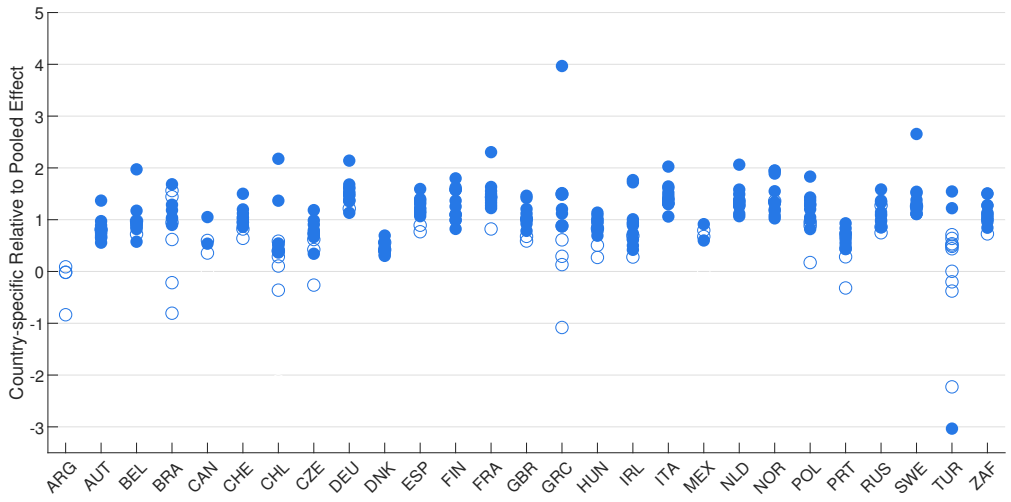
Figure 4: Response of Equity Markets for Selected Announcements



Notes: This figure shows the equity market responses for the four releases with the largest cross-country average effects. The light blue bar shows the pooled effect (Equation (9) with common coefficient γ^y instead of γ_i^y) while the dark blue bars show the country-specific effect, obtained from estimating equation (9). Missing country bars depict cases in which the country is dropped because it had less than 24 observations for a given announcement. The red error bands depict 95 percent confidence intervals, where standard errors are clustered at the event-level. The bar charts for all news releases are shown in Appendix Figure B1.

We continue with exploring the country-specific component in responsiveness in greater detail. Figure 5 plots the country-specific effect $\hat{\gamma}_i^y$ relative to the pooled effect $\hat{\gamma}^y$ (obtained by estimating equation (9) with common coefficients) for all 14 announcements. The figure shows that Germany, France, Italy, Netherlands, Norway, Sweden tend to respond systematically stronger than countries such as Denmark, Chile, Ireland, Mexico, and Portugal. When interpreted through the lens of our empirical framework (Section 2), this finding suggests that the former set of countries responds systematically stronger to U.S. and/or common shocks than the latter set of countries. We highlight again that—with one exception (Turkey)—the sign of the response is the same for all countries and all announcements.

Figure 5: Equity Market Responses by Country



Notes: This figure plots the country-specific equity market response relative to the pooled response, i.e. $\hat{\gamma}_i^y/\hat{\gamma}^y$. A filled circle indicates significance at the 5 percent level while an empty circle indicates an insignificant effect.

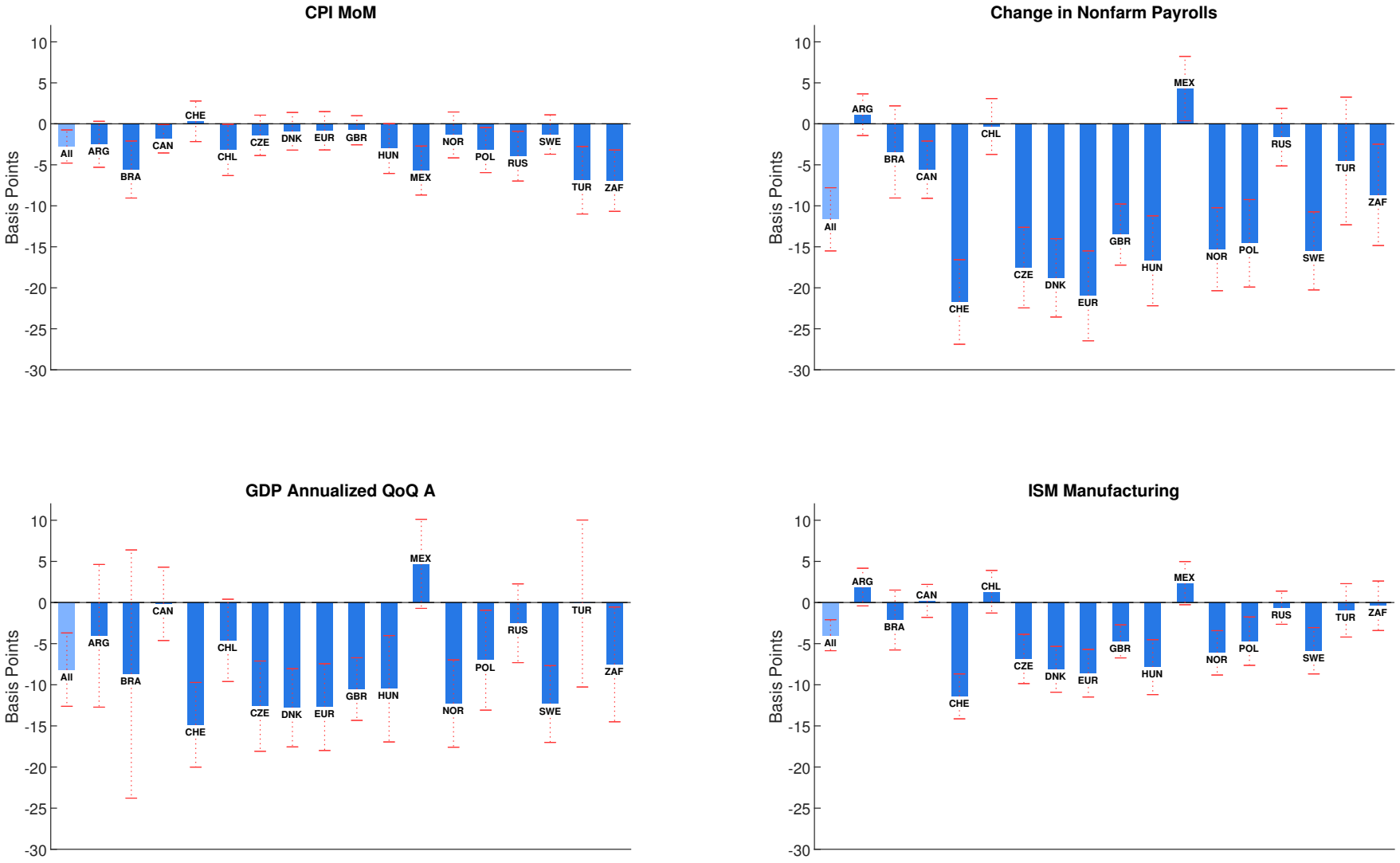
4.2.2 Exchange rates

We next turn to the heterogeneity of exchange rate responses. Figure 6 shows the currency-specific estimates for 4 selected announcements. (The full set announcements is shown in Appendix Figure B2.) As the top left panel shows, surprises in *CPI MoM* have small and insignificant effects for currencies of most developed countries, but exchange rates of developing countries such as Brazil, Mexico, Turkey, and South Africa exhibit a sizable and significant response. Higher-than-expected inflation leads these currencies to depreciate against the dollar.

After positive surprises in *Change in Nonfarm Payrolls*, *GDP Annualized QoQ A*, or

the *ISM Manufacturing*, exchange rates of developing countries (except Hungary) respond weakly and often insignificantly. Currencies of developed countries, however, depreciate against the dollar.

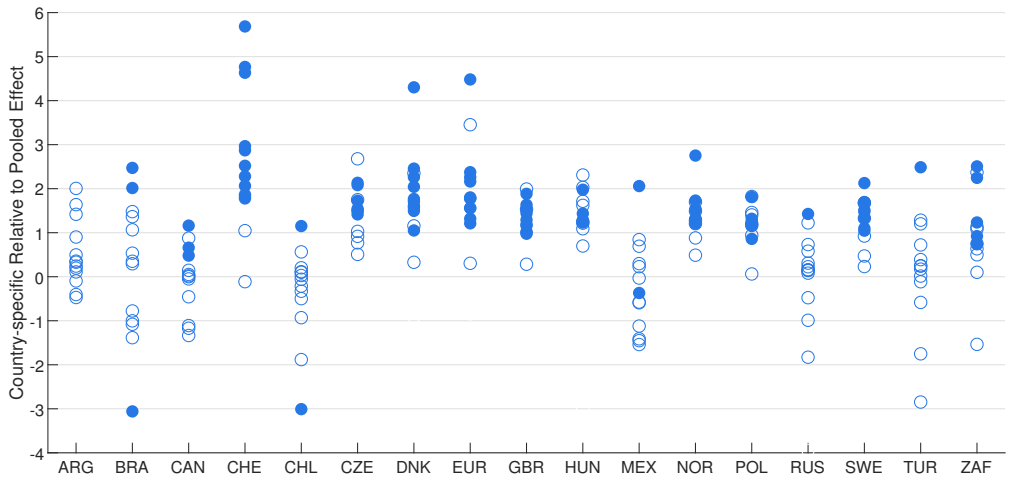
Figure 6: Response of U.S. Dollar Exchange Rates for Selected Announcements



Notes: This figure shows the U.S. dollar exchange rate responses for the four releases with the largest cross-country average effects. The light blue bar shows the pooled effect (Equation (9) with common coefficient γ^y instead of γ_i^y) while the dark blue bars show the country-specific effect, obtained from estimating equation (9). Missing country bars depict cases in which the country is dropped because it had less than 24 observations for a given announcement. The red error bands depict 95 percent confidence intervals, where standard errors are clustered at the event-level. The bar charts for all news releases are shown in Appendix Figure B2.

Figure 7 explores the systematic component of currencies responses to all 14 announcements. The Swiss Franc stands out as the most responsive currency, followed by the Euro and the Danish Kronor. Broadly, European exchange rates tend to display similar behavior (the Czech Republic (CZE), Denmark (DNK), the Euro Area (EUR), the United Kingdom (GBR), Hungary (HUN), Norway (NOR), Poland (POL), Sweden (SWE)). Currencies of developing countries often respond with the opposite sign—and sometimes significantly so (Brazil (BRA) and Chile (CHL)).

Figure 7: U.S. Dollar Exchange Rate Responses by Country



Notes: This figure plots the country-specific U.S. dollar exchange rate response relative to the pooled response, i.e. $\hat{\gamma}_i^y / \hat{\gamma}^y$. A filled circle indicates significance at the 5 percent level while an empty circle indicates an insignificant effect.

5 International Integration and Responsiveness to U.S. news

In this section we explore whether countries' asset price responsiveness to U.S. news correlates with measures of globalization. In particular, we study the role of financial integration and openness to trade. The evidence in this section relates to a large literature studying whether greater integration is associated with more correlated business cycles (e.g. Kose, Prasad, and Terrones (2003)).

We estimate specifications of the form

$$\Delta q_{i,t} = \alpha_i + \gamma^y s^y_{US,t} + \delta^y \left(s^y_{US,t} \times \text{Int}_{i,t-} \right) + \sum_{k \neq y} \gamma^k s^k_{US,t} + \sum_{k \neq y} \delta^k \left(s^k_{US,t} \times \text{Int}_{i,t-} \right) + \zeta \text{Int}_{i,t-} + \varepsilon_{i,t}, \tag{10}$$

where $\text{Int}_{i,t-}$ is a measure of integration and the subscript $t-$ indicates that the measures is predetermined (we use the calendar year prior to the announcement).

For ease of interpretation, we standardize the measures of integration by first subtracting the sample mean and then by dividing by the sample standard deviation. Hence, the main effect γ^y in equation (10) captures the average response and δ^y captures the differential response of a country with a one standard deviation greater-than-average degree of integration.

5.1 Measures of integration

As is common in the literature, we measure financial integration of country i in year τ as

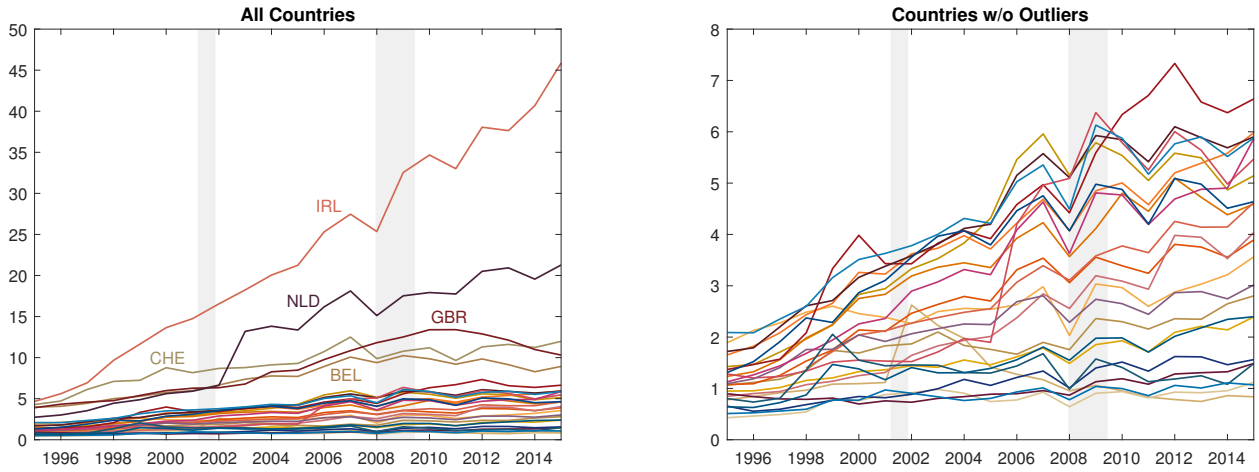
$$\text{finInt}_{i,\tau} = \frac{\text{FA}_{i,\tau} + \text{FL}_{i,\tau}}{\text{GDP}_{i,\tau}}, \tag{11}$$

where $\text{FA}_{i,\tau}$ and $\text{FL}_{i,\tau}$ denote the stock of foreign assets and liabilities, respectively. All series are measured in current U.S. dollars, and the data are taken from Lane and Milesi-Ferretti (2007, 2017).[8]

Figure 8 plots the time series of the financial integration measures. As the left panel demonstrates, a handful of countries experience an enormous growth in financial integration, most notably Ireland (IRL). While we report results for all countries in Appendix B, we prefer a set of baseline results that excludes these countries (Ireland (IRL), Switzerland (CHE), the Netherlands (NLD), the United Kingdom (GBR), and Belgium (BEL)), since they may unduely drive the results. The right panel of Figure 8 plots the financial integration measures for remaining countries.

[8] Theory does not make clear predictions as to whether these measures should be constructed at the bilateral level, i.e. between country i and the U.S., or at the multilateral level as equation (11). In our baseline analysis we use multilateral measures.

Figure 8: Time Series of Financial Integration by Country



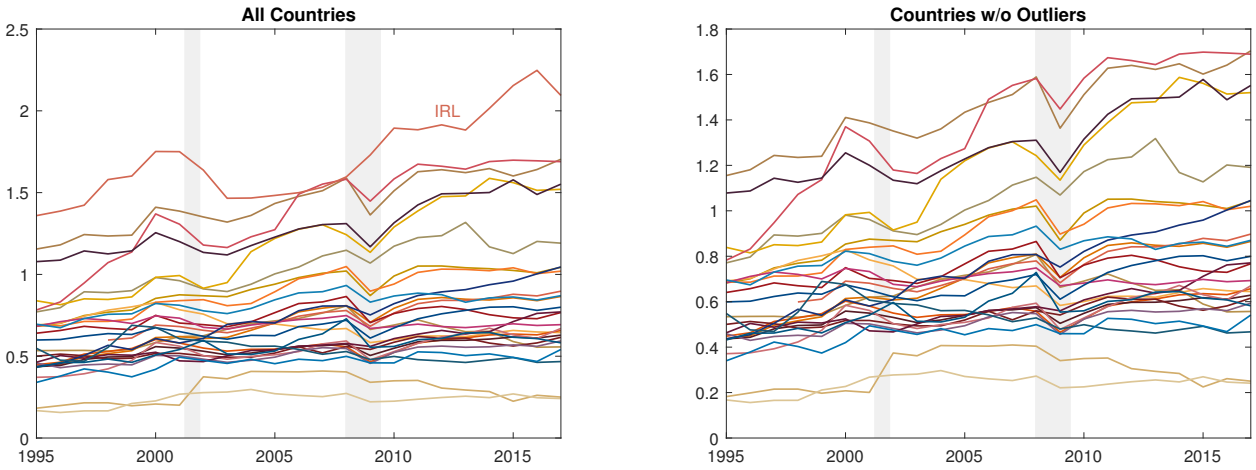
Notes: This figure shows the time series of financial integration from 1995 to 2015. The construction of the measure follows equation (11). The left hand side graph depicts the time series for all countries in the sample. The right hand side excludes the time series for the five outliers, i.e. Belgian, Ireland, Netherlands, Switzerland, and the United Kingdom. Note that the Euro Area is a separate line in both graphs.

Again following previous work, we measure trade integration (or openness) for country i and year τ as

$$\text{tradeInt}_{i,\tau} = \frac{\text{Imports}_{i,\tau} + \text{Exports}_{i,\tau}}{\text{GDP}_{i,\tau}}. \tag{12}$$

The time series of this measure are shown Figure 9. Relative to the financial integration measure, there is no clear outlier among this set of countries. For our baseline estimates we only exclude Ireland (IRL), since it is well-known that profit-shifting motives of multinational firms may artificially inflate Ireland's degree of trade openness. Again, results for a sample that includes Ireland are reported in Appendix B. Figures 8 and 9, both the between country and the within country variation of integration measures are sizable.

Figure 9: Time Series of Trade Integration by Country



Notes: This figure shows the time series of trade integration from 1995 to 2017. The construction of the measure follows equation (12). The left hand side graph depicts the time series for all countries in the sample. The right hand side excludes the time series for the five outliers, i.e. Ireland. Note that the Euro Area is a separate line in both graphs.

5.2 Results

5.2.1 Financial Integration

The top panel of Table 3 shows the estimates of equation (10) for stock market indexes on the left hand side, and using financial openness as the measure of integration. For 6 out of 14 news releases, the interaction term has a significant coefficient. Further, in all of these 6 cases the interaction term has the same sign as the main effect, indicating that countries with greater financial integration are more affected by news about the U.S. economy. The size of the interaction term is often large. For instance, in response to surprises about nonfarm payroll employment, a country with 1.5 standard deviations of greater-than-average financial openness responds twice as much as the average country.

When interpreting these results, it is important to note that the following. While we argue that asset prices *causally* respond to U.S. news releases, a significant interaction term does *not* necessarily imply that greater financial integration *causes* these responses to be greater. It is likely, for instance, that other measures of integration correlate with financial openness and ultimately drive the estimate on the interaction term. Nonetheless, our finding is important since it implies that financial integration itself or correlates of financial integration lead to greater asset price responsiveness to U.S. news.

The bottom panel of Table 3 shows estimates for exchange rates on the left hand side.

For 7 out of 14 announcements, the interaction term with financial integration is statistically significant. Countries with greater financial integration respond systematically stronger to these 7 U.S. news releases. Again, the magnitudes of the interaction terms are often large. Changing the financial integration measure by two standard deviations often doubles the effect. It is also worth noting that it is often the same announcement for which the interaction terms are significant for both stock market indexes and exchange rates on the left hand side. These announcement include nonfarm payrolls, GDP T, the ISM manufacturing index, and retail sales.

The results trade integration are shown in Table 4. With stock market indexes on the left hand side, the interaction with trade openness is significant for 2 out of 14 announcements. In both cases is the size of the interaction term relatively small. Exchange rates, however, respond systematically stronger for countries with greater trade integration. For 7 out of 14 U.S. news releases is the interaction term significant. The coefficient estimates of the interaction terms are often large. For surprises about nonfarm payroll employment, a one standard deviation increase in trade openness raises the size of the exchange rate response by half.

Table 3: Financial Integration

	CPI	Nonfarm Payrolls	CB Cons. Confidence	Durable Goods	GDP A	GDP S	GDP T	Housing Starts	ISM Mfg	Jobless Claims	New Homes	Retail Sales	UMich Sent P	UMich Sent F
Stock Index (bp)														
News	-7.09***	21.06***	13.70***	6.80***	20.13***	8.42***	4.48**	1.80	12.32***	-5.42***	4.36***	12.96***	6.13***	0.24
	(1.91)	(2.48)	(1.99)	(1.75)	(3.65)	(3.11)	(1.73)	(1.49)	(2.20)	(0.80)	(1.45)	(2.55)	(1.70)	(1.70)
Fin. Integration														
× News	1.16	14.00***	1.13	0.13	-1.24	2.86**	2.90***	1.20	4.73***	-1.19***	0.81	2.74***	0.50	-0.68
	(1.01)	(1.61)	(0.78)	(0.89)	(1.92)	(1.35)	(0.99)	(0.82)	(1.31)	(0.41)	(0.89)	(0.83)	(0.70)	(0.84)
R^2	0.13	0.17	0.13	0.06	0.17	0.08	0.06	0.01	0.12	0.03	0.03	0.15	0.05	0.03
Observations	3704	3719	3998	3667	1251	1277	1208	3657	3675	15905	3886	3266	3788	3837
Exchange Rate (bp)														
News	-1.48	-12.67***	-0.20	-1.91**	-8.22***	-0.66	-1.99*	-1.26	-3.15***	0.37	-1.56**	-2.04	-0.82	-1.62**
	(0.98)	(2.27)	(1.21)	(0.86)	(2.57)	(1.42)	(1.04)	(0.88)	(1.11)	(0.45)	(0.74)	(1.52)	(0.87)	(0.68)
Fin. Integration														
× News	0.54	-7.10***	-0.12	-0.47	-1.89*	-0.08	-0.93**	-0.96*	-1.38**	-0.14	-1.38***	-1.78**	-0.70	-0.40
	(0.49)	(1.42)	(0.47)	(0.39)	(0.97)	(0.67)	(0.44)	(0.51)	(0.62)	(0.27)	(0.51)	(0.74)	(0.43)	(0.34)
R^2	0.07	0.14	0.00	0.02	0.10	0.04	0.07	0.01	0.04	0.03	0.02	0.11	0.02	0.04
Observations	3026	3080	3180	3015	1025	1029	1019	2941	3170	13120	3116	2582	2907	2981

Notes: This table presents the regression results of equation (10) using the financial integration measure for all announcements. Top (bottom) panel shows the results for the stock index (exchange rate) as a dependent variable. Standard errors are clustered at event-level and reported in parentheses. ***, **, and * refer to significance at the 1, 5, and 10 percent level. Appendix Table B1 shows the regression results including the outliers.

Table 4: Trade Integration

	CPI	Nonfarm Payrolls	CB Cons. Confidence	Durable Goods	GDP A	GDP S	GDP T	Housing Starts	ISM Mfg	Jobless Claims	New Homes	Retail Sales	UMich Sent P	UMich Sent F
Stock Index (bp)														
News	-7.47***	17.97***	13.11***	6.29***	20.28***	8.50***	4.67***	1.94	11.57***	-5.09***	3.93***	12.29***	6.16***	0.18
	(1.84)	(2.64)	(1.93)	(1.72)	(3.64)	(2.99)	(1.77)	(1.38)	(2.18)	(0.76)	(1.38)	(2.88)	(1.63)	(1.70)
Trade Integration × News	0.49	3.57***	-0.62	-0.04	-1.59	0.39	0.41	0.54	1.56**	0.23	-0.38	0.08	0.03	-0.49
	(0.54)	(0.79)	(0.55)	(0.45)	(1.26)	(0.63)	(0.65)	(0.46)	(0.76)	(0.21)	(0.52)	(0.39)	(0.46)	(0.49)
R^2	0.14	0.13	0.13	0.05	0.19	0.07	0.04	0.01	0.09	0.03	0.03	0.15	0.05	0.03
Observations	5088	5158	5504	5083	1732	1763	1685	5060	5041	22049	5328	4501	5186	5236
Exchange Rate (bp)														
News	-2.71***	-12.41***	-0.94	-2.22***	-8.61***	-0.82	-2.61***	-1.59**	-3.91***	0.60	-1.70**	-2.44*	-1.09	-1.53**
	(1.04)	(2.12)	(1.13)	(0.84)	(2.42)	(1.33)	(0.99)	(0.80)	(1.02)	(0.43)	(0.69)	(1.37)	(0.81)	(0.65)
Trade Integration × News	0.36	-6.47***	-0.80*	-0.33	-1.18	-0.80	-0.27	-0.68**	-2.42***	0.28	-1.27***	-1.76***	-1.06***	-0.26
	(0.37)	(0.95)	(0.48)	(0.31)	(1.33)	(0.70)	(0.41)	(0.34)	(0.51)	(0.23)	(0.43)	(0.61)	(0.36)	(0.36)
R^2	0.06	0.14	0.01	0.02	0.11	0.02	0.08	0.02	0.05	0.02	0.02	0.10	0.02	0.04
Observations	3883	3945	4058	3861	1311	1317	1305	3776	4045	16808	3964	3341	3725	3809

Notes: This table presents the regression results of equation (10) using the trade integration measure for all announcements. Top (bottom) panel shows the results for the stock index (exchange rate) as a dependent variable. Standard errors are clustered at event-level and reported in parentheses. ***, **, and * refer to significance at the 1, 5, and 10 percent level. Appendix Table B2 shows the regression results including the outliers.

6 Transmission vs. Common Shocks

To be completed

7 Conclusion

To be completed

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A Appendix: Data

Table A1: Overview of Open/Closed Equity Markets during U.S. Macroeconomic News Announcements

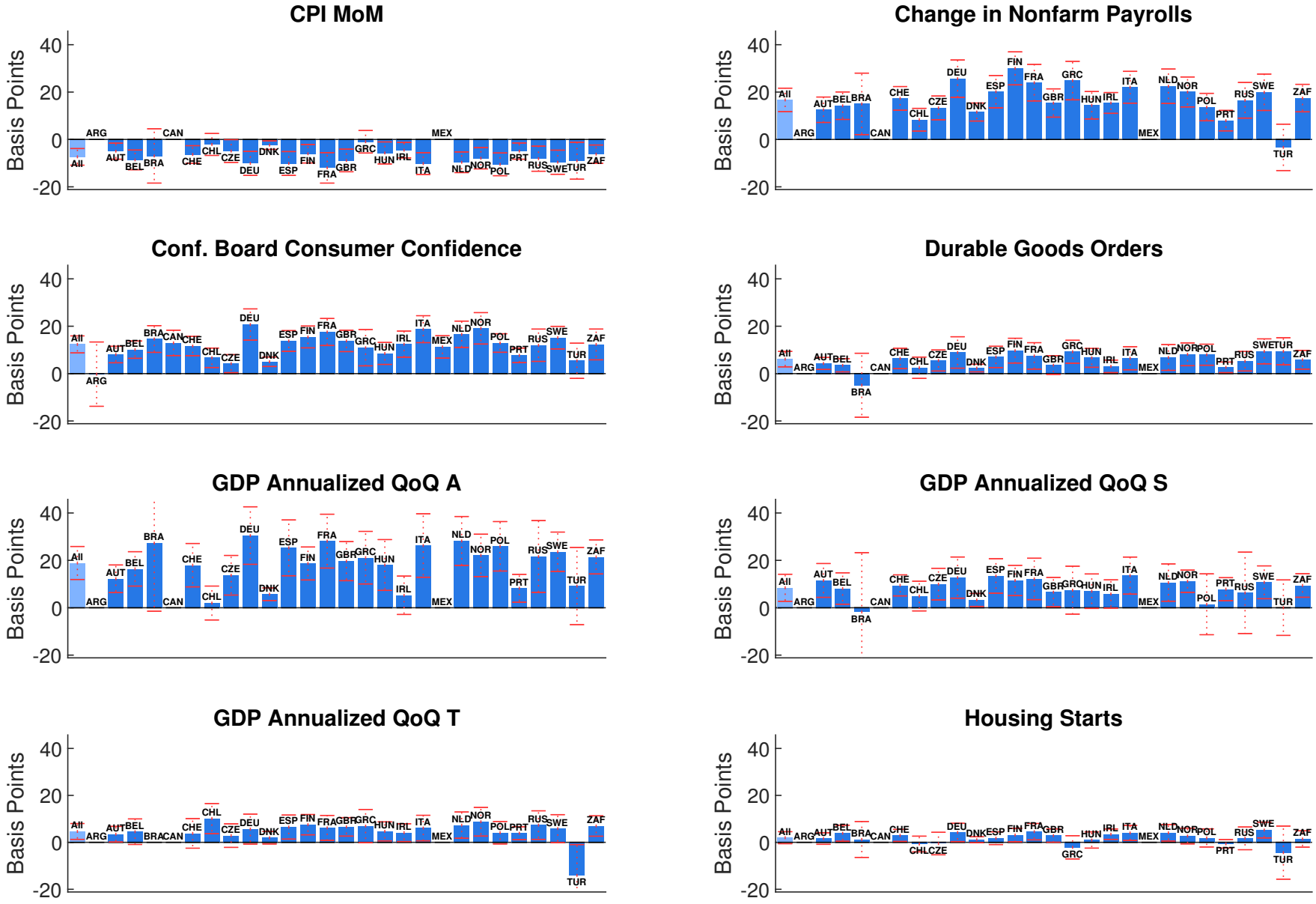
Event	ARG	AUT	BEL	BRA	CAN	CHE	CHL	CZE	DEU	DNK	ESP	FIN	FRA	GBR
CPI MoM	Closed	Open	Open	Open	Closed	Open	Open	Open	Open	Open	Open	Open	Open	Open
Change in Nonfarm Payrolls	Closed	Open	Open	Open	Closed	Open	Open	Open	Open	Open	Open	Open	Open	Open
Conf. Board Consumer Confidence	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open
Durable Goods Orders	Closed	Open	Open	Open	Closed	Open	Open	Open	Open	Open	Open	Open	Open	Open
GDP Annualized QoQ A	Closed	Open	Open	Open	Closed	Open	Open	Open	Open	Open	Open	Open	Open	Open
GDP Annualized QoQ S	Closed	Open	Open	Open	Closed	Open	Open	Open	Open	Open	Open	Open	Open	Open
GDP Annualized QoQ T	Closed	Open	Open	Open	Closed	Open	Open	Open	Open	Open	Open	Open	Open	Open
Housing Starts	Closed	Open	Open	Open	Closed	Open	Open	Open	Open	Open	Open	Open	Open	Open
ISM Manufacturing	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open
Initial Jobless Claims	Closed	Open	Open	Open	Closed	Open	Open	Open	Open	Open	Open	Open	Open	Open
New Home Sales	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open
Retail Sales Advance MoM	Closed	Open	Open	Open	Closed	Open	Open	Open	Open	Open	Open	Open	Open	Open
U. of Mich. Sentiment P	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open
U. of Mich. Sentiment F	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open

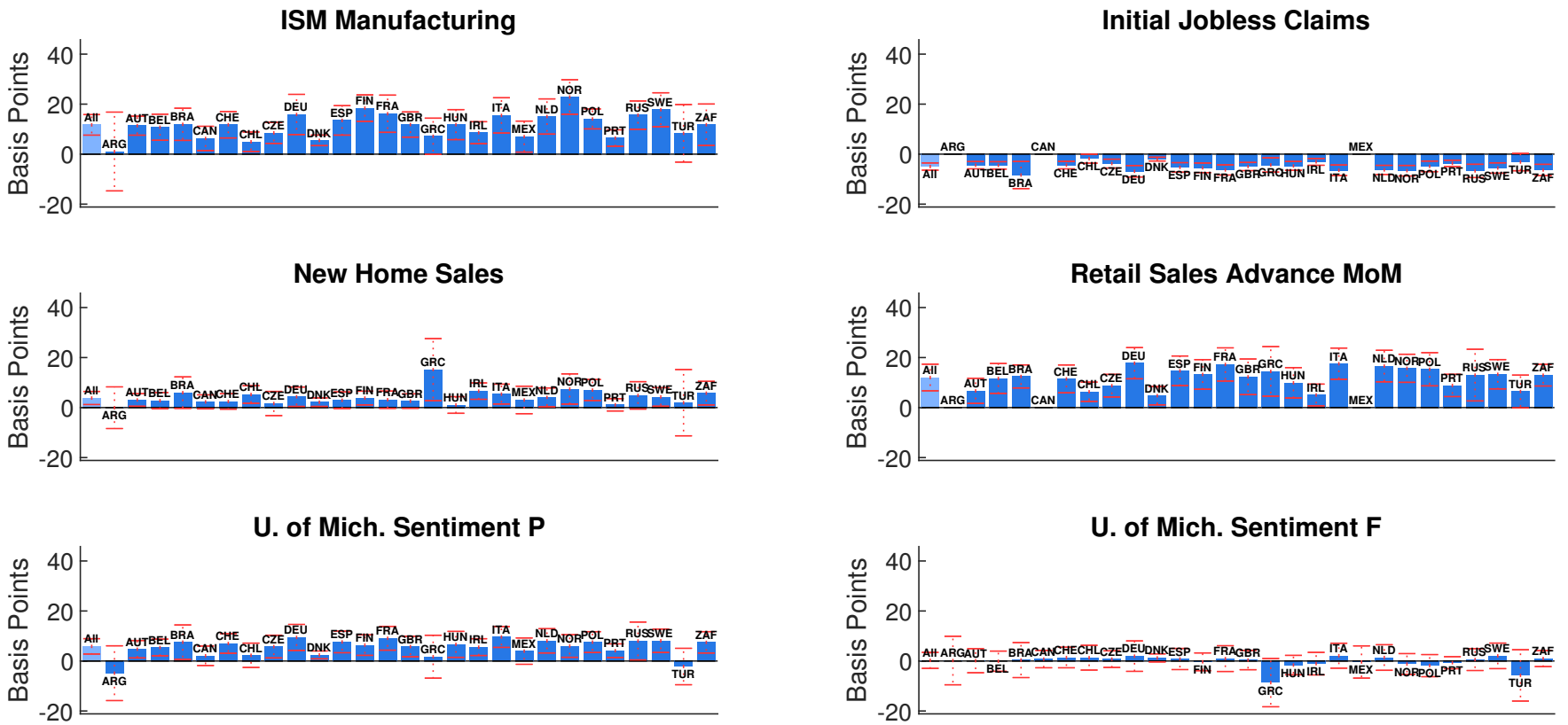
Event	GRC	HUN	IRL	ITA	MEX	NLD	NOR	POL	PRT	RUS	SWE	TUR	ZAF
CPI MoM	Open	Open	Open	Open	Closed	Open	Open	Open	Open	Open	Open	Open	Open
Change in Nonfarm Payrolls	Open	Open	Open	Open	Closed	Open	Open	Open	Open	Open	Open	Open	Open
Conf. Board Consumer Confidence	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open
Durable Goods Orders	Open	Open	Open	Open	Closed	Open	Open	Open	Open	Open	Open	Open	Open
GDP Annualized QoQ A	Open	Open	Open	Open	Closed	Open	Open	Open	Open	Open	Open	Open	Open
GDP Annualized QoQ S	Open	Open	Open	Open	Closed	Open	Open	Open	Open	Open	Open	Open	Open
GDP Annualized QoQ T	Open	Open	Open	Open	Closed	Open	Open	Open	Open	Open	Open	Open	Open
Housing Starts	Open	Open	Open	Open	Closed	Open	Open	Open	Open	Open	Open	Open	Open
ISM Manufacturing	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open
Initial Jobless Claims	Open	Open	Open	Open	Closed	Open	Open	Open	Open	Open	Open	Open	Open
New Home Sales	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open
Retail Sales Advance MoM	Open	Open	Open	Open	Closed	Open	Open	Open	Open	Open	Open	Open	Open
U. of Mich. Sentiment P	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open
U. of Mich. Sentiment F	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open

Notes: *Green* indicates that the corresponding equity market is usually open at the time of the news release. *Orange* indicates that the equity market is usually open but that the news release is around market opening or closing. In the case of Brazil, it indicates that the news release moves outside the trading hours during the U.S. daylight saving time since Sao Paulo, the location of the Brazilian stock market, does not observe daylight saving time. *Red* indicates indicates that the equity market is usually closed at the release time.

B Appendix: Additional Results

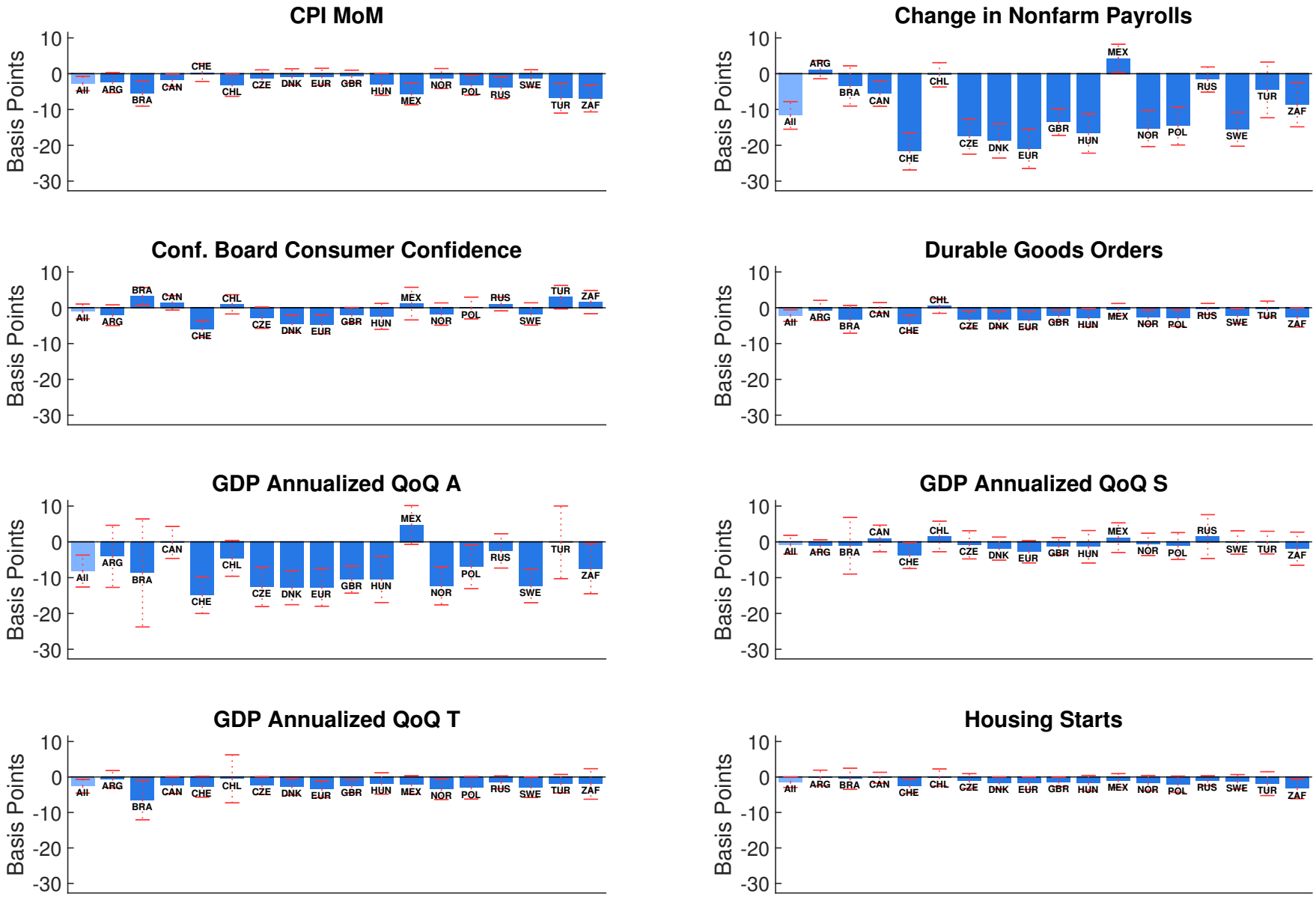
Figure B1: Response of Equity Markets for All Announcements

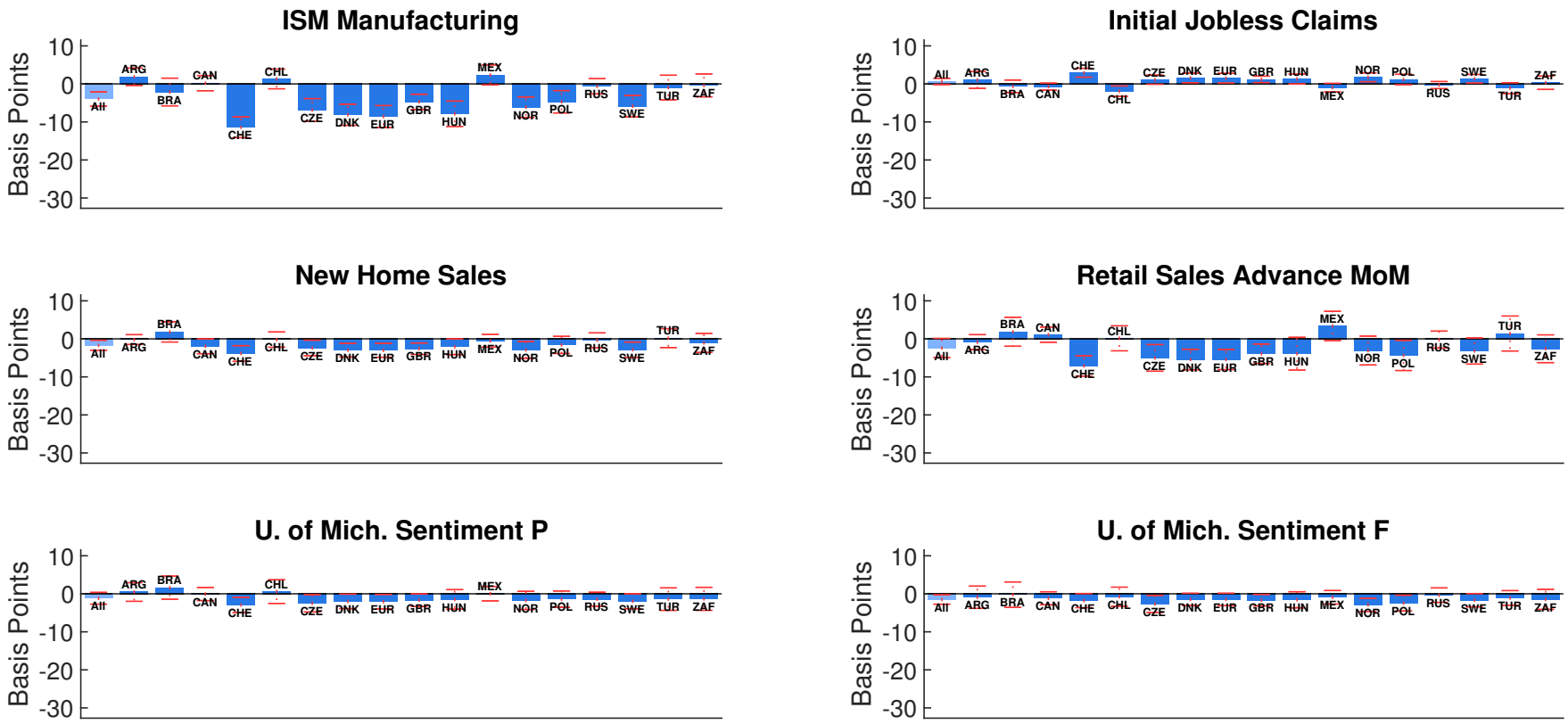




This figure shows the equity market responses for all releases. The light blue bar shows the pooled effect (Equation (9) with common coefficient γ^y instead of γ_i^y) while the dark blue bars show the country-specific effect, obtained from estimating equation (9). Missing country bars depict cases in which the country is dropped because it had less than 24 observations for a given announcement. The red error bands depict 95 percent confidence intervals, where standard errors are clustered at the event-level.

Figure B2: Response of U.S. Dollar Exchange Rates for All Announcements





Notes: This figure shows the U.S. dollar exchange rate responses for all releases. The light blue bar shows the pooled effect (Equation (9) with common coefficient γ^y instead of γ_i^y) while the dark blue bars show the country-specific effect, obtained from estimating equation (9). Missing country bars depict cases in which the country is dropped because it had less than 24 observations for a given announcement. The red error bands depict 95 percent confidence intervals, where standard errors are clustered at the event-level.

Table B1: Financial Integration — All Countries

	CPI	Nonfarm Payrolls	CB Cons. Confidence	Durable Goods	GDP A	GDP S	GDP T	Housing Starts	ISM Mfg	Jobless Claims	New Homes	Retail Sales	UMich Sent P	UMich Sent F
Stock Index (bp)														
News	-7.19***	18.64***	13.83***	6.30***	19.58***	8.60***	4.91***	2.16	12.07***	-5.25***	4.27***	11.98***	6.19***	0.31
	(1.89)	(2.65)	(2.03)	(1.74)	(3.68)	(3.01)	(1.77)	(1.46)	(2.30)	(0.78)	(1.44)	(2.79)	(1.69)	(1.75)
Fin. Integration														
× News	0.49	8.14***	0.95	-0.63	-1.48	0.66	1.31**	0.79*	2.29***	-0.38	0.99*	0.74	0.30	-0.51
	(0.66)	(1.11)	(0.59)	(0.44)	(1.39)	(0.68)	(0.59)	(0.46)	(0.74)	(0.25)	(0.54)	(0.57)	(0.41)	(0.55)
R^2	0.14	0.14	0.14	0.06	0.18	0.08	0.05	0.01	0.10	0.03	0.03	0.15	0.05	0.03
Observations	4821	4881	5149	4785	1638	1669	1593	4764	4740	20799	4990	4200	4819	4865
Exchange Rate (bp)														
News	-1.17	-13.31***	-0.69	-2.10**	-8.92***	-0.85	-2.08**	-1.33	-3.77***	0.62	-1.76**	-2.45*	-0.98	-1.58**
	(0.96)	(2.16)	(1.21)	(0.86)	(2.46)	(1.39)	(1.04)	(0.85)	(1.07)	(0.44)	(0.72)	(1.36)	(0.85)	(0.68)
Fin. Integration														
× News	0.85**	-6.47***	-0.88***	-0.62**	-2.22***	-0.56	-0.73*	-0.84**	-2.02***	0.43**	-1.26***	-1.94***	-0.69**	-0.15
	(0.38)	(0.86)	(0.30)	(0.31)	(0.69)	(0.57)	(0.37)	(0.34)	(0.39)	(0.19)	(0.36)	(0.50)	(0.28)	(0.28)
R^2	0.07	0.16	0.01	0.03	0.12	0.04	0.08	0.01	0.05	0.03	0.02	0.11	0.01	0.04
Observations	3495	3556	3652	3473	1181	1187	1175	3386	3648	15122	3574	2956	3321	3405

Notes: This table presents the regression results of equation (10) using the financial integration measure for all announcements and all countries. Top (bottom) panel shows the results for the stock index (exchange rate) as a dependent variable. Standard errors are clustered at event-level and reported in parentheses. ***, **, and * refer to significance at the 1, 5, and 10 percent level.

Table B2: Trade Integration — All Countries

	CPI	Nonfarm Payrolls	CB Cons. Confidence	Durable Goods	GDP A	GDP S	GDP T	Housing Starts	ISM Mfg	Jobless Claims	New Homes	Retail Sales	UMich Sent P	UMich Sent F
Stock Index (bp)														
News	-7.33***	17.70***	13.11***	6.14***	19.44***	8.40***	4.65***	2.02	11.38***	-4.99***	4.07***	11.88***	6.14***	0.11
	(1.80)	(2.62)	(1.92)	(1.68)	(3.56)	(2.94)	(1.73)	(1.34)	(2.15)	(0.75)	(1.37)	(2.85)	(1.60)	(1.70)
Trade Integration × News	0.76	2.85***	-0.58	-0.37	-2.92**	0.05	0.34	0.61	0.95	0.42*	0.02	-0.79**	-0.04	-0.66
	(0.57)	(0.76)	(0.53)	(0.41)	(1.37)	(0.69)	(0.59)	(0.45)	(0.73)	(0.22)	(0.51)	(0.38)	(0.46)	(0.50)
R^2	0.14	0.12	0.13	0.05	0.19	0.07	0.04	0.01	0.09	0.03	0.03	0.15	0.05	0.03
Observations	5334	5415	5756	5326	1818	1850	1770	5305	5271	23135	5571	4711	5417	5462
Exchange Rate (bp)														
News	-2.71***	-12.41***	-0.94	-2.22***	-8.61***	-0.82	-2.61***	-1.59**	-3.91***	0.60	-1.70**	-2.44*	-1.09	-1.53**
	(1.04)	(2.12)	(1.13)	(0.84)	(2.42)	(1.33)	(0.99)	(0.80)	(1.02)	(0.43)	(0.69)	(1.37)	(0.81)	(0.65)
Trade Integration × News	0.36	-6.47***	-0.80*	-0.33	-1.18	-0.80	-0.27	-0.68**	-2.42***	0.28	-1.27***	-1.76***	-1.06***	-0.26
	(0.37)	(0.95)	(0.48)	(0.31)	(1.33)	(0.70)	(0.41)	(0.34)	(0.51)	(0.23)	(0.43)	(0.61)	(0.36)	(0.36)
R^2	0.06	0.14	0.01	0.02	0.11	0.02	0.08	0.02	0.05	0.02	0.02	0.10	0.02	0.04
Observations	3883	3945	4058	3861	1311	1317	1305	3776	4045	16808	3964	3341	3725	3809

Notes: This table presents the regression results of equation (10) using the trade integration measure for all announcements and all countries. Top (bottom) panel shows the results for the stock index (exchange rate) as a dependent variable. Standard errors are clustered at event-level and reported in parentheses. ***, **, and * refer to significance at the 1, 5, and 10 percent level.