USING NEWSPAPERS FOR TEXTUAL INDICATORS: WHICH AND HOW MANY?

2022

BANCO DE ESPAÑA
Eurosistema

Documentos de Trabajo
N.º 2235

Erik Andres-Escayola, Corinna Ghirelli, Luis Molina,
Javier J. Pérez and Elena Vidal

USING NEWSPAPERS FOR TEXTUAL INDICATORS: WHICH AND HOW MANY? (*)

Erik Andres-Escayola

EUROPEAN CENTRAL BANK

Corinna Ghirelli

BANCO DE ESPAÑA

Luis Molina

BANCO DE ESPAÑA

Javier J. Pérez

BANCO DE ESPAÑA

Elena Vidal

BANCO DE ESPAÑA

(*) The views expressed in this paper are those of the authors and do not necessarily represent the views of the Banco de España or the Eurosystem. E-mail addresses: Erik.Andres Escayola@ecb.europa.eu (E. Andres-Escayola), corinna.ghirelli@bde.es (C. Ghirelli), lmolina@bde.es (L. Molina), javier.perez@bde.es (J. Pérez), elena.vidal@bde.es (E. Vidal). Corresponding author: DG Economics and Statistics, Banco de España, Calle Alcalá 48, 28014 Madrid, Spain. E-mail address: corinna.ghirelli@bde.es.

Documentos de Trabajo. N.º 2235

October 2022

ISSN: 1579-8666 (on line)

Abstract

This paper investigates the role that two key methodological choices play in the construction of textual indicators: the selection of local versus foreign newspapers and the breadth of the press coverage (i.e. the number of newspapers considered). The large literature in this field is almost silent about the robustness of research results to these two choices. We use as a case study the well-known economic policy uncertainty (EPU) index, taking as examples Latin America and Spain. First, we develop EPU measures based on press with different levels of proximity, i.e. local versus foreign, and corroborate that they deliver broadly similar narratives. Second, we examine the macroeconomic effects of EPU shocks computed using these different sources by means of a structural Bayesian vector autoregression framework and find similar responses from the statistical point of view. Third, we show that constructing EPU indexes based on only one newspaper may yield biased responses. This suggests that it is important to maximize the breadth of press coverage when building text-based indicators, since this improves the credibility of results. In this regard, our first and second results are good news for researchers, given that they provide a justification for the combined use of a larger amount of data from local and foreign sources.

Keywords: economic policy uncertainty, textual analysis, press coverage, Latin American economies, business cycles.

JEL classification: D80, C43, E32, O11.

Resumen

Este trabajo investiga el papel que desempeñan dos elecciones metodológicas a la hora de construir indicadores basados en análisis textuales: la selección de periódicos —locales frente a extranjeros— y la amplitud de la cobertura de prensa (es decir, la cantidad de periódicos que se utilizan para elaborarlos). La literatura que se ha ido desarrollando recientemente en este campo apenas toca estos dos temas ni examina la solidez de los resultados ante distintas elecciones en los dos terrenos mencionados. Para ofrecer una respuesta, tomamos como ejemplo el índice de incertidumbre de políticas económicas (EPU, por sus siglas en inglés) para varios países de América Latina y para España. En primer lugar, desarrollamos EPU basados en prensa con diferentes niveles de proximidad, es decir, local frente a extranjera, y corroboramos que ofrecen narrativas similares en términos generales. En segundo lugar, examinamos los efectos macroeconómicos de los *shocks* a los EPU calculados utilizando las diferentes fuentes por medio de un modelo bayesiano de vectores autorregresivos estructural, y encontramos respuestas similares desde el punto de vista estadístico. Finalmente, mostramos que la construcción de índices EPU basados en un solo periódico puede generar respuestas sesgadas. Esto sugiere que es importante maximizar la cobertura de prensa cuando se construyen indicadores basados en texto, ya que esto mejora la credibilidad de los resultados. En este sentido, nuestros primer y segundo resultados son buenas noticias para los investigadores, dado que brindan una justificación para el uso combinado de una mayor cantidad de datos de fuentes locales y extranjeras.

Palabras clave: incertidumbre de política económica, análisis textual, cobertura de prensa, economías latinoamericanas, ciclos económicos.

Códigos JEL: D80, C43, E32, O11.

1 Introduction

A broad and expanding literature in economics uses textual analysis to develop real-time measures of economic activity, policy uncertainty or social unrest. These measures are in turn confronted with economic and financial variables to show their relevance for economic and policy analysis and forecasting. The assumption that text reflects the underlying perceptions and actions of economic agents tends to be validated empirically (see, for example, Bloom, 2009; Bachmann et al., 2013; Jurado et al., 2015; Caldara et al., 2016; Scotti, 2016; Caldara and Iacoviello, 2022).

The literature typically focuses on one broad source of text: either the local press (for single-country studies) or the foreign-based press (for cross-country studies), with an interpretation of the results that abstracts from the type of data source. To convince the reader, most papers focus on the quality of the developed measures, without entering into the vagaries of the potential influence of the type of newspapers used, i.e. local or foreign. For instance, the well-known economic policy uncertainty (EPU) index pioneered by Baker et al. (2016) is based on local news.[1] A country's local press is considered the best option since it provides a detailed narrative of relevant national events. On the other hand, a very recent literature has constructed newspaper-based indicators using major international news sources (mostly leading Anglophone newspapers and networks).[2] The main argument is that using the same source for many countries enhances the cross-country comparability of the resulting indicators.

Table 1 shows a sample of this literature, specifying the number of sources used and their level of proximity with respect to the country of interest.[3] Based on this list, it emerges that there is no clear consensus on how many sources should be used to construct text-based indexes or which type of press should be considered.[4] This significant variation in approaches leaves the following questions open: (i) Do sources with different levels of proximity convey different information?; (ii) What is the role of the breadth of press coverage when constructing text-based indicators?; (iii) Is it better to use a broad coverage or is it sufficient to rely on only one source? These questions are relevant since newspaper repositories are usually not free of charge and the production of newspaper-based economic indicators is growing fast. This paper tries to answer these questions and give some guidance for the construction of these types of indexes.

In our application, we focus on the well-known and broadly used EPU indicator by Baker et al. (2016), for a number of countries: the 6 largest Latin American countries (Argentina,

[1] It was first calculated for the US and then constructed for other countries. The Policy Uncertainty website centralizes all EPU indexes based on the procedure of Baker et al. (2016).

[2] Examples include the political violence index of Mueller and Rauh (2018), the geopolitical risk index (Caldara and Iacoviello, 2022), the World Uncertainty Index (Ahir et al., 2019) and the Reported Social Unrest Index (Barrett et al., 2020).

[3] Note, this list is not exhaustive. Another strand of the literature relies on massive sources such as the entire Dow Jones news archives. We do not mention this literature since it is out of scope.

[4] A dedicated literature related to journalism examines differences between local and foreign press coverage and the consequences for textual analysis, giving examples of how different news sources may convey different messages (Papacharissi and de Fatima Oliveira, 2008; Pollak et al., 2011).

Brazil, Chile, Colombia, Mexico and Peru), as examples of emerging market economies, and Spain, as an example of a developed country. We construct this indicator for each country on the basis of, alternatively, local and foreign newspapers. When considering foreign sources, we select the major international newspapers produced in the US, the UK and Canada, since the Anglophone press is the most standard international source used in the literature. For Latin American countries, we pool the Anglophone press with Spanish news (major Spanish-language newspapers produced in Spain), given the economic importance of Latin America for Spain and the close cultural and economic ties between them (Ghirelli et al., 2021).[5] We then compare the narratives emerging from these indexes and examine their macroeconomic effects using a structural Bayesian vector autoregression (BVAR) framework. One possible hypothesis is that news with different levels of proximity convey different messages to the readers and this might affect newspaper-based indicators. However, we show quite the opposite. Although EPU indexes based on local and foreign news show obvious differences, they reflect the same narrative overall and deliver extremely similar macroeconomic impulse responses.[6] Notably, we find that a rise in policy uncertainty induces a decline in GDP growth, in line with expectations and the existing literature. GDP responses are small in magnitude but quite long-lasting, as they take about two years to revert to trend.

In the second part of our analysis, we first put forward the hypothesis that it is best to consider as many sources as possible when constructing newspaper-based indexes. Then, to shed some light on this issue, we show that it is often the case that macroeconomic responses to EPU indexes based on only one newspaper lie outside the confidence bands of responses to the EPU index based on all sources available in Factiva's global news database. This suggests that EPU indexes based on one single newspaper may provide biased results and that it is best to rely on multiple sources when constructing these indexes. That is, the larger the press coverage, the better.

This paper offers some general lessons for the relevant literature. First, we show that using local or foreign newspapers to construct textual indicators (EPUs) yields similar empirical results. As a consequence, our applications should reassure researchers that they can also rely on foreign sources to construct EPU indexes. This option may foster the comparability of results across countries and lay the groundwork for cross-country studies of uncertainty. Second, we show that using only one newspaper to build the EPU may yield biased results, while pooling news sources across different levels of proximity provides robust results. Based on this evidence, we advocate maximizing the breadth of the press coverage when constructing newspaper-based indicators.

The rest of the paper is structured as follows. Section 2 presents our EPU indexes based on press with different degrees of involvement in the region (local or foreign newspapers). In Section 3 we compare the narrative resulting from local versus foreign newspapers, while in Section 4 we examine the macroeconomic impact of EPU shocks and compare GDP responses across alternative sets of press. Section 4.3 shows that constructing the EPU index relying

[5] Separate results based on the Anglophone or Spanish press are available upon request.

[6] Results for other relevant variables included in our empirical exercises are also similar, most notably as regards financial variables such as the exchange rate and a measure of financial risk.

Table 1: A sample of press coverage types used in the related literature

Authors	Index	Country	#	Proximity
Baker et al. (2016)	EPU	US	10	Local
Cerda et al. (2018)	EPU	Chile	2	Local
Gil-León and Silva-Pinzón (2019)	EPU	Colombia	1	Local
Ghirelli et al. (2021)	EPU	LATAM countries	7	Foreign
Baker et al. (2016)	EPU	Mexico	3	Local
Baker et al. (2016)	EPU	Brazil	1	Local
Ghirelli et al. (2019)	EPU	Spain	7	Local
Jirasavetakul and Spilimbergo (2018)	EPU	Turkey	>100	All†
Huang and Luk (2020)	EPU	China	10	Local
Mueller and Rauh (2018)	Political violence	185 countries	3	Foreign
Caldara and Iacoviello (2022)	GPR	43 countries	3	Foreign
Ahir et al. (2019)	WUI	143 countries	1	Foreign
Barrett et al. (2020)	RSUI	130 countries	18	Foreign
Thorsrud (2020)	Business cycle	Norway	1	Local
Fraiberger et al. (2021)	Sentiment	25 countries	1	Foreign
Aguilar et al. (2021)	Sentiment	Spain	7	Local
Azzimonti (2018)	Partisan conflict	US	1	Local
Kalamara et al. (2022)	Sentiment & Uncertainty	UK	3	Local
Consoli et al. (2022)	Sentiment	US, Euro area	2	Local
Armesto et al. (2009)	Sentiment	US	1	Local
Alexopoulos and Cohen (2015)	Uncertainty	US	1	Local
Garcia (2013)	Sentiment	US	1	Local
Shapiro et al. (2022)	Sentiment	US	16	Local
Ardia et al. (2019)	Sentiment	US	18	Local
Rambaccussing and Kwiatkowski (2020)	Sentiment	UK	12	Local
Aprigliano et al. (2022)	Sentiment & Uncertainty	Italy	4	Local
Nyman et al. (2021)	Excitement in financial markets	UK	3	Local

Note: The third column refers to the country of interest for which the index is constructed. The fourth column (#) reports the number of sources used to construct the index. WUI stands for the world uncertainty index, GPR stands for the geopolitical risk index, and RSUI stands for the reported social unrest index. This table is not meant to be exhaustive. Table A.3 in the Appendix reports the same information with the list of all newspapers used in each study.
†: *All* means that both the foreign and local press are considered.

on only one newspaper may provide biased results. Finally, Section 5 offers some concluding remarks.

2 Foreign and local press-based EPU indexes

In this section, we construct the following alternative EPU indicators: (i) an index based on the available local sources; (ii) an index based on the available foreign newspapers; (iii) an index constructed by pooling together all available sources (i.e. local and foreign newspapers). We do this for the following countries: the main Latin American economies (Argentina, Brazil, Chile, Colombia, Mexico and Peru) as examples of emerging countries, and Spain, as a representative case of a developed country.[7]

[7]For the Latin American region, we also aggregate the indexes at the regional level (by simple mean) in order to obtain EPU indexes for the Latin American region as a whole.

To construct the EPU index, we follow Baker et al. (2016) and count the number of articles containing at least one keyword related to uncertainty, the economy and policy. To ensure that the EPU index based on foreign news is comparable to that based on local news, we hold fixed the criteria for search counts and the time coverage, and apply to the Anglophone press the translated queries from the original (local) language to English.[8]

In the rest of this section, we first list the news sources we select for each country (Section 2.1) and then outline the keywords we use in our queries (Section 2.2). Finally, we describe the construction of the index.

2.1 News sources

To access newspaper articles, we rely on the Factiva repository provided by Dow Jones. In all cases, we focus on the printed editions of newspapers and ignore their online versions.[9] For each country, we ensure that the selected newspapers cover almost the entire ideological spectrum in order to minimize any ideological bias that may stem from analysing the media.

For each newspaper, we consider all articles published from the first date at which the newspaper is collected in Factiva, starting from January 1997.[10] However, we start our analysis in November 2002 to have at least three sources available for each country considered when dealing with the local press.

Local press. For Brazil, we process articles written in Portuguese, while for all other countries we process articles in Spanish. For each country, we consider the most-read local generalist newspapers available in Factiva:

- Argentina: *Clarín, La Nación, Infobae*;
- Brazil: *O Globo, Folha de São Paulo, O Estado de São Paulo, Correio Braziliense, Estado de Minas, Agência Brasil*;
- Chile: *El mercurio, La Tercera, El diario financiero, Pulso*;
- Colombia: *El Espectador, El Nuevo Siglo, Portafolio*;
- Mexico: *Reforma, El Universal, La Jornada, El Financiero, El Economista, Agencia Mexicana de noticias*;
- Peru: *El comercio, La República, Gestión, Agencia peruana de noticias Andina*;
- Spain: *El País, El Mundo, Expansión, ABC, Cinco Días, El Economista, La Vanguardia*;

[8] For all countries except Brazil, we translate keywords from Spanish to English (for Brazil, we translate from Portuguese to English). Table B.2 in Section B of the Appendix provides the list of keywords in Spanish and English.

[9] The only exception is *Infobae* for Argentina. We included it because it is very popular in Argentina and we wanted to have at least 3 newspapers per country. Limiting the articles to those in the printed versions of the newspapers ensures the quality and relevance of the stories because editors select articles to be published in print given space limitations.

[10] The time coverage of each newspaper is provided in Table B.1 in Section B of the Appendix.

Foreign press. We select the following types of foreign press:

- Anglophone press: *Los Angeles Times, The Boston Globe, The Globe and Mail, The New York Times, The Telegraph U.K., The Times U.K., Chicago Tribune, The Guardian U.K., The Wall Street Journal, The Washington Post, The Economist.*
- Spanish press: *El País, El Mundo, Expansión, ABC, Cinco Días, El Economista, La Vanguardia.*

For Spain, we consider the available Anglophone press (Canada, UK and US) as the relevant foreign source, while for Latin American countries we use as relevant foreign sources both the Anglophone and the Spanish press, given the economic importance of Latin America for Spain and the close cultural and economic ties between them.

2.2 The keywords

For Spain, when considering local sources we borrow the EPU index constructed in Ghirelli et al. (2019).[11] To construct the EPU index for Spain based on the foreign press, we simply translate the keywords used for the local version of the index and launch the translated queries on the articles published in the Anglophone press.

For Latin American countries we build on Ghirelli et al. (2021), who constructed EPU measures for Latin American countries based on the Spanish press.[12] That is, each query is customized for each country and counts, in each considered newspaper, the number of articles containing at least one keyword related to the following concepts:

- **Uncertainty**: uncertain, uncertainty/uncertainties, unstable, instability/instabilities, risk(s).
- **Economy**: economic(s), economy.
- **Policy**: *the name of the central bank (CB) of the country, the name of the government's workplace in the country*, parliament, government, federal reserve, treasury, tariff(s), deficit(s), budget(s), public spending, debt ceiling, exchange rate(s), currency crash(es), sovereign debt, public debt, fiscal policy/policies, monetary policy/policies, legislation, reform(s), tax(es), overhaul, rule(s), norm(s), normative, regulation(s), law(s).

[11] For brevity, the list of keywords is reported in Table B.3 in Section B of the Appendix.

[12] Compared to the EPU indexes in Ghirelli et al. (2021), the indicators we present in this paper show two small technical differences: (i) we add a few new keywords that allow us to better capture the currency crisis in Argentina, and (ii) we select articles about the country of interest based on Factiva indexation rather than considering articles in which the name of the country appears in the text. This last choice is motivated by the fact that, especially in the Anglophone press, a news article may mention several Latin American countries even though it actually tells a story about one specific country. We check the robustness of our indicators to these technical changes, and it turns out that the results are very similar (available upon request).

In addition, when dealing with Latin American countries we rely on Factiva's indexation to exclude all articles related to sports and leisure and to select articles about the country of interest. This last requirement allows us to minimize the possibility of inflating the number of articles related to policy uncertainty in a country by also considering events happening in other countries—for example, to avoid counting articles from Argentina in which the Argentinian press refers to the reactions of Chileans living in Argentina to the events in Chile in October 2019.

Table B.2 in Section B of the Appendix reports the keywords used in the queries for the Latin American countries in English (for the Anglophone press), Spanish and Portuguese (for the local press).

2.3 Constructing the indexes

The construction of the indexes closely follows the procedure used by Baker et al. (2016). First, for each newspaper we count the number of articles published in a given month that contain words in the aforementioned blocks of keywords. Second, we express this count as a proportion of articles published by the newspaper in the month. When dealing with the local press, we divide this count by the total number of published articles that month, whereas in the foreign case we use the number of articles published that month that are about the country of interest. Third, we standardize each monthly series of scaled counts by dividing it by its standard deviation.[13] This makes the volatility of the series comparable across newspapers. Fourth, for each country we average the newspaper-based standardized series across newspapers to compute an aggregated index. Fifth, we rescale the resulting index to mean 100 to obtain a set of homogeneous country-based EPU indicators. Finally, for the Latin American region we also average the country-specific EPU measures across countries (simple mean) to come up with aggregated EPU indexes for the Latin American region.

In sum, for each considered country we construct three types of EPU index, each considering larger sets of newspapers with different levels of proximity to the country of interest: (i) an index based on local newspapers; (ii) an index based on foreign newspapers (Anglophone sources for Spain; both Anglophone and Spanish sources for Latin American countries); (iii) an index based on all of the aforementioned press, weighting equally each source irrespective of the level of proximity to the country of interest. These indexes are reported in Figures D.1–D.7 of Section D of the Appendix.

3 Comparing the narratives

In this context, the narrative of an index is a list of events that are written about in the underlying press and that are associated with sudden increases in uncertainty related to

[13] November 2002–December 2020 for the EPU index based on the local press; January 1997–December 2020 for the EPU index based on the foreign press, according to the availability of press data.

the economic policy of a country. We ask whether alternative sets of press reflect the same narrative or whether they convey different stories. To do so, we compare the narrative resulting from EPU indexes based on alternative sets of press, for each country. However, this requires setting a rule to identify the most relevant events composing the narrative in a homogeneous manner across countries.

As a first approximation, we define an EPU-related event as an episode associated with levels of the EPU index equivalent to the average plus 2 standard deviations. This simple rule allows us to consider as events peaks lying outside of the 98% probability band, i.e. events with only a 2% probability of occurrence. Then, for each country we list all events identified in the news according to this definition and check whether the same events emerge in the local and in the foreign press. As an example, we report below the narrative for Spain (Table 2).[14]

In this context, the narrative of an index is a list of events that are written about in the underlying press and that are associated with sudden increases in uncertainty related to the economic policy of a country. We ask whether alternative sets of press reflect the same narrative or whether they convey different stories. To do so, we compare the narrative resulting from EPU indexes based on alternative sets of press, for each country. However, this requires setting a rule to identify the most relevant events composing the narrative in a homogeneous manner across countries.

As a first approximation, we define an EPU-related event as an episode associated with levels of the EPU index equivalent to the average plus 2 standard deviations. This simple rule allows us to consider as events peaks lying outside of the 98% probability band, i.e. events with only a 2% probability of occurrence. Then, for each country we list all events identified in the news according to this definition and check whether the same events emerge in the local and in the foreign press. As an example, we report below the narrative for Spain (Table 2).[15]

Based on this notion, the events composing a narrative can be of two types: (i) events that are associated with a peak in the EPU index based on one type of press but not the other (labelled 'Foreign' or 'Local' in column 3 of Table 2); (ii) events that are associated with peaks in both types of press (labelled 'All press'). Of course, if a narrative is mostly made up of events of type (ii), the local and the foreign press convey the same information. In contrast, events of type (i) can indicate either that the local and foreign press report different news or that they report the same information but with a different intensity. In fact, since the narrative does not aim to list all EPU-relevant episodes but only those that are sufficiently important according to a given criteria, it could well be that events of type (i) are correctly reflected in the other press but only associated with smaller increases in the corresponding index. To investigate this, in columns 4 and 5 of Table 2 we label the events composing the narrative as being of type (i) or (ii) but considering less stringent definitions,

[14] To save space, the narratives of the Latin American countries are relegated to Tables C.1–C.6 in Section C of the Appendix.

[15] To save space, the narratives of the Latin American countries are relegated to Tables C.1–C.6 in Section C of the Appendix.

i.e. an episode is EPU-related if it is associated with a level of the index equivalent to the average plus one or half a standard deviation. Most events of type (i) based on the most stringent criterion become of type (ii) when using the more lenient one. This means that the indicators based on both types of press display a similar evolution, since they increase—although with different intensity—in correspondence with the same events. This reassures us that, overall, the local and the foreign press convey the same narrative.

Table 2: Events of economic policy uncertainty in Spain: comparison across types of press coverage

		Type of press		
Date	**Event description**	2SD	1SD	1/2 SD
May 2010	Greece bailout	Foreign	All press	
Nov 2010	Ireland bailout	Foreign	Foreign	All press
Apr 2011	Portugal bailout	Foreign	Foreign	All press
Jul 2011	ECB tightens interest rates to curb inflation	Foreign	All press	
Aug 2011	Crisis in Italy and Spain and alarm over possible future bailouts	Foreign	All press	
Nov 2011	Spanish general elections	All press		
Apr–Jul 2012	Spanish financial aid	All press		
Sep 2012	Spanish austerity measures incite a separatist crisis in Catalonia. Meanwhile, Germany finally approves the ESM.†	Foreign	All press	
Dec 2015	Spanish general elections	Foreign	All press	
Oct 2017	Catalan crisis	All press		
Apr 2020	Covid-19 crisis	All press		

Note: This table identifies the events associated with major peaks (equivalent to 2 standard deviations above the average) in the EPU indicator for Spain in either the local or foreign press. Whenever one event is reflected in one type of press but not the other, we check that it also appears in the other press but allowing for smaller peaks (i.e. one or half a standard deviation above the average).
†ESM stands for European Stability Mechanism.

Of course, the narratives of Spain and of the Latin American countries show that there are some qualitative differences between the foreign and the local press. We explain these differences below, giving some examples.

- *Local events only reflected in the local press*: Obviously, local news outlets tend to report more on local news. As a consequence, the local press may generate peaks associated with local shocks that are not covered in the foreign press because they are too local: e.g. the 2017 primary elections in Argentina (August 2017), a massive protest in Chile (August 2003), the refusal of the 2003 fiscal reform in Mexico (November-December 2003), the formation of a new government in Peru (February 2004) and the Peruvian political crisis (December 2017).

- *Local events only reflected in the foreign press*: Foreign news may generate peaks in the indicator in correspondence with local shocks that have implications abroad and that, for some reason, are not sufficiently echoed in the local newspapers to generate a peak. For instance, this is the case for the Argentinian default (June 2014), the elections of Lula da Silva in 2002 and Bolsonaro in 2018 in Brazil, the March 2011 free-trade agreement between Chile and the US, reforms in Chile (May 2014 and April 2016), the 2010 elections in Colombia, the free-trade agreement between the US and Colombia (April 2011), the consequences of the 2017 Venezuelan refugee crisis for Colombia and the 2018 election of Lopez Obrador in Mexico.

- *Foreign/international events only reflected in the local press*: Foreign/international events pop up in the narrative based on the foreign press only to the extent that they may affect the country of interest. This is because, by construction, when searching for EPU-related events in the foreign press we additionally require that the event is related to the country of interest. Hence, some international/foreign events may only appear as EPU-relevant shocks in the local press because when covering these stories the foreign press does not focus on the implications the events in question have on the country of interest. For an example, see the US FED Taper Tantrum of May 2013 in the Argentinian narrative and the 2008 subprime crisis in the Colombian narrative.

Despite these small differences, in the next section we show that both types of press reflect the same set of information, since the impulse responses to EPU shocks based on the local or foreign press are very similar. This suggests that, from a quantitative point of view, both types of press are valid sources with which to construct uncertainty indicators since they yield very similar empirical results.

4 Macroeconomic effects of EPU shocks

4.1 Empirical framework

Our baseline Bayesian vector autoregression (BVAR) models aim to study the economic impacts of high policy uncertainty. We show this analysis for Spain, Brazil and Mexico (the two largest Latin American countries) and the Latin American region as a whole,[16] using quarterly data from 2003Q1 to 2019Q4. We limit the sample to 2019Q4 and earlier in order not to include the Covid-19 crisis.[17] The models contain the following variables, in this order: (1) the Chicago Board Options Exchange (CBOE) Volatility Index (VIX) in levels;

[16] To construct the macroeconomic variables at the level of the Latin American region, we take the simple mean of the variables across the 6 Latin American countries, in order not to over-represent Mexico and Brazil in the aggregate.

[17] Results are robust to the inclusion of the Covid-19 period, but the impulse response functions are more unstable. Results are available upon request. In the context of vector autoregression (VAR) analysis, there is still no consensus on how to deal with the Covid-19 outlier encountered in most macroeconomic variables. Hence, shortening the sample is the most plausible approach for the purposes of this paper.

(2) the EPU index (in turn, based on the local, foreign, or all press) in levels; (3) portfolio capital flows as a percentage of GDP; (4) GDP in quarter-on-quarter growth rates (seasonally adjusted); (4) the headline consumer price index (CPI) in quarter-on-quarter growth rates (seasonally adjusted).[18] Portfolio capital flows represent a measure of financial markets. The VIX represents a measure of global financial risk and is included as an exogenous variable in the system under the assumption of block exogeneity, which implies that the global variable affects domestic ones but not the other way around.[19] All VAR models are estimated using Bayesian techniques.[20] This type of estimation is particularly relevant for our application since we are dealing with a short sample (due to the low availability of historical press articles); therefore, this shrinkage method allows us to minimize overparameterization issues. We impose the Minnesota prior on the VAR parameters by running a grid-search algorithm that selects the most suitable hyperparameters based on the marginal likelihood.

The specification is estimated including 4 lags of the endogenous variables. We choose this number of lags comparing the log marginal likelihood values and by means of visual inspection, i.e. comparing the GDP responses after unexpected shocks in the EPU variables. The results are stable when including up to 4 lags and then become meaningless, which suggests that 5 lags or more may generate overfitting problems due to the high number of parameters in the model (results available upon request). In Section 4.4, we show that our results are robust to more parsimonious specifications (including only one lag for each endogenous variable in the system). We rely on recursive identification à la Cholesky to identify the structural shocks in the model. The order of variables can be justified as follows. Foreign variables are treated as exogenous and are ordered before domestic variables. In particular, it is assumed that VIX shocks affect all variables in the system contemporaneously but that VIX does not react to shocks to other variables. The EPU variables affect financial variables, GDP and inflation contemporaneously but do not affect the VIX. Financial markets affect GDP and inflation immediately but do not affect uncertainty. Instead, GDP responds to shocks in policy uncertainty and financial variables in the same quarter but does not react to inflation. Finally, inflation is contemporaneously responsive to economic events (financial variables and GDP shocks), as well as to EPU shocks. Ordering the EPU variables before the economic variables implies that the former react contemporaneously only to their own shocks and that movements in policy uncertainty are unrelated to the business cycle. In Section 4.4, we discuss this assumption and show results relying on a model in which the EPU variables are ordered last, i.e. implying that policy uncertainty responds contemporaneously to all shocks (economic and financial) in the system. We discuss our main findings in the next section.

[18] In Section A of the Appendix, we provide additional details (Table A.2) and the main descriptive statistics (Table A.1) for the data.

[19] The VIX represents the market's expectations regarding the relative strength of near-term price changes in the S&P 500 index. Because it is derived from the prices of S&P 500 index options with near-term expiration dates, it generates a 30-day forward projection of volatility.

[20] For the computational implementation of the models, we use the developer version of the BEAR toolbox. For further details, see Dieppe et al. (2016).

4.2 Results

In this section, we track the macroeconomic effects of policy uncertainty for Spain, Brazil, Mexico and the Latin American region as a whole. Figure 1 shows the median impulse responses of GDP growth rates to an unexpected increase in the EPU indexes of one standard deviation, considering the local press, the foreign press and both together. A shock of one standard deviation is equivalent in magnitude to large changes in the EPU index for events such as the refusal of the Mexican fiscal reform in December 2003, the Mexican protest against the 'gazolinazo' (January 2017), the Mexican migration crisis of March 2021 and the 2018 Brazil truck driver strike (May).

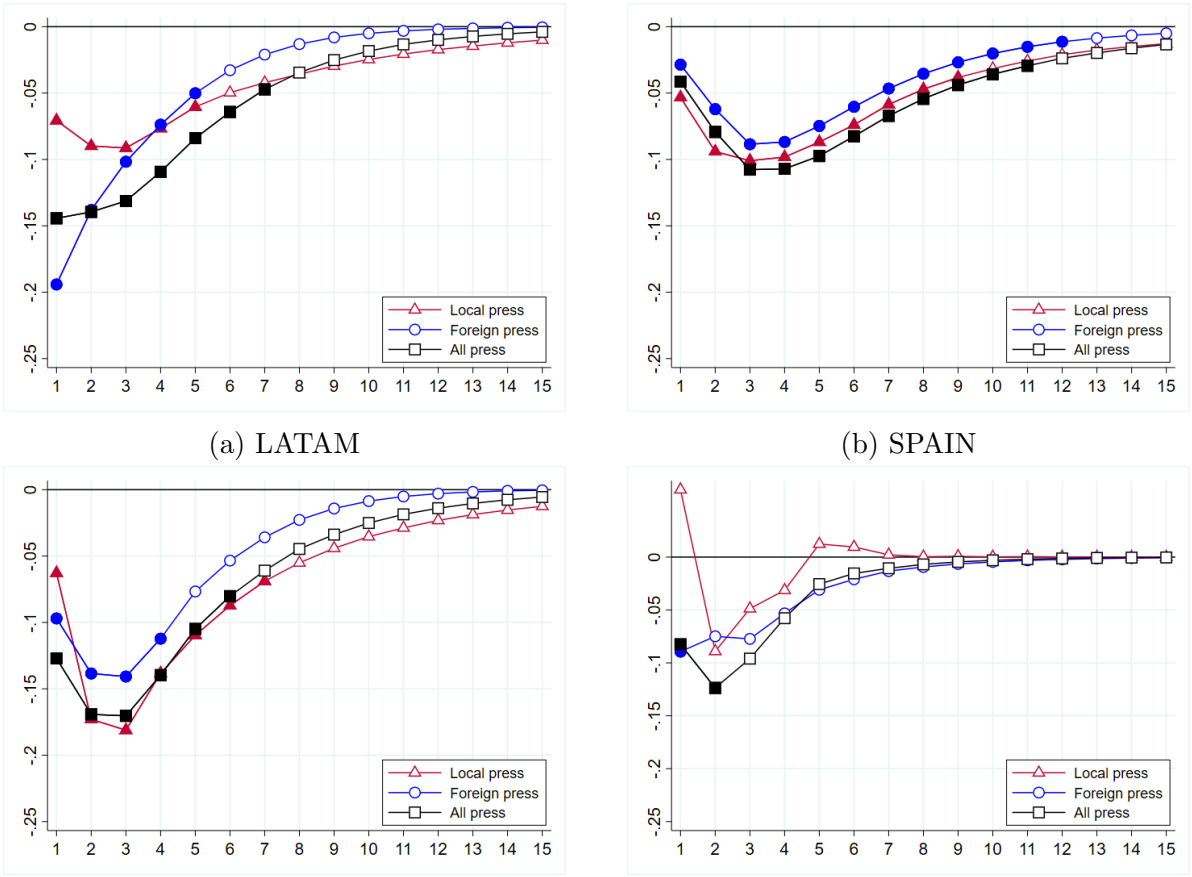
The following comments are worth noting. First, the responses show the expected sign: a rise in policy uncertainty induces a decline in GDP growth of about –0.2 pp. Second, the effects are quite persistent, since in all cases GDP growth takes about 2 years to revert to trend after the EPU shock. Third, results are very similar across types of press. Based on this evidence, it is hard to claim that one type of press is more appropriate than the other to measure uncertainty. On the contrary, this exercise confirms the conclusions we draw in the previous section: both the local and the foreign press provide the same narrative and very similar impulse responses. This implies that newspaper-based EPU indicators are robust to the type of press coverage used in the construction process. Given the popularity of these types of indicators, this result is important since it gives researchers considerable freedom when choosing news sources for the construction of textual indexes.

4.3 Breadth of press coverage

In this section, we shed some light on the role of the breadth of the press coverage when constructing textual indicators. Obviously, it is reasonable to believe that a good indicator should rely on a sufficiently large set of information. However, there is no consensus on how large this set of information should be, as far as the press is concerned (see Table 1). The EPU index for the US is based on 10 local newspapers (Baker et al., 2016). However, since then the literature has produced textual indicators based on more restricted sources, e.g. even using only one newspaper. With this in mind, we try to provide some guidance on the breadth of the press coverage one has to consider when constructing textual indexes.

In this exercise, we focus on Spain, Brazil and Mexico and proceed as follows. First, we consider as benchmark the EPU index we obtain by relying on all available press, i.e. pooling local and foreign sources, which allows us to retain as much information as possible. Second, we construct the local EPU considering one newspaper at a time and estimate the BVAR model accordingly. Then, we compare the GDP responses we obtain with EPU indexes based on only one newspaper with those obtained with the EPU index based on all available press. Results are reported in Figure 2. In each panel, the grey area depicts the 84%–16% credible set of the response associated with the index based on all available press (the benchmark), while the lines reflect the responses associated with specific local newspapers. According to the results, it is often the case that the latter fall outside the credible set of the response

Figure 1: Benchmark results: Impulse response functions (IRFs) of GDP to EPU shocks



(a) LATAM

(b) SPAIN

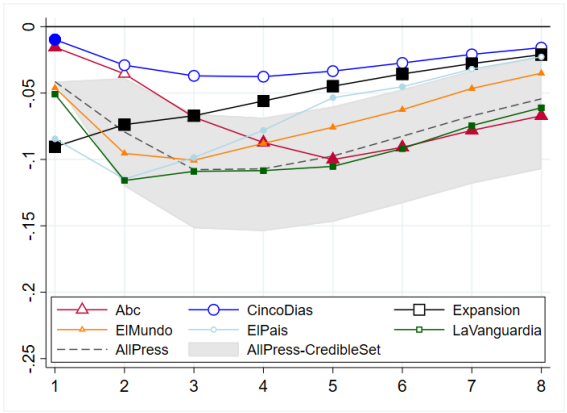
(c) BRAZIL

(d) MEXICO

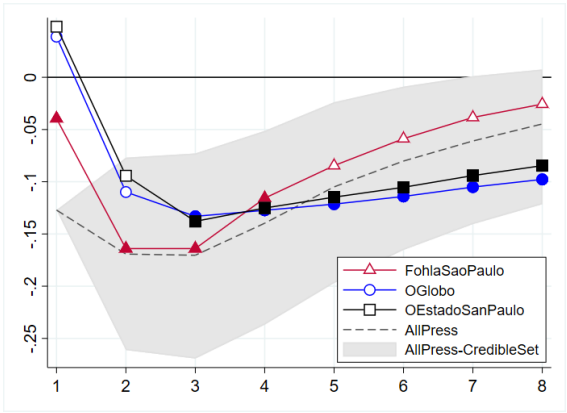
Note: Each panel depicts the median impulse response of GDP to a rise of one standard deviation in the EPU index in the Latin American (LATAM) region, Spain, Brazil and Mexico: the red, blue and black lines represent responses to EPU shocks based on local, foreign and all press, respectively. The EPU indexes for the LATAM region are constructed as the simple mean between the country-specific EPU indexes. For Spain, we consider a set of Anglophone newspapers as foreign sources. For all other cases, foreign sources are represented by both Anglophone and Spanish newspapers. Filled symbols indicate statistical significance within the 84%–16% credible set, while empty symbols represent not-significant estimates. The horizontal axis measures quarters since the shock.

based on a large press coverage. This evidence warns us that relying on only one newspaper may lead to biased results, since one specific source may fail to correctly report all relevant information related to an economic concept (e.g. due to political bias). Hence, it seems plausible that widening the press coverage as much as possible may be a safe choice when constructing newspaper-based indicators.

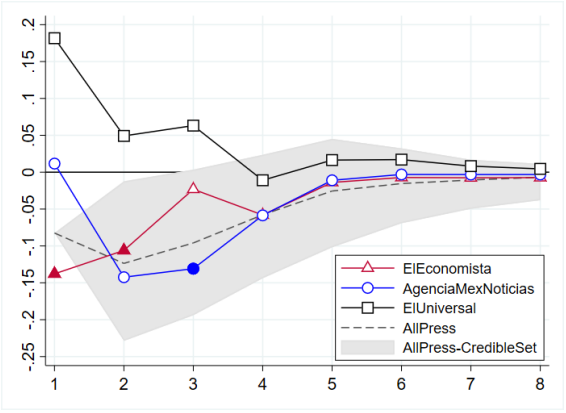
Figure 2: Robustness results regarding the breadth of press coverage: IRFs of GDP to EPU shocks



(a) SPAIN



(b) BRAZIL



(c) MEXICO

Note: Each panel depicts the median impulse responses of GDP to a rise of one standard deviation in the EPU index in Spain, Brazil and Mexico, respectively. In each panel, the dashed grey line depicts the median IRF of GDP to shocks in the EPU constructed based on all press (local and foreign) and the grey area depicts its corresponding 84%–16% credible set. For Spain, we consider a set of Anglophone newspapers as foreign sources. For Mexico and Brazil, foreign sources are represented by both Anglophone and Spanish newspapers. All other lines represent the IRFs of GDP to shocks in the EPU index constructed considering only one local newspaper at a time. Filled symbols indicate statistical significance within the 84%–16% credible set, while empty symbols represent not-significant estimates. The horizontal axis measures quarters since the shock.

4.4 Robustness of the model

In this section, we demonstrate the robustness of our findings by running a battery of alternative exercises (see Section F of the Appendix). To save space, we focus only on the case of the Latin American region and consider the local and the foreign press.[21]

First, for each specification we run a more parsimonious quarterly BVAR including only the first lags of the endogenous variables in the system (Figure F.1a). The results are very robust to this alternative specification, which suggests that our results are not affected by an overfitting problem, given the sample size considered.

[21] Results for single countries are available upon request.

Second, we change the order of the endogenous variables, putting the EPU index last in the system (Figure F.1b). This relaxes the assumption that policy uncertainty cannot be affected by the business cycle, i.e. it implies assuming that the EPU index can react immediately to changes in the economy (financial variables, GDP and prices). The results are smaller and less significant but qualitatively in line with the benchmark results.

Third, we run the same model with monthly data, including 6 months of lags (Figure F.1c). The results are in line with those obtained with quarterly data, although somewhat less precise. This is expected since macroeconomic series available at a monthly frequency are noisy and less reliable than quarterly macroeconomic variables.

Fourth, we use alternative financial variables in the model (Figure F.2 in Section F of the Appendix). That is, we drop non-residential portfolio capital flows in the model and add, in turn: (i) the exchange rates vis-à-vis the US dollar in changes (Fig. F.2a), (ii) equity in quarter-on-quarter growth rates (Fig. F.2b), (iii) the Emerging Markets Bonds Index (EMBI) (Fig. F.2c),[22] and (iv) residential portfolio capital flows (Fig. F.2d). GDP responses are in line with the benchmark specification.

Fifth, to reiterate that the local and the foreign press convey the same narrative, we extract the common component from the EPU indicators based on the local and foreign press and compute the GDP responses to shocks to the common component. Results are very similar to those obtained by considering shocks to the EPU based on, alternatively, the local and the foreign press. Moreover, responses to shocks to the idiosyncratic components of the EPU indexes based on the local and the foreign press (which rely on information that is not captured by the common component) are odd and do not point to any economic interpretation. This confirms that both types of press provide the same set of information. Results are available upon request.

[22] The EMBI is calculated as the spread between US bonds and the emerging-market bonds. It is developed by JP Morgan Chase and is considered the main indicator of country risk for emerging markets.

5 Conclusion

This paper aims to shed some light on the methodology for the construction of newspaper-based indexes. In particular, we focus on two specific issues. First, we investigate the role of the breadth of the press coverage used. Second, we ask whether the proximity of the press to the country of interest (e.g. local press versus foreign press) has an influence on the resulting dictionary-based indicator.

We proceed as follows. First, we construct a set of EPU indexes distinguishing between the available local and foreign press for a number of countries. We start from the assumption that different newspapers may convey different information and, hence, always consider at least 3 sources when constructing specific EPU indexes (when building foreign EPUs we use at least 7 sources; when constructing local EPUs we use at least 3 newspapers; see Section 2.1 for more details). We consider the 6 largest Latin American countries as examples of emerging markets and Spain as a case study for industrialized countries.

Second, we study the narratives emerging from these indicators to assess whether indicators based on sources with different levels of proximity deliver different narratives or whether they convey the same information. We conclude in favour of the latter, i.e. the foreign and local press tend to cover the same and most relevant information.

Third, in order to strengthen our conclusion, we estimate the impulse responses of GDP growth to uncertainty shocks by means of BVAR models and compare the responses resulting from using local, foreign or pooled press sources. We find that from a quantitative perspective, focusing on the local or foreign press or pooling all sources makes no difference.

Fourth, we focus on what happens if we use only one newspaper when constructing the EPU index. We estimate impulse responses considering EPU indexes based on only one local newspaper at a time and compare these responses to those we obtain when pooling all available sources together. We find that the responses obtained when relying on only one newspaper do not always fall withing the 84%–16% credible set of the responses obtained when pooling all available sources. This indicates that relying on one specific local newspaper may lead to biased responses.

Based on this evidence, we draw two conclusions. (i) The type of press used for the construction of newspaper-based indicators does not matter, as both foreign and local newspapers yield similar impulse responses. Note that the option to use foreign sources may enhance the comparability of results across countries, however, and lay the groundwork for cross-country studies of uncertainty. (ii) Relying on only one local newspaper may be misleading since responses may be very different from those obtained when pooling all available sources. Widening the breadth of the news coverage (local or foreign) when constructing text-based indicators reduces the risk of obtaining biased results that presents itself when relying on individual news sources. This is not trivial, given that newspaper repositories are usually not free of charge.

Both findings are important since these types of indicators have gained a lot of popularity and researchers are increasingly resorting to newspapers to construct economically relevant indicators.

Acknowledgements

We thank Concha Artola, Rodolfo Campos, Marina Diakonova, Angel Gavilán, Danilo Leiva, José M. González-Minguez, Margarita Machelett, Evi Pappa, Gabriel Pérez Quirós, Jacopo Timini, and participants at the internal seminar of the Banco de España for comments. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of interest statement

The authors have no conflict of interest to declare.

References

Aguilar, P., C. Ghirelli, M. Pacce, and A. Urtasun (2021). "Can news help measure economic sentiment? An application in COVID-19 times", *Economics Letters,* 199, 109730.

Ahir, H., N. Bloom, and D. Furceri (2019). *The World Uncertainty Index,* Working Papers 19-027, Standford Institute for Economic Policy Research.

Alexopoulos, M., and J. Cohen (2015). "The power of print: Uncertainty shocks, markets, and the economy", *International Review of Economics and Finance,* 40(C), pp. 8-28.

Aprigliano, V., S. Emiliozzi, G. Guaitoli, A. Luciani, J. Marcucci, and L. Monteforte (2022). "The power of text-based indicators in forecasting Italian economic activity", *International Journal of Forecasting.*

Ardia, D., K. Bluteau, and K. Boudt (2019). "Questioning the news about economic growth: Sparse forecasting using thousands of news-based sentiment values", *International Journal of Forecasting,* 35(4), pp. 1370-1386.

Armesto, M. T., R. Hernández-Murillo, M. T. Owang, and J. Piger (2009). "Measuring the Information Content of the Beige Book: A Mixed Data Sampling Approach", *Journal of Money, Credit and Banking,* 41(1), pp. 35-55.

Azzimonti, M. (2018). "Partisan conflict and private investment", *Journal of Monetary Economics,* 93, pp. 114-131, Carnegie-Rochester-NYU Conference on Public Policy held at the Stern School of Business at New York University.

Bachmann, R., S. Elstner, and E. R. Sims (2013). "Uncertainty and Economic Activity: Evidence from Business Survey Data", *American Economic Journal: Macroeconomics,* 5(2), April, pp. 217-249.

Baker, S. R., N. Bloom, and S. J. Davis (2016). "Measuring Economic Policy Uncertainty", *The Quarterly Journal of Economics,* 131(4), pp. 1593-1636.

Barrett, P., M. Appendino, K. Nguyen, and J. de León Miranda (2020). *Measuring Social Unrest Using Media Reports,* IMF Working Papers 2020/129, International Monetary Fund.

Bloom, N. (2009). "The Impact of Uncertainty Shocks", *Econometrica,* 77(3), pp. 623-685.

Caldara, D., C. Fuentes-Albero, S. Gilchrist, and E. Zakrajšek (2016). "The macroeconomic impact of financial and uncertainty shocks", *European Economic Review,* 88, pp. 185-207, SI: The Post-Crisis Slump.

Caldara, D., and M. Iacoviello (2022). "Measuring geopolitical risk", *American Economic Review,* 112(4), pp. 1194-1225.

Cerdá, R., A. Silva, and J. T. Valente (2018). "Economic Uncertainty Impact in a Small Open Economy: The Case of Chile", *Applied Economics,* 50(26), pp. 2894-2908.

Consoli, S., L. Barbaglia, and S. Manzan (2022). "Fine-grained, aspect-based sentiment analysis on economic and financial lexicon", *Knowledge-Based Systems,* 247, 108781.

Dieppe, A., R. Legrand, and B. Van Roye (2016). *The bear toolbox,* ECB working paper, European Central Bank.

Fraiberger, S. P., D. Lee, D. Puy, and R. Rancière (2021). "Media sentiment and international asset prices", *Journal of International Economics,* 133, 103526.

García, D. (2013). "Sentiment during Recessions", *The Journal of Finance,* 68(3), pp. 1267-1300.

Ghirelli, C., J. J. Pérez, and A. Urtasun (2019). "A new economic policy uncertainty index for Spain", *Economics Letters,* 182, pp. 64-67.

Ghirelli, C., J. J. Pérez, and A. Urtasun (2021). "The spillover effects of economic policy uncertainty in Latin America on the Spanish economy", *Latin American Journal of Central Banking,* 2(2), 100029.

Gil-León, J., and D. Silva-Pinzón (2019). "Índice de incertidumbre de política económica (EPU) para Colombia, 2000-2017", *Ensayos de Economía,* 29(55), pp. 37-56.

Huang, Y., and P. Luk (2020). "Measuring economic policy uncertainty in China", *China Economic Review,* 59 (101367).

Jirasavetakul, L.-B., and A. Spilimbergo (2018). *Economic policy uncertainty in Turkey,* IMF Working Papers 18/272, International Monetary Fund.

Jurado, K., S. C. Ludvigson, and S. Ng (2015). "Measuring Uncertainty", *American Economic Review,* 105(3), March, pp. 1177-1216.

Kalamara, E., A. Turrell, C. Redl, G. Kapetanios, and S. Kapadia (2022). "Making text count: Economic forecasting using newspaper text", *Journal of Applied Econometrics,* 37(5), pp. 896-919.

Mueller, H., and C. Rauh (2018). "Reading Between the Lines: Prediction of Political Violence Using Newspaper Text", *American Political Science Review,* 112(2), pp. 358-375.

Nyman, R., S. Kapadia, and D. Tuckett (2021). "News and narratives in financial systems: Exploiting big data for systemic risk assessment", *Journal of Economic Dynamics and Control,* 127, 104119.

Papacharissi, Z., and M. de Fatima Oliveira (2008). "News Frames Terrorism: A Comparative Analysis of Frames Employed in Terrorism Coverage in U.S. and U.K. Newspapers", *The International Journal of Press/Politics,* 13(1), pp. 52-74.

Pollak, S., R. Coesemans, W. Daelemans, and N. Lavrac (2011). "Detecting contrast patterns in newspaper articles by combining discourse analysis and text mining", *Pragmatics,* 21(4), pp. 647-683.

Rambaccussing, D., and A. Kwiatkowski (2020). "Forecasting with news sentiment: Evidence with UK newspapers", *International Journal of Forecasting,* 36(4), pp. 1501-1516.

Scotti, C. (2016). "Surprise and uncertainty indexes: Real-time aggregation of real-activity macro-surprises", *Journal of Monetary Economics,* 82, pp. 1-19.

Shapiro, A. H., M. Sudhof, and D. J. Wilson (2022). "Measuring news sentiment", *Journal of Econometrics,* 228(2), pp. 221-243.

Thorsrud, L. A. (2020). "Words are the New Numbers: A Newsy Coincident Index of the Business Cycle", *Journal of Business and Economic Statistics,* 38(2), pp. 393-409.

Appendix

A Data description

The data used to estimate the impact of policy uncertainty on macro and financial variables are sourced via Refinitiv. A complete description of the data is provided in Table A.2.

In the case of quarterly data, real GDP series are taken from the NationaI Institute for Geography and Statistics of Brazil (IBGE in Portuguese), the National Institute of Statistics and Geography of Mexico (INEGI in Spanish) and the Oxford Economic database for Argentina, Chile, Colombia and Peru. Inflation is calculated from the respective domestic consumer price indexes, constructed and published by the respective national statistics offices. In both cases, we take the quarterly rate of change. Macro series are seasonally adjusted; we use Refinitiv to adjust for seasonality any series published without seasonal adjustment. The quarterly rates of each country are averaged to obtain the Latin American inflation and growth rates, thus avoiding the overweighting of Brazil and Mexico.

Portfolio capital flows are extracted from balance of payments publications of the respective national statistics offices and complemented with data from the IMF's databases to build some series back to 2003. Capital flow series are scaled by the nominal GDP levels, and we avoid taking moving averages to reflect the direct impact of increases in EPU on the evolution of capital inflows and outflows. Latin American series are obtained adding portfolio capital flows.

The bilateral exchange rates vis–à–vis the USD are taken from Reuters. As there is no Latin American exchange rate against the US dollar, we take the quarterly changes in each exchange rate and average them for the six countries analysed. We use the benchmark MSCI equity indices in USD to estimate the change in stock prices, and although MSCI has a Latin American index, we prefer to extract the six individual indexes and calculate the average of the quarterly changes as the aggregate index is biased towards the evolution of the major firms of Brazil and Mexico, which have the highest market capitalization.

Finally, we include the VIX index, which represents the market's expectations regarding price changes in the S&P 500 index. Because it is derived from the prices of Standard and Poor's index options with near-term expiration dates, it generates a 30-day forward projection of volatility. The VIX is included in levels and attempts to capture global uncertainty, so it is useful to disentangle the effects of EPU shocks from the effects of international events that, in turn, could affect EPU.

The robustness exercise with monthly data uses the same variables as above but for the activity index and portfolio capital flows of non-residents. For the former, we use the monthly GDP proxies published by the national statistics offices and central banks of the region (Estimador Mensual de Actividad Económica (EMAE) for Argentina; Índice de Atividade Econômica do Banco Central (IBC-Br) for Brazil; Índice Mensual de Actividad Económica (Imacec) for Chile; Indicador de Seguimiento a la Economía (ISE) for Colombia; Indicador Global de la Actividad Económica (IGAE) for Mexico; and the INEI monthly GDP for Peru). In the case of portfolio flows by non-residents, the central banks of all countries except Peru publish monthly data.

Table A.1: Descriptive statistics

Variable	Mean	Median	Std. dev.	Max.	Min.	Obs.
Variable (2003Q1 - 2019Q4)						
Real GDP	0.82	0.86	0.84	2.50	-2.21	68
Inflation	0.50	0.46	0.22	1.20	0.08	68
Portfolio capital flows (liabilities)	1.43	1.53	1.64	4.20	-3.68	68
Portfolio capital flows (assets)	0.65	0.62	1.09	4.62	-2.81	68
Exchange rate	1.10	-0.18	4.34	20.70	-5.73	68
Equity Index	3.42	4.24	11.36	23.98	-41.19	68
VIX	18.42	16.21	7.86	58.32	10.30	68
Additional for robustness exercise (monthly data)						
Activity indicators	0.26	0.25	0.63	1.97	-2.41	205
Portfolio capital flows (liabilities)	0.33	0.39	0.67	2.31	-3.40	205
Variable (2020Q1 - 2021Q2)						
Real GDP	0.33	0.91	9.66	13.42	-16.00	6
Inflation	0.79	0.73	0.29	1.15	0.44	6
Portfolio capital flows (liabilities)	0.66	0.58	1.37	2.50	-1.40	6
Portfolio capital flows (assets)	0.72	0.56	0.68	1.63	0.07	6
Exchange rate	2.71	1.10	3.87	9.73	-0.27	6
Equity Index	-0.09	4.17	14.72	12.71	-24.96	6
VIX	26.24	25.70	5.73	34.51	17.97	6
Additional for robustness exercise (monthly data)						
Activity indicators	0.21	0.92	5.07	8.10	-15.49	18
Portfolio capital flows (liabilities)	0.30	0.41	0.91	1.86	-2.42	18

Note: This table reports descriptive statistics of the macroeconomic variables used in the empirical exercises.

Table A.2: Data description

Variable	Description	Sources	Transformation
Real GDP	Real GDP (seasonally adjusted)	National statistics offices via Refinitiv	q–o–q %
Inflation	Domestic CPI index (seasonally adjusted)	National statistics offices via Refinitiv	q–o–q %
Portfolio capital flows (liabilities)	Equity and debt flows, non- residents, net	National statistics offices and IMF balance of payments statistics via Refinitiv	% GDP, quarterly
Portfolio capital flows (assets)	Equity and debt flows, residents, net	National statistics offices and IMF balance of payments statistics via Refinitiv	% GDP, quarterly
Exchange rate	Nominal bilateral rate, units of local currency per USD	Refinitiv	q–o–q %
Equity Index	Main domestic equity index, USD	MSCI via Refinitiv	q–o–q %
VIX	Chicago Board of Exchange Volatility Index	Refinitiv	Level
EPU Indexes	Textual index based on Baker et al. (2016)		
Local press	Text analysis on at least 3 main newspapers from each country	Own estimations	Level
Spanish press	Text analysis on the leading 7 newspapers of Spain	Own estimations	Level
Anglophone press	Text analysis on 11 relevant newspapers from the UK, US and Canada	Own estimations	Level
Additional variables for robustness exercise (monthly data)			
Activity indicators	Monthly GDP proxies	National statistics offices and central banks sourced via Refinitiv	m–o–m %
Portfolio capital flows (liabilities)	Equity and debt flows, non-residents, net, (except Peru)	Central banks via Refinitiv	% GDP, monthly

Note: Domestic variables (i.e. all except VIX) correspond to the aggregate of six Latin American countries: Argentina, Brazil, Chile, Colombia, Mexico and Peru. We aggregate through simple averaging to give the same weight to each country.

Table A.3: A sample of source coverage in the related literature

Authors	Index	Country	#	Proximity	Sources Names
Baker et al. (2016)	EPU	US	10	Local	USA Today, Miami Herald, Chicago Tribune, The Washington Post, Los Angeles Times, The Boston Globe, San Francisco Chronicle, Dallas Morning News, Houston Chronicle, The Wall Street Journal.
Cerda et al. (2018)	EPU	Chile	2	Local	El Mercurio, La Segunda.
Gil-León and Silva-Pinzón (2019)	EPU	Colombia	1	Local	El Tiempo.
Ghirelli et al. (2021)	EPU	LA countries	7	Foreign	El País, El Mundo, La Vanguardia, ABC, Expansión, Cinco Días, El Economista.
Baker et al. (2016)	EPU	Mexico	3	Local	El Norte, Reforma, Mural.
Baker et al. (2016)	EPU	Brazil	1	Local	Folha de Sao Paulo.
Ghirelli et al. (2019)	EPU	Spain	7	Local	El País, El Mundo, La Vanguardia, ABC, Expansión, Cinco Días, El Economista.
Jirasavetakul and Spilimbergo (2018)	EPU	Turkey	>100	All†	Factiva's Top Sources (about 100 international news sources) and Turkish news sources written in English.
Huang and Luk (2020)	EPU	China	10	Local	Beijing Youth Daily, Guangzhou Daily, Jiefang Daily, People's Daily Overseas Edition, Shanghai Morning Post, Southern Metropolis Daily, The Beijing News, Today Evening Post, Wen Hui Daily, Yangcheng Evening News.
Mueller and Rauh (2018)	Political violence	185 countries	3	Foreign	The Economist, The New York Times, The Washington Post.
Caldara and Iacoviello (2022)	GPR	43 countries	3	Foreign	The New York Times, Chicago Tribune, The Washington Post.
(Ahir et al., 2019)	WUI	143 countries	1	Foreign	Economist Intelligence Unit country reports.
(Barrett et al., 2020)	RSUI	130 countries	18	Foreign	ABC Network, BBC, CBS Network, Canadian Broadcasting Corp, NBC Network, Los Angeles Times, Financial Times, The Boston Globe, The Globe and Mail, The New York Times, The Telegraph U.K., The Times U.K., Chicago Tribune, The Telegraph, The Guardian U.K., The Wall Street Journal, The Washington Post, The Economist.
Thorsrud (2020)	Business cycle	Norway	1	Local	Dagens Naeringsliv.
Fraiberger et al. (2021)	Sentiment	25 countries	1	Foreign	Reuters in English.
Aguilar et al. (2021)	Sentiment	Spain	7	Local	El País, El Mundo, La Vanguardia, ABC, Expansión, Cinco Días, El Economista.
Azzimonti (2018)	Partisan conflict	US	1	Local	The Washington Post, The New York Times, Los Angeles Times, Chicago Tribune, The Wall Street Journal, Newsday, The Dallas Morning News, The Boston Globe, Tampa Bay Times.
Kalamara et al. (2022)	Sentiment & Uncertainty	UK	3	Local	The Guardian, The Daily Mail, The Daily Mirror.
Consoli et al. (2022)	Sentiment	US, Euro area	2	Local	US Federal Reserve Beige Book, the European Central Bank Monthly Bulletin.
Armesto et al. (2009)	Sentiment	US	1	Local	US Federal Reserve Beige Book.
Alexopoulos and Cohen (2015)	Uncertainty	US	1	Local	New York Times.
Garcia (2013)	Sentiment	US	1	Local	New York Times.
Shapiro et al. (2022)	Sentiment	US	16	Local	Atlanta Journal-Constitution, The Boston Globe, Chicago Tribune, Detroit Free Press, Houston Chronicle, Los Angeles Times, Memphis Commercial Appeal, Miami Herald, Minneapolis Star Tribune, New Orleans Times-Picayune, The New York Times, Philadelphia Inquirer, San Francisco Chronicle, Seattle Times, St. Louis Post-Dispatch, The Washington Post.
Ardia et al. (2019)	Sentiment	US	18	Local	Daily News, the Journal of Commerce, Los Angeles Times, Orange County Register, Pittsburgh Post Gazette, St. Louis Post Dispatch, Star Tribune, Tampa Bay Times, Atlanta Journal–Constitution, Christian Science Monitor, Daily Oklahoman, New York Post, The New York Times, Philadelphia Daily News, Philadelphia Inquirer, Tampa Tribune, The Washington Post, USA Today.
Rambaccussing and Kwiatkowski (2020)	Sentiment	UK	12	Local	The Daily and Sunday Mirror, The Daily and Sunday Mail, The Daily Record, The Daily Telegraph, The Guardian, The Independent, The Financial Times, The Evening Standard, The Observer, The Sun, The Times, The Sunday Times, The Sunday Telegraph.
Aprigliano et al. (2022)	Sentiment & Uncertainty	Italy	4	Local	Il Corriere della Sera, Il Sole 24 Ore, La Repubblica, La Stampa.
Nyman et al. (2021)	Excitement in financial markets	UK	3	Local	Bank of England daily commentary, Reuters' news wire in the UK, broker research reports.

Note: The third column refers to the country of interest for which the index is constructed. The fourth column (#) reports the number of sources used to construct the index. This table is not meant to be exh
†: *All* means that both the foreign and local press are considered.

B Constructing the EPU indexes: local press coverage by country

Table B.1: Local press coverage by country

Country	Newspaper	Start of the considered period
Argentina	Clarín	January 2005
	La Nación	October 2002
	Infobae†	July 2018
Brazil	O Globo	April 1997
	Folha de São Paulo	January 1997
	O Estado de São Paulo	June 1997
	Correio Braziliense	May 2013
	Estado de Minas	May 2013
	Agência Brasil	January 2016
Chile	El mercurio	October 2002
	La Tercera	April 2014
	El diario financiero	July 2002
	Pulso	February 2015
Colombia	El Espectador	February 2008
	El Nuevo Siglo	September 2017
	Portafolio	October 2002
Mexico	Reforma	May 2004
	El Universal	October 2002
	La Jornada	December 2008
	El Financiero	January 2004
	El Economista	October 2002
	Agencia Mexicana de noticias	January 2002
Peru	El comercio	October 2002
	La República	September 2018
	Gestión	September 2013
	Agencia peruana de noticias Andina	September 2018
Spain	El País	January 2001
	El Mundo	January 1997
	Expansión	January 1997
	ABC	June 1997
	Cinco Días	January 1997
	El Economista	April 2008
	La Vanguardia	May 1997

Note: This table outlines, for each country, the local newspapers used to construct the EPU index based on the local press, along with the associated time coverage, which depends on the availability of the newspaper in Factiva.
† This is the only source that is solely available online. We included it because it is very popular in Argentina and we wanted to have at least 3 newspapers per country.

Table B.2: Keywords across press types for the Latin American region

Category	Spanish	Portuguese	Anglophone
Uncertainty	inciert∗, incertidumbr∗, inestabl∗, inestabili-dad/ inestabilidades, riesgo/ riesgos	incerto∗ or incerteza∗ or instável or instabil-idade/ instabilidades or risco/ riscos	uncertain, uncertainty/uncertainties, unstable, instability/instabilities, risk(s)
Economy	economic∗, economía	econômico∗ or economia	economic(s), economy
Policy	*the name of the central bank of the country, the name of the government's workplace in the country*, Parlamento, gobierno, Reserva Federal, Hacienda, arancel/aranceles, tributacion/tributaciones, déficit, déficits, presupuest∗, gasto público/gastos públicos, deuda pública/deudas públicas, la techo de deuda, techo de deuda, tipo de cambio, política fiscal/políticas fiscales, política monetaria/políticas monetarias, (el,de, del, un, por, este, ese, aquel) w/1 impuesto,† impuestos, legislación/legislaciones, reforma/reformas, deuda soberana, caida de la moneta, desplome de la moneta, norma/normas, normativ∗, regu-lación/ regulaciones, reglamento/ reglamen-tos, ley/leyes	*the name of the central bank of the country, the name of the government's workplace in the country*, parlamento, governo, tesouro, fazenda, economia, tarifa/tarifas, tributação, déficit/deficits, orçamento*, p gasto úblico/gastos publicos, despesa pública, resultado primário, receitas públicas, dívida p ública/dividas publicas, política fiscal/politicas fiscais, política monet ária/politicas monetarias, (a, de, isto, aquilo, que) w/1 imposto†, impos-tos, legislação, leis, reforma/ reformas, regras/regra, normativ∗, regulamento/regulamentos, lei/ leis	*the name of the central bank of the country, the name of the government's workplace in the country*, parliament, government, federal reserve, treasury, tariff(s), deficit(s), budget(s), public spending, debt ceiling, exchange rate(s), currency crash(es), sovereign debt, public debt, fiscal policy/policies, monetary policy/policies, legislation, reform(s), tax(es), overhaul, rule(s), norm(s), normative, regulation(s), law(s)

Note: This table presents all keywords used to construct the EPU index for the Latin American region. Spanish keywords are used to construct the EPU index based on the local and Spanish press. The only exception is the local press for Brazil, for which we use keywords in Portuguese. English keywords are used to construct the EPU index based on the Anglophone press. For Spain, the Anglophone and Spanish press are considered jointly to construct the EPU index based on the foreign press.

† Determiners are included to ensure that we capture sentences in which *impuesto* is a noun (meaning taxes) and not the past participle of the verb *imponer*, meaning to impose . *imponer*. *imponer*.

Table B.3: Keywords across press types for Spain

Category	Spanish	Anglophone
Uncertainty	inciert∗, incertidumbr∗, inestabl∗, inestabilidad/inestabilidades, riesgo/riesgos	uncertain, uncertainty/uncertainties, unstable, instability/instabilities, risk(s)
Economy	economic∗, economía	economic(s), economy
Policy	Moncloa, Parlamento, gobierno central, Hacienda, Comision Europea, Banco central Europeo, BCE, Banco de España, BdE, déficit, déficits, presupuest∗, gasto público/gastos públicos, deuda pública/deudas públicas, política fiscal/políticas fiscales, política monetaria/políticas monetarias, (el or de or del or un or por or este or ese or aquel) w/1 impuesto,† impuestos, legislación/legislaciones, reforma/reformas, norma/normas, normativ∗, regulación/ regulaciones, reglamento/ reglamentos, ley/leyes	Moncloa, parliament, central government, Bank of Spain, Banco de España, BdE, European Commission, European Central Bank, ECB, treasury, deficit(s), budget(s), public spending, public debt, fiscal policy/policies, monetary policy/policies, legislation, reform(s), tax(es), rule(s), norm(s), normative, regulation(s), law(s)

Note: This table presents all keywords used to construct the EPU index for Spain, as in Ghirelli et al. (2019). Spanish keywords are used to construct the EPU index based on the local press. English keywords are used to construct the EPU index based on the foreign press.
† Determiners are included to ensure that we capture sentences in which *impuesto* is a noun (meaning taxes) and not the past participle of the verb *imponer*, meaning to impose . *imponer*.

C Narrative across alternative press coverage by country

Table C.1: Events of economic policy uncertainty in Argentina: comparison across types of press coverage

		Type of press		
Date	**Event description**	2 SD	1 SD	1/2 SD
Dec 2002	The President of the central bank resigns	Foreign	All press	
Jan 2003	New deal with the IMF	Foreign	Foreign	All press
Jun 2008	Agriculture sector strikes	Foreign	Foreign	Foreign
May 2013	Rise of the 'blue dollar' and US Fed Taper Tantrum	Local	Local	Local
Jan 2014	Devaluation of peso	Foreign	Foreign	All press
June 2014	Default on bonds owned by so called 'holdouts'	Foreign	Foreign	Foreign
Aug 2017	Primary elections, opposition wins (Macri)	Local	Local	Local
May 2018	Currency crash	All press		
May–Jun 2018	IMF agreement	All press		
Aug–Sep 2018	Macri approves emergency economic measure to stop peso depreciation	All press		
Apr 2019	Strike against Macri	Local	Local	All press
Aug–Oct 2019	Primary elections won by opposition (Fernández) and currency crisis	All press		
Apr–May 2020	Covid-19 crisis: lockdown extension	All press		

Note: This table identifies events associated with major peaks (equivalent to 2 standard deviations above the average) in the EPU indicator for Argentina constructed using the local or foreign press. Whenever one event is reflected in one type of press but not the other, we check that it also appears in the other press but allowing for smaller peaks, i.e. one or half a standard deviation above average.

Table C.2: Events of economic policy uncertainty in Brazil: comparison across types of press coverage

		Type of press		
Date	**Event description**	2 SD	1 SD	1/2 SD
Nov 2002	Lula da Silva wins elections and high inflation	Foreign	Foreign	Foreign
Apr 2003	Iraq war	Foreign	Foreign	Foreign
Jul 2003	Pension reform and civil servant strikes	Foreign	Foreign	Foreign
Aug–Sep 2015	Leading political figures indicted in Lava Jato probe	All press		
Dec 2015	Economic crisis and possible impeachment of Rousseff	All press		
May-Jun 2017	Temer corruption case	Foreign	All press	
Oct 2018	Bolsonaro wins elections	Foreign	Foreign	Foreign
May 2019	Concerns about Bolsonaro's economic decisions, setback in the economy	Local	All press	
Aug 2019	Fire in the Amazon	Local	All press	
Oct 2019	Concerns about the economy and nothing relevant for the Spanish press	Local	All press	
Apr 2020	Covid-19 crisis: increase of deaths and lockdown extension in Sao Paulo	All press		
Jul 2020	Covid-19 crisis: Brazilian interest rate kept at historical minimum to foster growth	Foreign	All press	
Dec 2020	Covid-19 crisis: new variant outbreak	Local	All press	
Mar–Apr 2021	Covid-19 crisis: death record, Bolsonaro creates a new crisis committee	Local	All press	
Oct 2021	Inflation exceeds 10% and public expenditure ceiling breaks down	Local	All press	

Note: This table identifies events associated with major peaks (equivalent to 2 standard deviations above the average) in the EPU indicator for Brazil constructed using either the local or foreign press. Whenever one event is reflected in one type of press but not the other, we check that it also appears in the other press but allowing for smaller peaks, i.e. one or half a standard deviation above average.

Table C.3: Events of economic policy uncertainty in Chile: comparison across types of press coverage

		Type of press		
Date	**Event description**	2 SD	1 SD	1/2 SD
Nov 2002	Uncertainty about the new Fishing Law Local	Local All press		
Feb–Apr 2003	Iraq conflict	All press		
Aug 2003	First mass worker protest in 17 years	Local	Local	Local
Mar 2011	Chile and US sign free-trade agreement	Foreign	Foreign	Foreign
May 2014	Tax and foreign investment reform by Bachelet concerns investors	Foreign	Foreign	Foreign
Apr 2016	Labour market reform and debate about a change in constitution	Foreign	Foreign	Foreign
Dec 2019	Civil protests	Foreign	All press	
Mar–Apr 2020	Covid-19 crisis: lockdown extension	Local	All press	
Jun 2020	Covid-19 crisis: central bank announces liquidity measures	All press		
Oct 2020	New constitution referendum	Foreign	All press	
Apr-May 2021	Election of members to rewrite the constitution	Foreign	All press	

Note: This table identifies events associated with major peaks (equivalent to 2 standard deviations above average) in the EPU indicator for Chile constructed using either the local or foreign press. Whenever one event is reflected in one type of press but not the other, we check that it also appears in the other press but allowing for smaller peaks, i.e. one or half a standard deviation above average.

Table C.4: Events of economic policy uncertainty in Colombia: comparison across types of press coverage

		Type of press		
Date	**Event description**	2 SD	1 SD	1/2 SD
Oct-Nov 2008	Subprime crisis	Local	Local	Local
Apr 2010	Presidential elections	Foreign	Foreign	Foreign
Apr 2011	Uncertainty about the approval of FTA between Colombia and US	Foreign	Foreign	Foreign
Oct 2016	Voters reject FARC peace deal and tax reform	Foreign	Foreign	Foreign
Mar-Apr 2017	Venezuelan refugee crisis	Foreign	Foreign	Foreign
Jan 2020	Venezuela's Guaidó looks for Colombian support	Foreign	Foreign	All press
Apr-May 2020	Covid-19 crisis: lockdown and rating downgrade	All press		
Jul-Aug 2020	Covid-19 crisis: 100 days of quarantine	All press		
Oct 2020	Strike against Duque reforms	All press		
May–Jun 2021	Duque removes tax reform after protests	All press		

Note: This table identifies events associated with major peaks (equivalent to 2 standard deviations above average) in the EPU indicator for Colombia constructed using either the local or foreign press. Whenever one event is reflected in one type of press but not the other, we check that it also appears in the other press but allowing for smaller peaks, i.e. one or half a standard deviation above average. FTA stands for free trade agreement, while FARC stands for revolutionary armed forces of Colombia.

Table C.5: Events of economic policy uncertainty in Mexico: comparison across types of press coverage

		Type of press		
Date	**Event description**	2 SD	1 SD	1/2 SD
Jan–Mar 2003	Dollar volatility	Local	Local	All press
Apr 2003	Iraq conflict	All press		
Nov–Dec 2003	Congress refuses fiscal reform	Local	Local	Local
Jul 2006	Presidential elections contested by the opposition candidate	Foreign	Foreign	All press
Jun 2012	Euro crisis	Foreign	All press	
Nov 2012	US fiscal cliff	Local	All press	
Nov 2016	Trump election	Foreign	Foreign	Foreign
Jan 2017	Protests against the 'gasolinazo'	Foreign	All press	
Oct 2017	Renegotiation of NAFTA	Foreign	Foreign	Foreign
Jul 2018	AMLO wins presidential elections	Foreign	Foreign	Foreign
Jun–Jul 2019	Trump threatens US–Mexico border closure	Foreign	All press	
Mar–May 2020	Covid-19 crisis: extension of lock-down	All press		
Jun–Jul 2020	Covid-19 crisis: reopening measures	Foreign	Foreign	All press

Note: This table identifies events associated with major peaks (equivalent to 2 standard deviations above average) in the EPU indicator for Mexico constructed using either the local or foreign press. Whenever one event is reflected in one type of press but not the other, we check that it also appears in the other press but allowing for smaller peaks, i.e. one or half a standard deviation above average. AMLO stands for Andres Manuel López Obrador.

Table C.6: Events of economic policy uncertainty in Peru: comparison across types of press coverage

		Type of press		
Date	**Event description**	2 SD	1 SD	1/2 SD
Dec 2003	Social discomfort against Toledo	Foreign	Foreign	All press
Feb 2004	New government cabinet	Local	Local	Local
Apr–May 2011	Humala wins the elections	Foreign	Foreign	All press
Jul 2014	Congress approves the executive's economic reactivation package against commodities price drop	Local	Local	All press
Oct 2015	China's economic slowdown and transport reform (local)	Foreign	Foreign	All press
Jan 2016	Electoral candidates list and surveys	Local	Local	All press
Apr 2016	General elections	Foreign	Foreign	All press
Dec 2017	Political crisis due to Odebretch scandal that affects the president	Local	Local	Local
Mar 2018	Trump imposes duties on metal imports	Local	All press	
Apr–Jun 2020	Covid-19 crisis: concerns about employment and recession	Foreign	All press	
Jul 2020	Covid-19 crisis: one-month extension of lockdown	All press		
Nov 2020	Vizcarra's removal	Foreign	Foreign	All press
Jun–Jul 2021	Sol depreciation after Castillo government formation	Foreign	Foreign	All press
Oct 2021	Vote of no confidence for President Castillo	Foreign	Foreign	All press

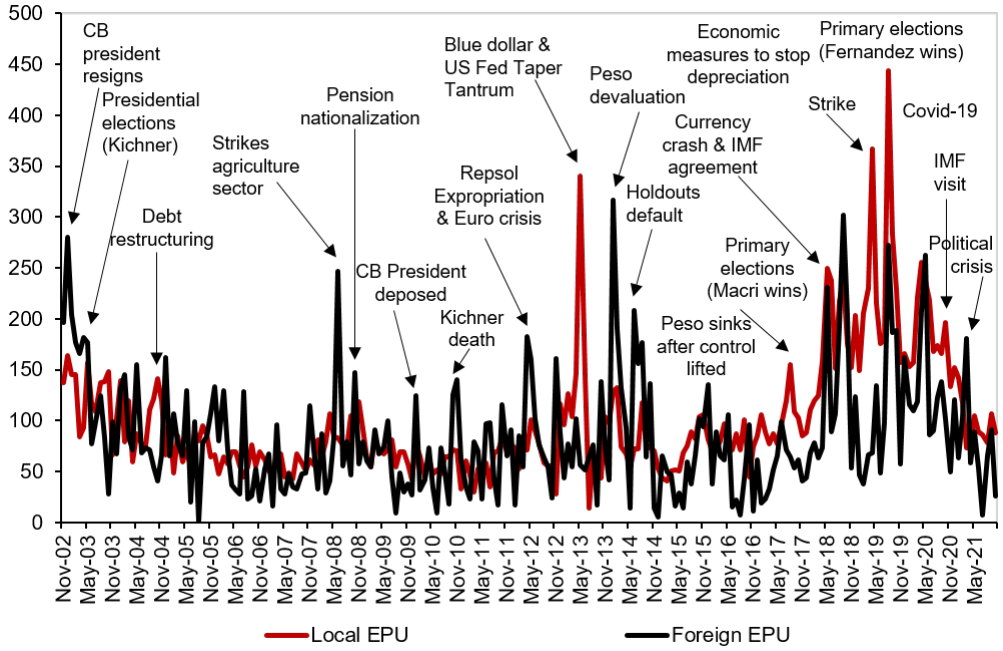
Note: This table identifies events associated with major peaks (equivalent to 2 standard deviations above average) in the EPU indicator for Peru constructed using either the local or foreign press. Whenever one event is reflected in one type of press but not the other, we check that it also appears in the other press but allowing for smaller peaks, i.e. one or half a standard deviation above average.

D Our EPU indexes by country

This section shows each country-level EPU index with its associated timeline of relevant events. In most cases, the peaks in the indexes are explained by events that might increase economic uncertainty in the country. This exercise is commonly used in the literature to provide evidence of the validity of the index as a proxy of economic uncertainty. Nevertheless, there are a few cases in which the spikes do not correspond to a relevant event in the country's recent history. This is noise. Following the literature, we manually clean the series by replacing each of these noisy peaks with the average of each series. Below, we provide a list of all noisy peaks for each country.

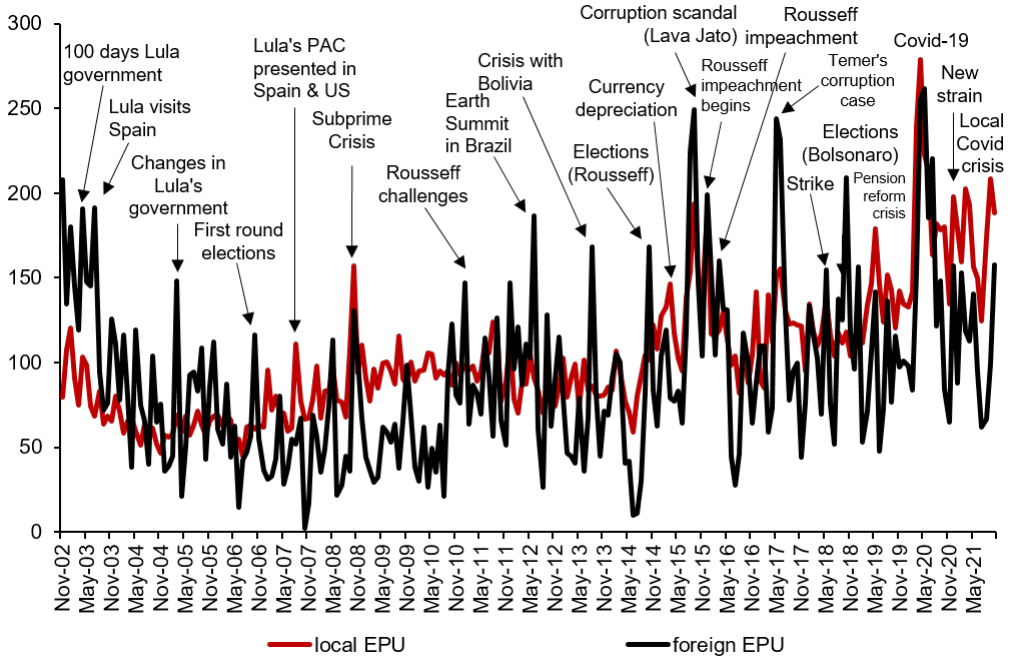
- Argentina: Jul. 2003, Jul. 2005 (foreign press)
- Chile: Feb. 2021 (foreign press)
- Peru: Sep. 2010, Jul. 2017 (foreign press)

Figure D.1: EPU indexes for Argentina



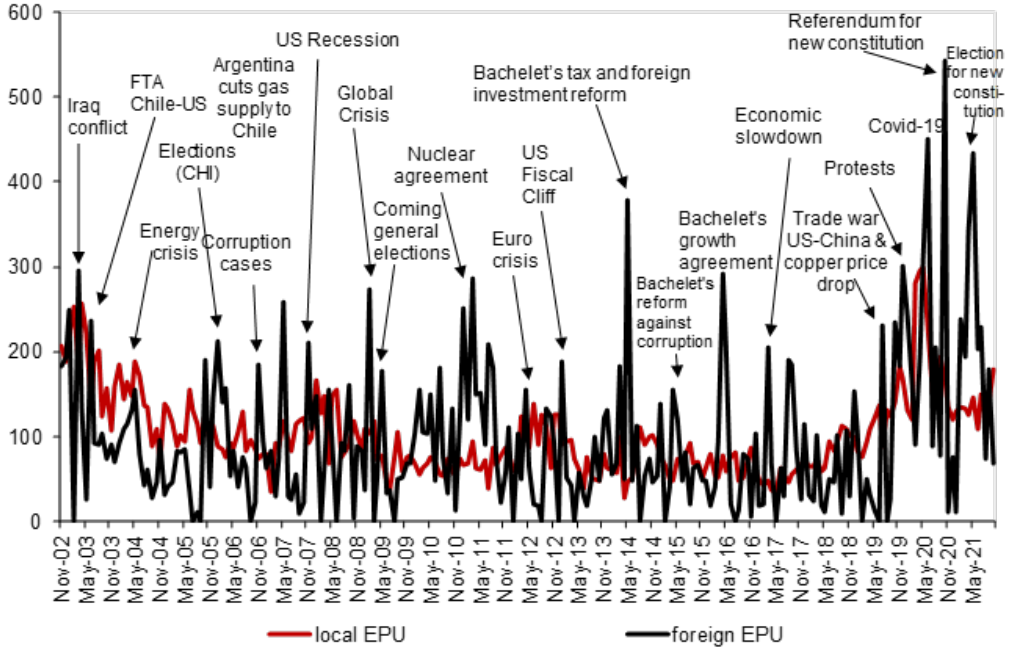
Note: This figure shows the EPU indexes for Argentina based on the local (red line) and foreign press (black line) against the narrative of events associated with increases in policy uncertainty in Argentina.

Figure D.2: EPU indexes for Brazil



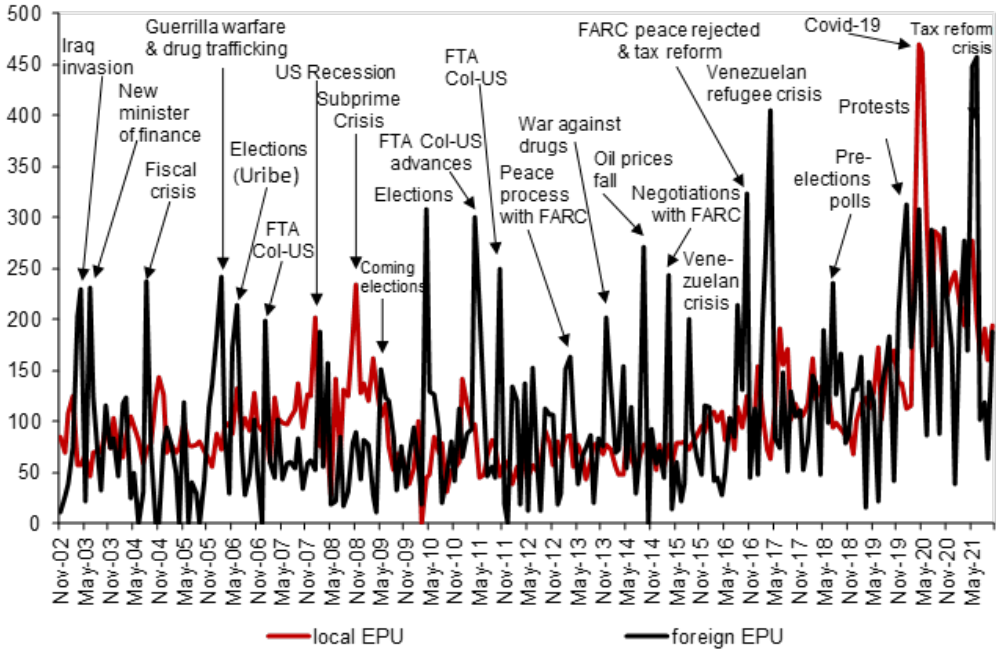
Note: This figure shows the EPU indexes for Brazil based on the local (red line) and foreign press (black line) against the narrative of events associated with increases in policy uncertainty in Brazil. PAC stands for Growth Acceleration Program.

Figure D.3: EPU indexes for Chile



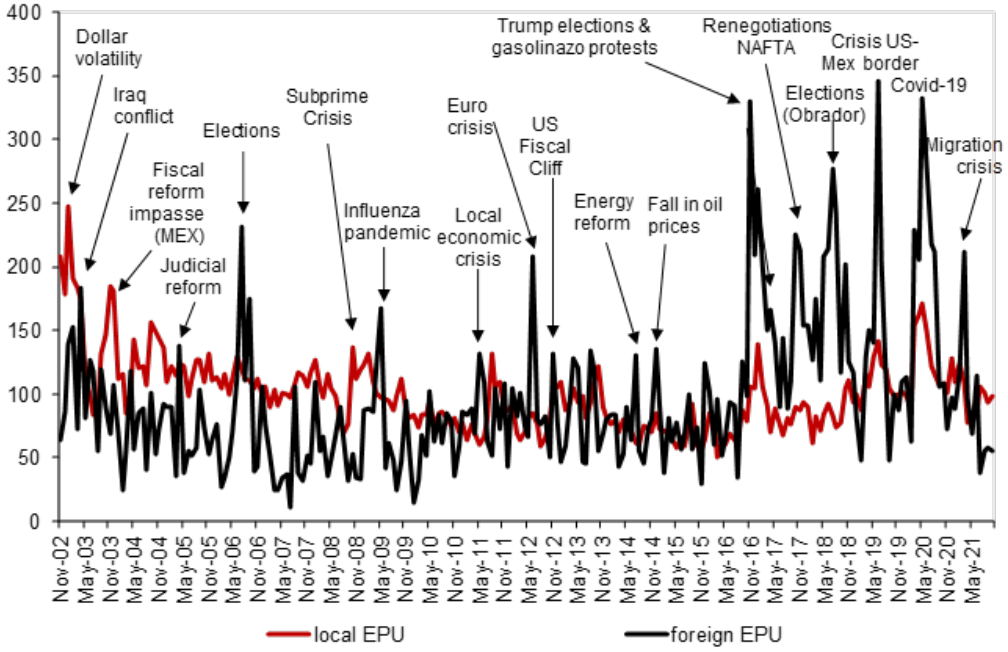
Note: This figure shows the EPU indexes for Chile based on the local (red line) and foreign press (black line) against the narrative of events associated with increases in policy uncertainty in Chile.

Figure D.4: EPU indexes for Colombia



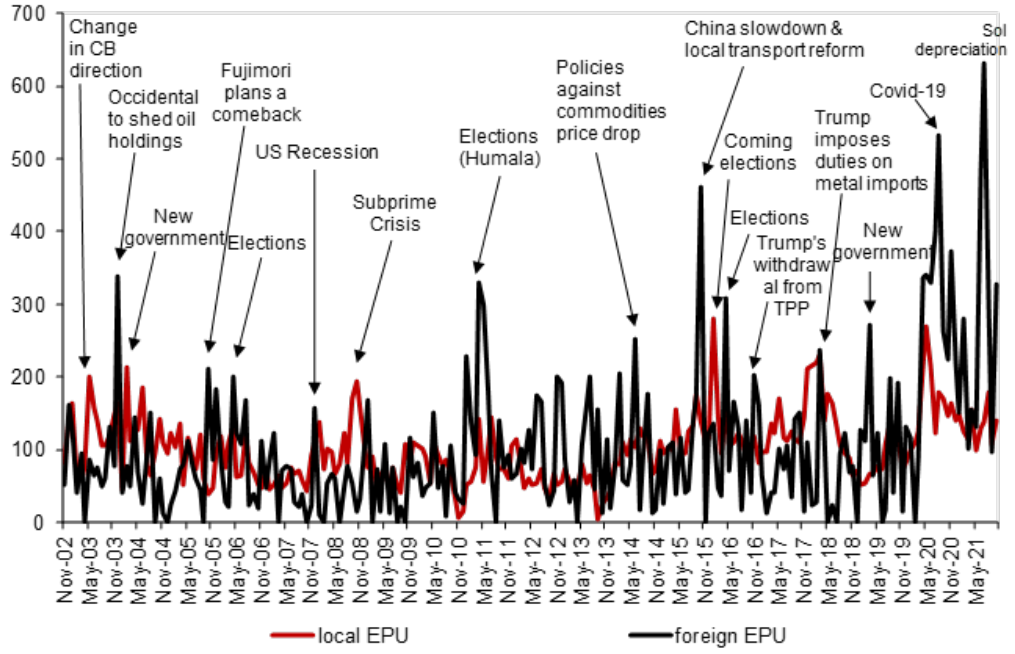
Note: This figure shows the EPU indexes for Colombia based on the local (red line) and foreign press (black line) against the narrative of events associated with increases in policy uncertainty in Colombia.

Figure D.5: EPU indexes for Mexico



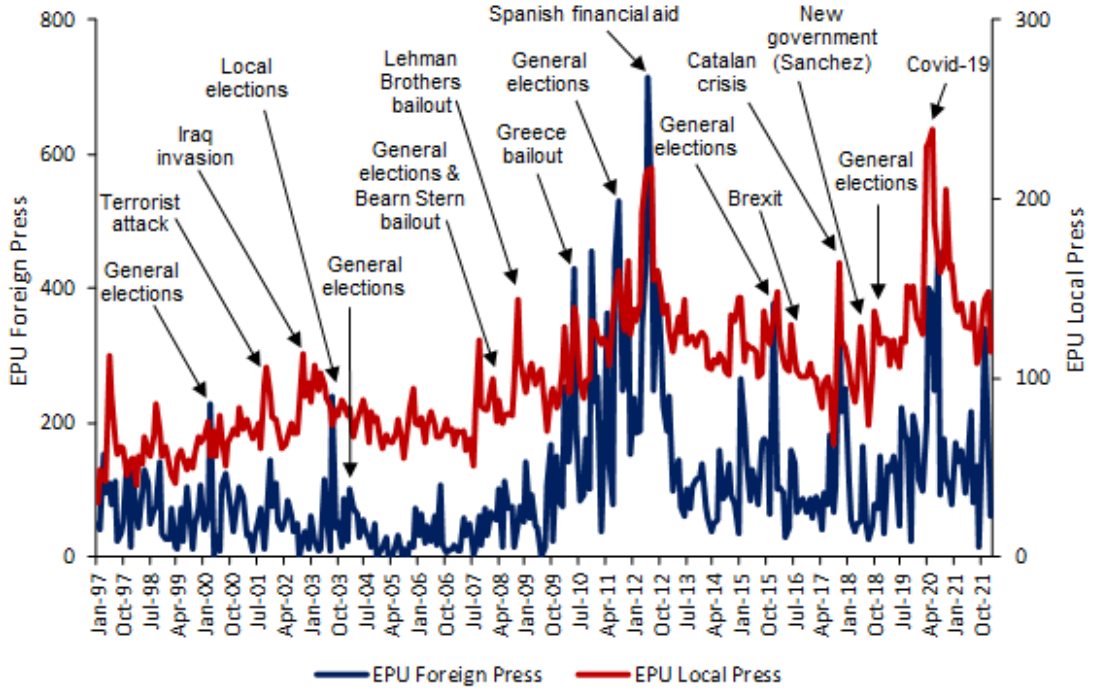
Note: This figure shows the EPU indexes for Mexico based on the local (red line) and foreign press (black line) against the narrative of events associated with increases in policy uncertainty in Mexico.

Figure D.6: EPU indexes for Peru



Note: This figure shows the EPU indexes for Peru based on the local (red line) and foreign press (black line) against the narrative of events associated with increases in policy uncertainty in Peru.

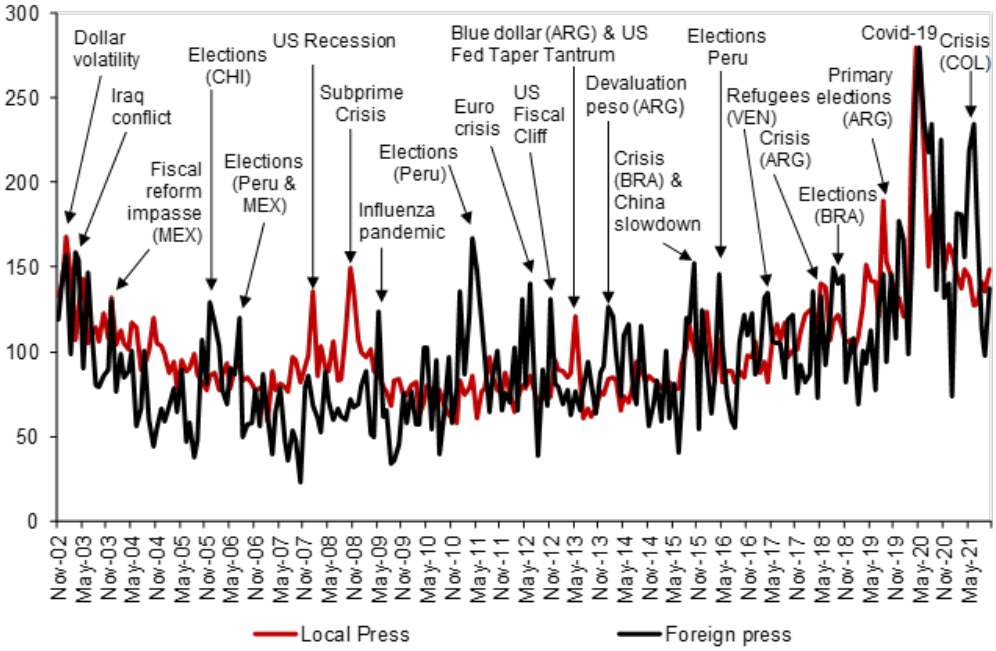
Figure D.7: EPU indexes for Spain



Note: This figure shows the EPU indexes for Spain based on the local (Spanish—red line) and foreign (Anglophone—blue line) press against the narrative of events associated with increases in policy uncertainty in this Spain.

E Our EPU indexes for the Latin American region

Figure E.1: EPU indexes for the Latin American region



Note: This figure shows the EPU indexes for the Latin American region based on the local (red line) and foreign press (black line) against the narrative of events associated with increases in policy uncertainty in this region. The Latin American region is defined as the following countries: Argentina, Brazil, Chile, Colombia, Mexico and Peru.

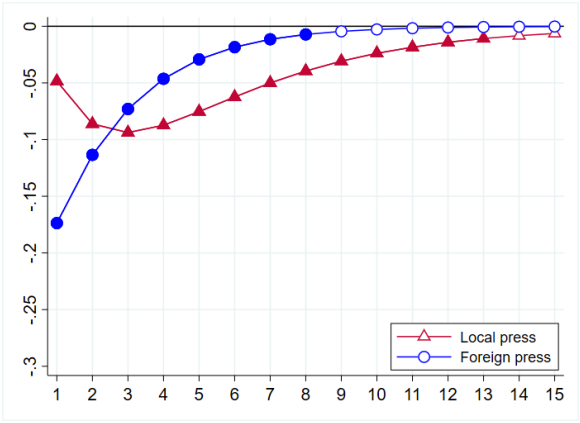
Table E.1: EPU indexes for the Latin American region: descriptive statistics across press coverage types

Type of Press	Mean	Median	St. dev.	Max.	Min.	Obs.	Label
Local	101.82	91.98	32.75	279.69	57.60	228	Local press
Foreign	101.26	88.49	45.18	279.66	23.34	298	Pool of Spanish and Anglophone press
All press	104.33	91.21	43.60	325.06	43.85	228	Pool of local, Spanish, and Anglophone press

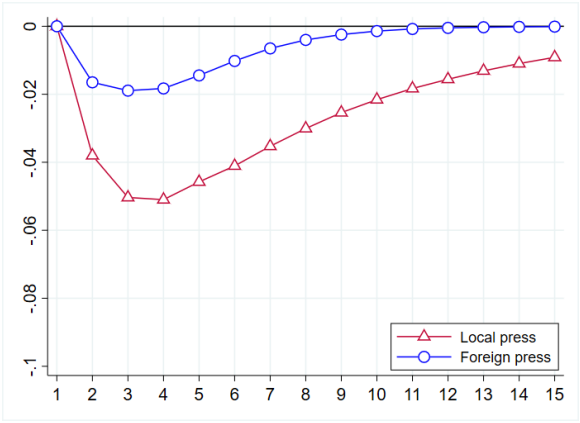
Note: This table reports descriptive statistics of EPU indexes based on local, foreign and all press.

F Robustness results: BVAR exercise

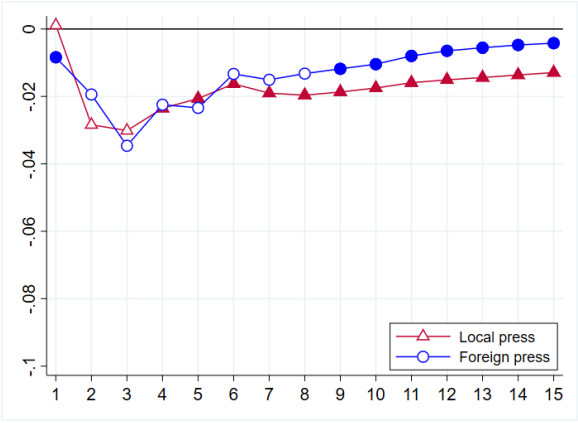
Figure F.1: Robustness results: IRFs of GDP to EPU shocks for the Latin American region



(a) One lag



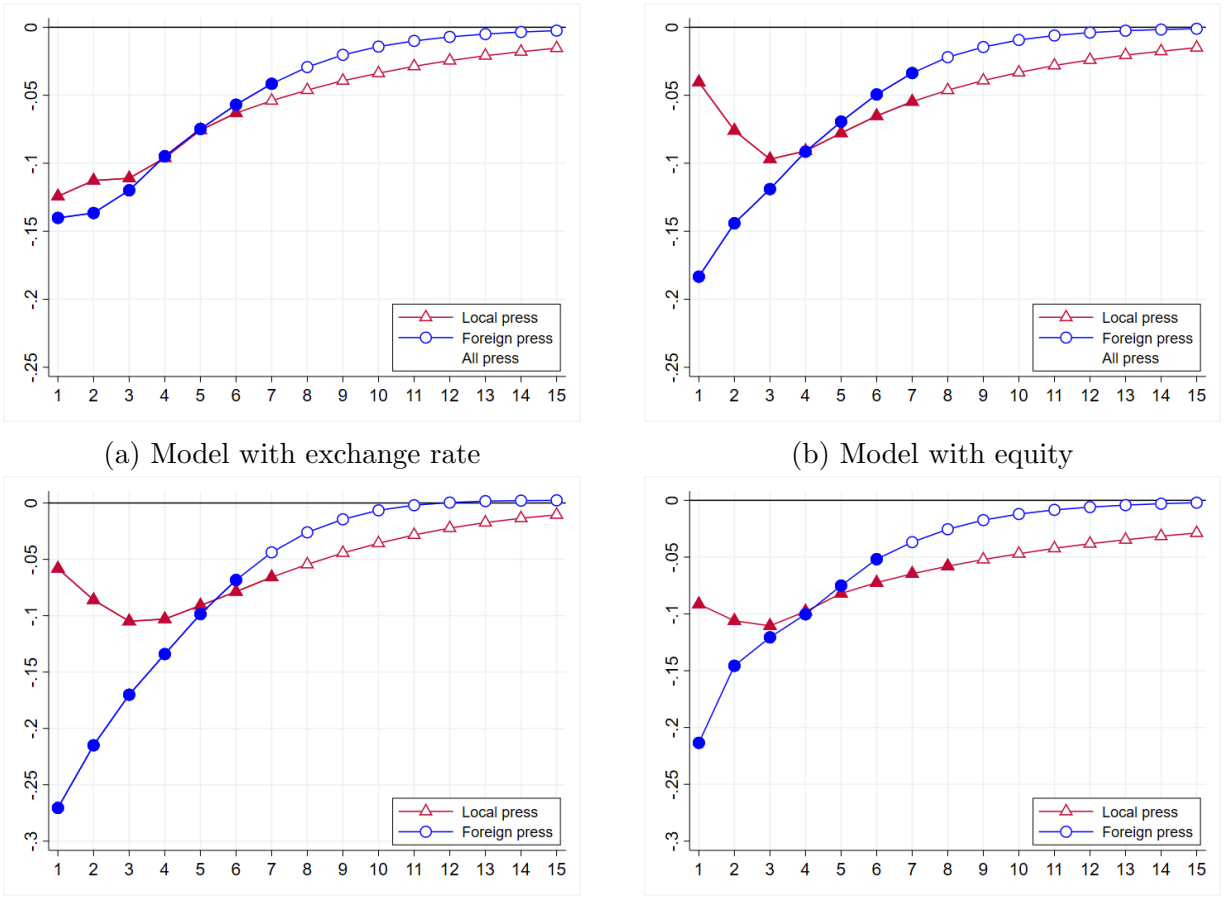
(b) Order



(c) Monthly

Note: Each panel depicts the median impulse response of GDP to a rise of one standard deviation in the EPU index in the LATAM region: the red and blue lines represent responses to EPU shocks based on the local and foreign press, respectively. Filled symbols indicate statistical significance within the 84%–16% credible set, while empty symbols represent not-significant estimates. The horizontal axis measures quarters since the shock.

Figure F.2: Robustness results: IRFs of GDP to EPU shocks for the Latin American region using alternative financial variables in the model



(a) Model with exchange rate

(b) Model with equity

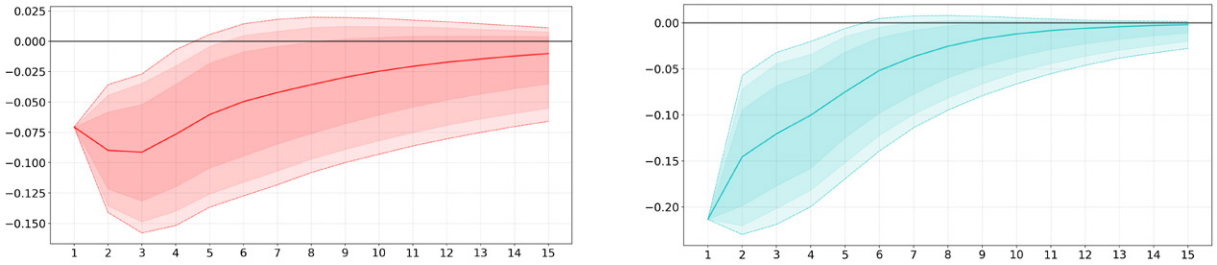
(c) Model with EMBI

(d) Model with residential PCF

Note: Each panel depicts the median impulse response of GDP to a rise of one standard deviation in the EPU index in the LATAM region: the red and blue lines represent responses to EPU shocks based on the local and foreign press, respectively. Filled symbols indicate statistical significance within the 84%–16% credible set, while empty symbols represent not-significant estimates. The horizontal axis measures quarters since the shock. PCF stands for portfolio capital flows.

G Additional benchmark results: BVAR exercise for the Latin American region

Figure G.1: Benchmark model: IRFs of GDP to EPU shocks with credible set



(a) Local press (b) Foreign press

Note: The panels depicts the median impulse response of the specified variable to a rise of one standard deviation in the (a) local press and (b) foreign press EPU indexes, along with the corresponding 90%–10%, 84%–16% and 68%–32% credible sets (marked by decreasing colour intensity). The horizontal axis measures quarters since the shock. In both cases we estimate the model with portfolio capital flows as financial variable.

BANCO DE ESPAÑA PUBLICATIONS

WORKING PAPERS

2120 ALEJANDRO FERNÁNDEZ-CEREZO, BEATRIZ GONZÁLEZ, MARIO IZQUIERDO and ENRIQUE MORAL-BENITO: Firm-level heterogeneity in the impact of the COVID-19 pandemic.
2121 EDUARDO GUTIÉRREZ and CÉSAR MARTÍN MACHUCA: The effect of tariffs on Spanish goods exports.
2122 JACOPO TIMINI: Revisiting the 'Cobden-Chevalier network' trade and welfare effects.
2123 ALEJANDRO BUESA, JAVIER J. PÉREZ and DANIEL SANTABÁRBARA: Awareness of pandemics and the impact of COVID-19.
2124 ALICIA AGUILAR and DIEGO TORRES: The impact of COVID-19 on analysts' sentiment about the banking sector.
2125 SILVIA ALBRIZIO, IVÁN KATARYNIUK, LUIS MOLINA and JAN SCHÄFER: ECB euro liquidity lines.
2126 ANTHONY BALD, ERIC CHYN, JUSTINE HASTINGS and MARGARITA MACHELETT: The causal impact of removing children from abusive and neglectful homes.
2127 IRMA ALONSO, PEDRO SERRANO and ANTONI VAELLO-SEBASTIÀ: The impact of heterogeneous unconventional monetary policies on the expectations of market crashes.
2128 MARÍA T. GONZÁLEZ-PÉREZ: Lessons from estimating the average option-implied volatility term structure for the Spanish banking sector.
2129 SIMÓN A. RELLA, YULIYA A. KULIKOVA, EMMANOUIL T. DERMITZAKIS and FYODOR A. KONDRASHOV: Rates of SARS-COV-2 transmission and vaccination impact the fate of vaccine-resistant strains.
2130 MATÍAS LAMAS and DAVID MARTÍNEZ-MIERA: Sectorial holdings and stock prices: the household-bank nexus.
2131 ALBERT BANAL-ESTAÑOL, ENRIQUE BENITO, DMITRY KHAMETSHIN and JIANXING WEI: Asset encumbrance and bank risk: theory and first evidence from public disclosures in Europe.
2132 ISABEL ARGIMÓN and MARÍA RODRÍGUEZ-MORENO: Business complexity and geographic expansion in banking.
2133 LUIS GUIROLA: Does political polarization affect economic expectations?: Evidence from three decades of cabinet shifts in Europe.
2134 CHRISTIANE BAUMEISTER, DANILO LEIVA-LEÓN and ERIC SIMS: Tracking weekly state-level economic conditions.
2135 SERGI BASCO, DAVID LÓPEZ-RODRÍGUEZ and ENRIQUE MORAL-BENITO: House prices and misallocation: The impact of the collateral channel on productivity.
2136 MANUEL ARELLANO, STÉPHANE BONHOMME, MICOLE DE VERA, LAURA HOSPIDO and SIQI WEI: Income risk inequality: Evidence from Spanish administrative records.
2137 ANGELA ABBATE and DOMINIK THALER: Optimal monetary policy with the risk-taking channel.
2138 MARTA BAŃBURA, DANILO LEIVA-LEÓN and JAN-OLIVER MENZ: Do inflation expectations improve model-based inflation forecasts?
2139 MÁXIMO CAMACHO, MARÍA DOLORES GADEA and ANA GÓMEZ LOSCOS: An automatic algorithm to date the reference cycle of the Spanish economy.
2140 EDUARDO GUTIÉRREZ, AITOR LACUESTA and CÉSAR MARTÍN MACHUCA: Brexit: Trade diversion due to trade policy uncertainty.
2141 JULIO A. CREGO and JULIO GÁLVEZ: Cyclical dependence in market neutral hedge funds.
2142 HERVÉ LE BIHAN, MAGALI MARX and JULIEN MATHERON: Inflation tolerance ranges in the new keynesian model.
2143 DIEGO COMIN, JAVIER QUINTANA, TOM SCHMITZ and ANTONELLA TRIGARI: Measuring TFP: the role of profits, adjustment costs, and capacity utilization.
2144 ROBERTO PASCUAL: Do analysts forecast differently in periods of uncertainty? An empirical analysis of target prices for Spanish banks.
2145 BEATRIZ GONZÁLEZ, GALO NUÑO, DOMINIK THALER and SILVIA ABRIZIO: Firm heterogeneity, capital misallocation and optimal monetary policy.
2201 RYAN BANERJEE and JOSÉ-MARÍA SERENA: Dampening the financial accelerator? Direct lenders and monetary policy.
2202 JUAN S. MORA-SANGUINETTI and ISABEL SOLER: La regulación sectorial en España. Resultados cuantitativos.
2203 JORGE E. GALÁN, MATÍAS LAMAS and RAQUEL VEGAS: Roots and recourse mortgages: handing back the keys.
2204 MONICA MARTINEZ-BRAVO and CARLOS SANZ: Inequality and psychological well-being in times of COVID-19: evidence from Spain.
2205 CORINNA GHIRELLI, DANILO LEIVA-LEÓN and ALBERTO URTASUN: Housing prices in Spain: convergence or decoupling?
2206 MARÍA BRU MUÑOZ: Financial exclusion and sovereign default: The role of official lenders.
2207 RICARDO GIMENO and CLARA I. GONZÁLEZ: The role of a green factor in stock prices. When Fama & French go green.

2208 CARLOS MONTES-GALDÓN and EVA ORTEGA: Skewed SVARs: tracking the structural sources of macroeconomic tail risks.

2209 RODOLFO G. CAMPOS, ILIANA REGGIO and JACOPO TIMINI: Thick borders in Franco's Spain: the costs of a closed economy.

2210 MARCO CELENTANI, MIGUEL GARCÍA-POSADA and FERNANDO GÓMEZ POMAR: Fresh start policies and small business activity: evidence from a natural experiment.

2211 JOSE GARCIA-LOUZAO, LAURA HOSPIDO and ALESSANDRO RUGGIERI: Dual returns to experience.

2212 ADRIÁN CARRO and PATRICIA STUPARIU: Uncertainty, non-linear contagion and the credit quality channel: an application to the Spanish interbank market.

2113 MARIO IZQUIERDO, ENRIQUE MORAL-BENITO, ELVIRA PRADES and JAVIER QUINTANA: The propagation of worldwide sector-specific shocks.

2214 HENRIQUE S. BASSO: Asset holdings, information aggregation in secondary markets and credit cycles.

2215 JOSÉ MANUEL CARBÓ and SERGIO GORJÓN: Application of machine learning models and interpretability techniques to identify the determinants of the price of bitcoin.

2216 LUIS GUIROLA and MARÍA SÁNCHEZ-DOMÍNGUEZ: Childcare constraints on immigrant integration.

2217 ADRIÁN CARRO, MARC HINTERSCHWEIGER, ARZU ULUC and J. DOYNE FARMER: Heterogeneous effects and spillovers of macroprudential policy in an agent-based model of the UK housing market.

2218 STÉPHANE DUPRAZ, HERVÉ LE BIHAN and JULIEN MATHERON: Make-up strategies with finite planning horizons but forward-looking asset prices.

2219 LAURA ÁLVAREZ, MIGUEL GARCÍA-POSADA and SERGIO MAYORDOMO: Distressed firms, zombie firms and zombie lending: a taxonomy.

2220 BLANCA JIMÉNEZ-GARCÍA and JULIO RODRÍGUEZ: A quantification of the evolution of bilateral trade flows once bilateral RTAs are implemented.

2221 SALOMÓN GARCÍA: Mortgage securitization and information frictions in general equilibrium.

2222 ANDRÉS ALONSO and JOSÉ MANUEL CARBÓ: Accuracy of explanations of machine learning models for credit decisions.

2223 JAMES COSTAIN, GALO NUÑO and CARLOS THOMAS: The term structure of interest rates in a heterogeneous monetary union.

2224 ANTOINE BERTHEAU, EDOARDO MARIA ACABBI, CRISTINA BARCELÓ, ANDREAS GULYAS, STEFANO LOMBARDI and RAFFAELE SAGGIO: The Unequal Consequences of Job Loss across Countries.

2225 ERWAN GAUTIER, CRISTINA CONFLITTI, RIEMER P. FABER, BRIAN FABO, LUDMILA FADEJEVA, VALENTIN JOUVANCEAU, JAN-OLIVER MENZ, TERESA MESSNER, PAVLOS PETROULAS, PAU ROLDAN-BLANCO, FABIO RUMLER, SERGIO SANTORO, ELISABETH WIELAND and HÉLÈNE ZIMMER. New facts on consumer price rigidity in the euro area.

2226 MARIO BAJO and EMILIO RODRÍGUEZ: Integrating the carbon footprint into the construction of corporate bond portfolios.

2227 FEDERICO CARRIL-CACCIA, JORDI PANIAGUA and MARTA SUÁREZ-VARELA: Forced migration and food crises.

2228 CARLOS MORENO PÉREZ and MARCO MINOZZO: Natural Language Processing and Financial Markets: Semi-supervised Modelling of Coronavirus and Economic News.

2229 CARLOS MORENO PÉREZ and MARCO MINOZZO: Monetary Policy Uncertainty in Mexico: An Unsupervised Approach.

2230 ADRIAN CARRO: Could Spain be less different? Exploring the effects of macroprudential policy on the house price cycle.

2231 DANIEL SANTABÁRBARA and MARTA SUÁREZ-VARELA: Carbon pricing and inflation volatility.

2232 MARINA DIAKONOVA, LUIS MOLINA, HANNES MUELLER, JAVIER J. PÉREZ and CRISTOPHER RAUH: The information content of conflict, social unrest and policy uncertainty measures for macroeconomic forecasting.

2233 JULIAN DI GIOVANNI, MANUEL GARCÍA-SANTANA, PRIIT JEENAS, ENRIQUE MORAL-BENITO and JOSEP PIJOAN-MAS: Government Procurement and Access to Credit: Firm Dynamics and Aggregate Implications.

2234 PETER PAZ: Bank capitalization heterogeneity and monetary policy.

2235 ERIK ANDRES-ESCAYOLA, CORINNA GHIRELLI, LUIS MOLINA, JAVIER J. PÉREZ and ELENA VIDAL: Using newspapers for textual indicators: which and how many?