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The spillover effects of economic policy uncertainty in Latin America on the Spanish economy ☆

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ABSTRACT

We construct economic policy uncertainty (EPU) indexes for a number of Latin American (LA) economies (Argentina, Brazil, Chile, Colombia, Mexico, Peru, Venezuela) and the region as a whole, based on reports in the Spanish press. Our measures are comparable across countries. We study the macroeconomic effects of LA EPU shocks on the analyzed American economies and the Spanish economy. To study the international spillover effects on the Spanish economy, we carry out two exercises by means of vector auto-regression models. First, we estimate responses to unexpected shocks in LA EPU of the quotations of Spanish companies which are highly exposed to Latin America. Second, we study the impact of LA EPU shocks on Spanish macroeconomic aggregates. Unexpected shocks in LA EPU significantly dampen commercial relationships between Spain and LA countries. Spanish firms decrease their exports and foreign direct investments in LA countries that experience negative shocks in EPU.

1. Introduction

The Latin American (LA) region has been subject to significant episodes of social and political unrest in the recent past. The outbursts of social stress at the end of 2019 in Chile, Colombia, and Ecuador, the events leading to Argentina's International Monetary Fund's program, and the more longstanding situation of Venezuela are recent landmark examples. These events, though, are not exceptional in the history of the region, with a number of papers pointing to weak political and economic institutions as a fundamental underlying driver. Many governments have reacted to social tensions with announcements of policy actions and reforms, leading to growing uncertainty about the future course of economic policies (see International Monetary Fund, 2019). More recently, the economic crisis caused by the global coronavirus epidemic could spark new outbreaks of social unrest in Latin America (see International Monetary Fund, 2020).

It is well established in the theoretical and empirical literature that heightened economic uncertainty has the potential to harm economic activity (e.g., Dixit and Pindyck, 1994; Gilchrist et al., 2014; Bloom, 2009b; Bloom et al., 2018; Kelly et al., 2016, or more recently Baker et al. (2020) and the references quoted therein on the COVID-19–related global shock to uncertainty). Through documentation of the spillover effects of rising uncertainty across countries, the literature also demonstrates that heightened economic

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Table 1
Main economic areas of relevance for Latin America (aggregate of Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela).

	%Total				Rank			
	USA	China	Euro area	Spain	USA(2)	China(1)	Euro area(3)	Spain(15)[b]
Exports of goods (b.USD)	21.6	4.8	2.1	4.0	1	4	14	7
Exports of services (b.USD)	16.9	7.0	1.8	4.8	2	5	15	6
Imports of goods (b.USD)	10.5	n.a.	2.6	5.0	1	n.a.	11	5
Imports of services (b.USD)	7.6	n.a.	1.3	2.8	2	n.a.	18	11
FDI: assets	4.0	0.7	4.0	28.3	10	18	9	1
FDI: liabilities	1.0	0.0	0.9	3.8	16	43	20	7
Portfolio: assets	3.8	0.0	1.5	1.8	9	18	14	12
Portfolio: liabilities	1.1	0.0	0.5	0.3	19	38	24	26
LA banks claims on residents of	0.6	0.0	0.2	0.3	12	18	19	13
LA residents debt to banks in	19.4	n.a.	49.2	40.7	2	n.a.	1	1

Notes: Sources: BIS, IMF, World Bank, OECD, Ministry of Industry, Trade and Tourism, and Bank of Spain. Latin America here is defined as the region composed of Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela.
a*Total* refers to the importance of Latin America for the total magnitude of interest of each country/region listed in the columns (USA, China, Euro area, Spain).
[b] The number in parentheses reports the position of each country/region in the worldwide ranking of GDP, adjusted by purchasing power parity.

uncertainty in one country can have global ramifications (e.g., Biljanovska et al., 2017; Colombo, 2013; Bhattarai et al., 2019; Trung, 2019). The latter can operate through financial markets or real channels, with stronger effects when the economic ties among countries and regions are stronger.

In this context, the objective of this project is twofold: first, to measure economic policy uncertainty (EPU henceforth) in LA countries in order to get a narrative of "uncertainty shocks" and their potential effect on the economic activity of LA countries, and second, to explore the extent to which those LA shocks have the potential to spill over to Spain. The latter country provides an interesting case study for this type of "international spillover" given its significant economic links with the region.

Table 1 clearly demonstrates the strong economic relationships between the LA region and Spain: not only is Spain important for the LA countries, but the opposite relationship is also true.[1] According to 2018 data, Latin America is the destination market for about 4% of Spanish exports, whereas it represents the market for only about 2% of exports from the Euro area. Similarly, 5% and 2.8% of Spanish imports of goods and services, respectively, come from LA countries. Moreover, Latin America is the most important destination for Spanish foreign direct investment (FDI) assets,[2] while FDI from LA investors ranked seventh among all FDI invested in Spain. Finally, 40% of the total foreign debt held by LA residents belongs to Spanish banks. Considering the entire Euro area, this share increases only to 50%, which means the bulk of LA residents' debt to foreign banks is to banks in Spain. These are notable figures, especially considering that Spain represents a relatively small market (it is 15th in the worldwide ranking of GDP).

As regards the first objective, a recent branch of the literature relies on newspaper articles to compute indicators of economic uncertainty. Text data is indeed a valuable new source of information since it reflects major current events that affect economic agents' decisions, and it is available with no time lag. In this paper we focus on EPU, which refers to episodes characterized by increased dispersion in agents' expectations about governments' future policy stands. The hypothesis is that greater uncertainty about possible changes in government policies induces economic agents to delay or refrain from engaging in consumption, production, and investment related to that country.[3] Since the seminal paper by Baker et al. (2016) that proposed an EPU index based on text-data for the US and several other countries, many researchers and economic analysts have used text-based uncertainty indicators in their analyses, providing empirical evidence of negative effects on activity in many countries.[4] In a nutshell, the EPU index relies on textual analysis and is based on the volume of newspapers' articles containing words related to "economy," "policy," and "uncertainty." In the spirit of Baker et al. (2016), we construct EPU indexes for the main LA countries: Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela. The indexes are built following the approach of Ghirelli et al. (2019) in the computation of such an index for Spain. The uncertainty indicators are based on reports published in the Spanish press, i.e., newspapers produced in Spain and written in the Spanish language. In this respect, the indexes are likely to reflect variations in LA countries' uncertainty that are relevant to the Spanish economy, given the importance of the region for the latter. Nonetheless, the Spanish press is likely to reflect the situation in

[1] In the table, the LA region is defined as the region comprising the seven LA countries considered in this study: Argentina, Brazil, Chile, Colombia, Mexico, Peru, Venezuela.

[2] FDI is investment made by an economic agent (firm or individual) located in one country into business interests located in another country.

[3] In some cases such uncertainty may originate from global shocks (like a global crisis) or from a local shock, e.g., an episode of social unrest in the country of interest. We aim to capture the evolution of policy uncertainty in a country regardless of its cause.

[4] E.g., Caggiano et al. (2020) use the US EPU series constructed by Baker et al. (2016) to study the effects of this variable on the Canadian economy; Ahir et al. (2019) build a world uncertainty index for 143 individual countries based on the quarterly Economist Intelligence Unit country reports. Choi and Shim (2019) use the EPU indicators available on the Economic Policy Indicator website (https://www.policyuncertainty.com/) to study the impact of these variables for a sample of emerging economies, among which are Chile and Brazil. Cerda et al. (2018) construct the EPU index for Chile and assess its impact on the Chilean economy.

the region more generally, given the existing close cultural ties. In this respect, we believe our indexes provide sensible and relevant measures of policy uncertainty for those countries. This is also in line with a branch of the literature that uses the international press to compute text-based indicators for broad sets of countries (e.g., Ahir et al., 2019; Mueller and Rauh, 2018).

Armed with these indicators, we study the macroeconomic effects of LA EPU shocks on the following: (i) the Spanish economy, given the focus on the Spanish press and (ii) the analyzed American economies, given our claim that the Spanish press might represent a good proxy of national developments in uncertainty. To analyze effects on the Spanish economy, we carry out two exercises. First, we consider stock market quotations of the most important Spanish companies that are also highly exposed in Latin America; to do so, we estimate monthly vector auto-regression (VAR) models[5] to compute the responses of companies' quotations to unexpected shocks in LA EPU, controlling for the Spanish economic cycle. Second, we study the spillover effects (EPU, GDP, exports, and FDI to LA countries), also in a VAR framework. All exercises cover the period from the first quarter 1997 to the second quarter 2019 (1997Q1-2019Q2).

The rest of the paper is organized as follows. In Section 2, we outline the construction of the EPU indexes. In Section 3.1, we describe the first exercise on Spanish multinational company quotations, while in Section 3.2 we show the second exercise based on Spanish macroeconomic variables and carry out some robustness analyses. In turn, Section 4 displays the macroeconomic effects of EPU shocks on LA countries. Finally, in Section 5, we sum up our findings. Note, the paper includes general explanations of specific economic topics in an effort to reach a wider audience.

2. Description of the EPU indexes

To build these indexes, we apply a similar procedure as the one used in Ghirelli et al. (2019) and use the same data sources. We consider seven relevant Spanish national newspapers: *El País, El Mundo, La Vanguardia, ABC, Expansión, Cinco Días*, and *El Economista*. The first four newspapers are the most-read generalist newspapers in Spain, while *Expansión, Cinco Días*, and *El Economista* are the three headline Spanish business newspapers. For each newspaper, we consider the articles published in the printed press and exclude articles published online.[6] All searches use the Dow Jones Factiva service.[7] For each newspaper, we conduct our search from the first date at which the newspaper appears in the Dow Jones Factiva database, starting in January 1997.

Searches are customized for each country. Our search counts the number of articles containing at least one keyword related to each of the following categories:[8] [9]

- Country: Argentina, Brazil, Chile, Colombia, Mexico, Peru, Venezuela;
- Uncertainty: *inciert**, *incertidumbr**, *inestabl**, *inestabilidad**, *riesgo**;
- Economy: *economic**, *economía*;
- Policy: the name of the central bank of the country,[10] the name of the government's workplace in the country,[11] *Parlamento, gobierno, Reserva Federal, Hacienda, arancel**, *tributacion**, *déficit, déficits, presupuest**, *gasto público, gastos públicos, deuda pública, deudas públicas, política fiscal, políticas fiscales, política monetaria, políticas monetarias, el impuesto, de impuesto, del impuesto, un impuesto, por impuesto, este impuesto, ese impuesto, aquel impuesto, impuestos,*[12] *legislación**, *reforma, reformas* or *norma, normas, normativ**, *regulación**, *reglamento**, *ley**.

The construction of the index closely follows the procedure used by Baker et al. (2016). First, for each newspaper/month, we scale the raw count by the total number of articles in which the name of the LA country of interest appears. Second, we standardize the monthly series of scaled counts and average them across the newspapers. Third, we rescale the resulting index to mean 100 in the period of January 1997–June 2018. Finally, one advantage of our methodology is that we obtain standardized EPU indexes for a number of LA countries. This allows us to easily aggregate them into an overall EPU index for the entire LA region (called *aggregated EPU index* hereafter).[13] This index is shown in Fig. 1. The country-specific EPU indexes are plotted in Section C of the Appendix (hereafter referred to as *LA EPU indexes*).

Note, we follow the evolution of policy uncertainty regardless of its origin. That is, peaks in our indexes may originate from global shocks (e.g., the global financial crisis) or from local shocks, (e.g., episodes of social unrest or electoral campaign in the country of

[5] VAR models are statistical models used to study the relationship between variables that affect each other over time. In this sense, all variables are endogenous and each variable in the model is a function of its past values.

[6] Limiting the articles included to those in the printed version of the newspapers ensures the quality and relevance of the stories because editors select articles to be published in print, given space limitations.

[7] Factiva is an online research platform provided by Dow Jones, which gathers news published worldwide. It is accessible through subscription.

[8] Following is the English translation of the keywords. Uncertainty block: uncertain*, instab*, risk*. Economy block: economic, economy. Policy block: Parliament, government, Federal Reserve, Ministry of Finance, tariff*, taxation*, deficit*, budget*, public spending/expenses, public debt*, fiscal polic*, monetary polic*, tax*, legislation*, reform*, norm*, regulatory, regulation*, law*.

[9] An asterisk "*" indicates that any posible alternative ending of the Word is taken into consideration, to account in particular for the word gender (feminine/masculine) and plurals.

[10] Argentina: Banco Central de Argentina; Brazil: Banco Central de Brasil; Chile: Banco Central de Chile; Colombia: Banco de la Republica or Banco Central de Colombia; Mexico: Banco de Mexico or Banco Central de Mexico; Peru: Banco Central de Peru; Venezuela: Banco Central de Venezuela.

[11] Argentina: Casa Rosada; Brazil: Palácio do Planalto; Chile: Palacio de La Moneda; Colombia: Casa de Nariño; Mexico: Residencia Oficial de Los Pinos; Peru: Palacio de Gobierno, Casa de Gobierno, or Casa de Pizarro; Venezuela: Palacio de Miraflores.

[12] We want to ensure that we capture sentences in which *impuesto* is a noun (meaning taxes) and not the past participle of the verb *imponer*.

[13] The LA region is defined as the countries considered in the analysis: Argentina, Brazil, Chile, Colombia, Mexico, Peru, Venezuela.

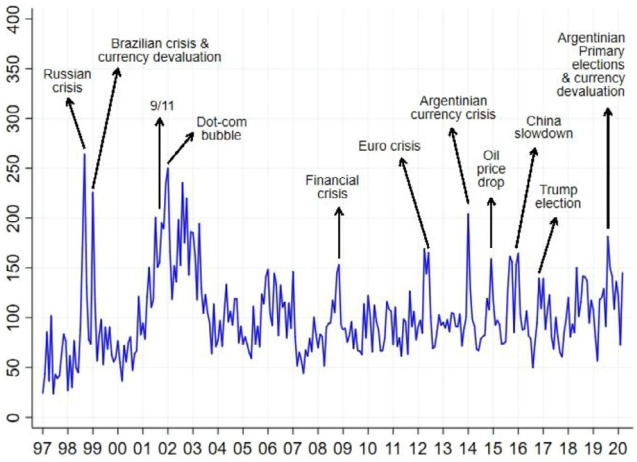


Fig. 1. Aggregated EPU index for the LA region. *Note:* This figure reports the aggregated EPU index for the LA region. The LA region is defined by the countries considered in the analysis: Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela. This index is given by the sum of the country-specific raw counts: The numerator is the number of articles satisfying the EPU requirements in at least one country among Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela; the denominator is the number of articles in which these countries are mentioned.

interest).[14] In section D of the Appendix, we compare the aggregated EPU index with the VIX, a well-known proxy of market risk. As expected, both indices show a similar evolution in periods that are characterized by global shocks, while they differ when local events occur in the countries of interest, as the VIX is not affected.

Other text-based EPU indexes are already available online on the Economic Policy Uncertainty Index website (https://www.policyuncertainty.com/) for some LA countries (namely, Brazil, Chile, Colombia, and Mexico). Hereafter, these indexes are called *website EPUs*. They are also constructed based on the procedure of Baker et al. (2016) and are based on each country's national press. Sections E and F in the Appendix describe the construction of each website EPU and provide detailed comparisons between the latter and our EPU indexes. The main difference with respect to our EPU measures is that the website EPUs are based on LA newspapers, while our indexes rely on the Spanish press. One advantage of our methodology is that while the website EPUs are developed by different authors and hence have their own peculiarities in terms of keywords, we provide "standardized" EPU indexes for several LA countries. This enhances the comparability of results across LA countries. In addition, compared to these indexes, our EPUs (i) expand the newspaper coverage, as a robustness measure; (ii) fine-tune the richness of keywords and expressions used in each case; and (iii) exclude words related to conflict, like "war" and "terror attacks," beyond the vagaries explained in Ghirelli et al. (2019), given our focus on ascertaining EPU.

3. Spillovers from Latin America to Spain

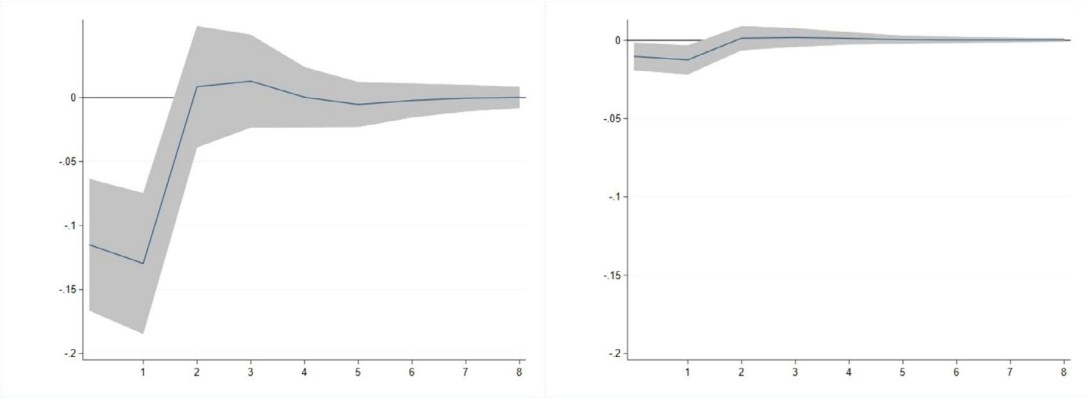
3.1. Monthly VARs on companies' stock market quotations

To study the impact of LA EPU shocks on the Spanish economy, we consider the quotations of the most important Spanish companies that are also highly exposed in LA countries, controlling for the Spanish macroeconomic cycle. We select the following companies, which have been listed in the IBEX-35 index since at least 2001, distinguishing whether they have economic interests in the LA region or not.[15] The firms with interests in LA are Banco de Santander, BBVA, Repsol, Telefonica, Mapfre, Naturgy, Iberdrola, Inditex, Melia Hotels, Viscofan, Indra Sistemas, Cie Automotive, Acerinox, ACS, Siemens Gamesa and Acciona.[16] Section B of the Appendix provides some figures to give an overview of the economic interests these companies have in the LA region.

[14] Another difference relates to the nature of the shocks: the EPU index captures shocks related to economic policy, while the VIX is related to financial uncertainty. See Ghirelli et al. (2021) for an analysis of the different types of uncertainty shocks for Spain.

[15] We need to consider companies that are quoted on the Madrid stock exchange for a reasonable period of time in order to carry out an analysis that is statistically robust enough. At most, we can consider the period from 1997, since the EPU indexes are available since then. We begin 2001 because this allows us to include a Spanish Bank (Banco Sabadell) among the companies that do not have interests in LA. Results are very similar if we consider only firms that are in the IBEX35 index since 1997 (available upon request).

[16] Banco de Santander, BBVA, Banco Sabadell: commercial banks; Repsol, Iberdrola, Naturgy, Siemens Gamesa: energy; Telefonica: communication; Mapfre: insurance; Acciona, ACS: construction; Inditex: clothing; Melia Hotels: tourism; Viscofan: meat casing; Indra Sistemas: IT services; Cie Automotive: automotive; Acerinox: steel.



(a) Companies with interests in LA (b) Companies with no interests in LA

Fig. 2. Impulse responses of company quotations to shocks in LA EPU. *Note*: Confidence intervals at the 5% level reported.

To strengthen our results, we also consider companies that are listed in the IBEX-35 but whose economic interests in the LA region are minor and/or discontinuous over time: Endesa, Ferrovial, Bankinter, Banco Sabadell, Colonial, Red Electrica, and Ence.[17] We define the status of economic interest based on the shares of sales in 2018 in the LA region.[18]

We first focus on the LA region and estimate the impact of the aggregated EPU in Latin America on the quotations of Spanish companies. We estimate the following monthly VAR model: $X_t = \Pi(L)X_t + \in_t$, where X_t is a set of endogenous variables, Π is a matrix of VAR coefficients capturing the dynamics of the system, and $\in_t : N(0, \Omega)$ is the vector of reduced-form residuals having zero mean and variance–covariance matrix Ω. The variables in X_t are the following: the aggregated EPU of the LA region, the EPU for Spain (as measured in Ghirelli et al., 2019), the Spanish 10-year sovereign debt spread over the German Bund, the Spanish real GDP (monthly estimates of quarterly GDP year-on-year growth rates),[19] the inflation rate (year-on-year growth rates of the monthly consumer price index), the Euro Stoxx 50 indicator (monthly growth rate), and an aggregated index that represents the quotations of selected companies that either have interests in the region or do not. In either case, we aggregate the monthly growth rates of company-specific quotations by weighting each company with its market capitalization.[20] The VAR model is estimated by ordinary least squares (OLS) method,[21] including the optimal number of lags according to the AIC criterion.

To make sure that the EPU shocks are orthogonal to the other stochastic elements in the econometric framework, we model the impulse vector responsible for the one-impact response of the variables in the vector X_t by means of a Cholesky decomposition of the reduced-form variance–covariance matrix Ω. Next, we calculate the impulse responses of the companies' quotations to an unexpected shock in the aggregated EPU index of the LA region. We consider shocks of one-standard deviation in the LA EPU index. In terms of magnitude, this corresponds to about one third of the size of the largest shocks associated to the narrative of the LA EPU, the Argentinian currency crisis, which occurred in the first quarter of 2014. This means that the overall response associated to this event would correspond to our impulse response results multiplied by a factor of 3. Results are reported in Fig. 2. As expected, companies that have interests in the region are negatively affected by uncertainty shocks. The quotation growth rates immediately decrease by 1%, and the effect remains significant for 2 months. By contrast, companies that do not have major economic interests in the region display negligible responses.

We now repeat the analysis provided so far at the most disaggregated level: i.e., we focus on the impact of each LA country's EPU on each company's quotations. We consider one LA country at a time and estimate the monthly VAR model described above with the following endogenous variables: the EPU of the LA country of interest, the EPU of Spain

[17] Endesa, Red Eléctrica: electric energy; Ence: renewable energy; Bankinter, Banco Sabadell: commercial banks; Colonial: real estate.

[18] Source: Spanish Securities and Exchange Commission (Comisión Nacional Mercado de Valores) and the Ministry of Industry, Trade and Tourism.

[19] The monthly estimates of GDP quarterly growth rates come from the estimation of a mixed-frequency dynamic factor model, as in Mariano and Murasawa (2003), for the Spanish economy (see Camacho and Perez Quiros, 2011). In this approach, all of the series included in the model are assumed to have a data generation process at the highest frequency (monthly), even though the low-frequency series (quarterly) are not observed every month. The unobserved latent monthly GDP can be obtained through interpolation methods since an unobserved monthly common factor is assumed to drive the dynamics of all series.

[20] We use the market capitalization weighting scheme used in the IBEX-35 index at the 20th of March 2020.

[21] The ordinary least squares (OLS) method estimates the parameters of a linear regression model by minimizing the sum of squared residuals. That is, this method chooses the parameters that minimize the distance between the observed data (the data points of the dependent variable) and the corresponding fitted values (i.e., the values predicted by the linear function of the explanatory variables).

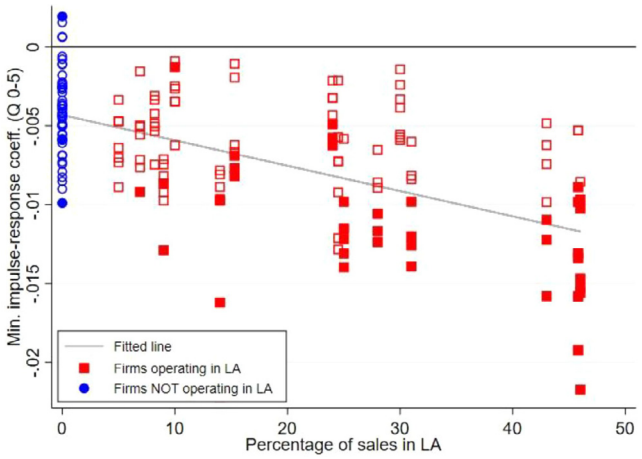


Fig. 3. Peak response of company quotations to LA EPU shocks. *Note:* Each point represents the minimum impulse response coefficient (from the contemporaneous coefficient to the coefficient of quarter 5 included) of one company's quotations to LA EPU shocks in one country. The impulse response function of a company's quotations to a country's EPU shocks is obtained by estimating a monthly VAR model with one lag for each company–country pair, as explained in the main text. Red squares represent companies that have interests in Latin America, while blue circles refer to companies that do not have interests in Latin America. In both cases, filled symbols indicate that at least two coefficients among those considered to compute the average response are significant at least the 10% confidence level.

(as measured in Ghirelli et al., 2019), the Spanish 10-year sovereign debt spread over the German Bund, the Spanish real GDP (monthly estimates of quarterly GDP year-on-year growth rates),[22] the inflation rate (year-on-year growth rates of monthly consumer price index), the IBEX-35 indicator (monthly growth rate), and the quotation of one specific company (monthly growth rates).

Next, for each company–LA country pair, we calculate the impulse responses of the company's quotations to an unexpected shock in the EPU index of the country. We summarize these findings in Fig. 3 and show the peak response (represented by the minimum impulse response coefficient from the current quarter to the fifth quarter included) for each company–country pair. On the x-axis, the companies are ordered by the % of sales in Latin America. Red squares represent companies that have interests in Latin America, while blue circles refer to companies that do not have interests in Latin America. In both cases, filled symbols indicate that at least two coefficients (among the first five coefficients) are significant at a confidence level of at least 10%. In this figure, we show the results for all countries.[23] The graph illustrates clearly that the peak response to a negative uncertainty shock in Latin America for companies that have important interests in Latin America is negative and significant (according to the aforementioned criterion), while companies with minor interests in the LA region are, as expected, not (or less) affected by LA EPU shocks. This suggests that, again, as expected, economic policy uncertainty in LA countries affects the quotations of Spanish companies that have economic interests in that region.[24]

3.2. Macro analysis

In this section, we study the spillover effects of LA uncertainty on the Spanish economy from a macro perspective. We concentrate on the impact of the aggregated EPU that represents the overall economic uncertainty in the seven considered countries. The definitions and the sources of the macro variables used in this analysis are reported in section A of the Appendix.

We carry out three exercises. First, we study the impact of uncertainty on the Spanish EPU and the Spanish GDP. The former represents the spillover effects of uncertainty from the LA region to Spain, whereas the second gives us the direct effect of LA uncertainty on the Spanish economy. To assess this impact, we estimate the following quarterly VAR model: model $X_t = \Pi(L)X_t + \in_t$, where X_t is a set of the following endogenous variables: the aggregated EPU (quarterly averages of monthly data), the EPU for Spain as measured in Ghirelli et al. (2019) (quarterly averages of monthly data), the Spanish 10-year sovereign debt spread over the German Bund (quarterly averages of monthly data), the Spanish real GDP (year-on-year growth rates), the inflation rate (year-on-year growth rates of CPI), and the bilateral exchange rate between the LA region and Spain (weighted measure of country-specific

[22] See footnote 18.

[23] Figs. M.2–M.8 in Section M of the Appendix report separate graphs of the same type of for each country (we display two types of graphs: the peak response and the average response, computed as the mean of the first five coefficients of the impulse response functions).

[24] The impulse responses of each company–country pair are available upon request. Overall, the results show that an unexpected increase of one standard deviation in the LA EPU index in a country generates a significant drop in the first 2 months of companies' quotation growth rates. Qualitatively, this holds for all countries, although results are less significant in some cases, such as for all companies in Peru and for Naturgy in almost all countries.

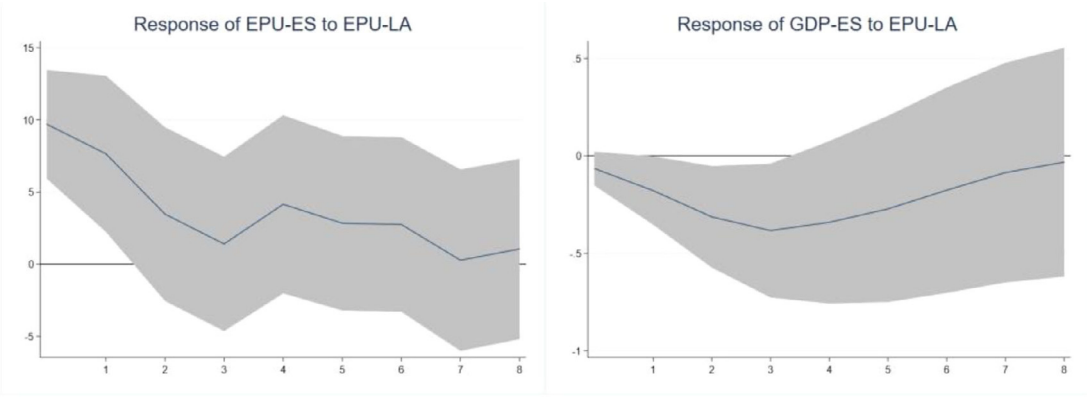


Fig. 4. Impulse responses of Spanish EPU and GDP growth to shocks in LA EPU. *Note:* Confidence intervals at the 5% level reported.

bilateral exchange rates between each of the seven countries and Spain).[25] Π is a matrix of VAR coefficients capturing the dynamics of the system, and $\in_t : N(0, \Omega)$ is the vector of reduced-form residuals having zero mean and variance–covariance matrix Ω.. The VAR models are estimated by OLS and include the optimal number of lags according to the AIC criterion, but for efficiency reasons, we set the number of lags to five whenever the optimal number of lags is above five. We decompose the variance–covariance matrix Ω by means of Cholesky decomposition to identify the shocks of the VAR model and compute the orthogonal impulse responses of Spanish macroeconomic variables to exogenous shocks in the aggregated EPU index. Both impulse response functions are reported in Fig. 4. The Spanish EPU increases by around seven units in the first 2 months, while the impact on the Spanish GDP is negative and slightly significant.

From a theoretical point of view, foreign uncertainty should have an impact on the Spanish GDP through a reduction of exports since the production processes of local Spanish firms is independent of changes in uncertainty in foreign countries. More specifically, higher uncertainty in a foreign country should decrease that country's GDP, thereby reducing the demand for goods exported from Spain to that country. We expect a decrease in Spanish goods exported to the foreign region (in real terms). In addition, foreign uncertainty may also affect Spanish FDI in the foreign region if Spanish firms aim to invest abroad in stable countries and hence reduce their investment or change destination countries for FDI in response to unexpected shocks in foreign uncertainty. Therefore, in the rest of the section we focus on the impact of LA uncertainty on Spanish exports and FDI.

To study the impact of LA uncertainty on Spanish exports, we estimate a quarterly VAR model in which endogenous variables are included in the following order: the aggregated EPU index of the LA region, a measure of the competitiveness of the price of the goods consumed in Spain relative to the prices of goods consumed in the foreign region (both expressed in euros, hence the need to account for changes in exchange rates),[26] the foreign region GDP (weighted measure of year-on-year growth rates of the seven LA countries),[27] Spanish real exports to the foreign region (weighted measure of year-on-year growth rates of the seven LA countries),[28] and the bilateral exchange rate between the LA region and Spain (weighted measure of quarterly bilateral exchange rates of the seven LA countries with Spain).[29] Since exports are driven by foreign country demand, we do not control for any Spanish macroeconomic variable apart from the competitiveness measure.

The FDI VAR model includes the following variables (in order): the aggregated EPU of the LA region, the foreign region's GDP (weighted measure of year-on-year growth rates of the seven LA countries), the GDP of Spain (year-onyear growth rates), net Spanish FDI to the foreign region (weighted measure of quarterly growth rates of stock values of the seven LA countries), and the bilateral exchange rate between the LA region and Spain (weighted measure of quarterly bilateral exchange rates of the seven LA countries with Spain).[30]

[25] As weights, we use each country's share of trade (import and export) with Spain (out of the seven LA countries considered). We do not use the bilateral exchange rate between Venezuela and Spain since the series is not credible.

[26] Note, a more precise measure of competitiveness would take into account the price of Spanish *exported* goods relative to the prices of goods *produced* in the foreign region. Unfortunately, we cannot use it in this aggregated exercise since this measure is available for Chile, Colombia, Peru and Venezuela only from 2005 onwards. However, we will use it in the country-specific exercises in Section H since this measure is available for Argentina, Mexico and Brazil from 1997 onwards.

[27] See footnote 25.

[28] Real exports of each country are obtained by deflating nominal exports with the price unit value index of Spanish exported goods.

[29] See footnote 25.

[30] As weights, we use each country's share of trade (import and export) with Spain (out of the seven LA countries considered). We do not use the bilateral exchange rate between Venezuela and Spain since the series is not credible.

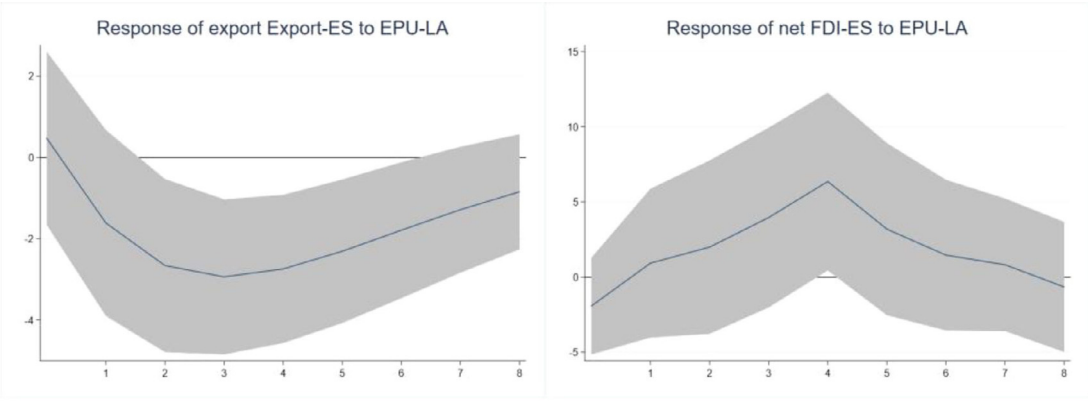


Fig. 5. Impulse responses of Spanish exports and FDI to shocks in LA EPU. *Note:* Confidence intervals at the 5% level reported.

In both cases, VAR models are estimated by OLS and include the optimal number of lags according to the AIC criterion (we cap lags at five for efficiency reasons). Fig. 5 report the impulse responses of Spanish exports (left) and FDI (right) to LA region's EPU shocks. LA EPU shocks reduce Spanish exports significantly in the entire region, by about 3 percentage points (pp), and the effect vanishes after 5 quarters. In contrast, the impact on FDI is small and mostly insignificant. However, it is likely that, in this case, the aggregated results mask country-specific impacts with opposite effects, given that Spanish investors may move investments from one country to another within the same region.

To further investigate this issue, we replicate the same analysis for each LA country separately.[31] Due to a matter of space, we relegate the full analysis to Section H in the Appendix and here convey the results for the most important LA countries: Argentina, Brazil and Mexico. Foreign country EPU shocks reduce Spanish exports significantly for Argentina and Brazil (by about 10 pp and 5 pp, respectively; the effect vanishes after 5 quarters in both cases), while results for Mexico are not statistically significant. In contrast, FDI drops in response to foreign EPU shocks in Mexico and Brazil (by about 10 pp and 5 pp, respectively; the impact remains significant for at least 6 quarters in both cases), while Spanish FDI in Argentina does not display a statistically significant response. Indeed, the country-specific analyses align with the results on the region as a whole and confirm that some country-specific FDI effects may cancel one another out.

In addition, we carry out a number of robustness checks. First, we perform the main analysis (one-step VAR model) using website EPUs available for Colombia, Chile, Brazil, and Mexico. Results are reported in Section L of the Appendix and align with those obtained using our EPU indexes. This suggests that our uncertainty indicators are coherent with other similar available measures.

Second, we did not control for any LA macroeconomic variables when estimating the spillover effects of LA EPU shocks to Spanish EPU or Spanish GDP. Thus, to the extent that uncertainty in Latin America affects the LA real economy, our estimated effect may combine the genuine impact of both LA uncertainty and of the LA economic situation on the Spanish economy. To tackle this issue, we replicate the analysis implementing local linear projection methods by means of a two-step procedure (Jordá, 2005) in Section I of the Appendix. Results point in the same direction as those obtained in the main VAR exercise. From a conceptual point of view, we believe that controlling for the foreign country's economic situation is not necessary in the analysis since the spillover of one country's uncertainty to another country may also occur through contagion among macroeconomic variables. Nevertheless, we interpret the similarity in terms of sign and significance in these impulse responses as further evidence that uncertainty in LA countries has spillover effects on the Spanish economy.

As a third robustness exercise, we explore the role of the uncertainty spillover (i.e., the indirect impact of LA EPU through its spillover to Spanish EPU) as a transmission mechanism to the real economy, in the spirit of Caggiano et al. (2020) (see section K of the Appendix). Results suggest that most of the impact of LA EPU on both exports and FDI occurs through a direct channel, while the indirect impact of LA EPU through the uncertainty spillover is negligible. This also confirms that economic agents make decisions about Spanish exports and FDI by looking at LA variables, which is reasonable. By contrast, most of the impact of LA EPU on Spanish GDP occurs through the uncertainty spillover channel.

Lastly, in section G of the Appendix, we report the forecast error variance decomposition (FEVD) of the aforementioned VAR models for the response variables on which we focused. This allows us to get an idea of how relevant LA EPU shocks are for the Spanish business cycle. LA EPU explains about 30% of the forecast error variance in Spanish EPU, whereas it explains up to slightly less than 20% of the forecast error variance for the Spanish GDP, Spanish exports, and Spanish FD. According to these results, LA EPU shocks are certainly not the most relevant shocks for the Spanish economy. However, they are not negligible either.

[31] For Venezuela, we do not include the bilateral exchange rate since the series is not credible.

4. The impact of LA EPU shocks on LA countries

This section provides a macro analysis of the EPU shocks' effects on LA countries' economic activity using our EPU indexes. The exercise aims to show that our EPU indexes based on the Spanish press are good proxies of economic uncertainty in LA countries. Our stance is based on the importance of the economic and cultural relationship between LA countries and Spain (see Table 1 and the discussion in Section 1). This makes Latin America a major region of interest for the Spanish press, especially given the relevant proportion of the LA population residing in Spain.[32]

4.1. Validating EPU indexes

We set up parsimonious VAR models to describe each LA country's economy and compute the impulse responses of the GDP growth rate to an unexpected shock in the national LA EPU index. This methodology is established in the literature as an empirical test that assesses the quality of uncertainty indicators (e.g., Baker et al., 2016). The underlying hypothesis is that economic uncertainty affects the real economy, which the literature has largely suggested (Bloom, 2009a; Bloom et al., 2007; Bloom, 2014). Thus, empirically, a valid indicator of economic uncertainty in a country should provide evidence that the national GDP growth rate falls when local uncertainty increases. We proceed as follows. For each LA country, we estimate a VAR model based on the following variables: the LA EPU index, the interest rate, the GDP growth rate, and the inflation growth rate. We exclude Venezuela due to data limitations. All VAR models are estimated by OLS, including the optimal number of lags according to the AIC criterion. We compute the national GDP growth rate's impulse responses to the national LA EPU index. The identification of the structural shocks in each VAR is obtained by means of Cholesky decomposition.

Fig. 6 reports our empirical exercises' main results (red lines in the graphs). In most cases, the national GDP growth rate drops after a shock in national economic uncertainty, as expected. For Argentina, a positive shock of one standard deviation in the national LA EPU index leads to a drop of 0.8 pp in the GDP growth rate in the first 3 quarters (significant at the 10% level) and then vanishes. In Brazil, the GDP growth rate drops by about 0.5 pp after a shock in economic uncertainty, an effect which persists until quarter 8 (significant at the 5% level until quarter 6 and significant at the 10% level from then onward). In Chile, the GDP growth rate drops by 0.4 pp for 3 quarters (significant at the 5% level) and then returns to zero. Results for Mexico are qualitatively similar, but not statistically significant at the conventional level. The GDP's response to uncertainty shocks is null for Peru and Colombia. Overall, the magnitude of our responses is reasonable and in line with that found for Spain (Ghirelli et al., 2019).

4.2. Robustness exercises

In this exercise we compare the impulse responses of LA GDP to shocks in our LA EPU index with those resulting from shocking the website EPUs, which are available for Brazil, Chile, Colombia, and Mexico (see https://www.policyuncertainty.com/). The latter and our LA EPU measures differ in three dimensions: (i) the press coverage, (ii) the time coverage, and (iii) the keywords in the search expressions. As for (i), the website EPUs are based mostly on one national local press, or at most two local national newspapers. This yields a quite small press coverage compared to our EPU indexes, which rely on seven national Spanish newspapers. As for (ii), our EPU measures start from 1997 onwards, while the website EPUs are constructed starting from 1991 for Brazil, 1993 for Chile, 2000 for Colombia, and 1996 for Mexico. This may make the comparison difficult, since the website EPUs rely on news regarding a time period our EPUs do not cover.[33] As for (iii), Table E.1 in the Appendix spells out the difference between our keywords and the keywords considered in the website EPUs for Brazil, Chile, Colombia, and Mexico. Apart for some peculiarities in each word set, the main issue is that the website EPUs for Mexico and Colombia also include terms that are more related to social conflict than to economic policy.

To make this comparison we carry out three robustness exercises. In the first exercise, we re–estimate the same VAR models described above, replacing our LA EPU indexes with the website EPU indexes and then computing the corresponding impulse responses of the national GDP growth rate to shocks in uncertainty. We do this for Brazil, Chile, Colombia, and Mexico. The resulting impulse responses are depicted in blue in Fig. 6. [34] The responses for Brazil, Chile, and Mexico are quite similar to those obtained with our LA EPU indexes. Overall, both our LA EPU indexes and the website EPUs convey negative and significant impulse responses, which is reassuring and suggests that the Spanish national press is a useful and reliable information source to construct EPU indexes for LA countries. The only exception is Colombia, for which the impulse response to the website EPU is negative and significant, while the response to our LA EPU index is not significant.

For the second exercise we investigate the relative role of the richness of keywords and press coverage for the validity of the uncertainty indexes. We do this for Chile, Mexico, and Colombia, ignoring Brazil since the two indexes for this country do not share the same language. Results are reported in Fig. 7. In all figures, the solid red line represents the response to positive shocks in our LA EPU index; the dashed blue line is the response to positive shocks in the website EPU; the other line (dashed green) represents

[32] In 2019, 25% of foreign residents in Spain came from Latin America, according to the National Statistical Institute of Spain.

[33] We can investigate the time coverage importance only for Colombia. We construct our LA EPU starting from 2000 onwards and estimate the impulse responses considering this time period. Results suggest that in this specific case, the time coverage is not significant. This is expected since the time windows are very similar, and only 3 years apart (from 1997 and from 2000).

[34] For Chile, Brazil, and Mexico, we consider the period from 1997 onwards, while the estimation for Colombia must start from 2000 since the index is not available before that.

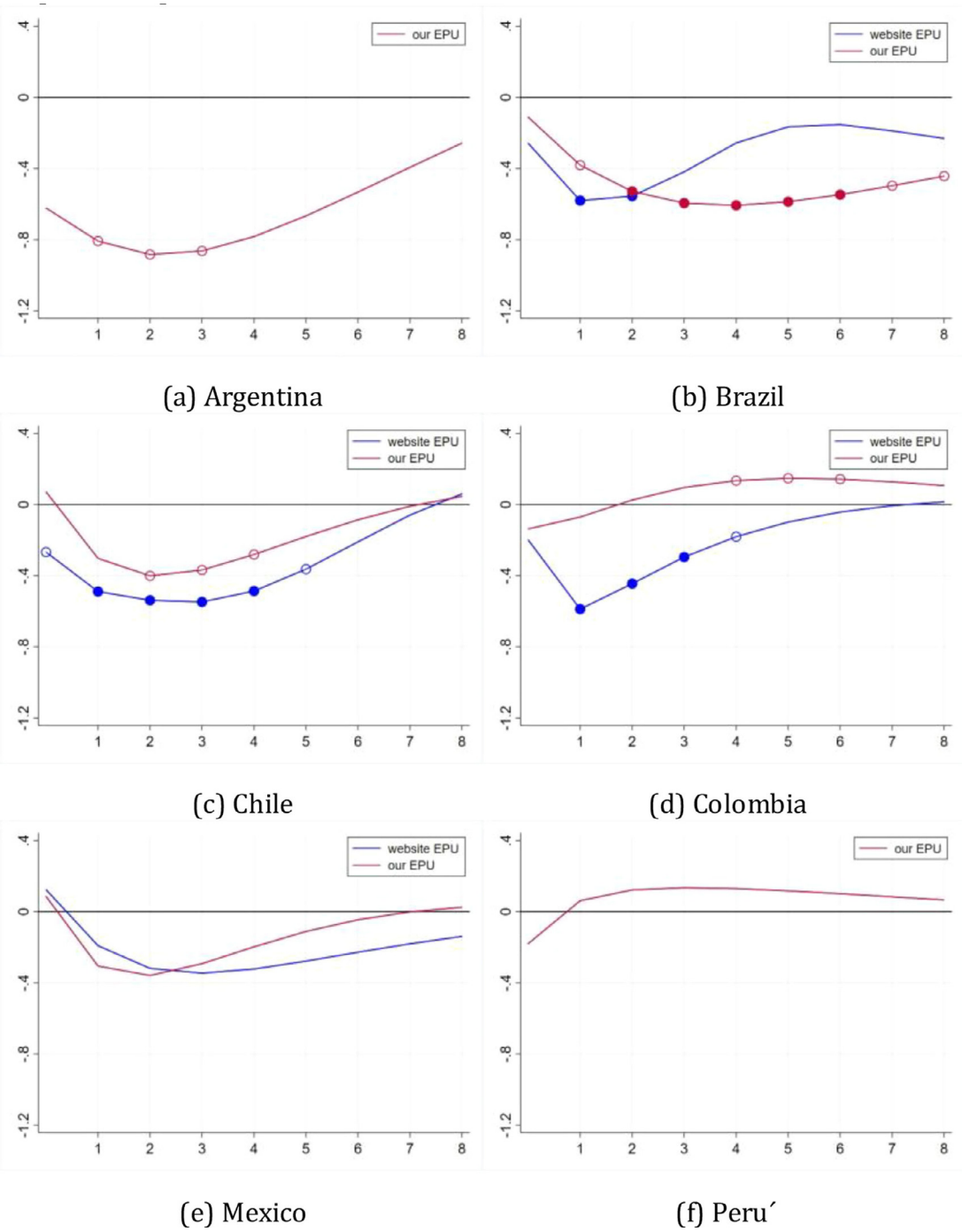


Fig. 6. Impulse responses of Latin American GDP to LA EPU shocks—our EPU indexes. *Note*: VAR models are estimated including the optimal number of lags according to the AIC criterion. Each graph shows the impulse response function up to 8 quarters to a positive shock of one standard deviation in the EPU index of the corresponding LA country. Filled circles indicate statistical significance at the 5% level; empty circles indicate statistical significance at the 10% level; a solid line indicates no statistical significance. Website EPU is the EPU index available at https://www.policyuncertainty.com/.

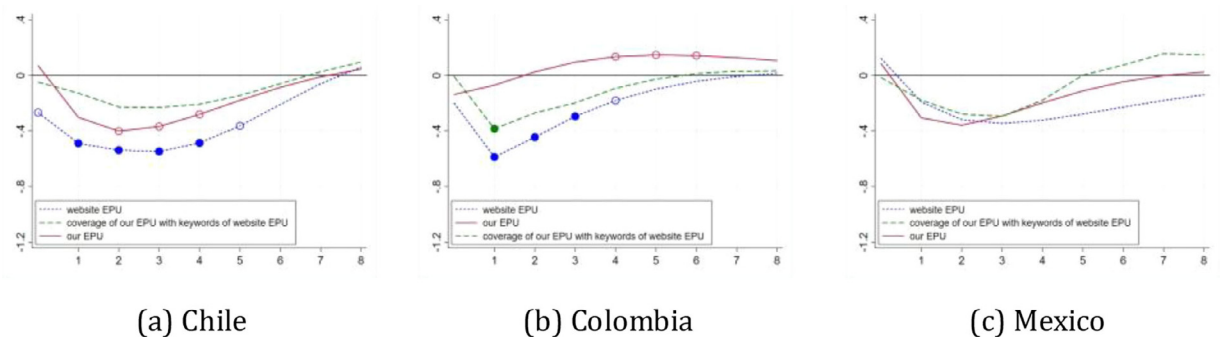


Fig. 7. Relative contribution of the richness of keywords and press coverage in improving the index. *Note*: "Our EPU" represents the response to positive shocks in our EPU index (solid red line). "Website EPU" is the response to positive shocks in the EPU index taken from the Economic Policy Uncertainty Index website (dashed blue line). The dashed green line represents the impulse response of the GDP growth rate to shocks in a new EPU index, as based on the press coverage of our EPU index (seven Spanish newspapers) using the website EPU's keywords. For Colombia, the orange dash line represents the impulse of GDP growth rate to shocks in a new EPU index using the website EPU's keywords and based on the press coverage of our EPU index (seven Spanish newspapers), but restricting the time coverage to the period from 2000 onwards, which is the time coverage of the "website EPU."

the results from shocking a new index that we construct considering the press coverage of our LA EPU index (i.e., seven Spanish newspapers), but using the website EPU's keywords instead of ours. Comparing the green line with the blue line allows us to assess the importance of using our set of words in the search expressions since the press coverage is the same for both indexes.

For Chile, the green line provides not significant results, as opposed to the blue line, which suggests that our set of keywords well identifies episodes of economic uncertainty. Our keywords allow us to construct a valid EPU index even though it is based on a set of newspapers whose main focus is not the LA region (e.g., the Spanish press). Finally, the website EPU (blue line), which is based on the national press, shows a negative and significant impact. As expected, the national press conveys extremely powerful information about national economic uncertainty.

For Colombia, the green line (obtained by searching the keywords of the website EPU in the Spanish press) depicts a negative response of the Colombian GDP growth rate to uncertainty shocks, which is in line with results obtained with the website EPU (blue line). We argue that in this specific case, the set of keywords and/or the press coverage are crucial to explain the difference in the resulting responses. In particular, the website index also counts articles containing *corruption, peace, conflict,* and *subsidy*, which may be related to the negotiations with the FARC group or issues related with internal national conflicts. These are likely to be negatively associated to the real economy. By contrast, in our index we restrict to keywords related to EPU.[35]

Finally, there is no significant relationship (although there is a negative one) between economic uncertainty and GDP growth in Mexico according to any index.

In the final robustness exercise we test the impact of adding specific keywords in the search expression. To do this we construct alternative LA EPU indexes by adding to our baseline keywords, alternatively, (a) words related to "war" (i.e., *militares, paz, conflicto/s, guerra/s*) or (b) "corruption" (i.e., *corrupción/es, corrupt**). We then compare the impulse responses of national GDP to shocks in our LA EPU indexes with those obtained by shocking the alternative LA EPUs (EPU+war or EPU+corruption). Results are shown in Fig. F.1 of Section F in the Appendix. They differ by country. For Chile and Brazil, the responses for the alternative EPUs are similar to the baseline EPU, but less significant. This suggests that for these countries, war- and corruption-related events do not necessarily coincide with events associated with EPU and add noise to the indicator if considered in the search. Quite the opposite seems to happen in Argentina. In this case, the responses are larger and more significant (up to the quarter 3) when the search expression includes keywords related to war or corruption. For Mexico, all indicators provide not significant responses. Finally, for Colombia and Peru, adding war- or corruption-related events to the uncertainty indicator provides GDP responses with positive (and statistically significant) effects after quarters 4 and 6, respectively. While the delayed positive response might be linked to post-conflict dynamics, we certainly do not claim to have an explanation for this result.

5. Conclusions

We construct EPU indexes for a number of LA economies (Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela) based on the Spanish press, following Baker et al.'s (2016) leading paper. The economic relevance of the region for Spain and the close

[35] Colombia is the only case that allows us to test whether the time coverage also plays a role in explaining the different responses to uncertainty shocks. The website EPU index starts from 2000, while our LA EPU considers articles from 1997 onwards. To gather a sense of this factor's importance in explaining the differences in the responses, we construct another index based on the website EPU's keywords and our press coverage, but from 2000. The corresponding GDP response is depicted by the dashed orange line in Fig. 7. This line qualitatively follows the website EPU's response, but the responses are not significant at the conventional confidence level. This suggests that for this case, the time coverage does not matter to explain the differences in responses.

cultural ties, including through a common language for a majority of countries, and comparison with existing indexes for some of the covered economies, allow us to claim that our indexes provide sensible and relevant measures of policy uncertainty for those countries. Resorting to the Spanish press allows us to build comparable measures across countries and to account for a wide press coverage.

Next, we study the macroeconomic effects of LA EPU shocks on, first, different dimensions of the Spanish economy and its linkages to Latin America, and second, the analyzed American economies, given our claim that the Spanish press might be a good proxy of national developments in uncertainty.

In regard to the first objective, our empirical analysis focuses on two aspects. First, we study the impact of EPU shocks in Latin America on the Spanish companies' performance operating in the LA region. We expect that higher uncertainty in one LA country will affect the investment decisions of Spanish companies that have subsidiaries in this LA country, i.e., investment in the LA country may be postponed due to the "wait-and-see effect," and/or local uncertainty may guide investment decisions toward other foreign countries or Spain.

To carry out this exercise, we consider the stock market quotations of the most important Spanish companies that are also highly exposed to LA countries, controlling for the Spanish macroeconomic cycle. Results show that an unexpected increase in the EPU index of an LA country generates a significant drop in the companies' quotation growth rates in the first 2 months. This holds for all LA countries considered in our study as well as for the LA region as a whole. These results are confirmed by tests in which we consider Spanish companies listed on the Spanish stock market, but whose economic interests in the LA region are minor and discontinuous over time. According to the results, EPU in Latin America does not affect these companies' quotations. This suggests that, as expected, the EPU of LA countries affects the quotations of Spanish companies that have economic interests in that region.

As a second exercise, we study the impact of LA EPU shocks on the following Spanish macroeconomic variables: the EPU index for Spain, exports, and foreign direct investments (FDIs) from Spain to Latin America, and Spanish GDP. We expect the spillover from one LA country's EPU to Spanish EPU to be related to commercial relationships between both countries. The higher the exposure of Spanish businesses to a given country, the greater the spillover. To the extent that the LA EPU reflects uncertainty in terms of the expected future economic policy situation in the country, unexpected shocks in the EPU of one LA country may affect the export and FDI decisions of Spanish companies. In terms of the relation between LA EPU and the Spanish GDP, we expect it to be driven by both the reduction in exports and the business decisions of multinational companies that have economic interests in the region. In particular, multinational companies take into account their subsidiaries' economic performance when deciding on investment and hiring in Spain. This in turn may affect the Spanish GDP. We carry out this second exercise at the quarterly level by means of VAR models. We document spillover effects from LA EPU indexes to Spanish EPU. In addition, we show that unexpected shocks in LA EPU significantly dampen the commercial relationship between Spain and LA countries. In particular, Spanish firms decrease their exports and FDI toward the countries that experience negative shocks in the EPU index.

Declaration of Competing Interest

The authors have no conflict of interest to declare.

Appendix

A. Macro data: sources and definitions

All macro variables are expressed at the quarterly level. The macro series for LA countries are provided by the corresponding national statistics offices and national central banks. The variables are defined as follows:

- GDP: year-on-year growth rate of GDP.
- Inflation: year-on-year change in consumer price index.
- Short-term interest rate: BADLAR in Argentina, 1-year treasury bond for Brazil, interbank rate for Mexico, 3-month loan rate for Chile, personal lending rate in Colombia, and interest rates for loans in domestic currency in Peru.

The Spanish variables are defined as follows:

- GDP: year-on-year growth rate of GDP (source: Spanish National Statistical Office).
- Inflation: year-on-year growth rate of Consume Price Index (source: Spanish National Statistical Office and Eurostat).
- Spread: Spanish 10-year sovereign debt spread over the German Bund (source: Thomson Reuters Datastream).
- Relative prices: competitiveness of the price of Spanish exported goods relative to the price of goods produced in the foreign country (source: European Central Bank).
- Exports: quarterly year-on-year Spanish real exports to the foreign country, provided by Eurostat. Real exports are obtained by deflating nominal exports with the price unit value index of Spanish exported goods, which is provided by the Ministry of Economic Affairs and Digital Transformation.
- FDI: quarterly year-on-year growth rate of stock values of Spanish net FDI to the foreign country (source: Ministry of Industry, Trade and Tourism).

B. Relevance of the LA region to quoted Spanish companies

In section 3.1, we study the impact of LA uncertainty on some Spanish companies' stock market prices. Among the companies listed in IBEX35, we select six that have important economic interests in the LA region and six that do not. This section reports some figures to show the LA region's importance for the companies in the former group: Banco de Santander, BBVA, Repsol, Telefonica, Mapfre, and Naturgy. All figures are taken from the companies' online income statements.

- Banco Santander has been the sixth largest bank (by total assets) in Brazil since 2013 and the second most important in Mexico since 2014. In 2019, Santander profits were decomposed as follows: 46.5% of profits were attributed to Europe, 37% to South America, and 16% to North America.
- In 2019, 45% of BBVA's income was attributed to Mexico.
- For Telefonica, 24% of its 2019 profit was attributed to Spain, 28% to Brazil, and 15% to the rest of South America.[36]
- As for 2019 Repsol profits, the highest share, 45%, refers to Europe, Africa, and Brazil, and the second most important region was the rest of South America and Caribbean countries (with 26%).[37]
- For 2019, Mapfre results can be decomposed as follows: 62% belonged to Spain and Portugal, 26% to the LA region, and 12% to the rest of the world.
- Naturgy builds infrastructure in the LA region: 19% of its 2019 profits refer to southern LA infrastructure (Argentina, Brazil, Chile, and Peru), and 6% to northern LA infrastructure (Mexico and Panama).
- Iberdrola: 19% of EBITDA on December 2018 refer to Brazil.
- Inditex: 15% of total sales in 2018 refer to Americas.
- Melia Hotels is a world-wide hotel company with 4% of its rooms in Brazil.
- Viscofan: in 14.5% of total sales and rendered services in 2018 refer to South America.
- Indra Sistemas: 20% of total revenues in 2019 refer to Americas.
- Cie automotive: 9.5% of total sales in 2019 refer to Brazil.
- Acerinox: 48% of 2019 revenues refer to the Americas.
- ACS: 5% of total sales in 2019 refer to South America.
- Siemens Gamesa: has four locations in South America: two in Brazil, one in Chile and one in Mexico.
- Acciona: 6% of 2018 revenues refer to Central and South America.

C. Our LA EPU indexes

This section shows the EPU index for each LA country with its associated timeline of relevant events. In most cases, the indexes' peaks are explained by events that may increase the economic uncertainty in the country. This exercise is commonly used in the literature to provide evidence in favor of the index's validity as a proxy of economic uncertainty. Nevertheless, there are few cases (seven) in which the spikes do not correspond to any relevant event in the country's recent history. This is noise. Hence, we manually clean the series by replacing each of these "noisy peaks" with the average of each series (this was necessary for Argentina, Chile, Brazil, and Peru). Results are robust to this operation.[38] Hereafter, we provide an explanation for each of these peaks.

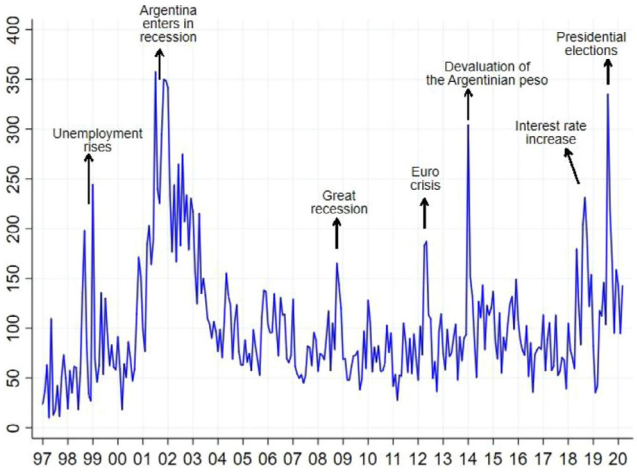


Fig. C.1. Argentina

[36] The figures refer to operating income before depreciation and amortization (OIBDA).
[37] The figures refer to earnings before interest, taxes, depreciation, and amortization (EBITDA).
[38] All results and the EPU series displayed in this manuscript refer to the EPU indexes' cleaned versions.

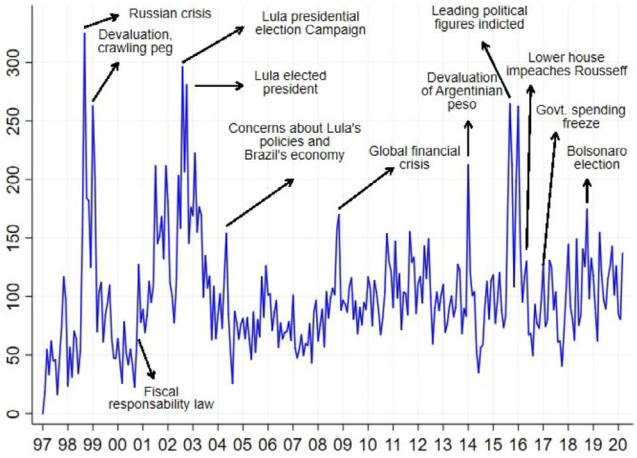


Fig. C.2. Brazil

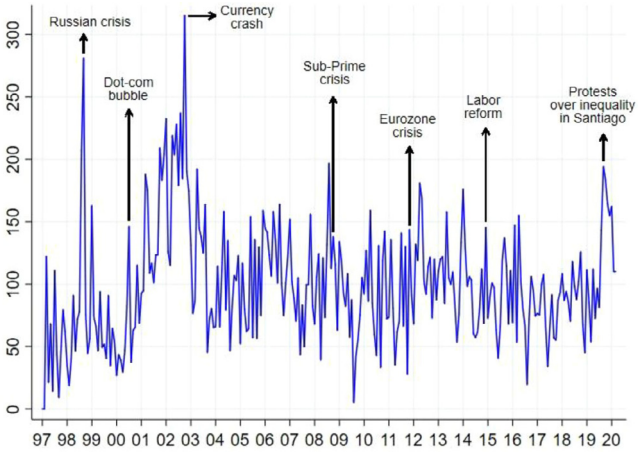


Fig. C.3. Chile

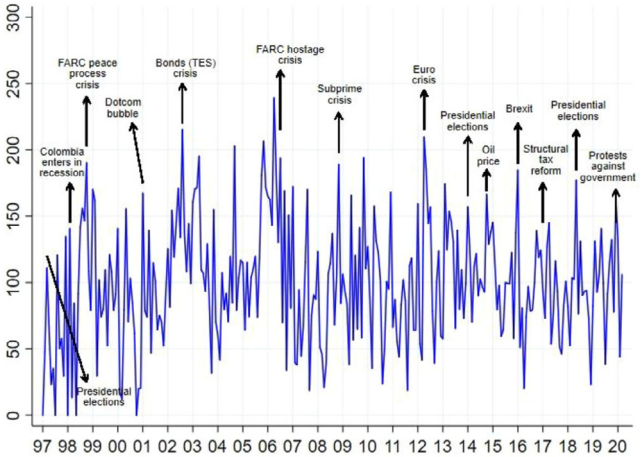


Fig. C.4. Colombia

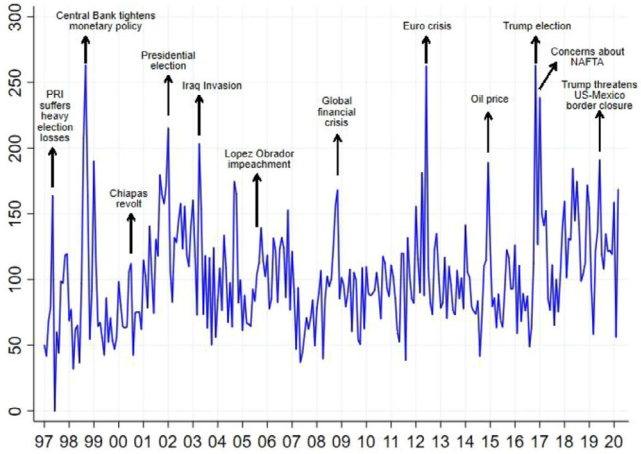


Fig. C.5. Mexico

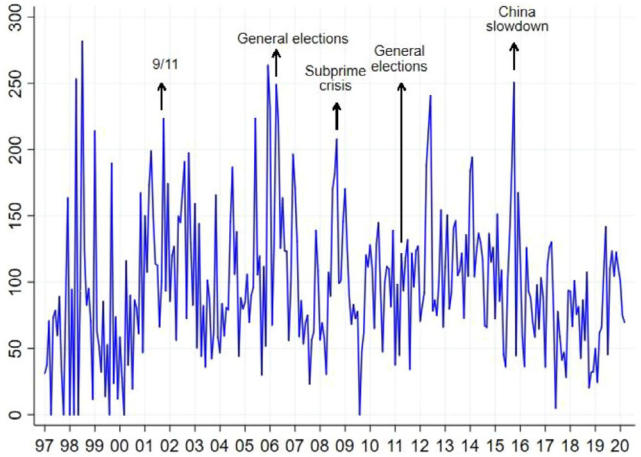


Fig. C.6. Peru

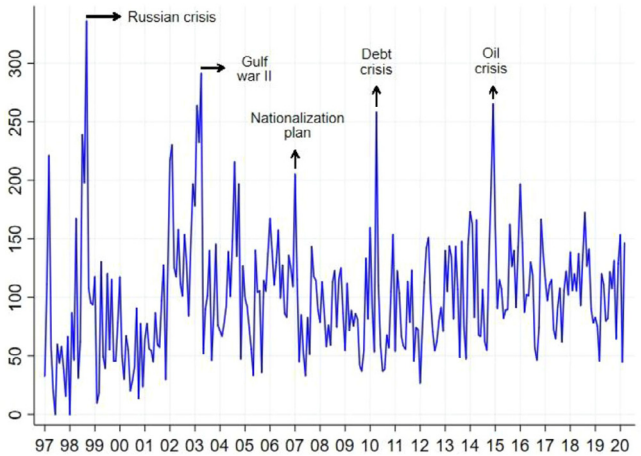


Fig. C.7. Venezuela

- Brazil and Argentina, January 2006: The indexes rise to around 150. Neither of these spikes correspond to specific events. January 2006 is the beginning of the Evo Morales's government in Bolivia and that of Michelle Bachelet in Chile. The articles in the Spanish press warn more generally about the possibility of a period of higher policy uncertainty in the LA region due to the upcoming general elections in some LA countries and the possible rise of populist governments. The Brazilian elections took place in October 2006, when Luis Ignacio Lula da Silva was reelected president. In Argentina, the general elections took place in October 2007, and Cristina Fernandez de Kirchner won the elections.
- Brazil, January 2007: The index rises to around 150. This spike is not related to any event in Brazil. The news in the Spanish press discusses the reelection of Hugo Chavez as President of Venezuela in January 2007.
- Chile, July, September, and November 2006: The index rises to around 200. We do not find an explanation for these spikes in the news. Immediately beforehand, in May–July 2006, students protested in Chile, but this is not reported in the Spanish press. Instead, the news focuses on various topics related to economic policy in emerging economies, including Chile. Hence, this spike should be read as an increase in the emerging economies' EPU.
- Peru, February 2011: The index rises to about 180. This spike does not correspond to any specific event in Peru. Some LA countries, including Peru, experienced rapid economic growth at this time due to an increase in the price of commodities. The articles in the Spanish press warn about the possibility of high inflation (Fig. C.1–C.7).

D. Comparison of our aggregate EPU index with the VIX index

This section compares the aggregate EPU index for all of the LA region with the Cboe Volatility Index (VIX) that the Chicago Board Options Exchange (Cboe) provides (see Fig. D.1). The aggregate EPU index is given by the sum of the country-specific raw counts as follows: the numerator is the number of articles satisfying the EPU requirements in at least one country among Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela; the denominator is the number of articles in which these countries are mentioned. The VIX is a proxy of stock market volatility and provides a quantifiable measure of market risk and investors' sentiments.

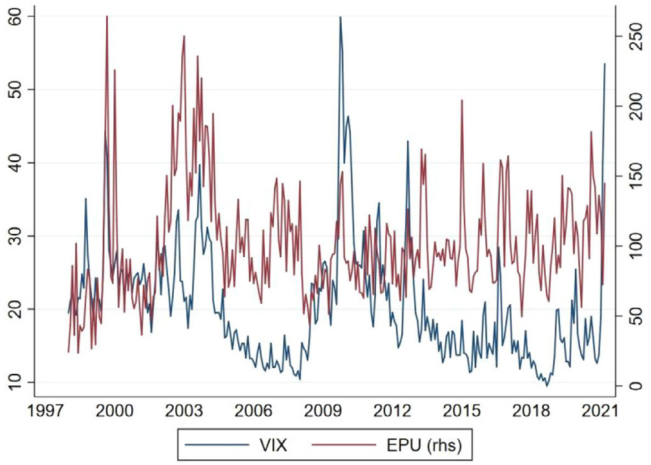


Fig. D.1. The aggregate EPU index vs. the VIX. *Note*: This figure compares the aggregate EPU index for all of the LA region with the Cboe Volatility Index (VIX).

E. Other available EPU measures

For some LA countries, namely Brazil, Chile, Colombia, and Mexico, other text-based EPU indexes are available online on the Economic Policy Uncertainty Index website (see https://www.policyuncertainty.com/). These measures follow Baker et al.'s (2016) procedure and are based on each country's national newspapers. This section briefly summarizes how each of them is constructed.

E.1. Brazil

Baker et al. (2016) constructed this index that is available at https://www.policyuncertainty.com/brazil_monthly.html . The EPU index is based on articles published in the newspaper *Folha de Sao Paulo* from 1991 onwards. The text searches are based on the following keywords:

- UNCERTAINTY: incierto, incerteza;
- ECONOMY: *económico,* economía;
- POLICY: *regulação, déficit,* orçamento*, imposto, banco central, alvorada, planalto, congresso, senado, câmara dos deputados, legislação, lei, tarifa*.

We briefly outline the differences between their set of keywords and ours. In the "uncertainty" set, we additionally consider the concept of instability (*inestabilidad/es*) and risk (*riesgo/s*). In the "policy" set, we add terms like "reform" (*reformas/s*), "public debt" (*deuda/s pública/s*), "fiscal policy" (*política/s fiscal/es*), "monetary policy" (*política/s monetaria/s*), and "public consumption" (*gasto/s público/s*). We restrict results to articles referring to the national central bank (*Banco Central de Brasil*), rather than a generic central bank, or to the Fed (*Reserva Federal*), given the US's importance in the region. They include "senate," "congress," and "chamber of deputies," while we consider "parliament" (*Parlamento*), "government" (*gobierno*), and "Ministry of Finance" (*Hacienda*). They include the official residence of the president of Brazil (*Palácio da Alvorada*) as well as the seat of the executive branch of the Brazilian federal government (*Palácio do Planalto*), while we consider only the latter.

Finally, for each noun, we consider both singular and plural forms, and for the adjectives we account for singular/plural and masculine/feminine, while they do not. The simple correlation coefficient between this index and our EPU index is 0.25 (computed using monthly data).

E.2. Chile

Cerda et al. (2018) constructed this index, which is available at https://www.policyuncertainty.com/chile_monthly.html. It is also extensively described in Silva (2018). It is based on frequency counts of articles published in two newspapers, *El Mercurio* and *La Segunda*, from January 1993 onwards. The text searches are based on the following keywords:

- UNCERTAINTY: incierto, incertidumbre;
- ECONOMY: any word starting with econ;
- POLICY: *política/s, impuesto/s, regulación, recaudación, reforma, congreso, senado/s, senador/es, diputado/a, gasto fiscal, gasto público, deuda pública, presupuesto fiscal, Banco Central, Ministerio de Hacienda*;
- CHILE: any word starting with *Chile*.

The latter requirement ensures the articles are related to domestic issues. This additional requirement is justified because Chile is a small, open economy, and hence Chilean newspapers extensively cover economic matters related to other countries.

We now compare our keywords with those of Cerda et al. (2018). In the "uncertainty" set, we additionally consider instability (*inestabilidad/es*) and risk (*riesgo/os*). In the "economy" set, they additionally look for economist(s) (*economista/s*), as opposed to us. In the "policy" set, we add the government workplace in Chile (*Palacio de La Moneda*) and "tariffs" (*arancel/es*). We search specifically for "fiscal policy" (*política/s fiscal/es*) or "monetary policy" (*política/s monetaria/as*), while they look for generic "policy/ies." They include *impuesto*, the singular term for "tax," which in Spanish may coincide with the past participle of "to impose" (*imponer*). We explicitly design the search so that we exclude the latter case. They include "money collection" (*recaudación*), which is often—but not necessarily— associated with tax collection. In contrast, we use the term *tributación/es*, which is the specific term for taxes. They add "tax expenditure" (*gasto fiscal*). We restrict our search to articles referring to the national central bank (*Banco Central de Chile*; rather than a generic central bank) or to the Fed (*Reserva Federal*), given the US's importance in the region. They search for "senate," "senator/s," "congress," and "deputy/ies," while we look at "Parliament" (*Parlamento*) and "government" (*gobierno*). In most of cases, they do not fully account for singular/plural and masculine/feminine forms (except for *impuesto/s, económico/a, economista/s,* and *diputado/a*). The correlation between this index and our EPU index is 0.24.

E.3. Colombia

Two alternative indexes are available on the Economic Policy Uncertainty website, with different authors constructing each. We consider Gil-León and Silva-Pinzón's (2019) EPU index because it is updated to the present (see https://www.policyuncertainty.com/colombia_gs.html). It is based on the leading national newspaper in Colombia, *El Tiempo*.

The text searches are based on the following keywords:

- UNCERTAINTY: incertidumbre, incierto;
- ECONOMY: any word that begins with *econ*;
- POLICY: *política, político, gobierno, impuestos, reforma, déficit fiscal, deuda pública, gasto público, crisis, congreso, Banco de la Republica, Ministerio de Hacienda, corrupción, paz, conflicto, subsidios*;
- COLOMBIA: any words starting with *Colombia*.

In the "uncertainty" set, we additionally consider instability (*inestabilidad/es*) and risk

(*riesgo/s*). In the "policy" set, they search for generic terms such as "politics" (*política*) and "politicians" (*político*), and concepts that are more related to social order than to economic policy, such as "crisis," "corruption," "peace," "conflict," and "subsidy." Instead, we target "budget" (*presupuest**), "tariffs" (*arancel/es*), "fiscal policy" (*política/s fiscal/es*) or "monetary policy" (*política/s monetaria/s*), and terms related to laws (*legislación/es, norma/s, normativ*, regulación/es, reglamento/s, ley/es*). In addition, we add the Fed (*Reserva Federal*) and the government workplace in Colombia (*Casa de Nariño*). They do not consider plurals. The correlation between this index and our EPU index is 0.01.

E.4. Mexico

Baker et al. (2016) built this index, which is available at https://www.policyuncertainty.com/mexico_monthly.html. It relies on the newspapers *El Norte* and *Reforma* from January 1996 and *Mural* from January 1999.

- UNCERTAINTY: incierto, incertidumbre;

Table E.1
Comparison of LA EPU indexes: keywords

	BRAZIL		CHILE		COLOMBIA		MEXICO	
	common kw([a])	different kw([b])	common kw	different kw	common kw	different kw	common kw	different kw
U	uncertainty, uncertain	instability, risk	uncertainty, uncertain	instability, risk	uncertainty, uncertain	instability, risk	uncertainty, uncertain	instability, risk
E	economic, economy		economic, economy	economist	economic, economy	economist	economic, economy	
P	law, regulation, legislation	norm, reform	reform, regulation	norm, law, legislation	reform	norm, law, legislation, regulation	regulation, law, legislation	reform, norm
	tax, tariff	taxation	tax	tariff, taxation, money collection	tax	taxation, tariff	tariff, tax, taxation	
	deficit, budget	public debt, public, expenditure, fiscal policy, monetary policy	budget, public debt, public expenditure	policy ([c]), tax expenditure, monetary policy, fiscal policy, deficit	deficit, public debt, public expenditure	budget, monetary policy, fiscal policy, policy ([c])	deficit, budget	public debt, public expenditure, monetary policy, fiscal policy
		Federal Reserve, Central Bank of Brazil, Ministry of Finance, government, Parliament, the government workplace, Senate, Congress, Chamber of Deputies, residence of the president, Central Bank	Ministry of Finance	Congress, Senate, senator, deputy, Central Bank, Central Bank of Chile, Federal Reserve, the government workplace, Parliament, government	government, Central Bank of Colombia, Ministry of Finance	Parliament, the government workplace, Federal Reserve, politician, Congress	Central Bank of Mexico, the government workplace, Federal Reserve	Congress, Senate, Chamber of Deputies, Parliament, government, Ministry of Finance
						crisis, corruption, peace, conflict		military, war

Notes:
[a] Keywords common between our LA EPU index and the website EPUs.
[b] Different keywords: red depicts keywords used in the website EPUs but not in our LA EPU, and blue indicates keywords we consider in our LA EPU but are not used in the website EPUs.
[c] In the website EPUs, any type of policy is included in the search expression; by contrast, we only searched for *monetary policy* and *fiscal policy*.

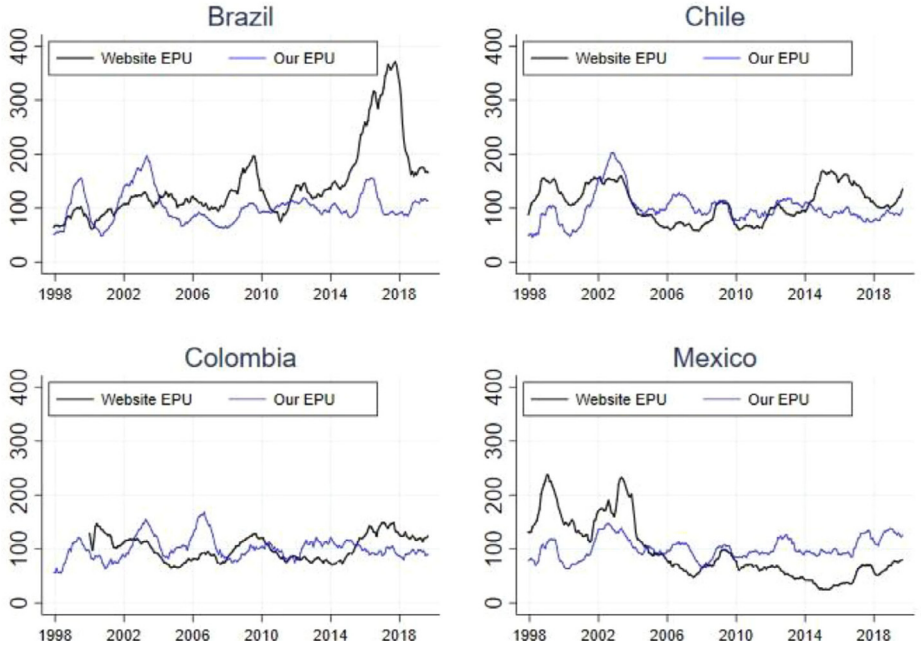


Fig. E.1. Comparison of EPU indexes: 12-month moving averages. *Note*: We compare our EPU index with the website EPUs for the LA countries for which other EPU indexes are available online. The website EPUs are all taken from the Economic Policy Uncertainty Index website (see https://www.policyuncertainty.com/). We plot monthly series, transformed as 12-month moving averages.

- ECONOMY: *económica, economía*;
- POLICY: *regulación, regulaciones, déficit, déficits, presupuesto, presupuestos, Banco de México, BdeM, Banxico, Los Pinos, Congreso General, senado, Cámara de Diputados, legislación, legislaciones, ley, leyes, arancel, aranceles, impuesto, tributación, impuestos, tributaciones, militar, militares, Guerra, guerras, la Fed, la Reserva Federal*.

In the "uncertainty" set, we additionally consider instability (*inestabilidad/es*) and risk (*riesgo/s*). In the "policy" set, we add "public spending" (*gasto/s público/s*), "public debt" (*deuda/s pública/s*), "fiscal policy" (*política/s fiscal/es*) or "monetary policy" (*política/s monetaria/s*), and additional terms related to laws (*reforma/s, norma/s, normativ*, reglamento/s*). By contrast, they search for "congress" (*congreso general*), "senate" (*senado*), and "Chamber of Deputies" (*cámara de diputados*), while we search for "Parliament" *Parlamento*, "government" (*gobierno*), and "Ministry of Finance" (*Hacienda*). They search for *impuesto*, confounding the past participle of "to impose" with the noun for "tax"; in our search, we ensure that we include only the latter. In addition, they include terms more related to social order than economic policy: *militar, militares, guerra/s*. Plural terms are only included in the "policy" set, but not in the other two sets. The correlation between this index and our LA EPU index is 0.22.

Fig. E.1 below shows our LA EPU measures against the website EPUs. To reduce the noise and ease the comparability, we compute the 12-month moving averages of both indexes.

F. Comparing our LA EPU index with the website EPUs

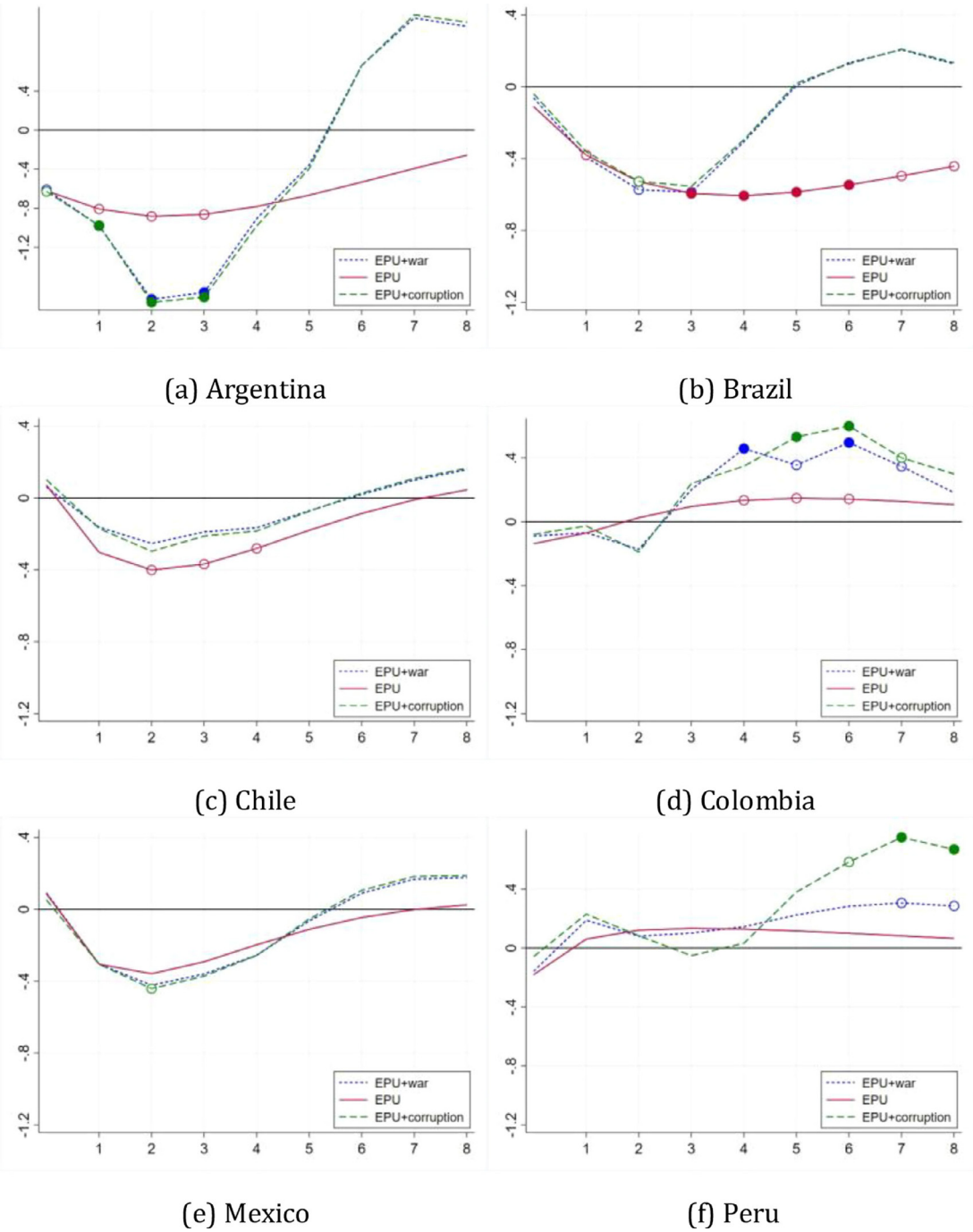


Fig. F.1. LA GDP impulse responses to LA EPU shocks. Testing specific keywords' relevance to our LA EPU indexes. *Notes*: VAR models estimates include the optimal number of lags according to the AIC criterion. Each graph shows the impulse response function up to 8 quarters to a positive shock of one standard deviation in the EPU index of the corresponding LA country. EPU refers to the response to our LA EPU index; EPU +war refers to an EPU index in which we added words related to "war" to the list of keywords (militar, militares, paz, conflicto/s, guerra/s); EPU + corruption refers to an EPU index in which we added words related to "corruption" to the list of keywords (corrupción/es, corrupt*). Filled circles indicate a statistical significance of 5%; empty circles indicate a statistical significance of 10%; a solid line indicates no statistical significance.

G. Macro analysis: forecast error variance decomposition

The forecast error variance decomposition describes the relative importance of each structural shock in affecting the forecast error variance of our response variables. For the Spanish EPU, the LA EPU explains about 30% of the forecast error variance at all horizons (from the first quarter ahead to the 2 years ahead). For the Spanish GDP, most of the forecast error variance in the first quarter is explained by the Spanish GDP. In subsequent quarters, however, the Spanish inflation and the Spanish EPU gain importance in explaining the forecast error variance (they explain between 25% and 30% of the variance, respectively). The LA EPU explains up to slightly below 20% of the forecast error variance (at one year ahead). Finally, regarding Spanish exports and Spanish FDI, the LA EPU explains up to slightly below 20% of the forecast error variance; its importance grows at larger horizons to a maximum at the two-year ahead horizon.

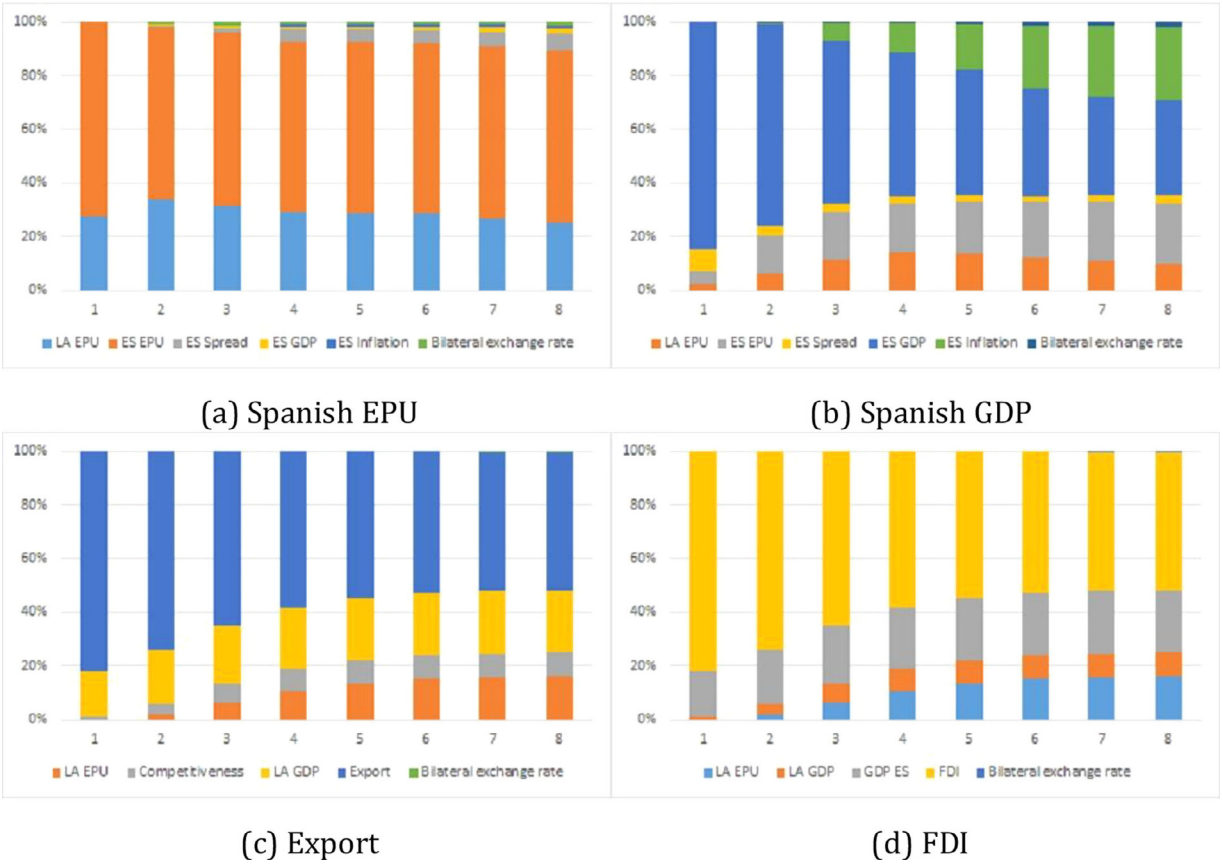


Fig. G.1. Forecast error variance decomposition. *Notes*: The upper figures report the forecast error variance decomposition for the Spanish EPU (left) and for the Spanish GDP (right) as the response variables. The figures are based on the first VAR model explained in Section 3.2 of the main text (the VAR model includes the following endogenous variables in this order: LA EPU, Spanish EPU, Spanish spread, Spanish GDP, Spanish inflation, and the bilateral exchange rate between the LA region and Spain). The bottom figures report the forecast error variance decomposition for Spanish exports (left) and for Spanish FDI (right) as response variables, respectively based on the second and third VAR explained in Section 3.2 of the main text (the second VAR contains LA EPU, competitiveness, LA GDP, Spanish exports, and the bilateral exchange rate between the LA region and Spain; the third VAR contains LA EPU, LA GDP, Spanish GDP, Spanish FDI, and the bilateral exchange rate between the LA region and Spain). In all cases, we consider the aggregate exercise considering the LA region as a whole.

H. Macro analysis: country-specific exercises

In this analysis, we repeat the analysis from Section 3.2 of the main text at the country level (i.e., for each LA country separately). We study one LA country at a time.

We estimate the following quarterly VAR model: $X_t = \prod(L)X_t + \in_t$, where X_t is a set of the following endogenous variables: the EPU of one LA country (quarterly averages of monthly data), the EPU for Spain as measured in Ghirelli et al. (2019) (quarterly averages of monthly data), Spain's 10-year sovereign debt spread over the German Bund (quarterly averages of monthly data), Spain's real GDP (year-on-year growth rates), the inflation rate (year-on-year growth rates of CPI), and the bilateral exchange rate between a specific LA country and Spain. Π is a matrix of VAR coefficients capturing the system's dynamics, and $\in_t : N(0, \Omega)$ is the vector of

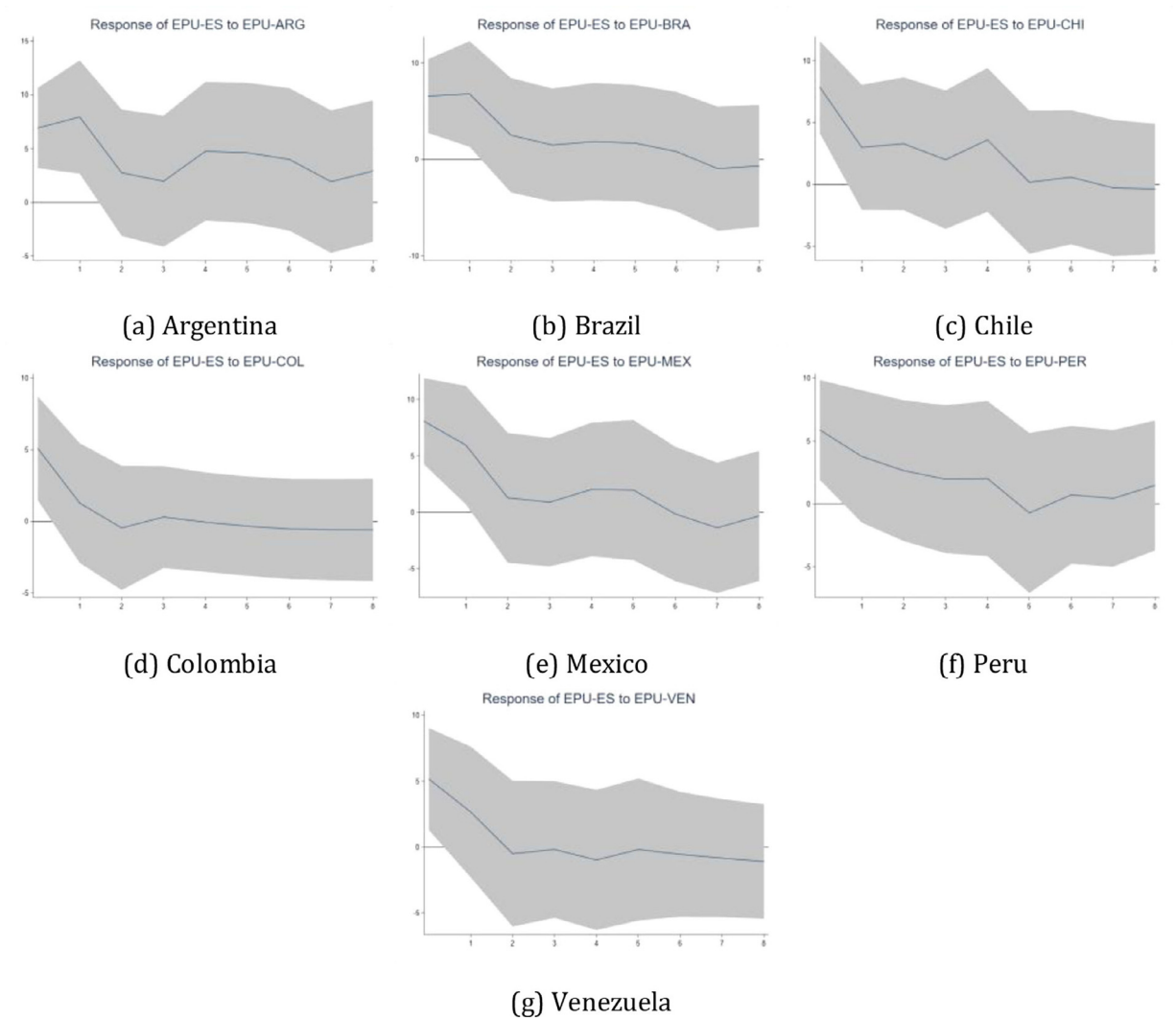


Fig. H.1. Impulse responses of Spanish EPU to LA EPU shocks. *Notes*: Confidence intervals at 5% are reported. The VAR includes optimal lags according to the AIC criterion. VAR models are defined as in Section 3.2. For Venezuela, the bilateral exchange rate is omitted because the series is not credible.

reduced-form residuals with a zero mean and variance–covariance matrix Ω. The VAR models are estimated via OLS and include the optimal number of lags according to the AIC criterion. For efficiency reasons, we set five lags whenever the optimal number of lags is above five.[39] We decompose the variance–covariance matrix Ω via a Cholesky decomposition to identify the VAR models' shocks and to compute the orthogonal impulse responses of Spanish macroeconomic variables to exogenous shocks in the LA EPU index of interest.[40]

Figs. H.1 and H.2 report impulse response functions for the Spanish EPU and the Spanish GDP, respectively. For an unexpected shock in the LA EPU of one standard deviation, the Spanish EPU increases by around five units in the first 2 months. The spillover effect is biggest for Mexico, entailing an increase in the Spanish EPU of about seven units. In addition, the Spanish GDP falls by around 0.1 percentage points (pp) and goes back to zero after at least 4 months for Argentina, Chile, Mexico, and Peru. Other countries' results are not significant.

We now focus on the two channels that may explain the spillover effect of LA uncertainty on the Spanish GDP: exports and the Spanish FDI. We restrict the analysis to Argentina, Brazil, and Mexico for data availability.

[39] Results do not change if we include one lag for efficiency reasons; see Figures J.1–J.2 in Section J of the Appendix for the main LA countries: Argentina, Brazil, and Mexico.

[40] Results remain similar if we order Spanish GDP as last after Spanish inflation. Results are available upon request.

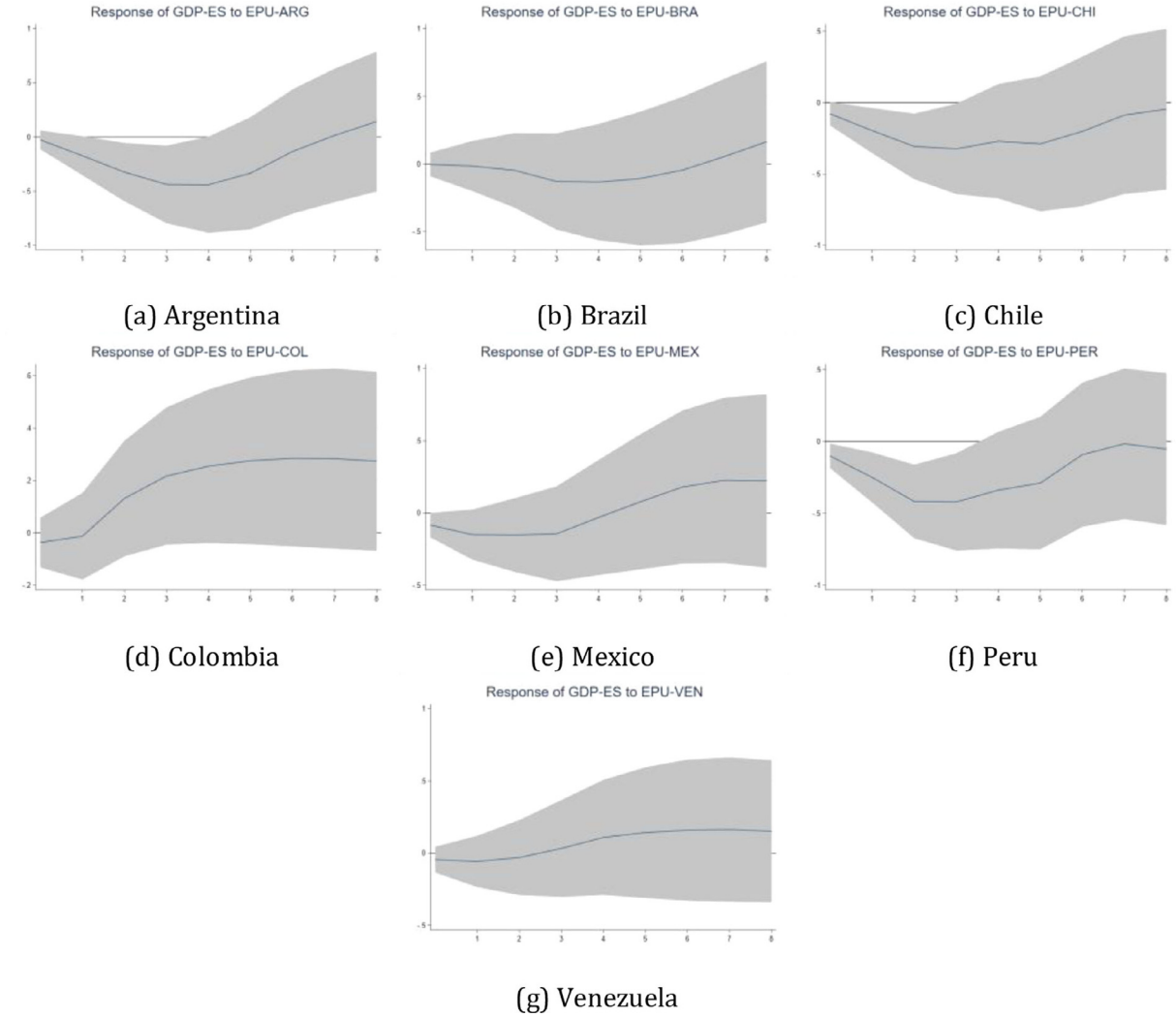


Fig. H.2. Impulse responses of Spanish GDP to LA EPU shocks. *Notes*: Confidence intervals at 5% are reported. The VAR includes optimal lags according to the AIC criterion. The VAR includes optimal lags according to the AIC criterion. VAR models are defined as in Section 3.2. For Venezuela, the bilateral exchange rate is omitted because the series is not credible.

To study foreign uncertainty's impact on Spanish exports, we estimate a quarterly VAR model that includes endogenous variables in the following order: the EPU index of the LA country, a measure of competitiveness of Spain's exported goods prices relative to the prices of goods produced in a foreign country (both expressed in Euros to account for changes in exchange rates), the foreign country's GDP (year-on-year growth rate), Spanish real exports to the foreign country (quarterly growth rates), and the bilateral exchange rate between an LA country and Spain.[41] Real exports are obtained by deflating nominal exports with the price unit value index of Spain's exported goods. The competitiveness measure is important because it allows controlling for any changes in the relative prices between goods exported from Spain and those produced in a foreign country (changes which may affect the demand) on top of the demand variation due to exchange rate fluctuations.

The FDI VAR models instead include the following variables (in order): the EPU of the foreign country, the foreign country's GDP (year-on-year growth rate), Spain's GDP (year-on-year growth rates), Spain's net FDI to the foreign country (year-on-year growth rates of stock values), and the bilateral exchange rate between the LA country of interest and Spain.[42]

[41] As a robustness test, we estimate the VAR by switching the order between the price competitiveness measure and the foreign country's GDP. Results are very similar (see Figure J.6).

[42] As a robustness test, we estimate the VAR by switching the order between the GDP measures and setting the Spanish GDP before the foreign country's GDP. Results are very similar (see Figure J.5).

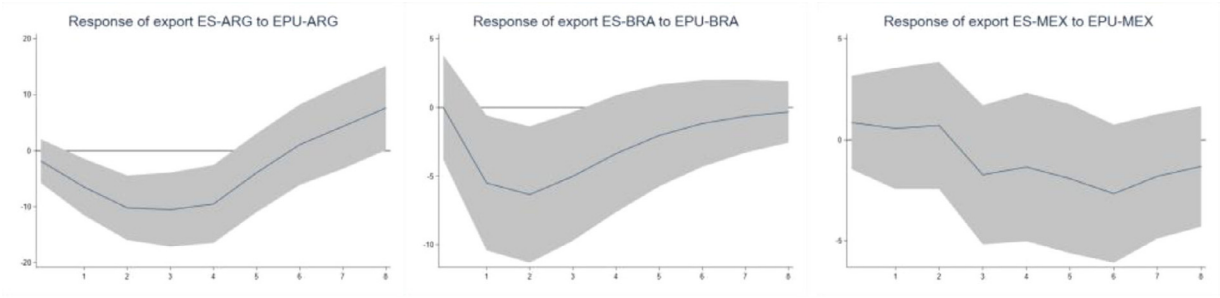


Fig. H.3. VAR: Impulse responses of Spanish exports to LA EPU shocks. *Notes*: Confidence intervals at the 5% level reported. VAR: optimal number of lags. The VAR includes optimal lags according to the AIC criterion. VAR models are defined as in Section 3.2.

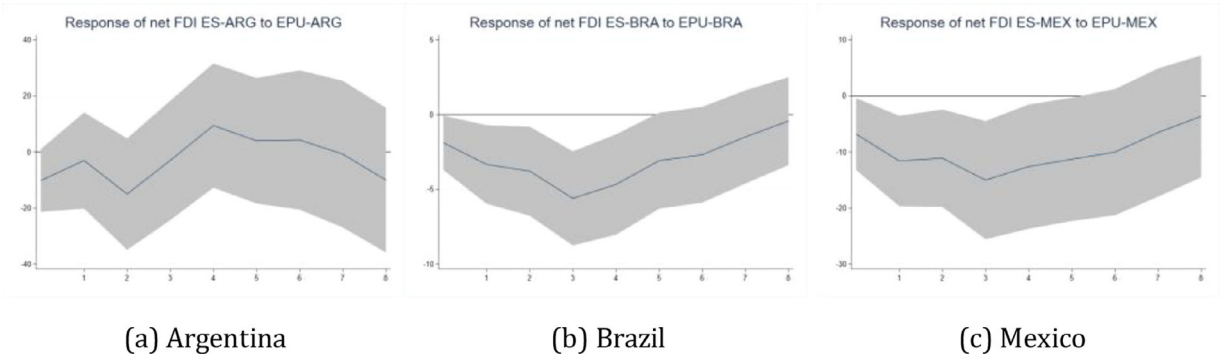


Fig. H.4. VAR: Impulse responses of Spanish net FDI to LA EPU shocks. *Notes*: Confidence intervals at 5% are reported. VAR: optimal number of lags. The VAR includes optimal lags according to the AIC criterion. VAR models are defined as in Section 3.2.

Again, all VAR models are estimated via OLS and include the optimal number of lags according to the AIC criterion (we cap lags at five for efficiency reasons).[43] Figs. H.3 and H.4 report the impulse responses of Spanish exports and FDI to foreign countries' EPU shocks, respectively, for the main LA countries: Argentina, Brazil, and Mexico. Foreign country EPU shocks reduce Spanish exports significantly for Argentina and Brazil (by about 10 pp and five pp, respectively; the effect vanishes after five quarters in both cases), while results for Mexico are not statistically significant. By contrast, FDI drops in response to foreign EPU shocks in Mexico by about 10 pp and in Brazil by about five pp. In both cases, the impact remains significant for at least six quarters.

I. Macro analysis: local projections method

In the macro analysis (Section 3.2 and H), we did not control for any LA macroeconomic variables when estimating the spillover effects of LA EPU shocks to the Spanish EPU or Spanish GDP. Thus, to the extent that uncertainty in Latin America affects the LA real economy, our estimated effect may combine the genuine impact of LA uncertainty and of the LA economic situation on the Spanish economy. To tackle this, we repeat the analysis via a two-step procedure as follows. For brevity, we focus on Argentina, Brazil, and Mexico.

We proceed as follows. First, we re-estimate the same VAR model from the previous exercise, a Spain-related VAR with the following endogenous variables: the EPU of one LA country (Argentina, Brazil, or Mexico), Spain's EPU, Spain's 10-year sovereign debt spread over the German Bund, the real Spanish GDP, the inflation rate, and the bilateral exchange rate.

Second, we estimate the residual from the VAR's first equation (the equation with the LA EPU index on the left-hand side) to extract the structural shock of the LA EPU index, cleaned from its correlation with the Spanish macroeconomic variables.

Finally, we estimate the impulse responses of the computed LA EPU shock on the Spanish economy by means of local projections, following the procedure in Jordá (2005).

That is, we estimate sequential regressions in which the dependent variable (thus, the Spanish EPU and the Spanish GDP) is shifted several steps ahead (up to eight quarters) and regressed on the LA EPU shock while controlling for lagged values of the dependent variable and the GDP growth rate of the LA country of interest (the contemporaneous term and one-lag values). In the estimation, we use the Newey–West (1987) correction for standard errors regarding serial correlation. Then, we plot the coefficients

[43] Results are similar if we include only one lag in the VAR models (see Figure J.3 in Section J of the Appendix).

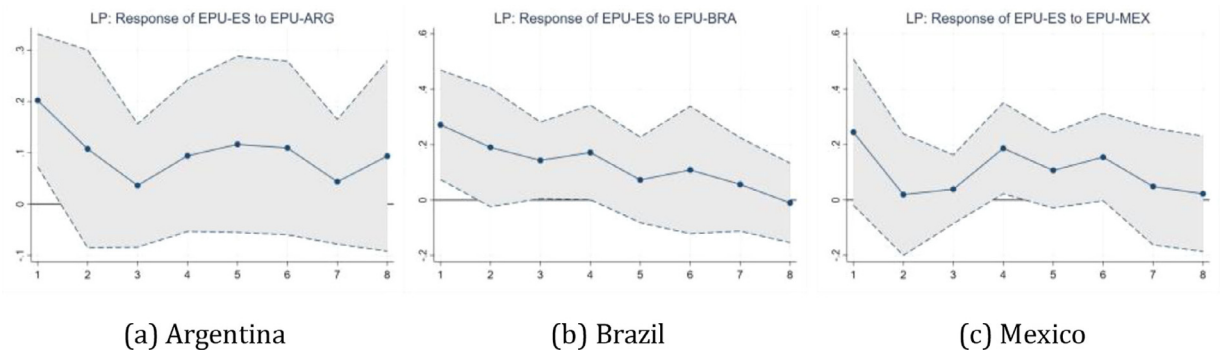


Fig. I.1. Local projections: Spanish EPU's impulse responses to LA EPU shocks. *Notes*: Confidence intervals at 5% are reported.

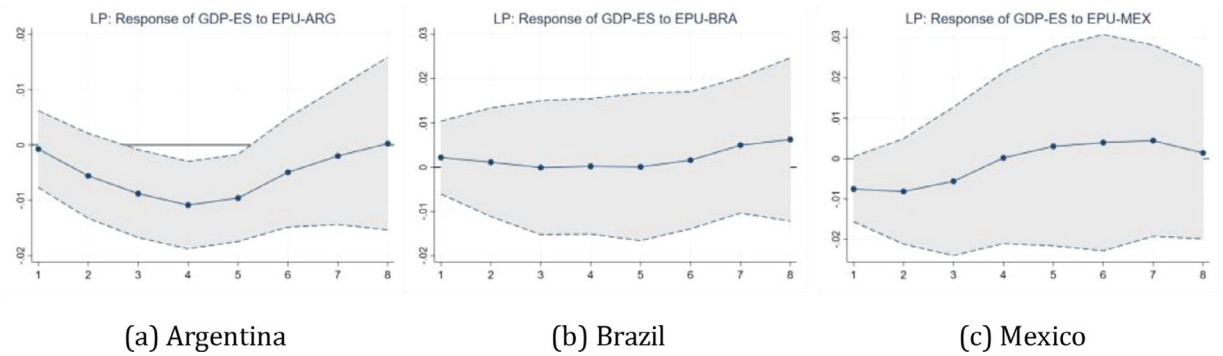


Fig. I.2. Local projections: Spanish GDP's impulse responses to LA EPU shocks. *Notes*: Confidence intervals at 5% are reported.

of the contemporaneous LA EPU shock over the same time horizon, which gives the dependent variable's impulse responses to LA EPU shocks while controlling for the macroeconomic situation of the LA country. Results appear in Figs. I.1 and I.2 and align with those obtained in the main VAR exercise. Conceptually, we believe that controlling for the foreign country's economic situation is unnecessary in the analysis (thus, our baseline model is the one-step VAR) because the spillover of one country's uncertainty to another country may also occur through contagions among macroeconomic variables. Nevertheless, we interpret the similarity in terms of sign and significance in these impulse responses (Fig. I.1 and Fig. I.2) as further evidence of spillovers of uncertainty in LA countries due to the Spanish economy.

J. *Macro analysis: one lag and order of variables*

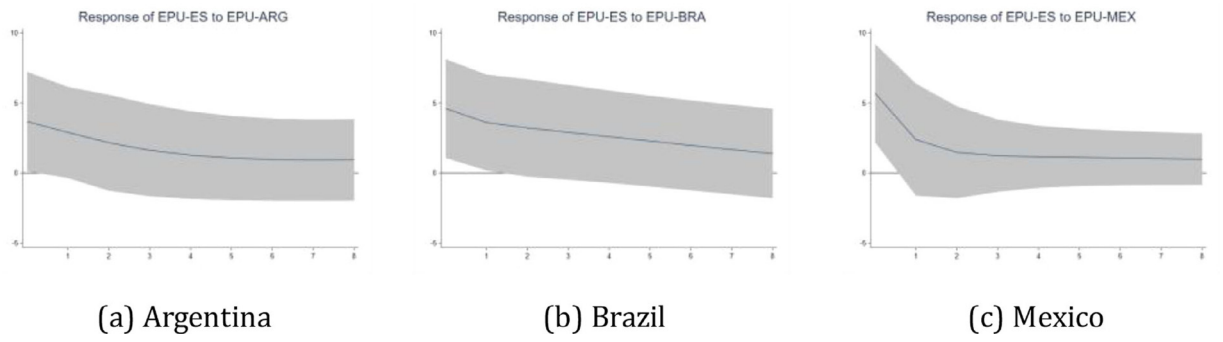


Fig. J.1. Spanish EPU's impulse responses to LA EPU index shocks: One lag. *Notes*: Confidence intervals at 5% are reported.

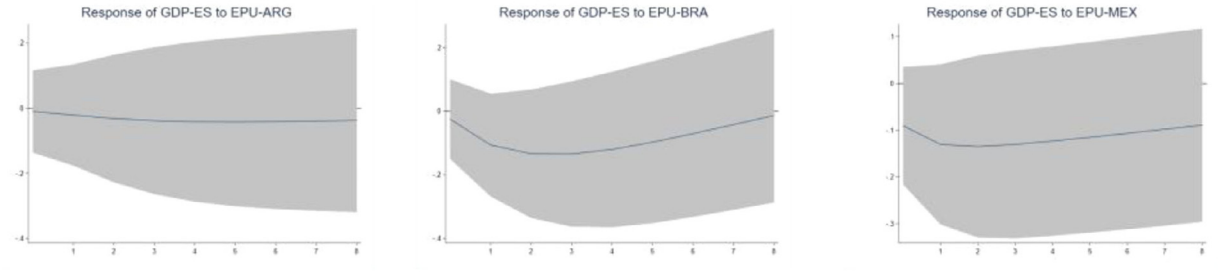


Fig. J.2. Spanish GDP's impulse responses to LA EPU index shocks: One lag. *Notes*: Confidence intervals at 5% are reported.

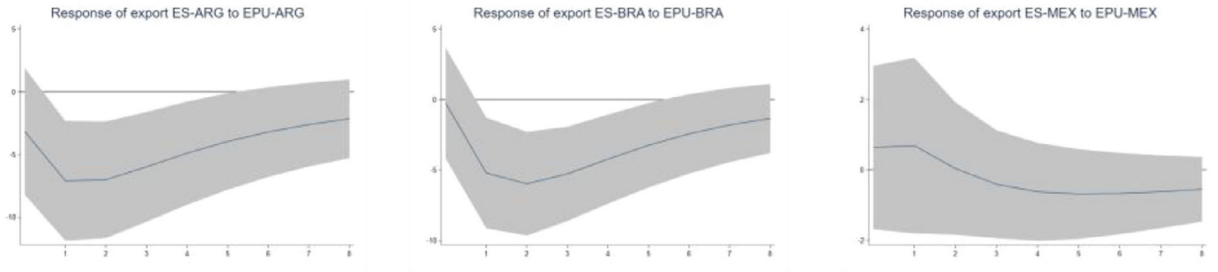


Fig. J.3. VAR: Spanish exports' impulse responses to LA EPU index shocks: One lag. *Notes*: Confidence intervals at 5% are reported.

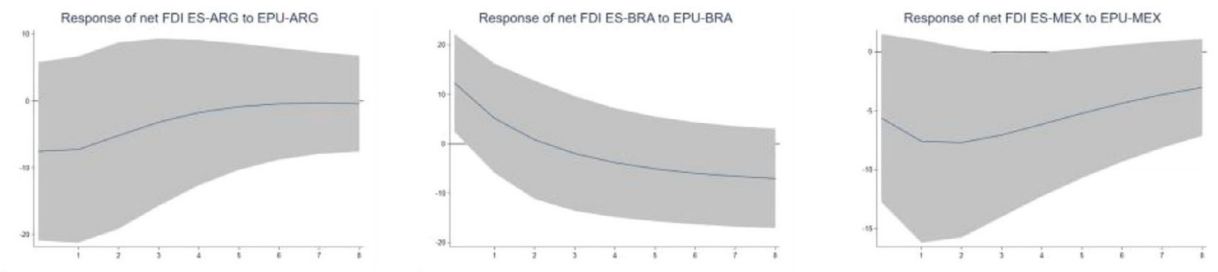


Fig. J.4. VAR: Spanish net FDI's impulse responses to LA EPU index shocks: One lag. *Notes*: Confidence intervals at 5% are reported.

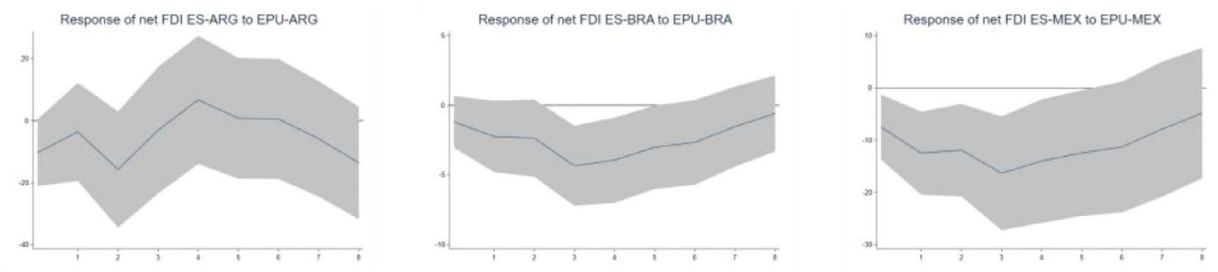


Fig. J.5. VAR: Spanish net FDI's impulse responses to LA EPU index shocks: Setting the Spanish GDP before the foreign country's GDP. *Notes*: Confidence intervals at 5% are reported. The VAR includes optimal lags according to the AIC criterion.

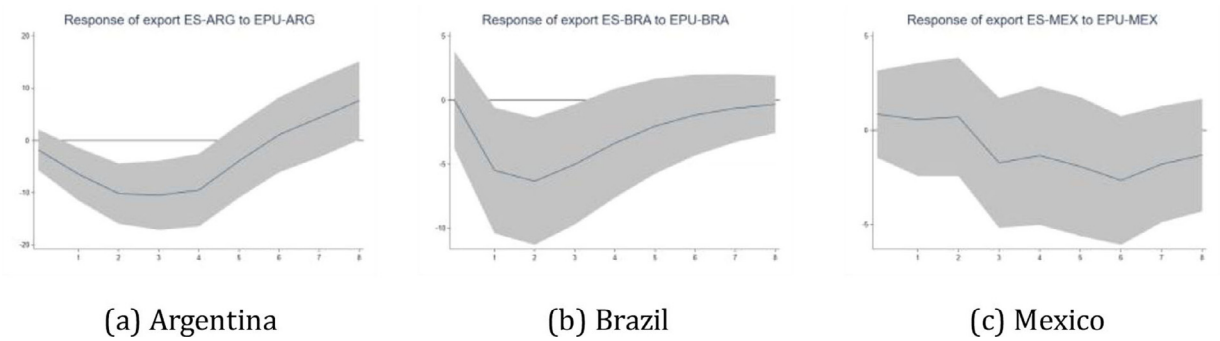


Fig. J.6. VAR: Spanish exports' impulse responses to LA EPU index shocks: Setting the price competitiveness measure after the foreign country's GDP. *Notes*: Confidence intervals at 5% are reported. The VAR includes optimal lags according to the AIC criterion.

K. Macro analysis: exploring the uncertainty spillover

In this section, we explore the uncertainty spillover's role (i.e., the LA EPU's direct impact via its spillover to Spanish EPU) as a mechanism for transmission to the real economy, in the spirit of Caggiano et al. (2020). To do this, we compare two impulse responses obtained from alternative VAR models in which the Spanish EPU is either allowed or not allowed to respond to systematic movements in LA EPU. The first VAR is the baseline model in which the Spanish EPU is included in the VAR as an endogenous variable, so the Spanish EPU is free to react once the system is shocked.[44] In the alternative version of the VAR model, we include the Spanish EPU as an exogenous variable, so it cannot freely react once the system is shocked. Results appear in Fig. K.1, which compares the two models' impulse responses. The blue line refers to the model in which the Spanish EPU can adjust to shocks in LA EPU, and the red line refers to the model in which the Spanish EPU cannot react to LA EPU shocks. For Spanish exports and FDI, the impulse responses of the aggregated EPU for the LA region on the target variables are basically unchanged. This suggests that most of the LA EPU's impact on exports and on FDI occurs through a direct channel, but the LA EPU's indirect impact through the uncertainty spillover is negligible. This also confirms that the economic agents make decisions about Spanish exports and FDI by looking at LA variables, which is reasonable. By contrast, the Spanish GDP results suggest that most of the LA EPU's impact on Spanish GDP occurs through the uncertainty spillover.

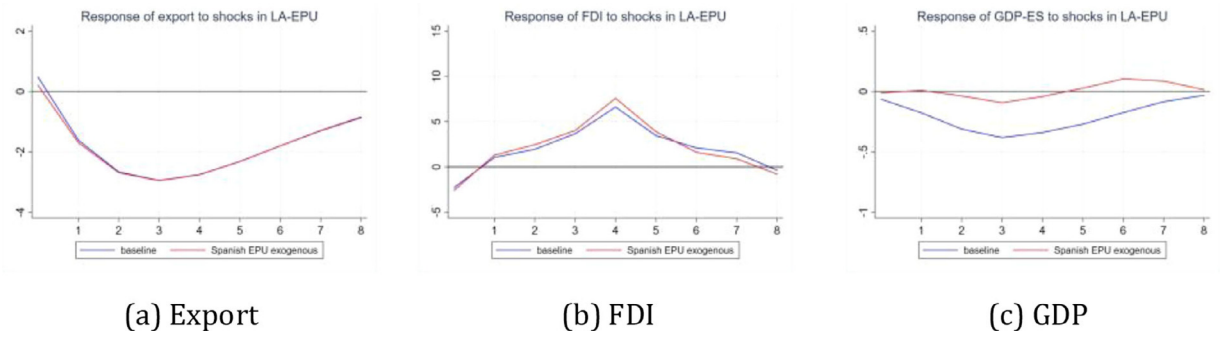


Fig. K.1. Impulse responses to LA EPU index shocks: The role of the uncertainty spillover. *Notes*: The graphs report the corresponding target variable's impulse responses to shocks in LA EPU. The blue line represents the impulse response of the target variable to LA EPU shocks based on the model in which the Spanish EPU can adjust to shocks in the LA EPU. The red line represents the target variable's impulse response to LA EPU shocks based on the model in which the Spanish EPU is exogenous to the system and hence cannot react once the system is shocked.

L. Macro analysis: using the website EPUs

[44] For the Spanish GDP, the first VAR corresponds to the VAR estimated in section 3.2 of the main text. For Spanish exports and the Spanish FDI, the corresponding VAR estimated in section 3.2 did not include the Spanish EPU. Hence, we added it and placed it second, just after the LA EPU. The impulse responses of interest are virtually unchanged once we include the Spanish EPU in the system.

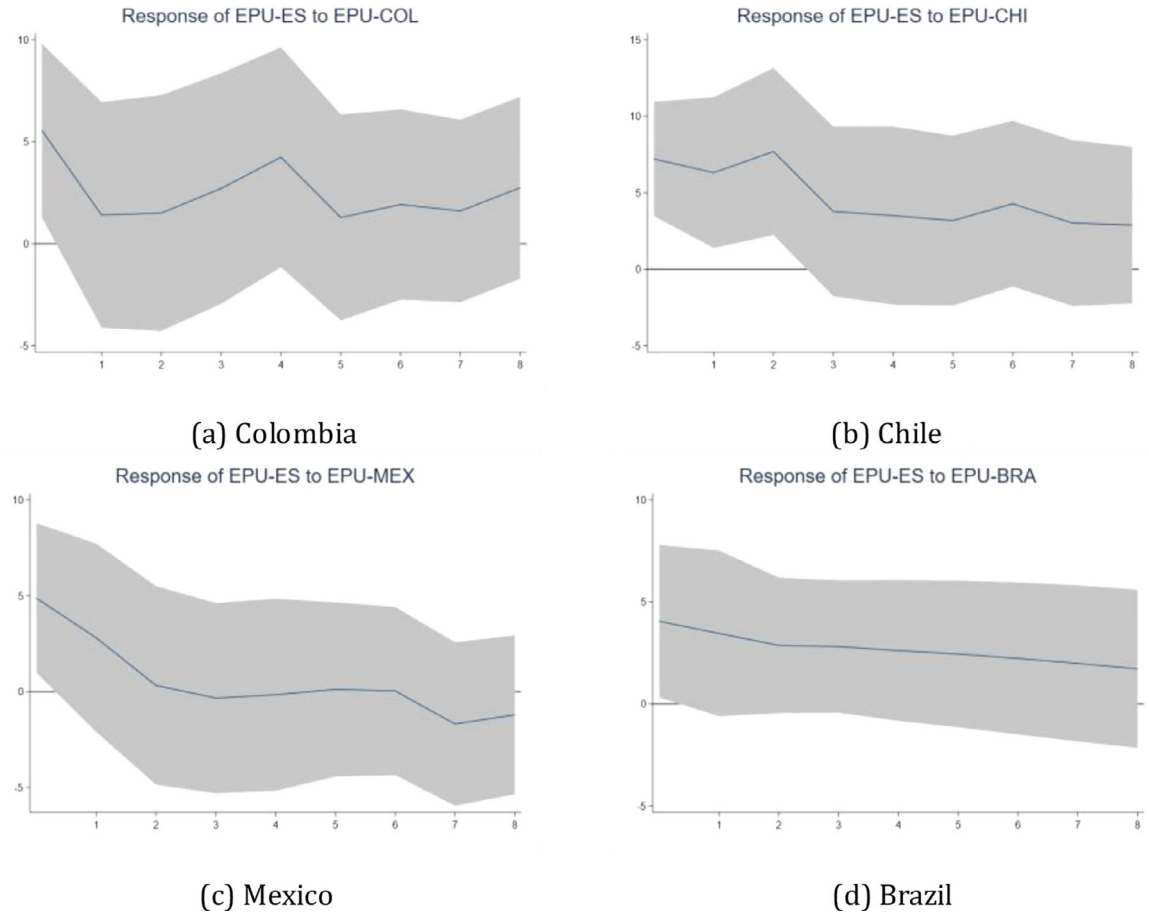


Fig. L.1. Spanish EPU's impulse responses to LA EPU index shocks. *Notes*: Confidence intervals at 5% are reported. The VAR includes optimal lags according to the AIC criterion.

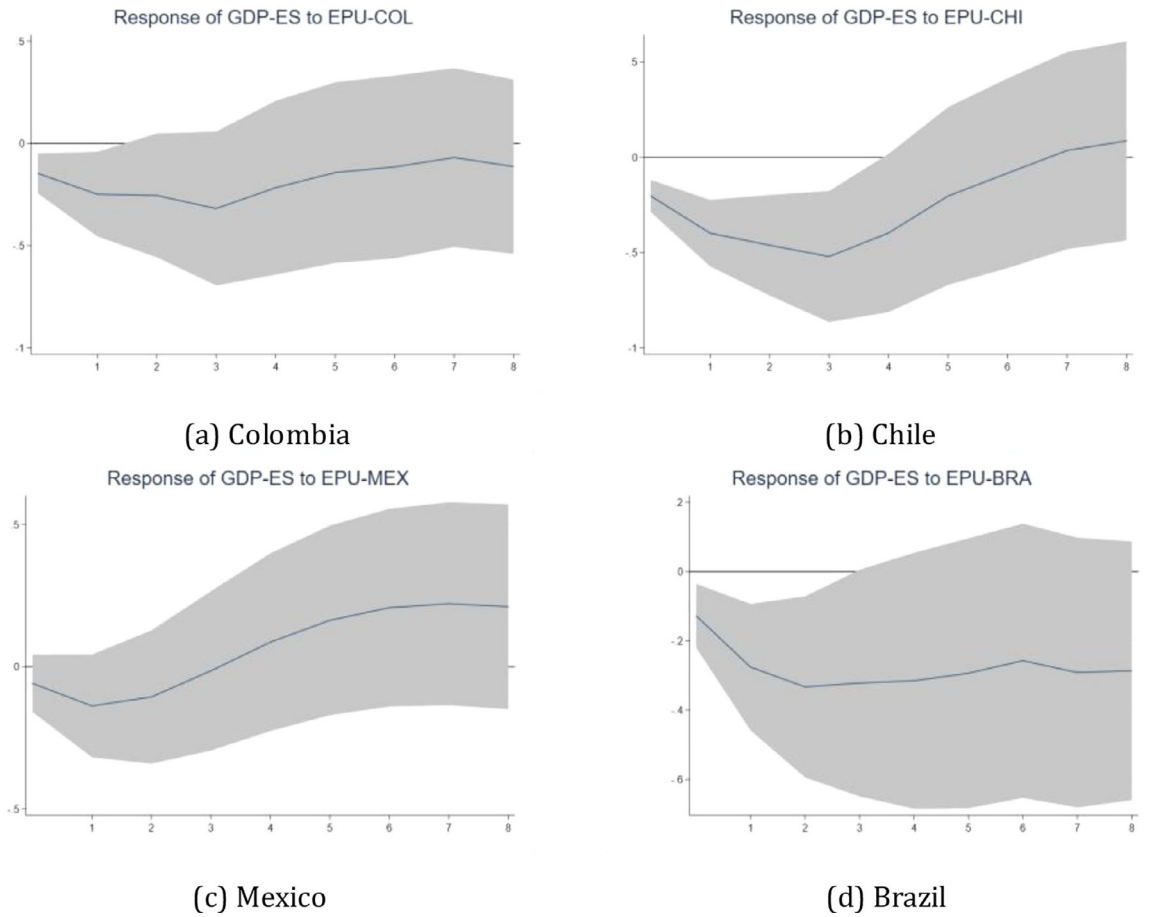
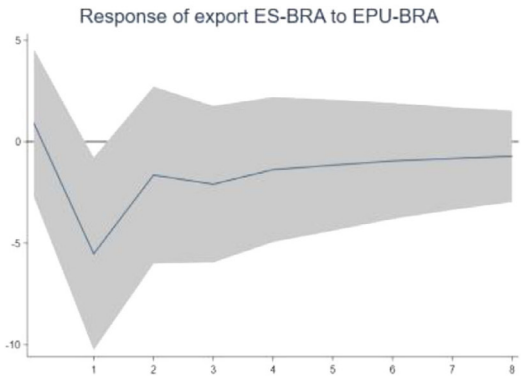
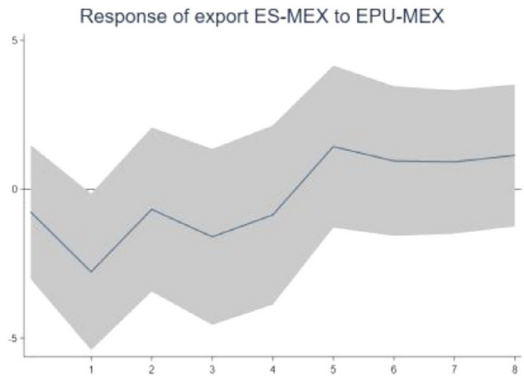


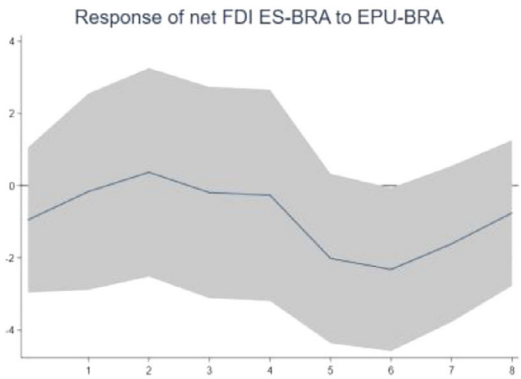
Fig. L.2. Spanish GDP's impulse responses to LA EPU index shocks. *Notes*: Confidence intervals at 5% are reported. The VAR includes optimal lags according to the AIC criterion.



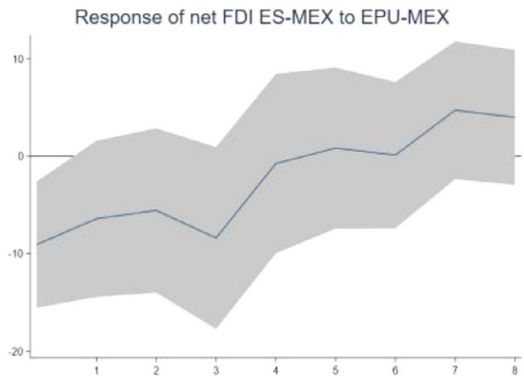
(a) Exports-Brazil



(b) Exports-Mexico



(c) FDI-Brazil



(d) FDI-Mexico

Fig. L.3. Impulse responses of Spanish exports and FDI to LA EPU index shocks. *Notes*: Confidence intervals at 5% are reported. The VAR includes optimal lags according to the AIC criterion.

M. Monthly VARs on company quotations

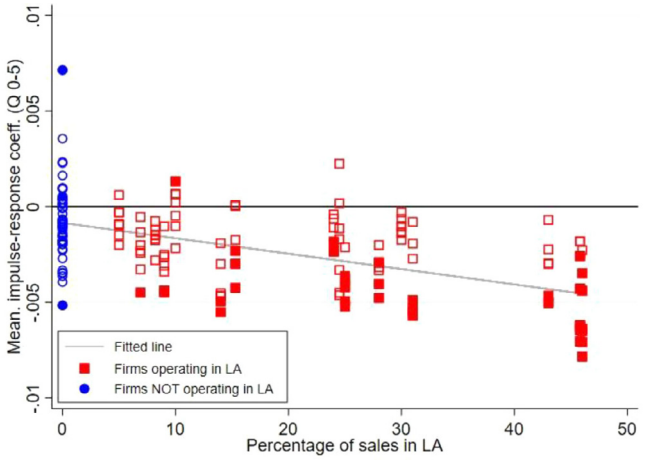


Fig. M.1. Company quotations' average responses to LA EPU shocks. *Notes*: Each point represents the average impulse response of one company's quotations to LA EPU shocks in one country. The impulse response function of a company's quotations to a LA country's EPU shocks is obtained by estimating a monthly VAR model with one lag for each company–country pair, as explained in the main text. The average impulse response is the average of the first six impulse responses' estimated coefficients (from the current quarter through the fifth quarter). Red squares represent companies with interests in Latin America, and blue circles represent companies without interests in Latin America. In both cases, filled symbols indicate that at least two coefficients (among those considered to compute the average response) are significant at least at a 10% confidence level.

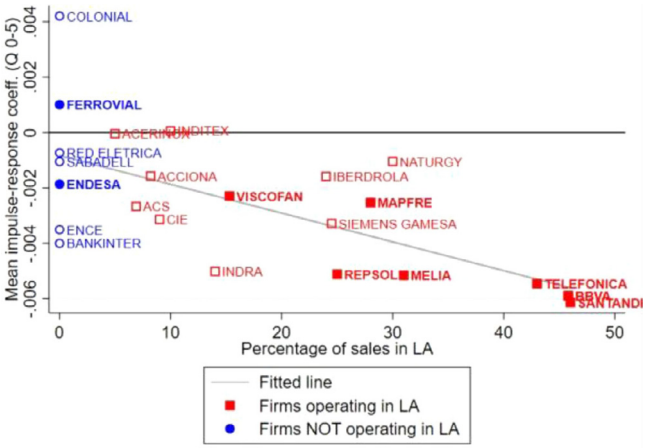


Fig. M.2. Average responses of company quotations to LA EPU shocks: Argentina. *Notes*: Each point represents the average impulse response of one company's quotations to EPU shocks in Argentina. The average impulse response is the average of the estimated coefficients of the first six impulse responses (from the current quarter through the fifth quarter). Red squares represent companies with interests in Latin America, and blue circles represent companies without interests in Latin America. In both cases, filled symbols indicate that at least two coefficients (among those considered to compute the average response) are significant at least at a 10% confidence level. When the average response is significant according to this criterion, the company label is bold.

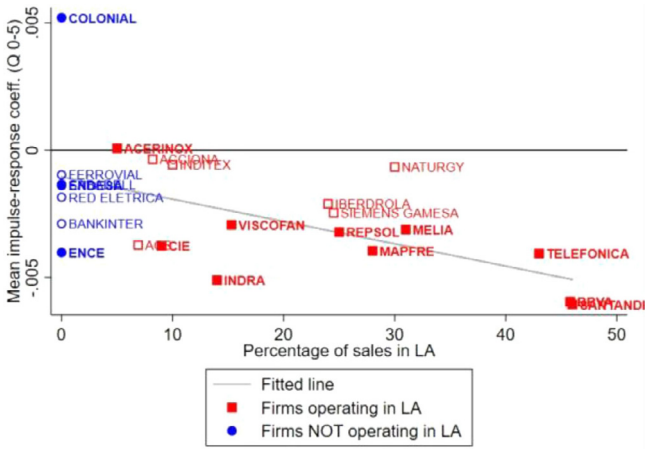


Fig. M.3. Average responses of company quotations to LA EPU shocks: Brazil. *Notes*: Each point represents the average impulse response of one company's quotations to EPU shocks in Brazil. The average impulse response is the average of the estimated coefficients of the first six impulse responses (from the current quarter through the fifth quarter). Red squares represent companies with interests in Latin America, and blue circles represent companies without interests in Latin America. In both cases, filled symbols indicate that at least two coefficients (among those considered to compute the average response) are significant at least at a 10% confidence level. Whenever the average response is significant according to this criterion, the company label is bold.

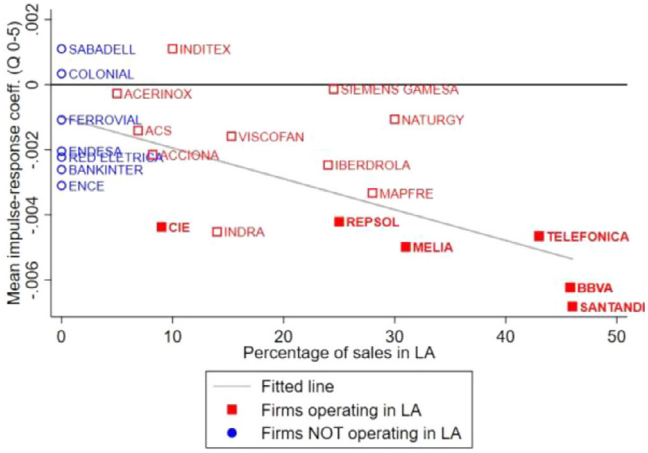


Fig. M.4. Average responses of company quotations to LA EPU shocks: Chile. *Notes*: Each point represents the average impulse response of one company's quotations to EPU shocks in Chile. The average impulse response is the average of the estimated coefficients of the first six impulse responses (from the current quarter through the fifth quarter). Red squares represent companies with interests in Latin America, and blue circles refer to companies without interests in Latin America. In both cases, filled symbols indicate that at least two coefficients (among those considered to compute the average response) are significant at least at a 10% confidence level. When the average response is significant according to this criterion, the company label is bold.

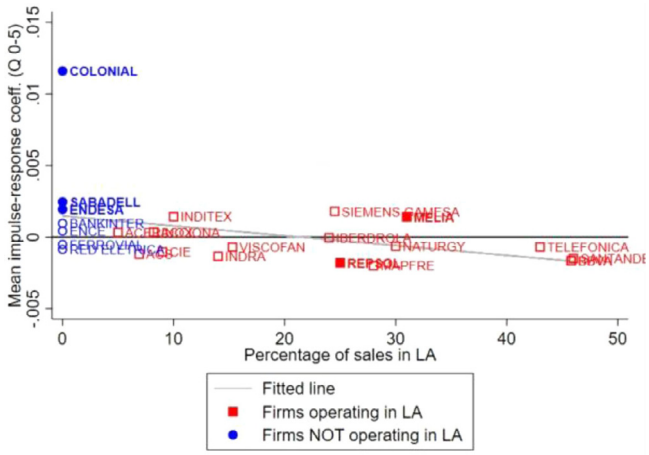


Fig. M.5. Average responses of company quotations to LA EPU shocks: Colombia. *Notes*: Each point represents the average impulse response of one company's quotations to EPU shocks in Colombia. The average impulse response is the average of the estimated coefficients of the first six impulse responses (from the current quarter through the fifth quarter). Red squares represent companies with interests in Latin America, and blue circles represent companies without interests in Latin America. In both cases, filled symbols indicate that at least two coefficients (among those considered to compute the average response) are significant at least at a 10% confidence level. When the average response is significant according to this criterion, the company label is bold.

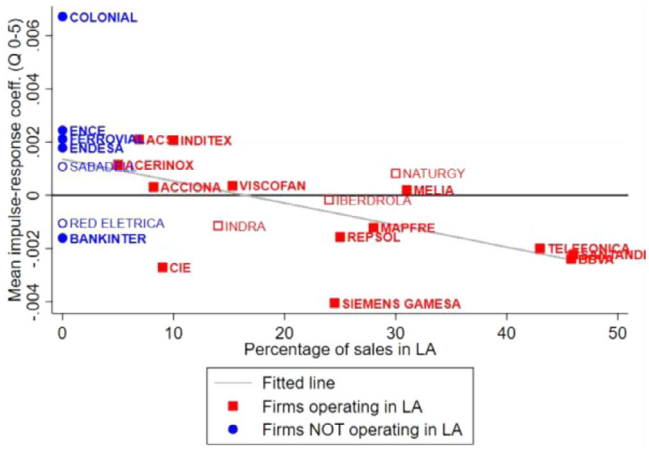


Fig. M.6. Average responses of company quotations to LA EPU shocks: Mexico. *Notes*: Each point represents the average impulse response of one company's quotations to EPU shocks in Mexico. The average impulse response is the average of the estimated coefficients of the first six impulse responses (from the current quarter through the fifth quarter). Red squares represent companies with interests in Latin America, and blue circles represent companies without interests in Latin America. In both cases, filled symbols indicate that at least two coefficients (among those considered to compute the average response) are significant at least at the 10% confidence level. When the average response is significant according to this criterion, the company label is bold.

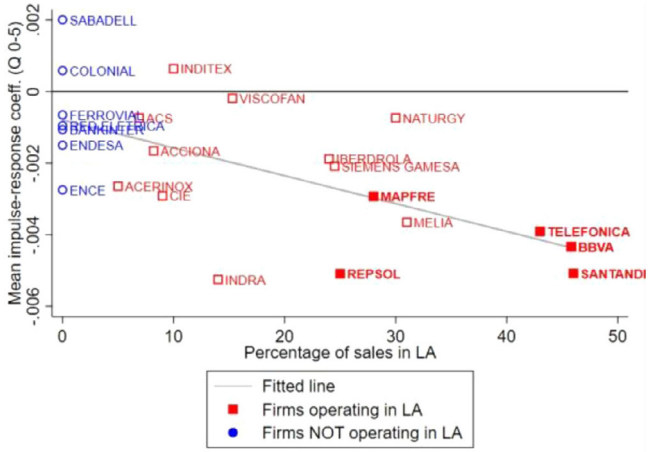


Fig. M.7. Average responses of company quotations to LA EPU shocks: Peru. *Notes*: Each point represents the average impulse response of one company's quotations to EPU shocks in Peru. The average impulse response is the average of the estimated coefficients of the first six impulse responses (from the current quarter through the fifth quarter). Red squares represent companies with interests in Latin America, and blue circles represent companies without interests in Latin America. In both cases, filled symbols indicate that at least two coefficients (among those considered to compute the average response) are significant at least at a 10% confidence level. When the average response is significant according to this criterion, the company label is bold.

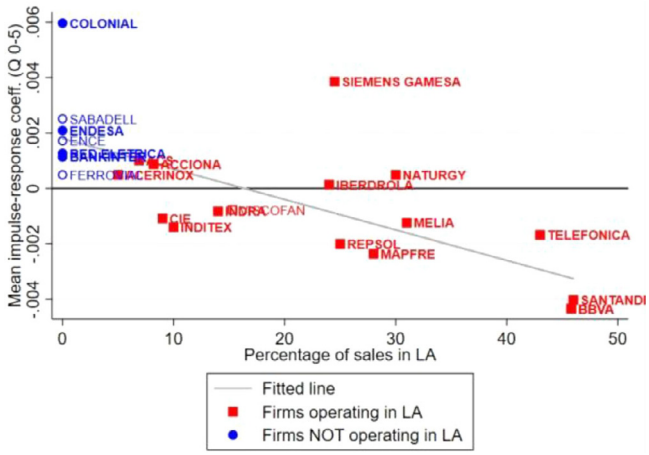


Fig. M.8. Average responses of company quotations to LA EPU shocks: Venezuela. *Notes*: Each point represents the average impulse response of one company's quotations to EPU shocks in Venezuela. The average impulse response is the average of the estimated coefficients of the first six impulse responses (from the current quarter through the fifth quarter). Red squares represent companies with interests in Latin America, and blue circles refer to companies without interests in Latin America. In both cases, filled symbols indicate that at least two coefficients (among those considered to compute the average response) are significant at least at a 10% confidence level. When the average response is significant according to this criterion, the company label is bold.

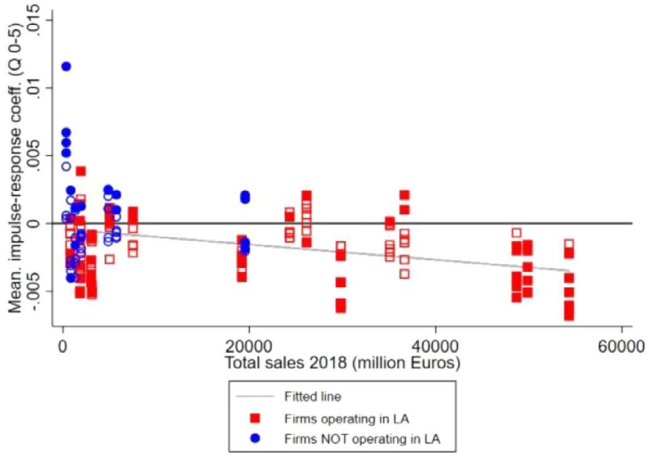


Fig. M.9. Average responses of company quotations to aggregated EPU shocks. *Notes*: Each point represents the average impulse response of one company's quotations to the aggregated EPU shocks of all countries together. The average impulse response is computed as the average of the estimated coefficients of the first six impulse responses (from the current quarter through the fifth quarter). Red squares represent companies with interests in Latin America, and blue circles refer to companies without interests in LA. In both cases, filled symbols indicate that at least two coefficients (among those considered to compute the average response) are significant at least at a 10% confidence level. On the x-axis, companies are ordered by total sales.

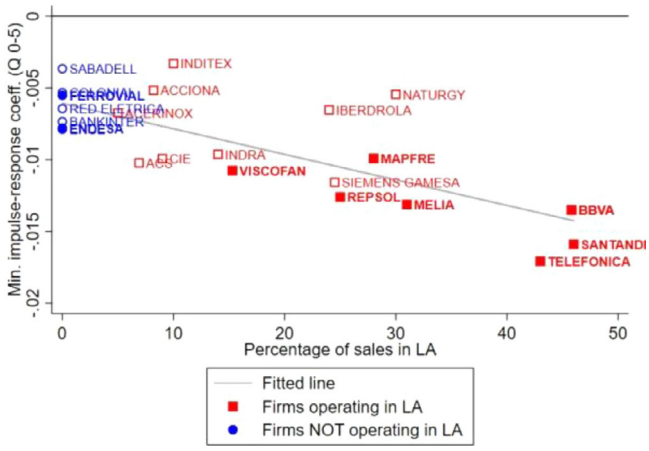


Fig. M.10. Peak response of company quotations to LA EPU shocks: Argentina. *Notes*: Each point represents the minimum impulse response of one company's quotations to EPU shocks in Argentina. Red squares represent companies with interests in Latin America, and blue circles represent companies without interests in Latin America. In both cases, filled symbols indicate that at least two coefficients (among the first five coefficients) are significant at least at a 10% confidence level. When the minimum response is significant according to this criterion, the company label is bold.

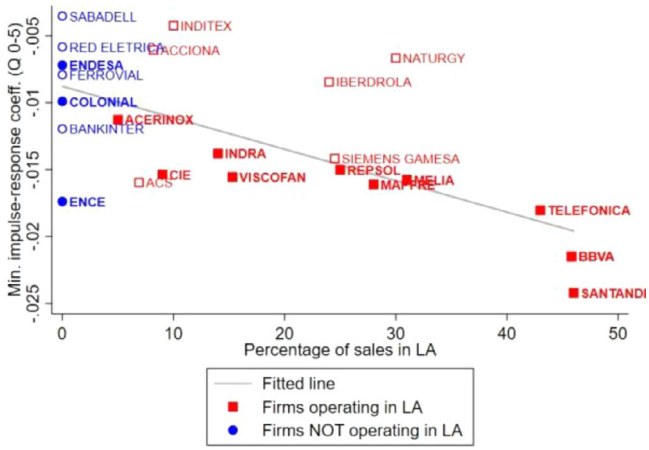


Fig. M.11. Peak response of company quotations to LA EPU shocks: Brazil. *Notes*: Each point represents the minimum impulse response of one company's quotations to EPU shocks in Brazil. Red squares represent companies with interests in Latin America, and blue circles represent companies without interests in Latin America. In both cases, filled symbols indicate that at least two coefficients (among the first five coefficients) are significant at least at a 10% confidence level. When the minimum response is significant according to this criterion, the company label is bold.

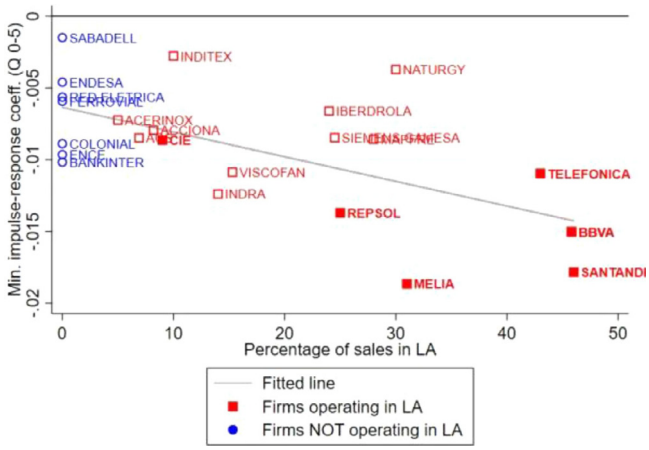


Fig. M.12. Peak response of company quotations to LA EPU shocks: Chile. *Notes*: Each point represents the minimum impulse response of one company's quotations to EPU shocks in Chile. Red squares represent companies with interests in Latin America, while blue circles represent companies without interests in Latin America. In both cases, filled symbols indicate that at least two coefficients (among the first five coefficients) are significant at least at a 10% confidence level. When the minimum response is significant according to this criterion, the company label is bold.

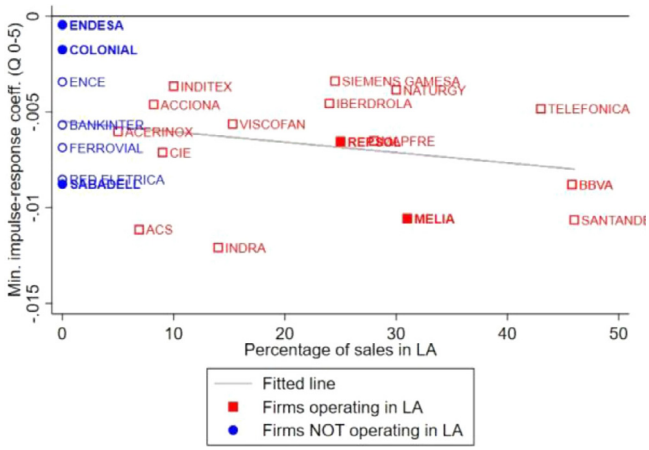


Fig. M.13. Peak response of company quotations to EPU shocks: Colombia. *Notes*: Each point represents the minimum impulse response of one company's quotations to EPU shocks in Colombia. Red squares represent companies with interests in Latin America, and blue circles refer to companies without interests in Latin America. In both cases, filled symbols indicate that at least two coefficients (among the first five coefficients) are significant at least at a 10% confidence level. When the minimum response is significant according to this criterion, the label is bold.

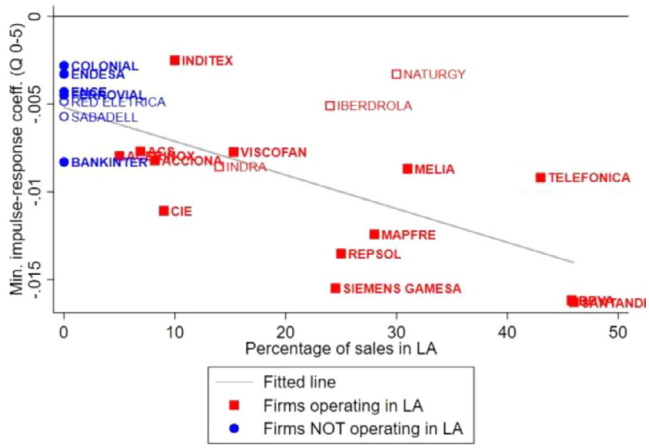


Fig. M.14. Peak response of company quotations to LA EPU shocks: Mexico. *Notes*: Each point represents the minimum impulse response of one company's quotations to EPU shocks in Mexico. Red squares represent companies with interests in Latin America, and blue circles refer to companies without interests in Latin America. In both cases, filled symbols indicate that at least two coefficients (among the first five coefficients) are significant at least at a 10% confidence level. When the minimum response is significant according to this criterion, the company label is bold.

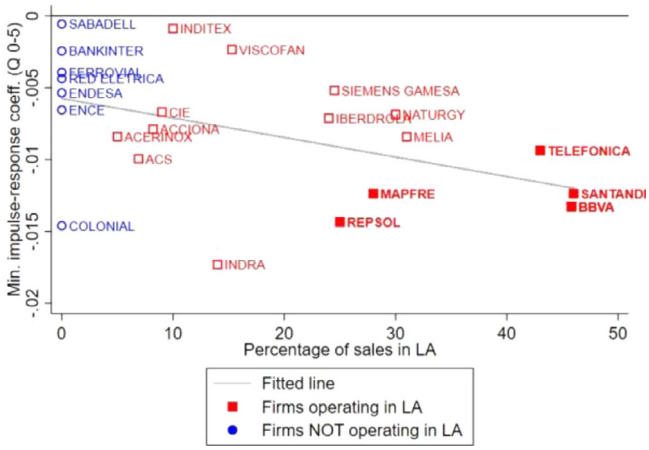


Fig. M.15. Peak response of company quotations to LA EPU shocks: Peru. *Notes*: Each point represents the minimum impulse response of one company's quotations to EPU shocks in Peru. Red squares represent companies with interests in Latin America, and blue circles represent companies without interests in Latin America. In both cases, filled symbols indicate that at least two coefficients (among the first five coefficients) are significant at least at a 10% confidence level. When the minimum response is significant according to this criterion, the label is bold.

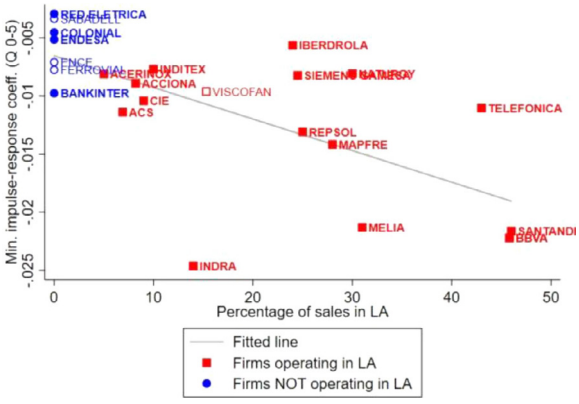


Fig. M.16. Peak response of company quotations to LA EPU shocks: Venezuela. *Notes*: Each point represents the minimum impulse response of one company's quotations to EPU shocks in Venezuela. Red squares represent companies with interests in Latin America, and blue circles represent companies without interests in Latin America. In both cases, filled symbols indicate that at least two coefficients (among the first five coefficients) are significant at least at a 10% confidence level. When the minimum response is significant according to this criterion, the company label is bold.

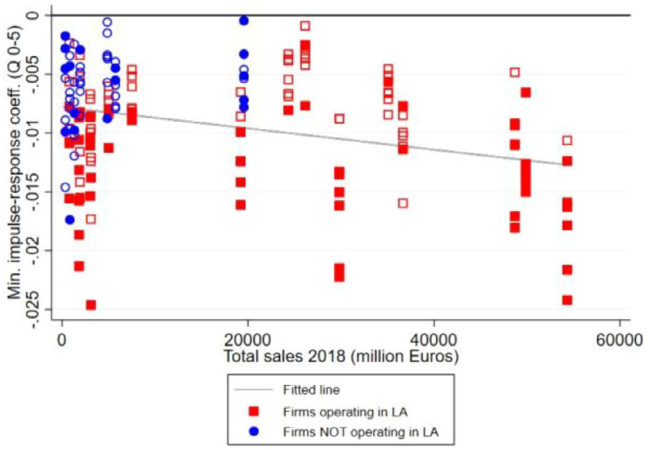


Fig. M.17. Peak response of company quotations to EPU shocks. *Notes*: Each point represents the minimum impulse response of one company's quotations to the EPU shocks of all countries together. Red squares represent companies with interests in Latin America, and blue circles represent companies without interests in Latin America. In both cases, filled symbols indicate that at least two coefficients (among the first five coefficients) are significant at least at a 10% confidence level. On the x-axis, companies are ordered by total sales.

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