

ECONOMIC POLICY UNCERTAINTY  
IN LATIN AMERICA: MEASUREMENT  
USING SPANISH NEWSPAPERS  
AND ECONOMIC SPILLOVERS

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# ECONOMIC POLICY UNCERTAINTY IN LATIN AMERICA: MEASUREMENT USING SPANISH NEWSPAPERS AND ECONOMIC SPILLOVERS (\*)

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BANCO DE ESPAÑA

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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 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 autoregression 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 dampen significantly the commercial relationship between Spain and LA countries. Spanish firms decrease their exports and foreign direct investments towards LA countries that experience negative shocks in EPU.

**Keywords:** economic policy uncertainty, uncertainty shocks, Latin America's economies.

**JEL classification:** D8, C43, E2, E3.

## Resumen

En este documento se construyen índices de incertidumbre sobre las políticas económicas para los principales países de América Latina (Argentina, Brasil, Chile, Colombia, México, Perú y Venezuela) a partir de la prensa española. El uso de la prensa española permite elaborar medidas de incertidumbre comparables entre los países, así como el cálculo de una medida de incertidumbre agregada para América Latina. Se estudian los impactos macroeconómicos de cambios inesperados en la incertidumbre en América Latina sobre: i) la economía española, y ii) las economías de los países de América Latina, según el supuesto de que la prensa española es una fuente adecuada para medir la evolución de la incertidumbre en estos países. Con respecto al primer objetivo, se presentan dos ejercicios. Primero, se estiman modelos vectoriales autorregresivos (VAR) con frecuencia mensual para calcular el impacto sobre la rentabilidad en la bolsa de las empresas españolas con una exposición económica más importante a la región, ante *shocks* inesperados en la incertidumbre en América Latina. Segundo, se estudian los efectos contagio de aumentos de la incertidumbre en América Latina sobre la economía española, desde una perspectiva macroeconómica (incertidumbre, PIB, exportaciones e inversión extranjera directa de España hacia América Latina) en un marco VAR. Los resultados muestran la existencia de un efecto contagio de la incertidumbre en América Latina sobre la incertidumbre en la economía española. Además, los *shocks* analizados afectan de manera significativa a las relaciones económicas entre España y los países de América Latina. Las empresas españolas disminuyen sus exportaciones y su inversión extranjera directa hacia los países de América Latina donde se producen *shocks* negativos en la incertidumbre acerca de las políticas económicas.

**Palabras clave:** incertidumbre acerca de las políticas económicas, *shocks* de incertidumbre, economías de América Latina.

**Códigos JEL:** D8, C43, E2, E3.

# 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 IMF program, and the more long-standing 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. The reaction of many governments to social tensions has taken the form of announcements about 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 episodes of social outbreak 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 global Covid-19-related global shock to uncertainty). By documenting spillover effects of rising uncertainty across countries, the literature also demonstrates that heightened economic 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 a stronger effect the stronger the economic ties among countries and regions.

In this context, the objective of this project is twofold: first, to measure economic policy uncertainty 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 shows that the LA region and Spain are tied by strong economic relationships: not only is Spain relevant for LA countries, but the other way around is also true.<sup>1</sup> According to 2018 data, Latin America is the destination market of about 4% of Spanish exports, whereas it represents only about 2% of the exports from the Euro area. Similarly,

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<sup>1</sup>In the table, the LA region is defined as the region comprising the 7 LA countries considered in this study: Argentina, Brazil, Chile, Colombia, Mexico, Peru, Venezuela.

5% and 2.8% of Spanish imports of goods and services come from LA countries, respectively. Moreover, Latin America is the most important destination for Spanish FDI assets, while among all FDI invested in Spain from abroad, those belonging to LA investors are ranked 7th. Finally, 40% of the total debt of LA residents issued by foreign banks belongs to Spanish banks. Considering the entire Euro area, this share increases only to 50%, which means that the bulk of LA residents debt to foreign banks is in Spain. These are notable figures, especially considering that Spain represents a relatively small market (it is ranked 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 lag. Since the seminal paper by Baker et al. (2016) that proposed the Economic Policy Uncertainty (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.<sup>2</sup> In the spirit of Baker et al. (2016), we construct EPU indexes for the main Latin American countries: Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela. The indexes are built following the approach of Ghirelli et al. (2019) for the computation of such an index for Spain. The uncertainty indicators are based on the Spanish press. 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 the region more generally, given the existing close cultural ties. In this respect, one may claim that 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 (see, for example, Ahir et al. (2019), or Mueller and Rauh (2018)).

Armed with these indicators, we study the macroeconomic effects of LA EPU shocks on: (i) the Spanish economy, given the focus on the Spanish press; (ii) the analyzed American

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<sup>2</sup>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.

economies, given our claim that the Spanish press might represent a good proxy of national developments in uncertainty. As regards the first block, we carry out two exercises. First, we consider the stock market quotations of the most important Spanish companies that are also highly exposed to Latin America; to do so, we estimate monthly vector autoregression (VAR) models 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 of LA EPU shocks on Spanish macroeconomic aggregates (EPU, GDP, exports, and FDI to LA countries), also in a VAR framework. All exercises cover the period of 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 G we show the second exercise based on Spanish macroeconomic variables, and in Section H we carry out some robustness analyses. In turn, Section 4 displays the macroeconomic effects of EPU shocks on Latin American countries. Finally, in Section 5, we sum up our findings.

## 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 7 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. We

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

	% Total <sup>a</sup>				Rank			
	USA	China	Euro area	Spain	USA(2)	China(1)	Euro area(3)	Spain(15) <sup>b</sup>
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.

<sup>a</sup> *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).

<sup>b</sup> The number in parentheses reports the position of each country/region in the worldwide ranking of GDP, adjusted by purchasing power parity.

consider the printed press and discard articles published online.<sup>3</sup> All searches are carried out using the Dow Jones Factiva service. For each newspaper, we conduct our search from the first date at which the newspaper appears in the Dow Jones Factiva database, starting from January 1997.

Every search is customized for each country. Our search counts the number of articles containing at least one keyword related to each of the following categories:

- Country: *Argentina, Brazil, Chile, Colombia, Mexico, Peru, or Venezuela.*
- Uncertainty: *incierto\* or incertidumbre\* or inestable\* or inestabilidad/inestabilidades or riesgo/riesgos;*
- Economy: *economic\* or economía;*
- Policy: the name of the central bank of the country<sup>4</sup> or the name of the government's workplace in the country<sup>5</sup> or *Parlamento or gobierno or Reserva Federal or Hacienda or arancel/aranceles or tributacion/tributaciones or déficit or déficits or presupuest\* or gasto público/gastos públicos or deuda pública/deudas públicas or política fiscal/políticas fiscales or política monetaria/políticas monetarias or (el or de or del or un or por or este or ese or aquel) w/1 impuesto or impuestos<sup>6</sup> or legislación/legislaciones or reforma/reformas or norma/normas or normativ\* or regulación/ regulaciones or reglamento/reglamentos or ley/leyes.*

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 Latin American 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

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<sup>3</sup>The printed newspapers ensure meeting standards in terms of quality and relevance of the stories since the editor selects the articles to be published in the printed version of the newspaper, given space limitations.

<sup>4</sup>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.

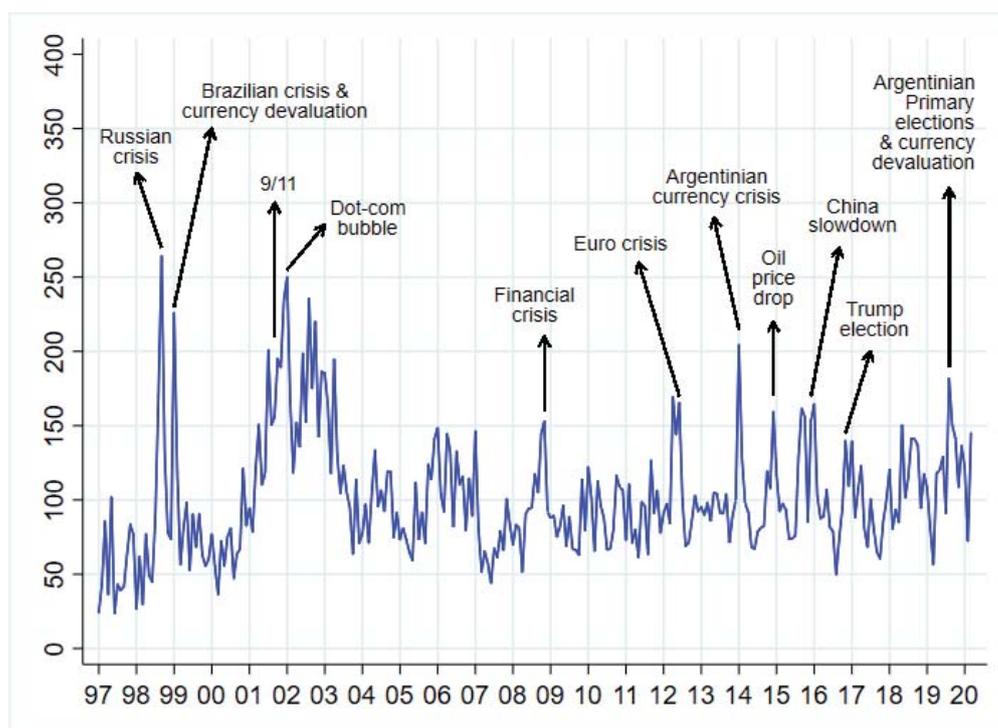
<sup>5</sup>Argentina: Casa Rosada; Brazil: Palácio do Planalto; Chile: Palacio de La Moneda; Colombia: Casa de Nariño; Mexico: Residencia Oficial de Los Pinos; Peru: Palacio de Gobierno, Casa de Gobierno, or Casa de Pizarro; Venezuela: Palacio de Miraflores.

<sup>6</sup>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*.

entire LA region.<sup>7</sup> This index is shown in Figure 1. The country-specific EPU indexes are plotted in Section C of the Appendix.

For some Latin American countries, other text-based EPU indexes are already available online on the Economic Policy Uncertainty Index website (<https://www.policyuncertainty.com/>), namely, Brazil, Chile, Colombia, Mexico). Hereafter, these indexes are called *website EPU*s. They are also constructed based on the procedure of Baker et al. (2016) and are based on each country’s national press. Section D and E in the Appendix describe the construction of each website EPU index and provide a detailed comparison between the latter and our EPU indexes. The main difference with respect to our EPU measures is that they are based on LA newspapers, while our indexes rely on the Spanish press. One advantage of our methodology is that while the website EPU 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 EPU (i) expand the newspaper coverage, as

Figure 1: Aggregated EPU index for the LA region



*Notes:* 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, 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.

<sup>7</sup>The LA region is defined by the countries considered in the analysis: Argentina, Brazil, Chile, Colombia, Mexico, Peru, Venezuela.

a robustness measure; (ii) fine-tune the richness of keywords and expressions used in each case; and (iii) beyond the vagaries explained in Ghirelli et al. (2019), we do not use words related to conflict, like “war” and “terror attacks”, given our focus on ascertaining economic policy uncertainty.

## 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 to Latin American countries, controlling for the Spanish macroeconomic cycle. We select the following companies that are listed in the IBEX-35 index at least since 2001, distinguishing whether they have economic interests in LA or not.<sup>8</sup> 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.<sup>9</sup> Section B of the Appendix provides some figures to give a flavor of the economic interests of these companies in the LA region. 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.<sup>10</sup> We define the status of economic interest based on the shares of sales in 2018 in the LA region.<sup>11</sup>

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:  $X_t = \Pi(L)X_t + \epsilon_t$ , where  $X_t$  is a set of endogenous variables,  $\Pi$  is a matrix of VAR

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<sup>8</sup>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 robust enough from the statistical point of view. At most, we can consider the period from 1997, since our EPU indexes are available since then. We choose 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).

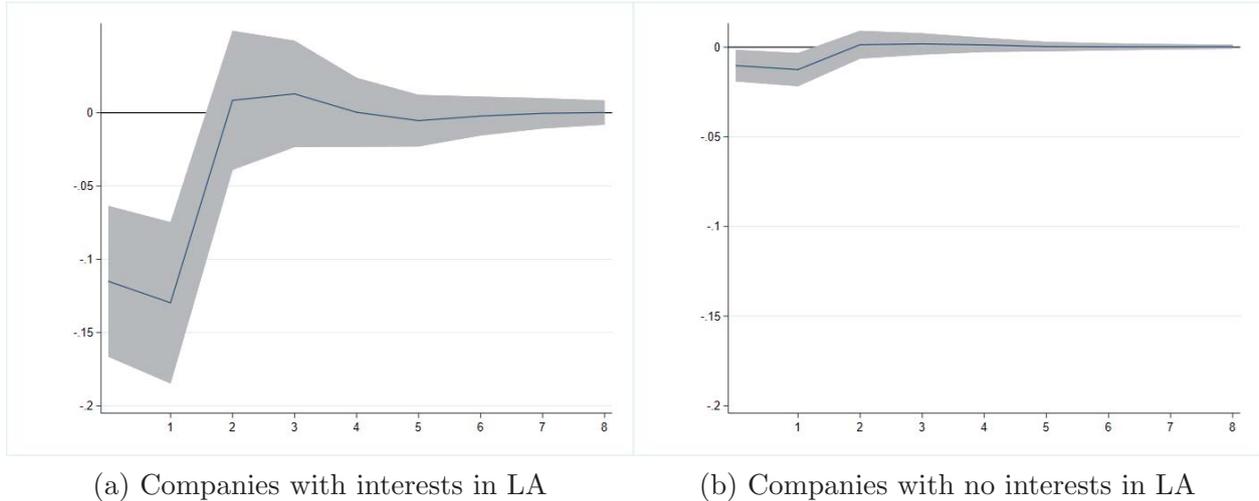
<sup>9</sup>Banco de Santander, BBVA, Banco Sabadell: commercial banks; Repsol, Iberdrola, Naturgy, Siemens Gamesa: energy; Telefonica: communication; Mapfre: insurance; Acciona, ACS: construction; Inditex: clothing; Melia Hotels: tourism; Viscofan: meat casing; Indra Sistemas: IT services; Cie automotive: automotive; Acerinox: steel.

<sup>10</sup>Endesa, Red Electrica: electric energy; Ence: renewable energy; Bankinter, Banco Sabadell: commercial banks; Colonial: real estate.

<sup>11</sup>Source: Spanish Securities and Exchange Commission (Comisión Nacional Mercado de Valores) and the Ministry of Industry, Trade and Tourism.

coefficients capturing the dynamics of the system, and  $\epsilon_t : N(0, \Omega)$  is the vector of reduced-form residuals having zero mean and variance–covariance matrix  $\Omega$ . 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 GDP quarterly growth rates),<sup>12</sup> the inflation rate (monthly growth rates of consumer price index), the Euro Stoxx 50 indicator (monthly

Figure 2: Impulse responses of company quotations to shocks in LA EPU



Notes: Confidence intervals at the 5% level reported.

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.<sup>13</sup> The VAR model is estimated by OLS, 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  $\Omega$ . Next, we calculate the impulse responses of the companies' quotations to an unexpected shock in the 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

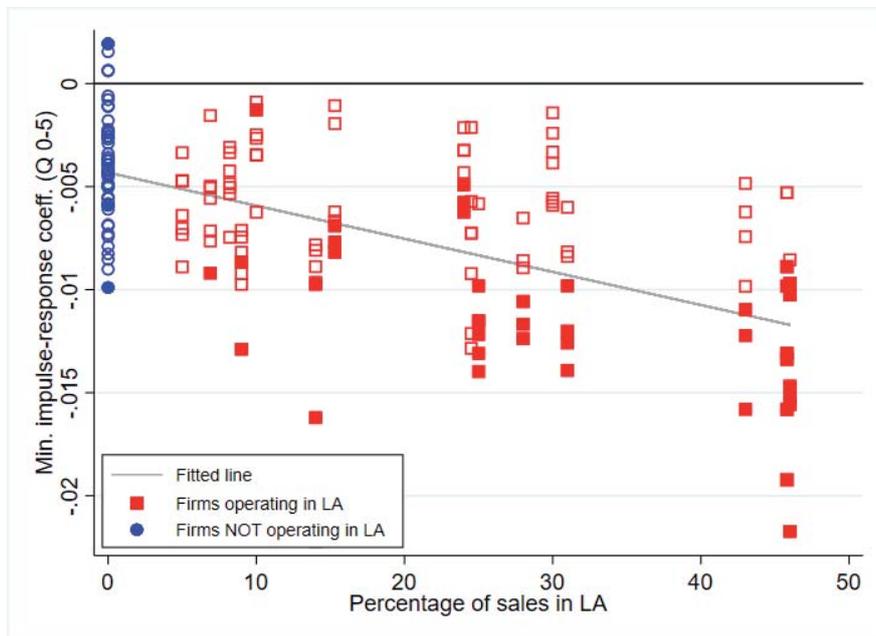
<sup>12</sup>The monthly estimates of GDP quarterly growth rates come from the estimation of a mixed-frequency dynamic factor model, as in Mariano and Murasawa (2003), for the Spanish economy (see Camacho and Perez Quiros, 2011). In this approach, all of the series included in the model are assumed to 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.

<sup>13</sup>We use the market capitalization weighting scheme used in the IBEX35 index at the 20th of March 2020.

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 Figure 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 a negligible response.

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 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 GDP quarterly growth rates),<sup>14</sup> the inflation rate (monthly growth rates of consumer price index), the IBEX-35 indicator (monthly growth rate), and the quotation of one specific company (monthly growth rates).

Figure 3: Peak response of company quotations to EPU shocks



Notes: Each point represents the minimum impulse response coefficient (from the contemporaneous coefficient to the coefficient of the fifth quarter included) of one company’s quotations to 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 at the 10% confidence level.

<sup>14</sup>See footnote 12.

Next, for each pair of company and Latin American country, we calculate the impulse responses of the company's quotations to an unexpected shock in the EPU index of the country. We summarize all of these findings in Figure 3, in which we 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 least at the 10% confidence level. In this figure, we pool together the results of all countries.<sup>15</sup> The graph illustrates clearly that the peak response to a negative uncertainty shock in Latin America of companies that have important interests in Latin America is negative and significant (according to the aforementioned criterion), while the 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.<sup>16</sup>

## 3.2 Macro analysis

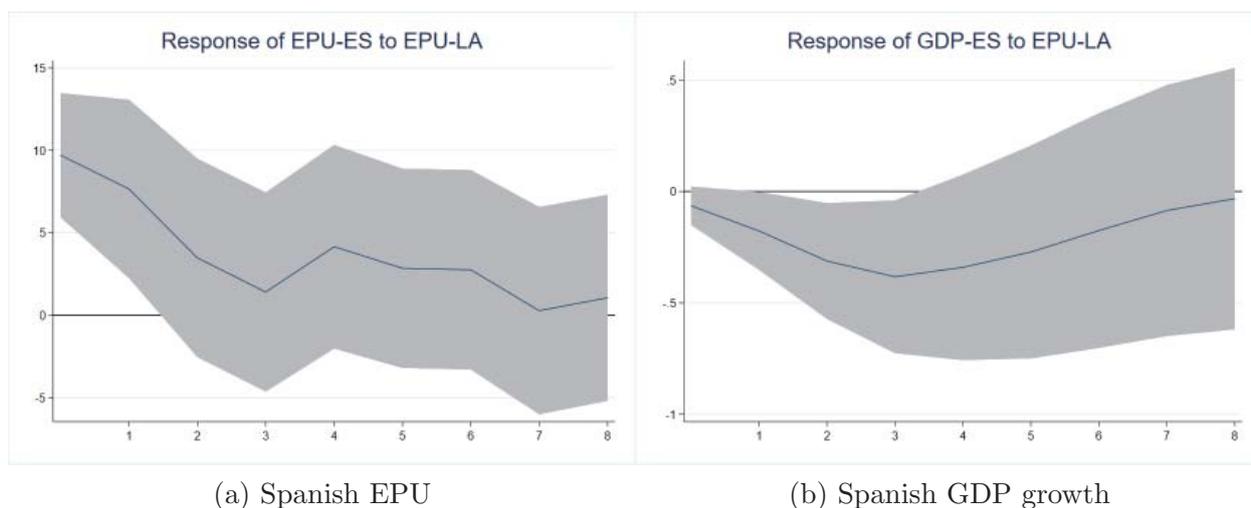
In this section we study the spillover effects of LA uncertainty on the Spanish economy from a macro perspective. We concentrate on the impact of the aggregated EPU that represents the economic uncertainty in the 7 considered countries taken together.

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 do that, we estimate the following quarterly VAR model:  $X_t = \Pi(L)X_t + \epsilon_t$ , 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

<sup>15</sup>Figures L.2–L.8 in Section L of the Appendix report the same type of graph for each country separately (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).

<sup>16</sup>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 EPU index in an LA country generates a significant drop in the first two months of companies' quotation growth rates. Qualitatively, this holds for all countries, although results are less significant in some cases, such as all companies in Peru or Naturgy in almost all countries.

Figure 4: Impulse responses of Spanish EPU and GDP growth to shocks in LA EPU



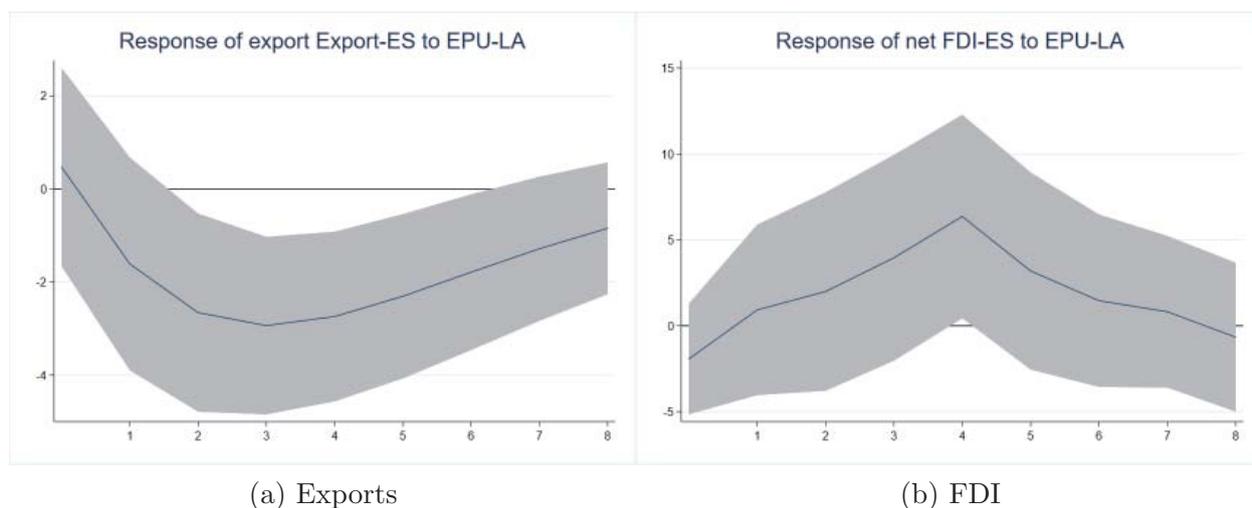
Notes: Confidence intervals at the 5% level reported.

the German Bund (quarterly averages of monthly data), the Spanish real GDP (quarterly annual growth rates), the inflation rate (quarterly annual growth rates of CPI), and the bilateral exchange rate between the LA region and Spain (weighted measure of country-specific bilateral exchange rates of each of the 7 countries with Spain)<sup>17</sup>.  $\Pi$  is a matrix of VAR coefficients capturing the dynamics of the system, and  $\epsilon_t : N(0, \Omega)$  is the vector of reduced-form residuals having zero mean and variance-covariance matrix  $\Omega$ . 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 5 lags whenever the optimal number of lags is above 5. We decompose the variance-covariance matrix  $\Omega$  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 Figures 4. The Spanish EPU increases by around 7 units in the first two months, while the impact on the Spanish GDP is negative and slightly significant.

From a theoretical point of view, the impact of foreign uncertainty on the Spanish GDP should occur through a reduction of exports since the production of local Spanish firms is independent of changes in the uncertainty of foreign countries. Namely, 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 exported goods

<sup>17</sup>As weights we use each country's share of trade (import and export) with Spain (out of the 7 LA countries considered). We do not use the bilateral exchange rate between Venezuela and Spain since since the series is not credible.

Figure 5: Impulse responses of Spanish EPU and GDP growth to shocks in LA EPU



Notes: Confidence intervals at the 5% level reported.

towards the foreign region (in real terms). In addition, foreign uncertainty may also affect Spanish FDI to the foreign region if Spanish firms aim to invest abroad in stable countries and hence reduce or change the 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 the endogenous variables are included in the following order: the aggregated EPU index of the LA region, a measure of 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 accounting for changes in exchange rates),<sup>18</sup> the foreign region GDP (weighted measure of quarterly annual growth rates of the 7 LA countries),<sup>19</sup> Spanish real exports to the foreign region (weighted measure of quarterly annual growth rates of the 7 LA countries),<sup>20</sup> and the bilateral exchange rate between the LA region and Spain (weighted measure of quarterly bilateral exchange rates of the 7 LA countries with Spain).<sup>21</sup> Since exports are driven by foreign country demand, we do not control for any Spanish macroeconomic variable apart from the competitiveness measure.

<sup>18</sup>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 G since this measure is available for Argentina, Mexico and Brazil from 1997 onwards.

<sup>19</sup>See footnote 17.

<sup>20</sup>Real exports of each country are obtained by deflating nominal exports with the price unit value index of Spanish exported goods.

<sup>21</sup>See footnote 17.

The FDI VAR model instead include the following variables (in order): the aggregated EPU of the LA region, the foreign region's GDP (weighted measure of quarterly annual growth rates of the 7 LA countries), the GDP of Spain (quarterly annual growth rates), Spanish net FDI to the foreign region (weighted measure of quarterly annual growth rates of stock values of the 7 LA countries), and the bilateral exchange rate between the LA region and Spain (weighted measure of quarterly bilateral exchange rates of the 7 LA countries with Spain).<sup>22</sup>

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 5 for efficiency reasons). Figure 5 report the impulse responses of Spanish exports (left) and FDI (right) to LA region's EPU shocks, respectively. LA EPU shocks reduce Spanish exports significantly in the entire region (by about 3 pp, and the effect vanishes after 5 quarters). By 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 different sign, if Spanish investors 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.<sup>23</sup> Due to a matter of space we relegate this analysis to Section G in the Appendix and here comment 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. By contrast, FDI drops in response to foreign EPU shocks in Mexico by about 10 pp and Brazil by about 5 pp. In both cases, the impact remains significant for at least 6 quarters. By contrast, Spanish FDI in Argentina do not display a statistically significant response. Indeed, the country-specific analysis is in line with results on the region as a whole and confirms that some country-specific FDI effects may cancel out.

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

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<sup>22</sup>As weights we use each country's share of trade (import and export) with Spain (out of the 7 LA countries considered). We do not use the bilateral exchange rate between Venezuela and Spain since since the series is not credible.

<sup>23</sup>For Venezuela, we do not include the bilateral exchange rate since the series is not credible.

Second, note that in this section 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 both the genuine impact of LA uncertainty and of the LA economic situation on the Spanish economy. To tackle this issue, in Section H of the Appendix we replicate the analysis implementing local linear projection methods by means of a two-step procedure (Jordá, 2005). 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 of the existence of spillovers of uncertainty in Latin American countries to 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 J 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 the economic agents take 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 F 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. As for the Spanish EPU, LA EPU explains about 30% of the forecast error variance. As for the Spanish GDP, Spanish exports and Spanish FDI, LA EPU explains up to slightly less than 20% of the forecast error variance. According to these results, LA EPU shocks are obviously not the most relevant shocks for the Spanish economy. However, they are not negligible either.

## **4 The impact of LA EPU shocks on LA countries**

This section provides a macro analysis of the effect of EPU shocks on LA countries' economic activity using our EPU indexes. The aim of the exercise is to show that our EPU indexes

based on the Spanish press are good proxies of economic uncertainty in Latin American countries. Our stance is based on the importance of the economic and cultural relationship between Latin American 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 Latin American population residing in Spain.<sup>24</sup>

## 4.1 Validation of the EPU indexes

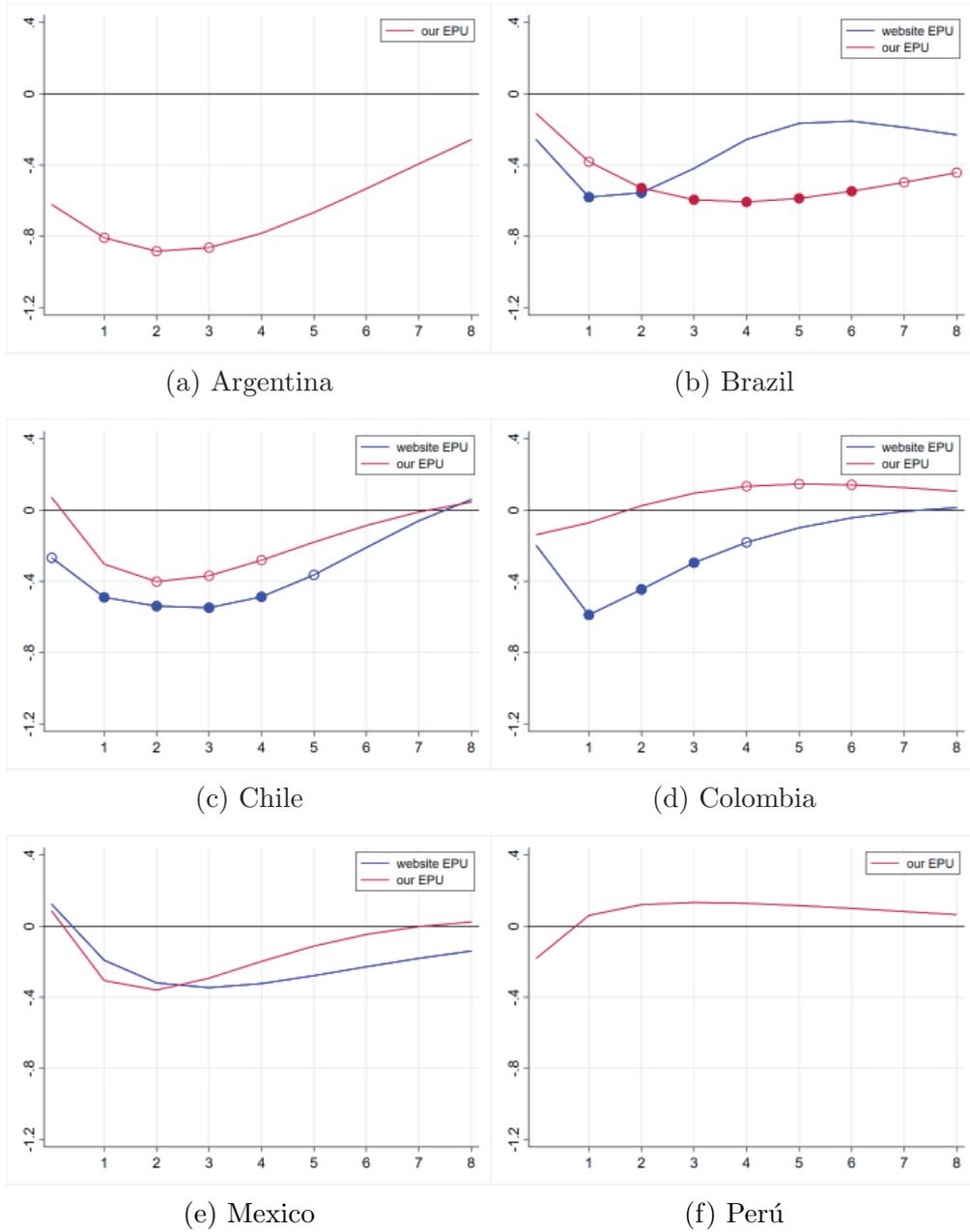
We set up parsimonious VAR models to describe the economy of each Latin American country and compute the impulse responses of the GDP growth rate to an unexpected shock in the national EPU index. This methodology is established in the literature as an empirical test to assess the quality of uncertainty indicators (e.g., Baker et al., 2016). The underlying hypothesis is that economic uncertainty affects the real economy, which has been largely suggested by the literature (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 Latin American country, we estimate a VAR model based on the following variables: the 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 impulse responses of the national GDP growth rate to the national EPU index. The identification of the structural shocks in each VAR is obtained by means of Cholesky decomposition.

Figure 6 reports the main results of our empirical exercises (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 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, and this effect persists until quarter 8 (significant at the 5% level until quarter 6 and significant at the 10% level afterward). In Chile, the GDP growth rate drops by 0.4 pp for 3 quarters (significant at the 5% level) and then comes back to zero. Results for Mexico are qualitatively similar but not statistically significant at the conventional level. The response of GDP to uncertainty shocks is null for

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<sup>24</sup>In 2019, 25% of foreign residents in Spain came from Latin America according to the National Statistical Institute of Spain.

Figure 6: Impulse responses of Latin American GDP to Latin American EPU shocks. Our EPU indexes



*Notes:* 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/>.

Perú 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 Latin American GDP to shocks in our 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 EPU measures differ in three dimensions: (i) the press coverage; (ii) the time coverage; (iii) the keywords in the search expressions. As for (i), the website EPUs are based on the national local press, and are based mostly on one, or at most two local national newspapers. This yields a quite small press coverage compared to our EPU indexes, which rely on 7 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 that is not covered by our EPUs.<sup>25</sup> As for (iii), Table D.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. A part for some peculiarities in each set of words, the main issue is the fact 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 a first exercise, we re-estimate the same VAR models described above, replacing our 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 Figure 6.<sup>26</sup> The responses for Brazil, Chile, and Mexico are quite similar to those obtained with our EPU indexes. Overall, the fact that both our EPU indexes and the website EPUs convey negative and significant impulse responses is reassuring, and suggests that the Spanish national press is a useful and reliable source of information to construct EPU indexes for Latin American countries. The only exception is Colombia, for which the impulse response to the website EPU is negative and significant, while the response to our EPU index is not significant.

As a 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 for this country the two indexes do not share the same language. Results are reported in Figure 7. In all figures, the solid red line represents

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<sup>25</sup>Only for Colombia, we can investigate the importance of the time coverage. We construct our EPU starting from 2000 onwards and estimate the impulse responses considering this time period. Results suggest that in this specific case the time coverage does not really matter. This is expected since the time windows are very similar, and only 3 years apart (from 1997 and from 2000).

<sup>26</sup>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.

the response to positive shocks in our EPU index; the dashed blue line is the response to positive shocks in the website EPU; the other line (dashed green) represents the results from shocking a new index that we construct considering the press coverage of our EPU index (i.e., 7 Spanish newspapers) but using the keywords of the website EPU 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 fact that the green line provides not significant results, as opposed to the blue line, suggests that our set of keywords identifies episodes of economic uncertainty well. Our keywords allows 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, 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 counts also articles that contain *corruption*, *peace*, *conflict*, *subsidy*, which may be related to the negotiations with the FARC group or issues related with internal national conflicts, and that are likely to be negatively associated to the real economy. By contrast, in our index we restrict to keywords related to economic policy uncertainty.<sup>27</sup>

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

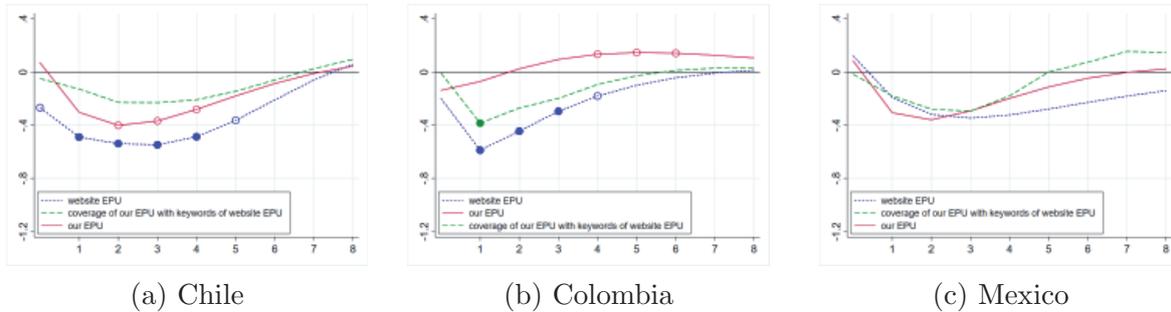
In the last robustness exercise we test the impact of adding specific keywords in the search expression. To do this we construct alternative EPU indexes by adding to our baseline keywords, alternatively, (a) words related to “war” (i.e., *militares*, *paz*, *conflicto/s*, *guerra/s*) or (b) “corruption” (i.e., *corrupcion/es*, *corrupt\**). We do this for all coun-

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<sup>27</sup>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 EPU considers articles from 1997 onwards. To get a sense of the importance of this factor in explaining the differences in the responses, we construct another index that is based on the website EPU’s keywords and our press coverage, but from 2000. The corresponding GDP response qualitatively follows the response of the website EPU, but the responses are not significant at the conventional confidence level (results available upon request). This suggests that, for this case, the time coverage does not matter to explain the differences in responses.

tries except Venezuela. We then compare the impulse responses of national GDP to shocks in our EPU indexes with those obtained by shocking the alternative EPUs (EPU+war or EPU+corruption). Results are shown in Figure E.1 of Section E in the Appendix. They

Figure 7: Relative contribution of the richness of keywords and press coverage in improving the index



Notes: *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 based on the press coverage of our EPU index (7 Spanish newspapers) using the keywords of the website EPU. For Colombia, the orange dash line represents the impulse of GDP growth rate to shocks in a new EPU index using the keywords of the website EPU and based on the press coverage of our EPU index (7 Spanish newspapers), but restricting the time coverage to the period from 2000 onwards, which is the time coverage of the *website EPU*.

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 that are associated with economic policy uncertainty 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 third quarter) 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 provide GDP responses with positive (and statistically significant) effects after quarters 4 and 6, respectively. While one may argue that the delayed positive response may be linked to post-conflict dynamics, we certainly do not claim to have an explanation for this result.

## 5 Conclusions

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

As regards the first objective, our empirical analysis focuses on two aspects. First, we study the impact of LA EPU shocks on the performance of Spanish companies operating in the LA region. We expect that higher uncertainty in one LA country would 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 towards 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 two months. This holds for all LA countries considered in our study. These results are confirmed by tests in which we consider Spanish companies that are listed on the Spanish stock market but whose economic interests in the Latin American region are minor and discontinuous over time. According to the results, economic policy uncertainty in Latin America does not affect these companies’ quotations. This suggests that, as expected, the economic policy uncertainty 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 EPU reflects uncertainty about 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. As for the relation between LA EPU and the Spanish

GDP, we expect it to be driven by the reduction in exports (indirect effect) and by the business decisions of multinational companies that have economic interests in the region. In particular, multinational companies take into account the economic performance of their subsidiaries when deciding upon investment and hiring in Spain. This, in turn, may affect the Spanish GDP. This second exercise is carried out 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 towards the countries that experience negative shocks in the EPU index.

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# 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, inter-bank 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 CPI (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 the stock market prices of some Spanish companies. Among the companies listed in IBEX35, we select 6 that have important economic interests in the LA region and 6 that do not. This section reports some figures to show that the LA region is important 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 6th 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 BBVAs income was attributed to Mexico.
- For Telefonica, 24% of its 2019 profit is attributed to Spain, 28% to Brazil, and 15% to the rest of South America.<sup>28</sup>
- As for 2019 Repsol profits, the highest share, 45%, refers to Europe, Africa, and Brazil, and the second most important region is the rest of South America and Caribbean countries (with 26%).<sup>29</sup>
- For 2019, Mapfre results can be decomposed as follows: 62% belong 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: el 15% of total sales in 2018 refer to Americas.
- Melia Hotels is a world wide hotel company and 4% of rooms are in Brazil.
- Viscofan:in 14.5% of total sales and rendered services in 2018 refer to South America.

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<sup>28</sup>The figures refer to operating income before depreciation and amortization (OIBDA).

<sup>29</sup>The figures refer to earnings before interest, taxes, depreciation, and amortization (EBITDA).

- 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 4 locations in South America: 2 in Brazil, 1 in Chile and 1 in Mexico.
- Acciona: 6% of 2018 revenues refer to Central and South America.

## C Our EPU indexes

This section shows the EPU index for each LA country with its associated timeline of relevant events. In most cases, the peaks of the indexes 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 validity of the index as a proxy of economic uncertainty. Nevertheless, there are few cases (7) 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.<sup>30</sup> Hereafter, we provide an explanation for each of these peaks.

- 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 government of Evo Morales in Bolivia and 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.

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<sup>30</sup>All results and the EPU series displayed in this manuscript refer to the cleaned versions of the EPU indexes.

- 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, November 2006: the index rises to around 200. We do not find an explanation for these spikes in the news. Right 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 economic policy uncertainty of emerging economies.
- 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.

Figure C.1: Argentina

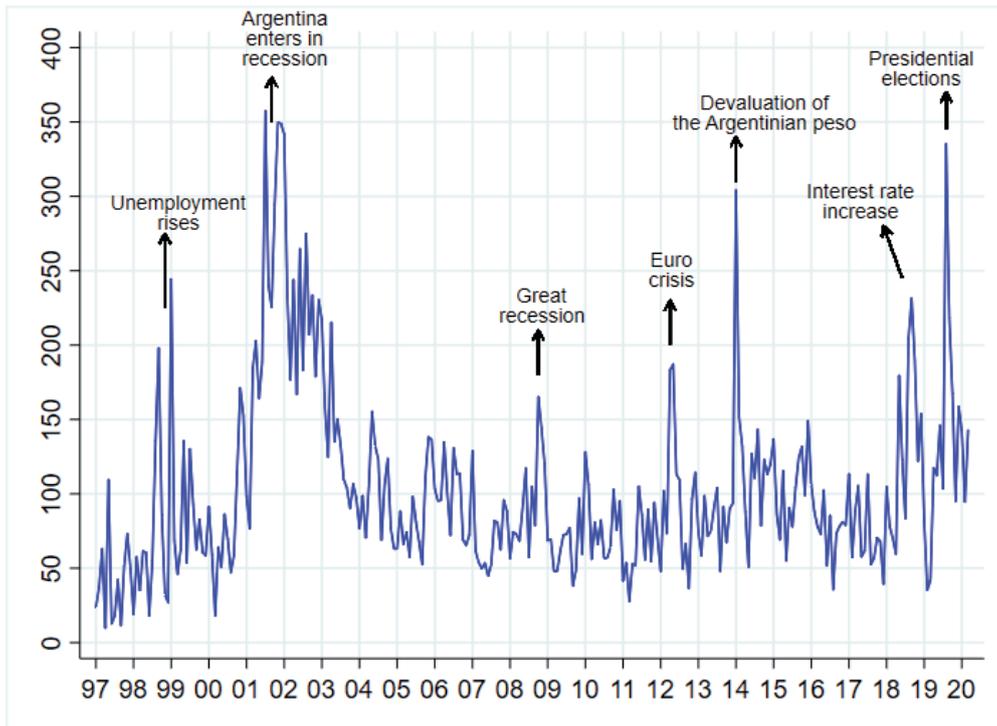


Figure C.2: Brazil

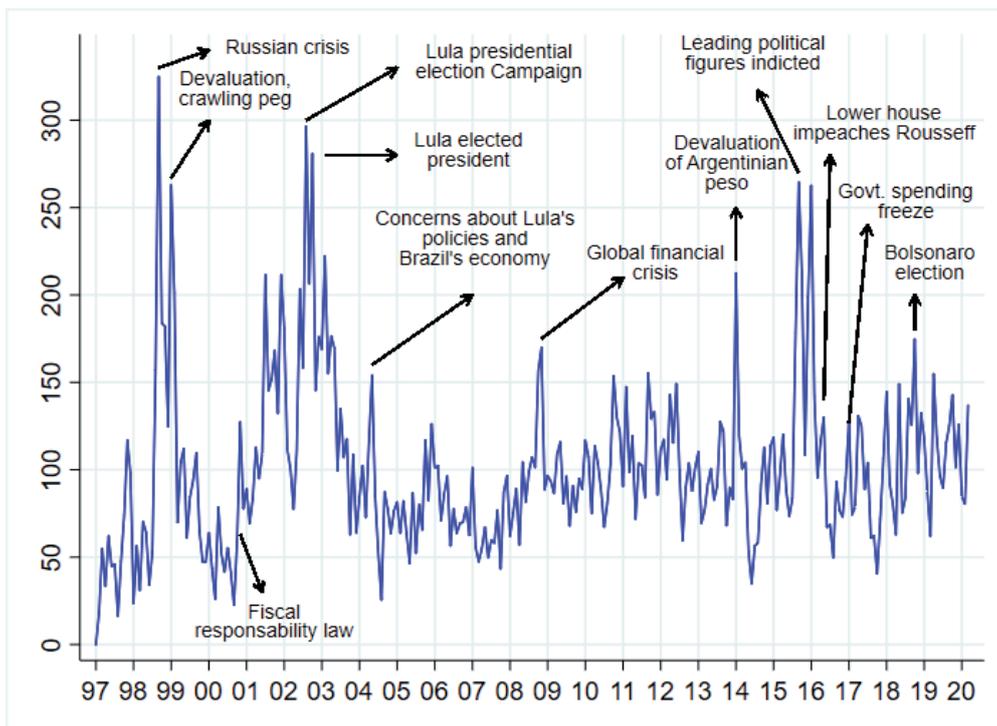


Figure C.3: Chile

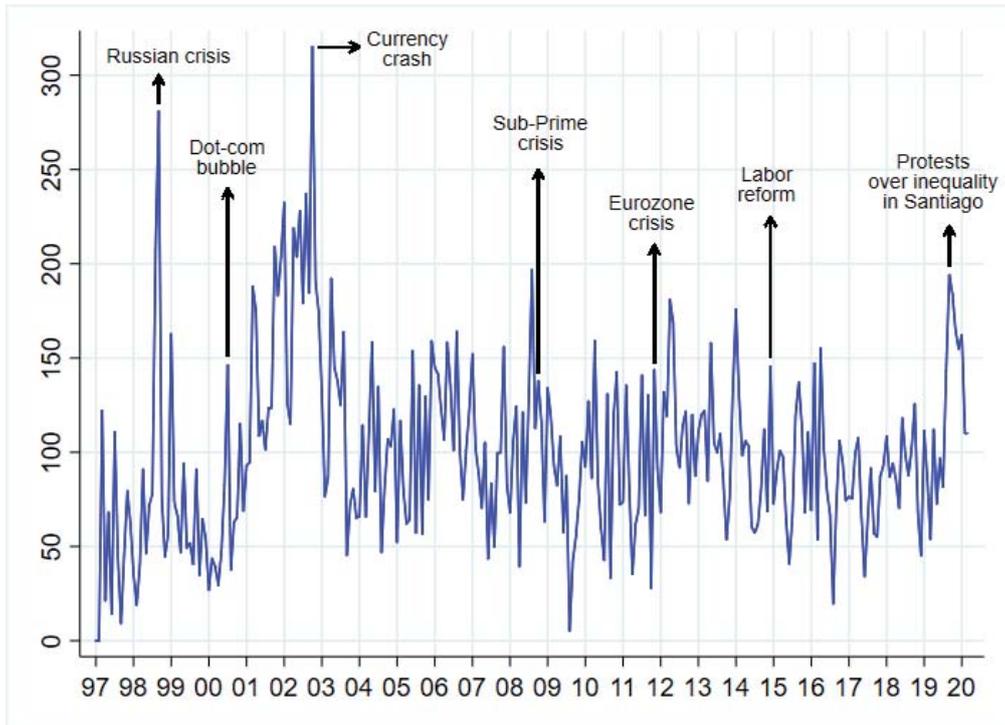


Figure C.4: Colombia

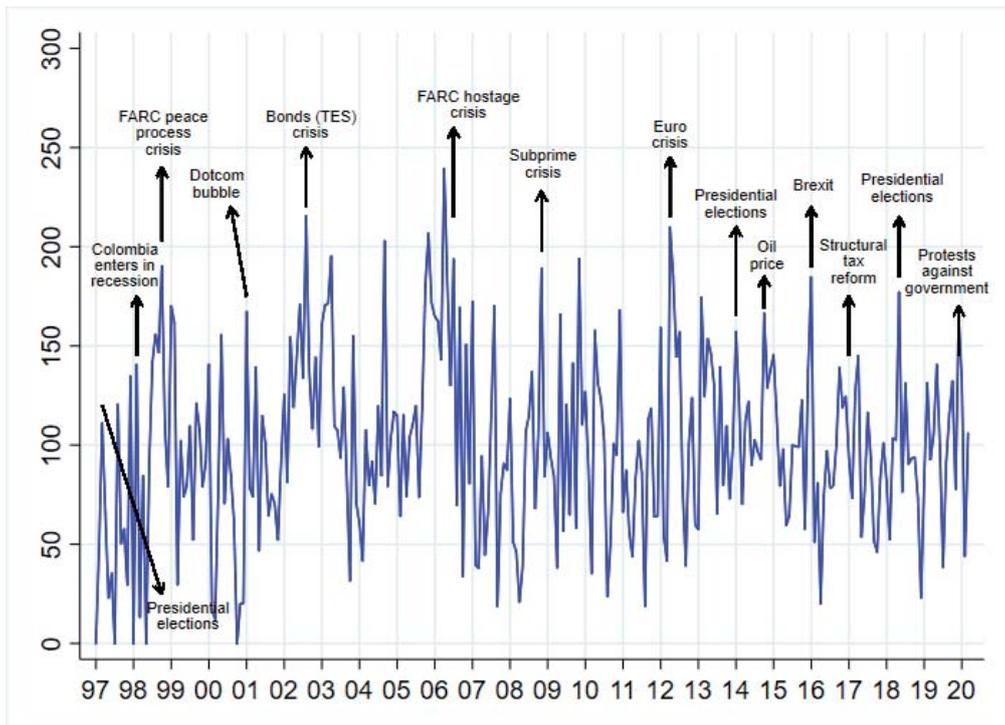


Figure C.5: Mexico

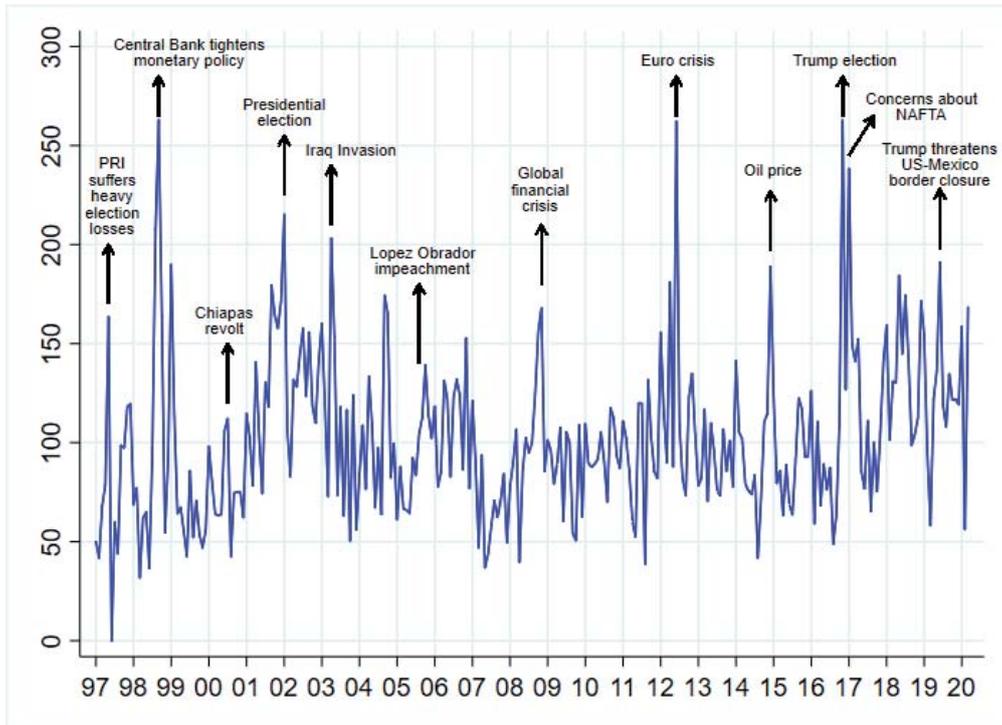


Figure C.6: Peru

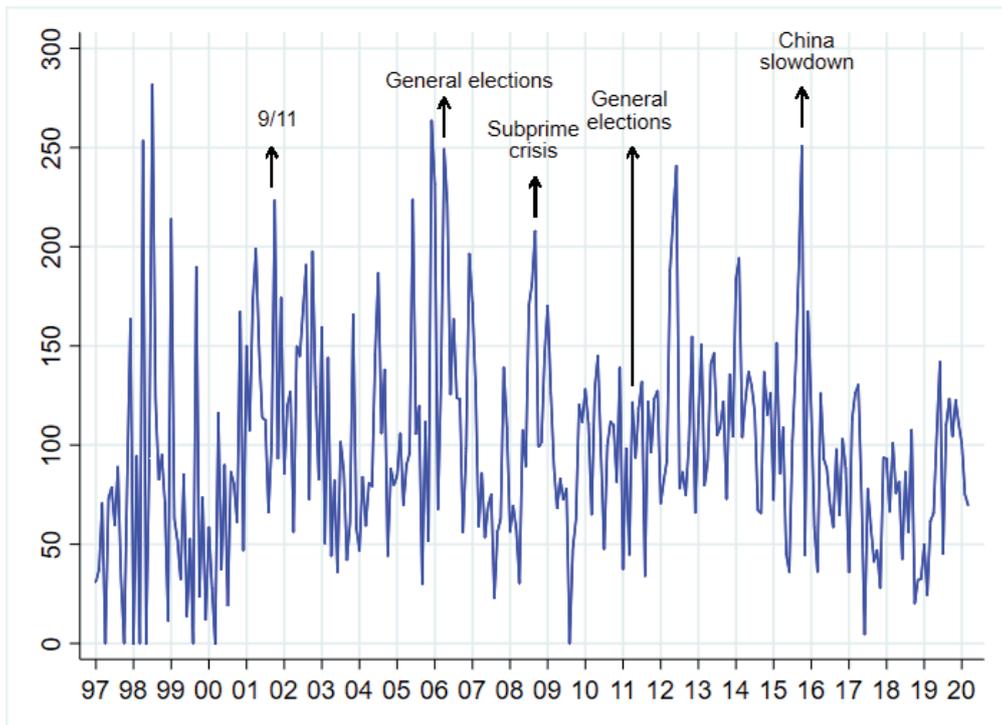
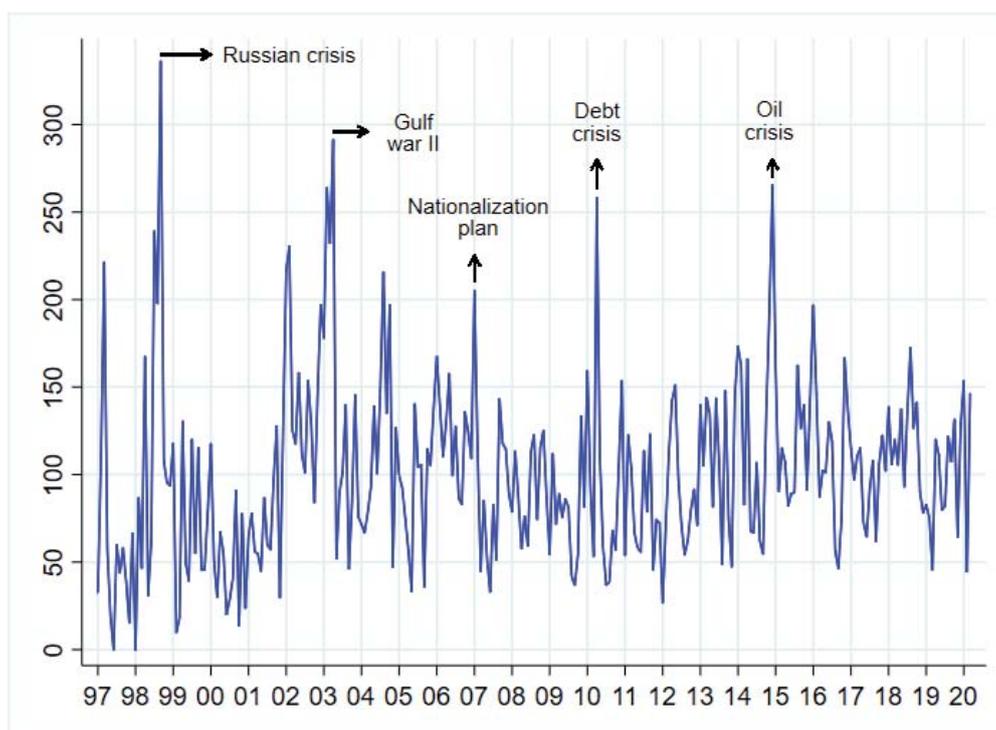


Figure C.7: Venezuela



## D 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 the procedure of Baker et al. (2016) and are based on national newspapers of each country. This section briefly summarizes how each of them is constructed.

### D.1 Brazil

This index was constructed by Baker et al. (2016) and is available at [https://www.policyuncertainty.com/brazil\\_monthly.html](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: *incerto, incerteza*;
- ECONOMY: *econômico, economia*;
- 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 publica/s*), “fiscal policy” (*politica/s fiscal/es*), “monetary policy” (*politica/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 importance of the US 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 psingular 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).

## D.2 Chile

This index is available at [https://www.policyuncertainty.com/chile\\_monthly.html](https://www.policyuncertainty.com/chile_monthly.html) and was constructed by Cerda et al. (2018). 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 that starts with *econ*;
- POLICY: *política/s, impuesto/s, regulación, recaudación, reforma, congreso, senado/s, senador/es, diputado/a, gasto fiscal, gasto público, deuda publica, presupuesto fiscal, Banco Central, Ministerio de Hacienda*;
- CHILE: any word that starts with *Chile*.

The latter requirement ensures that the articles are related to domestic issues. This additional requirement is justified by the fact that 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” (*politica/s fiscal/es*) or “monetary policy” (*politica/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 importance of the US 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*, *economico/a*, *economista/s*, *diputado/a*). The correlation between this index and our EPU index is 0.24.

### D.3 Colombia

Two alternative indexes are available on the Economic Policy Uncertainty website, each constructed by different authors. We consider the EPU index by Gil-León and Silva-Pinzón (2019) because it is updated to the present (see [https://www.policyuncertainty.com/colombia\\_gs.html](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 like “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 Nario*). They do not consider plurals. The correlation between this index and our EPU index is 0.01.

#### D.4 Mexico

This index is available at [https://www.policyuncertainty.com/mexico\\_monthly.html](https://www.policyuncertainty.com/mexico_monthly.html) and was built by Baker et al. (2016). It relies on the newspapers *El Norte* and *Reforma* from January 1996 and *Mural* from January 1999.

- UNCERTAINTY: *incierto, incertidumbre*;
- ECONOMY: *económica, economía*;
- POLICY: *regulación, regulaciones, deficit, deficits, 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, military, 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” (*camara 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 make sure that we include only the latter. In addition, they include terms that are more related to social order than economic policy: *military, 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 EPU index is 0.22.

Table D.1: Add caption

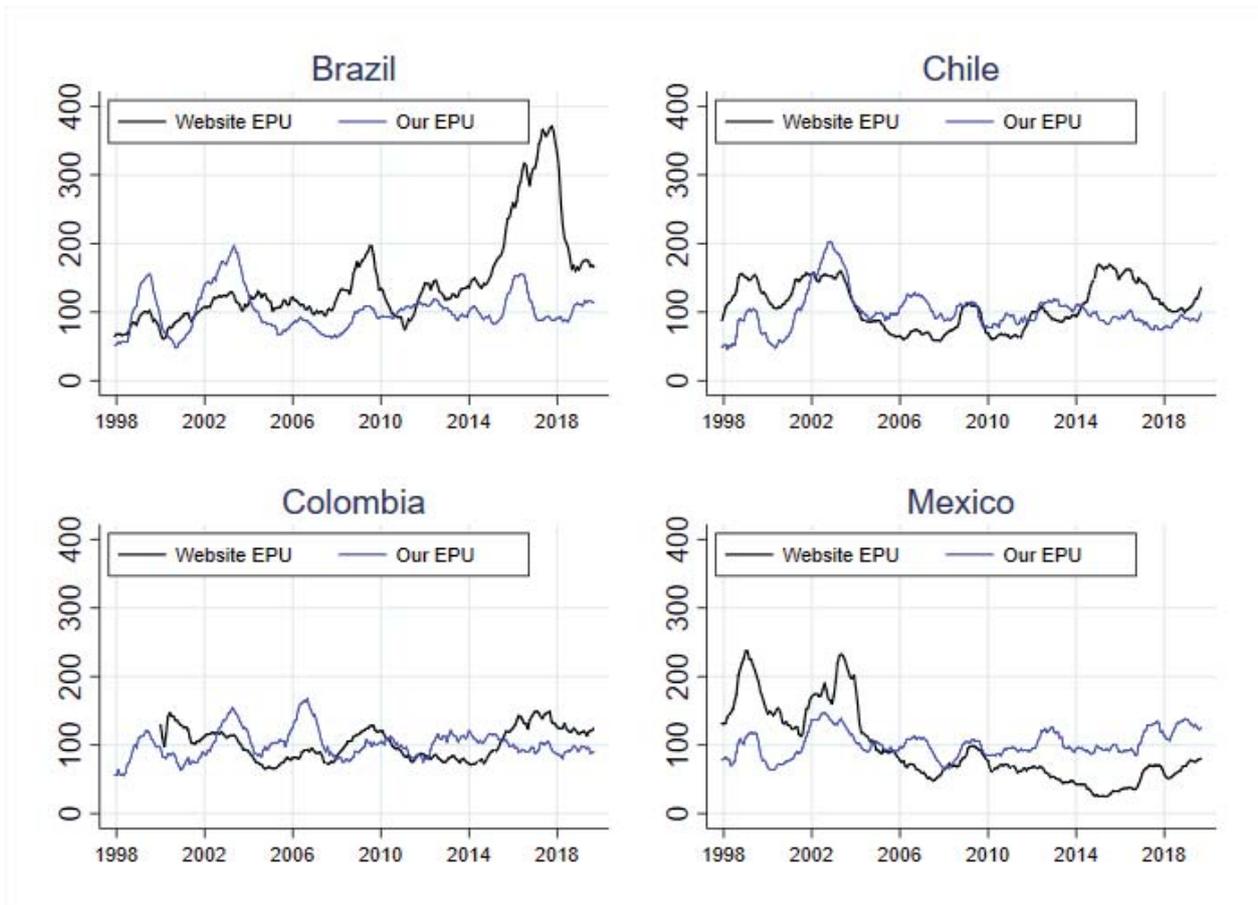
	BRAZIL		CHILE		COLOMBIA		MEXICO	
	common kw <sup>(a)</sup>	different kw <sup>(b)</sup>	common kw	different kw	common kw	different kw	common kw	different kw
U	uncertainty, uncertain	instability, risk	uncertainty, uncertain	instability, risk	uncertainty, uncertain	instability, risk	uncertainty, uncertain	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, 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 <sup>(c)</sup> , tax expenditure, monetary policy, fiscal policy, deficit	deficit, public debt, public expenditure	budget, monetary policy, fiscal policy, policy <sup>(c)</sup>	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: <sup>a</sup>: Common keywords between our EPU index and the website EPUs. <sup>b</sup>: Different keywords: red depicts the keywords that are used in the website EPUs but not in our EPU, while blue indicates the keywords that we consider in our EPU but that are not used in the website EPUs. <sup>c</sup>: In the website EPUs, any type of policy is included in the search expression; by contrast, we only search for *monetary policy* and *fiscal policy*.

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

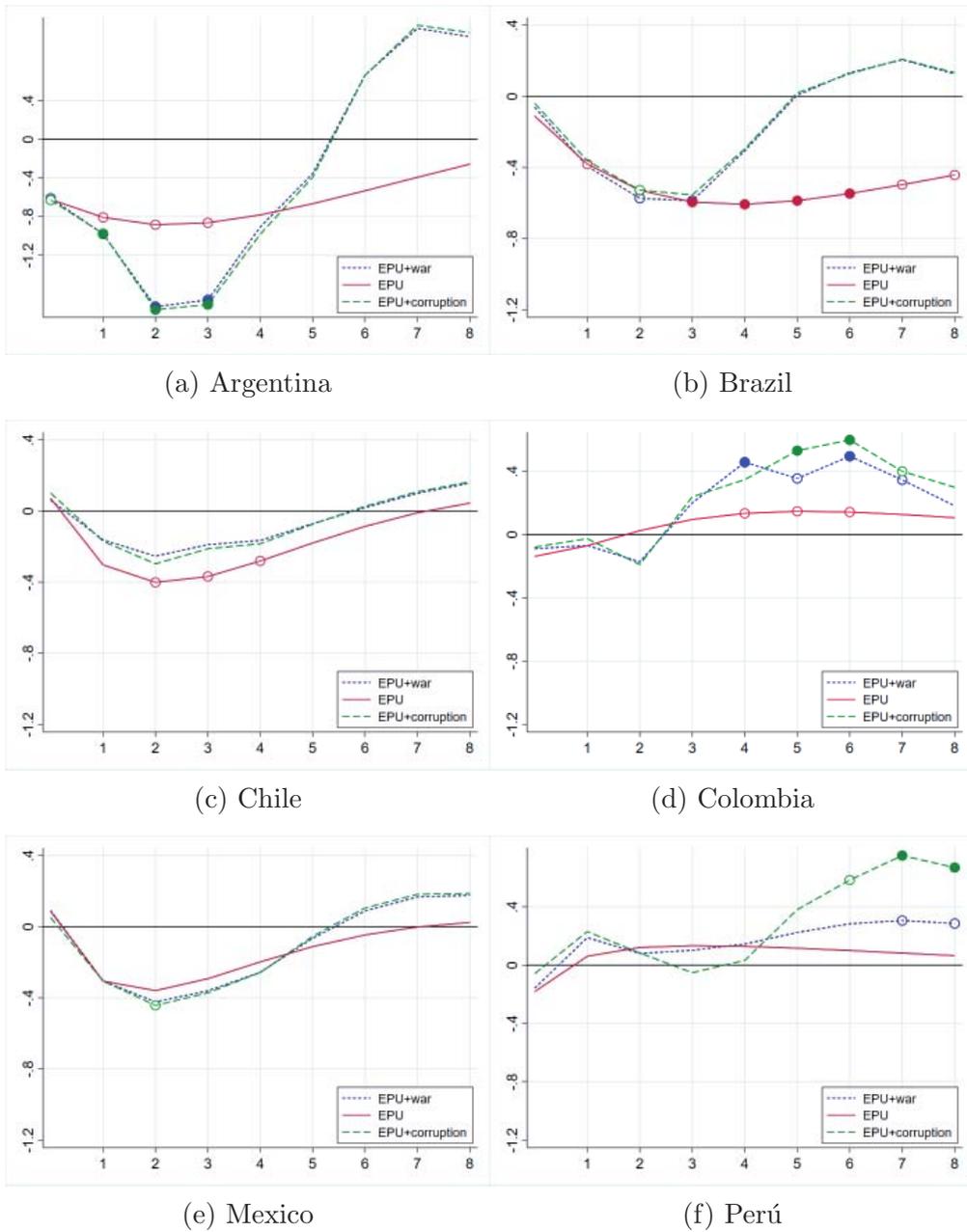
*Notes:* We compare our EPU index with the website EPU for the LA countries for which other EPU indexes are available online. The website EPU's are all taken from the Economic Policy Uncertainty Index website (see <https://www.policyuncertainty.com/>). We plot monthly series, transformed as 12-month moving averages.

Figure D.1: Comparison of EPU indexes: 12-month moving averages



## E Comparing our EPU index with the website EPU

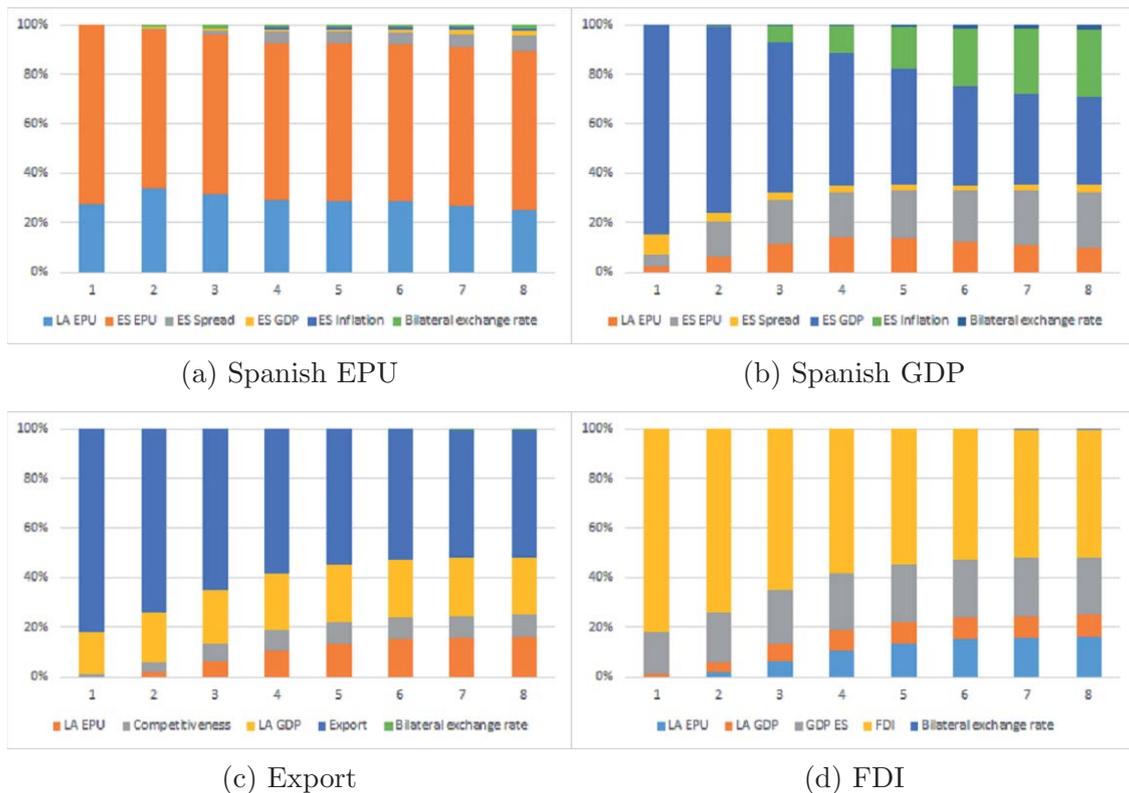
Figure E.1: Impulse responses of LA GDP to LA EPU shocks. Testing the relevance of specific keywords on our EPU indexes.



*Notes:* 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. *EPU* refers to the response to our EPU index; *EPU + war* refers to an EPU index to which we add words related to “war” to the list of keywords (*military, militares, paz, conflicto/s, guerra/s*); *EPU + corruption* refers to an EPU index to which we add words related to “corruption” to the list of keywords (*corrupcion/es, corrupt\**). 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.

## F Macro analysis: Forecast error variance decomposition

Figure F.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 response variable, based on the first VAR model explained in Section 3.2 of the main text (a VAR model which 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 Spanish FDI (right) as response variable, 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 export, and the bilateral exchange rate between LA region and Spain; the third VAR contains: LA EPU, LA GDP, Spanish GDP, Spanish FDI, and the bilateral exchange rate between LA region and Spain). In all cases we consider the aggregate exercise, considering the LA region as a whole.

The forecast error variance decomposition provides information about the relative importance of each structural shock in affecting the forecast error variance of our response variables. As for the Spanish EPU, the LA EPU explains about 30% of the forecast error variance at all horizons (from the 1 quarter-ahead to the 2 year-ahead horizon). As for the Spanish GDP, in the first quarter most of the forecast error variance is explained by the Spanish GDP. However, in the subsequent quarters 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 less than 20% of the forecast error variance (at one-year ahead horizon). Finally, in case of Spanish exports and Spanish FDI, the LA EPU explains up to slightly than 20% of the forecast error variance; its importance grows at larger horizons and it is maximum at the two-year ahead horizons.

## G Macro analysis: country-specific exercises

In this analysis, we repeat the analysis carried out in 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:  $X_t = \Pi(L)X_t + \epsilon_t$ , where  $X_t$  is a set of the following endogenous variables: the EPU of one specific LA country (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 (quarterly annual growth rates), the inflation rate (quarterly annual growth rates of CPI), and the bilateral exchange rate between the specific LA country and Spain.  $\Pi$  is a matrix of VAR coefficients capturing the dynamics of the system, and  $\epsilon_t : N(0, \Omega)$  is the vector of reduced-form residuals having zero mean and variance–covariance matrix  $\Omega$ . 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 5 lags whenever the optimal number of lags is above 5.<sup>31</sup> We decompose the variance–covariance matrix  $\Omega$  by means of Cholesky decomposition to identify the shocks of the VAR models and compute the orthogonal impulse responses of Spanish macroeconomic variables to exogenous shocks in the LA EPU index of interest.<sup>32</sup>

Figures G.1 and G.2 report impulse response functions for the Spanish EPU and the Spanish GDP, respectively. For an unexpected shock in LA EPU of one standard deviation, the Spanish EPU increases by around 5 units in the first two months. The spillover effect is biggest for Mexico, entailing an increase in the Spanish EPU of about 7 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. For the other countries, results are not significant.

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

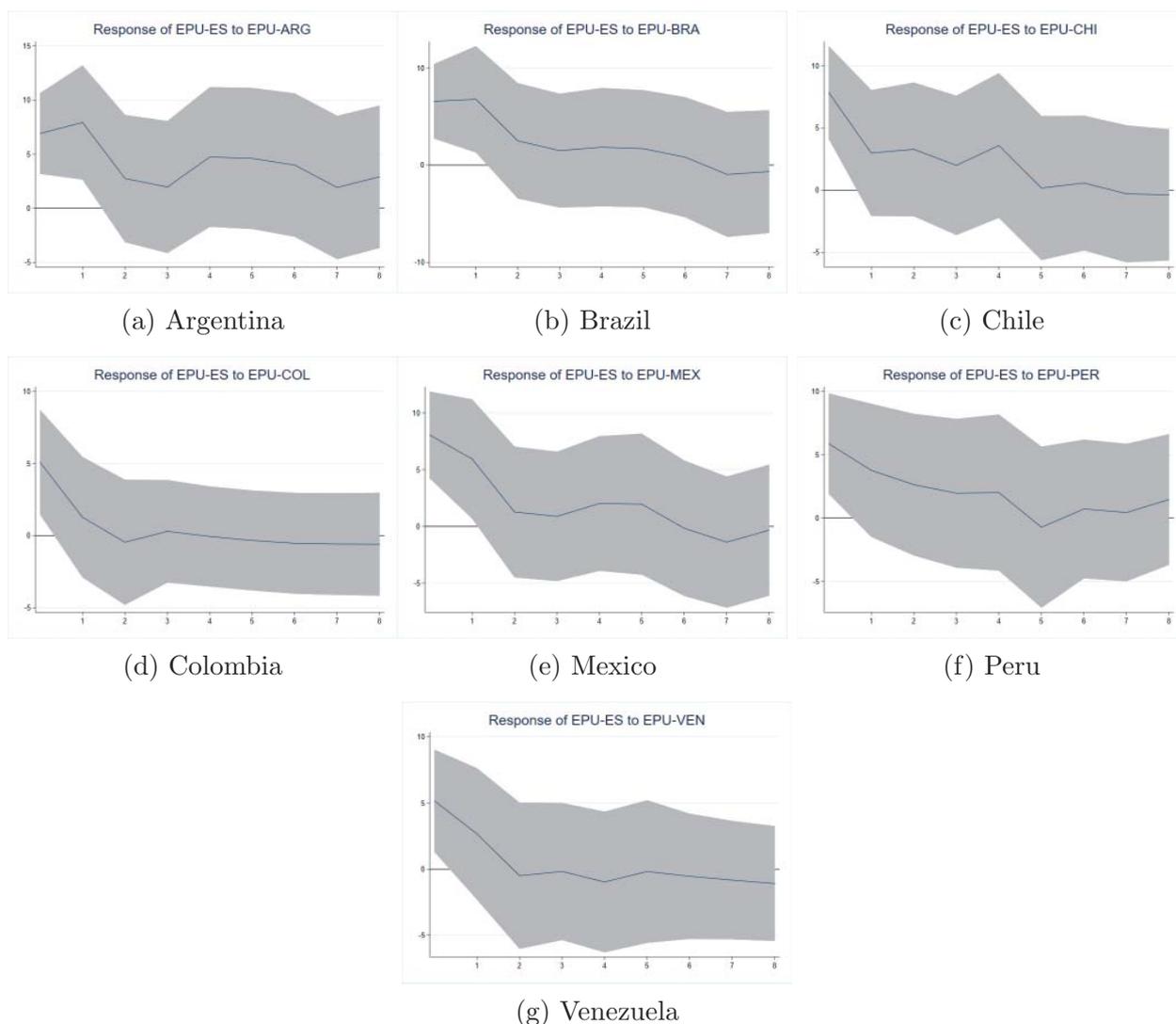
To study the impact of foreign uncertainty on Spanish exports, we estimate a quarterly VAR model in which the endogenous variables are included in the following order: the EPU index of the LA country, a measure of competitiveness of the price of Spanish exported

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<sup>31</sup>Results do not change if we include one lag for efficiency reasons; see Figures I.1–I.2 in Section I of the Appendix for the main LA countries: Argentina, Brazil, and Mexico.

<sup>32</sup>Results are very similar if we order Spanish GDP as last after Spanish inflation. Results available upon request.

Figure G.1: Impulse responses of Spanish EPU to Latin American EPU shocks

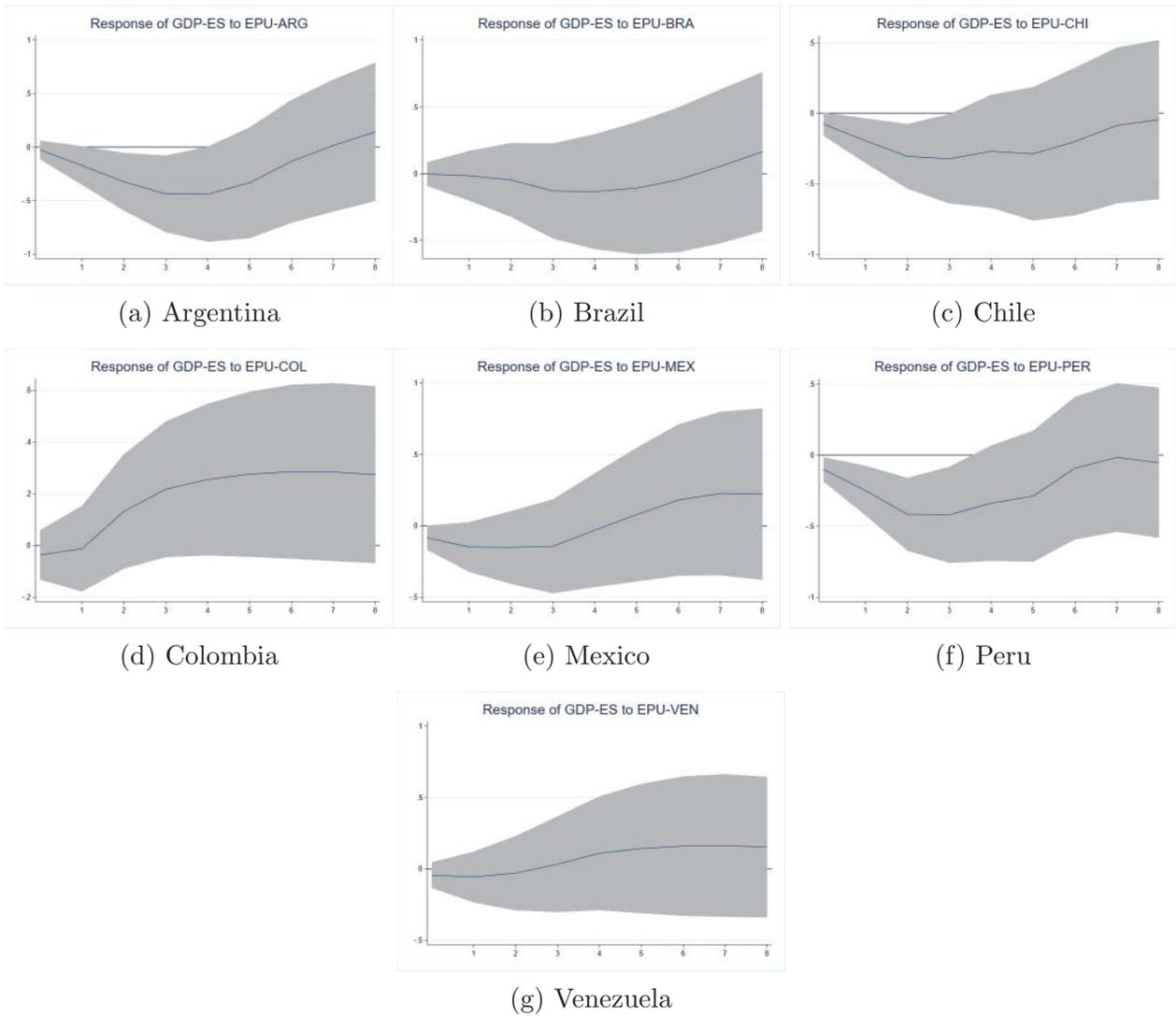


*Notes:* Confidence intervals at the 5% level reported. The VAR includes optimal lags according to the AIC criterion. VAR models are defined as in Section 3.2. For Venezuela, the bilateral exchange rate is not included since the series is not credible.

goods relative to the prices of goods produced in the foreign country (both expressed in Euros, hence accounting for changes in exchange rates), the foreign country GDP (quarterly annual growth rate), Spanish real exports to the foreign country (quarterly annual growth rates), and the bilateral exchange rate between the LA country of interest and Spain.<sup>33</sup> Real exports are obtained by deflating nominal exports with the price unit value index of Spanish exported goods. The competitiveness measure is important since it allows controlling for any changes in the relative prices between the goods exported from Spain and those produced in the foreign country that may affect the demand, on top of the demand variation that is due to exchange rate fluctuations.

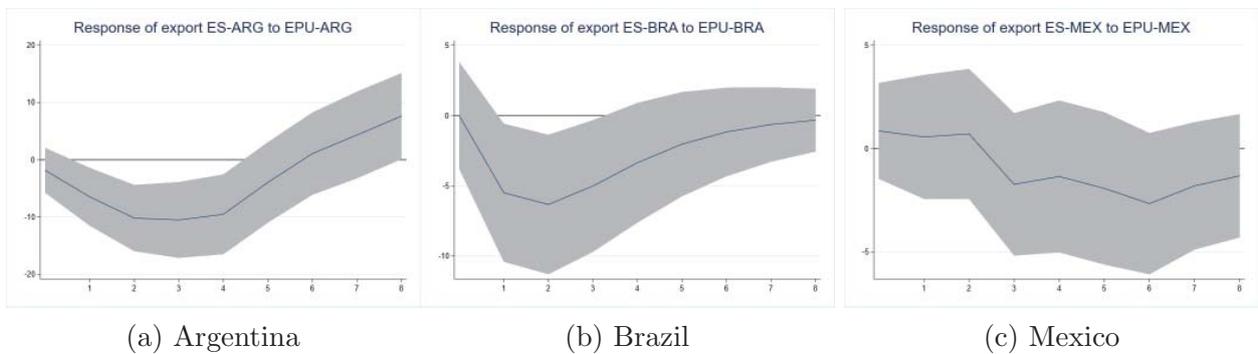
<sup>33</sup>As a robustness test, we estimate the VAR by switching the order between the price competitiveness measure and the GDP of the foreign country. Results are very similar (see Figure I.6).

Figure G.2: Impulse responses of Spanish GDP to Latin American EPU shocks



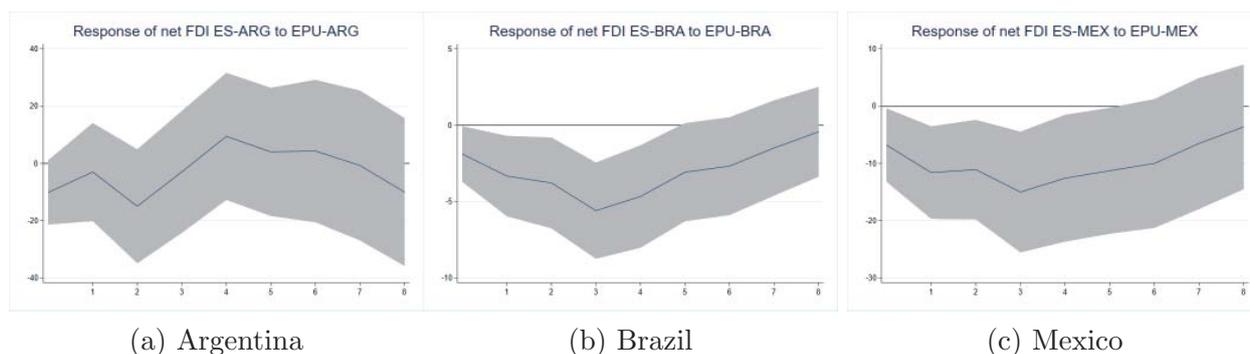
*Notes:* Confidence intervals at the 5% level reported. The VAR includes optimal lags according to the AIC criterion. The VAR includes optimal lags according to the AIC criterion. VAR models are defined as in Section 3.2. For Venezuela, the bilateral exchange rate is not included since the series is not credible.

Figure G.3: VAR: Impulse responses of Spanish exports to Latin American 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.

Figure G.4: VAR: Impulse responses of Spanish net FDI to Latin American 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.

The FDI VAR models instead include the following variables (in order): the EPU of the foreign country, the foreign country's GDP (quarterly annual growth rate), the GDP of Spain (quarterly annual growth rates), Spanish net FDI to the foreign country (quarterly annual growth rates of stock values), and the bilateral exchange rate between the LA country of interest and Spain.<sup>34</sup>

Again, all VAR models are estimated by OLS and include the optimal number of lags according to the AIC criterion (we cap lags at 5 for efficiency reasons).<sup>35</sup> Figures G.3 and G.4 report the impulse responses of Spanish exports and FDI to foreign countries' EPU shocks, respectively, for the main LA countries: Argentina, Brazil, 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. By contrast, FDI drops in response to foreign EPU shocks in Mexico by about 10 pp and Brazil by about 5 pp. In both cases, the impact remains significant for at least 6 quarters.

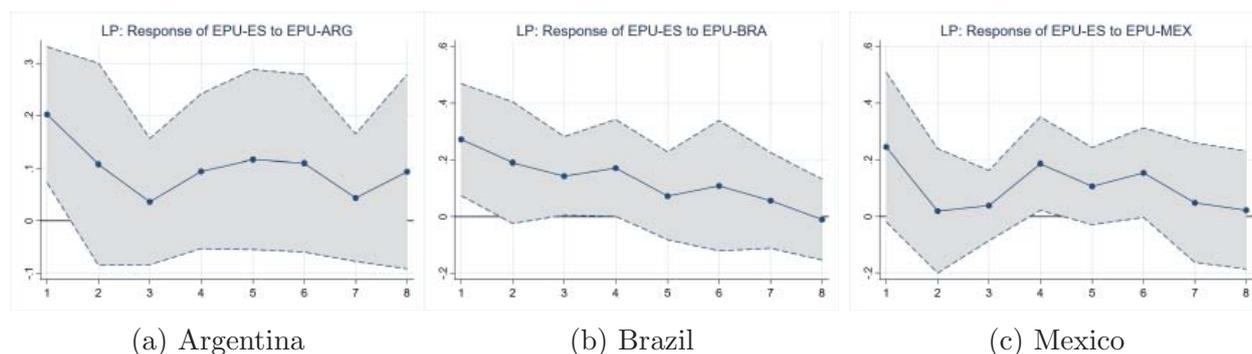
## H Macro analysis: local projections method

In the macro analysis (Section 3.2 and G), 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 both the genuine impact of LA uncertainty and of the LA

<sup>34</sup>As a robustness test, we estimate the VAR by switching the order between the GDP measures and set the Spanish GDP before the GDP of the foreign country. Results are very similar (see Figure I.5).

<sup>35</sup>Results are similar if we include only one lag in the VAR models (see Figure I.3 in Section I of the Appendix).

Figure H.1: Local projections: impulse responses of Spanish EPU to Latin American EPU shocks

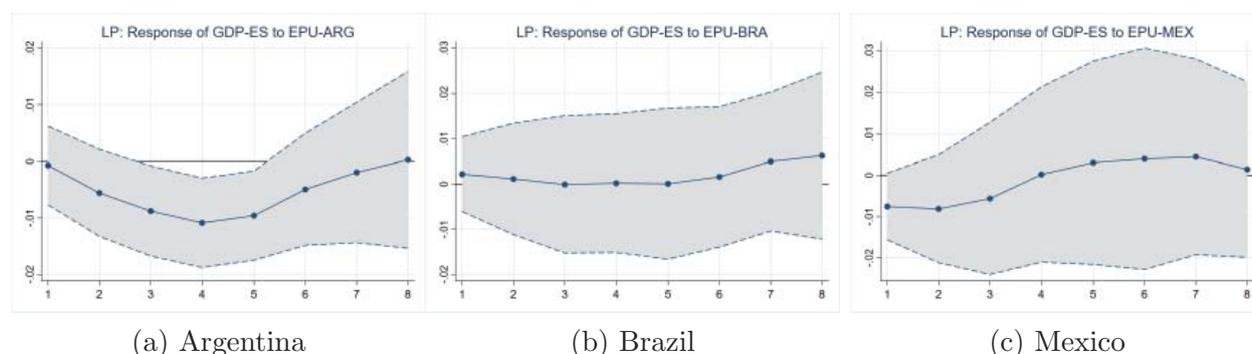


Notes: Confidence intervals at the 5% level reported.

economic situation on the Spanish economy. To tackle this, we repeat the analysis by means of 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 of the previous exercise, i.e., a Spain-related VAR with the following endogenous variables: the EPU of one Latin American country (among Argentina, Brazil, and Mexico), the EPU for Spain, the Spanish 10-year sovereign debt spread over the German Bund, the real Spanish GDP, the inflation rate, and the bilateral exchange rate.

Figure H.2: Local projections: impulse responses of Spanish GDP to Latin American EPU shocks



Notes: Confidence intervals at the 5% level reported.

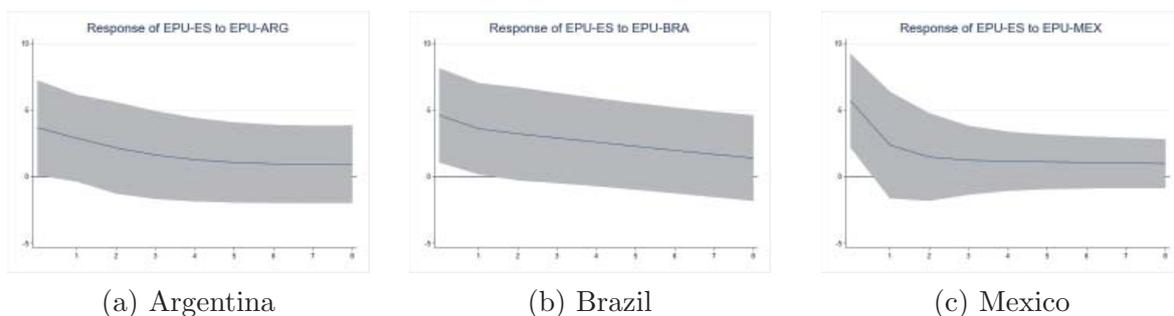
Second, we estimate the residual from the first equation of the VAR (the equation with the EPU index on the left-hand side) in order to extract the structural shock of the Latin American EPU index, cleaned from its correlation with the Spanish macroeconomic variables.

Finally, we estimate the impulse responses of the so-computed Latin American “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 (in turn, the Spanish EPU and the Spanish GDP) is shifted several steps ahead (up to 8

quarters) and regressed on the Latin American “EPU shock”, controlling for lagged values of the dependent variable and the GDP growth rate of the Latin American country of interest (the contemporaneous term and one-lag values). In the estimation, we use the Newey–West (1987) correction to correct standard errors for serial correlation. Then, we plot the coefficients of the contemporaneous “EPU shock” over the same time horizon, which gives the impulse responses of the dependent variable to Latin American EPU shocks, controlling for the macroeconomic situation of the Latin American country. Results are reported in Figures H.1 and H.2. 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 (for this reason, our baseline model is the one-step VAR) 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 (Figure H.1 and Figure H.2) as further evidence of the existence of spillovers of uncertainty in Latin American countries to the Spanish economy.

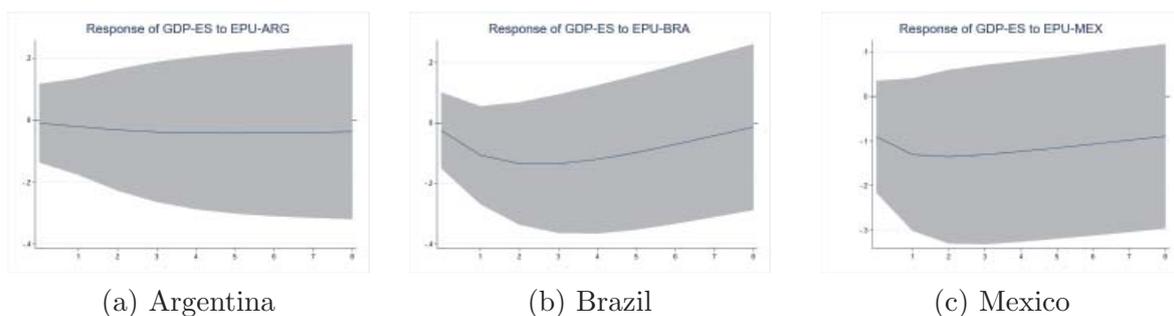
## I Macro analysis: one lag and order of variables

Figure I.1: Impulse responses of Spanish EPU to LA EPU index shocks: one lag



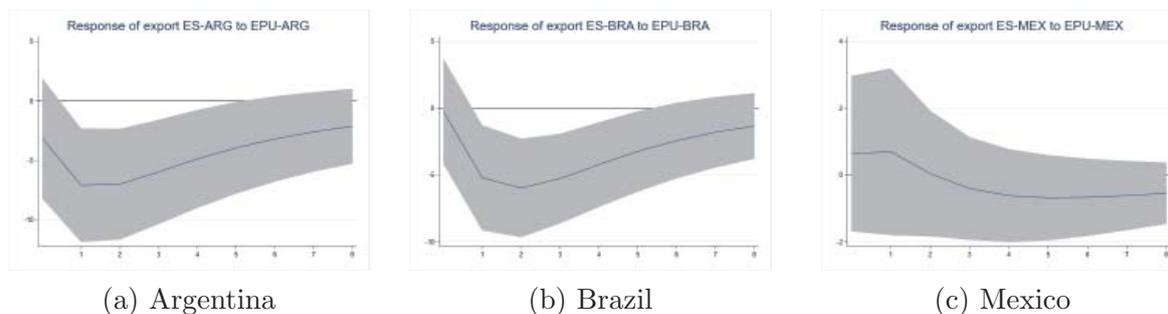
Notes: Confidence intervals at the 5% level reported.

Figure I.2: Impulse responses of Spanish GDP to LA EPU index shocks: one lag



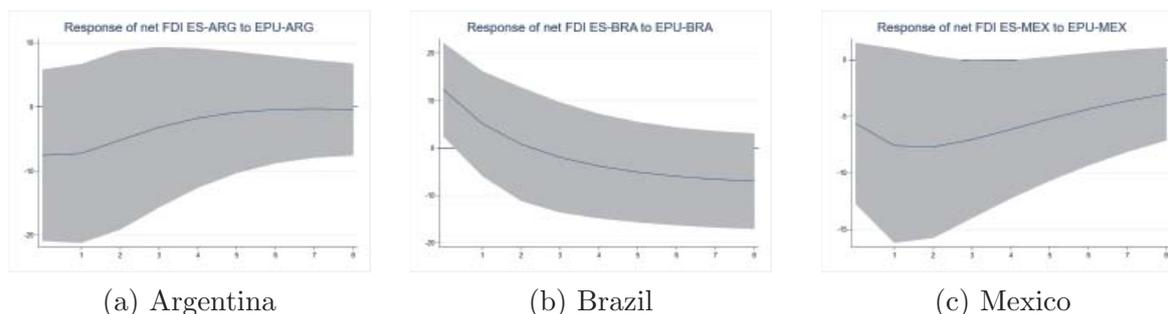
Notes: Confidence intervals at the 5% level reported.

Figure I.3: VAR: Impulse responses of Spanish exports to LA EPU index shocks: one lag



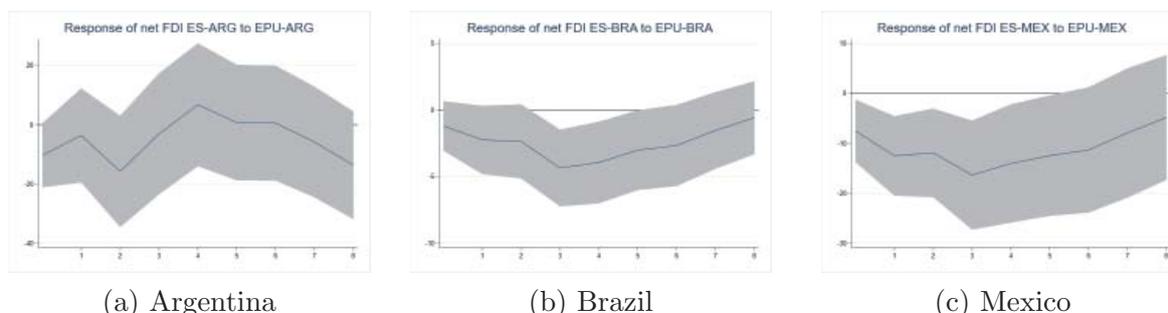
Notes: Confidence intervals at the 5% level reported.

Figure I.4: VAR: Impulse responses of Spanish net FDI to LA EPU index shocks: one lag



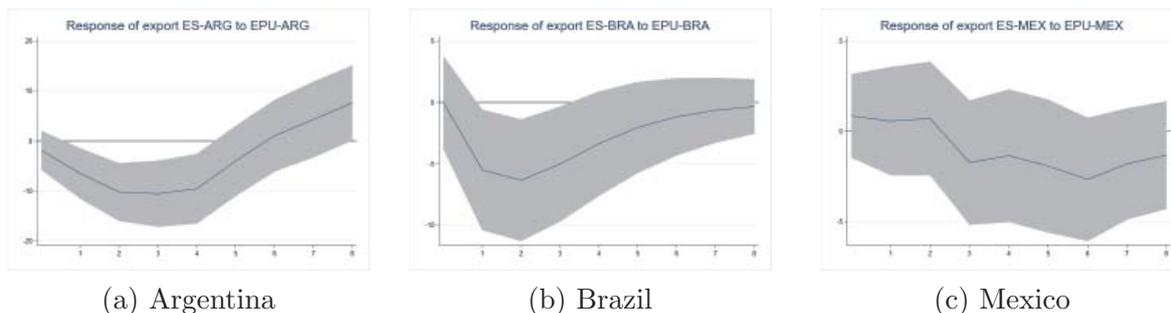
Notes: Confidence intervals at the 5% level reported.

Figure I.5: VAR: Impulse responses of Spanish net FDI to LA EPU index shocks: setting the Spanish GDP before the GDP of the foreign country



Notes: Confidence intervals at the 5% level reported. The VAR includes optimal lags according to the AIC criterion.

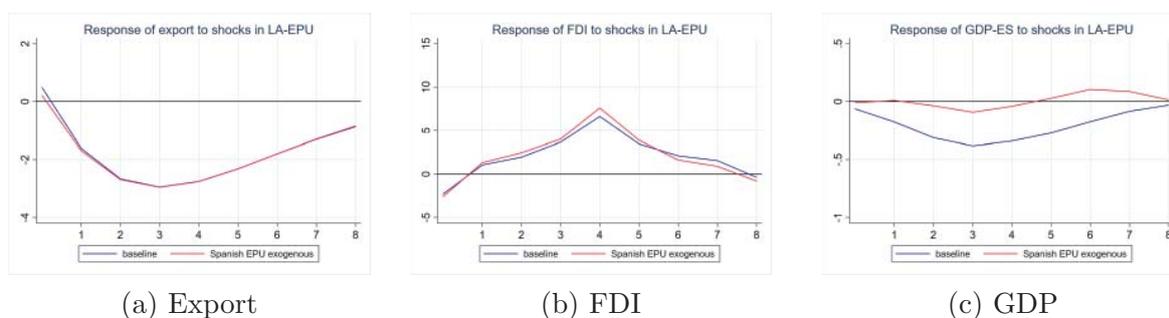
Figure I.6: VAR: Impulse responses of Spanish exports to LA EPU index shocks: setting the price competitiveness measure after the GDP of the foreign country.



Notes: Confidence intervals at the 5% level reported. The VAR includes optimal lags according to the AIC criterion.

## J Macro analysis: exploring the uncertainty spillover

Figure J.1: Impulse responses to LA EPU index shocks: the role of the uncertainty spillover



Notes: The graphs report the impulse responses of the corresponding target variable to shocks in LA EPU. The blue line represents to the impulse response of the target variable to LA EPU shocks based on the model in which the Spanish EPU is allowed to adjust to shocks in LA EPU, while the red line represents the impulse response of the target variable 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.

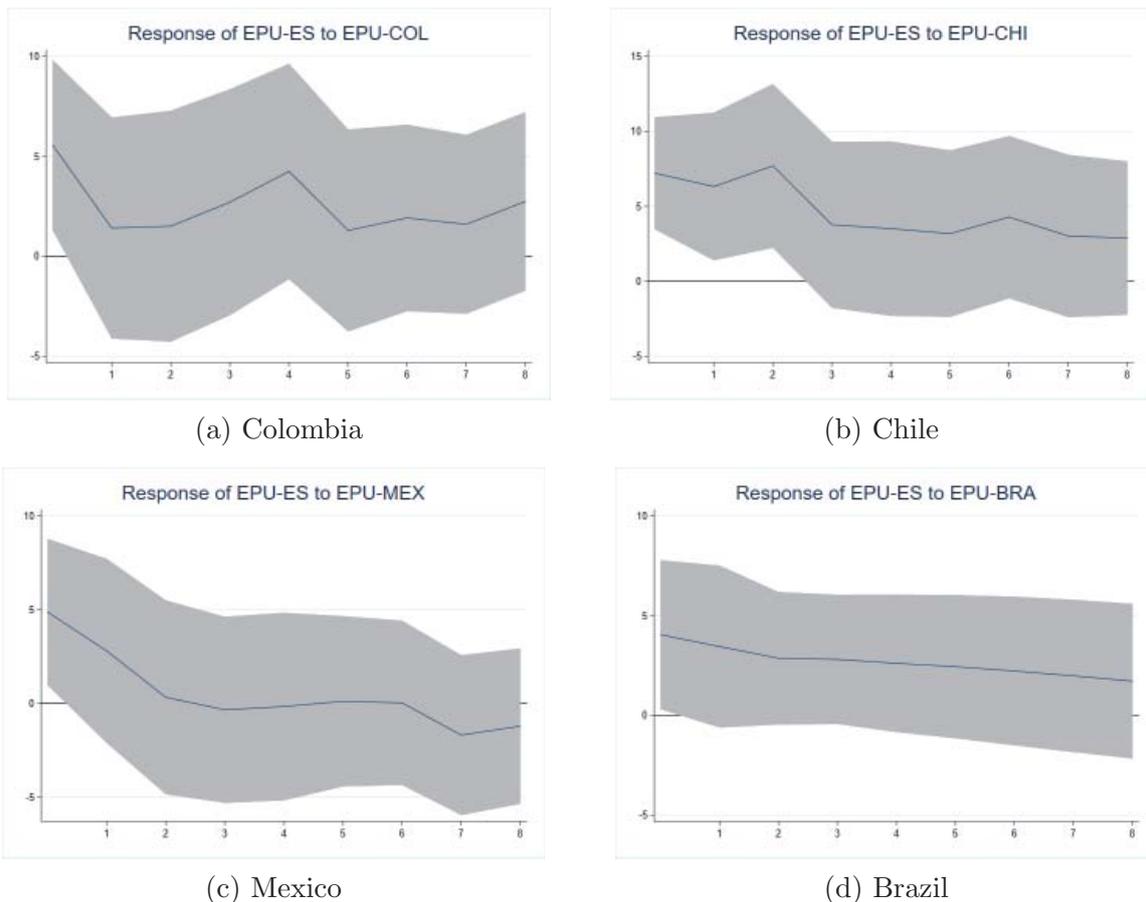
In this section we explore the role of the uncertainty spillover (i.e. the indirect impact of LA EPU through its spillover to Spanish EPU) as a transmission mechanism to the real economy, in the spirit of Caggiano et al. (2020). To do this, we compare two impulse responses obtained from alternative VAR models in which the Spanish EPU is either allowed or not 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, meaning that the Spanish EPU is left free to react once the system is shocked.<sup>36</sup> By contrast, in the alternative version of the VAR model we include the Spanish EPU as an exogenous variable, which means that it cannot freely react once the system is shocked. Results are reported in Figure J.1,

<sup>36</sup>For the Spanish GDP, the first VAR corresponds to the VAR estimated in section 3.2 of the main text. For Spanish exports and Spanish FDI, the VAR corresponding VAR estimated in section 3.2 did not include the Spanish EPU. Hence we added it and place it as second, just after the LA EPU. The impulse responses of interest are virtually unchanged once we include the Spanish EPU in the system.

which compares the impulse responses of the two models: the blue line refers to the model in which the Spanish EPU is allowed to adjust to shocks in LA EPU, while 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 LA EPU on the target variables are basically unchanged. This suggests 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 the economic agents take decisions about Spanish exports and FDI by looking at LA variables, which is reasonable. By contrast, the results on Spanish GDP suggests that most of the impact of LA EPU on Spanish GDP occurs through the uncertainty spillover.

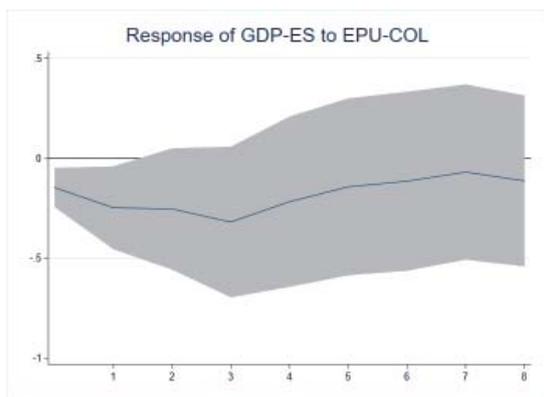
## K Macro analysis: using the website EPU's

Figure K.1: Impulse responses of Spanish EPU to LA EPU index shocks

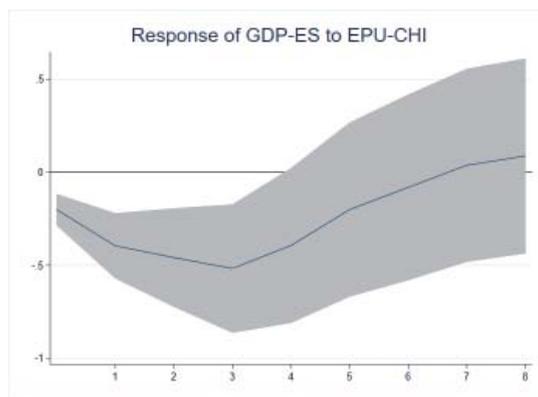


Notes: Confidence intervals at the 5% level reported. The VAR includes optimal lags according to the AIC criterion.

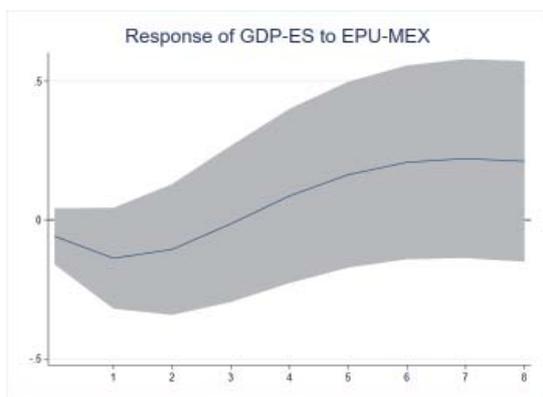
Figure K.2: Impulse responses of Spanish GDP to LA EPU index shocks



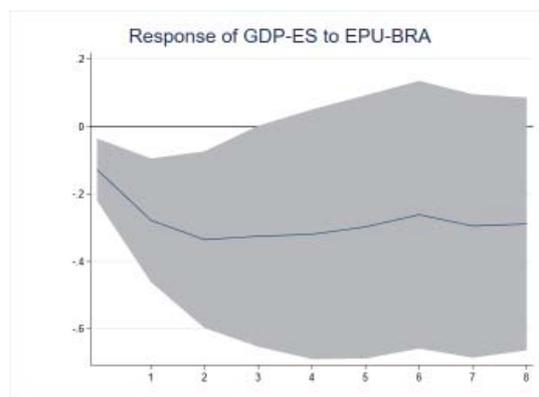
(a) Colombia



(b) Chile



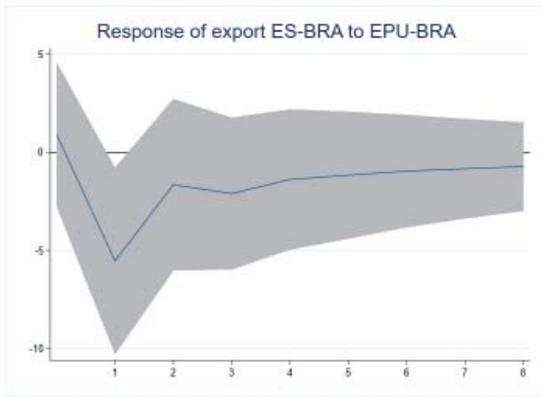
(c) Mexico



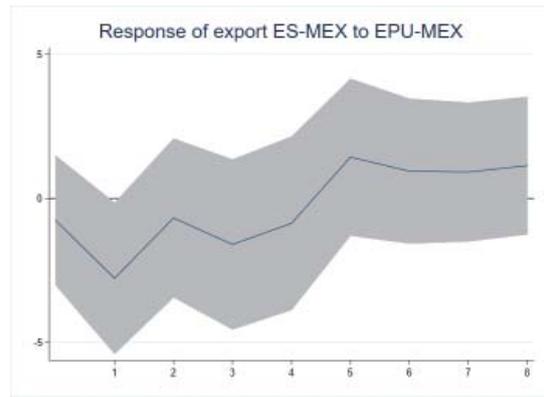
(d) Brazil

Notes: Confidence intervals at the 5% level reported. The VAR includes optimal lags according to the AIC criterion.

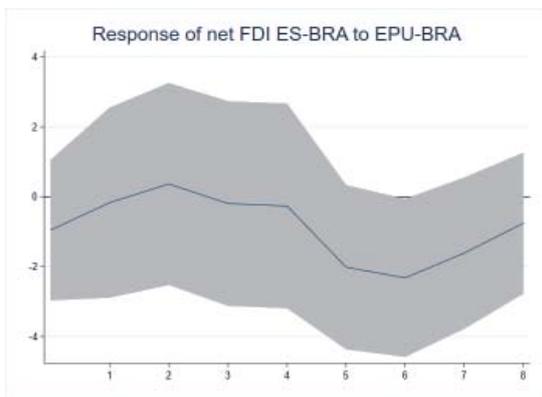
Figure K.3: Impulse responses of Spanish exports and FDI to LA EPU index shocks



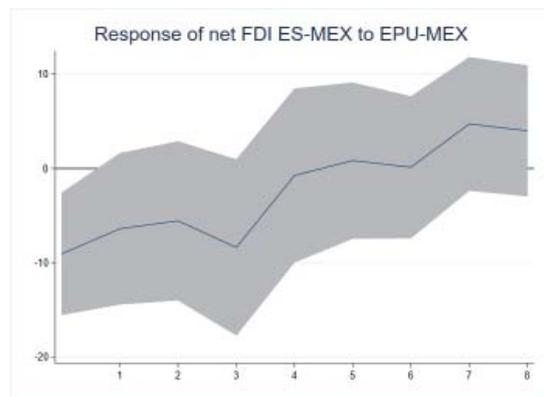
(a) Exports-Brazil



(b) Exports-Mexico



(c) FDI-Brazil

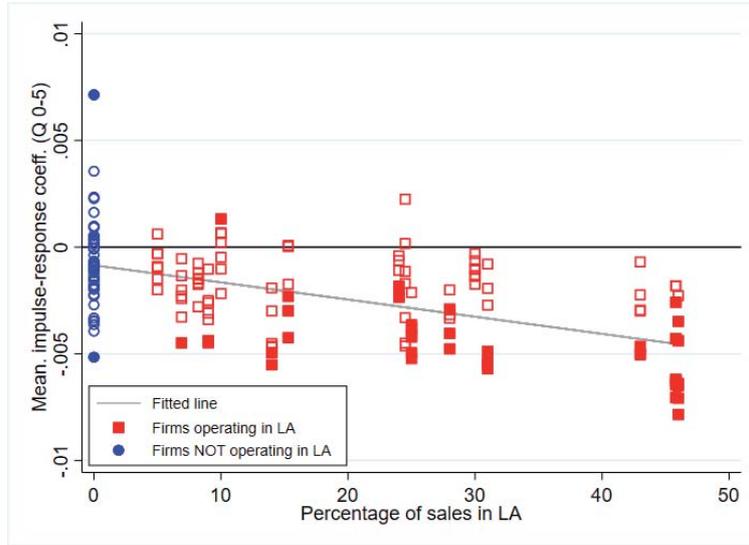


(d) FDI-Mexico

Notes: Confidence intervals at the 5% level reported. The VAR includes optimal lags according to the AIC criterion.

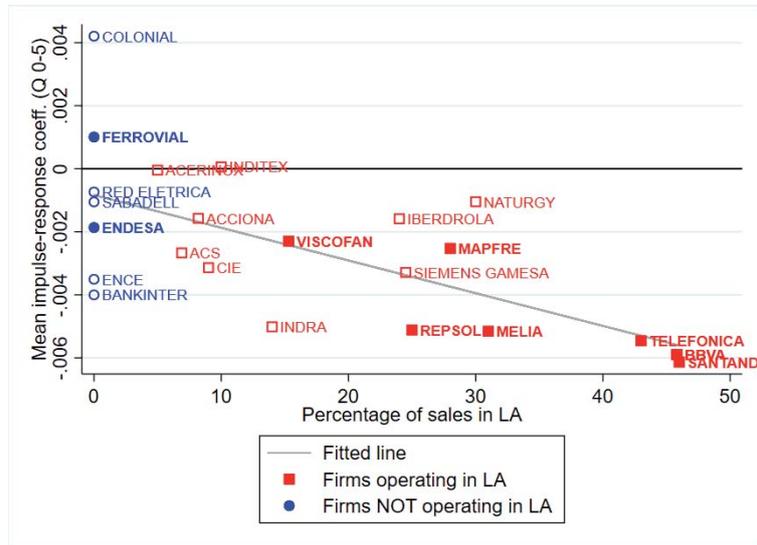
## L Monthly VARs on company quotations

Figure L.1: Average responses of company quotations to EPU shocks



*Notes:* Each point represents the average impulse response of one company's quotations to 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. The average impulse response is computed as the average of the first 6 impulse responses estimated coefficients (from the current quarter to the fifth quarter included). 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 at the 10% confidence level.

Figure L.2: Average responses of company quotations to 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 computed as the average of the estimated coefficients of the first 6 impulse responses, from the current quarter to the fifth quarter included. Red squares represent companies that have interests in LA, while blue circles refer to companies that do not have 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. Whenever the average response is significant according to this criterion, the company label is in bold.

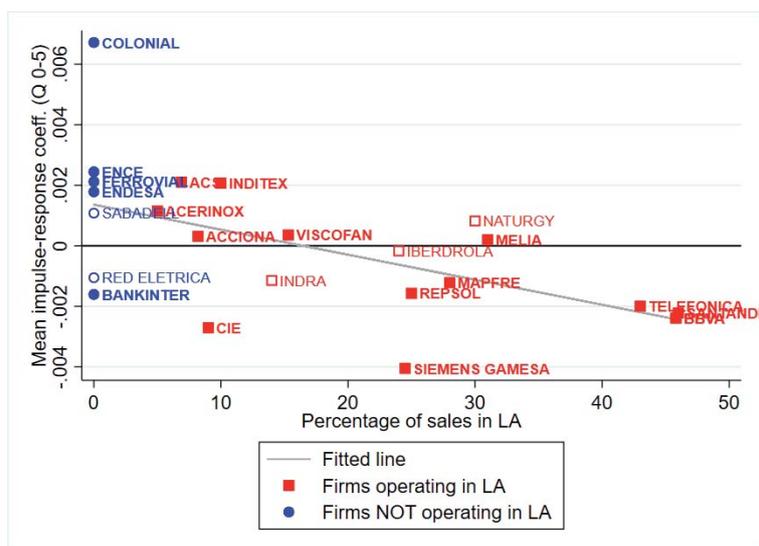


Figure L.5: Average responses of company quotations to EPU shocks: Colombia



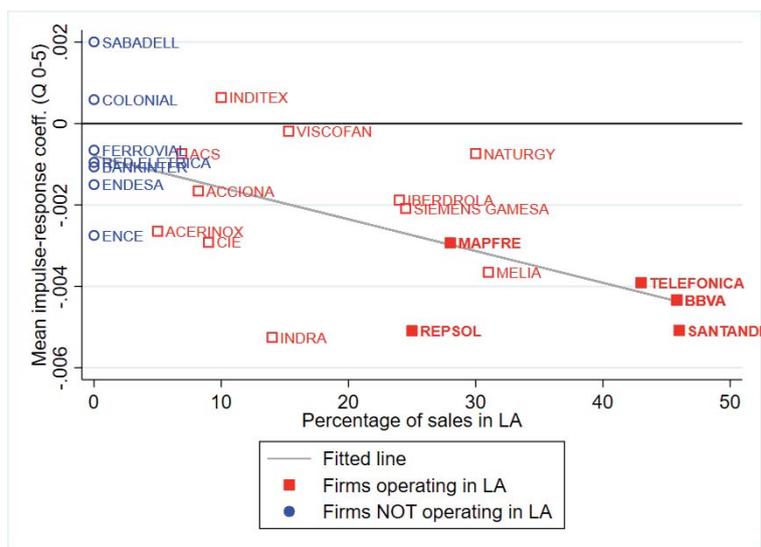
Notes: Each point represents the average impulse response of one company's quotations to EPU shocks in Colombia. The average impulse response is computed as the average of the estimated coefficients of the first 6 impulse responses, from the current quarter to the fifth quarter included. Red squares represent companies that have interests in LA, while blue circles refer to companies that do not have 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 the 10% confidence level. Whenever the average response is significant according to this criterion, the company label is in bold.

Figure L.6: Average responses of company quotations to EPU shocks: Mexico



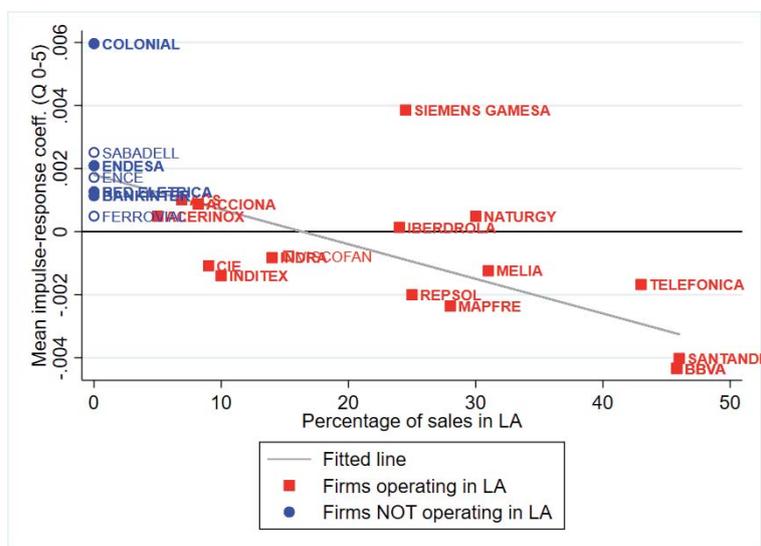
Notes: Each point represents the average impulse response of one company's quotations to EPU shocks in Mexico. The average impulse response is computed as the average of the estimated coefficients of the first 6 impulse responses, from the current quarter to the fifth quarter included. Red squares represent companies that have interests in LA, while blue circles refer to companies that do not have 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 the 10% confidence level. Whenever the average response is significant according to this criterion, the company label is in bold.

Figure L.7: Average responses of company quotations to EPU shocks: Peru



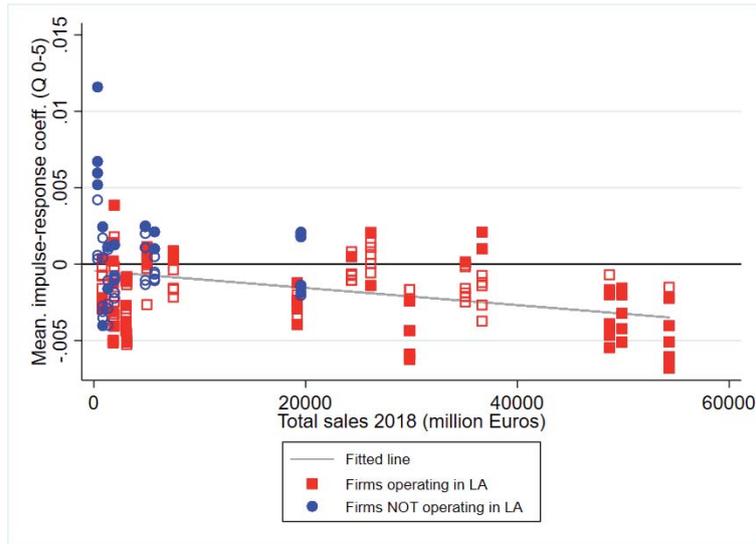
Notes: Each point represents the average impulse response of one company's quotations to EPU shocks in Peru. The average impulse response is computed as the average of the estimated coefficients of the first 6 impulse responses, from the current quarter to the fifth quarter included. Red squares represent companies that have interests in LA, while blue circles refer to companies that do not have 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 the 10% confidence level. Whenever the average response is significant according to this criterion, the company label is in bold.

Figure L.8: Average responses of company quotations to EPU shocks: Venezuela



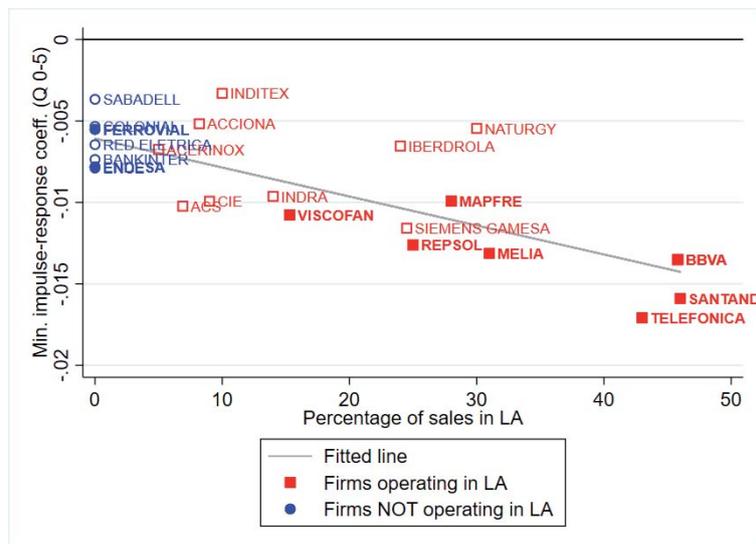
Notes: Each point represents the average impulse response of one company's quotations to EPU shocks in Venezuela. The average impulse response is computed as the average of the estimated coefficients of the first 6 impulse responses, from the current quarter to the fifth quarter included. Red squares represent companies that have interests in LA, while blue circles refer to companies that do not have 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 the 10% confidence level. Whenever the average response is significant according to this criterion, the company label is in bold.

Figure L.9: Average responses of company quotations to EPU shocks



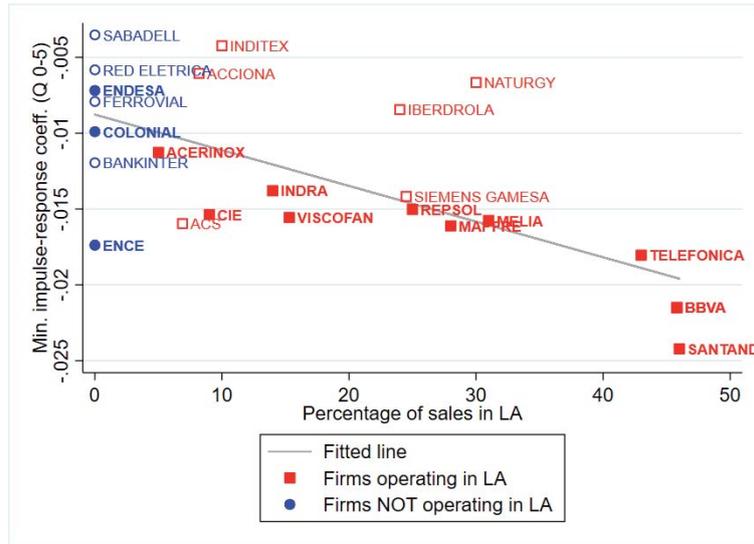
*Notes:* Each point represents the average impulse response of one company's quotations to EPU shocks, pooling all countries together. The average impulse response is computed as the average of the estimated coefficients of the first 6 impulse responses, from the current quarter to the fifth quarter included. Red squares represent companies that have interests in LA, while blue circles refer to companies that do not have 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 the 10% confidence level. On the x-axis, companies are ordered by total sales.

Figure L.10: Peak response of company quotations to EPU shocks: Argentina



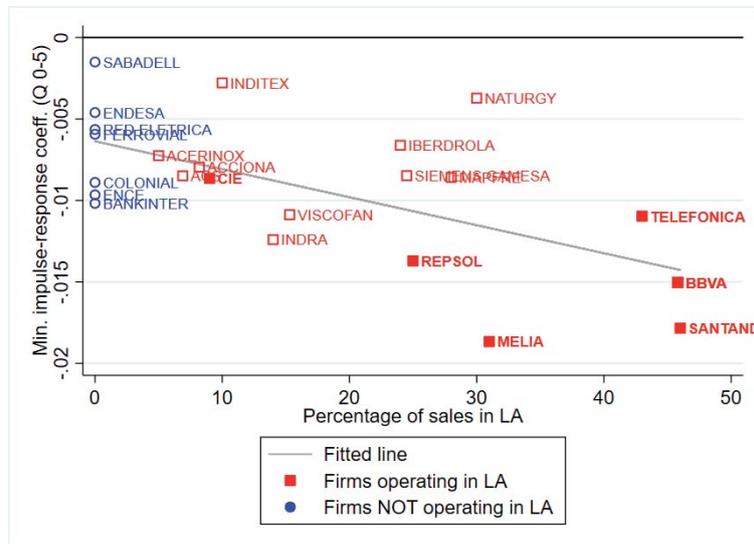
*Notes:* Each point represents the minimum impulse response of one company's quotations to EPU shocks in Argentina. Red squares represent companies that have interests in LA, while blue circles refer to companies that do not have interests in LA. In both cases, filled symbols indicate that at least two coefficients (among the first five coefficients) are significant at least at a 10% confidence level. Whenever the minimum response is significant according to this criterion, the company label is in bold.

Figure L.11: Peak response of company quotations to EPU shocks: Brazil



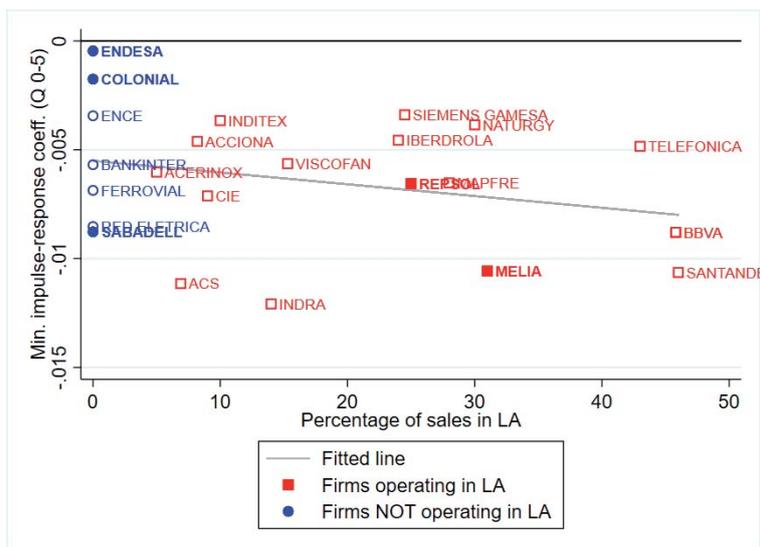
Notes: Each point represents the minimum impulse response of one company's quotations to EPU shocks in Brazil. Red squares represent companies that have interests in LA, while blue circles refer to companies that do not have interests in LA. In both cases, filled symbols indicate that at least two coefficients (among the first five coefficients) are significant at least at a 10% confidence level. Whenever the minimum response is significant according to this criterion, the company label is in bold.

Figure L.12: Peak response of company quotations to EPU shocks: Chile



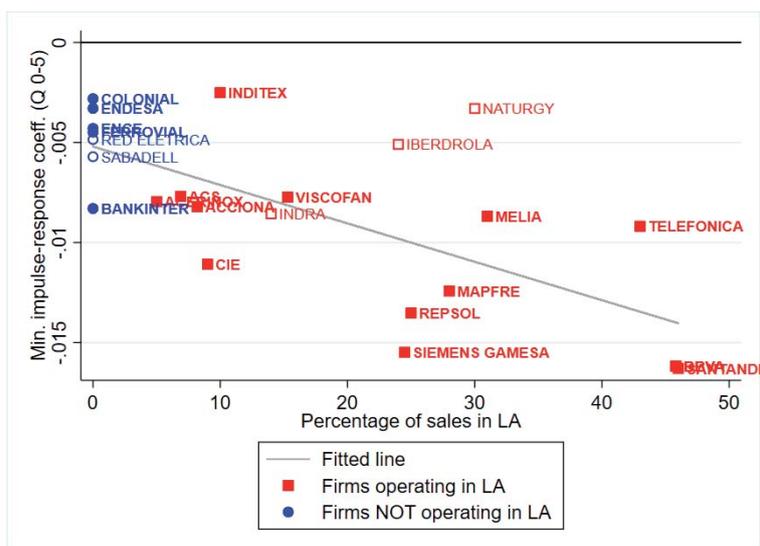
Notes: Each point represents the minimum impulse response of one company's quotations to EPU shocks in Chile. Red squares represent companies that have interests in LA, while blue circles refer to companies that do not have interests in LA. In both cases, filled symbols indicate that at least two coefficients (among the first five coefficients) are significant at least at a 10% confidence level. Whenever the minimum response is significant according to this criterion, the company label is in bold.

Figure L.13: Peak response of company quotations to EPU shocks: Colombia



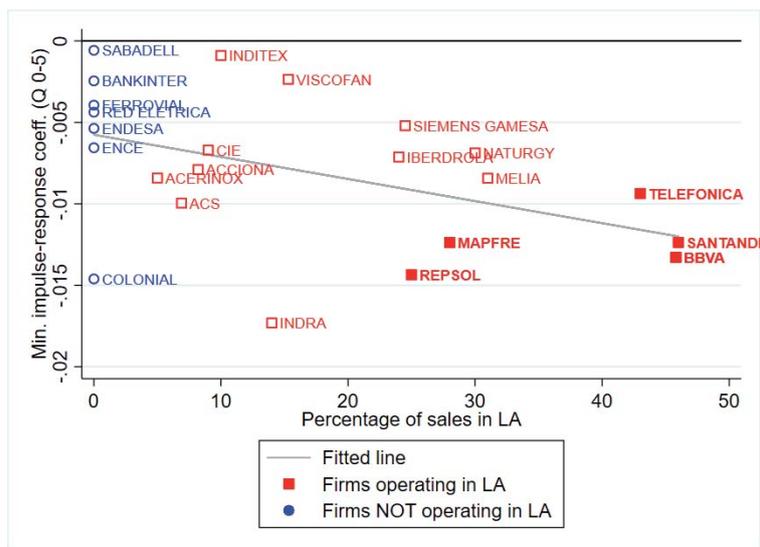
Notes: Each point represents the minimum impulse response of one company's quotations to EPU shocks in Colombia. Red squares represent companies that have interests in LA, while blue circles refer to companies that do not have interests in LA. In both cases, filled symbols indicate that at least two coefficients (among the first five coefficients) are significant at least at a 10% confidence level. Whenever the minimum response is significant according to this criterion, the company label is in bold.

Figure L.14: Peak response of company quotations to EPU shocks: Mexico



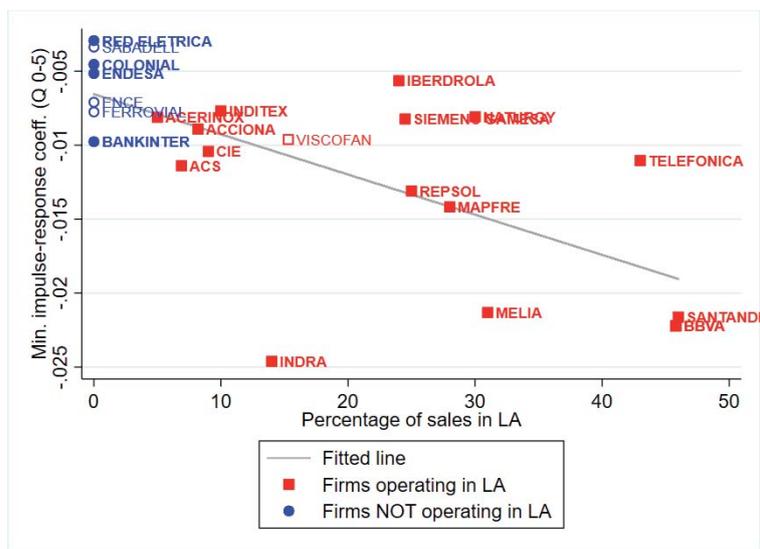
Notes: Each point represents the minimum impulse response of one company's quotations to EPU shocks in Mexico. Red squares represent companies that have interests in LA, while blue circles refer to companies that do not have interests in LA. In both cases, filled symbols indicate that at least two coefficients (among the first five coefficients) are significant at least at a 10% confidence level. Whenever the minimum response is significant according to this criterion, the company label is in bold.

Figure L.15: Peak response of company quotations to EPU shocks: Peru



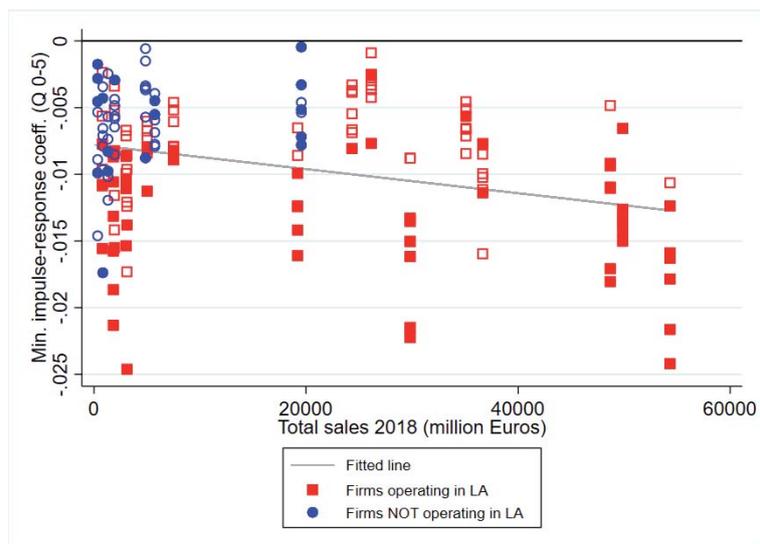
Notes: Each point represents the minimum impulse response of one company's quotations to EPU shocks in Peru. Red squares represent companies that have interests in LA, while blue circles refer to companies that do not have interests in LA. In both cases, filled symbols indicate that at least two coefficients (among the first five coefficients) are significant at least at a 10% confidence level. Whenever the minimum response is significant according to this criterion, the company label is in bold.

Figure L.16: Peak response of company quotations to 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 that have interests in LA, while blue circles refer to companies that do not have interests in LA. 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. Whenever the minimum response is significant according to this criterion, the company label is in bold.

Figure L.17: Peak response of company quotations to EPU shocks



*Notes:* Each point represents the minimum impulse response of one company's quotations to EPU shocks, pooling all countries together. Red squares represent companies that have interests in LA, while blue circles refer to companies that do not have interests in LA. 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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