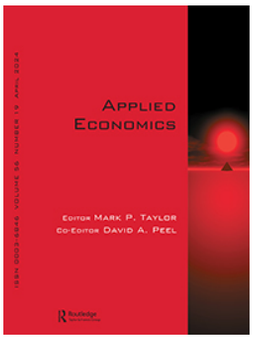

Routledge
Taylor & Francis Group

Applied Economics

ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/raec20

Cross-listing flows under uncertainty: an international perspective

Abraham Agyemang, Faruk Balli, Russell Gregory-Allen & Hatice Ozer Balli

To cite this article: Abraham Agyemang, Faruk Balli, Russell Gregory-Allen & Hatice Ozer Balli (2024) Cross-listing flows under uncertainty: an international perspective, Applied Economics, 56:19, 2357-2374, DOI: 10.1080/00036846.2023.2186368

To link to this article: https://doi.org/10.1080/00036846.2023.2186368

Published online: 12 Mar 2023.

APPLIED ECONOMICS
2024, VOL. 56, NO. 19, 2357–2374
https://doi.org/10.1080/00036846.2023.2186368

Routledge
Taylor & Francis Group

Cross-listing flows under uncertainty: an international perspective

Abraham Agyemang[a], Faruk Balli[a,b], Russell Gregory-Allen[a] and Hatice Ozer Balli[a]

[a]School of Economics and Finance, Massey University, Auckland, New Zealand; [b]Higher School of Economics and Business of Al-Farabi Kazakh National University, Almaty, Kazakhstan

ABSTRACT

The impact of policy uncertainty on corporate decisions and strategies continues to receive significant interest in recent discussions. As a contribution, this study examines how economic policy uncertainty (EPU) in the domestic and global markets impacts corporate cross-listing decisions. To this end, we employ firm and country-level data from 1990 to 2016 from 13 countries. We implement a Granger Causality, Quantile on Quantile Regression (QQR), and Wavelet Coherence approaches and show that monthly local and global EPU influence the cross-listing decisions of firms, with stronger influence for firms from smaller domestic markets. We suggest that firms from smaller domestic markets seek more cross-listing in the face of high local EPU and reduce or avoid cross-listing during high global EPU periods. Our findings suggest that policy transparency could have important implications for current and future corporate decisions.

KEYWORDS

Economic policy uncertainty; cross-listing; Granger Causality; Quantile on Quantile Regression; and Wavelet Coherence

JEL CLASSIFICATION

F12; G15; F23

I. Introduction

Studies have long shown how the economic fabric of countries influences corporate decisions and strategies. However, recent studies note that uncertainties about economic policies tend to have similar impacts (Kang, Lee, and Ratti 2014; Wang, Chen, and Huang 2014; Gulen and Ion 2015; Zhang et al. 2015; Bonaime, Gulen, and Ion 2018). These studies explain that economic policies shape the economic fabric of countries, which informs corporate decisions and strategies. A vital consideration is how periods of high policy uncertainty hinder firm growth and expansions, among other decisions. Topical international events and national policy debates, especially during the US election, the BREXIT referendum, tax reform debates in the UK, and US-China trade disagreements among others have significantly contributed to higher Economic Policy Uncertainties (henceforth, EPU) with significant subsequent implications for firms in recent years (Baker et al. 2016; Bordo, Duca, and Koch 2016; Zeng, Zhong, and He 2019; Xu 2020)[1] For example, Handley and Limao (2015) find that firms' export investments reduce during periods of high policy uncertainty. Gulen and Ion (2015) report lower firm capital investments during periods of high economic policy uncertainty (EPU) while Zhang et al. (2015) and Bonaime, Gulen, and Ion (2018) postulate that periods of high EPU result in lower mergers and acquisitions decisions. We add to the ongoing discussions by examining how EPU impacts the cross-listing decisions of firms.

With over 2,000 cross-listed firms on the NYSE, about 1,800 on the LSE, and over 20,000 ADRs and GDRs on several stock markets across the globe, cross-listing has shown to be of great relevance to firms[2] The extant cross-listing literature argues that cross-listing conventionally presents firms with the option of raising foreign capital, especially for firms from developing economies (Khurana, Martin, and Periera 2007; Choi et al. 2009). Additionally, cross-listed firms report increased analyst coverage (Baker, Nofsinger, and Weaver 2002), improved information environment (Bris et al. 2012), improved liquidity (Bacidore and Sofianos 2002; Berkman and Nguyen 2010) better corporate governance (King and Segal 2003; Karolyi 2012; Li, Brockman, and

CONTACT Faruk Balli f.balli@massey.ac.nz School of Economics and Finance, Massey University, Auckland, New Zealand

[1]See for example, Caggiano, Castelnuovo, and Figueres (2017), who shows higher volatility in unemployment rates during periods of high economic policy uncertainties.

[2]Approximation of figures from LSE, NYSE, BNY Mellon and World Federation of Exchanges websites.

Zurbruegg 2015) and improved revenue (Pagano, Röell, and Zechner 2002; Dodd 2013). Coffee (2002), Lang, Lins, and Miller (2003), and Korczak and Korczak (2013) argue that these benefits are possible due to the macroeconomic characteristics in the domestic and/or host countries, which stem from government policies. Thus, the decision to cross-list to a specific destination depends on the market characteristics of both the domestic country and the prospective host country.

There are, however, two opposing arguments on how country characteristics impact cross-listing decisions. For example, Claessens, Klingebiel, and Schmukler (2006) find that firms from high-income economies with sound macro policies, efficient legal systems, greater market openness, and high growth prospects engage in more cross-listing. Pagano, Röell, and Zechner (2002) on the other hand, show that countries with stronger corporate governance standards attract more cross-listing from countries with weaker ones[3] Supporting the latter argument, Korczak and Korczak (2013), indicates that the number of cross-listings reduces as a domestic country becomes more developed. Pagano et al. (2001) further assert that firms from European countries tend to cross-list on markets that are liquid, and large, and where firms from their industry are already cross-listed. Based on these facts among others, while it is clear that the economic conditions of countries are essential influencers of the cross-listing decisions and their flows, it is unclear the direction of the impact. We postulate, in line with previous studies, that if policies drive and form the basis of such market characteristics, uncertainties about them could be important for the cross-listing decision (see, e.g. Hall 2020; Collier and Dollar 2001).

More importantly, periods of high local EPU may have several implications for firms seeking to cross-list and other firms. First, firms may be discouraged from borrowing from banks during high local EPU periods. For example, Zhang et al. (2015) show that firms reduce their leverage ratio during periods of high domestic economic policy uncertainty. They highlight that firms revert to using retained earnings and equity as sales and profits drop during high EPU periods. Second, lenders are likely to increase the risk premium and demand higher interest as the risk of default increases during periods of higher local EPU. For example, Manzo (2013) indicates that a 10% increase in uncertainty leads to a 3% increase in risk premium demanded by lenders. However, higher local EPU may also lead to firms cutting their investment expenditure, reducing the need to raise funds from global markets through cross-listing (Gulen and Ion 2015). Thus, though periods of high local EPU may drive firms abroad, there is also a possibility it may discourage foreign listing as the need for additional funds for investments may vanish.

Given this background, we examine how cross-listing decisions respond to shocks to local and global EPU. Specifically, we perform a Granger Causality test, a Quantile-on-Quantile Regression (QQR) approach, and a Wavelet Coherence analysis to investigate how local and global EPU impact the cross-listing decisions of firms. The EPU Index measures the level of general uncertainty at the national level using several underlying components. For example, the ratio of policy-related economic uncertainty newspaper coverage, the number of tax code provisions set to expire, and lastly, the level of disagreement among economic forecasters about the prospects of a given country. Together with other keywords that connote economic policy-related uncertainty, these components proxy the level of general economic uncertainty in a given country measured monthly. Higher EPU values show higher economic uncertainty, while lower EPU values show lower economic uncertainty in a given month. Higher EPU values show higher economic uncertainty, while lower EPU values show lower economic uncertainty in a given month. The Granger Causality approach provides an initial indication of the correlation between the present values of cross-listing decisions of firms and the present and lag values of EPU. However, the Granger Causality approach is unable to show the direction and dynamics of the relationship over time. We adopt a contemporary but well-established methodology to curb this limitation. Similar to a linear model, the QQR approach examines the relationship between cross-

[3]This is mainly attributed to information environment argument presented by Domowitz, Glen, and Madhavan (1998).

listing and EPU at each quantile of both variables. We finally implement a Wavelet Coherence approach, which shows the co-movement between these two-time series over time and at different frequencies.

Results from all three approaches suggest that both local and global EPU significantly impact firm cross-listing decisions. We also show that country development status and size mitigate the impact of local and global EPU on cross-listing decisions. Specifically, we report that firms from smaller/less-developed markets respond more to local EPU by seeking foreign listing while firms from larger/more-developed markets show limited response. We again indicate that firms from smaller markets reduce/avoid cross-listing in the face of high EPU, while those from larger markets show relatively limited response. Our results suggest that high local EPU does not discourage investments; rather, firms seek foreign sources of funds to finance their operations and investments.

II. Literature

Economic Policy changes and their impacts are well studied, although these studies show mixed results. For example, Engel, Hayes, and Wang (2007) show an increase in the number of privatization of firms after the passage of the Sarbanes Oxley (SOX) Act of 2002 in the US. Zhang (2007) finds a negative cumulative abnormal return during the SOX Act passage. However, recent discussions indicate that due to the documented outcomes of previous policy changes, uncertainties about future policy changes and their effects have increased with a greater impact on corporate decisions (Baker et al. 2016). For example, Zhang et al. (2015) indicate that firms tend to use internal funds during periods of economic policy uncertainty. Bonaime, Gulen, and Ion (2018) argue that the rate of mergers and acquisitions reduces significantly during periods of high economic policy uncertainty. Brogaard and Detzel (2015) document that an increase of one standard deviation in EPU results in a 1.5% increase in forecasted three-month abnormal returns. These studies, among others, are indicative of the fact that EPU is a significant economic risk factor that normally has implications for corporate decisions and strategies. We contribute to this discussion by examining how EPU influences the cross-listing decisions of firms.

Earlier studies on cross-listing argued that the motivation for cross-listing was to raise additional funds that were not readily available in the domestic markets (Lang, Lins, and Miller 2003; Khurana, Martin, and Periera 2007; Sarkissian and Schill 2016). However, recent studies show that in addition to raising funds, firms cross-list for other reasons (Lang, Lins, and Miller 2003; Choi et al. 2009; Berkman and Nguyen 2010; Korczak and Korczak 2013; Balli et al. 2022). For example, Pagano, Röell, and Zechner (2002) show that firms cross-list to improve liquidity, increase visibility, for better corporate governance, and as part of their expansionary business strategy. Merging several studies on the motivation for cross-listing, Dodd (2013) shows that these motivations are skewed towards both domestic and host market characteristics than firm-specific characteristics. Doidge, Karolyi, and Stulz (2009) support this argument by indicating that although firms may possess similar characteristics, foreign firms prefer a US listing to other markets due to certain peculiar market characteristics. All these studies, among others, emphasize the relevance of market characteristics for the cross-listing decisions of firms.

Starting from Hargis (2000) another strand of the literature has examined the impact of cross-listing on firm performance. Firms with exposure to developed economies and emerging markets grew rapidly after cross-listing. Frijns et al. (2010) examine the price discovery of Australian and New Zealand bilaterally listed stocks and find that in both cases the home market is dominant in terms of price discovery. However, they also observe that as firms grow larger and their cost of trading in Australia declines, the Australian market becomes more informative. Silva and Chávez (2008) also emphasized the importance of cross-listing in the Latin American markets. They find that only big firms enjoy liquidity access therefore their returns are remarkable compared to smaller firms that cross-listed overseas. Analyzing Central and Eastern European stock markets, Korczak and Korczak (2013) find that cross-listing and stock market performance is not linear. There are ups and downs but overall, the impact is positive. Cross-listing and international markets integration is also investigated. Ahearne, Griever, and Warnock (2004) showed that cross-listing decreases the asymmetric information between international investors,

therefore reducing 'home bias'. Similarly, Ke, Ng, and Wang (2010) find that US investors have great exposure to other emerging markets when cross-listing from those markets occurs in the US markets. In particular local fund managers in the US, consider cross-listing in the US a positive sign to invest abroad. Baker, Nofsinger, and Weaver (2002) also find that firms listed on the NYSE and LSE experience higher visibility and capital inflows. Therefore they are more integrated with the rest of the world. Overall, cross-listing creates exposure and decreases the asymmetric information between developed and developing economies. Thus, as investment flows to those markets increase, cross-listing creates a positive impact on market integration.

A generous number of studies show that market characteristics are founded on government policies, economic or otherwise. For example, Devarajan, Swaroop, and Zou (1996) emphasize a strong relationship between government policies on expenditure and total economic growth. They also argue that sectors of an economy that receive more government budgets tend to show greater development structurally and become increasingly efficient. These actions encourage growth and make those sectors more attractive to foreign corporations that operate in the same or similar sectors. Studying the influence of government policies on economic activities, Pastor and Veronesi (2012) indicate that changes in government policies influence both the targeted sector as well as other sectors closely or remotely connected to the targeted sector. They also show that government policies dictate the macroeconomic and institutional frameworks of a given economy on which economic activities thrive or fail. Thus, further emphasizing the relevance of government economic policies in determining the market structure and characteristics of a given country. They also infer that uncertainty about government policies is likely to influence the general confidence of market stakeholders and their decisions.

Recent studies on the influence of Economic Policy Uncertainty on firm decisions focused on how either idiosyncratic and/or general uncertainty influenced firm operations with more emphasis on firm investment and capital structure. For example, Rodrik (1991) indicates that firms withhold investments until residual uncertainty about policies and reforms is eliminated. Gulen and Ion (2015) show that policy uncertainty can depress firm investments by inducing a precautionary delay because of investment irreversibility. In agreement with this notion, they further argue that minimum levels of policy uncertainty could lead to huge repercussions in firms' drive to invest. Specific to Economic Policy Uncertainty, Wang, Chen, and Huang (2014), among others,[4] emphasize that firms reduce their investment as EPU increases, and vice versa. Julio and Yook (2012), using the elections period as a proxy of EPU, argue that periods of economic and political uncertainty are accompanied by some 4.8% reduction in firm investment expenditure.

A few studies also consider the influence of policy uncertainties on corporate capital structures. For example, Wang, Chen, and Huang (2014) postulate that during periods of policy uncertainties, firms tend to use internal sources of funds while eschewing the benefits of external funding. Myers (1984) examines how firms decide on their sources of funds. He showed that firms consider the potential future macroeconomic outlook of their respective countries. Supporting this argument Titman and Wessels (1988) examine theories of firm optimal capital structure and indicates that firms' decisions on sources of funds are dependent on attributes that are responsible for the various costs and/or benefits associated with a given type of financing option. They emphasize, in addition to firm-specific characteristics, that future expectations about general economic characteristics play a vital role in determining both the choice and the associated cost of the financing option. Feng (2001) argues that typically, firms' investments and capital structure are closely linked to government economic policies as these policies indicate the direction of the country. Thus, unlike other forms of uncertainties, Economic Policy Uncertainty is exogenous, making it of grave importance to firm decisions. We contribute to these ongoing discussions by examining how EPU influences the cross-listing decisions of firms.

[4]See for example, Kang, Lee, and Ratti (2014).

III. Data and descriptive statistics

In this paper, we analyse the relevance of local and global EPU in the cross-listing decisions of firms from 13 countries for the period 1990 to 2016, based on the availability of the EPU Index developed by Baker et al. (2016)[5] and the continuity of the cross-listing data. The main variables are collected on monthly terms. The EPU Index measures the level of general uncertainty at the national level using several underlying components. For example, the ratio of policy-related economic uncertainty newspaper coverage, the number of tax code provisions set to expire, and lastly, the level of disagreement among economic forecasters about the prospects of a given country. Together with other keywords that connote economic policy-related uncertainty, these components proxy the level of general economic uncertainty in a given country measured monthly. Higher EPU values show higher economic uncertainty, while lower EPU values show lower economic uncertainty in a given month. We adopt the EPU index at both the country/local level and the global levels to examine how each level of economic uncertainty influences the cross-listing decisions of firms.

For the cross-listing data, we source data on the monthly values of cross-listings from each sample domestic country in a given month to different destination markets from DataStream. Common to the literature, we normalize the cross-listing values by the market capitalization values of each domestic market, which controls for the effect of large firms having a better capacity to undertake more cross-listing than smaller firms (King and Segal 2003). Thus, also controlling for the effects of outlier observations. We follow Sarkissian and Schill (2016) and consider only firm-initiated cross-listings while ignoring all non-equity listings due to data unavailability. We also ignore delisted, merged, and suspended firms as common in the literature (Pagano et al. 2001; Berkman and Nguyen 2010; Karolyi 2012).

To measure economic policy uncertainty, we resort to the monthly EPU index of Baker et al. (2016) for 13 countries for the period 1990 to 2016 to examine this relationship. Baker et al. (2016) constructs a weighted average frequency count of news articles that contain words that connote uncertainty about a country for each month. For example, the US EPU index comprises three main components, news-based, tax-based, and forecasters' disagreements as keywords. Higher EPU values generally indicate higher economic uncertainty, while lower EPU values suggest lower economic uncertainty for each sample month for each country. We then source data on the total market value of shares cross-listing for each month for each sample country and scale them by the monthly market capitalization of the domestic market.

Table 1 presents the summary statistics for the value of cross-listing, local EPU, and global EPU. From the table, we observe relatively similar averages of 2.05 local EPU for bigger countries except for Italy. This could be because of the limited policy changes in these countries (Van Stel and Suddle 2008). Similarly, we also observe that the standard deviation of cross-listing for all countries is around 1 except Korea, which could be explained by the strong influence the Korean government has on the internationalization and/or cross-listing decisions of firms (Kim 2003). We also observe relatively higher maximum cross-listing values for the US and UK, which is expected as the US, and the UK have shown continuous higher and increasing cross-listing in other foreign markets (Sarkissian and Schill 2016). For the standard deviation of local EPU, we observe considerable variations, which could be an indication of the differences in the economic characteristics and fabric of each sample country. For the UK, we observe particularly the highest local EPU value, which could be due to national events including the BREXIT referendum, which spurred the level of uncertainty about the future economic prospects after BREXIT (Baker et al. 2016). From the global EPU values, we observe mean values that are similar to those of local EPU for smaller economies except Italy, with larger economies showing larger local EPU than global. Skewness and kurtosis values show a relatively limited dataset; thus, results are not outlier-driven.

[5]Baker et al. (2016) develop and introduce a measure of Economic Policy Uncertainty for 19 countries, which this study adopts.

Table 1. Country-wise descriptive statistics.

Country	Variables	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
Australia	EPU	1.94	1.95	2.52	1.41	0.20	0.07	3.49
	CL	2.87	2.94	5.72	0.35	1.09	−0.20	2.78
Canada	EPU	2.05	2.06	2.65	1.48	0.22	0.03	2.58
	CL	3.15	3.24	5.99	0.09	0.98	−0.45	3.74
France	EPU	2.05	2.06	2.65	1.05	0.28	−0.35	3.07
	CL	3.66	3.75	7.44	0.51	1.15	0.07	3.23
Germany	EPU	2.05	2.05	2.66	1.45	0.20	−0.11	2.83
	CL	3.50	3.46	7.84	0.38	1.30	0.26	3.22
Ireland	EPU	1.95	1.98	2.37	1.30	0.25	−0.63	2.88
	CL	3.17	3.22	7.25	0.46	1.19	0.47	4.94
Italy	EPU	2.05	2.09	2.39	1.50	0.15	−0.67	3.11
	CL	3.36	3.31	6.09	−0.02	0.99	−0.39	4.01
Japan	EPU	1.99	1.98	2.38	1.69	0.13	0.60	3.32
	CL	3.87	3.97	6.92	1.26	0.92	−0.13	3.36
Korea	EPU	1.96	1.96	2.61	1.35	0.23	−0.06	2.61
	CL	3.89	3.90	4.35	3.20	0.41	−0.56	2.40
Netherlands	EPU	1.97	1.99	2.37	1.43	0.13	−0.33	4.97
	CL	3.58	3.59	6.87	0.25	1.06	−0.15	3.67
Spain	EPU	1.92	1.82	2.61	1.37	0.19	0.86	3.98
	CL	0.73	2.00	12.00	0	1.41	3.46	19.89
Sweden	EPU	1.98	1.99	2.29	1.73	0.09	−0.16	2.67
	CL	3.11	3.09	5.73	0.93	0.98	0.13	2.65
UK	EPU	2.00	1.89	3.06	1.40	0.29	0.81	3.02
	CL	4.36	2.00	81.00	0	7.69	6.03	52.30
US	EPU	2.02	2.00	2.45	1.65	0.15	0.38	2.91
	CL	4.73	4.65	9.08	1.26	1.26	0.66	4.94
Global	EPU	1.98	1.93	2.45	1.71	0.14	0.84	3.72

EPU is the monthly local Economic Policy Uncertainty index for each sample country; CL is the monthly values of cross-listing for each sample country. CL values are multiplied by 10,000 given most CL values are below 1%.

IV. Empirical analysis

Granger Causality

This study examines how Economic Policy Uncertainty influences cross-listing decisions of firms. We start our analysis by first adopting the Granger Causality methodology introduced by Engle and Granger (1987). This method detects the causal relationship between global EPU and cross-listing and then local EPU and cross-listing. Granger Causality examines the correlation between the present values of cross-listing decisions of firms and the present and past values of Economic Policy Uncertainty[6] The Granger Causality estimation model is expressed as:

$$CL_t = a_1 + \sum_{j=1}^{k} \alpha_i CL_{t-j} + \sum_{j=1}^{k} \beta_i EPU_{t-j} + \varepsilon_{1t} \quad (1)$$

where CL_t is the log monthly value of cross-listing from a given country to different destination markets at a given time. CL_{t-j} is the lag of CL_t while EPU_{t-j} is the lag aggregate Economic policy value for each given country.

Table 2 shows the Granger Causality estimation results between local EPU and cross-listing and global EPU and cross-listing[7] The results indicate that global EPU granger causes cross-listing for firms from Japan, Korea, Sweden, and Australia. We also observe that for firms from Australia, Germany, Ireland, Italy, Korea, and the Netherlands, local EPU granger causes cross-listing. Though we are unable to conclude the direction and magnitude of the impact of either global or local EPU on the cross-listing decisions, we can generalize from Table 2 that firms from smaller economies tend to be influenced by both global and local EPUs. These results further suggest, in line with the cross-listing literature, that firms cross-list on foreign markets to benefit from the better economic conditions (Baker, Nofsinger, and Weaver 2002; Dodd 2013; Korczak and Korczak 2013). We postulate that EPUs strongly captures these economic conditions. However, the Granger Causality approach is unable to provide the direction of the relationship.

[6]Following Cheung and Lai (1995) and common to the application of the Granger causality methodology and time series analysis, we test for unit root in the data using the Augmented Dicky-Fuller (Case *et al.*) test and find that we have strong evidence to reject the unit root hypothesis.
[7]We could not estimate the causality between cross-listing and Global economic policy due to insufficient Global EPU observations for Netherlands.

Table 2. Estimation results for granger causality.

Country	Global_EPU	Local_EPU
Australia	3.32***	2.49**
Canada	1.09	1.24
France	1.06	0.23
Germany	0.34	2.02*
Ireland	1.32	2.61**
Italy	1.52	0.25***
Japan	2.50*	0.435
Korea	3.87**	0.03***
Netherlands	0.49	4.72***
Spain	0.89	0.97
Sweden	0.99***	1.49
UK	0.89	0.94
US	1.71	0.49

Table prints the F-statistics that show whether Global EPU or Local EPU granger cause cross-listing for a listed country within the sample. The dependent variable for Granger Causality model is CL, which is the value of the cross-listings from the sample countries for each month from January 1990 to December 2016. *, ** and *** indicate that the F-tests are statistically significant at 10%, 5%, and 1% respectively.

Quantile on quantile estimation

Although the results from the granger causality test highlight how elements of both local and global could predict cross-listing decisions, we are unable to ascertain a comprehensive understanding of this relationship. We adopt a Quantile-on-Quantile Regression (QQR) approach to curbing this.

The QQR approach, as introduced by Koenker and Bassett (1978), provides a scope to examine how the quantiles of a given variable influence those of another variable based on a blend of non-parametric and quantile estimation. Generally regarded as an extension to the OLS estimation approach, the quantile regression differentiates itself by showing the dependencies between two variables at different quantile distributions. Thus, Quantile regressions estimate the impact at the tails of the distribution of the dependent variable, enabling a comprehensive examination of the impact of the independent variable on the dependent variable. The nonparametric component of the QQR model allows for the dimensionality difficulty linked with the nonparametric model. Thus, adopting the QQR approach offers the ability to examine the dependence of one variable on another, showing a piece of more detailed information on the dependence compared to the OLS among other standard approaches.

For this study, we set up a QQR model that seeks to examine how local and global EPU separately influences the decision to cross-list. Our QQR model can be expressed as:

$$CL_t = \beta^{\emptyset}(EPU_t) + \alpha^{\theta} CL_{t-1}\varepsilon_t^{\emptyset} \tag{2}$$

Where CL_t proxies the total value of shares cross-listed from a given country in month t. EPU_t represents the local or global Economic Policy Uncertainty value or a given country in month t. $\emptyset$ is the $\emptyset th$ quantile of the conditional distribution of cross-listing while $\varepsilon_t^{\emptyset}$ is the error term, conditional $\emptyset th$ quantile equals zero. Following Sim and Zhou (2015) $\beta^{\emptyset}$ (.) is allowed to be unknown, given that we are unable to associate any prior information for the cross-listing and EPU relationship.

To examine how the $\emptyset th$ quantile of Local and Global EPUs relate to the th quantile of cross-listing, we study Eq. (1) in the neighbourhood ofEPU^{τ}. With $\beta^{\emptyset}$ (.) unknown, we estimate the function by taking a first-order Taylor expansion a quantile EPU^{τ} which results in Eq. (2) given as

$$\begin{aligned} CL_t &= \beta^{\emptyset}(EPU_t) \\ &\approx \beta^{\emptyset}(EPU^{\tau}) + \beta^{\emptyset'}(EPU^{\tau})(EPU_t - EPU^{\tau}) \end{aligned} \tag{3}$$

Where $\beta^{\emptyset}$ is a proxy that represents the marginal effect and a partial derivation of $\beta^{\emptyset}(EPU_t)$ relating toEPU. It could also be regarded similar to the slope coefficient in a linear regression setup. Both $\beta^{\emptyset}(EPU^{\tau})$ and $\beta^{\emptyset'}(EPU^{\tau})$ are functions of $\emptyset$ and τ are functions and can, therefore, be expressed as $\beta_0(\emptyset,\tau)$and $\beta_1(\emptyset,\tau)$ respectively. With this in mind, Eq. (2) can then be rewritten as

$$\beta^{\emptyset}(EPU_t) \approx \beta_0(\emptyset,\tau) + \beta_1(\emptyset,\tau)(EPU_t - EPU^{\tau}) \tag{4}$$

We can also modify Eq. (1) by replacing the derivation from Eq. (3) into Eq. (1) which provides the expression:

$$CL_t = \beta_0(\emptyset,\tau) + \beta_1(\emptyset,\tau)(EPU_t - EPU^{\tau}) + \varepsilon_t^{\emptyset} \tag{5}$$

Where Eq. (4) provides the quantile-on-quantile dependence between the cross-listing decisions of firms and Local and global EPU. However, estimating Eq. (4) requires replacing EPU_t with an estimated proxy $\widehat{EPU_t}$ while replacing EPU^{τ} with

$\widehat{EPU^{\tau}}$. By solving Eq. (5), we obtain the local linear estimates of parameters b_0 and b_1, which are also the estimates of β_0 and β_1. Eq. (5) is given as:

$$\min_{b_0,b_1} \sum_{i=1}^{n} \rho_{\theta}\left[CL_t - b_0 - b_1\left(\widehat{EPU_t} - \widehat{EPU^{\tau}}\right)\right] K\left(\frac{F_n\left(\widehat{EPU_t}\right) - \tau}{h}\right) \quad (6)$$

Where $\rho_{\theta}(\mu)$ proxies the quantile loss function while h represents the kernel bandwidth parameter. To weigh the observations in the neighbourhood ofEPU^{τ}, we adopt the Gaussian Kernel approach. This approach is widely used in financial and economic studies for its simple computation and efficiency. The Gaussian Kernel approach is symmetric around zero and allocates low weights to observations farther away from the neighbourhood of $\widehat{EPU^{\tau}}$ based on bandwidth$h$. The weights are inverse to the distance of $\widehat{EPU_t}$ from.

Common to most approaches, the selection of suitable bandwidth could prove problematic. Specifically, while choosing a small bandwidth could reduce bias estimates, it increases the variances and vice versa. Thus, the selection of a bandwidth that minimizes both the bias and variance is imperative. We follow Sim and Zhou (2015) and choose a bandwidth parameter where $h = 0.05$.

Estimates of quantile-on-quantile regression

This section presents the estimation results of the QQR approach adopted in this study. The approach shows the dependence between cross-listing decisions of firms and local and global EPU. Estimating this relationship using the QQR approach requires the selection of quantiles of local and global EPU (indexed byτ) while showing how such τ-quantiles of local and global EPU influences the $\emptyset$-quantiles of cross-listing. Given that we are interested in how local and global EPUs affects the cross-listing decision, we begin our analysis by investigating the dependence between local EPU and cross-listing. The results of the QQR approach are reported in a two-dimensional plot in Figure 1 (see Appendix).

Figure 1 provides three detailed results about the dependence between cross-listing and local EPUs, which in the Granger Causality estimations are unable to reveal.

First, we report a positive dependence between the quantiles of Local EPUs of most of the sample countries and the quantiles of the outbound cross-listing from those countries. The results suggest that periods of high economic uncertainty increase firms seeking foreign listing. This finding is in line with the extant literature that argues that macro-economic conditions play a significant role in the decision to cross-list, as firms seek foreign listing to raise foreign funds (e.g. Hargis and Ramanlal 1998; Silva and Chávez 2008; Hostak et al. 2013; Korczak and Korczak 2013; Balli et al. 2017; Balli, Ghassan, and Al Jeefri 2021).

Second, notwithstanding the reported general positive dependence, we observe considerable heterogeneity across the sample countries. A natural reason could be either the variation in the local market characteristics, including size and level of competition for funding (see, for example, Pagano, Röell, and Zechner 2002).

Third, we find significant variations of the slope coefficient ($\beta^{\emptyset}$)at different quantiles of Local EPU and cross-listing for each sample country. These variations suggest that the dependency between local EPU and cross-listing is subject to the magnitude of local EPU shocks and potentially the ability of the domestic market to absorb such shocks. It is worth noting that while Figure 1 shows a general positive dependence between local EPU and cross-listing, the relationship is strongest at extreme local EPU levels. This finding suggests that firms decide to cross-list when local EPU is at its highest whereas, low and medium local EPU might not generate significant cross-listing decisions.

At the country level, we report a pattern for more developed markets and other markets. Specifically, we find that the strongest connection between local EPU and cross-listing is shown in weaker markets, while more advanced equity markets such as the US, UK, and Germany show a limited influence of local EPU. While market size, among other market characteristics, can be cited as a potential reason for this finding, these

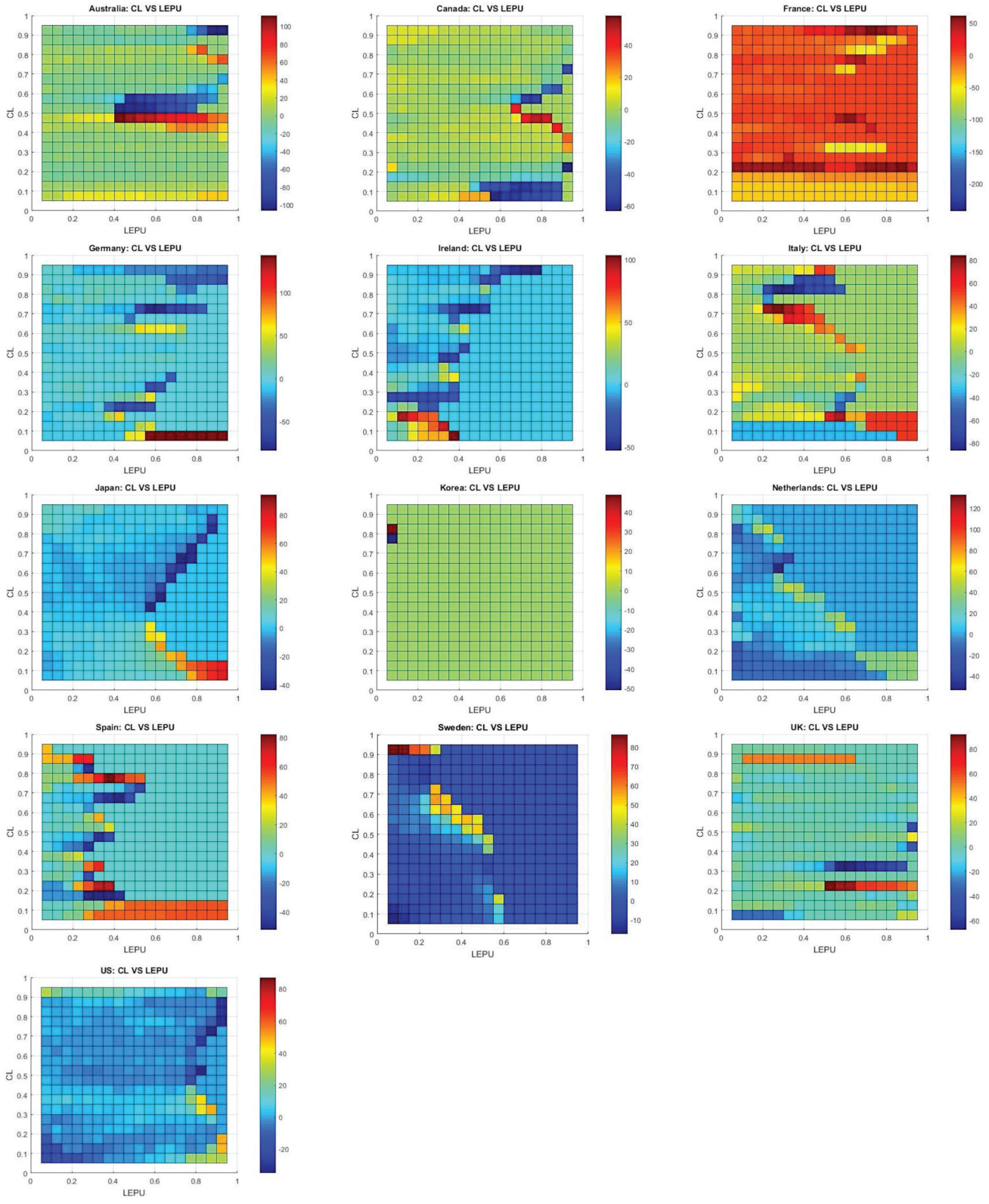

Figure 1. Quantile on Quantile Estimation for Local EPU and Cross-Listing. **Note**: Figure 1 is a two-dimensional estimation showing a pairwise dependence between local EPU (LEPU) and cross-listing (CL) for each sample country. Warmer (red) spots show high positive dependence, while colder (blue) spots show negative dependence between local EPU and cross-listing (CL) for each sample country. The x-axis shows the quantiles of local EPU (LEPU) while the y-axis shows the quantiles of cross-listing (CL)

markets are among the first choice for cross-listing. Thus, local EPU is more likely to influence the inflows of cross-listings than outflows (Doidge, Karolyi, and Stulz 2009). It is also important to indicate that Korea does not have enough quantile observations to draw any substantial conclusions.

Like Figures 1 and 2 provides a two-dimensional presentation of the QQR estimation for the relationship between global EPU and cross-listing. Particularly, Figure 2 shows the relationship between the quantiles of global EPU and the quantiles of cross-listing for each given sample country. Figure 2 provides interesting results from a general, quantile, and country perspective. We observe a general negative relationship between global EPU and cross-listing decisions. This finding suggests that firms are not motivated to cross-list when global uncertainty is worse. A possible explanation is that periods of worse global EPU generally indicates that most potential host markets are likely to be struggling economically. Thus, cross-listing during such periods might result in low patronage and financial loss, given the costs involved in cross-listing (Domowitz, Glen, and Madhavan 1998; Lang, Lins, and Miller 2003; Khurana, Martin, and Periera 2007; Choi et al. 2009).

We also find significant variations in the dependence for different quantiles of both global EPU and cross-listing. Similar to Figure 1, this finding suggests that different global EPU shocks result in different shocks in cross-listing. In particular higher global EPU (higher quantiles of global EPU) discourages high cross-listing (higher quantiles of cross-listing). We further note that this relationship becomes weaker at lower quantiles of both global EPU and cross-listing. Our results suggest that while higher global EPU may signal higher global uncertainty, low to medium global EPU may signal that there are still host markets that might be doing well enough to encourage cross-listing from some markets. Thus, the dependence between global EPU and cross-listing is more pronounced as global uncertainty heightens.

A country-level examination reveals the role of country dynamics in the global EPU and cross-listing relationship. While we observe the strongest negative relationship at higher quantiles of global EPU and cross-listing for most sample countries, some countries show mild impact. Consistent with Figure 1, we find that larger economies tend to be less affected by global EPU compared to smaller economies. In particular, the US, UK, Germany, and Canada show the strongest dependence when global EPU is approaching its highest rather than at its highest. A possible reason could be that these markets tend to be net transmitters of EPU compared to smaller economies, which are net receivers (Klößner and Sekkel 2014; Yin and Han 2014; Bernal, Gnabo, and Guilmin 2016).

Though the QQR approach provides a comprehensive picture of the relationship between our variables of interest, the approach assumes the relationship at a given time. In this regard, a QQR approach could be regarded similar to a cross-sectional estimation that provides the relationship between variables at a given time. Thus, the QQR approach is unable to show the dynamics in this relationship over time.

Wavelet coherence Methodology

Given the time limitation of the QQR approach, we further test the relationship between local EPU and cross-listing and global EPU and cross-listing using wavelet coherence analysis. Unlike the QQR approach, which only shows the relationship at only different frequencies, the wavelet coherence breaks down the sample into periods and frequencies and detects periods where two-time series co-moves. The wavelet coherence shows the nature of co-movement between two-time series over a specified time and at different frequencies. Thus, we measure the co-movement between two sets of paired variables, which is similar to the squared correlation coefficient in linear regression. We first measure the correlation between local EPU and cross-listing and then global EPU and cross-listing. This tells us how these two sets of paired time-series co-move in time-frequency space and produces a wavelet coherence coefficient between 0 and 1.

Following Rua and Nunes (2009) and Torrence and Compo (1998), the wavelet is expressed as:

$$\psi_{u,s}(t) = \frac{\psi\left(\frac{t-u}{s}\right)}{\sqrt{s}} \tag{7}$$

Where scale s and location u are at time t, $\sqrt{s}$ is a normalization factor that provides unit variance

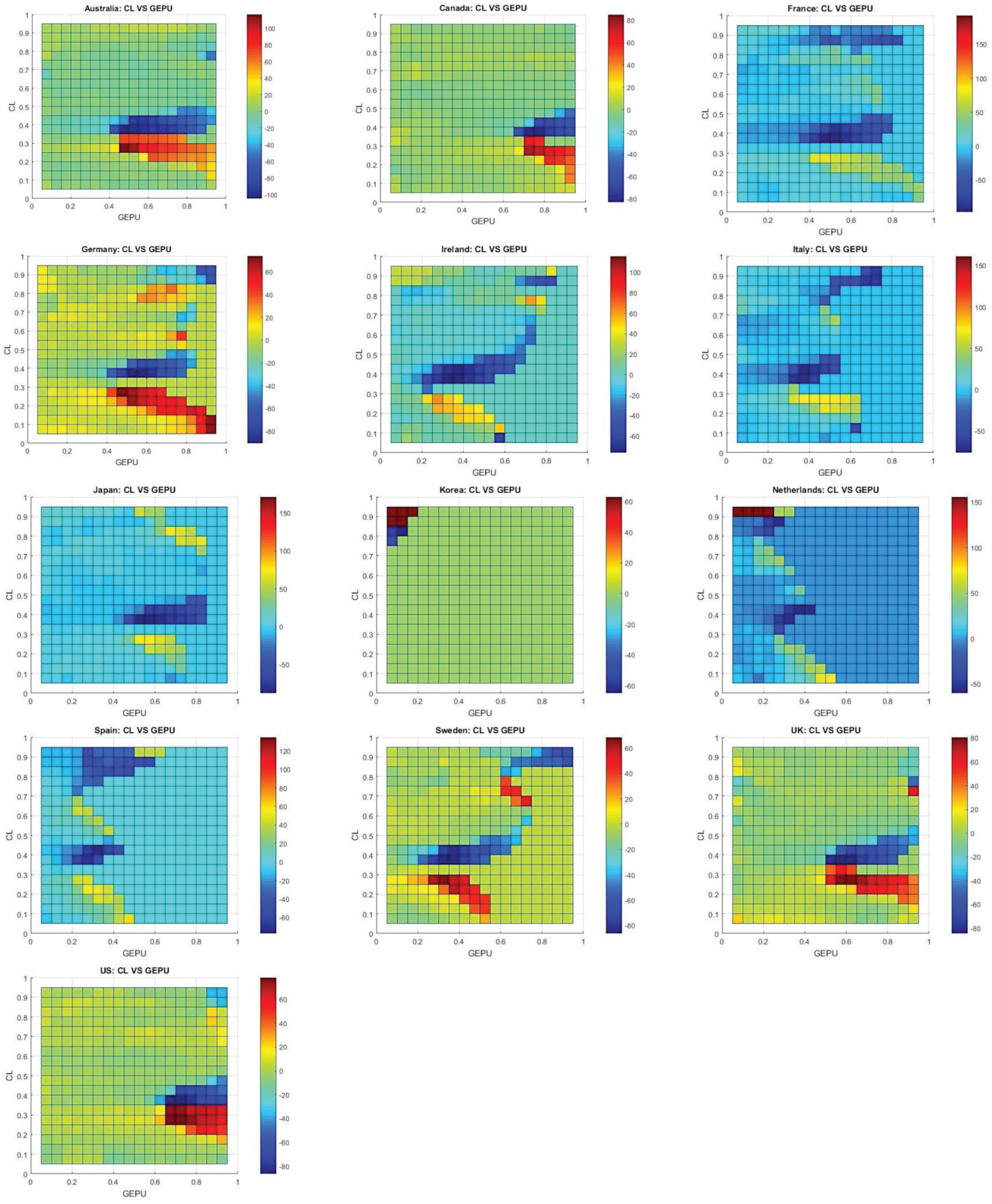

Figure 2. Quantile on quantile estimation for global EPU and cross-listing. **Note**: Figure 2 is a two-dimensional estimation showing a pairwise dependence between global EPU (GEPU) and cross-listing (CL) for each sample country. Warmer (red) spots show high positive dependence, while colder (blue) spots show negative dependence between global EPU and cross-listing (CL) for each sample country. The x-axis shows the quantiles of global EPU (GEPU) while the y-axis shows the quantiles of cross-listing (CL)

of the wavelet. Scales and frequencies on a wavelet have a negative relationship, implying that higher scales denote lower frequencies. This is given with the notion that a wavelet has a mean of zero and is generally normalized in a way that $-\infty + \infty\psi(t)dt = 0$ and $-\infty + \infty\psi 2(t)dt = 1$. To explain the wavelet coherence methodology, we begin by introducing the cross-wavelet transform, following Cai et al. (2017). According to Torrence and Compo (1998), cross wavelet can be expressed as:

$$W_{xy}(u,s) = W_x(u,s)W_y(u,s) \tag{8}$$

where the continuous wavelet transforms of $x(t)$ and $y(t)$ are given as $W_x(u,s)$ and $W_y(u,s)$ respectively. $W_{xy}(u,s)$ shows the periods and/or areas where time series,x and y covary at each given scale.

Given this background, the wavelet coherence seeks to identify areas in a combined time and frequency spectra where both time series x and y co-move even if there is less low common power of co-movement. Similar to Vacha and Barunik (2012), the squared wavelet coherence coefficient is expressed as:

$$R^2(u,s) = \frac{\left[S\left(s^{-1}W_{xy}(u,s)\right)\right]^2}{S\left(s^{-1}\left[W_x(u,s)\right]^2\right)S\left(s^{-1}\left[W_y(u,s)\right]^2\right)} \tag{9}$$

where S denotes the smoothing operator given that the result of the above equation, Equation 9 should be within the boundaries of zero and one, i.e. $0 \leq R^2 \leq 1$. This further indicates that values closer to one show evidence of a high correlation between x and y while values closer to zero show low levels of correlation between x and$y$.

Wavelet coherence analysis

This section presents an analysis of the wavelet coherence results for the sample countries, highlighting the correlation between local EPU and cross-listing. For this pairwise correlation analysis, wavelet coherence graphs are generated. The wavelet coherence for all sample countries is shown in Figures 3 and 4. The y-axis of the graphs refers to the frequency of correlation (i.e. scale). The y-axis shows the frequency, with high frequencies showing a stronger co-movement between the two series. The x-axis, which is expressed in years, shows the period (i.e. 1990 to 2016) where the time series correlate. Regions with warmer colours (Collins *et al.*) are closer to 1 showing a higher correlation between the time series. Warmer coloured areas closer to the bottom of the graph show high correlation at higher frequencies, while warmer coloured areas closer to the top of the graph show high correlation at lower frequencies. Warmer colours closer to the right show high correlation at the end of the sample period while warmer colours that are closer to the left show a high correlation at the beginning of the sample period. Regarding the level of significance, areas in the white contoured shape represent 5% significance (Rua and Nunes 2009). This implies that areas showing warmer colour indicate a high and significant correlation between the time series and vice versa. Arrows pointing to the right indicate in-phase, left-pointing arrows indicate anti-phase, while downward-pointing indicates leading with upward showing lagging.

Figure 3 shows evidence of co-movement between local EPU and cross-listing, while Figure 2 shows those of global EPU and cross-listing for all sample countries (Australia, Canada, France, Germany, Ireland, Italy, Japan, Korea, Netherlands, Spain, Sweden, UK, and the US). We witness general evidence of the dependence of cross-listing decisions on the level of local EPU and global EPU for all countries. This dependence is seen across several periods and frequencies. Specifically, we see stronger dependence during periods from 1990 to 2002 between global EPU and cross-listing. However, we generally see limited evidence of this dependence between local EPU and cross-listing from the period 1998 to 2004. This could be an indication of firms being more concerned about global economic conditions, especially because cross-listing was an emerging concept during these periods (Domowitz, Glen, and Madhavan 1998). We observe a stronger positive relationship between local EPU and cross-listing for smaller markets while larger markets show little influence of local EPU in the cross-listing decisions of firms. For example, Australia, Italy, Korea and Spain show a strong influence of Local EPU in the mid-1990s and early 2000s at medium to high frequencies while the US and UK limited evidence.

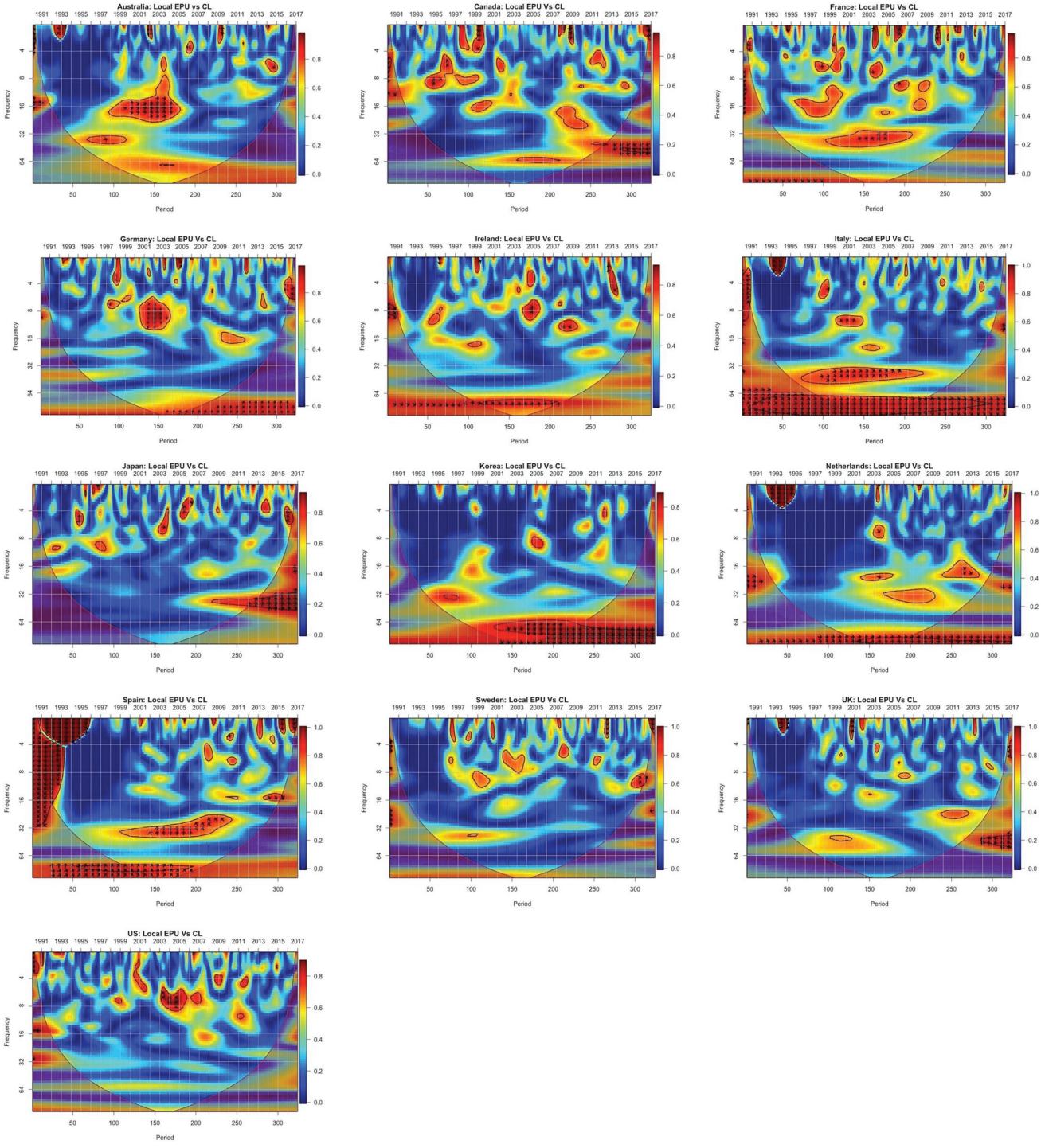

Figure 3. Wavelet coherence analysis for local EPU versus cross-listing. **Note**: Figure 3 is a Wavelet coherence estimation showing a pairwise correlation between Local EPU and cross-listing (CL) sample countries. Warmer (Collins *et al.*) spots show high co-movement between the two variables, while colder (blue) spots show low co-movement between the pair variables. The x-axis represents years from 1990 to 2016 while the y-axis show frequency in months.

From Figure 4, we observe that relatively smaller economies in our sample, including the Netherlands, Sweden and Korea, exhibit high negative co-movement between global EPU and the cross-listing decisions. This is a contrast to larger economies like the United States, United Kingdom and Germany who show limited co-movement similar to the Granger Causality analysis. However, for Australia, we observe high positive co-movement between global EPU and cross-

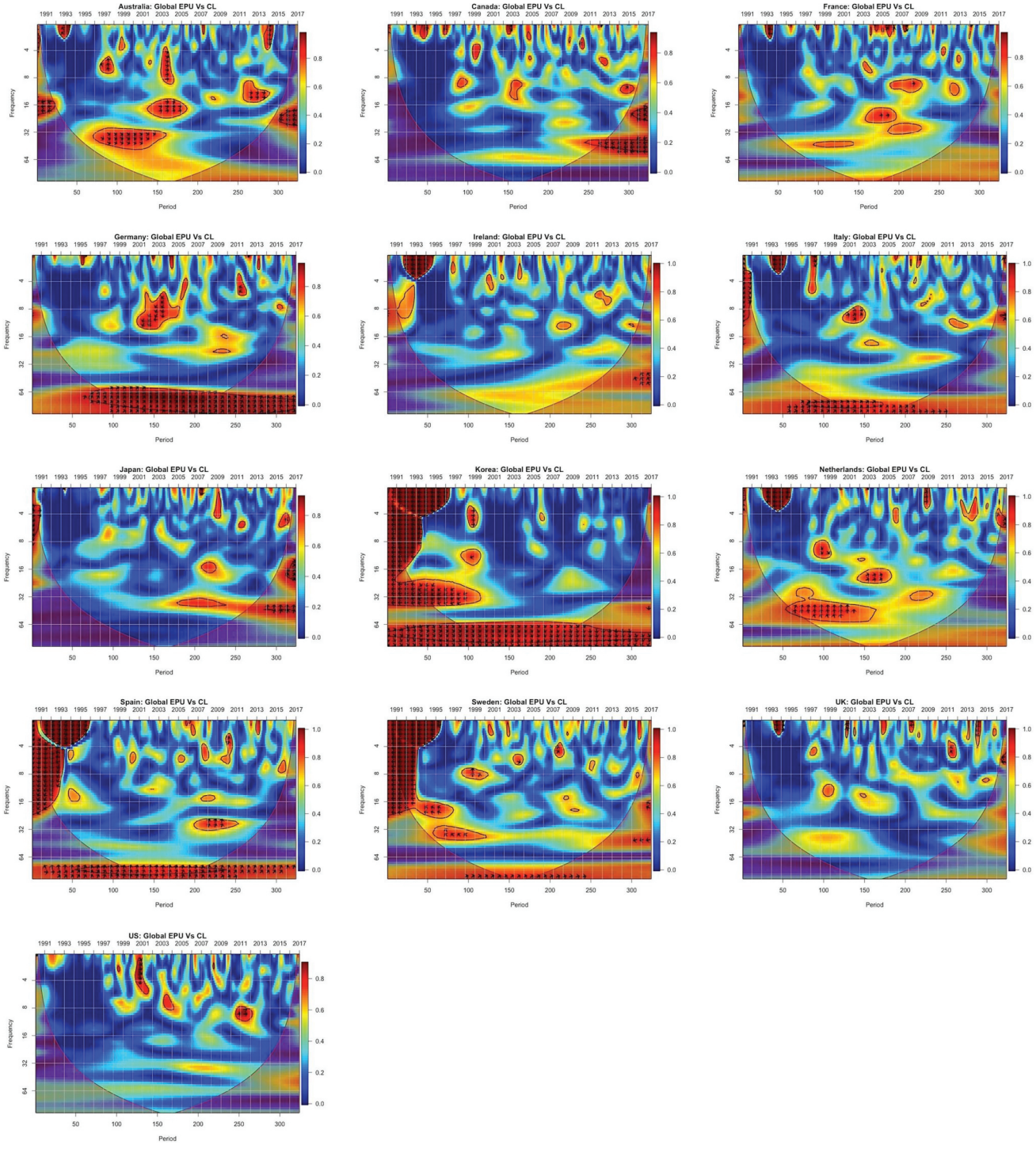

Figure 4. Wavelet coherence analysis for global EPU versus cross-Listing. **Note**: Figure 4 is a Wavelet coherence estimation showing a pairwise correlation between Global EPU and cross-listing (CL) sample countries. Warmer (Collins *et al.*) spots show high co-movement between the two variables, while colder (blue) spots show low co-movement between the pair variables. The x-axis represents years from 1990 to 2016 while the y-axis show frequency in months.

listing decisions during various periods with the strongest between 1996 and 2003. Generally, these results show that when firms from smaller or less developed markets are uncertain about global economic policies and conditions, they tend not to list on foreign markets. Our findings are consistent with the cross-listing literature which shows that the developmental prospects of destination/

foreign markets are vital considerations for the cross-listing decisions of firms (Hargis and Ramanlal 1998; Korczak and Korczak 2013; Azzimonti 2018).

Generally, our results infer two main issues; first, uncertainty about the economic policy in the domestic country motivates firms to cross-list abroad. Secondly, uncertainty about global economic policies makes firms reluctant to cross-list abroad. Specifically, our results support the argument that poor economic conditions in the domestic country encourage firms to seek international listing as a means of seeking a more conducive market among other well-researched benefits. These findings are comparable to those from the foreign direct investment literature that shows that investors seek foreign investment opportunities in the presence of poor economic conditions in their domestic markets (Bevan and Estrin 2004).

It is also interesting to again observe that countries with smaller markets tend to show more co-movement between EPU and cross-listing in general, similar to the Granger Causality and QQR analyses and those of Feldstein (1999). In his paper, he shows that smaller economies tend to be affected by global events as they are predominantly trade-reliant on bigger economies, thus, making them receivers of shocks and spillovers. Supporting this line of argument, Calvo and Reinhart (1996) indicates that smaller economies are more vulnerable to both regional and global events due to such trade connections.

Most importantly, our findings suggest that the wavelet coherence methodology is able to observe a certain correlation that is not captured by the Granger Causality methodology as shown by Engle and Granger (1987); Torrence and Compo (1998); Cai et al. (2017).

V. Conclusions

The role of policy uncertainty in corporate decisions remains a growing area of research and discussion, especially in recent years. This study contributes to the ongoing discussions by investigating the relationship between Economic Policy Uncertainty and the cross-listing decisions of firms. To this end, we collect firm and country-level data for 13 countries selected purely based on the availability of the Economic Policy Uncertainty data and the market value of shares cross-listed from the year 1990 to 2016. We begin our analysis by employing a Granger Causality methodology, which shows that local and global Economic Policy Uncertainties are important in the cross-listing decisions of firms. However, given the inability of the Granger Causality approach to establish the direction of the relationship, we implement two contemporary approaches: Quantile on Quantile Regression (QQR) and Wavelet Coherence approaches. While the QQR approach provides a quantile examination of the relationship, the Wavelet Coherence approach provides both time and frequency examination of the relationship.

Our results reveal that local EPU is positively associated with cross-listing decisions, while global EPU is negatively associated with cross-listing decisions. Our results further reveal that the size/characteristics of the domestic market mitigate this association. Specifically, we show that smaller or less developed markets exhibit more impact from Local EPU using the Granger Causality estimation. Although the results from the Quantile-on-Quantile Regression (QQR) and the Wavelet Coherence approaches are generally similar to those of the Granger Causality, we find that the Granger Causality estimation does not capture some co-movements.

In summary, the results suggest that periods of high local EPU influence firms from smaller markets to seek foreign listing, while firms from larger markets show limited influence. On the other hand, periods of high global EPU influences firms from smaller markets to reduce or avoid foreign listing. These results provide two important implications for policymakers. First, although policy uncertainty cannot be totally avoided, policymakers could create and maintain policy transparency as they have implications on corporate decisions. Second, the results of this study emphasize the relevance of economic policies in the domestic market in attracting/repelling foreign investments.

Disclosure statement

No potential conflict of interest was reported by the author(s).

References

Ahearne, A. G., W. L. Griever, and F. E. Warnock. 2004. "Information Costs and Home Bias: An Analysis of US Holdings of Foreign Equities." *Journal of International Economics* 62 (2): 313–336. doi:10.1016/S0022-1996(03)00015-1.

Azzimonti, M. 2018. "Partisan Conflict and Private Investment." *Journal of Monetary Economics* 93: 114–131. doi:10.1016/j.jmoneco.2017.10.007.

Bacidore, J. M., and G. Sofianos. 2002. "Liquidity Provision and Specialist Trading in NYSE-Listed Non-US Stocks." *Journal of Financial Economics* 63: 133–158. doi:10.1016/S0304-405X(01)00092-7.

Baker, N. Bloom, S. J. Davis, and S. R. Baker. 2016. "Measuring Economic Policy Uncertainty." *The Quarterly Journal of Economics* 131 (4): 1593–1636. doi:10.1093/qje/qjw024.

Baker, H. K., J. R. Nofsinger, and D. G. Weaver. 2002. "International Cross-Listing and Visibility." *The Journal of Financial and Quantitative Analysis* 37: 495–521. doi:10.2307/3594990.

Balli, F., A. Agyemang, R. Gregory-Allen, and H. O. Balli. 2022. "Corporate Dividend Smoothing: The Role of Cross-Listing." *Journal of Corporate Finance* 72: 102151. doi:10.1016/j.jcorpfin.2021.102151.

Balli, F., H. Ghassan, and E. H. Al Jeefri. 2021. "Sukuk and Bond Spreads." *Journal of Economics and Finance* 45: 529–543. doi:10.1007/s12197-021-09545-9.

Balli, F., G. S. Uddin, H. Mudassar, and S. M. Yoon. 2017. "Cross-Country Determinants of Economic Policy Uncertainty Spillovers." *Economics Letters* 156: 179–183. doi:10.1016/j.econlet.2017.05.016.

Berkman, H., and N. H. Nguyen. 2010. "Domestic Liquidity and Cross-Listing in the United States." *Journal of Banking & Finance* 34: 1139–1151. doi:10.1016/j.jbankfin.2009.11.011.

Bernal, O., J. -Y. Gnabo, and G. Guilmin. 2016. "Economic Policy Uncertainty and Risk Spillovers in the Eurozone." *Journal of International Money and Finance* 65: 24–45. doi:10.1016/j.jimonfin.2016.02.017.

Bevan, A. A., and S. Estrin. 2004. "The Determinants of Foreign Direct Investment into European Transition Economies." *Journal of Comparative Economics* 32: 775–787. doi:10.1016/j.jce.2004.08.006.

Bonaime, A., H. Gulen, and M. Ion. 2018. "Does Policy Uncertainty Affect Mergers and Acquisitions?" *Journal of Financial Economics* 129: 531–558. doi:10.1016/j.jfineco.2018.05.007.

Bordo, M. D., J. V. Duca, and C. Koch. 2016. "Economic Policy Uncertainty and the Credit Channel: Aggregate and Bank Level US Evidence Over Several Decades." *Journal of Financial Stability* 26: 90–106. doi:10.1016/j.jfs.2016.07.002.

Bris, A., S. Cantale, E. Hrnjić, and G. P. Nishiotis. 2012. "The Value of Information in Cross-Listing." *Journal of Corporate Finance* 18: 207–220. doi:10.1016/j.jcorpfin.2011.11.009.

Brogaard, J., and A. Detzel. 2015. "The Asset-Pricing Implications of Government Economic Policy Uncertainty." *Management Science* 61: 3–18. doi:10.1287/mnsc.2014.2044.

Caggiano, G., E. Castelnuovo, and J. M. Figueres. 2017. "Economic Policy Uncertainty and Unemployment in the United States: A Nonlinear Approach." *Economics Letters* 151: 31–34. doi:10.1016/j.econlet.2016.12.002.

Cai, X. J., S. Tian, N. Yuan, and S. Hamori. 2017. "Interdependence Between Oil and East Asian Stock Markets: Evidence from Wavelet Coherence Analysis." *Journal of International Financial Markets, Institutions and Money* 48: 206–223. doi:10.1016/j.intfin.2017.02.001.

Calvo, S. G., and C. M. Reinhart. 1996. "Capital Flows to Latin America: Is There Evidence of Contagion Effects?" SSRN 636120.

Cheung, Y.-W., and K. S. Lai. 1995. "Lag Order and Critical Values of the Augmented Dickey–Fuller Test." *Journal of Business & Economic Statistics* 13: 277–280. doi:10.1080/07350015.1995.10524601.

Choi, J.-H., J.-B. Kim, X. Liu, and D. A. Simunic. 2009. "Cross-Listing Audit Fee Premiums: Theory and Evidence." *The Accounting Review* 84: 1429–1463. doi:10.2308/accr.2009.84.5.1429.

Claessens, S., D. Klingebiel, and S. L. Schmukler. 2006. "Stock Market Development and Internationalization: Do Economic Fundamentals Spur Both Similarly?" *Journal of Empirical Finance* 13: 316–350. doi:10.1016/j.jempfin.2006.03.002.

Coffee, J. C., Jr. 2002. "Racing Towards the Top?: The Impact of Cross-Listings and Stock Market Competition on International Corporate Governance." *Columbia Law Review* 102 (7): 1757–1831. Columbia law review. doi:10.2307/1123661.

Collier, P., and D. Dollar. 2001. "Can the World Cut Poverty in Half? How Policy Reform and Effective Aid Can Meet International Development Goals." *World Development* 29: 1787–1802. doi:10.1016/S0305-750X(01)00076-6.

Devarajan, S., V. Swaroop, and H.-F. Zou. 1996. "The Composition of Public Expenditure and Economic Growth." *Journal of Monetary Economics* 37: 313–344. doi:10.1016/0304-3932(96)01249-4.

Dodd, O. 2013. "Why Do Firms Cross-List Their Shares on Foreign Exchanges? A Review of Cross-Listing Theories and Empirical Evidence." *Review of Behavioural Finance* 5: 77–99. doi:10.1108/RBF-05-2013-0020.

Doidge, C., G. A. Karolyi, and R. M. Stulz. 2009. "Has New York Become Less Competitive Than London in Global Markets? Evaluating Foreign Listing Choices Over Time." *Journal of Financial Economics* 91: 253–277. doi:10.1016/j.jfineco.2008.02.010.

Domowitz, I., J. Glen, and A. Madhavan. 1998. "International Cross-Listing and Order Flow Migration: Evidence from an Emerging Market." *The Journal of Finance* 53: 2001–2027. doi:10.1111/0022-1082.00081.

Engel, E., R. M. Hayes, and X. Wang. 2007. "The Sarbanes–Oxley Act and firms' Going-Private Decisions." *Journal of Accounting and Economics* 44: 116–145. doi:10.1016/j.jacceco.2006.07.002.

Engle, R. F., and C. W. Granger. 1987. "Co-Integration and Error Correction: Representation, Estimation, and Testing." *Econometrica: Journal of the Econometric Society* 55 (2): 251–276. doi:10.2307/1913236.

Feldstein, M. 1999. *Self-Protection for Emerging Market Economies*. National Bureau of Economic Research Working Paper 6907.

Feng, Y. 2001. "Political Freedom, Political Instability, and Policy Uncertainty: A Study of Political Institutions and Private Investment in Developing Countries." *International Studies Quarterly* 45: 271–294. doi:10.1111/0020-8833.00191.

Frijns, B., A. Gilbert, and A. Tourani-Rad. 2010. "The Dynamics of Price Discovery for Cross-Listed Shares: Evidence from Australia and New Zealand." *Journal of Banking & Finance* 34 (3): 498–508.

Gulen, H., and M. Ion. 2015. "Policy Uncertainty and Corporate Investment." *The Review of Financial Studies* 29: 523–564. doi:10.1093/rfs/hhv050.

Hall, P. A. 2020. *The Political Power of Economic Ideas: Keynesianism Across Nations*. Princeton University Press.

Handley, K., and N. Limao. 2015. "Trade and Investment Under Policy Uncertainty: Theory and Firm Evidence." *American Economic Journal: Economic Policy* 7: 189–222. doi:10.1257/pol.20140068.

Hargis, K. 2000. "International Cross-Listing and Stock Market Development in Emerging Economies." *International Review of Economics & Finance* 9 (2): 101–122. doi:10.1016/S1059-0560(99)00048-9.

Hargis, K., and P. Ramanlal. 1998. "When Does Internationalization Enhance the Development of Domestic Stock Markets?" *Journal of Financial Intermediation* 7: 263–292. doi:10.1006/jfin.1998.0237.

Hostak, P., T. Lys, Y. G. Yang, and E. Carr. 2013. "An Examination of the Impact of the Sarbanes–Oxley Act on the Attractiveness of US Capital Markets for Foreign Firms." *Review of Accounting Studies* 18: 522–559. doi:10.1007/s11142-013-9222-2.

Julio, B., and Y. Yook. 2012. "Political Uncertainty and Corporate Investment Cycles." *The Journal of Finance* 67: 45–83. doi:10.1111/j.1540-6261.2011.01707.x.

Kang, W., K. Lee, and R. A. Ratti. 2014. "Economic Policy Uncertainty and Firm-Level Investment." *Journal of Macroeconomics* 39: 42–53. doi:10.1016/j.jmacro.2013.10.006.

Karolyi, G. A. 2012. "Corporate Governance, Agency Problems and International Cross-Listings: A Defense of the Bonding Hypothesis." *Emerging Markets Review* 13: 516–547. doi:10.1016/j.ememar.2012.08.001.

Ke, D., L. Ng, and Q. Wang. 2010. "Home Bias in Foreign Investment Decisions." *Journal of International Business Studies* 41: 960–979. doi:10.1057/jibs.2009.48.

Khurana, I. K., X. Martin, and R. Periera. 2007. "Cross-Listing and Firm Growth." *Review of Finance* 12: 293–322. doi:10.1093/rof/rfm031.

Kim, H. -J. 2003. "Cross-Listing of Korean Companies on Foreign Exchanges: Law and Policy." *Journal of Korean* L: 3, 1. doi:10.2139/ssrn.357760.

King, M. R., and D. Segal. 2003. "Corporate Governance, International Cross Listing and Domestic Bias. International Cross Listing and Domestic Bias." (March 19, 2003). doi:10.2139/ssrn.441760.

Klößner, S., and R. Sekkel. 2014. "International Spillovers of Policy Uncertainty." *Economics Letters* 124: 508–512. doi:10.1016/j.econlet.2014.07.015.

Koenker, R., and G. Bassett Jr. 1978. "Regression Quantiles." *Econometrica: Journal of the Econometric Society* 46 (1): 33–50. doi:10.2307/1913643.

Korczak, A., and P. Korczak. 2013. "The Development of Emerging Stock Markets and the Demand for Cross-Listing." *Journal of Empirical Finance* 24: 63–77. doi:10.1016/j.jempfin.2013.08.002.

Lang, M. H., K. V. Lins, and D. P. Miller. 2003. "ADRs, Analysts, and Accuracy: Does Cross Listing in the United States Improve a Firm's Information Environment and Increase Market Value?" *Journal of Accounting Research* 41: 317–345. doi:10.1111/1475-679X.00106.

Li, S., P. Brockman, and R. Zurbruegg. 2015. "Cross-Listing, Firm-Specific Information, and Corporate Governance: Evidence from Chinese A-Shares and H-Shares." *Journal of Corporate Finance* 32: 347–362. doi:10.1016/j.jcorpfin.2014.10.008.

Manzo, G. 2013. "Political Uncertainty, Credit Risk Premium and Default Risk. Credit Risk Premium and Default Risk." (August 31, 2013). doi:10.2139/ssrn.2376608.

Myers, S. C. 1984. "The Capital Structure Puzzle." *The Journal of Finance* 39: 574–592. doi:10.1111/j.1540-6261.1984.tb03646.x.

Pagano, M., O. Randl, A. A. Röell, and J. Zechner. 2001. "What Makes Stock Exchanges Succeed? Evidence from Cross-Listing Decisions." *European Economic Review* 45: 770–782. doi:10.1016/S0014-2921(01)00132-5.

Pagano, M., A. A. Röell, and J. Zechner. 2002. "The Geography of Equity Listing: Why Do Companies List Abroad?" *The Journal of Finance* 57: 2651–2694. doi:10.1111/1540-6261.00509.

Pastor, L., and P. Veronesi. 2012. "Uncertainty About Government Policy and Stock Prices." *The Journal of Finance* 67: 1219–1264. doi:10.1111/j.1540-6261.2012.01746.x.

Rodrik, D. 1991. "Policy Uncertainty and Private Investment in Developing Countries." *Journal of Development Economics* 36: 229–242. doi:10.1016/0304-3878(91)90034-S.

Rua, A., and L. C. Nunes. 2009. "International Comovement of Stock Market Returns: A Wavelet Analysis." *Journal of Empirical Finance* 16: 632–639. doi:10.1016/j.jempfin.2009.02.002.

Sarkissian, S., and M. J. Schill. 2016. "Cross-Listing Waves." *The Journal of Financial and Quantitative Analysis* 51: 259–306. doi:10.1017/S0022109016000016.

Silva, A. C., and G. A. Chávez. 2008. "Cross-Listing and Liquidity in Emerging Market Stocks." *Journal of Banking & Finance* 32: 420–433. doi:10.1016/j.jbankfin.2007.07.003.

Sim, N., and H. Zhou. 2015. "Oil Prices, US Stock Return, and the Dependence Between Their Quantiles." *Journal of Banking & Finance* 55: 1–8. doi:10.1016/j.jbankfin.2015.01.013.

Titman, S., and R. Wessels. 1988. "The Determinants of Capital Structure Choice." *The Journal of Finance* 43: 1–19. doi:10.1111/j.1540-6261.1988.tb02585.x.

Torrence, C., and G. P. Compo. 1998. "A Practical Guide to Wavelet Analysis." *Bulletin of the American Meteorological Society* 79: 61–78. doi:10.1175/1520-0477(1998)079<0061:APGTWA>2.0.CO;2.

Vacha, L., and J. Barunik. 2012. "Co-Movement of Energy Commodities Revisited: Evidence from Wavelet Coherence Analysis." *Energy Economics* 34: 241–247. doi:10.1016/j.eneco.2011.10.007.

Van Stel, A., and K. Suddle. 2008. "The Impact of New Firm Formation on Regional Development in the Netherlands." *Small Business Economics* 30: 31–47. doi:10.1007/s11187-007-9054-1.

Wang, Y., C. R. Chen, and Y. S. Huang. 2014. "Economic Policy Uncertainty and Corporate Investment: Evidence from China." *Pacific-Basin Finance Journal* 26: 227–243. doi:10.1016/j.pacfin.2013.12.008.

Xu, Z. 2020. "Economic Policy Uncertainty, Cost of Capital, and Corporate Innovation." *Journal of Banking & Finance* 111: 105698. doi:10.1016/j.jbankfin.2019.105698.

Yin, L., and L. Han. 2014. "Spillovers of Macroeconomic Uncertainty Among Major Economies." *Applied Economics Letters* 21: 938–944. doi:10.1080/13504851.2014.899665.

Zeng, J., T. Zhong, and F. He. 2019. "Economic Policy Uncertainty and Corporate Inventory Holdings: Evidence from China." *Accounting & Finance* 60 (2): 1727–1757.

Zhang, I. X. 2007. "Economic Consequences of the Sarbanes–Oxley Act of 2002." *Journal of Accounting and Economics* 44: 74–115. doi:10.1016/j.jacceco.2007.02.002.

Zhang, G., J. Han, Z. Pan, and H. Huang. 2015. "Economic Policy Uncertainty and Capital Structure Choice: Evidence from China." *Economic Systems* 39: 439–457. doi:10.1016/j.ecosys.2015.06.003.