Who are our owners?

Exploring the cross-border ownership links of European businesses to assess the risk of illicit financial flows

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Abstract

This paper investigates the patterns of business ownership in Europe, using a unique dataset on the nationality of 28.7 million shareholders of companies registered in 41 European countries. By means of an exploratory multivariate analysis, it tests whether ownership links between different countries are driven exclusively by social and macroeconomic variables—such as trade or geographic or cultural proximity—or instead are also related to measures of financial secrecy, corruption and lack of compliance to anti-money laundering regulations. The results indicate that factors other than licit economic incentives explain the international ownership structure of European companies. European firms have an abnormal number (i.e. above the predicted value) of owners from tax havens and countries with poor financial transparency, which may suggest the use of holding companies for money laundering, tax evasion and to conceal illicit financial flows. However, ceteris paribus, the number of owners is abnormal in countries where rule of law and the control of corruption are more effective, suggesting that high level of corruption may be a *cost* in money laundering activities. The findings contribute to the current international debate on illicit financial flows – as framed by United Nations SDG 16.4 - and can be used by public agencies and

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private actors to detect anomalies in business ownership and prevent potential financial crime schemes at corporate level.

Keywords: corporate ownership, offshore countries, money laundering, corruption, tax evasion, illicit financial flows

JEL-classification:

1. Introduction

In recent years, a global consensus has emerged on the need to increase the transparency of company ownership in order to prevent transnational crimes (FATF 2016, 2014; European Commission 2017). Criminals hide their identities or their illicit proceeds behind a veil of complex corporate structures, often set up in off-shore countries. As stressed by recent media investigations such as *Panama Papers* or *Paradise Papers* (ICIJ 2017, 2018), opaque corporate entities can be used for tax evasion and tax avoidance purposes (see e.g., Alstadsæter et al. 2017; Cobham and Janský 2017; Zucman 2013), to conceal large-scale corruption schemes (van der Does de Willebois et al. 2011), to launder money (Unger et al. 2014; Savona and Riccardi 2017), and to facilitate transnational organised crime (Steinko 2012; Savona and Riccardi 2018). Therefore, more knowledge on (especially cross-border) business ownership is of utmost importance in detecting and preventing illicit financial flows (IFF) related to money laundering and tax evasion schemes.[2]

This need has also been stressed by FATF Recommendations (2012) and acknowledged at European Union (EU) level in the updated versions of the anti-money laundering (AML) Directive—i.e. the so-called 4th AML Directive (EU Directive 2015/849) and the 5th AML Directive (EU Directive 2018/843). The EU AML regime requires (i) obliged entities—such as banks, notaries and other professionals—to investigate the ownership structure and identify the beneficial owners of their customers; and (ii) EU Member States (EU MSs) to set up central public registers of beneficial owners (Art. 13:1(b)). Despite the regulatory developments, knowledge

[2] The definition of illicit financial flows is not always consistent. Yet, most literature agrees to include under this umbrella concept illicit activities such as money laundering, corruption (especially *grand* corruption) and tax evasion—eventually, including tax avoidance—schemes whenever the related flows of assets are transnational (Aziani 2018; UNODC 2017).

about who owns European businesses remains scant. Just as scant is the understanding of the extent to which business ownership connections with certain foreign countries are 'risky'.

This paper addresses this gap in knowledge by analysing cross-border ownership links as 'red flags' of illicit financial flows.[3] It is one of the first empirical analyses of the determinants of companies' cross-border ownership links, and one of the first empirical investigations of the role played by financial secrecy and control of corruption in favouring illicit financial flows. By means of an exploratory multivariate analysis of data on the nationality of shareholders of companies registered in 41 European countries, the paper tests: a) whether cross-border business-ownership links are exclusively driven by geographical, social, business-related, and macroeconomic variables—e.g. economic size or cultural proximity—or; b) whether they are explained also by other country characteristics that can attract illicit financial flows such as the levels of financial secrecy and corruption (as suggested by e.g. John Walker and Unger 2009). To this end, the paper develops a methodology, based on an adaptation of a *gravity model*, which makes it possible to detect 'anomalous' cross-border ownership links, i.e. ties which are abnormally above the value predicted by legal determinants such as geographic, social and economic relations between two countries, and which therefore suggest that corporate entities are used to manage illicit financial flows. The ranking of anomalous links produced by this paper can help countries to identify more precisely those foreign jurisdictions on which to focus their monitoring and investigation resources and with which to strengthen international police and judicial cooperation. For instance, we find that companies from Eastern European countries and the Balkans have a higher number of

[3] We define 'cross-border ownership link' or 'cross-border shareholding' as any case in which a shareholder – either a natural or legal person – from a country *j* holds a share in the share capital of a legal person registered in a country *i*, when *i* is not equal to *j*. As explained below, the focus of this paper is on legal persons only. The unit of analysis is the country, i.e. the aggregate volume of ownership links between legal persons located in i and j.

anomalous connections with Cyprus; while Western European countries have more of them with the Marshall Islands and the Seychelles.

The paper is structured as follows: Section 2 provides a literature review and presents our theoretical model and research hypothesis. Section 3 describes the data and the methodology. We report the results of our estimation models in Section 4. Section 5 discusses research and policy implications.

2. Literature overview and research hypothesis

Why is a company in a country (henceforth country *i*) owned by a shareholder in another country (henceforth country *j*)? There can be many reasons. While most cross-border ownership links have fair and legal economic explanations, some corporate ownerships may be driven by illicit purposes, like tax evasion or money laundering. The contention of this paper is that suspicious ownership links can be detected by means of a comparison between an *ideal* scenario—in which cross-border ownership links are explained uniquely by legal determinants—and the observed reality—in which also illicit motivations count.

The gravity model of bilateral trade has become the "workhorse of applied international economics" (Eichengreen and Irwin 1998) and has been used in many different contexts. The empirical results obtained with the model have generally been judged as very good (Ferwerda et al. 2013). Deardorff (1998) argues that the model is sensible, intuitive and easy to understand as a reduced theoretical model to explain bilateral trade. Besides international trade, the gravity model has proved to be a useful framework in which to explain other cross-border relations, such as migration (Karemera et al. 2000; Lewer and Van den Berg 2008), tourism (Khadaroo and Seetanah 2008), sovereign lending (Rose and Spiegel 2004), inventive activity (Picci 2010), trade-based

money laundering (Ferwerda et al. 2013) and suspicious bank transfers (Cassetta et al. 2014). We decide to use it also to explain cross-border ownership links.

We produce a gravity-type model that enables description of the principal legal determinants of cross-border ownership links (i.e. ideal scenario) and to spot 'anomalous' links (i.e., those links that appear to be abnormally above the values predicted on the basis of legitimate factors). We consider these anomalies as proxies for—or 'red flags' of—illicit financial flows: anomalous ownership links between country *i* and *j* may indicate that there are illicit financial flows between those two countries.[4] In doing so, we focus exclusively on ownership links between legal persons—like limited companies, individual firms or other legal entities. A large body of literature shows that legal persons are much more frequently used as veils for hiding IFF schemes (Savona and Riccardi 2017, 2018; Steinko 2012; Unger et al. 2014; van der Does de Willebois et al. 2011). Also the legitimate drivers which explain ownership links change according to the nature of the owner; for example, while migration patterns may explain ownership by individuals, they are not necessarily related to ownership links between two legal entities.

2.1 Using a gravity model to explain cross-border business ownership links

The gravity model is inspired by Newton's universal law of gravity which asserts that the attraction between two objects (F) depends on the mass of those objects (m_i and m_j),—the inverse of—their squared distance (r^2) and the gravitational constant (G):

(1) $F_{ij} = G \frac{m_i m_j}{r_{ij}^2}$.

[4] Ownership links—as we measure them—are not monetary values. Therefore, they cannot be used to estimate the size or value of illicit financial flows between two countries, but rather the probability that illicit financial flows exist.

By taking the logarithms of equation (1), it is possible to obtain a linear relationship which is suited to econometric analysis (see e.g. Cassetta et al. 2014):

$$(2)\ \ln F_{ij} = g + \beta_1 \ln m_i + \beta_2 \ln m_j - \beta_3 \ln r_{ij}^2 + \varepsilon_{ij}$$

In the international trade framework, the volume of trade between countries increases when the countries have larger economies and when they are closer—in both geographical and cultural terms—to each other (Anderson 1979). We assume the same pattern for cross-border business ownership links: the larger the economies and the closer the countries, the more likely it is to find ownership links among entities registered in two countries. The cross-border relation between *j* (i.e. the country where the owner is based) and *i* (the country where the owned company is based) is determined by supply conditions in *j*, by demand conditions in *i*, and by specific preference relations—or their absence—between *i* and *j*. Put in econometric terms:

$$(3)\ \ln Y_{ij} = g + \beta_1 \ln X_i + \beta_2 \ln X_j - \beta_3 \ln D_{ij}^2 + \beta_2 \ln P_{ij} + \varepsilon_{ij}$$

where $Y_{i,j}$ is the value of the relationship between countries *i* and *j*, *X* is the size of the economy of countries *i* and *j*, $D_{i,j}$ and $P_{i,j}$ denote the distance between countries *i* and *j* and a possible special preference relationship, respectively.

Because of the specific nature of the cross-border relation under analysis, we supplement and adjust the traditional gravity model with determinants which could be significant in regard to business ownership, according to the literature. First, we translate the mass of the objects—i.e. countries—in terms of economic and financial relations. In particular, we hypothesise that, besides the size of the real economy—measured generally through GNI (gross national income) or GDP (gross domestic product)— also a larger financial market leads to more business ties and therefore

increases the numerosity of cross-border ownership links. The basic premise is that countries with big financial markets have a greater capacity to invest in companies abroad.

Another reason to invest in a company abroad is the *return* on investment. Since our analysis is at the macro level (i.e., countries), we cannot use profitability measures—such as profit margin or return on equity—at the company level, as is common in the corporate finance literature (O'Regan 2016; Ross et al. 2012). Instead, we use GDP growth. The higher the growth of a country's economy, the more likely becomes, *ceteris paribus*, the attraction of foreign investments and therefore of foreign business owners (Aitken et al. 1996; Almfraji and Almsafir 2014; Harris and Robinson 2003).

Companies registered in a country *i* may attract foreign shareholders from countries *j* for other reasons as well. Investors may prefer to set up businesses in countries that have a more favourable corporate tax regime, i.e. in cases in which country *j* (where the shareholders are from) has a higher tax rate than country *i*. However, entrepreneurs may decide to set up a holding company or parent company in a country with a favourable tax rate so that they can then shift profits to their parent company and minimise the overall fiscal pressure on the business group (Devereux et al. 2002; Zucman 2013). This would then be reflected in a lower tax rate for country *j* (where the parent companies would be registered) than in country *i*. Therefore, we conclude that the corporate tax rate is relevant, but its expected sign is unclear.

Another important factor for foreign investors is how easy it is to set up a business when deciding where to locate their companies (World Bank 2019). The quicker and more efficient the process to set up a legitimate business in a certain country, the more likely it becomes that foreign investors will go there to establish a company—and then become shareholders.

Cultural and social proximity may influence the international structure of business ownership by increasing trust, reducing the barriers for legal trade, and by facilitating the access to valuable information (Ghemawat 2001; Lameli et al. 2013; Lee and Park 2015; Rauch 1999; Sgrignoli et al. 2015). For instance, since Italy hosts a high number of Romanian citizens, we should expect a relatively high number of Romanian owners of Italian businesses, i.e. the number of immigrants of nationality *j* in country *i* can be a determinant of the number of cross-border ownership links between those countries. However, this may be relevant to ownership links with natural persons but not necessarily with legal persons. Likewise, speaking the same language may facilitate business relationships between two countries. Finally, we control for present and former political and institutional relationships.

2.2 Including measures of financial secrecy in the gravity model

Our contention is that geographical, social and economic determinants are fundamental in explaining cross-border ownership links, but they may not be enough. We believe that another crucial driver explaining a part of cross-border ownership links is the potential need for secrecy. For this purpose, legal persons based in j-countries characterized by high levels of financial and corporate opacity may be exploited to ultimately control companies based in country *i* where financial transparency is higher. There are several reasons why investors may decide to hide themselves behind opaque corporate veils. Although fully licit ones do exist—e.g. personal privacy—opaque jurisdictions are mostly used for illicit purposes—e.g. conceal tax evasion, money laundering and generally speaking illicit financial flows (Aziani 2018; Janský and Kokeš 2016; van der Does de Willebois et al. 2011). Therefore, we test the hypothesis (H1) that secrecy plays a key role in explaining cross-border business ownerships. In particular, that it helps explaining the volume of ownership links which are abnormally above what is predicted by a

gravity model based exclusively on legitimate determinants—i.e. macroeconomic, social, geographical and cultural factors.

2.3 Discussing the interplay between secrecy and corruption in favouring financial crime schemes

If higher levels of secrecy in country *j* may increase the number of foreign shareholders based in that country, what would be the role of corruption and rule of law? *Ceteris paribus*, are foreign shareholders more numerous from countries with high or low levels of corruption? What is the interplay between corruption and secrecy?

Even if the question is crucial in terms of policy design, the role of corruption in determining the international network of illicit financial flows has not been investigated to any great extent, especially in empirical terms. Existing studies—mostly theoretical—do not report the same direction of causality; on the contrary, the literature on the relation between corruption and illicit financial flows is ambiguous about the sign (see Chaikin and Sharman 2009 for a review). Walker (1999) assumes that criminals do not like—excessively—corrupt countries, because corruption increases the costs of money laundering due to necessary side payments and bribes. On the other hand, Unger (2013) argues that a low level of corruption may make it difficult to find facilitators for hiding and laundering illicit financial flows. Dreher and Schneider (2010) find empirical evidence that the relation between shadow economy and corruption is not straightforward either: corruption reduces the shadow economy in high-income countries, but increases it in low-income ones. Savona and Riccardi (2018) show that corruption is closely correlated to intensity in the use of cash, which in turn is a facilitator of money laundering and integration of illicit proceeds. Finally, the Basel AML Index considers corruption a risk factor of money laundering, implying that more corruption is related to more money laundering.

We tested this relationship and in particular the hypothesis (H2), based on Walker (1999), that high levels of corruption in a country reduce the risk of money laundering because of the extra costs imposed on launderers in terms of bribes and inefficiency. Rational investors setting up shell companies to conceal illicit activities would opt for countries with a high level of secrecy but a low level of corruption. For similar reasons, criminals would prefer countries with a stronger rule of law.

Table 1. Research hypotheses: legal and illegal determinants of cross-border ownership links

	Dependent variable: number of shareholders of nationality j of companies registered in country i	
	Legal determinants	*Expected sign*
	Size of the real economy, country *i* and country *j*	+
	Geographic distance	-
	Geographic contiguity	+
	Size of the financial market, country *i* and country *j*	+
	Ease of setting up a business, country *i*	+
	Corporate tax rate, country *i*	-/+
	GDP growth, country *i*	+
	Shared language	+
	Former colonial relationship	+
	Former same country	+
	Migrants of nationality *j* in country *i*	+
	EU membership, country *i* and country *j*	+
	WTO membership, country *i* and country *j*	+
	Illicit determinants	*Expected sign*
H1	Financial secrecy, country *j*	+
H2	Control of corruption, country *j*	+
	Rule of law, country i	+

Note: Table 2 reports the variables selected to operationalize these factors and their summary statistics

3. Data and methodology

Our empirical approach moved through three steps. First, we constructed a baseline scenario, in which only legal macroeconomic and social factors ('legal determinants') were used as independent variables to explain the intensity of cross-border ownership links. We then regressed the studentized Pearson residuals emerging from the models against measures of secrecy, corruption and rule of law to test our hypotheses H1 and H2. At the same time, analysis of the residuals made it possible to identify and rank the pair of countries corresponding to the most unpredicted connections. Potential illicit financial flows are more likely to move along those ownership links. Indeed, studentized Pearson residuals work as measures of 'anomalous' cross-border links that we interpreted as 'red flags' of possible illicit financial flows. In step 3, we jointly tested the explanatory power of both legal and illicit determinants as a robustness check (the third set of econometric models is presented in the Appendix).

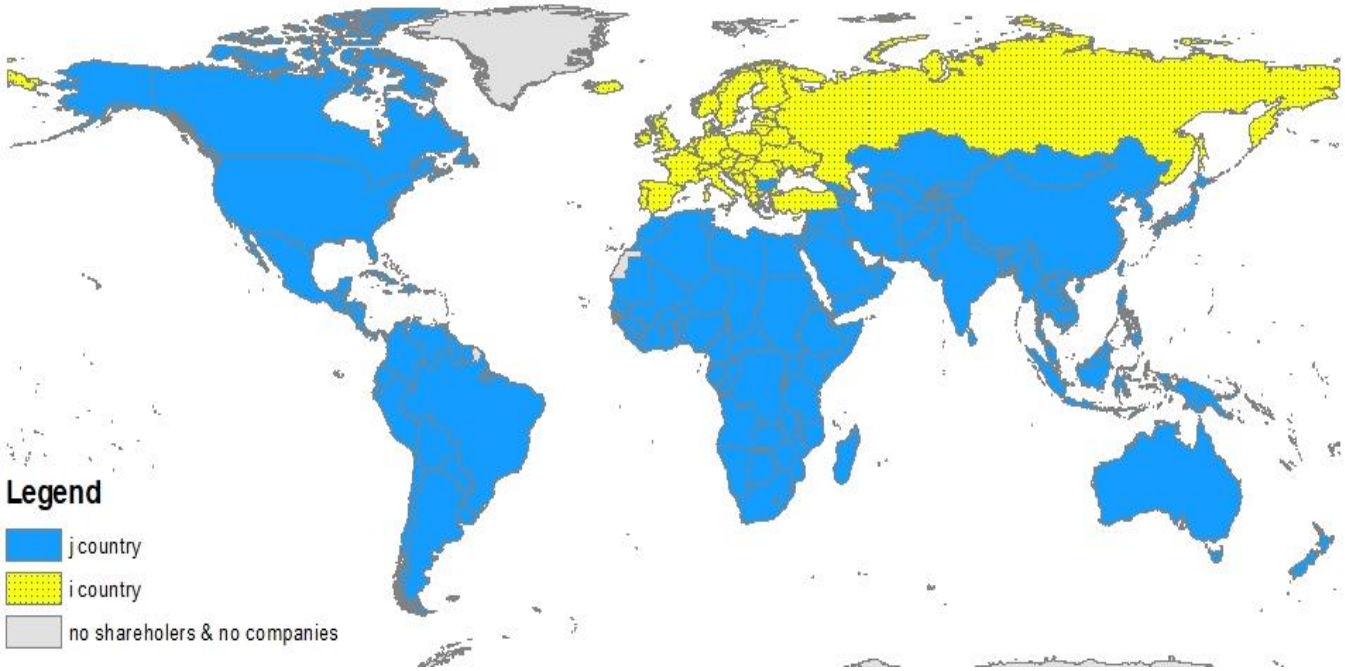
We used GLM binomial regressions with robust standard errors clustered at country-*i* level to run the different specifications of the econometric models referring to steps 1 to 3. GLM binomial regressions were preferred to alternative econometric instruments in consideration of the fact that our dependent variable consisted of count data with a large amount of zeros (see e.g. Cameron and Trivedi 2013; Hilbe 2011). The estimated beta coefficients can be interpreted as elasticities, as the control and dependent variables were expressed in logarithms. The coefficients reported were standardized to assess the relative importance of the correlations identified.

3.2 Operationalization of the dependent variable

To operationalize our dependent variable—i.e. (the natural logarithm of) the number of shareholders of country *j* of companies in country *i*—we constructed a dataset based on business

ownership information taken from the Bureau van Dijk's ORBIS database.[5] We analysed the shareholders of all companies in the database for 46 European countries. The companies in these 46 European countries (i.e. *i-countr*ies) have 28.7 million shareholders (of which 9.3 million are legal persons) from 211 countries worldwide (i.e., *j* countries) (see Figure 1).[6] We aggregated the number of ownership links between all country pairs, which resulted in 9,660 unique country pairs in which the *j* country (country of the shareholder) was different from the *i* country (country where the company was registered).

Figure 1. Countries of companies (*i* countries) and shareholders (*j* countries)



Note: all *i* countries are simultaneously also *j* countries.

Source: authors' elaboration on Bureau van Dijk data.

[5] Information on the ownership structures mainly refers to 2015, but not exclusively. In consideration of this, 2015 was selected as year of reference to operationalize independent variables as well.

[6] Out of the original 46 countries, information on independent variables was available only for 41 countries, which were those included in the final model. The 5 countries *i* excluded from the analysis were Andorra, Gibraltar, Liechtenstein, Monaco, San Marino.

The ORBIS database is the only central repository of data on business owners at international level. Data on business owners are usually held by national business registers, but they cover only the firms registered in that country. Conversely, ORBIS makes it possible to reproduce the entire global network of shareholders; for this reason, it is widely used in empirical analysis in the business ownership domain (see e.g. Garcia-Bernardo et al. 2017; Cobham and Janský 2017; Joaristi, Serra, and Spezzano 2018). However, information on the shareholder's country is not always available and its degree of availability varies among countries for a number of reasons: differences in company law, in privacy rules, in the accessibility of company registries accessed by ORBIS. To account for the heterogeneity of the available information, we controlled for the share of available information on the nationality of business owners in each country *i* in all our models.

3.2 Operationalization of the legitimate determinants of cross-border ownership

Operationalization of the independent variables representing the legitimate determinants of cross-border ownership links exploited open access databases commonly used in macro-level economic and sociological studies (see Table 2). In particular, the economic size of the countries considered was estimated in terms of GNI as reported by the World Bank (WB) (2017). The geographic distance of each pair of countries was operationalized by a) their physical distance weighted for the location of the population within the countries and b) by the fact of sharing a border: both variables were drawn from CEPII (2017). We relied on the stock market capitalization and alternatively on bank deposits as measures of the size of the financial markets, both as share of GDP and as estimated by the WB (2017).

We retrieved data on the nominal corporate income tax rate from KPMG (2017) and we integrated them with data furnished by Deloitte (2018) to operationalize the fiscal pressure in the

countries considered. The number of days required to open a business, as calculated by the WB (2017), was used as proxy for the bureaucratic efficiency of a country. The estimate of the GDP growth was taken from the WB (2017). Conceptually, these factors proxy the convenience of investing in country *i* rather than in country *j*. Therefore, they did not enter our linear equation separately for *i* and *j*, but instead in the form of the difference between the value in *i* and the value in *j*.

Finally, we operationalized social, cultural, and institutional determinants of the cross-border ownership links. In particular, we considered if the *i* and the *j* country were EU MSs and members of the WTO, if they were formerly part of the same country or if they had had a colonial relationship—data from CEPII (2017). To test the hypothesis that cultural and social proximity influences cross-border business ownerships, we included among the regressors a) migration flows between *j* and *i* countries as reported by the UN (2016) and b) the presence of a common language spoken by more than 9% of the population in any pair of countries. Data on language commonality were gathered from CEPII (2017).

3.3 Operationalization of financial secrecy, rule of law and control of corruption

We alternated the use of four different variables to measure financial secrecy. First, we exploited a dummy variable produced by Tax Justice Network (2011) which indicates if a country can be considered a tax haven. Second, we built a variable which combined different lists of tax havens presented by 13 scientific papers. In particular, a country could obtain a score ranging from 0 to 13; in the latter case if it was indicated as a tax haven by all the 13 papers. Finally, we used the 2015 and the 2018 Financial Secrecy Score (FSS) estimated by Tax Justice Network (2018). Contrary to 'black lists' of tax havens, the FSS is not a binary division between black-listed and white-listed countries; it locates countries along a secrecy spectrum ranging from countries with

very high transparency (e.g. Finland) to ones with very low transparency (e.g., Vanuatu) (Cobham et al. 2015).[7]

Operationalizing the concept of rule of law is challenging, since the concept comprises two main aspects: the existence of certain rules, and how they are enforced (Kaufmann et al. 2011). Within the framework of the *Worldwide Governance Indicators (WGI) project*, the WB (2017) provides an indicator of the rule of law for 215 countries. The original data are the perceptions of governance collected from 31 different data sources provided by 25 different organizations. The WB's (2017, 1) rule of law indicator "[…] captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence".

Among the possible indicators of corruption, we used the *Control of Corruption* indicator of the WB (2017). An alternative estimate of the level of corruption in a given country is the *Corruption Perceptions Index (CPI)* produced by Transparency International (2016). Several studies indicate a correlation between the two indicators above 0.97 for the year and the countries available in both the databases (e.g., Butler, Gluch, and Mitchell 2007; Antonaccio and Tittle 2007). Consequently, the use of one or the other should not affect the final estimates. We decided to use the WB indicator because of the wider agreement among scholars on the soundness of its methodology.

[7] Estimates are not available for all countries in the world, especially for African countries. We interpolated the missing values with the average FSS.

Table 2. Variables Operationalization and Summary Statistics

	N. Obs.	Mean	Std. Dev.	Source
N. of shareholders (Legal person) (j in i), ln	9660	1.08	1.86	BvD's ORBIS
Legitimate determinants				
Gross National Income (i), ln	8610	-2.05	1.83	WB
Gross National Income (j), ln	8331	-3.37	2.37	WB
Geo. distance, ln	8800	8.45	0.88	CEPII
Contiguity	8852	0.02	0.14	CEPII
EU membership (i)	9660	0.59	0.49	EU
EU membership (j)	9660	0.13	0.34	EU
WTO member (i)	9660	0.80	0.40	WTO
WTO member (j)	9660	0.75	0.43	WTO
Former colonial relationship	8865	0.03	0.16	CEPII
Former same country	8865	0.01	0.10	CEPII
Procedures to start (i-j), ln	7896	2.82	0.26	WB
Tax rate (i-j), ln	9450	3.72	0.28	KPMG & Deloitte
GDP growth (i-j), ln	7503	2.55	0.28	WB
Migrants (j in i), ln	9315	-3.71	3.57	UN
Common language	9114	0.05	0.22	CEPII
Bank deposits as share of GDP (i), ln	8400	4.19	0.50	WB
Bank deposits as share of GDP (j), ln	7964	3.85	0.67	WB
Market capitalization as share of GDP (i), ln	7140	3.42	0.99	WB
Market capitalization as share of GDP (j), ln	5210	3.23	1.54	WB
H1: Financial Secrecy				
Tax haven dummy, FSI (j)	9614	0.31	0.46	Tax Justice Network
Sum of 13 tax haven dummies (j), ln	9660	0.64	0.94	Multiple[a]
Financial Secrecy Score (FSS) 2015 (j), ln	9660	4.09	0.19	Tax Justice Network
Financial Secrecy Score (FSS) 2018 (j), ln	9660	4.18	0.12	Tax Justice Network
H2: Rule of Law and Control of Corruption				

Rule of law (i), ln	9030	-0.21	3.09	WB
Rule of law (j), ln	9249	0.66	1.20	WB
Control of Corruption (i), ln	9030	0.93	0.40	WB
Control of Corruption (j), ln	9249	0.96	0.36	WB
Additional Controls				
Available info on shareholders' nationality (i), ln	9660	-1.42	1.17	BvD's ORBIS

Note: The reported number of observations refer to country pairs *i – j*, given by the combination of the 46 countries *i* and 211 countries *j*. Not all variables were available for all country pairs, leading to different number of observations.
[a] We thank Petr Jansky and Miroslav Palansky for providing these data.

4. Empirical Results

In what follows we describe our estimation models, which are organized into three sets, each corresponding to a step of the empirical approach adopted. In the first set of models (*LE – Legal economy*, see Table 3), we started from a basic gravity model based on countries' economic size and geographical distance (i.e., Model LE.1); then we progressively added the complete set of control variables related to *legal* determinants of cross-border ownership (Models LE.2 to LE.7). As hypothesised, the number of foreign shareholders from country *j* was positively correlated with the GNI of both countries *i* and *j*, while it was negatively correlated with the geographic distance between the countries: the bigger and the closer the countries, the higher the number of ownership links. In Model LE.2, we introduced controls for the EU and WTO memberships of both the *i* and *j* countries. The number of foreign shareholders registered in EU countries is, *ceteris paribus*, higher than the number of foreign shareholders from outside the EU. This is not surprising considering that 27 out of the 46 countries included in the sample were in the EU. The influence of WTO membership was instead weak, probably because most countries in the world are part of the organization. Model LE.3 includes in the analysis our proxy for the social, cultural, and legal proximity between the *i* and *j* countries. Countries in which part of the population speak the same language, because those countries have been part of the same country

or in a colonial relationship, have a stronger connection in terms of companies' ownership. Conversely, the size of the population migrating from *j* to *i* is not correlated to the number of shareholders. Given that data refer to legal persons only, this result is not surprising.

Models LE.4 and LE.5 added the differential between any pair of countries *i* and *j* in terms of number of procedures required to open a business (taken as a measure of the ease of doing business), tax rates, and GDP growth (as a measure of 'return on investment'). Finally, Models LE.6 and LE.7 included the size of the financial sector measured either by bank deposits or market capitalisation as share of the national GDP. Also in specifications LE.4 to LE.7, significant correlations had the expected sign. the ease of setting up a business is positively correlated with a higher number of foreign shareholders. Conversely, foreign shareholders are negatively correlated with the differential in the corporate tax rate, a result which apparently contradicts the extensive literature on profit-shifting (Cobham and Janský 2017; Zucman 2013). Finally, the proposed proxies for the importance of the financial sector are positively correlated when considering the *j* country where the owner is located, while they are not significant when focusing on the location of the company—i.e., *i* country.

Table 3. I Set - Legitimate drivers of cross-border ownership links, Legal Persons, Clustered Robust GLM Binomial

	Dependent Variable: number of foreign shareholders (of nationality j in companies registered in country i),ln						
	LE.1	LE.2	LE.3	LE.4	LE.5	LE.6	LE.7
Gross National Income (i), ln	0.24***	0.22***	0.19***	0.20***	0.20***	0.17***	0.16***
Gross National Income (j), ln	0.36***	0.32***	0.32***	0.32***	0.31***	0.26***	0.19***
Geo. distance, ln	-0.24***	-0.11***	-0.09***	-0.08***	-0.08***	-0.11***	-0.11***
Contiguity	0.02**	0.04***	0.01*	0.01*	0.01*	0.02*	0.00
EU membership (i)		0.05	0.05	0.05	0.04	0.03	0.02
EU membership (j)		0.17***	0.19***	0.18***	0.18***	0.11***	0.14***
WTO member (i)		0.02	0.03	0.06	0.05	0.04	0.05
WTO member (j)		0.03*	0.02*	-0.01	-0.00	0.03***	0.01
Former colony			0.04***	0.04***	0.04***	0.05***	0.04***
Former same country			0.02*	0.02**	0.02**	0.02*	0.03**
Migrants (j in i), ln			0.01	0.01	0.01	0.08**	0.03
Common language			0.07***	0.07***	0.07***	0.03*	0.04***
Procedures to start (i-j), ln				0.15***	0.14***	0.08***	0.10***
Tax rate (i-j), ln				-0.04*	-0.04*	-0.04*	-0.03**
GDP growth (i-j), ln					0.03	-0.00	0.02
Bank deposits (i), ln						0.04	
Bank deposits (j), ln						0.33***	
Market capitalization (i), ln							0.01
Market capitalization (j), ln							0.15***
Available info (i), ln	0.11***	0.11***	0.11***	0.09**	0.09*	0.09*	0.07*
N. of observations	7216	7216	6886	6766	6766	6168	3576
N. of i countries	41	41	40	40	40	39	34
N. of j countries	177	177	175	172	172	161	108
AIC	18528	18153	17399	17122	17116	14550	11441
BIC	18570	18222	17495	17231	17232	14678	11559

Note: the table reports the standardized beta coefficients of Cluster?ed Robust Binomial GLM regressions of real economy, financial market, demographic, and macropolitical-related variables on the number of international shareholders from all over the world in a sample of 34 to 41 European countries. All continuous variables enter the regression in the form of natural logarithms.

The Akaike information criterion (AIC) and the Bayesian information criterion (BIC) values provide two measures of the relative quality of the models. *, **, and ***, indicate coefficients significantly different from zero at the 95.0%, 99.0%, and 99.9% confidence level, respectively.

Models belonging to the first set present the *ideal* scenario in which only legal determinants of foreign investments are considered. According to the approach proposed, ownership links that appear to be abnormally above the predicted values may be interpreted instead as 'anomalous' links and therefore possible markers of illicit financial flows. Studentized Pearson residuals reveal these abnormalities. For this purpose, we use the residuals of LE.5, which is the model showing the best goodness of fit.[8] However, residuals from any of the 7 models are closely correlated (see Table 4).

Table 4. Residuals' correlations

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1)	SPR, model LE.1	1.00						
(2)	SPR, model LE.2	0.97	1.00					
		(0.00)						
(3)	SPR, model LE.3	0.96	0.99	1.00				
		(0.00)	(0.00)					
(4)	SPR, model LE.4	0.93	0.96	0.97	1.00			
		(0.00)	(0.00)	(0.00)				
(5)	SPR, model LE.5	0.93	0.96	0.97	1.00	1.00		
		(0.00)	(0.00)	(0.00)	(0.00)			
(6)	SPR, model LE.6	0.84	0.88	0.88	0.90	0.90	1.00	
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		
(7)	SPR, model LE.7	0.84	0.87	0.89	0.94	0.94	0.86	1.00

[8] The reduction in the variation in the number of available observations and countries included does not allow for ranking the overall goodness of fit of the alternative specifications through the AIC and BIC. The sample considerably shrinks on passing from LE.5 to LE.6 and even more from LE.6 to LE.7; in consideration of this we present results based on LE.5. LE.5 conserves 94% of the observations of the richest models and 40 out of 41 *i*-countries and 172 out of 177 *j*-countries.

			(0.00)	(0.00)	(0.00)	(0.00)

Note: the table reports the correlation between the studentised Pearson residual obtained in models LE.1 to LE.7 together with the significance of each correlation.

A number of countries—which appear as tax havens in the literature in this domain, see below in the Discussion —emerge by ranking the highest residuals, i.e. the most 'anomalous' ownership links. Belize appears 22 times among the top 3 anomalous connections by *i*-country, the Marshall Islands and the Seychelles 18, the Bahamas 7, Panama 6 (see Table 5). However, also European countries (i.e. Cyprus, Luxembourg, Malta, Switzerland) frequently appear as *j* countries in abnormal links. A similar picture emerges from Table 6 reporting the 20 *j*-countries with the highest average studentized Pearson residuals. Table 7 proposes instead the 20 *i*-countries (location of the company) with highest residuals.

Table 5. Top-three anomalous links by country *i*, Studentised Pearson Residuals

Country i (company location)	Size of the residual	Country j (shareholder location)	Country i (company location)	Size of the residual	Country j (shareholder location)
Albania	2.01	Switzerland	Luxembourg	9.71	Belize
Albania	1.82	Cyprus	Luxembourg	8.79	Seychelles
Albania	1.74	Lebanon	Luxembourg	7.60	Bahamas
Austria	3.06	Belize	Macedonia	3.13	Bosnia
Austria	2.79	Marshall Islands	Macedonia	2.49	Switzerland
Austria	2.55	Seychelles	Macedonia	2.23	Cyprus
Belarus	4.15	Switzerland	Malta	7.23	Marshall Islands
Belarus	4.00	Georgia	Malta	2.42	Barbados
Belarus	3.48	Cyprus	Malta	1.82	Panama
Belgium	5.75	Marshall Islands	Moldova	1.90	Belize
Belgium	3.65	Panama	Moldova	1.60	Switzerland
Belgium	3.20	Bahamas	Moldova	1.45	Bahamas
Bosnia	1.88	Cyprus	Montenegro	5.37	Belize

Bosnia	1.71	Switzerland	Montenegro	2.66	Panama
Bosnia	1.42	Saint Kitts & Nevis	Montenegro	2.63	Cyprus
Croatia	2.91	Belize	Netherlands	6.29	Marshall Islands
Croatia	2.65	Australia	Netherlands	4.61	Belize
Croatia	1.55	Malta	Netherlands	4.38	Seychelles
Cyprus	15.15	Belize	Norway	7.23	Marshall Islands
Cyprus	15.13	Marshall Islands	Norway	3.05	Iceland
Cyprus	13.82	Seychelles	Norway	2.20	Seychelles
Czech Republic	9.47	Seychelles	Poland	1.88	Cyprus
Czech Republic	7.79	Marshall Islands	Poland	1.71	Bahamas
Czech Republic	7.33	Belize	Poland	1.69	Iceland
Denmark	5.52	Seychelles	Portugal	7.64	Seychelles
Denmark	4.67	Belize	Portugal	7.57	Saint Kitts & Nevis
Denmark	2.35	Bahamas	Portugal	6.11	Belize
Estonia	12.66	Marshall Islands	Romania	7.45	Seychelles
Estonia	11.66	Belize	Romania	6.93	Belize
Estonia	9.24	Seychelles	Romania	6.91	Marshall Islands
Finland	2.18	Switzerland	Russia	12.42	Seychelles
Finland	1.75	Iceland	Russia	11.28	Belize
Finland	1.57	Norway	Russia	8.96	Marshall Islands
France	1.97	Gambia	Serbia	7.18	Belize
France	1.66	Iceland	Serbia	6.12	Saint Vincent & Grenadines
France	1.63	Kuwait	Serbia	5.03	Marshall Islands
Germany	3.17	Seychelles	Slovak Republic	4.32	Seychelles
Germany	3.01	Marshall Islands	Slovak Republic	4.1	Panama
Germany	2.86	Belize	Slovak Republic	4.04	Belize

Greece	8.47	Marshall Islands	Slovenia	3.23	Seychelles
Greece	4.98	Liberia	Slovenia	2.81	Bosnia
Greece	2.74	Panama	Slovenia	1.88	Switzerland
Hungary	10.81	Seychelles	Spain	3.83	Marshall Islands
Hungary	9.98	Belize	Spain	1.79	Bahamas
Hungary	6.78	Dominica	Spain	1.47	Barbados
Iceland	1.69	Norway	Sweden	2.15	Iceland
Iceland	1.42	Mauritius	Sweden	1.86	Switzerland
Iceland	0.99	Switzerland	Sweden	1.69	India
Ireland	2.33	Bahamas	Switzerland	5.90	Marshall Islands
Ireland	2.12	Belize	Switzerland	4.28	Saint Vincent & Grenadines
Ireland	1.98	Cyprus	Switzerland	3.62	Belize
Italy	3.45	El Salvador	Turkey	1.38	Switzerland
Italy	2.33	Seychelles	Turkey	1.28	Marshall Islands
Italy	2.13	Marshall Islands	Turkey	1.18	Bahrain
Latvia	10.20	Belize	Ukraine	14.61	Belize
Latvia	9.22	Seychelles	Ukraine	11.57	Saint Kitts & Nevis
Latvia	8.42	Marshall Islands	Ukraine	10.97	Seychelles
Lithuania	3.39	Iceland	United Kingdom	4.33	Marshall Islands
Lithuania	3.17	Belize	United Kingdom	3.68	Costa Rica
Lithuania	2.16	Cyprus	United Kingdom	3.58	Panama

Note: for each *i* country, the table reports the three most anomalous connections as identified by their studentised Pearson residual. LE.5 is the model of reference.

Table 6. Anomalous links: top-20 *j*-countries by average studentised Pearson residual

Rank	Country j (shareholder location)	Average Residual
1	Belize	3.75
2	Marshall Islands	3.58
3	Seychelles	3.49
4	Bahamas	2.27
5	Panama	2.24
6	Montenegro	1.90
7	Saint Kitts & Nevis	1.80
8	Cyprus	1.65
9	Switzerland	1.61
10	Saint Vincent & Grenadines	1.56
11	Iceland	1.30
12	Malta	1.08
13	Norway	1.06
14	Liberia	0.99
15	Dominica	0.95
16	Mauritius	0.92
17	India	0.81
18	China, Hong Kong SAR	0.78
19	Luxembourg	0.77
20	Singapore	0.71

Note: the table reports the top 20 *j* countries whose links are above the model prediction as expressed by their studentised Pearson residual. LE.5 is the model of reference.

Table 7. Anomalous links: top-20 *i*-countries by average studentised Pearson residual

Rank	Country i (company location)	Average Residual
1	Russia	0.81
2	Cyprus	0.80
3	Ukraine	0.60
4	Luxembourg	0.53
5	Estonia	0.43
6	Netherlands	0.35
7	Hungary	0.28
8	Latvia	0.22
9	United Kingdom	0.22
10	Serbia	0.2
11	Portugal	0.16
12	Czech Republic	0.11
13	Romania	0.07
14	Belgium	0.04
15	Belarus	0.03
16	Switzerland	0.03
17	France	-0.05
18	Germany	-0.07
19	Italy	-0.08
20	Montenegro	-0.09

Note: the table reports the top 20 *i* countries whose links are above the model prediction as expressed by their studentised Pearson residual. LE.5 is the model of reference.

To investigate whether these anomalous cross-border links are correlated to secrecy and corruption, we ran a second set of models (IFF-related Determinants, see Table 8). In these models the residuals estimated in LE.5 were regressed respectively on measures of financial secrecy, corruption and rule of law, and in particular (i) tax haven dummies (Models IFF.1 and IFF.2), (ii) the Financial Secrecy Score (IFF.3 and IFF.4), and then (iii) combining tax haven dummies

together with rule of law (IFF.5 and IFF.6) and with control of corruption measures (IFF.7 and IFF.8). Note that secrecy jurisdictions are often also tax havens (Gara and De Franceschis 2015). Nonetheless, by controlling for the tax rate of countries *i* and *j*, as mentioned above, we isolated those links which were not driven by tax optimisation purposes but by criminal ones.

Both the tax haven dummies used in the models are positively correlated to the size of the residuals; the same applies to the FSS referring to both 2015 and 2018. The results confirm our hypothesis (H1) that anomalous cross-border ownership links are explained by the financial secrecy of country *j*. Among the first four models, the one using the sum of 13 different tax haven dummies has the strongest explanatory power and it is therefore exploited as baseline for the following regressions (IFF.6 to IFF.8), which test the relationship between anomalous ownership links and corruption and, eventually, between corruption and financial secrecy. Conversely, the level of the rule of law in country *i* is negatively correlated (see IFF.6) while control of corruption in country *i* is not significant (see IFF.8). The findings confirm our hypothesis (H2): abnormal cross-border ownership links are positively correlated with effectiveness of the rule of law and control of corruption, therefore suggesting that corruption may be an extra cost when setting up businesses abroad for 'anomalous' purposes—presumably related to illicit activities.

Table 8. Second Step - Illicit drivers of cross-border ownership links - Studentised Pearson Residuals, Legal Persons, Cluster?ed Robust GLM

	Dependent Variable: Studentised Pearson Residuals of the j i relationship							
	IFF.1	IFF.2	IFF.3	IFF.4	IFF.5	IFF.6	IFF.7	IFF.8
Tax haven dummy (j)	0.33***							
Sum of 13 tax haven dummies (j), ln		0.40***			0.37***	0.37***	0.36***	0.36***
FSS '15 (j)			0.09***					
FSS '18 (j)				0.10***				
Rule of law (i), ln						-0.09***		
Rule of law (j), ln					0.06***	0.06***		
Control of Corruption (i), ln								-0.04
Control of Corruption (j), ln							0.08***	0.08***
N. of observations	6766	6766	6766	6766	6766	6766	6766	6766
N. of i countries	40	40	40	40	40	40	40	40
N. of j countries	172	172	172	172	172	172	172	172
AIC	20332	19942	21079	21072	19917	19856	19901	19893
BIC	20345	19956	21092	21085	19938	19884	19921	19920

Note: the table reports the standardized beta coefficients of Cluster?ed Robust GLM regressions of variables representing tax havens, the level of rule of law, and control of corruption on the residuals emerging from the empirical specification modelling licit determinants of transnational shareholding (i.e. LE.5). The AIC and the BIC values provide measures of the relative quality of the models. *, **, and ***, indicate coefficients significantly different from zero at the 95.0%, 99.0%, and 99.9% confidence level, respectively.

5. Discussion

The analysis suggests some interesting results and implications. Firstly, in terms of countries which appear frequently in cross-border anomalous ownership links (i.e. *country j*): as mentioned, Belize appears 22 times among the top 3 anomalous connections by *i*-country, the Marshall Islands and the Seychelles 18 times, the Bahamas 7, Panama 6 (see Table 5). It is clear that – given the European perimeter of our sample of *i*-countries – the Caribbean area plays a crucial role as a location of legal persons-shareholders related to anomalous ownership links of companies registered in Europe. The results confirm previous studies in this field, such as Garcia-Bernardo et al. (2017) and the large body of evidence furnished by well-known journalistic investigations like *Panama Papers* or *Paradise Papers*.

However, also European countries frequently crop up as *j*-countries in abnormal links. In particular, Cyprus, Iceland, Luxembourg, Malta, Montenegro and Switzerland rank among the first 20 *j*-countries by studentised Pearson residual. These names, again, do not surprise and appear in previous literature related to both money laundering and organised crime investigations (especially Cyprus, Malta and Switzerland - see for example Transcrime 2018). Indeed, as highlighted by several European FIUs, most suspicious transaction reports in AML point to European countries (e.g. for Italy, see Gara and De Franceschis, 2015) rather than exotic destinations. At the same time, the mentioned European jurisdictions can play a role as locations of intermediate owners – or *conduits*, to use the term employed by Garcia-Bernardo et al. (2017): for example, a beneficial owner of, say, Russian origin, in order to control a company located in a *i-country*, say Poland, may use as intermediate owner one or more companies located, say, in Cyprus. In this situation, Cyprus would appear as country-*j* of the ownership chain, despite the fact that the ultimate owner is of a third nationality and resident or located in another country.

The available data – limited to first level shareholders – unfortunately do not allow reconstruction of the entire ownership structure; therefore, we are not fully able to test if a shareholder in any country-*j* acts as intermediate or ultimate owner. But we are able to check whether countries showing high residuals as *j*-countries (Table 6) also show high residuals as *i*-countries (where the company is located - Table 7). Bearing in mind that the samples of *i*- and *j*-countries are not the same, the only three jurisdictions which appear in both the lists are Cyprus, Luxembourg and Switzerland,[9] confirming that these three countries play some role as *conduits* or intermediate owners in anomalous ownership links (especially the first two).

Table 7 suggests another interesting result: companies registered in Eastern European and Balkan countries tend to have a higher share of anomalous ownership links. Seven *i*-countries (Russia, Cyprus, Ukraine, Estonia, Hungary, Latvia, Serbia) in the top ten ranked by residual are located in Eastern Europe. How to interpret this result? On the one hand, it could be argued that the lack of trust in financial and political institutions in these countries (Howard 2002; Shlapentokh 2006) may foster financial outflows which, in turn, could generate a higher number of holding companies of foreign nationality; on the other hand, the recent political turmoils in some of these areas (e.g. Russia, Ukraine, Hungary, Serbia) may have induced local entrepreneurs to secure their capital in foreign entities. In any case, there is evidence that corporates and financial institutions in some of these Eastern European countries (in particular Cyprus, Hungary and Baltic countries) have been used as *conduits* to launder illicit proceeds originating from former Soviet countries (see e.g. the role of the Latvian and Estonian business sector in the *Troika laundromat* investigation – Transcrime 2018; OCCRP 2014).

[9] Also Montenegro, but with a negative average residual as i-country, meaning that the expected number of cross-border ownership links of firms registered in the country is lower than predicted by only legitimate factors.

The role of Switzerland warrants some further discussion. While the country frequently appears in investigations related to illicit financial flows, also in relation to tax evasion (Zucman 2013; Ferwerda and Reuter 2018), previous literature shows that Switzerland, rather than being the location of shell companies, plays a key role at global level as a location for foreign bank accounts in which to store illicit funds, as also clearly demonstrated by the analysis of large-scale corruption cases carried out by van der Does de Willebois et al. (2011).

Finally it must be noted that only few of the *j*-countries characterised by high values of residuals (Table 6) appear also in official blacklists related to anti-money laundering or tax evasion issued at international level. In particular, only Bahamas is listed in the FATF AML blacklist;[10] only Bahamas and Panama in the EU AML blacklist of third countries;[11] only Belize, Marshall Islands and Dominica in the EU blacklist of non-cooperative tax jurisdictions.[12] Given the weakness of these official lists, due to geo-political biases as thoroughly discussed by previous literature (see e.g. (Sharman 2012, 2009; Unger and Ferwerda 2008), the empirical perspective proposed by this paper could be used as an alternative approach in the identification of 'high-risk' countries.

The analysis of the determinants of the anomalous ownership links (Table 8) shows the significant role played by financial secrecy: regardless of how it is measured, secrecy is always strongly correlated with the levels of residuals. This result is not surprising and confirms the large amount of literature pointing to the opacity of the financial, banking and corporate sector as a key

[10] FATF 'High risk and other monitored jurisdictions' blacklist. Only Iran and North Korea appear in the 'high risk' blacklist, while Bahamas (plus other 11 country) is classified as "other monitored jurisdiction" as of May 17, 2019 (http://www.fatf-gafi.org/countries/#high-risk).
[11] "EU blacklist of third countries in line with the Anti-Money Laundering Directive (2019/2612(RSP))", as set by the Delegated Act issued on 19 February 2019. To be noted is that the blacklist is currently under review after rejection by the Council (http://www.europarl.europa.eu/doceo/document/TA-8-2019-0216_EN.html).
[12] Countries which "refused to engage with the EU or to address tax good governance shortcomings" (situation on May 17, 2019). (https://ec.europa.eu/taxation_customs/tax-common-eu-list_en).

vulnerability in terms of money laundering and illicit financial flows (Aziani 2018; Janský and Kokeš 2016; van der Does de Willebois et al. 2011).

More surprising, and interesting, is the strong positive correlation between the amount of anomalous ownership links and the level of control of corruption and rule of law in *j*-countries: i.e. the stronger the corruption in a country, the lower is the amount of 'anomalous' owners coming from that country. The result confirms the hypothesis, suggested by Walker (1999), that rational investors wanting to set up shell companies to conceal illicit activities would opt for jurisdictions with a high level of secrecy but a low level of corruption and a stronger rule of law. In this sense, corruption and institutional weakness could be interpreted as a cost, in money laundering, rather than a facilitator.

This paper is only a first step towards better understanding, supported by empirical evidence, of the determinants of cross-border ownership links aimed at concealing illicit financial flows. Future analysis should be able to go beyond the first level of shareholders and map the overall network of 'anomalous' ownership links. Moreover, the relationship between illicit financial flows and corruption (not as a predicate offence, but as a facilitator or obstacle of IFF) requires in-depth investigation, possibly with the employment of more solid measures of corruption also at a local level.

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Appendix

The third set of models (*ALL Determinants*) reconciles the determinants of cross-border ownership links related to the legal economy (first step) and to secrecy and corruption (second step). When combined together, most correlations maintain the significance and the sign as in both steps, migrants and tax differential being the two exceptions. A large part of the explanatory power of the tax differential seems to be absorbed by the tax haven dummies, but when we include the FSS the correlation between number of shareholders and tax differentials remains significant at the 95% confidence level, with a negative sign. Migration becomes a relevant factor when controlling for tax havens and the level of the rule of law or of corruption controls. Overall, the Akaike and the Bayesian criterions indicate an improvement of each model included in the third set with respect to LE.5 (AIC 17,116, BIC 17,232), with ALL.8 being the overall preferred model.

Table 9. III Set - Complete Models (Licit Economy and Illicit Financial Flows), Legal Persons, Cluster?ed Robust Binomial GLM

	Dependent Variable: number of foreign shareholders (j in i),ln							
	ALL.1	ALL.2	ALL.3	ALL.4	ALL.5	ALL.6	ALL.7	ALL.8
Gross National Income (i), ln	0.18***	0.18***	0.20***	0.20***	0.17***	0.16***	0.17***	0.17***
Gross National Income (j), ln	0.27***	0.33***	0.35***	0.35***	0.25***	0.24***	0.27***	0.26***
Geo. distance, ln	-0.12***	-0.12***	-0.07***	-0.07***	-0.12***	-0.11***	-0.12***	-0.11***
Contiguity	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
EU membership (i)	0.04	0.04	0.04	0.04	0.04	0.09*	0.03	0.07
EU membership (j)	0.10***	0.11***	0.22***	0.23***	0.05***	0.05***	0.07***	0.07***
WTO member (i)	0.04	0.04	0.05	0.05	0.03	0.01	0.03	0.03
WTO member (j)	0.01	0.00	-0.00	-0.00	-0.05***	-0.05***	-0.02*	-0.02*
Former colony	0.05***	0.05***	0.04***	0.04***	0.05***	0.05***	0.05***	0.04***
Former same country	0.03**	0.03***	0.02**	0.03**	0.02**	0.02**	0.02**	0.02**

Procedures to start (i-j), ln	0.12***	0.12***	0.15***	0.16***	0.05**	0.05**	0.05**	0.04*
Migrants (j in i), ln	0.07*	0.08**	0.02	0.02	0.11***	0.14***	0.11***	0.14***
Common language	0.04**	0.04***	0.06***	0.07***	0.04**	0.04**	0.04**	0.04***
Tax rate (i-j), ln	-0.02	-0.03	-0.04*	-0.04*	-0.03	-0.03*	-0.03	-0.02
GDP growth (i-j), ln	0.03	0.03	0.03	0.03	0.02	0.03	0.02	0.03
Tax haven dummy (j)	0.25***							
Sum of 13 tax haven dummies (j), ln		0.29***			0.22***	0.22***	0.23***	0.23***
FSS '15 (j)			0.08***					
FSS '18 (j)				0.10***				
Rule of law (i), ln						-0.10***		
Rule of law (j), ln					0.24***	0.25***		
Control of Corruption (i), ln								-0.08*
Control of Corruption (j), ln							0.21***	0.21***
Available info (i), ln	0.09*	0.08*	0.09*	0.08*	0.09*	0.12***	0.09*	0.09**
N. of observations	6766	6766	6766	6766	6766	6766	6766	6766
N. of i countries	40	40	40	40	40	40	40	40
N. of j countries	172	172	172	172	172	172	172	172
AIC	16418	16154	17064	17042	15879	15793	15899	15852
BIC	16541	16277	17187	17165	16009	15929	16029	15988

Note: the table reports the standardized beta coefficients of Cluster?ed Robust Binomial GLM regressions of the number of international shareholders in a sample of European countries. In these models we add some controls for tax havens to address the potential use of companies in IFFs schemes. Models 4 to 6 include also indicators of the strength of the Rule of Law, while Models 7 to 9 include? Corruption Control to understand the nature of the countries where these illicit schemes take place. All continuous variables enter the regression in the form of natural logarithm. The AIC and the BIC values provide two measures of the relative quality of the models. *, **, and *** indicate coefficients significantly different from zero at the 95.0%, 99.0%, and 99.9% confidence level, respectively.