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Minimum Capital and Cross-Border Firm Formation in Europe

Martin Gelter

Fordham University and ECGI

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Abstract

This article explores the impact of minimum capital requirements on trends in incorporations of UK-based private limited companies by non-UK founders within Europe. The legal capital system, including minimum capital requirements, has faced increasing criticism over the past two decades for its alleged inefficiency, hindering business formation, and affecting founders' incorporation choices in European countries. I construct comprehensive panels of minimum capital and minimum pay-in requirements from 1995 to 2020 for 31 countries, including all EU and EEA member states (except the UK) and Switzerland. Many European countries have reduced or abolished minimum capital requirements during this period. Utilizing this dataset, I examine the influence of minimum capital relative to GDP per capita on the number of cross-incorporations to the UK from each country while controlling for other factors. The regression analysis reveals that minimum capital requirements significantly impact corporate mobility, with more demanding requirements associated with more cross-incorporations. The paper highlights the effects of regulatory arbitrage in corporate law across countries. As European countries have progressively reduced minimum capital requirements to facilitate firm formation, this research provides valuable evidence on how such requirements influence entrepreneurs' choices. With the impact of Brexit eliminating the freedom of establishment in the UK under EU treaties, the landscape of budding entrepreneurs seeking other favorable jurisdictions is expected to evolve in the coming years. The article underscores the importance of corporate law in shaping firm formation decisions and its effectiveness in retaining jurisdictional control over local businesses.

Martin Gelter
Professor of Law
Fordham University School of Law
150 W. 62nd Street
New York, NY 10023, United States
phone: +1 646 312 8752
e-mail: mgelter@law.fordham.edu

Fordham University School of Law

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By
Martin Gelter
PROFESSOR OF LAW

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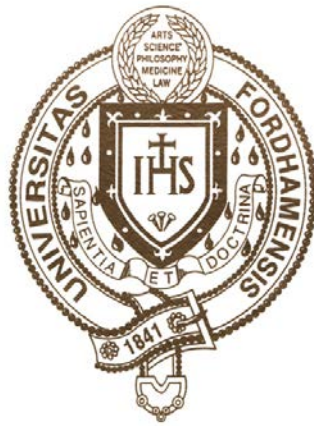
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Abstract: *This article explores the impact of minimum capital requirements on trends in incorporations of UK-based private limited companies by non-UK founders within Europe. The legal capital system, including minimum capital requirements, has faced increasing criticism over the past two decades for its alleged inefficiency, hindering business formation, and affecting founders' incorporation choices in European countries. I construct comprehensive panels of minimum capital and minimum pay-in requirements from 1995 to 2020 for 31 countries, including all EU and EEA member states (except the UK) and Switzerland. Many European countries have reduced or abolished minimum capital requirements during this period. Utilizing this dataset, I examine the influence of minimum capital relative to GDP per capita on the number of cross-incorporations to the UK from each country while controlling for other factors. The regression analysis reveals that minimum capital requirements significantly impact corporate mobility, with more demanding requirements associated with more cross-incorporations. The paper highlights the effects of regulatory arbitrage in corporate law across countries. As European countries have progressively reduced minimum capital requirements to facilitate firm formation, this research provides valuable evidence on how such requirements influence entrepreneurs' choices. With the impact of Brexit eliminating the freedom of establishment in the UK under EU treaties, the landscape of budding entrepreneurs seeking other favorable jurisdictions is expected to evolve in the coming years. The article underscores the importance of corporate law in shaping firm formation decisions and its effectiveness in retaining jurisdictional control over local businesses.*

Keywords: Centros, legal capital, minimum capital, regulatory arbitrage, cross-border firm formation, startups
JEL Codes: G32, K22, M13

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1. Introduction

Company laws in many European countries have traditionally adhered to a legal capital system, and most have required founders to contribute a minimum amount of capital to form a private limited company. During the past 20 years, the legal capital system overall and specifically minimum capital requirements have increasingly been criticized as inefficient by scholars, some policymakers, and international organizations such as the World Bank, which routinely describes it as a hindrance to business formation in its annual Doing Business Report. While European Union

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(EU) law establishes a minimum capital requirement in public limited companies, Member States are free to innovate in this area of company law in private limited companies. Many European countries – inside and outside the EU – have begun to modify or abolish minimum capital requirements in private limited companies or have created capital-less forms of limited liability business entities for new firm formations.[1]

A contributing factor to this development has been that, since the early 2000s, business founders in EU and European Economic Area (EEA) countries have, at least in theory, been able to choose in which EU or EEA Member State to incorporate. Many prospective founders in Continental European countries initially selected the UK, which has no minimum capital requirement. During the mid-2000s, scholars in some countries observed an increasing number of UK companies controlled by non-UK citizens or residents.

This study investigates the impact of minimum capital requirements for trends in UK incorporations by non-UK founders of private limited companies. The paper is the first to construct panels of minimum capital and minimum pay-in requirements from 1995 to 2020 for 31 countries, namely all Member States of the European Union (EU) and the European Economic Area (EEA) (besides pre-Brexit UK), as well as Switzerland. I test the impact of the ratio of minimum capital to GDP per capita on the number of cross-incorporations to the UK from each country and control for other possible factors. While other papers have explored the impact of the freedom to choose the country of incorporation, a few of which have looked into the effects of specific reforms in individual countries, none so far has looked at a key variable such as minimum capital across the entire EU and European Free Trade Association (EFTA) over such an extensive period. The fact

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[1] For a survey, see Bartolacelli 2017.

that there have been many reforms over the past two decades allows us to use a wealth of information. The regressions provide evidence that corporate law, especially minimum capital, is important for corporate mobility. The analysis thus sheds light on trends in regulatory arbitrage in corporate law across countries. Even as the UK has left the European Union with Brexit, corporate mobility in Europe will remain relevant as other jurisdictions remain potentially attractive destinations for cross-border incorporation.

2. Background and literature: Regulatory arbitrage in corporate law

2.1. The debate about minimum legal capital requirements for private limited companies

Traditionally, most European company laws have used a legal capital system. Firms must state their nominal capital in their articles of incorporation and the amount that attaches to each ownership share. The capital system has two primary intrinsic features. First, shareholders must contribute at least a measurable amount to the company's capital, either in cash or in kind. Second, the company may not return the nominal amount to shareholders outside of liquidation. Dividends and other distributions are thus limited to, at most, the company's surplus and reserves, i.e., the company's total equity minus the company's legal capital.[2]

In addition, many countries require or have traditionally required a minimum capital set in the law (e.g., Armour, Fleischer, Knapp, and Winner 2017, 231). Explanations mainly relate to the

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[2] EU law establishes a minimum capital requirement of EUR 50,000 for public limited companies as well as capital contribution and capital maintenance rules. Directive 2017/1132/EU of 14 June 2017 relating to certain aspects of company law (Codified Company Law Directive), 2017, O.J. (L 169) 6, art. 44-67. Previously, these rules were found in the Second Company Law Directive of 13 December 1976, 77/91/EEC, 1977 O.J. (L 26) 1 and subsequently the "recast" Second Company Law Directive 2012/30/E of 25 October 2012, 2012 O.J. (L 315) 74. While the EU law requirements do not extend to private limited companies, many Member States and other European jurisdictions have or had such requirement also for these forms of business entities (e.g. Armour, Fleischer, Knapp, and Winner 2017, 231).

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alleged need to protect creditors in limited liability entities. First, minimum capital is supposed to create a buffer against losses (e.g., Eidenmüller, Grunewald, and Noack 2006, 19). Second, minimum capital requirements are thought to restrict the availability of limited liability to serious business ventures and weed out potential firm foundations that are problematic for creditors due to their non-serious nature (e.g., Mülbert and Birke 2002, 717-718). Third, requiring members to commit a non-trivial amount of funds is sometimes expected to improve their commitment to the firm and avoid risk; otherwise, because of the debt overhang problem, member-managers would operate mainly at the expense of creditors (Eidenmüller, Grunewald, and Noack 2006, 23-24).

During the past twenty years, minimum capital and the legal capital system have been heavily criticized (e.g., Enriques and Macey 2001; Mülbert and Birke 2002; Rickford 2004; Armour 2006). Critics argue that a firm can quickly lose its capital to ordinary business activity and does not create a buffer against losses (e.g., Schön 2004, 437; Mülbert 2006, 386). For this reason, it arguably does not help creditors. In addition, at least contractual creditors would likely bargain for capital maintenance and minimum capital requirements if these were efficient (Enriques and Macey 2001, 1188-95). Generally, such "adjusting" creditors have several creditor protection tools available, such as requiring security interests, covenants, adjusting interest rates, or refusing to lend. The last option is open even to unsophisticated trade creditors (e.g., Schön 2004, 437-38; Armour 2006, 20).

Therefore, legal capital as well as minimum capital requirements are increasingly considered unnecessary impediments to business formation. Minimum capital restricts limited liability entities to founders who have the financial capability to contribute a certain amount to the firm (e.g., Mülbert 2006, 386). By forcing some founders to start a business without the benefit of limited liability, minimum capital may inhibit business formation and deter some entrepreneurial

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activity (Eidenmüller, Grunewald, and Noack 2006, 27-28). One could object that most companies will need sufficient capital to start business activities, for which minimum capital can be used (e.g., Eidenmüller, Grunewald, and Noack 2006, 25). Consequently, legal requirements will only inhibit the formation of a small segment of firms.

The World Bank made minimum capital requirements part of their (now abandoned) "Doing Business" index, in the context of which it is a negative factor reducing a country's ranking (e.g., World Bank 2005, 18). Capital requirements were seen as a hindrance to business formation partly because founders must go through certain formalities to show company registers that the minimum capital has been made available to the new firm, such as appraisals of the value of contributions in kind or proof of payment for cash contributions. The Doing Business ranking reportedly motivated several countries to reduce or eliminate minimum capital requirements (e.g., for Italy, Guidotti 2015, 301-302).

2.2. Minimum capital and the role of regulatory arbitrage

Regulatory arbitrage is often discussed in the context of minimum capital requirements for private companies in Europe in the past two decades. Most countries worldwide only have a single corporate law, the most important exception being the United States. Even in large economies with a significant federal system, such as Brazil or Germany, founders typically must select one of the legal forms available under the single domestic law of business associations. Within the EU, this situation started to change in the early 2000s. Previously, Member States were divided between those using the "incorporation theory" and those following the "real seat theory" to determine which organizational law applies to a business entity. Under the incorporation theory, which was used, e.g., in the UK, the jurisdiction where a company was incorporated determines the law applicable to a company. By contrast, the real seat theory, used in much of Continental Europe, is

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more complex. Under its most extreme form, a corporation is only validly founded if it follows the jurisdiction's formation procedures where its "real seat" is located. Thus, the legal personality of a firm with its headquarters in Germany will only be recognized by the courts if incorporated under German law. A firm headquartered in Germany but incorporated in the UK would be treated as legally non-existent, or the courts might treat it as a partnership, resulting in the unlimited liability of its shareholders for corporate obligations (e.g., Dammann 2004, 483-84). Some EU Member States, such as the Netherlands, applied the incorporation theory but had laws that created restrictions for firms registered elsewhere but with their headquarters in the Netherlands. These firms were similarly subject to the liability of shareholders in some cases, which was intended to discourage the use of "pseudo-foreign" corporations incorporated in another EU Member State to circumvent Dutch law (e.g., Gelter 2017).

In the three seminal cases of Centros (1999)[3], Überseering (2002)[4], and Inspire Art (2003)[5], the Court of Justice of the European Union (CJEU)[6] completely changed this state of affairs. While not explicitly declaring the real seat theory incompatible with EU law, the case law rendered it inapplicable against the backdrop of the freedom of establishment enshrined in the EU Treaties. Member States were required to recognize the legal personality of firms validly incorporated in another Member State, and they were (barring exceptional circumstances) not allowed to impose restrictions on such firms (e.g., Becht, Enriques, and Korom 2009, 171-72).

These cases had a noticeable impact on the incorporation choices of new privately held businesses. Scholars soon noted an uptick in the number of firms registered in the Companies

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[3] Centros Ltd v Erhvervs- og Selskabsstyrelsen, Case C-212/97 [1999] E.C.R. I-1459.
[4] Überseering BV v. Nordic Construction Company Baumanagement GmbH, Case C-208/00 [2002] E.C.R. I-9919.
[5] Kamer van Koophandel en Fabrieken voor Amsterdam v. Inspire Art Ltd., Case C-167/01 [2003] E.C.R. I-10155.
[6] Before the Treaty of Lisbon, the court was known as "European Court of Justice" (ECJ).

House for England and Wales. Founders from Continental European EU Member States were increasingly selecting English law to set up "Private Limited Companies," using the opportunity created by the CJEU. Agencies began to offer services on the internet to facilitate UK incorporation and marketed them, for example, to German founders. One crucial issue was that founders were not required to dedicate a specific minimum amount of capital to the business to set up a private limited company in the UK. Other Member States sometimes required considerable sums (e.g., the highest amount was Austria, were the minimum capital is set at € 35,000, although founders only had to contribute € 17,500 before registration). Moreover, founders typically needed to go through more complex procedural requirements to protect the firm's creditors during the formation stage.

The following years saw the emergence of a debate about the possibility and desirability of regulatory arbitrage in corporate law concerning privately held firms (e.g., Heine and Kerber 2002; Enriques 2004; Dammann 2004; Kieninger 2004; Armour 2005; Gelter 2005; Kirchner, Painter, and Kaal 2005; Tröger 2005; Birkmose 2006; Deakin 2006; Ventoruzzo 2006). However, the practical availability of English legal forms on the Continent varied considerably between countries. Becht, Enriques, and Korom (2009) performed an experimental study, showing that considerable practical hurdles impeded registering a branch office of a "pseudo-UK" firm in several jurisdictions.

At least in some Member States, legal scholars and policymakers were concerned about the formation of potentially dubious UK firms operating in the respective country. Some countries began to engage in what could be called "defensive regulatory competition" (e.g., Enriques and Gelter 2006, 600; Ringe 2013, 243; Gelter 2019). This term refers to legislative measures that would make a UK private limited company less attractive to founders in comparison. However, it

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is not entirely clear to what extent these changes were induced by regulatory competition motives or other factors, such as the desire to create a better environment for startup businesses, competitive pressure from outside the EU (such as Delaware, see Giuduci & Agstner 2019), or the desire to improve on the World Bank ranking (Guidotti 2015, 301-302).

The UK finally left the EU with Brexit becoming effective on February 1, 2020. Some courts have already found that UK private limited companies no longer enjoy the EU's freedom of establishment[7], which will mean (at least in some Member States) making the choice of UK law much more complex because of the resulting uncertainty. However, other Member States have attracted relatively little attention in the debate and may become attractive destinations in the future, including some with legal systems related to that of the UK and no minimum capital requirements, such as Ireland and Cyprus. To the extent that minimum capital will continue to play a role, the debate and empirical findings will remain relevant.

2.3. Parallels in the US

In the United States, lawyers setting up a corporation or LLC (Limited Liability Company) for their clients are used to freely selecting their state of incorporation. While the reg debate focuses on regulatory competition in the context of publicly traded firms (e.g., Bebchuk 1992; Romano 1993), there is also regulatory arbitrage for incorporation choices of privately held firms. The evidence suggests that founders and their lawyers typically choose between their home-state law and the law of Delaware, the most popular jurisdiction (Dammann and Schündeln 2012). One explanation is lawyers' familiarity with Delaware corporate and LLC law nationwide. Delaware

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[7] German Federal Supreme Court (BGH) February 17, 2021, II ZB 25/17; Austrian Supreme Court (OGH), January 27, 2022, 9 Ob 74/21d.

thus benefits from a network effect generated by having a large set of companies already registered in the state (Ribstein and O'Hara 2008, 703; Zorzi 2017, 256). Surveys among lawyers emphasize the power of the Delaware brand (Gevurtz 2012, 105). Venture capital investors are more likely to select investments in firms whose governing law they are familiar with (Broughman, Fried, and Ibrahim 2014, 893). The quality of Delaware's court system is considered a significant advantage, as well as its innovativeness in legislation (Kobayashi and Ribstein 2011, 128).

In terms of substantive law, for both LLCs and closely held corporations, the risk of piercing the corporate veil seems to play a role, as well as minority oppression statutes (Dammann and Schündeln, 2011, 95-96; Dammann and Schündeln 2012, 755-56). Thus, it appears that the choice of the applicable state law is driven at least in part by ex-post liability risks for managers and members, which founders expecting to control the firm will want to avoid. By contrast, ex-ante commitment mechanisms such as minimum capital play a lesser role (if any) in the US. While states are divided on whether they use a legal capital system,[8] no state has a minimum capital requirement. As a result, the US's usefulness as a comparison is limited.

2.4. Previous empirical literature in Europe

This study investigates the role of minimum capital and minimum pay-in requirements for regulatory arbitrage. It is the first paper based on a complete panel of minimum capital requirements across Europe over several decades. In light of this, this paper provides a far more comprehensive data analysis than the existing literature, which tends to focus more on specific reforms and countries or more limited periods.

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[8] Legal capital systems exist e.g. in Delaware and New York. See DGCL § 170 and N.Y. Bus. Corp L. § 510(b). By contrast the (Revised) Model Business Corporation Act, on which some state laws are based, does not have a legal capital system at all. See RMBCA § 6.40(c). See generally Manning & Hanks 2013.

Several papers look at minimum capital in the context of barriers to entrepreneurship. The World Bank's Doing Business Report measured procedural and formal steps for company formation, which includes minimum capital as part of its index, since 2004 (see Djankov 2009). Dreher and Gassebner (2013) investigated factors that determine "nascent entrepreneurship," measured as a percentage of individuals who have taken steps to form a business during the past year in 43 countries in a panel ranging from 2003 to 2005. They found that (besides other factors such as corruption and the duration of business formation), minimum capital has a numbing effect on the percentage of entrepreneurs. Braun, Eidenmüller, Engert, and Hornuf (2013) looked at company law reforms reducing or eliminating minimum capital requirements in the mid-to-late 2000s in Spain, France, Hungary, Germany, and Poland and performed a difference-in-difference regression comparing public and private limited companies, where only the latter group was affected by the reform. The reforms in each country (and in a cross-country regression) made the "reformed" national type of legal entity relatively more popular. Ahonen (2020) used a difference-in-difference method to explore the effect of the 2006 reduction of minimum capital in Finland by comparing the impact of changing requirements on different industries, with industries with higher percentages of sole entrepreneurs forming more limited companies after the reform.

Some literature explores drivers that induced Continental European founders to incorporate in the UK after the Centros case. Armour (2005, 385-86) provided tentative evidence on incorporations of German businesses based on a text search in the English Companies House database. Subsequent papers use Bureau van Dijk's FAME and ORBIS databases, which has become the standard in this literature.[9] Looking at UK-based founded by non-UK residents, Becht, Mayer, and

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[9] The papers differ in their method of identifying such firms. Details are discussed in the online appendix.

Wagner (2008) compare the number of companies from EU to non-EU states from 1997 to 2006. Their difference-in-difference analysis finds that the CJEU's *Centros* decision had a statistically significant impact on the number of pseudo-foreign firms within the EU. The effects were greater in countries with higher minimum capital, higher paid-up capital, and higher setup costs, which were more affected by Centros. Ringe (2013, 247-253) compares time series for firm formations in the UK originating in Germany and Austria, finding that the number decreased simultaneously in both countries (starting around 2007). He, therefore, suggests that a notable German reform of 2008 could not have been the cause of the downturn. Following up on this point, Gelter (2019) compares monthly firm formations between Germany and Austria on the one hand and Belgium and the Netherlands on the other hand, finding that the German reform likely had an incremental effect relative to Austria, even if it may not have been the only factor in reducing the number of "German" limited company formations in the UK. Finally, Gerner-Beuerle, Mucciarelli, Siems, and Schuster (2018) look at cross-incorporations between all EU member states (not just in the UK). Their cross-sectional regression looks at several covariates (such as shared language, geographic proximity, the similarity of legal traditions, etc.) to identify the factors that make incorporation in a specific other country more likely.

This study is the first of its kind to create panels of minimum capital and minimum pay-in requirements spanning 1995 to 2020 in 31 countries, including all European Union (EU) and European Economic Area (EEA) member states (except the UK) and Switzerland.[10] The paper as-

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[10] Becht, Mayer and Wagner (2008) use minimum capital, minimum pay-in amounts and set-up costs in, only in the form of one time-invariant value per country.

sesses how the ratio of minimum capital to GDP per capita affects the number of companies incorporating in the UK from each country while also controlling for other potential factors. No previous paper has looked at a panel across a comparable number over this timeframe. Moreover, the paper investigates two critical variables of interest, minimum capital and minimum pay-in requirements, that were collected for the entire period in all countries. This allows us to analyze this crucial variable's role and investigate the impact on cross-incorporations from around Europe into the UK.

3. Data, variables, and descriptive statistics

3.1. Data collection

To estimate the number of firms formed in the UK and controlled by individuals from other EU countries founded each year, I used the ORBIS database and generally followed the search strategies of Becht, Mayer, and Wagner (2008), Ringe (2013), and Gerner-Beuerle, Mucciarelli, Siems, and Schuster (2018).[11] Looking at UK private limited firms where the majority of directors are nationals of other EU Member States, I constructed a time series of UK incorporations for each country, thus putting together a panel of countries for 1995 to 2020. I looked at all firms that have at least one person on ORBIS's director/manager list with citizenship in one of 31 countries.[12] I included all 27 EU members, the three additional European Economic Area members (Iceland,

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[11] Details are discussed in the online appendix.
[12] The search was originally conducted in November 2017, but the data were updated in June 2023.

Liechtenstein, and Norway), and Switzerland.[13] Table 1 shows averages of pseudo-foreign incorporations estimated in this way for five-year periods between 1995 and 2020 to show the development over time.[14]

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[13] This country is neither a member of the EU or the EEA but has a bilateral agreement with the EU that gives it access to certain aspects of the common market. Companies having their registered office, central administration or principal place in Switzerland have the right to provide services in EU Member States (and vice versa), but the freedom of establishment does not apply to them. Agreement between the European Community and its Member States, of the one part, and the Swiss Confederation, of the other, on the free movement of persons, 2002 O.J. (L 114) 6, annex I, art. 18 (extending the freedom to provide services to companies).

[14] We plot timelines for each country in Figures 1a and 1b in the online appendix.

Table 1: Average yearly number of estimated incorporations from each country in the UK for five-year periods (highest average in bold print)

	1996-2000	2001-2005	2006-2010	2011-2015	2016-2020
Common law					
Cyprus	82.80	**176.20**	145.00	138.60	130.20
Ireland	123.60	271.80	361.60	779.20	**1112.20**
Malta	2.00	7.00	10.80	17.40	**28.20**
EU-15					
Austria	24.40	233.40	**370.80**	253.40	205.60
Belgium	41.60	130.80	**472.20**	313.20	314.60
Denmark	29.80	**454.60**	173.80	235.40	187.60
Finland	4.40	17.60	40.20	60.40	140.20
France	319.00	491.80	672.80	1064.40	**1612.60**
Greece	45.60	79.80	139.40	317.80	**536.60**
Germany	200.80	4563.80	**6586.80**	1782.00	1485.20
Italy	91.00	226.60	528.80	1054.80	**1570.80**
Luxembourg	3.40	5.00	5.60	11.20	**13.40**
Netherlands	326.20	801.60	**1535.20**	898.20	614.20
Portugal	9.80	48.40	80.00	189.40	**433.60**
Spain	15.60	48.80	106.80	596.20	**718.40**
Sweden	40.20	138.60	687.20	1053.80	**1097.40**
(Other) new member states					
Bulgaria	4.00	71.40	85.40	189.80	**290.20**
Croatia	0.20	0.80	6.00	29.80	**112.00**
Czech Republic	6.00	38.00	118.60	249.20	**314.60**
Estonia	0.40	3.60	18.20	42.60	**71.00**
Hungary	3.80	49.00	77.20	345.40	**556.40**
Latvia	0.80	2.60	9.80	55.20	**245.80**
Lithuania	0.40	3.80	19.60	98.60	**362.20**
Poland	10.00	204.40	539.80	1399.80	**2236.20**
Romania	2.00	27.80	111.80	470.80	**1073.60**
Slovakia	0.40	3.20	21.40	78.20	**217.20**
Slovenia	0.00	1.60	6.60	24.60	**81.00**
EFTA					
Iceland	2.40	9.20	23.00	**25.00**	23.80
Liechtenstein	3.40	4.80	6.00	**5.20**	2.60
Norway	8.20	556.20	**3966.00**	2026.40	902.20
Switzerland	67.20	129.60	**240.20**	153.60	225.40

National trends differ remarkably. While most countries have the highest averages from

2016 to 2020, cross-incorporations peaked earlier in a minority of jurisdictions. The fact that some

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countries do not exhibit a permanent upward trend indicates that the more prominent presence of newer firms in this model is not due to the unexplained attrition of older firms in the database.[15] There are few, if any, clear patterns. One is that the number of firms consistently increased in all formerly communist Member States. This pattern may be connected to the relatively late date these countries joined the EU, making cross-incorporations available. Another factor that may play a role in country-specific trends is immigration to the UK, which I discuss in section 3.3 below and for which I control in the regression analysis in section 4. However, this trend has not even been broken by Brexit, which one would expect to reduce foreign incorporations in the UK.

Among the other jurisdictions, Mediterranean countries (plus Sweden and Ireland) have continued to show an increase in recent years. In some countries, an explanation could be idiosyncratic hurdles to registering branches of foreign companies, such as the ones documented by Becht, Enriques, and Korom (2009), that may have disappeared over time. However, this does not, for example, explain the case of Sweden, where cross-incorporation did not pose a significant hurdle.

For countries with an earlier "Limited boom," an explanation may be that the CJEU's original case law in the early 2000s concerned Denmark, Germany, and the Netherlands. The legal and business communities may have become aware of the possibility of cross-incorporating early on in countries with close cultural and linguistic connections, such as Austria, Belgium, Switzerland, and Norway. However, in summary, no single theory easily explains trends across countries.

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[15] This is also confirmed by a comparison to an earlier download of the data from 2017.

3.2. Minimum capital and minimum pay-in requirements as independent variables

The main question of interest is whether the amount of capital founders must commit to a business in a specific country has an impact on cross-incorporations abroad to set up a private limited company. Minimum capital can be described as the amount that members must at least commit to the company, even if they are not immediately required to contribute the total amount at the time of company registration. Thus, as will be detailed, I constructed two variables: <u>minimum capital</u> and the <u>minimum pay-in amount</u>. In some jurisdictions, these two amounts are or were always the same, while in others, they differed. For example, in Germany, the minimum capital in a *GmbH* (Gesellschaft mit beschränkter Haftung) amounts to € 25,000, of which only half must be paid into the firm before registration.[16] By contrast, Switzerland has a minimum capital of CHF 20,000. Before 2008, each member had to contribute at least 50% of their share before registration, whereas, since that year, the total amount needs to be paid in.[17]

In jurisdictions where members can elect not to contribute the full capital sum, they are generally liable for the difference in the event of the company's insolvency. Some countries do not stipulate that the "missing" capital must be filled up unless shareholders or the company decides to request it, whereas others set a maximum period.[18] For the analysis, either variable could plausibly matter; founders might care about the formal capital sum they have to register, which

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[16] §§ 5, 7(2) GmbHG (Germany). This figure applies to the "normal" GmbH and does not take the *UG (haftungsbeschränkt)* into account, which was made available only in late 2008. See § 5a GmbHG.

[17] Art. 773, 774, 777c OR (Switzerland).

[18] We relied on the formal distinction between the capital figure and relief from having to pay-in the capital amount in distinguishing minimum capital and minimum pay-in in cases where they function similarly. For example, while the German *UG (haftungsbeschränkt)* allows a minimum capital as low as € 1, the Spanish *Sociedad en régimen de formación sucesiva* does not allow a reduction of minimum capital, but a deferral of the capital contribution. Spain therefore has a pay-in requirement of zero after 2013. Hungary between 2006 and 2014 provides a contrary example. Cash contributions had to be paid in within a year after registration of the company. Such cases were treated as having a minimum pay-in equivalent to the minimum capital, i.e. both figures are the same.

ultimately indicates their maximum liability, or they might care about the amount they must pay upfront. The two variables are highly correlated, which makes it impossible to disentangle the two effects; each variable is only included separately in the regressions. As the primary target country, the UK has no minimum capital requirement. Still, the same is also true for two of the origin countries, namely Cyprus and Ireland, throughout the period of analysis.

National minimum capital and minimum pay-in requirements are not readily available (especially not over time) and were compiled from a multiplicity of sources. The process is described in more detail in an online appendix. Table 2 surveys the main types of reforms. Table 1 in the online appendix provides a detailed list.

Table 2: Overview of reforms relating to minimum capital in private limited companies

Type of reform	Countries and years of implementation
Reduction of minimum capital	Denmark (2010, 2019), Estonia (2011), Finland (2006), Greece (2008, 2012), Hungary (2007, reverted 2014), Liechtenstein (2017), Norway (2012), Poland (2009), Sweden (2010, 2020)
Elimination of minimum capital	Belgium (2019), Croatia (2013), Czech Republic (2014), Finland (2019), France (2004), Italy (2013), Lithuania (2012), Portugal (2011), Romania (2020)
Modified private limited company form or special rules for companies founded below regular minimum	Belgium (2010), Bulgaria (2009), Denmark (2014, abolished 2019), Germany (2008), Greece (2012/13), Italy (2012/13), Luxembourg (2017), Netherlands (2012)
Modified company form based on public limited company	Slovakia (2017)
Lower capital requirements for ten years after firm formation	Austria (2014)
"Successive firm formation" without pay-in requirement	Spain (2013)

Standardizing the variables for the analysis was also necessary, given that capital figures are given in national currencies. The figures were first converted into US dollars using the exchange rate reported by the World Bank for the respective year. In a cross-country statistical analysis, using absolute figures while ignoring the income level and purchasing power of the sums in

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question in the respective country would not yield meaningful results. For example, the same amount in USD would likely be easier to afford for an aspiring Swiss entrepreneur compared to a similarly positioned person in Bulgaria. For further analysis, I divide the minimum capital and minimum pay-in amount by the country's GDP per capita in purchasing power parities, as reported by the World Bank.[19] This normalization considers that the same figure might be a considerable hurdle for company formation in a low-income country but not a high-income jurisdiction.[20] I use these ratios (in logarithmic form) as the key independent variable.

As we are interested in hurdles for new entrepreneurs, I look not only at the *formal* minimum capital and pay-in requirements. To construct our minimum capital and pay-in timelines, I look at the *effective* amounts required of a new entrepreneur attempting to register a limited liability entity while committing as little capital as possible. Consequently, the timelines consider minimum capital for capital-less companies, even if they are available only after firm formation. However, I consider only firm types available to founders in general without meaningful limitations. Thus, the variable takes the German *UG (haftungsbeschränkt)*[21] into account, which is available to every founder, but not the original Italian *società a reponsabilità limitata semplificata* of 2012,

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[19] In the case of Liechtenstein, where this figure was not available, the GDP/PPP for Switzerland was used.

[20] Arguably, UK incorporation could also be less affordable for entrepreneurs from low-income jurisdictions, which could reduce the number of cross-incorporations to the UK to a small extent. Arguably, country-fixed effects and country time trends should largely absorb such a phenomenon.

[21] See § 5a GmbHG. The *UG (haftungsbeschränkt)* is a form of GmbH that does not require the regular minimum capital but must create certain reserves from profits. It was introduced in a 2008 law and became available to founders. Other reforms taken into account include the *Gründungsprivilegierung* in Austria, the former *SPRL-Starter* in Belgium, the *Jednostavno društvo s ograničenom odgovornošću* in Croatia, the Danish *Iværksætterselskab,* the Greek *Idiotiki Kafalaiouchiki Etiaria (IKE),* and the (former) Italian *Società a responsabilità limitata a capitale ridotto*. We also decided to include the private limited company with no minimum capital under Latvian company law introduced to art. 185[1] of the Commercial Code in as of May 1, 2010, which is limited to 5 members all of whom must be natural persons. We also included the "Small Company" introduced into Lithuanian law in September 2012, which is limited to 10 members. We took an analogous approach for minimum pay-in requirements, but occasionally had to make judgment calls. We decided to include relief from pay-in of contributions under § 140[1] of the Estonian Commercial Code, which is only available to natural persons.

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which was open only to founders under the age of 35 at the time.[22] More detail can be found in Table 1 of the Online Appendix, which references the relevant reforms changing the effective minimum capital and minimum pay-in amounts and, where applicable, introducing special legal forms for "capital-less" companies.

3.3. Control variables

I include several covariates in the analysis to control for alternative explanations, the sources of which are summarized in Table 3 below. A country's GDP might explain the number of firm formations each year. This controls for the size of the country and its economy. One would expect more firm formations in countries and periods with more economic activity, which could partly explain cross-incorporations to the UK.[23]

Corporate tax rates might provide an alternative explanation for why companies seek to incorporate in another jurisdiction; founders might seek to take advantage of a lower tax rate, or they might hope that the pseudo-foreign nature of the firm allows them to avoid taxes. However, companies are usually taxed in the country where they have a business establishment for which the state of incorporation should matter little. In the context of the pseudo-foreign incorporations studied here, it is conceivable that firms are used in schemes to avoid or evade national taxes.

Another possible explanation is that founders avail themselves of the possibility to incorporate in another jurisdiction because they find the legal system, in general, more attractive. The

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[22] See Bartolacelli 2016, 668-70.
[23] Absolute annual GDP is not included, as it is collinear with the country fixed effects and GDP growth.

competence of the Delaware courts is one of the explanations for this state's preeminence in incorporations in the US (see section 2.3). The closest proxy I could find was the World Bank's <u>rule of law</u> index, which goes back to 1996.

<u>EU and EEA membership</u> likely matters in using the freedom of establishment enshrined in these treaties, given that the European Court of Justice created the opportunity to incorporate in another Member State (at least for those countries that did not allow it before). Following Becht, Mayer, and Wagner (2008), I also interact this variable with the CJEU's *Centros* case of 1999. These authors found that countries subject to the EU's freedom of establishment exhibited more cross-incorporations in the UK after the case.

Table 3: Control variables

Variable	Description	Source
log(GDP)	Country's GDP on a logarithmic scale	https://data.worldbank.org/
Corporate tax	Corporate Tax Rate for years 1994-2016 (KPMG and Tax foundation)	https://taxfoundation.org/publications/corporate-tax-rates-around-the-world/ (July 1, 2023)
Rule of law	World Bank's Rule of Law Index (1996-2016)	http://info.worldbank.org/governance/wgi/index.aspx
EU / EEA	Country is European Union or European Economic Area member in the given year (dummy variable)	https://en.wikipedia.org/wiki/Member_state_of_the_European_Union https://en.wikipedia.org/wiki/European_Economic_Area
log(migrants)	UN estimates of the number of migrants living in the UK	https://www.un.org/development/desa/pd/content/international-migrant-stock (July 2, 2023)
log(total number of firms)	Total number of business entities founded per year in the country of origin	ORBIS

Migration of citizens from EU Member States has a significant potential impact that could confound the effects investigated here because residents of the UK may be more inclined to incorporate there regardless of their citizenship. Migration patterns from individual countries to the UK changed considerably, especially as Central European countries joined the EU. For example, according to UN estimates, in 1995, 233,229 Germans and 64,757 Poles lived in the UK. The corresponding figures in 2020 were 310,043 and 835,975, indicating approximately a 33% increase for Germany but almost an increase by a factor of nearly 13 for Poland.

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As discussed in section 3.1, relying on the residence of citizenship data from ORBIS to control this phenomenon would be problematic because data on directors only report the directors' citizenship consistently, but not their place of residence. Following Gerner-Beuerle, Mucciarelli, Siems, and Schuster (2018), I use UN estimates of the number of migrants from each country as a covariate. The migration data are estimates provided by the UN for 1990, 1995, 2000, 2005, 2010, 2015, and 2020. Values for other years were interpolated using Kalman smoothing. The estimates are converted to a log scale, as the number of individuals better matches the dependent variable, which is also on a logarithmic scale. Overall, the ratio between migrants in 2020 and 1995 varies between .66 (Ireland) and 71.15 (Lithuania).

Finally, another factor could be the number of firms formed in a particular country. If private limited companies are formed more widely, individuals may also be more likely to incorporate in the UK. I include the logarithm of the total number of business entities founded in the country in question to account for the possibility that the trends captured in the regression models reflect an overall increase in such firms.[24] The number includes limited liability entities and other firms, such as partnerships. Depending on the country, incorporating in the UK may substitute for either type of firm to a certain extent. Overall, there appear to be positive time trends in all jurisdictions, the strength of which differs between countries.

Table 4 shows the correlation matrix between the control variables and the minimum capital and minimum pay-in variables.

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[24] This also takes care of the possible question of whether the dependent variable of interest should be the number of firms are the percentage of UK-incorporated firms from the jurisdiction in question. An alternative would be to use the percentage of UK-based firms as the dependent variable. Given that the percentage is typically very low, this would raise a number of econometric issues, such as fitted values below zero.

Table 4: Pearson correlations between variables

All variables are on a year/country basis. *log (no. firms founded in UK)* is the natural logarithm of the number of firms founded in the UK. *log(GDP)* is the natural logarithm of the country's GDP that year. *log(total no. firms)* is the number of firms founded in the country every year (including cross-corporations in the dataset), *log(migrants)* is the estimated number of migrants from the country residing in the UK in logarithmic form. *corporate tax* is the corporate tax rate. *Rule of law index* is the country's score on the World Bank's rule of law index. *log (minimum capital / GDP_PPP)* is the natural logarithm of minimum capital divided by GDP (Purchasing Power Parity), *log (minimum pay-in / GDP_PPP)* is the minimum amount of capital to be paid into a newly founded firm within a year after registration.

	log (no. firms founded in UK)	*log(GDP)*	*log (total no. firms)*	*log (migrants)*	*corporate tax*	*Rule of law*	*log (minimum capital / GDP_PPP)*
log(GDP)	0.75***						
log (total no. firms)	0.70***	0.85***					
log (migrants)	0.67***	0.63***	0.68***				
corporate tax	-0.06*	0.33***	0.19***	0.10***			
Rule of law	0.22***	0.27***	-0.03	-0.13***	0.19***		
log (minimum capital / GDP_PPP)	-0.17***	0.07*	-0.08**	-0.23***	0.29***	0.14***	
log (minimum pay-in / GDP_PPP)	-0.17***	0.01	-0.15***	-0.30***	0.22***	0.22***	0.89***
***$p < 0.01$, **$p < 0.05$, *$p < 0.1$							

A few of the correlations may not be entirely intuitive, such as the negative association between minimum capital and firm formations in the UK. It is essential to remember that these are panel data, and the number of firm formations varies widely between countries. Moreover, firm formations generally increased in most countries over time, while minimum capital relative to GDP mainly decreased.

For a level-based difference-in-difference analysis, I classified country-year observations in the panel into having no or only trivial minimum capital requirement, a non-trivial requirement, and a high minimum capital requirement (on the definitions of these categories, see section 4.3 below). Table 5 shows the means and standard deviations of the control variables for all firms and all three subgroups. There are no striking differences between the groups, except maybe that units with high minimum capital also had a high corporate tax rate and a strong rule of law index.

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Table 5: Summary statistics by level of capital requirement

	All	**No or only trivial minimum capital**	**Non-trivial minimum capital**	**High minimum capital**
observations	806	268	416	122
log(GDP)	25.54 (1.73)	25.72 (1.78)	25.15 (1.74)	26.49 (0.99)
log(total no. firms)	10.34 (1.40)	10.70 (1.41)	9.95 (1.42)	10.88 (0.73)
log(migrants)	10.03 (1.94)	11.20 (1.28)	9.11 (2.03)	10.59 (0.99)
corporate tax	26 (8)	24 (9)	26 (7)	31 (10)
rule of law	1.16 (0.63)	1.08 (0.65)	1.15 (0.65)	1.37 (0.51)

Note: All variables are on a year/country basis. For purposes of difference-in-difference analysis in section 4.3, countries were categorized into three groups with no or a trivial minimum capital requirement, a non-trivial and a high minimum capital requirement, with all thresholds of minimum capital/GDP per capita of .5 and .08, with all intra-country changes resulting from reforms in the law and ignoring changes due to inflation and exchange rate fluctuations. *Observations* is the number of firms in that group. *log(GDP)* is the natural logarithm of the country's GDP that year. *log(total no. firms)* is the number of firms founded in the country every year (including cross-corporations in the dataset), *log(migrants)* is the estimated number of migrants from the country residing in the UK in logarithmic form. *corporate tax* is the corporate tax rate. *Rule of law index* is the country's score on the World Bank's rule of law index.

4. Regression analysis

4.1. Basic models

The primary regressions attempt to capture the impact of minimum capital and minimum pay-in requirements across all countries surveyed in this paper. The structure of the regression model is as follows:

$$\log(y_{st}) = \boldsymbol{\beta} X_{st} + \gamma CAP_{st} + \eta EU\_EEA + \lambda EU\_EEA \times Centros + A_s + B_t + \delta t_s + \varepsilon_{st}$$

The dependent variable is the *logarithm of the number of companies (plus one)* registered in the UK from each country following the definition in section 3.1 above (y_{st}). The use the logarithm of the number of firms addresses the issue of non-normal residuals.[25]

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[25] Alternatively, poisson or negative binomial regression (in the case of overdispersion) could be used for count data. Negative binomial regressions yielded similar results as the equivalent OLS models (not reported).

The model is a fixed effects (FE) regression for country s and year t, where *CAP* indicates the minimum capital and minimum pay-in ratios defined in section 3.2. A_s are country-specific fixed effects, and B_t is the period-specific fixed effect. X_{st} is the matrix of covariates. t_s are country specific linear time trends, i.e., the country indicator variables interacted with the year. I also include coefficients on EU/EEA membership and interact them with the *Centros* case ($EU\_EEA \times Centros$) to replicate Becht, Mayer, and Wagner's (2008) analysis that sought to measure the impact of the case using a difference-in-difference approach. The model aims to exploit contemporaneous differences in treatment to explore differences in the trends between countries. However, given that the overall trends appear to differ among the diverse countries in the dataset, the model includes country-specific firm-formation trends.

For purposes of statistical inference, I use wild cluster bootstrapping following Cameron, Gelbach, and Miller (2008). I cluster on the level of treatment assignment (i.e., capital levels, which are highly serially correlated within countries) (see Abadie, Athay, Imbens, and Wooldridge 2023). Bootstrapping is advisable because the number of clusters is small (31 countries and 26 years (on the problem of few clusters, see Bertrand, Duflo, and Mullainathan 2004).

Columns (1) through (3) in Table 6 report the critical results of the basic models with minimum capital as the key variables of interest. Column (3) includes the World Bank's "rule of law" index, which begins only in 1996. Columns (4) and (5) add a (triple) interaction term between the applicability of the Centros case and minimum capital or minimum pay-in, respectively.

Table 6: Effects of minimum capital requirement on log(number of firms)

	(1) 1995-2020	(2) 1995-2020	(3) 1996-2020	(4) 1995-2020	(5) 1995-2020
log(GDP)	-1.171	-1.106	-0.954	-0.295	-1.031
	(-2.588, 0.247)	(-2.636, 0.504)	(-2.661, 0.813)	(-1.134, 0.537)	(-2.408, 0.460)
log(migrants)	-0.167	-0.115	-0.104	0.847***	-0.135
	(-0.632, 0.412)	(-0.473, 0.434)	(-0.466, 0.448)	(0.516, 1.245)	(-0.608, 0.470)
log(total no. firms)	0.284	0.277*	0.271*	0.122	0.312*
	(-0.088, 0.600)	(-0.035, 0.561)	(-0.045, 0.531)	(-0.519, 0.814)	(-0.075, 0.644)
Corporate tax		0.012	0.014		
		(-0.025, 0.053)	(-0.026, 0.057)		
Rule of Law			-0.143		
			(-0.808, 0.611)		
log(Minimum capital / GDP-PPP)	1.312***	1.308***	1.392***	0.622	0.488
	(0.606, 2.053)	(0.629, 1.978)	(0.827, 2.066)	(-0.431, 1.871)	(-0.701, 1.575)
EU/EEA member * Centros	0.306	0.281	0.237	0.290	-0.059
	(-0.138, 0.729)	(-0.156, 0.694)	(-0.205, 0.675)	(-0.557, 1.058)	(-0.641, 0.519)
EU/EEA member x Centros x				0.967	1.120*
log(Minimum capital / GDP-PPP)				(-0.590, 2.131)	(-0.038, 2.068)
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes
Country time trend	Yes	Yes	Yes	No	Yes
Observations	806	804	775	806	806
R² (full model)	0.944	0.944	0.945	0.903	0.946
R² (proj. model)	0.592	0.596	0.612	0.289	0.603
Adj. R² (full model)	0.937	0.937	0.938	0.895	0.939
Adj. R² (proj. model)	0.541	0.545	0.560	0.230	0.552
Residual Std. Error	0.536 (df = 715)	0.535 (df = 712)	0.525 (df = 683)	0.694 (df = 744)	0.530 (df = 714)

***$p < 0.01$; **$p < 0.05$; *$p < 0.1$ (Wild bootstrap clustering by country following Cameron et al. 2008). Numbers in parentheses are 95% confidence intervals. The bootstrap was performed using the *fwildclusterboot* package in R (equivalent to the boottest method in Stata). The bootstrap does not produce standard errors because this would assume the asymptotic normality of the coefficients (Roodman et al. 2019). The dependent variable is the number of cross-incorporations in the UK from each country each year.

The minimum capital regressions in columns 1 through 3 provide consistent support for the significance of minimum capital as a driving factor for cross-border incorporations into the UK. With both the independent variable of interest and the dependent variable on a logarithmic scale, the coefficient of 1.312 in Model 1 in Table 6 translates into an increase in cross-incorporations in the UK from a country of more than 13% in the case of a rise in the ratio between minimum capital and GDP per capita of 10%.

Models 4 and 5 in Tables 6 provide variations on the first regression model with further interactions. The goal is to explore whether minimum capital requirements only started to have an impact with the *Centros* case. It is, therefore, interacted with EU/EEA membership and the case (which was decided in 1999 and is therefore assumed to be effective from 2000 onwards). It can only be used within an interaction term as a time-invariant variable. Model 5 thus looks like this:

$$\log(y_{st}) = \boldsymbol{\beta} \mathrm{X}_{st} + \gamma CAP_{st} + \eta_1 EU\_EEA \times Centros$$

$$+ \eta_2 EU\_EEA \times Centros \times CAP_{st} + A_s + B_t + \delta t_s + \varepsilon_{st}$$

Interestingly, the triple interaction term *EU/EEA * Centros * Minimum capital ratio* is insignificant in Models 4 and 5 in Tables 6. Based on these results, we cannot say that the impact of minimum capital was triggered only by the Centros case. While the lack of significance does not prove the null hypothesis of no effect,[26] it is also possible that founders from high minimum capital jurisdictions were already looking for an exit route earlier.

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[26] Becht, Mayer and Wagner (2008) found that the case had an effect by comparing EU countries with non-EU countries.

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Table 11 in the Appendix compares Model 1 of Table 6 to a series of less complex models that omit fixed effects and/or time trends. The minimum capital is absorbed by country-fixed effects when time is not accounted for; this is likely because minimum capital is relatively stable over time within countries. Interestingly, the *Centros * EU_EEA* interaction is significant when I do not include year-fixed effects or country-specific time trends. This supports the impact of the case but likely differing across countries.

Table 12 in the Appendix replaces the minimum capital variable with the minimum pay-in variable. The results are similar but tend to be weaker. The two variables are highly correlated, which makes it hard to determine which one is the main driver.

Table 14 in the Appendix replicates Models 1, 4, and 5 from Tables 6 and 12 with weighted regression models as a robustness check. I.e., country-year observations are weighted by the country's GDP in the respective year. Interestingly, minimum capital and pay-in coefficients are larger, possibly because of high-GDP countries such as Germany, where cross-incorporations decreased after the reform. In addition, the coefficient on the interaction term between minimum capital and Centros is strongly significant in Model 5, which could be interpreted to mean that minimum capital primarily had an impact after the case.

4.2. Models with time lags and leads

Table 7 reports regressions where lagged and leading versions of the minimum capital variable are added to Model 1 of Table 6. (Table 13 in the Appendix provides analogous regressions for minimum pay-in). The non-lagged variable remains significant in all models. Only the one-year lagged variable is significant in some specifications (and reduces the coefficient size on the "regular" variable. Thus, the impact of changes to minimum capital is partly delayed, but there is no evidence for an anticipated effect. In principle, one could suspect that the results found in this

paper could be due to reverse causation, i.e., because countries that have many cross-incorporations are more likely to adjust their minimum capital requirements downwards than others. In this case, one would expect the leading variables to be significant. However, none of them are in any of the regression specifications, and the size of the coefficient on the "regular" variable is hardly changed. Consequently, these models mitigate in favor of minimum capital requirements affecting cross-incorporations rather than vice versa.

Table 7: Lagging and Leading minimum capital models

	Table 6, Model 1	Lagging Models			Leading Models		
log(GDP)	-1.171 (-2.588, 0.247)	-1.037 (-2.493, 0.447)	-0.778 (-2.281, 0.789)	-0.710** (-2.207, 0.893)	-1.292** (-2.578, -0.027)	-1.391** (-2.572, -0.231)	-1.457** (-2.580, -0.365)
log(migrants)	-0.167 (-0.632, 0.412)	-0.181 (-0.652, 0.398)	-0.199 (-0.692, 0.414)	-0.158 (-0.659, 0.481)	-0.179 (-0.629, 0.394)	-0.194 (-0.620, 0.361)	-0.213 (-0.654, 0.338)
log(total no. firms)	0.284 (-0.088, 0.600)	0.223 (-0.129, 0.509)	0.110 (-0.261, 0.390)	0.058* (-0.350, 0.355)	0.307* (-0.024, 0.629)	0.310** (0.004, 0.643)	0.290* (-0.007, 0.626)
EU/EEA member x Centros	0.306 (-0.138, 0.729)	0.243 (-0.196, 0.677)	0.202 (-0.219, 0.629)	0.130 (-0.306, 0.564)	0.296 (-0.136, 0.708)	0.290 (-0.134, 0.695)	0.280 (-0.135, 0.673)
log(Minimum capital / GDP-PPP)	1.312*** (0.606, 2.053)	0.636** (0.074, 1.199)	0.641** (0.128, 1.187)	0.722** (0.277, 1.205)	1.163** (0.274, 2.440)	1.192*** (0.392, 2.427)	1.121** (0.329, 2.332)
-- one-year lag		0.961** (0.250, 1.907)	0.665** (0.002, 1.316)	0.642 (0.048, 1.393)			
-- two-year lag			0.436 (-0.541, 1.679)	0.236 (-0.712, 0.840)			
-- three-year lag				0.277 (-0.391, 1.534)			
-- one-year lead					0.173 (-0.767, 0.796)	0.043 (-0.836, 0.728)	-0.001 (-0.913, 0.723)
-- two-year lead						0.160 (-0.573, 1.273)	0.519 (-0.205, 1.812)
-- three-year lead							-0.412 (-1.669, 0.878)
Observations	806	775	744	713	775	744	713
R^2 (full model)	0.944	0.945	0.946	0.945	0.945	0.946	0.947
R^2 (proj. model)	0.592	0.614	0.626	0.628	0.586	0.582	0.572
Adj. R^2 (full model)	0.937	0.938	0.938	0.937	0.938	0.939	0.940
Adj. R^2 (proj. model)	0.541	0.563	0.574	0.575	0.531	0.525	0.510
Residual Std. Error	0.536 (df = 715)	0.523 (df = 684)	0.513 (df = 653)	0.507 (df = 622)	0.532 (df = 684)	0.529 (df = 653)	0.526 (df = 622)

***$p < 0.01$; **$p < 0.05$; *$p < 0.1$ (Wild bootstrap clustering by country following Cameron et al. 2008). Numbers in parentheses are 95% confidence intervals. The bootstrap was performed using the *fwildclusterboot* package in R (equivalent to the boottest method in Stata). The bootstrap does not produce standard errors because this would assume the asymptotic normality of the coefficients (Roodman et al. 2019). All models include country- and year-fixed effects and a country time trend. The dependent variable is the number of cross-incorporations in the UK from each country each year. Lag variables are minimum capital one, two, or three years before the year of observation, lead variables are minimum capital one, two or three years after the year of observation.

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4.3. Level-based difference-in-differences regressions

An alternative way to explore the impact of minimum capital requirements is to code the reforms affecting capital requirements as dummy variables rather than continuous ones. This method provides a cruder measurement of the phenomenon. Still, it permits a more straightforward difference-in-differences setup that also lends itself to alternative models that have been developed in the literature in recent years. For purposes of these alternative models, each country's minimum capital for any given year was converted into three categories, namely a "high" (category III), a "non-trivial" (category II), and no or only a trivial minimum capital requirement (category I). While it is difficult to convert a continuous variable such as minimum capital into discrete categories, doing so permits a straightforward discrete difference-in-difference regression design. As a general principle, the threshold between categories I and II was set at a ratio between minimum capital and GDP per capita of 0.08, and the threshold between categories II and III at 0.5. However, because the regressions attempt to capture the effects of legislative reforms, occasions where countries moved across thresholds (sometimes temporarily) because of exchange rate fluctuations, inflation or economic growth were ignored for the coding, i.e., the country stayed in its previous category until an actual reform.[27] Table 8 shows the classification of countries over time.

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[27] The cutoffs were chosen to avoid these situations as much as possible.

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Table 8: Coding of minimum capital levels as indicator variables

Country	Level I (no or only trivial minimum capital)	Level II (non-trivial minimum capital)	Level III (high minimum capital)
Austria		2014-2020	1995-2013
Belgium	2010-2020		1995-2009
Bulgaria	2010-2020	1995-2009	
Croatia	2013-2020	1995-2012	
Cyprus	1995-2020		
Czech Republic	2014-2020	1995-2013	
Denmark	2014-2018	2010-2013, 2019-2020	1995-2009
Estonia		1995-2020	
Finland	2007-2020	1995-2006	
France	2004-2020	1995-2003	
Germany	2009-2020		1995-2008
Greece	2013-2020	2008-2012	1995-2007
Hungary		2008-2013	1995-2007, 2014-2020
Iceland		1995-2020	
Ireland	1995-2020		
Italy	2013-2020	1995-2012	
Latvia	2010-2020	1995-2009	
Liechtenstein		1995-2020	
Lithuania	2013-2020	1995-2012	
Luxembourg	2017-2020	1995-2016	
Malta	1995-2020		
Netherlands	2013-2020		1995-2012
Norway	2012-2020	1995-2011	
Poland	2009-2020	1995-2000	2001-2008
Portugal	2011-2020	1995-2010	
Romania	1995-2020		
Slovakia	2017-2020	1995-2016	
Slovenia		1995-2020	
Spain		1995-2020	
Sweden	2020	1995-2019	
Switzerland		1995-2020	

Note: As a general rule, the thresholds between these categories were set at a ratio between minimum capital and GDP per capita of 0.5 (II v. III) and 0.08 (I v. II). All coded reforms are leaps across one (or sometimes both) of these thresholds. Moves across thresholds because of exchange rate fluctuations, inflation or economic growth are ignored.

I begin by visualizing incorporation trends in event study format in Figure 1. The two panels are based on the following OLS regression, where *s* indicates the country and *t* the year:[28]

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[28] This follows Autor et al. (2006).

$$\log(y_{st}) = \sum_{\tau=-10}^{10} \beta_\tau R_{st+\tau} + A_s + B_t + \varepsilon_{st}$$

R is an indicator that takes a value of 1 only in one year relative to the introduction of a reform, with τ being an offset for the number of years before or after the reform.[29] β is thus the vector of coefficients for the years from 10 years before to 10 years after the reform (A_s are country-fixed effects, and B_t are year-fixed effects). In Figure 1, which looks at reforms eliminating "high" minimum capital, we can see no significant differences between treatment and control countries before the reform, which supports that parallel trend assumption. In years following the removal of high minimum capital, we see some statistically significant negative coefficients, meaning that eliminating it results in a reduction in corporate outward mobility. The right panel, which looks at reforms removing non-trivial minimum capital, are less clear. If anything, we see a slight drop in the initial years after the reform, but the confidence interval always includes zero.

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[29] E.g., β_{-4} equals 1 for observations four years before the reform.

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Figure 1: Leads and lags plots for reforms
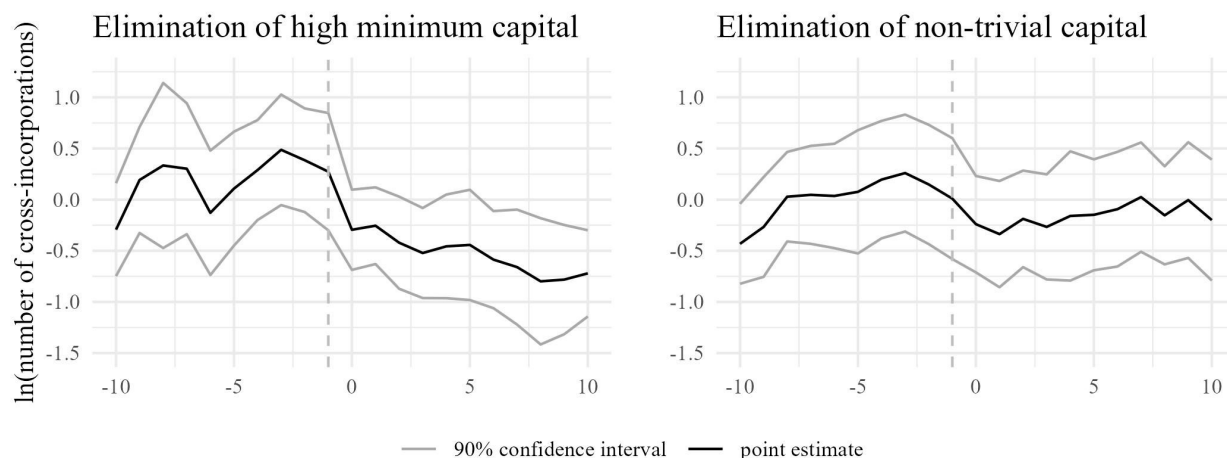
Note: The plots estimate regressions in the form $\log(y_{st}) = \sum_{\tau=-10}^{10} \beta_\tau R_{st+\tau} + A_s + B_t + \varepsilon_{st}$, where A and B are country- and year-fixed effects, respectively. The coefficient vector β_τ estimates the log of the number of cross-incorporations from each country in the UK relative to the introduction of the reform. The x-axis shows the year relative to the reform, with 0 being the first year of implementation. The y-axis shows the effect on the natural logarithm of the number of cross-incorporations to the UK. Standard errors are clustered by country.

I proceed with a set of panel fixed effects regressions where reforms reducing minimum capital requirements are marked with an indicator variable, the reformed countries constituting the treatment group, and the non-reformed countries the control group. These take the following form:

$$\log(y_{st}) = \boldsymbol{\beta}X_{st} + \gamma R_{st} + \eta EU\_EEA + \lambda EU\_EEA \times Centros + A_s + B_t + \delta t_s + \varepsilon_{st}$$

As previously, R is the indicator variable for treatment and X_{st} a set of control variables, A_s are country-specific fixed effects, and B_t is the period-specific fixed effect. Again, t_s is a country-specific time trend. I also include EU/EEA membership interacted with the *Centros* case ($EU\_EEA \times Centros$). Treatment and control groups vary by regression.

Model (1) seeks to test the abandonment of "high" minimum capital (Level III) in favor of a lower level. It includes only countries with high minimum capital in at least part of this period (Austria, Belgium, Denmark, Germany, Hungary, Netherlands, and Poland). Levels I and II are the treatment group, and Level III is the control group. Model (2) tests the abolition of minimum capital. It includes all countries that ever had a minimum capital (Levels II and III) and uses Level

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I as a treatment and Levels II and III as a control group. Model (3) explores the transition from "high" to a mere "non-trivial" minimum capital. Hence, the population in the regression includes only countries that had Level III at any time but omits years with Level I. The treatment group is Level II, and the control group is Level III. Finally, Regression (4) seeks to capture the effect of a transition from a "non-trivial" (but not high) minimum capital to none. The population is all countries with Level II in any year (excluding years with Level III). The treatment group is Level II, and the control group is Level II. Results are reported in Table 9.

	(1) Abolish High Minimum Capital	(2) Abolish Minimum Capital	(3) Reduce High Minimum Capital to Non-Trivial Amount	(4) Abolish Non-Trivial Minimum Capital
log(GDP)	-3.695* (-7.452, 0.061)	-1.932 (-5.187, 1.324)	-3.075*** (-4.192, -1.959)	-1.061 (-2.526, 0.405)
log(migrants)	0.057 (-0.089, 0.203)	-0.187 (-0.850, 0.477)	-0.117 (-0.524, 0.290)	-0.201 (-0.679, 0.277)
log(total no. firms)	0.366*** (0.177, 0.555)	0.251*** (0.078, 0.424)	0.040 (-0.741, 0.822)	0.258 (-0.169, 0.684)
Treatment	-0.246*** (-0.365, -0.128)	-0.386 (-1.115, 0.344)	-0.213*** (-0.392, -0.033)	-0.272 (-0.713, 0.170)
EU/EEA member * Centros	0.211 (-0.395, 0.816)	0.408 (-0.256, 1.072)	0.284 (-0.579, 1.147)	0.296*** (0.113, 0.480)
Country fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Country time trend	Yes	Yes	Yes	Yes
Observations	208	702	152	549
R^2 (full model)	0.940	0.944	0.935	0.948
R^2 (proj model)	0.706	0.570	0.580	0.560
Adj. R^2 (full model)	0.924	0.936	0.908	0.940
Adj. R^2 (proj model)	0.627	0.513	0.408	0.490
F Statistic	32.626*** (df = 12; 163)	26.500*** (df = 31; 619)	12.333*** (df = 12; 107)	21.484*** (df = 28; 472)

***$p < 0.01$; **$p < 0.05$; *$p < 0.1$ (Wild Bootstrap Clustering following Cameron et al. 2008). Numbers in parentheses are 95% confidence intervals. The bootstrap was performed using the *ClusterSEs* package in R. The bootstrap does not produce standard errors because this would assume the asymptotic normality of the coefficients (Roodman et al. 2019). All models cover the years 1995 to 2020 and include country and year fixed effects and a country time trend. The dependent variable is the number of cross-incorporations in the UK from each country each year.

The ***treatment*** variable is based on three different levels. Levels are assigned based on the ratio between minimum capital and GDP per capita, with of 0.5 as the difference between II and III, and 0.08 between I v. II. Only legislative reforms are coded as changes in level, i.e., moves across thresholds because of exchange rate fluctuations, inflation, or economic growth, are ignored.

Regression (1) looks only at the population of countries that ever had high minimum capital (Level III), using Levels I and II as treatment and Level III as the control. *Regression (2)* includes all countries that ever high any minimum capital (Levels II and III), using Level I as treatment and Levels II and III as controls. *Regression (3)* includes all countries that ever had high minimum capital and omitting years with Level I. Level II is the treatment and Level III as control. *Regression (4)* includes all countries that ever had non-trivial minimum capital (Level II), omitting years with Level I. Level I is the treatment, Level II is the control group.

Interestingly, we get significant results on the treatment only in regressions (1) and (3) (despite the small sample size resulting from the omission of countries that never had high minimum capital). The coefficients on the treatment translate approximately into a 20% reduction of

yearly cross-incorporations to the UK. Consequently, there is evidence for an influence of the removal of high minimum capital (Level III) but not for a marginal effect of a removal of a non-trivial minimum capital and its outright abolition.

4.4. Sun-Abraham estimator

In recent years, considerable debate has been about possible bias in staggered difference-in-difference models when treatment times vary, and treatment effects differ across units (Athey and Imbens 2022; Baker et al. 2022; Roth et al. 2023). In Table 10, I implement the estimator proposed by Sun and Abraham (2021), which includes estimated effects pre- and post-period for each year relative to the enactment of the reform, and controlling variables. In each of the four regressions, the definition of treatment and control groups is the same as in Section 4.3 (Table 9). In Table 10, only Model 1 provides evidence for an effect of the treatment, with multiple years after the reform exhibiting a negative and statistically significant coefficient.[30] Figure 2 plots the treatment effect ten years before and after the enactment of the reform for Model (1) and shows that the confidence interval remains below 0 in most years.

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[30] The *fixest* package in R, which was used for these regressions, allows for the computation of an aggregated average treatment on the treated (ATT) of -0.889, which is statistically significant on the 5% level.

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**Table 10: Sun-Abraham models for heterogeneous treatment effects**

	(1) Abolish High Minimum Capital	(2) Abolish Minimum Capital	(3) Reduce High Minimum Capital to Non-Trivial Amount	(4) Abolish Non-Trivial Minimum Capital
log(GDP)	0.219 (0.285)	-0.622 (0.637)	-3.565 (2.264)	-0.669 (0.702)
log(migrants)	1.356 (0.062)***	0.944 (0.316)***	1.466 (0.354)***	0.842 (0.334)**
log(total no. firms)	-0.191 (0.134)	0.215 (0.396)	-0.179 (0.561)	0.377 (0.478)
EU/EEA * Centros	-0.424 (0.041)***	0.714 (0.272)**	-0.735 (0.151)***	0.635 (0.341)*
Year -10	-0.669 (0.490)	-0.416 (0.326)	0.299 (0.573)	-0.288 (0.275)
Year -9	0.023 (0.517)	-0.286 (0.234)	0.847 (0.744)	-0.261 (0.240)
Year -8	0.134 (0.731)	0.032 (0.197)	0.809 (0.935)	0.285 (0.157)*
Year -7	-0.071 (0.954)	-0.016 (0.220)	0.656 (1.136)	0.190 (0.192)
Year -6	-0.277 (0.321)	0.021 (0.178)	-0.084 (0.492)	0.111 (0.153)
Year -5	0.031 (0.461)	0.134 (0.128)	-0.049 (0.574)	0.145 (0.126)
Year -4	0.023 (0.384)	0.172 (0.138)	0.112 (0.389)	0.229 (0.150)
Year -3	0.058 (0.310)	0.250 (0.086)***	0.488 (0.253)*	0.312 (0.083)***
Year -2	0.022 (0.057)	0.200 (0.088)**	0.475 (0.095)***	0.249 (0.110)**
Year 0	-0.324 (0.096)**	-0.093 (0.115)	0.198 (0.300)	0.009 (0.079)
Year 1	-0.412 (0.323)	-0.189 (0.154)	0.494 (0.299)	0.018 (0.085)
Year 2	-0.784 (0.220)***	-0.099 (0.226)	0.567 (0.326)	0.198 (0.149)
Year 3	-1.060 (0.250)***	-0.186 (0.278)	-0.457 (0.291)	0.133 (0.233)
Year 4	-1.006 (0.260)***	-0.318 (0.319)	0.923 (0.190)***	-0.019 (0.297)
Year 5	-1.056 (0.279)***	-0.244 (0.339)	-0.484 (0.156)**	0.087 (0.285)
Year 6	-1.128 (0.318)***	-0.242 (0.372)		0.119 (0.279)
Year 7	-1.235 (0.393)**	-0.140 (0.431)		0.265 (0.333)
Year 8	-1.333 (0.393)**	-0.639 (0.515)		-0.239 (0.291)
Year 9	-1.166 (0.422)**	-0.102 (0.678)	-2.272 (1.069)*	0.726 (0.336)**
Year 10	-1.012 (0.323)**	-0.321 (0.783)	-2.357 (1.101)*	0.623 (0.364)
Num. obs.	207	701	151	548
R^2 (full model)	0.981	0.946	0.955	0.959
R^2 (proj model)	0.906	0.591	0.712	0.653
Adj. R^2 (full model)	0.913	0.905	0.873	0.921
Adj. R^2 (proj model)	0.834	0.545	0.554	0.598

***$p < 0.01$; **$p < 0.05$; *$p < 0.1$. The Sun-Abraham (2021) estimator has been calculated using the *fixest* package in R. It estimates the effect of reforms of minimum capital on the logarithm of the number of cross-incorporation from each country to the UK as the dependent variable. Year effects are relative to year -1 (the year before the enactment of the reform). Standard errors (in parenthesis) are clustered by country.

The ***treatment*** variable is based on three different levels. Levels are assigned based on the ratio between minimum capital and GDP per capita, with of 0.5 as difference between II and III, and 0.08 between I v. II. Only legislative reforms are coded as changes in level, i.e., moves across thresholds because of exchange rate fluctuations, inflation or economic growth are ignored.

Regression (1) looks only at the population of countries that ever had high minimum capital (Level III), using Levels I and II as treatment and Level III as the control. ***Regression (2)*** includes all countries that ever high any minimum capital (Levels II and III), using Level I as treatment and Levels II and III as controls. ***Regression (3)*** includes all countries that ever had high minimum capital and omitting years with Level I. Level II is the treatment and Level III as control. ***Regression (4)*** includes all countries that ever had non-trivial minimum capital (Level II), omitting years with Level I. Level I is the treatment, Level II is the control group.

Figure 2: Estimated effect of the removal of "high" minimum capital on the number of cross-incorporations with a 95% confidence interval
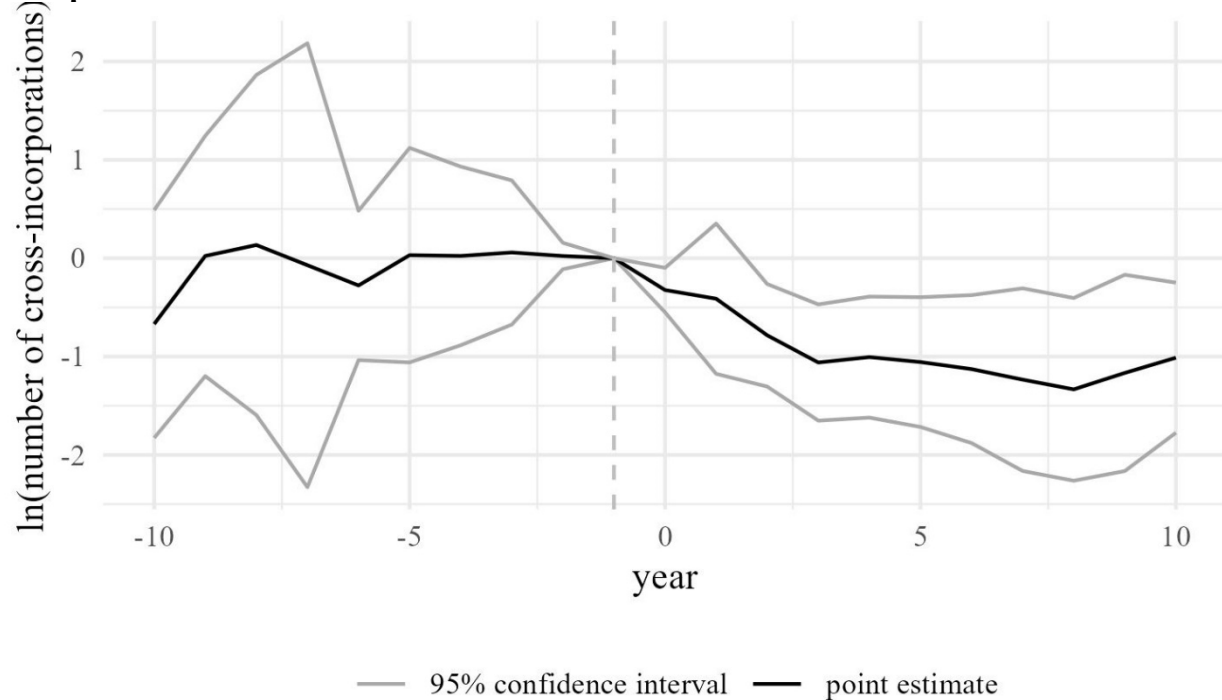
Note: The figure shows the results from Model (1) in Table 10 in graphical form. The dependent variable is the logarithm of the number of cross-incorporations from each country to the UK. Year effects are relative to year -1 (the year before the enactment of the reform).

5. Discussion

Overall, the regressions support that corporate law drives founders' incorporation choices in European countries. As expected, countries with more onerous formation requirements thus seem to have more firm formations in the UK. The legal capital system has come under increased scrutiny in Europe during the past two decades (e.g., Enriques and Macey 2001; Mülbert and Birke 2002; Rickford 2004; Armour 2006). The regressions suggest a considerable evasive effect on capital regulation in jurisdictions that do not have such a requirement. This highlights how barriers to entry may affect firm formations and how founders will often look to avoid burdensome regulation by exploiting regulatory arbitrage opportunities. While I do not seek to make a normative

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claim about the effectiveness of minimum capital in protecting creditors, the results strongly suggest that founders often perceive it as a hurdle in firm formation even though the contribution is not lost but available to run the business. As to specific reforms, the difference-in-differences models provide evidence that removing high minimum capital requirements often stems the tide of outward corporate mobility. However, I do not find evidence that eliminating smaller minimum capital requirements has an effect. The results align with Becht, Mayer and Wagner's (2008) findings, who found that the *Centros* case had a noticeable impact on cross-incorporations from high-minimum-capital countries.

Endogeneity could, in principle, be a concern for these results. Reductions in minimum capital may be the political consequence of rising cross-border incorporations. This is, however, not universally true. First, during the past 20 years, the World Bank's Doing Project has consistently argued against minimum capital requirements and included it in its Doing Business Ranking (e.g., World Bank 2005, 18), which was another motivation for some countries to remove or reduce capital requirements (e.g., Guidotti 2015, 301-302; Fleischer 2017, 329). Second, a debate about regulatory competition does not guarantee reforms. For example, scholars and policymakers in Austria and Germany intensely debated the CJEU case law mid-2000s. They were similarly concerned about cross-incorporations to the UK, but the Austrian reform came years later.

Some of the regression models provided in this paper provide further support in favor of causation in the direction from higher capital requirements to increased corporate mobility: First, models with lagged and leading minimum capital variables show no evidence for a leading effect of reforms, but rather for lagged ones (section 4.2). Second, the difference-in-difference models in sections 4.3 and 4.4 provide evidence for the effect of the reduction of high minimum capital over several years after the reform but not before.

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6. Conclusion

Since the early 2000s, many European countries have reduced minimum capital requirements for privately held firms or introduced new, capital-less business forms to facilitate firm formation. By creating a novel dataset on minimum capital requirements in 31 countries from 1995 to 2016, this paper provides evidence that high minimum capital requirements are vital in encouraging founders to seek incorporation in another jurisdiction where possible. The analysis provides evidence for regulatory arbitrage in Europe, and it provides evidence that minimum capital requirements incentivize entrepreneurs to seek to evade the national corporate law in question.

As we have seen, however, regulatory arbitrage opportunities needed to become available for these requirements to play a considerable role. High minimum capital interacted with EU/EEA membership and with the application of the *Centros* case, which allows incorporating in another jurisdiction within the EU and EEA, is strongly associated with cross-incorporations in the UK. The study highlights the significance of corporate law on firm. This paper thus provides evidence that the trend against minimum capital is suitable to help jurisdictions retain control over the corporate law applying to local businesses. With Brexit becoming fully effective at the end of 2020 and eliminating the right to cross-incorporate in the UK under EU treaty provisions, a more diverse picture in future years where budding entrepreneurs seek out other jurisdictions.

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Appendix

Table 11: Effect of minimum capital on log(number of firms)

	Pooled OLS	Country FE	Country FE & Global Time Trend	Year FE	Two-way FE	Table 6, Model 1
Constant	-14.378*** (-20.136, -6.905)					
log(GDP)	0.477** (0.026, 0.835)	0.926** (0.117, 1.846)	0.072 (-0.687, 1.041)	0.403** (0.015, 0.709)	-0.488 (-1.608, 0.569)	-1.171 (-2.588, 0.247)
log(migrants)	0.301*** (0.068, 0.594)	0.832*** (0.502, 1.191)	0.752*** (0.345, 1.129)	0.324*** (0.098, 0.609)	0.824*** (0.424, 1.211)	-0.167 (-0.632, 0.412)
log(total no. firms)	0.157 (-0.140, 0.497)	0.413 (-0.234, 1.067)	0.231 (-0.376, 0.874)	0.178 (-0.086, 0.484)	0.111 (-0.493, 0.758)	0.284 (-0.088, 0.600)
log(Minimum capital / GDP-PPP)	-0.198 (-1.104, 0.630)	-0.076 (-1.063, 0.687)	1.107** (0.296, 1.900)	0.906* (-0.132, 2.207)	1.118** (0.270, 2.043)	1.312*** (0.606, 2.053)
EU/EEA member	0.772 (-0.164, 1.760)	-0.253 (-1.362, 0.814)	0.037 (-1.092, 1.194)	0.695 (-0.158, 1.631)	0.159 (-1.018, 1.384)	
Centros	1.009*** (0.440, 1.519)	0.230 (-0.174, 0.639)	0.088 (-0.260, 0.450)			
EU/EEA member * Centros	0.520 (-0.127, 1.193)	0.759** (0.183, 1.321)	0.635** (0.072, 1.181)	0.096 (-0.489, 0.711)	0.484* (-0.077, 1.016)	0.306 (-0.138, 0.729)
Year trend			0.089*** (0.043, 0.138)			Country-specific
Country FE	No	Yes	Yes	No	Yes	Yes
Year FE	No	No	No	Yes	Yes	Yes
Observations	806	806	806	806	806	806
R² (full model)	0.759	0.881	0.895	0.801	0.901	0.944
R² (proj. model)	0.759	0.747	0.775	0.702	0.279	0.592
Adj. R² (full model)	0.757	0.875	0.889	0.793	0.893	0.937
Adj. R² (proj. model)	0.757	0.735	0.764	0.690	0.220	0.541
Residual Std. Error	1.055 (df = 798)	0.755 (df = 768)	0.712 (df = 767)	0.973 (df = 774)	0.699 (df = 744)	0.536 (df = 715)

***$p < 0.01$; **$p < 0.05$; *$p < 0.1$ (wild bootstrap clustering by country following Cameron et al. 2008). Numbers in parentheses are 95% confidence intervals. The bootstrap was performed using the *fwildclusterboot* package in R (equivalent to the boottest method in Stata). The bootstrap does not produce standard errors because this would assume asymptotic normality of the coefficients (Roodman et al. 2019). The dependent variable is the number of cross-incorporations in the UK from each country each year.

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Table 12: Effects of capital pay-in requirement on log(number of firms)

	(1) 1995-2020	(2) 1995-2020	(3) 1996-2020	(4) 1995-2020	(5) 1995-2020
log(GDP)	-1.223*	-1.167	-1.013	-0.362	-1.140
	(-2.672, 0.216)	(-2.727, 0.462)	(-2.729, 0.755)	(-1.260, 0.506)	(-2.589, 0.399)
log(migrants)	-0.175	-0.135	-0.132	0.854***	-0.154
	(-0.658, 0.413)	(-0.509, 0.423)	(-0.508, 0.431)	(0.516, 1.247)	(-0.623, 0.443)
log(total no. firms)	0.289	0.274*	0.273*	0.111	0.302
	(-0.082, 0.603)	(-0.044, 0.558)	(-0.046, 0.532)	(-0.521, 0.773)	(-0.079, 0.621)
Corporate tax		0.009	0.010		
		(-0.028, 0.049)	(-0.028, 0.052)		
Rule of Law			-0.234		
			(-0.911, 0.506)		
log(Minimum pay-in / GDP-PPP)	1.312***	1.272***	1.379***	1.090	0.515
	(0.478, 2.157)	(0.413, 2.087)	(0.767, 2.286)	(-0.633, 2.977)	(-1.052, 1.749)
EU/EEA member * Centros	0.296	0.271	0.230	0.487	0.009
	(-0.142, 0.706)	(-0.163, 0.672)	(-0.208, 0.649)	(-0.408, 1.252)	(-0.590, 0.567)
EU/EEA member * Centros * log(Minimum capital / GDP-PPP)				0.400	1.127
				(-1.342, 2.486)	(-0.259, 2.767)
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes
Country time trend	Yes	Yes	Yes	No	Yes
Observations	806	804	775	806	806
R^2 (full model)	0.943	0.943	0.944	0.901	0.944
R^2 (proj. model)	0.587	0.590	0.605	0.277	0.594
Adj. R^2 (full model)	0.936	0.936	0.937	0.893	0.937
Adj. R^2 (proj. model)	0.534	0.538	0.553	0.218	0.542
Residual Std. Error	0.540 (df = 715)	0.539 (df = 712)	0.529 (df = 683)	0.700 (df = 744)	0.536 (df = 714)

***$p < 0.01$; **$p < 0.05$; *$p < 0.1$ (Wild bootstrap clustering by country following Cameron et al. 2008). Numbers in parentheses are 95% confidence intervals. The bootstrap was performed using the *fwildclusterboot* package in R (equivalent to the boottest method in Stata). The bootstrap does not produce standard errors because this would assume asymptotic normality of the coefficients (Roodman et al. 2019). The dependent variable is the number of cross-incorporations in the UK from each country each year.

Table 13: Lagging and Leading capital pay-in models

	Table 7, Model 1	Lagging Models			Leading Models		
log(GDP)	-1.223* (-2.672, 0.216)	-1.102 (-2.585, 0.412)	-0.848 (-2.373, 0.750)	-0.773** (-2.283, 0.843)	-1.352** (-2.669, -0.062)	-1.464** (-2.676, -0.296)	-1.530*** (-2.690, -0.422)
log(migrants)	-0.175 (-0.658, 0.413)	-0.189 (-0.683, 0.392)	-0.215 (-0.751, 0.412)	-0.179 (-0.729, 0.474)	-0.187 (-0.660, 0.395)	-0.206 (-0.663, 0.363)	-0.234 (-0.717, 0.333)
log(total no. firms)	0.289 (-0.082, 0.603)	0.235 (-0.105, 0.507)	0.125 (-0.228, 0.389)	0.073* (-0.313, 0.351)	0.313* (-0.021, 0.633)	0.314** (0.008, 0.645)	0.291* (-0.004, 0.620)
EU/EEA member x Centros	0.296 (-0.142, 0.706)	0.225 (-0.210, 0.647)	0.176 (-0.244, 0.596)	0.101 (-0.331, 0.527)	0.286 (-0.141, 0.684)	0.282 (-0.139, 0.672)	0.271 (-0.142, 0.652)
log(Minimum pay-in / GDP-PPP)	1.312*** (0.478, 2.157)	0.736* (-0.044, 1.585)	0.698** (0.028, 1.524)	0.724** (0.099, 1.502)	1.135** (0.124, 2.768)	1.140** (0.200, 2.735)	1.052** (0.074, 2.600)
-- one-year lag		0.879* (-0.212, 2.220)	0.606 (-0.329, 1.547)	0.610 (-0.309, 1.673)			
-- two-year lag			0.496 (-0.643, 2.130)	0.419 (-0.768, 1.341)			
-- three-year lag				0.178 (-0.439, 1.686)			
-- one-year lead					0.226 (-1.278, 1.000)	0.228 (-0.951, 0.848)	0.175 (-1.082, 0.833)
-- two-year lead						0.008 (-0.843, 1.171)	0.536 (-0.151, 2.028)
-- three-year lead							-0.668 (-2.185, 0.234)
Observations	806	775	744	713	775	744	713
R^2 (full model)	0.943	0.944	0.945	0.944	0.944	0.946	0.947
R^2 (proj. model)	0.587	0.606	0.618	0.621	0.580	0.576	0.567
Adj. R^2 (full model)	0.936	0.937	0.937	0.936	0.937	0.938	0.939
Adj. R^2 (proj. model)	0.534	0.555	0.566	0.566	0.524	0.518	0.504
Residual Std. Error	0.540 (df = 715)	0.528 (df = 684)	0.518 (df = 653)	0.512 (df = 622)	0.536 (df = 684)	0.533 (df = 653)	0.530 (df = 622)

***$p < 0.01$; **$p < 0.05$; *$p < 0.1$ (Wild bootstrap clustering by country following Cameron et al. 2008). Numbers in parentheses are 95% confidence intervals. The bootstrap was performed using the *fwildclusterboot* package in R (equivalent to the boottest method in Stata). The bootstrap does not produce standard errors because this would assume the asymptotic normality of the coefficients (Roodman et al. 2019). All models include country- and year-fixed effects and a country time trend. The dependent variable is the number of cross-incorporations in the UK from each country each year. Lag variables are minimum pay-in one, two, or three years before the year of observation, lead variables are minimum pay-in one, two, or three years after the year of observation.

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Table 14: Key models in Tables 6 and 7 with observations weighted by GDP

	Weighted Table 6			Weighted Table 12		
	Model 1	**Model 4**	**Model 5**	**Model 1**	**Model 4**	**Model 5**
log(GDP)	-3.816	-0.906	-2.594	-3.979	-1.088	-3.374
	(-7.640, 1.631)	(-3.241, 1.637)	(-6.174, 1.665)	(-7.828, 1.536)	(-3.851, 1.601)	(-7.206, 2.031)
log(migrants)	0.180	1.303***	0.393	0.057	1.332***	0.115
	(-1.085, 1.315)	(0.533, 2.078)	(-0.452, 1.209)	(-1.208, 1.209)	(0.504, 2.212)	(-0.865, 1.099)
log(total no. firms)	0.491	-0.138	0.390	0.469	-0.181	0.396
	(-0.633, 1.198)	(-1.059, 0.531)	(-0.678, 0.974)	(-0.663, 1.151)	(-1.115, 0.475)	(-0.680, 1.012)
EU/EEA member * Centros	0.582*	0.003	-0.607	0.653*	0.432	-0.154
	(-0.068, 1.402)	(-1.832, 1.076)	(-1.553, 0.137)	(-0.035, 1.466)	(-0.922, 1.215)	(-1.036, 0.530)
log(Minimum capital / GDP-PPP)	2.058***	0.118	-0.350			
	(0.588, 3.162)	(-1.850, 2.405)	(-1.241, 0.671)			
EU/EEA member * Centros * log(Minimum capital / GDP-PPP)		2.295	2.382***			
		(-0.517, 4.285)	(1.219, 3.329)			
log(Minimum pay-in / GDP-PPP)				2.662**	1.096	0.544
				(0.507, 4.559)	(-0.894, 3.467)	(-1.153, 2.361)
EU/EEA member * Centros * log(Minimum pay-in / GDP-PPP)					1.987	2.274***
					(-0.899, 5.529)	(0.608, 4.777)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Country time trend	Yes	No	Yes	Yes	No	Yes
Num. obs.	806	806	806	806	806	806
R^2 (full model)	0.918	0.881	0.926	0.917	0.872	0.922
R^2 (proj. model)	0.583	0.396	0.622	0.580	0.351	0.602
Adj. R^2 (full model)	0.908	0.871	0.916	0.907	0.862	0.912
Adj. R^2 (proj. model)	0.530	0.347	0.573	0.527	0.298	0.551
Residual Std. Error	303,652.000 (df = 715)	358,325.600 (df = 744)	289,442.500 (df = 714)	304,757.800 (df = 715)	371,587.000 (df = 744)	296,933.200 (df = 714)

Observations are weighted by GDP in the respective country and year.

***p < 0.01; **p < 0.05; *p < 0.1 (wild bootstrap clustering by country following Cameron et al. 2008). Numbers in parentheses are 95% confidence intervals. The bootstrap was performed using the *fwildclusterboot* package in R (equivalent to the boottest method in Stata). The bootstrap does not produce standard errors because this would assume the asymptotic normality of the coefficients (Roodman et al. 2019). The dependent variable is the number of cross-incorporations in the UK from each country each year.

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