Regulatory Integration of International Capital Markets*

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Abstract

I examine the real and financial effects of regulatory integration of international capital markets using a unique policy plan proposed by the European Union. This policy plan creates a common European market for financial services and capital, through, e.g., passporting rights. For identification, I exploit the bilateral and staggered nature of laws that are passed at the European level but are implemented by national governments. Over the course of its implementation, regulatory integration more than doubles external financing for publicly listed firms and causes large increases in investment and employment. The effects are stronger for firms that are more dependent on external finance. These results highlight the importance of regulatory integration of international capital markets for firms' financing decisions and real outcomes.

Keywords: International law, regulation, integration, passporting rights, capital markets, external finance, real effects.
JEL classification: F36, G15, G18, G28, G30, K22, K33.

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1 Introduction

In recent decades, financial regulation has changed significantly, for instance with the Dodd-Frank Act in the United States and the Basel Accords internationally. But what should be the geographical scope of such laws? For example, should securities laws be designed at a regional level as in Canada or at the national level as in the United States? Or should such laws be designed internationally as in the European Union? On the one hand, regulatory integration can lead to more competition and as a result to increases in real outcomes (Jayaratne and Strahan (1996), Black and Strahan (2002)), and it can avoid regulatory arbitrage (Bebchuk (1992), Houston, Lin, and Ma (2012)). On the other hand, regulatory integration does not take the heterogeneity of the involved areas into account (Stiglitz (2002)) and prevents the benign aspects of regulatory competition across jurisdictions (Revesz (1992), Coffee Jr. (2002), Karolyi and Taboada (2015)).

I contribute to this debate by establishing that regulatory integration of international capital markets has large effects on financial and real outcomes. In the 2000s, the European Union (EU) implemented a policy plan to create a common European market for financial services and capital. Over its implementation, the regulatory integration of international capital markets caused net external financing by publicly traded companies to more than double. Firms used this additional capital to increase investment and employment.

Studying regulatory changes is challenging, since laws are not passed randomly. For instance, the struggle between the winners and losers of regulatory changes can determine if and when laws are changed (Kroszner and Strahan (1999)). Moreover, regulatory changes can coincide with macroeconomic shocks or trends. A government might, for example, time an unpopular reform so that it coincides with an uptick in the business cycle.

I overcome these identification challenges by exploiting the unique institutional setup of the EU's policy making process. First, I use the bilateral nature of this policy plan. Since regulatory integration between two countries only occurs if both countries have implemented a given law, the proxies for regulatory integration in this paper are based on the *bilateral implementation* of EU laws. Second, I use the interaction of two staggered sets of events that occur at different institutional levels. The first set of staggered events involves laws passed at the EU level. The second set of staggered events results from European countries individually implementing each of

these laws within the broad time frame set by the EU for each law. Importantly, I account for potential concerns that the pattern of the staggered implementation of the laws across countries is endogenous by exploiting the bilateral nature of this policy plan. In the 2000s, the EU put forward the Financial Services Action Plan (FSAP) to create a common market for financial services and capital. I focus on the FSAP's most important laws (Slaughter and May (2007), Christensen, Leuz, and Hail (2016), European Commission (2016)): These four "Lamfalussy directives" reduce the regulatory costs of providing financial services across borders, reduce the regulatory costs for the cross-border issuance of securities, harmonize and tighten insider dealing regulation, and harmonize and tighten disclosure provisions.[1]

I illustrate the construction of the baseline index of regulatory integration with three countries and one law (Figure 1). If a country has not implemented a law, its index value is always 0. If a country has implemented a law, I look at the two pairs between this country and the remaining two countries. If the other country in a pair has not implemented the law, the index value for this pair is 0. If both countries in a given pair have implemented the law, the index value for this pair is 1. I average the index values across the two pairs a country is involved in. If no other country has implemented the law, the overall index value is 0. If one (two) out of the other two countries has (have) implemented this law, the country's index value is 0.5 (1).

This index is the proxy for regulatory integration of international capital markets and is therefore the explanatory variable of interest in the regression analysis. I use a difference-in-differences analysis of a panel data set of publicly traded European companies, which uses the variation in the timing of the implementation of these laws across countries (Figure 2). In addition to firm-level and macroeconomic controls, the setting allows me to include firm fixed effects and year $\times$ industry $\times$ European region fixed effects, while clustering standard errors at the country level. This mitigates concerns that unobserved time-invariant differences across firms or time-varying regional differences across industries might drive the results.

The main result is that over its implementation period of approximately five years, regulatory

[1]The first two laws are so-called "passporting rights", which are the focus of the debate on the impact of "Brexit" on the United Kingdom's financial sector. For instance, Jamie Dimon, the CEO of JPMorgan Chase & Co., stated in July 2016: "If we have that passport after Brexit, we likely would not have to make any change at all." "But I think the European Union will not accept that. It will put more conditions on the U.K. and might force banks to become smaller in London." Bloomberg (2016): "Dimon Says Brexit Could Be Reversed as Europe Fixes Region," July 7, http://www.bloomberg.com/news/articles/2016-07-07/jpmorgan-s-dimon-says-not-too-late-to-go-back-on-brexit (accessed October 1, 2016).

integration of international capital markets led to an increase of over 100% in net external financing by companies, when compared to the sample mean of net external financing (five percentage points). Concerning the use of this additional capital, I find increases of 37% for capital expenditures and 16% for the number of employees. One reason for the large magnitude of the effects is that, at least until the European Sovereign Debt Crisis, the FSAP was the EU's most important policy with respect to financial markets after the introduction of the euro (Altomonte and Nava (2006), Fonteyne (2007)). Furthermore, the particularly large increases in net external financing and capital expenditures concern flow variables with small base levels.

One potential concern is that the preceding results are driven by endogenous implementation timing of the laws, for instance due to lobbying by the financial sector in a country. Thus, I refine the baseline index by only keeping the part of the index that comes from other countries' implementation (Figure 3). I discard the part of the index that is due to the country's own implementation. In the example, if the first country implements the law, nothing changes for this country compared to the original index, because no other country has implemented the law yet. If the second country implements this law, these two out of the three countries are now integrated, so the index values of both countries change to 0.5 under the old index. For the refined index, however, only the index value of the country that first implemented the law changes to 0.5, while for the other country the index value remains at 0. If the third of the three countries now implements the law, the index value of the "first-mover" country changes to 1, the index value of the "second-mover" country changes to 0.5, while the index value of the third country remains at 0. The refined index of a country therefore does not change when a country itself implements a law, but only when another country does. This alleviates endogeneity concerns with respect to the implementation timing of these laws.

A second potential concern is that countries timed their implementation strategically with respect to other countries, making the countries' implementation order endogenous. To illustrate, one country might front run another country with its implementation timing to provide its financial sector an advantage. I turn to the Group of Seven (G7), which is an informal bloc of industrialized democracies with four members from Europe: France, Germany, Italy and the United Kingdom (UK). The idea is that compared to the rest of Europe, these four countries chose their implementation timing only with respect to other large countries or themselves and not with respect to the rest of the EU. However, these large countries are economically and politically important for the

remaining countries, since together they accounted for around 70% of the GDP and population of the EU in 2000 (World Bank (2016b)). I drop all firms from these four large countries from the data set, but still use these countries for the computation of the index. For the index of regulatory integration for the remaining countries, I only consider regulatory integration of the remaining countries with the large countries, and not regulatory integration among the smaller countries themselves. Therefore, only regulatory integration of the large countries with the small countries drives the regulatory integration index of the small countries. The motivation is that the implementation timing of the large countries is exogenous for the remaining countries. I also apply the prior refinement so that the index of regulatory integration of a country only changes when other countries implement a law but not when a country itself implements a law. Combining these two refinements alleviates endogeneity concerns about strategic implementation timing of these laws.

The effect of the first refined index on net external financing is about ten percent smaller than that of the baseline index. The estimate for the second refined index is more than 50 percent larger than the baseline estimate. This increase is both driven by regulatory integration having a stronger impact on smaller countries and by regulatory integration with large countries having a particularly strong effect on small countries (in contrast to regulatory integration among small countries).

A third potential concern is that countries experience macroeconomic shocks or trends that coincide with the implementation of the laws. For instance, a country might speed up its implementation of a law if the country's stock market is performing well. Following Rajan and Zingales (1998), the effect of regulatory integration should be stronger for firms in industries that are more dependent on external finance. I now exploit industry variation in the treatment effect. Therefore, I absorb macroeconomic shocks or trends with year $\times$ country fixed effects. I use these instead of the standard year $\times$ industry $\times$ European region fixed effects, since the identification comes from the interaction of regulatory integration and external finance dependence. The estimate for the interaction term of regulatory integration and external finance dependence is positive. Regulatory integration leads to an increase of net external finance of about 70% for the industry that is most dependent on external finance (in contrast to the industry least dependent on external finance), when compared to the sample mean of net external financing. This result addresses concerns that the implementation timing of the laws coincides with country-level macroeconomic developments.

I also provide evidence on the underlying channels and mechanisms behind the preceding results.

First, the previously discussed test on the external finance dependence of industries indicates that an increase in the supply of financing is a potential mechanism for the results.

Second, I decompose net external financing into net debt issues and net equity issues. Both net debt issues and net equity issues significantly increase. Around 70% of the increase in net external financing is however driven by net debt issues, while only 30% is driven by net equity issues.

Third, I investigate the role of the general regulatory environment in a country for the regulatory integration of international capital markets. I interact a proxy for regulatory quality by Christensen, Leuz, and Hail (2016) with the regulatory integration index and find a positive estimate for the interaction term. One interpretation of this finding is that international and domestic law are complements.

Fourth, I find stronger treatment effects for larger firms than for smaller ones. Foreign financial firms focus on arm's length transactions and on large firms (Mian (2006)). For small firms, relationship-based transactions and the distance to a financial service provider matter (Petersen and Rajan (1994), Berger and Udell (1995), Guiso, Sapienza, and Zingales (2004)). The stronger treatment effect of regulatory integration of international capital markets for large firms is consistent with an increase in arm's length financial services provided by foreign financial institutions.

Fifth, total financing volume could have remained unchanged, while the increase in financing for the firms in the sample could have occurred through a reallocation of financing from firms at the extensive margin through entry or exit. In a country-level analysis of entry, exit, and net entry rates, I do *not* find evidence that a change in the sample composition of publicly listed companies explains the results.

In addition, I examine whether there are heterogeneous effects across countries. In light of the work by Mundell (1961) on optimum currency areas, one might expect that the effect of regulatory integration of international capital markets on net external financing was stronger within the eurozone than for the rest of Europe. This prediction is supported by the data, which suggests that a common currency facilitates the regulatory integration of international capital markets. In line with the stylized fact of the credit boom in Southern Europe in the 2000s, which was driven by inflows of foreign capital (Hale and Obstfeld (2016)), I find a stronger effect of regulatory integration of international capital markets in Southern Europe. The underlying economic force behind this stronger treatment effect for Southern Europe could have been Southern Europe's lower financial

development compared to Northern and Western Europe (La Porta, López de Silanes, Shleifer, and Vishny (1997, 1998)).

Besides the aforementioned debate on the geographical scope of financial regulation, I contribute to the literature on law and finance (La Porta, López de Silanes, Shleifer, and Vishny (1997, 1998)). In particular, I add to the nascent work on the relationship between *international* law and finance (Kalemli-Ozcan, Papaioannou, and Peydró (2010) (the euro's effect on country-level financial integration), Kalemli-Ozcan, Papaioannou, and Peydró (2013) (business cycle synchronization), Christensen, Leuz, and Hail (2016) (stock market liquidity)). Importantly, this is the first paper establishing that the regulatory integration of international capital markets affects firm-level outcomes such as net external financing, investment and employment.

By documenting that this regulatory integration not only increased financial outcomes, but also led to expansions in important real variables such as investment or employment, I contribute to the literature on the relationship between financial development and economic growth (King and Levine (1993a,b), Levine (1997), Levine and Zervos (1998), Rajan and Zingales (1998)), which has focused on domestic financial development.

Moreover, there is research that has examined the effects of financial liberalizations (Bekaert and Harvey (2000), Henry (2000), Bekaert, Harvey, and Lundblad (2005)). Financial liberalizations remove *restrictions* on foreign investments *independent* of the country from which the investor comes. In contrast, my paper is about the *bilateral regulatory* integration of countries with no such restrictions for foreign investors. Furthermore, this literature has focused on emerging economies, while I analyze Europe. The similarity between my paper and this body of research are policy changes that make it easier for foreign capital to enter a country.

A parallel also exists with the US banking deregulation (Jayaratne and Strahan (1996), Kroszner and Strahan (1999), Black and Strahan (2002)), which integrated previously separated financial markets. In contrast, this literature studies banking regulation, while my paper studies capital markets regulation. Furthermore, this research stream analyzes explicit restrictions on competition within and across US states, while the policies in my paper harmonize regulations that differ across countries. Last, the setting in my paper is international, in contrast to the focus of this literature on the US.

The paper proceeds as follows. Section 2 explains the institutional background and the data.

Section 3 contains the empirical strategy and the results. Section 4 provides evidence on the channels behind my results. Section 5 presents heterogeneous effects. Section 6 concludes.

2 Institutional Background and Data

2.1 The Policy Making Process of the European Union

The so-called "directives" are a key policy tool of the EU across all policy areas, including financial markets. These directives are passed at the EU level but are implemented by each country individually. Importantly, the member countries of the EU have no choice in whether they implement a directive that has been agreed upon at EU-wide level. For each directive, the EU sets a deadline by which a directive has to be implemented. Using a combination of informal consultations with violating states to address cases that come down to legal uncertainty or misunderstandings, and an infringement procedure, the European Commission successfully achieves compliance of the EU Member States with EU law (Tallberg (2002)). This policy making process therefore guarantees that the same directive is implemented across Europe. However, since the national implementation is undertaken by the Member States, there is a staggered implementation pattern. I will exploit this pattern for identification.

2.2 The Key of the Financial Services Action Plan: The Lamfalussy Directives

To study the effects of the regulatory integration of international capital markets, I examine a major policy plan by the EU. While the EU already had a common market for goods and labor at the turn of the millennium, a common market for financial services and capital was lagging behind. The EU therefore put forward the Financial Services Action Plan (FSAP) to create a common market for financial services and capital (European Commission (1999)). The FSAP is the EU's most important policy (at least until the recent financial crisis) with respect to financial markets after the introduction of the euro (Altomonte and Nava (2006), Fonteyne (2007)). The significance of the FSAP is also highlighted by the following quote from a publication by the International Monetary Fund:

> One of the EU's most comprehensive legal and regulatory endeavors got under way in the form of the Financial Services Action Plan. This undertaking is probably on a par

with what the single market meant for cross-border trade in goods. (Fonteyne (2007)).

I focus on the FSAP's most important directives, the four so-called "Lamfalussy directives" (Slaughter and May (2007), Christensen, Leuz, and Hail (2016), European Commission (2016)). These directives are named after Alexandre Lamfalussy who chaired the "Committee of Wise Men on the Regulation of European Securities Markets". The "Lamfalussy directives" include a "single passport" for investment services, a "single passport" to raise capital on a pan-European basis, and two directives that harmonize the regulation and enforcement of the rules on the release of accounting information and on insider dealing. The passporting rights are clearly important since they are at the center of the debate on the impact of "Brexit" on the UK's financial sector (see quote in footnote (1)).

The objective of the Directive on Markets in Financial Instruments (MiFID) is the creation of a single market for financial instruments. The key features of this directive can be best explained with an example. Take a UK-based bank that sells a financial security, e.g. a derivative, to a Danish company. Under the old regulatory regime, the UK and Denmark both had their own, different regulations. If both the UK and Denmark have implemented the Directive on Markets in Financial Instruments, the several changes come into play. Both countries now have the same regulations governing such cross-border transactions. Furthermore, under the old regime, for all practical purposes, the regulator overseeing such a cross-border transaction was the regulator from the customer's country: in this example Denmark. Under the new regulatory regime, regulatory oversight is transferred to the host country of the bank. Once this regulation is in force across Europe, financial service providers no longer need to satisfy a variety of different and costly regulatory requirements across different European countries. Under the new regime, it thus becomes possible for the bank in my example to have one trading desk based in London focusing on one particular financial instrument that it markets all over Europe.

The Prospectus Directive also includes passporting rights. While the Directive on Markets in Financial Instruments involved passporting rights for financial services providers, the key feature of the Prospectus Directive is that the passport is at the level of individual securities. I illustrate this directive with the prior example of a Danish firm. If this Danish firm wanted to issue a corporate bond, it had to satisfy the prospectus requirements of each country in which it wanted to market this

bond. Under the Prospectus Directive, it now becomes possible to raise capital on a pan-European basis with one prospectus, or "single passport", that satisfies the new single European prospectus requirements.

The directive on insider dealing and market manipulation, often also called the Market Abuse Directive, contains three key features that were harmonized and tightened across the countries involved. First, disclosure rules for inside information aimed at leveling the playing field between insiders and outsiders. Second, ex-post penalties for market manipulation and insider trading. Third, stricter enforcement against violations of the regulations on insider trading and market manipulation.

The Transparency Directive harmonized and tightened transparency regulations for the release of accounting information by companies. This was achieved using a set of disclosure provisions, and requirements concerning the enforcement of these disclosure rules.

2.3 Data and Sample

Next, I explain the construction of the sample and the variables, with the exception of the regulatory integration index, which is explained in the section on the empirical strategy and results.

To narrow differences between my treatment group and control group for my difference-in-differences analysis of a panel data set of firm data, I restrict my analysis to European countries. Due to its superior data availability for European firms (Dai (2012)), I rely on Worldscope (Worldscope Fundamentals Annual and Worldscope Stock Data, both accessed through WRDS). Thus, I am restricted to publicly listed companies. Applying a definition from the United Nations Statistics Division, I divide the 21 countries in my sample into four European regions, which will be important for the definition of my fixed effects. The countries and regions are (Table 1): Northern Europe: Denmark, Finland, Ireland, Norway, Sweden, UK; Western Europe: Austria, Belgium, France, Germany, Luxembourg, Netherlands, Switzerland; Eastern Europe: Czech Republic, Hungary, Poland, Slovakia; Southern Europe: Greece, Italy, Portugal, Spain. The sample starts in 1991 for Northern, Southern and Western Europe (Dai (2012), Bris, Koskinen, and Nilsson (2014)). Due to limitations in data coverage the sample starts in 1997 for the four Eastern European countries. The sample ends in 2009 for several reasons. The European Sovereign Debt Crisis which commenced in 2010 caused massive interventions in the financial sector by governments, regulators and central banks

and it included bailouts for Greece, Ireland and Portugal. These events are heterogeneously spread out over Europe. The magnitude of the interventions in a country could be correlated with the size of the shock to its financial sector. These interventions affected the financial sector and the integration of international capital markets in various ways. First, some national regulators explicitly aimed to reduce international financial integration, in particular concerning the flow of capital into other countries. German regulators, for instance, prevented the Italian bank UniCredit from using its internal capital markets to move money from its German subsidiary HypoVereinsbank to subsidiaries in countries that were more severely hit by the sovereign debt crisis than Germany.[2] The motivation behind this were German regulators' fears that German savers would lose money if the foreign parent entities of German banks got into financial trouble, and that German banks would be safer if capital did not leave the German banking system. Second, corporate lending was crowded out by sovereign lending, with the channels for this effect including government influence (Becker and Ivashina (2016)). Because of these regulatory interventions and distortions, I end my sample before the onset of the European Sovereign Debt Crisis in 2010.

Concerning the empirical design, the data and the sample, the closest paper to mine is by Bris, Koskinen, and Nilsson (2014), who study the firm-level effects of the euro on corporate financing. I generally apply their sample criteria, data filters and variable definitions (Table 2). As is standard in corporate finance research, I exclude firms from the regulated financial (SIC codes 6000 to 6999) and utility industries (SIC codes 4900 to 4949).. Furthermore, information on all the data items for dependent variables, independent variables, industry classification, country and identifier (Worldscope Permanent I.D.) needs to be available. Observations with implausible values are excluded, such as firm-years with negative sales or negative total assets. Firm-years with a book value of assets or a stock market capitalization of less than 1 million USD (constant 1991 USD) are excluded from the sample. I also drop firms with 0 employees or 1 employee. Like Bris, Koskinen, and Nilsson (2014), I include a filter so that the remaining observations do not include firms that would be "dummied" out by the firm fixed effects because for instance they would only be in the sample for, e.g., one year, thereby effectively not contributing to the estimation of my results. Similar to

[2]Handelsblatt (2011): "Bafin will Hypovereinsbank vor Mutter schützen," 21 December, http://www.handelsblatt.com/unternehmen/banken-versicherungen/medienbericht-bafin-will-hypovereinsbank-vor-mutter-schuetzen/5985072.html (accessed October 15, 2016). Handelsblatt (2013): "EU-Kommission rüffelt deutsche Finanzaufsicht," 3 January, http://www.handelsblatt.com/politik/international/kapitalverkehr-eu-kommission-rueffelt-deutsche-finanzaufsicht/7581240.html (accessed October 15, 2016).

Bris, Koskinen, and Nilsson (2014), I require that firms appear at least once in my data set before and after 1999, which is the year in which the Financial Services Action Plan was put forward. I compute missing values for data items, if data entries for the constituents of these data items are available. For instance, total debt is filled in with the sum of short term debt and long term debt if information on the latter two is available but information on the former is missing. Since the calendar year and the fiscal year of many firms differ, I assign all firm-years whose fiscal year ends in January to March of year t to the calendar year t-1. All other firm-years are assigned to year t. If information on preferred stock, deferred income taxes and investment tax credit, capital expenditures, net proceeds from sale/issue of common and preferred stock, or common/preferred stock redeemed, retired or converted is missing, the missing values are set to 0. Nominal variables (e.g. book value of assets or stock market capitalization) are in USD as provided by Worldscope. Unless these variables are used to construct ratios such as profitability, these variables are deflated with the price index for gross domestic product, as provided by the Bureau of Economic Analysis, to reflect constant 1991 USD.

I define net debt issues as total debt in year t minus total debt in year t-1, divided by the book value of total assets in t-1. Net equity issues is defined as the difference of net proceeds from sale/issue of common and preferred stock and common/preferred stock redeemed, retired, converted (both in year t), divided by book value of total assets in t-1. Net external finance is defined as the sum of net debt issues and net equity issues. Cash holdings (Cash/AT in tables) is defined as cash over total book value of assets. Profitability (EBITDA/AT in tables) is defined as EBITDA over the book value of assets. Collateral/AT is defined as the sum of net property, plant and equipment and inventories, divided by the book value of assets. Book equity is defined as total assets minus total liabilities minus preferred stock plus deferred income taxes and investment tax credit. Tobin's Q is defined as total assets minus book equity plus stock market capitalization, over total assets. Market Lev. is defined as total debt over (total debt minus book equity plus stock market capitalization). Sales Gr. is defined as the annual growth rate in net sales. ln(USD MCAP) is the natural logarithm of the stock market capitalization of a firm in constant 1991 USD. All ratios are winsorized at the 1% level on both sides of the distribution.

I use several macroeconomic control variables. EU Accession is a dummy variable that switches from 0 to 1 if a country joins the EU during my sample period. Currency Regime is the coarse

currency regime classification from Ilzetzki, Reinhart, and Rogoff (2011). A value of 1 in the coarse currency regime classification stands for currency unions and tight currency pegs. A value of 4 for this variable stands for a freely floating currency. Real GDP Growth is the annual year-on-year percentage change in constant price GDP. Inflation is the annual year-on-year percentage change of average consumer prices. Both data items are from the World Economic Outlook database provided by the International Monetary Fund (2015). Unless stated otherwise, the independent variables are lagged one year compared to the dependent variable in the regression specifications.

3 Empirical Strategy and Results

3.1 Regulatory Integration Index

For the construction of the regulatory integration index I exploit the institutional details of the aforementioned policy making process by the EU. In particular, I use the staggered implementation of EU directives (thereafter referred to as laws) across Europe. Since I am interested in the regulatory integration of international capital markets, my country-specific, time-varying index of regulatory integration is based on the *bilateral implementation* of EU laws, in contrast to e.g. the unilateral implementation of anti-takeover laws by US states. The idea behind this bilateral notion is that regulatory integration between two countries, for instance through passporting rights, only occurs if both countries have implemented a given policy.

I illustrate my index of regulatory integration with three countries and one law. Take one of these three countries. If a country has not implemented a law, its index value is always 0. If a country has implemented a law, I look at the two pairs between this country and the remaining two countries. If the other country in a pair has not implemented the law, the index value for this pair is 0. If both countries in a given pair have implemented the law, the index value for this pair is 1. I average the two index values across the two pairs to get the index value for the country. If no other country has implemented the law, the overall index value is 0. If one (two) out of the other two countries has (have) implemented this law, the country's index value is 0.5 (1).

I now illustrate this example step by step. Consider these three countries, one law and three different points in time (t=1, t=2, t=3). In the visualizations in Figure 1, changes in the contemporaneous time period are represented with *dashed* circles, arrows or bars, while changes in the

preceding time periods are represented with *solid* circles, arrows or bars. If country A implements the law at t=1 (Panel A of Figure 1), its index value remains 0, because the other two countries have not implemented the law yet.

At t=2, country B implements the law (Panel B of Figure 1). The bilateral link between country A and country B is activated by country B's implementation. Country A is now integrated with one out of the two other countries. Country A's index value therefore increases to 0.5 since one of its two possible links is activated. The same applies to country B.

At t=3, country C implements the law (Panel C of Figure 1). The implementation by country C activates the links between countries A and C and between countries B and C. All three countries are now integrated with both of the other two countries. The index of regulatory integration increases from 0.5 to 1 for countries A and B, since these two countries are now integrated with one additional country. The index value for country C increases from 0 to 1, since it is now integrated with both other countries while it previously was not integrated with any country.

I apply the above procedure for all countries in my sample and all four laws. Therefore, the regulatory integration index ranges from 0 to 4.

Information on the national implementation dates of these laws, the Lamfalussy laws, is hand-collected from various sources, including EU documents, national implementation laws, publications by law firms, and a research tool for legal documents. Every implementation date is verified using two independent sources. I use the implementation dates for these laws to compute the regulatory integration index at the quarterly frequency using the above procedure. Since sufficient coverage of accounting data for European publicly listed companies is only available at the yearly frequency (meaning that my outcome variables and my other independent variables are at the yearly frequency), I compute the yearly average of the regulatory integration index for each country by averaging the quarterly values. I thereby capture the variation in the economic implications of whether a law was, for example, implemented in the first or the last quarter of a given year. I then use the value of the regulatory integration index for a given country in year t-1 as my variable of interest in the analysis of firm-level outcome variables in year t.

Panel A of Figure 2 presents the yearly average of the regulatory integration index, computed by equally weighting the yearly value of the regulatory integration index across the countries implementing the laws in my sample. The average time span between the first country and the last

country implementing a law is roughly two years. Importantly, the four laws are not passed by the EU simultaneously. About one law is implemented per year across Europe, over a total time period of four to five years.

Panel B of Figure 2 illustrates the yearly average of the regulatory integration index for the Czech Republic and Slovakia, two neighboring countries in Eastern Europe. Panel C of Figure 2 presents the yearly average of the regulatory integration index for Italy and Spain, two countries in Southern Europe. These two figures highlight the differences in the regulatory integration of international capital markets across Europe over time, which are the foundation of my identification strategy.

3.2 External Finance

This subsection contains the main result of my paper. I examine the empirical relation between net external finance, my outcome variable, and the regulatory integration of international capital markets, measured with the regulatory integration index, as defined in the preceding subsection. I employ a difference-in-differences analysis of a panel data set of publicly listed European companies that uses the variation in the implementation timing of the laws across countries for identification. I include firm fixed effects to account for time-invariant firm unobservables. Since the data indicates that (publicly listed) European firms are not changing their legal incorporation across countries, my firm fixed effects are also controlling for any time-invariant country unobservables. I include year $\times$ industry $\times$ European region fixed effects to control for unobserved differences across firms due to industry conditions in a European region in a given year. Industry is defined at the 3-digit SIC code level and I have divided Europe into four regions (see Table 1). Note that I cannot control for country $\times$ year fixed effects, since the variable of interest, the regulatory integration index, varies at the country-year level. I cluster standard errors at the country level, since there might be time-series and cross-sectional correlation of observations within a given country.

I also include macroeconomic and firm-level controls. One important macroeconomic factor is whether a country has its own currency or whether it is part of a currency union. For instance, about two thirds of the countries in my sample join the euro currency area during my sample period. One potential advantage of a currency union is increased trade among its members due to a lack of currency risk. One potential disadvantage of a currency union is that monetary policy is not country-specific. To account for these differences in currency regimes, I control for the coarse

currency regime classification by Ilzetzki, Reinhart, and Rogoff (2011). A value of 1 in the coarse currency regime classification stands for currency unions and tight currency pegs. A value of 4 for this variable stands for a freely floating currency. In addition, I include a dummy variable that switches from 0 to 1 if a country joins the European Union during my sample period, thereby capturing potential changes for these countries due to EU membership. To account for general macroeconomic developments, I control for real GDP growth and inflation at the country level (Erel, Julio, Kim, and Weisbach (2012)). Since my outcome variable is measured in year t, while my independent variables are measured in year t-1 to avoid any mechanical relationship, I control both for real GDP growth and for inflation in year t and year t-1 in a given country.

To control for differences in investment opportunities, I control for Tobin's Q (Lang, Stulz, and Walkling (1991)) and sales growth (Kim and Kung (2016)). To control for differences in profitability, I include EBITDA over total assets (Bris, Koskinen, and Nilsson (2014)). To control for potential borrowing constraints of firms, I employ market leverage (Moeller, Schlingemann, and Stulz (2004)). Since the ability of firms to access external financing might be affected by their ability to provide collateral, I control for the ratio of collateral (net property, plant and equipment plus inventory) to total assets (Bris, Koskinen, and Nilsson (2014)). To adjust for potential differences in the need to access external finance, I control for cash holdings (Bris, Koskinen, and Nilsson (2006)). Lastly, to control for potential differences associated with firm size, I control for the natural logarithm of stock market capitalization in constant 1991 USD (Moeller, Schlingemann, and Stulz (2004), Hadlock and Pierce (2010)). Table 3 contains summary statistics on all independent variables.

Table 4 contains the results for the regression of net external finance on the above variables. In model 1 of the table, I only include the regulatory integration index and year fixed effects. The point estimate of the regulatory integration index is 1.20 percentage points, with a p-value of 0%. In model 2, I add firm-level and macroeconomic control variables, and the point estimate for the regulatory integration index increases slightly to 1.25 percentage points, while the p-value remains at 0%. In model 3, I additionally control for firm fixed effects. The magnitude of the coefficient of the regulatory integration index increases to 1.65 percentage points, with a p-value of 0%. In model 4, my tightest specification, I replace year fixed effects with year $\times$ industry $\times$ European region fixed effects. The point estimate of the regulatory integration index is 2.06 percentage points, with a p-value of 0%.

Regarding the economic significance, the point estimate of 2.06 for the regulatory integration index in model 4 implies that if all countries in my sample implement 1 law, net external finance by the companies in these countries increases by 2.06 percentage points. If all countries in my sample implement all 4 laws, the effect on net external financing for the firms from these countries is four times this point estimate. Thus, the economic magnitude of this effect is large. Given the sample average of 4.95 percentage points of net external finance, if all countries in my sample implement one law, net external finance by the companies in these countries increases by 42%. If all countries implement all laws, net external finance therefore more than doubles.

There are several reasons why the magnitude of my results are reasonable. First, at least until the European Sovereign Debt Crisis, the FSAP was the EU's most important policy with respect to financial markets after the introduction of the euro (Altomonte and Nava (2006), Fonteyne (2007)). As a consequence, an important policy plan might result in large changes in related outcome variables. Second, while the preceding results are large in relative terms, they concern a flow variable with a small absolute level. Third, cross-sectional tests discussed in later sections of the paper document that my results are in line with several stylized facts in the data, including, for instance, the credit boom in Southern Europe in the 2000s.

The point estimates of the control variables have the expected signs, except for the point estimate of the EU Accession dummy, which is significantly negative. This finding can be explained by the fact that the four Eastern European countries in my sample undertook bankruptcy and collateral reforms before joining the EU. These were externally imposed on them as part of the conditions that they had to fulfill to meet the entry requirements for the European Union.[3] Therefore, the macroeconomic conditions in Eastern Europe for raising external capital before these countries joined the EU were much more attractive than their macroeconomic variables such as real GDP growth would suggest. This "unobserved" ease of raising net external finance in these countries before they joined the EU therefore explains the negative point estimate for the EU Accession dummy. Moreover, the point estimates for the EU Accession dummy in separate analyses of net debt issues and net equity issues indicate that the negative point estimate for the EU Accession dummy is entirely driven by net debt issues, which is in line with the preceding result and bankruptcy

[3]See Haselmann, Pistor, and Vig (2010) for an analysis of these externally imposed bankruptcy and collateral reforms in Eastern Europe.

and collateral reforms being more important for debt than equity.

Furthermore, the economic magnitudes of the point estimates of the control variables also seem reasonable. For instance, if one moves from the 25th to the 75th percentile for Tobin's Q net external finance increases by 3.86 percentage points. For market leverage a one standard deviation increase results in a reduction of net external finance of more than 8 percentage points. In contrast, the same one standard deviation change in market leverage results in a reduction of net external finance of only 1.70 percentage points, when computed with the point estimate for market leverage from model 2, which does not include firm fixed effects. This highlights the importance of controlling for time invariant firm unobservables by including firm fixed effects. A large change in market leverage might, for example, result from a substantial unanticipated reduction in profits. Such a large decrease in profits not only reduces a firms future ability to repay its debt, but simultaneously also decreases a firm's stock market capitalization, thereby mechanically increasing market leverage, while also sending a negative signal about a firm's future growth options. In addition, financial covenants might be violated, which can force a firm to delever and decrease its investment substantially (Nini, Smith, and Sufi (2012)). Last, concerning, e.g., a firm's cash holdings, a one standard deviation increase in this variables reduces net external finance by more than 2 percentage points.

3.3 Real Effects: The Use of the Additional Financing

Having established that the regulatory integration of international capital markets leads to an increase in net external finance, a natural question is whether there are any real effects concerning the use of this additional financing. I analyze these real effects in Table 5 by using the same research design as in my tightest specification when analyzing the relation between net external finance and regulatory integration of international capital markets (model 4 of Table 4). In model 1 of Table 5, I investigate whether regulatory integration of international capital markets affects firm size, which I measure as the logarithm of total assets. The point estimate for the regulatory integration index in this specification is 5.87, with a p-value of 0%. This implies that if all countries in my sample implement one law, the firms in these countries grow by 5.87 percent. In model 2 of Table 5, I investigate whether the regulatory integration of international capital markets affects investment. The dependent variable is the investment rate, which is defined as capital expenditures in the current year over total assets at the end of the preceding year. I find that if all countries implement

one law (out of the total of four), the investment rate increases by 0.61 percentage points (p-value 0%), which corresponds to an increase of 9.35 percent relative to the average investment rate of 6.53 percentage points in my sample. Finally, I investigate whether the regulatory integration of international capital markets affects firm-level employment, by using the natural logarithm of the number of employees as my dependent variable in model 3 of Table 5.[4] I document that if all countries implement one law, employment increases by 4.07 percent, with the result being highly statistically significant (p-value 2%).

Since net external financing and the investment rate are both flow variables which are computed by dividing by book assets, their magnitudes can be directly related. 30% of the increase in net external financing is invested in capital expenditures. Since the number of employees and total assets are stock variables, no direct statement about the use of the remaining 70% of the additional capital can be made, but it appears reasonable to assume that the remaining financing is spent to increase the workforce and to increase the firm size.

3.4 Endogeneity in the Timing of the Implementation Dates

While there is evidence that the timing of the national implementation of EU laws is generally driven by lengthy and inflexible legislative procedures[5] (and in the case of these four laws, the Lamfalussy directives, due to their complexity, also by the time needed to set up new supervisory authorities),[6] it is still possible that the timing of a country's decision to implement a given law is endogenous. To address this concern, I create the "Regulatory Integration Takeout" index, in which I only keep the part of the index that comes from other countries' implementation and discard the part of the index that is due to the country's own implementation.

I use my prior example of three countries and one law to illustrate the construction of this refined index of regulatory integration. If the first country implements the law, nothing changes for this country compared to the original index, because no other country has yet implemented the law. If the second country implements this law, these two out of the three countries are now

[4] In models 1 and 3, where the dependent variables are log(assets) and log(employees), I do not control for firm size to avoid a mechanical relationship with the dependent variable.

[5] Knill and Lenschow (1998), Tallberg (2002), Börzel, Hofmann, Panke, and Sprungk (2010). The legislative procedures include the drafting of national implementation laws, consultation periods, multiple readings in the various chambers of national parliaments, signing by the head of state, and the public notification of the national implementation law.

[6] Kalemli-Ozcan, Papaioannou, and Peydró (2010, 2013), Christensen, Leuz, and Hail (2016).

integrated so that the index values of both countries change to 0.5 under the old index. For the refined "Regulatory Integration Takeout" index, however, only the index value of the country that first implemented the law changes to 0.5, while for the other country the index value remains 0. If the last of the three countries now implements the law, the index value of the "first-mover" country changes to 1, the index value of the "second-mover" country changes to 0.5, while the index value of the third country remains 0. The "Regulatory Integration Takeout" index of a given country is therefore driven only by other countries' implementation timing, and not by the country's own implementation timing. This alleviates endogeneity concerns with respect to the implementation timing.

I now illustrate this example step by step. Consider these three countries, one law and three different points in time (t=1, t=2, t=3). In the visualizations in Figure 3, changes in the contemporaneous time period are represented with *dashed* circles, arrows or bars, while changes in the preceding time periods are represented with *solid* circles, arrows or bars. If country A implements the law at t=1 (Panel A of Figure 3), its index value remains 0, because the other two countries have not yet implemented the law. The index values for the countries therefore do not differ across the baseline index and this refinement.

At t=2, country B implements the law (Panel B of Figure 3). The bilateral link between country A and country B is activated by country B's implementation. Importantly, for the refined "Regulatory Integration Takeout" index, only the index value of the country that first implemented the law changes to 0.5, while for the other country the index value remains 0, because the fact that country B is now also integrated with country A is discarded when computing the index value for country B. This is because country B's implementation timing might be endogenous and should therefore not drive its own index value. As can be seen in Panel B of Figure 3, the index values for country A are the same across the regulatory integration and the regulatory integration takeout indexes. For country B however, the regulatory integration index takes a value of 0.5, while the regulatory integration takeout index takes a value of 0.

At t=3, country C implements the law (Panel C of Figure 3). The implementation by country C activates the links between countries A and C and between countries B and C, respectively. To account for the potential endogeneity in the timing of country C's implementation, only the effect that country C's implementation has on countries A and B is taken into account when computing

the three countries' values for the regulatory integration takeout index. The effect that country C's implementation has on its own index value is discarded. Since countries A and B are now integrated with one more country, their index values increase by 0.5 each, to 1 for country A and to 0.5 for country B. The index value for country C remains 0, because the information of its regulatory integration is discarded. In contrast, under the baseline index, the index value would have been 1 for each of the three countries.

I apply the methodology of the regulatory integration takeout index to all countries in my sample and all four laws. Since I discard the effect of the regulatory integration on the late adopters' index values, this refined index cannot reach the value 4 for all countries. In model 1 of Table 6, I use the regulatory integration takeout index as my variable of interest, while otherwise using the same regression framework as before. The point estimate for the regulatory integration takeout index is slightly changed from the one for the original regulatory integration index, with a point estimate of 1.83 percentage points (p-value 0%), instead of 2.06 percentage points.

3.5 Strategic Implementation Timing

A further concern is that countries time their implementation strategically with respect to other countries, making countries' implementation order endogenous. To address this concern, I create the "Regulatory Integration Takeout Big 4" index. I turn to the Group of Seven (G7), which is an informal bloc of industrialized democracies. The G7 has four European members which I define as large countries: France, Germany, Italy and the UK (see Table 1). The idea is that compared to the rest of Europe, these four countries have chosen their implementation timing only with respect to other large countries or themselves, and not with respect to the rest of the EU, since these large countries do not take the remaining countries into account. If, for instance, Germany were to strategically time its implementation of a given law, my assumption is that only domestic issues in Germany and the corresponding issues in France, Italy and the UK would affect the German implementation timing, but not, for instance, domestic issues in Denmark. However, these large countries are economically and politically important for the remaining countries, since together they accounted for 72% of the GDP and 68% of the population of the EU in 2000 (World Bank (2016b)). I drop all firms from these four countries from my data set, but still use these countries for the computation of my index. For the remaining countries, I only consider regulatory integration

of the remaining countries with the large countries, and not regulatory integration among the remaining countries themselves. To illustrate, the idea is that for a small country such as Finland, regulatory integration with the UK or Germany is important while regulatory integration with, for instance, Austria is less important. Therefore, only regulatory integration of the large countries with the remaining countries drives the regulatory integration index of the remaining countries. The motivation is that the implementation timing of the large countries is exogenous for the remaining countries. In addition, I also apply the prior refinement from the "Regulatory Integration Takeout" index for the "Regulatory Integration Takeout Big 4", so that the timing of when a country itself implements a law does not affect its index value. Taken together, these two refinements therefore address the endogeneity of the implementation timing and of countries' strategic implementation timing with respect to each other.

I explain the construction of the "Regulatory Integration Takeout Big 4" index. To fully illustrate all features of this refined index of regulatory integration, I need to extend the preceding example from three to four countries. Imagine that two out of these four countries are large countries. I drop the firms from the two large countries from the sample and only use the two large countries for the computation of my index. Take one of the two small countries. For this small country, I only consider the two links it has with the two large countries, and not the one with the other small country. So for this small country, possible index values are 0, 0.5 and 1. Taking, for example, Sweden, its index of regulatory integration is now only driven by the country-pairs that it forms with the four large countries, but not with other small countries such as Portugal or Greece. I also apply the prior refinement of not taking into account the effect of the country's own implementation on its index value. If the country implements the law after both large countries, its index remains 0. If it implements the law after one large country but before the other, its index is capped at 0.5. Only if the small country implements the law before the two large countries can its index reach 1.

I now illustrate this example step by step. Consider these four countries, one law and four different points in time (t=1, t=2, t=3, t=4). Furthermore, countries A and C are the large countries in this example, which is visualized using larger letters in Figure 4. Moreover, in the visualizations, changes in the contemporaneous time period are represented with *dashed* circles, arrows or bars, while changes in the preceding time periods are represented with *solid* circles,

arrows or bars. At t=1, country A implements the law (Panel A of Figure 4). Since country A is a large country, I do not compute country A's index value for this refined index of regulatory integration, since the firms from country A are excluded from the sample.

At t=2, country B implements the law (Panel B of Figure 4). The bilateral link between country A and country B is activated by country B's implementation. As for the regulatory integration takeout index, country B's value for the "Regulatory Integration Takeout Big 4" index remains 0, since I am discarding the effect that the country's implementation has on its own index value.

At t=3, country C implements the law (Panel C of Figure 4). The implementation by country C activates the links between countries A and C and between countries B and C, respectively. Importantly, since only firms from small countries remain in my sample, I am not interested in the link between countries A and C. Thus, the arrow between countries A and C is crossed out in Panel C of Figure 4. In contrast, I take the link between the large country C and the small country B into account. Since the link between the two countries is activated by country C, the index value of country B increases. In this example with two large and two small countries, a small country can have up to two links with large countries. Therefore, the index of country B increases by 0.5, since one out of two links has been activated. Since countries A and C are large countries, I do not compute their index values.

At t=4, country D implements the law (Panel D of Figure 4). The implementation by country D activates the links between countries A and D, between countries B and D, and between countries C and D, respectively. Importantly, since I only consider links between large and small countries, but not links among small countries, the link between countries B and D is discarded (crossed out) in Panel D of Figure 4. Furthermore, since it is country D that has activated its own links with the large countries A and C, I discard the effect that these two links have on country D's value for the "Regulatory Integration Takeout Big 4" index. As noted before, I do not compute this refined index of regulatory integration for countries A and C. Therefore, compared to Panel C, the index values in Panel D for the "Regulatory Integration Takeout Big 4" index do not change. In the last time period, the index values for countries B and D are 0.5 and 0, respectively.

I apply the methodology of the "Regulatory Integration Takeout Big 4" index to all countries in my sample and all four laws. In models 2 to 4 of Table 6, I examine the effect of regulatory integration of international capital markets on net external finance. First, note that firms from

France, Germany, Italy, and the UK are now excluded from the sample. In model 2 of Table 6, I use the standard regulatory integration index for this smaller sample and find a point estimate of 2.54 percentage points, with a p-value of 0%. Next, I apply the regulatory integration takeout index from the prior subsection to this sample in model 3 of Table 6. The point estimate for the regulatory integration takeout index is 2.98 percentage points with a p-value of 0%. The point estimate for the regulatory integration takeout index increases compared to the regulatory integration index. The reason is that while the changes in the dependent variable caused by the regulatory integration of international capital markets remain the same, the changes in the values of the refined index are smaller than the ones in the original index, which results in a larger point estimate. In model 4 of Table 6, I apply the "Regulatory Integration Takeout Big 4" index. The point estimate for this variable is 3.24 percentage points, with a p-value of 0%. The increase in the point estimate compared to the prior specification is due to the computation of the index now only considering the regulatory integration with the four large countries.

3.6 Macroeconomic Shocks or Trends

I address the concern that countries experience macroeconomic shocks or time trends that are coinciding with the timing of the implementation of the laws. Crucially, the pattern of these shocks or time trends also needs to explain the two refined indexes, which already raises the bar for any alternative explanation. Following the paper by Rajan and Zingales (1998) on external finance dependence, the treatment effect of regulatory integration should be stronger for firms in industries that are more dependent on external finance. I construct a proxy for external finance dependence for three-digit SIC code industries in Europe following Rajan and Zingales (1998), based on the Worldscope data for publicly traded companies that I also use in the rest of the paper. Since I want to interact this proxy of external finance dependence with the regulatory integration index, I standardize the proxy so that it ranges from 0 to 1. As the proxy of external finance dependence is time-invariant, its main effect on external finance dependence is absorbed by my firm fixed effects.

First, I estimate a regression with the main effect of regulatory integration and the interaction of regulatory integration and external finance dependence. I find that that the interaction term is significantly positive, whether I include year fixed effects (model 1 of Table 7) or year $\times$ industry $\times$ region fixed effects (model 2 of Table 7). Importantly, I can exploit industry variation in the

treatment effect. Therefore, I can absorb any macro shocks or time trends with year × country fixed effects, which I use instead of my standard year × industry × region fixed effects. Since my identification now comes from the interaction of regulatory integration and external finance dependence, it is no concern that the main effect of regulatory integration is absorbed by my year × country fixed effects. The estimate for the interaction term of regulatory integration and external finance dependence in this specification is statistically significantly positive (model 3 of Table 7).

4 Channels

4.1 Net Debt Issues and Net Equity Issues

I provide evidence for the channels of the effect of regulatory integration of international capital markets on net external financing. I decompose net external financing into its components: net debt issues and net equity issues, using otherwise the same regression specification as for my analysis of net external finance in model 4 of Table 4. Both net debt issues and net equity issues significantly increase due to regulatory integration, as can be seen in Table 8. The point estimates for net debt issues and net equity issues are 1.26 and 0.57 percentage points respectively. Both effects are highly significant. The magnitudes of the treatment effects differ substantially with respect to their contribution to the overall increase of net external financing: Around 70% of the increase in net external financing is driven by net debt issues, while the remaining 30% is driven by net equity issues. Compared to the corresponding sample averages for net debt and net equity issues, if one law is implemented in all countries in my sample, this implies a 26% increase in net equity issues compared to a 50% increase for net debt issues.

4.2 General Regulatory Quality

In this subsection, I investigate whether the effect of regulatory integration of international capital markets on external financing depends on the general regulatory environment of a country. From a theoretical perspective, the direction of an interaction effect between regulatory integration of international capital markets and the general regulatory environment in a country is unclear. One argument for a positive interaction effect is that domestic regulations and international regulations could be complements, meaning that countries are better able to apply international laws when they

are better able to formulate and implement domestic policies, too. For instance, countries that have a well functioning legislative and judiciary might be better able to implement European regulations on insider trading or the release of accounting information. Another argument for a positive interaction effect is that countries with better regulations have lower frictions for financial transactions across international borders. To illustrate, a country with less frictions concerning the undertaking of private business activity might benefit more from the introduction of passporting rights that now allow financial institutions to provide financial services across Europe more efficiently. This would imply that the effects of the regulatory integration of international capital markets on external finance are not driven by the harmonization of regulations, but by the removal of frictions that hinder cross-border activities.

In contrast, an alternative prediction is that international and domestic laws are substitutes. One example is that in a country where regulations concerning the private sector are less conducive to business, international law concerning insider trading or the release of accounting information might compensate for the lack of good domestic regulations. Accordingly, international law might be of particular relevance when the quality of domestic law is low, implying a negative interaction effect of regulatory integration of international capital markets and the regulatory environment in a country. Lastly, a reduction of frictions to cross-border financial transactions might have a particularly strong effect in countries that have higher frictions for domestic business activities, so that for instance, a lack of domestic competition can be compensated by competition from outside the country.

I use information on the general regulatory environment in countries that has been used by another paper investigating the effects of the regulatory integration of international capital markets: Christensen, Leuz, and Hail (2016) employ a dummy variable that classifies countries depending on the "government's ability to formulate and implement sound policies and regulations that permit and promote private sector development". A value of one for this dummy variable indicates that a country has a higher general quality of regulations. For this dummy variable all countries in Eastern Europe and Southern Europe are classified as having a low regulatory quality. In Western Europe Belgium and France are coded as having a low regulatory quality. In Northern Europe Norway is classified as having a low general regulatory environment concerning regulations that promote private sector development. I interact this dummy variable with the regulatory integration

index. Since my fixed effects are defined at the level of these four European regions, this test is essentially comparing differences in regulatory quality within Northern and Western Europe and how the interact with the regulatory integration of international capital markets.

In Table 9, I apply the preceding regression framework, while adding the interaction term of the regulatory integration index and the dummy for the general regulatory quality. Note that the main effect for general regulatory quality is absorbed by the firm fixed effects. The point estimate for the regulatory integration index is 1.85 percentage points (p-value 0%) and the point estimate for the interaction term is 0.40 percentage points (p-value 6%). This suggests that domestic and international laws are complements. In addition, this is also consistent with at least part of the effect of the regulatory integration of international capital markets on external finance being driven by the removal of frictions concerning cross-border transactions.

4.3 Firm Size

I examine whether there are any differential treatment effects across large and small firms. Since I am particularly interested in whether there is a difference in the results for firm size within countries (and not across countries), I want to avoid firms that I define as large being concentrated only in a subset of the countries in my sample. Furthermore, since even after controlling for inflation, firm size increases over time due to real economic growth, one also needs to condition on time for such an analysis. Therefore, I define a firm in a given year t as small if its value is below the median value for a given firm size proxy for a given country in the previous year. Thereby, half of the observations in each country-year are classified as small firms. My dummy variable takes the value one if a firm is small according to this definition. As proxies for firm size, I use Worldscope data on stock market capitalization, book assets, and sales in US dollars.

To test whether the effect of regulatory integration depends on firm size, I interact the dummy variable that proxies for firm size with the regulatory integration index, while controlling for the main effect of regulatory integration. The results in Table 10 indicate a significantly weaker effect of regulatory integration for smaller firms. The estimates for the main effect of regulatory integration across the three different proxies for firm size are 2.39 percentage points (stock market capitalization), 2.42 percentage points (book assets), and 2.37 percentage points (sales), while the p-values for all 3 point estimates are 0%. The point estimates for the interaction of the regulatory

integration index with the firm size dummies based on stock market capitalization and book assets are -0.66 and -0.63 percentage points, with p-values of 1 and 3%. The corresponding values for the interaction term based on sales are -0.55 percentage points and 4%.

Foreign financial firms focus on arm's length transactions and on large firms (Mian (2006)). For small firms, relationship-based transactions and the distance to a financial service provider are important (Petersen and Rajan (1994), Berger and Udell (1995), Guiso, Sapienza, and Zingales (2004)). Thus, the stronger treatment effect of regulatory integration of international capital markets for large firms is consistent with an increase in arm's length financial services provided by foreign financial institutions as a potential mechanism behind my results.

4.4 Sample Composition of Publicly Listed Companies

One channel for my results could be that the total financing volume in Europe has been unchanged, while regulatory integration caused a reallocation of financing among publicly listed companies. In particular, it could be that while on the one hand the financing provided to the companies in my sample increased (as documented earlier in this paper), on the other hand the financing for publicly listed companies not in my sample decreased by the same aggregate amount, leaving the total financing volume unchanged. Such a shift in the allocation of financing can occur through changes on the extensive margin of which firms are part of my sample. Such changes can occur through entries (initial public offerings, hereafter IPOs) and exits (delistings, whether through bankruptcy, takeovers or going private).

One challenge in analyzing whether changes in the sample composition through entries or exits drive my results is that I do not observe the entries or exits that do not occur. Consequently, this channel cannot be studied at the firm level. Due to the relatively low number of entries and exits of publicly listed firms at the industry level (even in large economies such as Germany), I address this concern by studying country-level changes in entry and exit. Since the absolute number of entries and exits needs to be examined in relation to the number of firms in a country, I study entry and exit rates. These rates are defined as the number of firms that enter (exit) the sample through IPO (delisting) in a given country in a given year t, divided by the number of publicly listed firms in the same country in year t-1. I also compute the net entry rate, which is the difference between the entry rate and the exit rate. The data on IPOs are from the Thomson Reuters SDC Platinum's

database on New Issues.[7] I apply data filters for IPOs for the SDC Platinum database in line with Doidge, Karolyi, and Stulz (2013). Since there is no reason to believe that Worldscope stops covering firms that it has covered in the past without the firm having exited the sample through exactly one of the ways that I want to capture, I use the last year a firm appears in Worldscope as the firm's exit year.

I then use the entry rate, exit rate and net entry rate as my outcome variables in a country-level analysis of potential changes in the sample composition. The variable of interest is, as before, the regulatory integration index. I include country and year × European region fixed effects and cluster at the country level. I include the same country-level macroeconomic controls as in the firm-level analysis. I employ this research design in Models 1 (entry), 3 (exit) and 5 (net entry) of Table 11. Since one of the well established stylized facts from the IPO literature (see Ritter and Welch (2002) for a review) is the high cyclicality of IPOs, I control for macro determinants of IPO activity identified by Lowry (2003): the stock market return in a country, the stock price volatility in a country, and the q ratio of the stocks in country. Data on the average stock market return and average stock price volatility based on the national stock market indexes are from the Global Financial Development database from the World Bank (2016a). To avoid large outliers, I compute the median q ratio in a country using Worldscope data. As for the other macro controls used in the paper, I control for the values of these IPO controls in the years t and t-1. In Models 2 (entry), 4 (exit), and 5 (net entry) of Table 11, I employ the above research design while additionally controlling for those variables shown to be important in the IPO literature.

The results in Table 11 suggest that the effect of regulatory integration on the outcome variables is not statistically significant, which implies that a reallocation of financing among publicly listed companies is a less likely channel. In addition, the lack of a significant effect of regulatory integration of international capital markets on entries is in line with the preceding result that these regulatory changes had a stronger treatment effect on large firms compared to smaller ones (firms that undertake an IPO are generally smaller than already listed firms).

[7] I turn to IPO data from SDC Platinum to identify entries, because even Worldscope with its superior coverage of European firms (Dai (2012)) undersamples publicly listed companies. Importantly, the coverage in Europe improves for the late 1990s and the early 2000s. Relying on the first time a firm appears in the Worldscope data to indicate the date a company goes public would therefore overestimate the actual number of IPOs occurring.

5 Heterogeneous Effects

In this section I investigate whether there is a heterogeneous effect of the regulatory integration of international capital markets on net external finance across different European regions and countries.

5.1 Euro Countries and Southern Europe

First, I examine whether the effect of regulatory integration differs across eurozone and non-eurozone countries in Europe. If the effect of regulatory integration is larger in the eurozone than in the rest of Europe, this hints that a common currency facilitates regulatory integration of international capital markets. Examining such a potential heterogeneous treatment effect is important, since Mundell's seminal work on optimal currency areas (Mundell (1961)) suggests that free movement of capital within a currency area is a prerequisite for the functioning of a currency union. In addition, a large number of studies shows that the introduction of the euro led to an increase in international capital flows across the associated countries (see, for instance, Lane and Milesi-Ferretti (2007), Hale and Obstfeld (2016); for a survey see Lane (2006)). Last, Kalemli-Ozcan, Papaioannou, and Peydró (2010) document that regulatory integration through the FSAP was one of the three factors underlying the euro's effect on country-level financial integration.[8]

To test for a differential treatment effect for euro-currency and non euro-currency countries, I include the regulatory integration index, and an interaction effect of the index with a euro-currency dummy in my regression. It is reassuring that in Model 1 of Table 12, the main effect of the regulatory integration index on net external finance is 1.38 percentage points (p-value 0%), while the additional effect of the regulatory integration index for the euro countries is 0.58 percentage points (p-value 3%).[9]

An important stylized fact is the credit boom in Southern Europe in the 2000s, which was driven by inflows of foreign capital and which burst during the European sovereign debt crisis (see, for

[8] The other two factors were the removal of currency risk and an increase in trade.

[9] While my cross-sectional results for individual countries hold with year × region × industry fixed effects, I include year fixed effects in all specifications in which I study heterogeneous effects across different countries. The reason is that when investigating whether there is a heterogeneous effect for an entire region of Europe, I cannot include region based fixed effects. As a consequence, I would have to include different fixed effects depending on whether I investigate the results for a European region or for the individual countries within this region, making a comparison of the point estimates difficult. Furthermore, the more natural comparison for how a given country is performing within Europe is against the average effect for Europe, and not how it is performing against the the average effect for a given European region.

instance, Lane (2012), Reis (2013), Hale and Obstfeld (2016)). Therefore, I study whether there is a heterogeneous treatment effect of regulatory integration on net external finance in Southern Europe compared to the rest of Europe. In Model 2 of Table 12, I find that the main effect of regulatory integration is 1.62 percentage points (p-value 0%), while the additional effect for Southern Europe is 1.53 percentage points (p-value 0%). In Model 3 of Table 12 I disentangle the treatment effect for Southern Europe into separate point estimates for its constituent countries: Portugal (1.19 percentage points, p-value 0%), Italy (0.85 percentage points, p-value 0%), Greece (2.13 percentage points, p-value 0%), and Spain (1.25 percentage points, p-value 0%). The main effect of regulatory integration to which these country specific effects need to be added is 1.56 percentage points (p-value 0%). These findings are in line with the stylized facts on the credit boom in Southern Europe in the 2000s and the recent sovereign debt crisis in these countries, in particular Greece. Interestingly, the point estimate for Greece in Model 3 is significantly different from the point estimates for Italy and Spain at the 1% level and from the point estimate for Portugal at the 5% level.

Since the four Southern European countries are all in the eurozone, I investigate whether the additional effect of regulatory integration for the eurozone is driven by the effect for Southern Europe or whether these are two independent effects. I decompose *Regulatory Integration* $\times$ *Euro* into *Regulatory Integration* $\times$ *South* and *Regulatory Integration* $\times$ *Euro Not South*. In Model 4 of Table 12, I find that the main effect for the regulatory integration index is 1.48 percentage points (p-value 0%), while the point estimates for *Regulatory integration* $\times$ *South* and *Regulatory Integration* $\times$ *Euro Not South* are 1.69 percentage points (p-value 0%) and 0.31 percentage points (p-value 26%). Interestingly, this suggests that the additional effect for the eurozone is largely driven by the Southern European countries. This result is in line with Bris, Koskinen, and Nilsson (2014), whose result on an increase in net external financing due to the euro is driven by "weak" euro countries.[10] Furthermore, their result is concentrated in the later part of their sample that overlaps with the years when these laws were implemented.

[10] Bris, Koskinen, and Nilsson (2014) define Finland, Ireland, Italy, Portugal and Spain as "weak" euro countries, since they had a currency crisis in the years before the introduction of the euro. Greece is excluded from their data set.

5.2 European Regions and Large Countries

In this subsection, I provide additional evidence for heterogeneous treatment effects across different regions and countries in Europe. In Model 1 of Table 13, I replace the main effect for regulatory integration with four separate estimates for the four regions of Europe in my sample. *Regulatory Integration North* has a point estimate of 1.55 percentage points. *Regulatory Integration West* has a point estimate of 1.73 percentage points. *Regulatory Integration South* has a point estimate of 3.18 percentage points and *Regulatory Integration East* has a point estimate of 2.37. Except for a p-value of 7% for *Regulatory Integration East*, the other three point estimates all have a p-value of 0%.[11] The lower significance of the point estimate for Eastern Europe is probably because only 1% of the firm-year observations in the sample are from Eastern Europe, so the associated statistical power is low. These results suggest that in line with the results in the previous subsection, the effect of the regulatory integration index on net external finance was strongest in Southern Europe, which experienced a large inflow of foreign capital in the 2000s (see, for instance, Lane and Milesi-Ferretti (2007) and Hale and Obstfeld (2016)). Furthermore, the developing economies of Eastern Europe (Czech Republic, Hungary, Poland, and Slovakia) experienced the second strongest treatment effect. This might reflect their lower levels of GDP per capita and financial development compared to Western and Northern Europe, implying a stronger effect on net external finance once companies located in these countries could access capital markets in other parts of Europe more easily.

In Model 2 of Table 13, I analyze whether the effect of regulatory integration differs across companies in France, Germany, Italy and the UK compared to the rest of Europe. However, the results indicate that there are no significantly different treatment effects.

6 Conclusion

I study the real effects of regulatory integration of international capital markets. I exploit a unique policy plan by the EU, which created a common European market for financial services and capital. The so-called "passporting rights" were an important part of this policy. I use a novel empirical approach to overcome the challenges inherent in studying regulatory changes by exploiting the

[11] The estimate for Southern Europe is significantly different at the 1% level from the ones for Northern and Western Europe.

bilateral and staggered nature of European laws that reduced the regulatory costs of engaging in cross-border financial services. Importantly, I account for potential concerns that the pattern of the staggered implementation of the laws across countries is endogenous by exploiting the bilateral nature of these laws.

Over the course of its implementation, regulatory integration of international capital markets causes external financing by European publicly listed companies to more than double. Concerning the use of this additional capital, I find large increases in investment and employment. Thereby, I document that an increase of the size of the regulatory area by integrating national markets to create a common market across countries can lead to large increases in important financial and real outcome variables. Thus, my paper contributes to the debate on the regulatory area of financial regulation. In addition, I also add to the literature on law and finance (La Porta, López de Silanes, Shleifer, and Vishny (1997, 1998)), which has focused on *domestic* law, while my paper is about *international* law.

In light of the large effects of regulatory integration of international capital markets on net external financing, investment and employment, one should note that policy makers and academics are thinking about ways to stimulate the real economy in Europe after the recent financial crisis. A lot of attention is paid to the unconventional monetary policy by the European Central Bank (ECB), and a large number of academic papers are investigating the real effects of the unconventional monetary policy in Europe, the US, and elsewhere.[12] In contrast, regulatory policies by the EU that are meant to stimulate growth have received relatively little attention. For instance, in 2015, the EU proposed an action plan on a capital markets union (European Commission (2015)). Building upon the policy plan studied in this paper, the idea of this action plan is to deepen the integration of European capital markets even further. With the capital markets union, the EU aims to promote investment, employment and economic growth by increasing the supply of financing. Considering the large real effects of regulatory integration documented in this paper, regulatory policies like the action plan on a capital markets union deserve more attention.

One avenue for future research is to explore how the regulatory integration of international capital markets affects the financial sector itself. This would complement this paper, which focuses

[12]See, for instance, Hausman and Wieland (2014), Krishnamurthy, Nagel, and Vissing-Jorgensen (2015), Acharya, Eisert, Eufinger, and Hirsch (2016), Chakraborty, Goldstein, and MacKinlay (2016), Koijen, Koulischer, Nguyen, and Yogo (2016).

on the effects of regulatory integration of international capital markets on the real economy.

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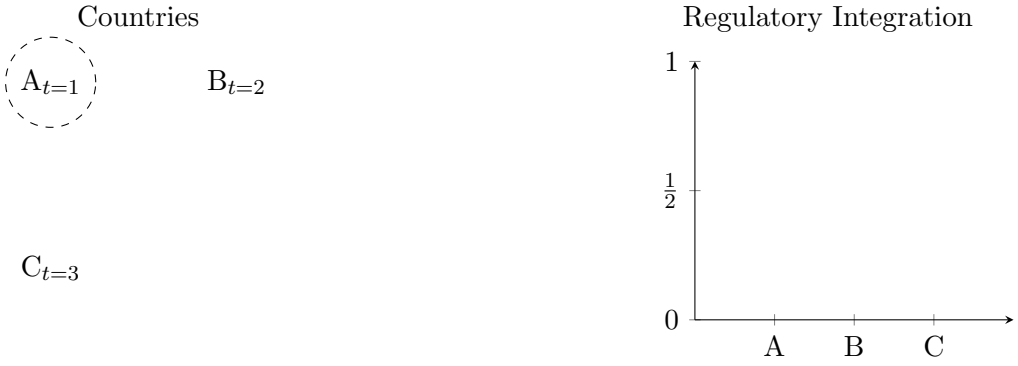
Figure 1: Regulatory Integration Index

This figure illustrates the construction of the regulatory integration index. The construction and the economic motivation of the index are discussed in detail in section 3.1. Consider three countries and one law. Take one of these three countries. If a country has not implemented a law, its index value is always 0. If a country has implemented a law, I look at the two pairs between this country and the remaining two countries. If the other country in a pair has not implemented the law, the index value for this pair is 0. If both countries in a given pair have implemented the law, the index value for this pair is 1. I average the two index values across the two pairs to get the index value for the country. If no other country has implemented the law, the overall index value is 0. If one (two) out of the other two countries has (have) implemented this law, the country's index value is 0.5 (1). I illustrate this example step by step. In the visualizations, changes in the contemporaneous (preceding) time period(s) are represented with dashed (solid) circles, arrows or bars.

Panel A: Regulatory Integration Index at t=1

If country A implements the law at t=1, its index value remains 0, because neither of the other countries have implemented the law yet.



Panel B: Regulatory Integration Index at t=2

At t=2, country B implements the law. The bilateral link between country A and B is activated. Country A is now integrated with one out of the two other countries. Country A's index value therefore increases to 0.5 since one of its two possible links is activated. The same applies to country B.

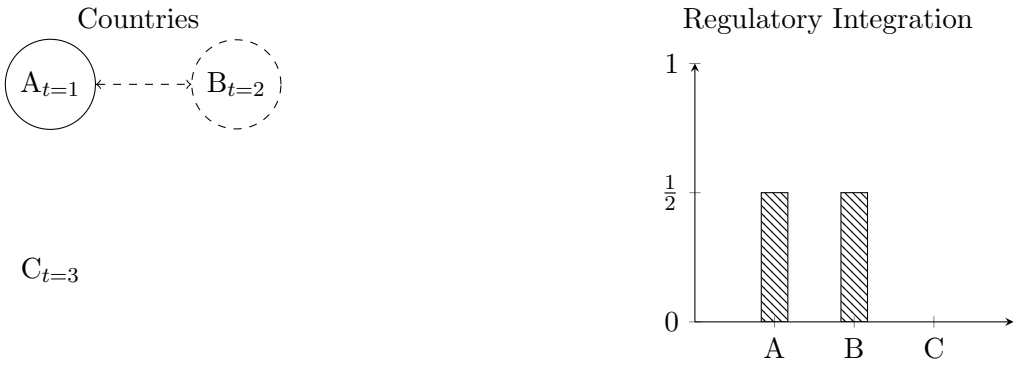


Figure 1: Regulatory Integration Index (Continued)

Panel C: Regulatory Integration Index at t=3

At t=3, country C implements the law. The implementation by country C activates the links between countries A and C and between countries B and C. All three countries are now integrated with the other two countries. The index of regulatory integration increases from 0.5 to 1 for countries A and B, since these two countries are now integrated with one additional country. The index value for country C increases from 0 to 1, since it is now integrated with both other countries, while it previously was not integrated with any country.

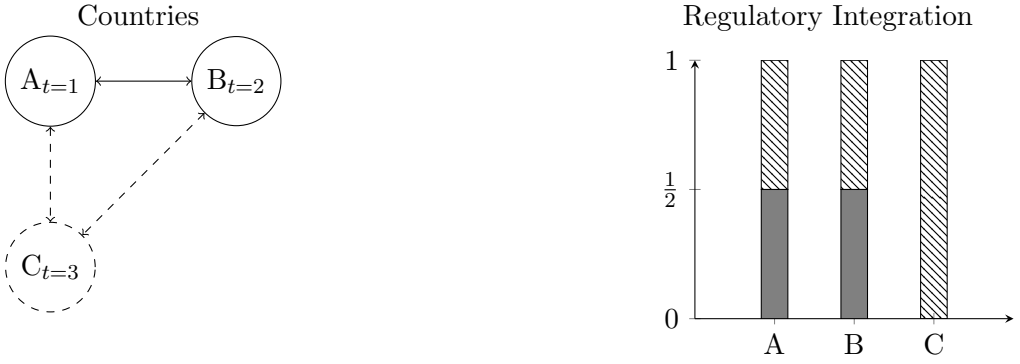
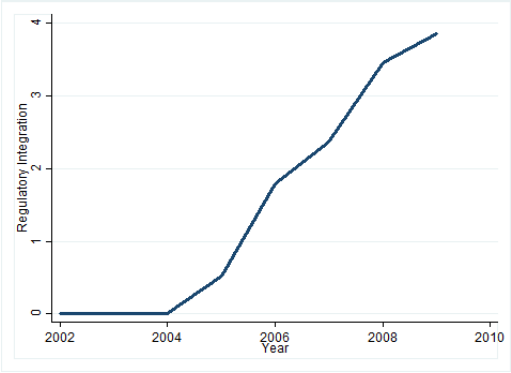


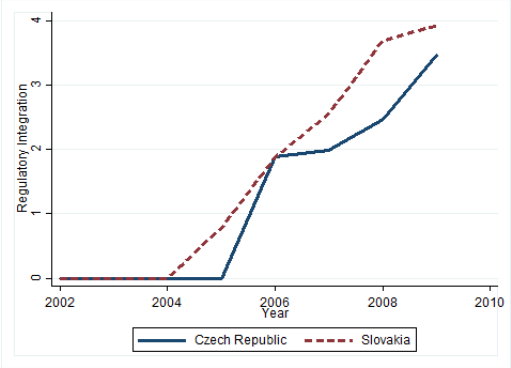
Figure 2: Yearly Average of Regulatory Integration Index

This figure presents the yearly average of the regulatory integration index, computed by equally weighting the yearly value of the index across the countries that are implementing the laws in my sample. See Figure 1 for an illustration of the index.

Panel A: Yearly Average of Regulatory Integration Index across Europe



Panel B: Yearly Average of Regulatory Integration Index: Czech Republic vs. Slovakia



Panel C: Yearly Average of Regulatory Integration Index: Italy vs. Spain

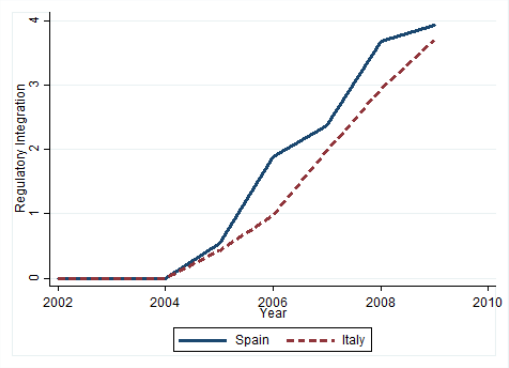
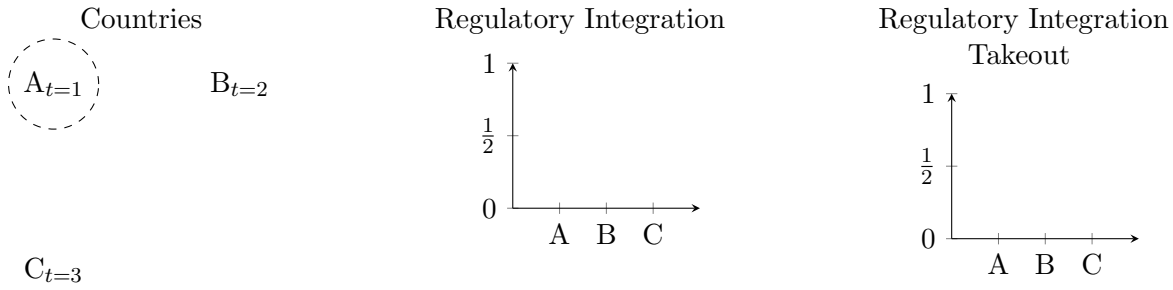


Figure 3: First Refinement of Regulatory Integration Index

This figure illustrates the construction of the regulatory integration takeout index, which is the first refinement of the baseline regulatory integration index. This refinement addresses the concern that the timing of a country's decision to implement a given law is endogenous. The construction and the economic motivation of this index are discussed in detail in section 3.4. For this refinement, I only keep that part of the index that comes from other countries' implementation and I discard the part of the index that is due to the country's own implementation. Using the prior example of three countries, if the first country implements the law, nothing changes for this country compared to the original index, because no other country has yet implemented the law. If the second country implements this law, only the index value of the country that first implemented the law changes to 0.5, while for the other country the index value remains 0. If the last of the three countries now implements the law, the index value of the first-mover country changes to 1, the index value of the second-mover country changes to 0.5, while the index value of the third country remains 0. The regulatory integration takeout index of a given country is therefore driven only by other countries' implementation timing, and not by the country's own implementation timing. This alleviates endogeneity concerns with respect to the implementation timing. I illustrate this example step by step. In the visualizations, changes in the contemporaneous (preceding) time period(s) are represented with dashed (solid) circles, arrows or bars.

Panel A: Regulatory Integration Takeout Index at t=1

If country A implements the law at t=1, its index value remains 0, because neither of the other two countries have implemented the law yet.



Panel B: Regulatory Integration Takeout Index at t=2

At t=2, country B implements the law. The bilateral link between country A and country B is activated by country B's implementation. For the refined regulatory integration takeout index only the index value of country A, which implemented the law first, changes to 0.5, while for country B the index value remains 0, because the fact that country B is now also integrated with country A is discarded when computing B's index value.

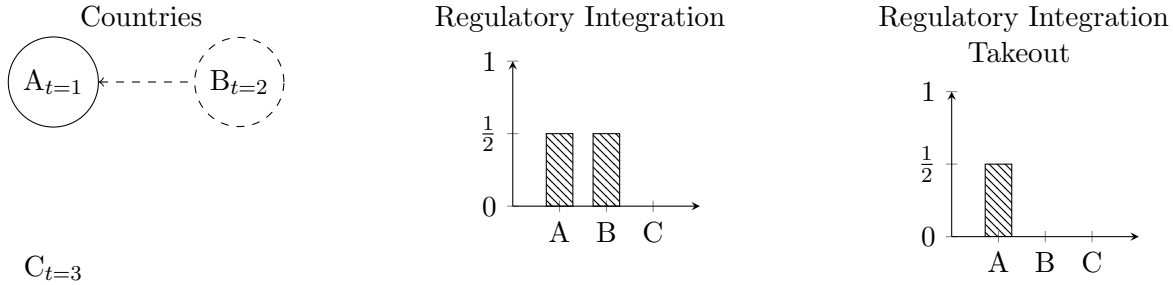


Figure 3: First Refinement of Regulatory Integration Index (Continued)

Panel C: Regulatory Integration Takeout Index at t=3

At t=3, country C implements the law. The implementation by country C activates the links between countries A and C and between countries B and C. Only the effect of country C's implementation on countries A and B is taken into account when computing the three countries' values for the regulatory integration takeout index. In contrast, the effect that country C's implementation has on its own index value is discarded. Since countries A and B are now integrated with one more country, their index values increase by 0.5 each, to 1 for country A and to 0.5 for country B. The index value for country C remains 0.

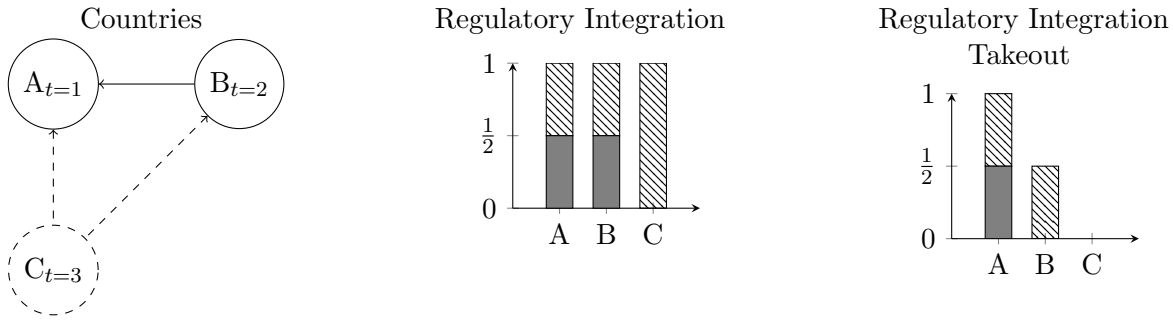
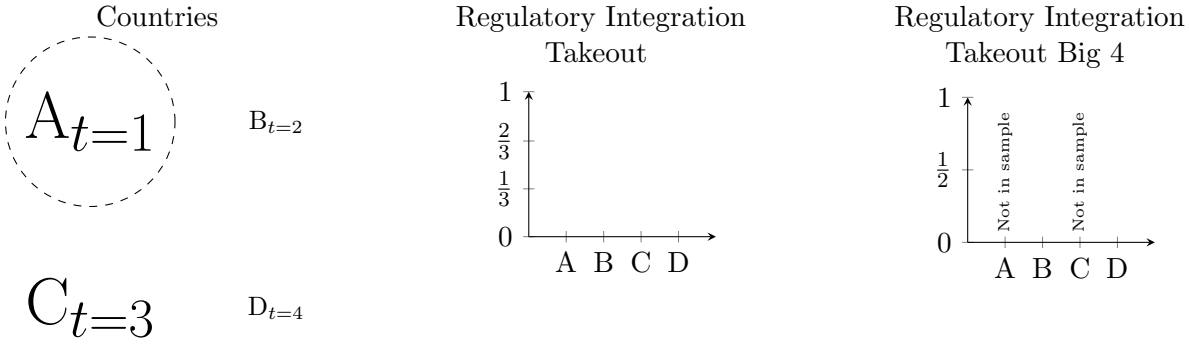


Figure 4: Second Refinement of Regulatory Integration Index

This figure illustrates the construction of the regulatory integration takeout big 4 index, which is the second refinement of my baseline regulatory integration index. The construction and the economic motivation of this index are discussed in detail in section 3.5. The regulatory integration takeout big 4 index addresses the concern that countries time their implementation strategically with respect to other countries, so that countries' implementation order is endogenous. To fully illustrate all features of this refinement, I extend the example from three to four countries, with two of these four countries being large countries. I drop firms from the two large countries from the sample and only use the two large countries for the computation of the index. Take a small country. For this small country, I only consider the two links it has with the two large countries, and not the one with the other small county. For this small country, possible index values are 0, 0.5 and 1. I also apply the prior refinement of not taking into account the effect of the country's own implementation on its index value. If the country implements the law after both large countries, its index remains 0. If it implements the law after one large country but before the other, its index is capped at 0.5. Only if the small country implements the law before the two large countries can its index value reach 1. I illustrate this example step by step, with A and C being large countries. In the visualizations, changes in the contemporaneous (preceding) time period(s) are represented with dashed (solid) circles, arrows or bars.

Panel A: Regulatory Integration Takeout Big 4 Index at t=1

At t=1, country A implements the law. Since country A is a large country, I do not compute country A's index value, as large countries are excluded from the sample.



Panel B: Regulatory Integration Takeout Big 4 Index at t=2

At t=2, country B implements the law. The link between country A and country B is activated by country B's implementation. Country B's index value remains 0, since I am discarding the effect of the country's own implementation on its index value.

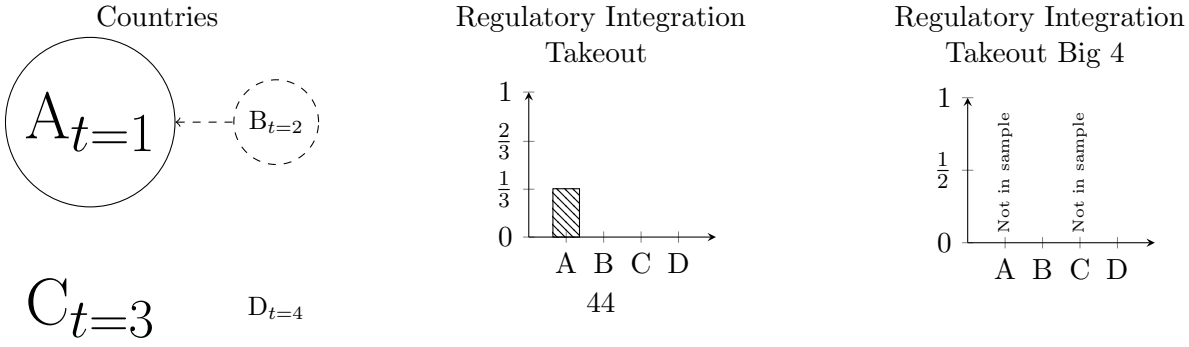
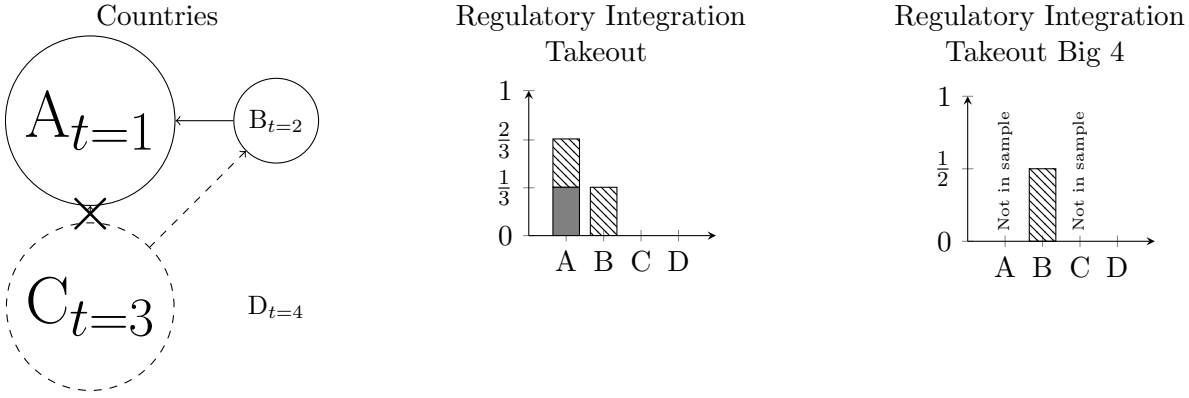


Figure 4: Second Refinement of Regulatory Integration Index (Continued)

Panel C: Regulatory Integration Takeout Big 4 Index at t=3

At t=3, country C implements the law. The implementation by country C activates the links between countries A and C and between countries B and C. As only firms from small countries remain in my sample, I am not interested in the link between countries A and C (crossed out). In contrast, I take the link between the large country C and the small country B into account. Since the link between the two countries is activated by country C, the index value of country B increases. In this example with two large and two small countries, a small country can have up to two links with large countries. Therefore, the index of country B increases by 0.5, because one out of two links has been activated. Since countries A and C are large countries, I do not compute their index values.



Panel D: Regulatory Integration Takeout Big 4 Index at t=4

At t=4, country D implements the law. The implementation by country D activates the links between countries A and D, countries B and D, and countries C and D. Since I only consider links between large and small countries, but not links among small countries, the link between countries B and D is discarded (crossed out). Furthermore, since it is country D that has activated its own links with the large countries A and C, I ignore these two links when computing country D's value for the regulatory integration takeout big 4 index. I do not compute this refined index of regulatory integration for the large countries A and C. Therefore, the index values for the regulatory integration takeout big 4 index do not change at t=4.

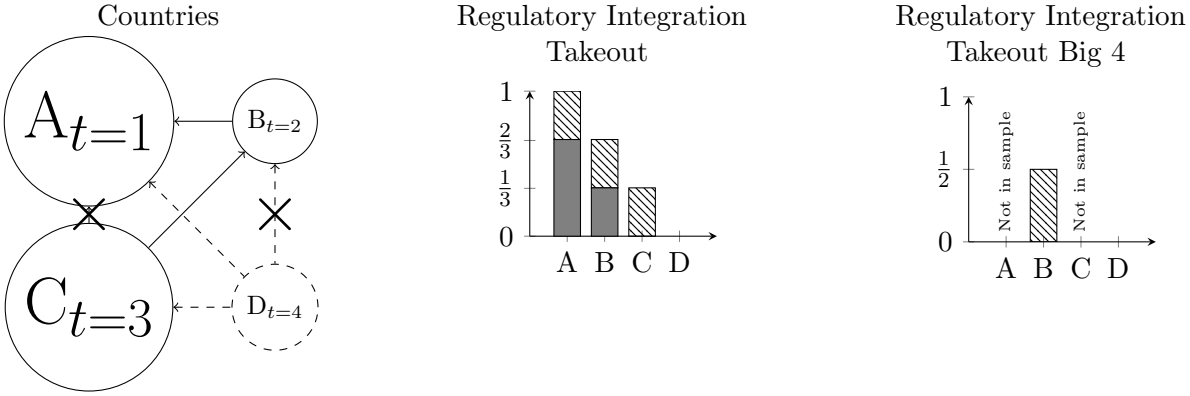


Table 1: Countries in Sample

This table presents the 21 European countries that are part of the sample. Using a definition from the United Nations Statistics Division, I divide these countries into four European regions. Large Country indicates whether a country is a large European country. I classify European countries as large, if they are part of the Group of Seven (G7), which is an informal bloc of industrialized democracies.

Country	European Region	Large Country
Austria	West	No
Belgium	West	No
Czech Republic	East	No
Denmark	North	No
Finland	North	No
France	West	Yes
Germany	West	Yes
Greece	South	No
Hungary	East	No
Ireland	North	No
Italy	South	Yes
Luxembourg	West	No
Netherlands	West	No
Norway	North	No
Poland	East	No
Portugal	South	No
Slovakia	East	No
Spain	South	No
Sweden	North	No
Switzerland	West	No
United Kingdom	North	Yes

Table 2: Variable Definitions

This table presents the variable definitions, with the exception of the indexes of regulatory integration. For the indexes of regulatory integration see the corresponding figures. The source for accounting and share price data is Worldscope. All ratios are winsorized at the 1% level on both sides of the distribution.

Variable	Definitions
Net External Finance	Net external finance is the sum of net debt issues and net equity issues.
Net Debt Issues	Net debt issues is total debt in year t minus total debt in year t-1, divided by the book value of total assets in t-1.
Net Equity Issues	Net equity issues is the difference of net proceeds from sale/issue of common and preferred stock and common/preferred stock redeemed, retired, converted (both in year t), divided by book value of total assets in t-1.
Currency Regime	Currency regime is the coarse currency regime classification from Ilzetzki, Reinhart, and Rogoff (2011).
EU Accession	EU accession is a dummy variable that switches from 0 to 1, if a country joined the European Union during my sample period.
Real GDP Growth	Real GDP growth is the annual year-on-year percentage change in constant price GDP from the World Economic Outlook database (International Monetary Fund (2015)).
Inflation	Inflation is the annual year-on-year percentage change of average consumer prices from the World Economic Outlook database (International Monetary Fund (2015)).
Tobin's Q	Tobin's Q is total assets minus book equity plus stock market capitalization, over total assets.
Book Equity	Book equity is total assets minus total liabilities minus preferred stock plus deferred income taxes and investment tax credit.
EBITDA/AT	EBITDA/AT is EBITDA over total book value of assets.
Market Lev.	Market lev. is defined as total debt over a denominator which includes total debt minus book equity plus stock market capitalization.
Collateral/AT	Collateral/AT is the sum of net property, plant and equipment and inventories.
Cash/AT	Cash/AT is defined as cash over total book value of assets.
Sales Gr.	Sales gr. is the annual growth rate in net sales.
ln(USD MCAP)	ln(USD MCAP) is the natural logarithm of the stock market capitalization of a firm in constant 1991 USD.

Table 3: Summary Statistics

This table presents the summary statistics for the main variables used in the paper. The sample contains data on publicly traded companies from 21 European countries, which are listed in Table 1. Variable definitions are provided in Table 2. The sample starts in 1991 and ends in 2009. Financials and utilities are excluded from the sample. All ratios are winsorized at the 1% level on both sides of the distribution. Unless stated otherwise, the independent variables are lagged one year compared to the dependent variable in a regression specification.

	Mean	St. Dev.	N
Net External Finance	4.95	20.06	40,371
Regulatory Integration	0.32	0.86	40,371
Currency Regime	2.04	1.05	40,371
EU Accession	0.08	0.28	40,371
Real GDP Growth	2.24	2.10	40,371
Inflation	2.18	1.54	40,371
Tobin's Q	1.58	1.10	40,371
EBITDA/AT	11.53	12.73	40,371
Market Lev.	19.02	16.12	40,371
Collateral/AT	48.06	21.82	40,371
Cash/AT	11.78	13.20	40,371
Sales Gr.	15.51	57.26	40,371
ln(USD MCAP)	18.91	2.18	40,371

Table 4: Main Result - The Impact of Regulatory Integration on External Financing

This table documents the relationship between regulatory integration of international capital markets and net external finance. The dependent variable is net external finance. The regulatory integration index is illustrated in Figure 1. All other variables are defined in Table 2. (Lag.) Real GDP growth and (lag.) inflation are contemporaneous (from the previous year). All other explanatory variables are lagged by one year. Firm FE refers to firm fixed effects. Year FE refers to year fixed effects. Year × Ind. × Region FE refers to fixed effects for the interaction of years, 3-digit SIC code industries, and the 4 European regions described in Table 1. Standard errors are clustered at the country level. P-values are reported in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

	(1)	(2)	(3)	(4)
		Net External Finance		
Regulatory Integration	1.20***	1.25***	1.65***	2.06***
	(0.00)	(0.00)	(0.00)	(0.00)
Currency Regime		-0.17	-0.11	-0.20
		(0.35)	(0.61)	(0.44)
EU Accession		-1.01***	-5.49***	-4.75**
		(0.00)	(0.00)	(0.01)
Real GDP Growth		0.14	-0.10	-0.11
		(0.23)	(0.46)	(0.53)
Inflation		-0.45**	-0.54***	-0.31*
		(0.03)	(0.01)	(0.05)
lag. Real GDP Growth		0.47***	0.32**	0.19
		(0.00)	(0.04)	(0.31)
lag. Inflation		0.49***	0.33**	0.51**
		(0.00)	(0.03)	(0.02)
Tobin's Q		4.20***	5.44***	5.44***
		(0.00)	(0.00)	(0.00)
EBITDA/AT		-18.70***	-3.03	-5.06
		(0.00)	(0.49)	(0.29)
Market Lev.		-10.61***	-48.83***	-53.44***
		(0.00)	(0.00)	(0.00)
Collateral/AT		0.20	1.11	-0.39
		(0.88)	(0.48)	(0.81)
Cash/AT		-6.97***	-15.56***	-17.19***
		(0.00)	(0.00)	(0.00)
Sales Gr.		2.83***	0.50	0.64**
		(0.00)	(0.13)	(0.05)
ln(USD MCAP)		-0.38**	-3.41***	-4.02***
		(0.04)	(0.00)	(0.00)
Adj. R^2	0.02	0.10	0.20	0.19
N	40,371	40,371	40,371	40,371
Firm FE	No	No	Yes	Yes
Year FE	Yes	Yes	Yes	Absorbed
Year × Ind. × Region FE	No	No	No	Yes
Cluster	Country	Country	Country	Country

Table 5: Real Effects - The Use of the Additional Financing

This table documents the relationship between regulatory integration of international capital markets and real outcomes. The dependent variable in column 1 is firm size, measured with the logarithm of total assets. The dependent variable in column 2 is the investment rate, which is contemporaneous capital expenditures over total assets in the previous year. The dependent variable in column 3 is the logarithm of the number of employees of a company. The regulatory integration index is illustrated in Figure 1. All control variables from Table 4 are included but not displayed. Firm FE refers to firm fixed effects. Year × Ind. × Region FE refers to fixed effects for the interaction of years, 3-digit SIC code industries, and the 4 European regions described in Table 1. Standard errors are clustered at the country level. P-values are reported in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

	(1) log(Assets)	(2) Investment Rate	(3) log(Employees)
Regulatory Integration	5.87***	0.61***	4.07**
	(0.00)	(0.00)	(0.02)
Adj. R^2	0.95	0.43	0.93
N	40,371	40,371	39,508
Firm FE	Yes	Yes	Yes
Year × Ind. × Region FE	Yes	Yes	Yes
Cluster	Country	Country	Country
Controls	Yes	Yes	Yes

Table 6: Identification - Endogeneity in Timing of Implementation of Laws

This table documents the relationship between regulatory integration of international capital markets and net external finance, using different indexes of regulatory integration. The dependent variable is net external finance. The index of regulatory integration in columns 1 and 3 is the regulatory integration takeout index, which is illustrated in Figure 3. The index of regulatory integration in column 2 is the regulatory integration index, which is illustrated in Figure 1. The index of regulatory integration in column 4 is the regulatory integration takeout big 4 index, which is illustrated in Figure 4. In columns 2 to 4, firms from the four large countries France, Germany, Italy and the United Kingdom are excluded from the sample (see Table 1). All control variables from Table 4 are included but not displayed. Firm FE refers to firm fixed effects. Year × Ind. × Region FE refers to fixed effects for the interaction of years, 3-digit SIC code industries, and the 4 European regions described in Table 1. Standard errors are clustered at the country level. P-values are reported in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

	(1)	(2)	(3)	(4)
		Net External Finance		
Regulatory Integration		2.54***		
		(0.00)		
Regulatory Integration Takeout	1.83***		2.98***	
	(0.00)		(0.00)	
Regulatory Integration Takeout Big 4				3.24***
				(0.00)
Adj. R^2	0.19	0.15	0.15	0.15
N	40,371	13,673	13,673	13,673
Firm FE	Yes	Yes	Yes	Yes
Year × Ind. × Region FE	Yes	Yes	Yes	Yes
Cluster	Country	Country	Country	Country
Controls	Yes	Yes	Yes	Yes
Sample	All	No Big 4	No Big 4	No Big 4

Table 7: Identification - Macro Shocks and Trends - External Finance Dependence

This table documents the relationship between regulatory integration of international capital markets and net external finance, while accounting for differences in external finance dependence across industries. The dependent variable is net external finance. Two measures of regulatory integration are used. The first measure of regulatory integration is the regulatory integration index, which is illustrated in Figure 1. A proxy for external finance dependence following Rajan and Zingales (1998) is constructed. This proxy is standardized so that its values are between 0 and 1. The second measure of regulatory integration is the interaction of the regulatory integration index and the proxy for external finance dependence. All control variables from Table 4 are included but not displayed. Firm FE refers to firm fixed effects. Year FE refers to year fixed effects. Year × Ind. × Region FE refers to fixed effects for the interaction of years, 3-digit SIC code industries, and the 4 European regions described in Table 1. Year × Country FE refers to fixed effects for the interaction of years and countries. Standard errors are clustered at the country level. P-values are reported in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

	(1)	(2)	(3)
	Net External Finance		
Regulatory Integration	1.14***	0.56	
	(0.00)	(0.30)	
Regulatory Integration × External Finance Dependence	0.98**	3.08***	0.88**
	(0.03)	(0.00)	(0.04)
Adj. R^2	0.20	0.19	0.21
N	39,977	39,977	39,977
Firm FE	Yes	Yes	Yes
Year FE	Yes	Absorbed	Absorbed
Year × Ind. × Region FE	No	Yes	Absorbed
Year × Country FE	No	No	Yes
Cluster	Country	Country	Country
Firm Controls	Yes	Yes	Yes
Macro Controls	Yes	Yes	Absorbed

Table 8: Channel - Net Debt Issues and Net Equity Issues

This table documents the relationship between regulatory integration of international capital markets, and net debt issues and net equity issues. The dependent variables are net debt issues and net equity issues, which are defined in Table 2. The regulatory integration index is illustrated in Figure 1. All control variables from Table 4 are included but not displayed. Firm FE refers to firm fixed effects. Year × Ind. × Region FE refers to fixed effects for the interaction of years, 3-digit SIC code industries, and the 4 European regions described in Table 1. Standard errors are clustered at the country level. P-values are reported in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

	(1)	(2)
	Net Debt Issues	Net Equity Issues
Regulatory Integration	1.26***	0.57***
	(0.00)	(0.00)
Adj. R^2	0.15	0.20
N	40,371	40,371
Firm FE	Yes	Yes
Year × Ind. × Region FE	Yes	Yes
Cluster	Country	Country
Controls	Yes	Yes

Table 9: Channel - General Regulatory Quality

This table documents the relationship between regulatory integration of international capital markets and net external finance, while accounting for the general regulatory quality of a country. The dependent variable is net external finance. The regulatory integration index is illustrated in Figure 1. I employ a proxy for the general regulatory quality used by Christensen, Leuz, and Hail (2016), "which captures the government's ability to formulate and implement sound policies and regulations that permit and promote private sector development". A value of one for this dummy variable indicates that a country has a higher general quality of regulations. I interact this proxy of the general regulatory environment with the regulatory integration index. All control variables from Table 4 are included but not displayed. Firm FE refers to firm fixed effects. Year × Ind. × Region FE refers to fixed effects for the interaction of years, 3-digit SIC code industries, and the 4 European regions described in Table 1. Standard errors are clustered at the country level. P-values are reported in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

	Net External Finance
Regulatory Integration	1.85***
	(0.00)
Regulatory Integration x Prior Regulation	0.40*
	(0.06)
Adj. R^2	0.19
N	40,371
Firm FE	Yes
Year × Ind. × Region FE	Yes
Cluster	Country
Controls	Yes

Table 10: Channel - Firm Size

This table documents cross-sectional differences in the effect of regulatory integration of international capital markets on external financing of companies that differ in firm size. The dependent variable is net external finance. The regulatory integration index is illustrated in Figure 1. Three dummy variables are used to proxy for firm size. Each of these dummy variables takes on the value of one, if a firm belongs to the smallest 50% of publicly listed firms in a given country in the prior year. The three proxies for firm size are stock market capitalization (abbreviated as Mcap), total book values of assets (abbreviated as Assets) and sales. The three resulting dummy variables are interacted with the regulatory integration index. All control variables from Table 4 are included but not displayed. Firm FE refers to firm fixed effects. Year × Ind. × Region FE refers to fixed effects for the interaction of years, 3-digit SIC code industries, and the 4 European regions described in Table 1. Standard errors are clustered at the country level. P-values are reported in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

	(1)	(2)	(3)
	Net External Finance		
Regulatory Integration	2.39***	2.42***	2.37***
	(0.00)	(0.00)	(0.00)
Regulatory Integration × Small (Mcap)	-0.66**		
	(0.01)		
Regulatory Integration × Small (Assets)		-0.63**	
		(0.03)	
Regulatory Integration × Small (Sales)			-0.55**
			(0.04)
Adj. R^2	0.19	0.19	0.19
N	40,371	40,371	40,371
Firm FE	Yes	Yes	Yes
Year × Ind. × Region FE	Yes	Yes	Yes
Cluster	Country	Country	Country
Controls	Yes	Yes	Yes

Table 11: Channel - Change in Sample Composition through Entry or Exit

This table documents the analysis of potential changes in the sample composition of publicly listed companies through entry or exit. The dependent variable in columns 1 and 2 is the entry rate, defined as the number of initial public offerings (IPOs) in a country in a given year, divided by the number of publicly listed companies in the same country in the prior year. The dependent variable in columns 3 and 4 is the exit rate, defined as the number of delistings in a country in a given year, divided by the number of publicly listed companies in the same country in the prior year. The dependent variable in columns 5 and 6 is the net entry rate, which is the difference between the entry rate and the exit rate in a country in a given year. The regulatory integration index is illustrated in Figure 1. All macroeconomic control variables from Table 4 are included but not displayed. In columns 2, 4 and 6, I additionally control for determinants of IPO activity identified by the IPO literature: The stock market return in a country, the stock price volatility in a country, and the Tobin's Q of the stocks in a country. Country FE refers to country fixed effects. Year × Region FE refers to fixed effects for the interaction of years and 4 European regions described in Table 1. Standard errors are clustered at the country level. P-values are reported in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Entry Rate		Exit Rate		Net Entry Rate	
Regulatory Integration	0.15	-0.12	-0.04	-0.06	0.19	-0.05
	(0.52)	(0.54)	(0.86)	(0.82)	(0.60)	(0.89)
Adj. R^2	0.26	0.47	0.35	0.35	0.35	0.45
N	325	325	325	325	325	325
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year × Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Country	Country	Country	Country	Country	Country
Macro controls	Yes	Yes	Yes	Yes	Yes	Yes
Stock Market Controls	No	Yes	No	Yes	No	Yes

Table 12: Heterogeneous Effects - Euro Countries and Southern Europe

This table documents cross-sectional differences in the effect of regulatory integration of international capital markets on external financing across different countries and European regions. The dependent variable is net external finance. The regulatory integration index is illustrated in Figure 1. The regulatory integration index is interacted with geographic variables. Euro denotes the euro currency countries. South indicates the four Southern European countries in my sample: Portugal, Italy, Greece and Spain. Euro Not South stands for the euro currency countries, with the exception of the four Southern European countries. All control variables from Table 4 are included but not displayed. Firm FE refers to firm fixed effects. Year FE refers to year fixed effects. Standard errors are clustered at the country level. P-values are reported in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	Net External Finance			
Regulatory Integration	1.38***	1.62***	1.56***	1.48***
	(0.00)	(0.00)	(0.00)	(0.00)
Regulatory Integration × Euro	0.58**			
	(0.03)			
Regulatory Integration × South		1.53***		1.69***
		(0.00)		(0.00)
Regulatory Integration × Euro Not South				0.31
				(0.26)
Regulatory Integration × Portugal			1.19***	
			(0.00)	
Regulatory Integration × Italy			0.85***	
			(0.00)	
Regulatory Integration × Greece			2.13***	
			(0.00)	
Regulatory Integration × Spain			1.25***	
			(0.00)	
Adj. R^2	0.20	0.20	0.20	0.20
N	40,371	40,371	40,371	40,371
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Cluster	Country	Country	Country	Country
Controls	Yes	Yes	Yes	Yes

Table 13: Heterogeneous Effects - European Regions and Large Countries

This table documents cross-sectional differences in the effect of regulatory integration of international capital markets on external financing across different countries and European regions. The dependent variable is net external finance. The regulatory integration index is illustrated in Figure 1. The regulatory integration index is interacted with the European regions defined in Table 1. All control variables from Table 4 are included but not displayed. Firm FE refers to firm fixed effects. Year FE refers to year fixed effects. Standard errors are clustered at the country level. P-values are reported in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

	(1)	(2)
	Net External Finance	
Regulatory Integration North	1.55***	
	(0.00)	
Regulatory Integration West	1.73***	
	(0.00)	
Regulatory Integration South	3.18***	
	(0.00)	
Regulatory Integration East	2.37*	
	(0.07)	
Regulatory Integration		1.97***
		(0.00)
Regulatory Integration × France		-0.43
		(0.20)
Regulatory Integration × Germany		-0.14
		(0.73)
Regulatory Integration × Italy		0.44
		(0.21)
Regulatory Integration × UK		-0.43
		(0.18)
Adj. R^2	0.20	0.20
N	40,371	40,371
Year FE	Yes	Yes
Firm FE	Yes	Yes
Cluster	Country	Country
Controls	Yes	Yes