

Capital Markets Union and Beyond

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Franklin Allen, Ester Faia, Michael Haliassos,
and Katja Langenbucher

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Foreword

In June 2015 the European Commission issued a plan titled “Completing Europe’s Economic and Monetary Integration.” The steps devised for the future development of the union foretold the creation of a financial union that included both banking and a capital market union, followed by further integration in the labor market and in the social security system, leading toward a fiscal union. The document came after years of turbulence due to the worldwide financial crisis, the euro area sovereign debt crisis, and the political tensions fostering populist movements across Europe. This document, which came fifteen years after the creation of the euro, shows not only the determination in carrying through the integration process but perhaps also the desire to increase efficiency. The US monetary union began in 1788 with the ratification of the US Constitution. The first bank in the United States was chartered in 1791 as part of Alexander Hamilton’s plan to reorganize the finances of the government. The development of the banking union in the United States occurred over several years and throughout various banking and financial crises. The creation of a capital market union started only at the beginning of the nineteenth century and developed faster in the second half of the century, hence taking several decades after the creation of the monetary union. The creation of the US monetary union suffered from several costs, including a civil war, but it’s largely indicated as a successful example.

The need for a capital markets union (CMU) in Europe goes beyond the historical necessities of advancing the integration process. In Europe, and contrary to Anglo-Saxon countries, firms had largely relied on the banking system. In many cases regulation prevented markets from exerting the discipline needed to contain externalities and to advance in the growth process. The advent of the 2007–2008 crisis had shown the limits of this architecture as credit supply fell, spreading the consequences of unwise investment policies to the real sector. Moreover for several decades academics have been debating about the possible distortion created by banking systems with large monopoly

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power, mostly for their limitation to fund innovative enterprises. The joint need of granting access to funding to citizens and firms of all European countries and of improving the efficiency and risk-sharing opportunities of the financial system at large elevated the capital market union among the priorities in the agenda of the policy makers.

This book collects contributions from academics in economics, finance, and law, as well as from policy makers and practitioners, and is aimed at fostering public debate on the design and implementation of the CMU. The four parts of the book are devoted, respectively, to the overall design challenges and background of CMU; the main targets, namely households and firms; the markets that will be involved in or directly influenced by CMU; and the role of the institutional framework in the success of CMU.

Part I describes the background to the introduction of CMU and defines key overall challenges that the design of CMU needs to meet. There is evidence that consumption risk sharing is weaker in Europe than in other advanced economies, providing fertile ground for greater openness in financial markets. Financial and economic integration have increased considerably since the introduction of the European Union, but they have not made considerable leaps following introduction of the euro. This is clearly suggested by differences in industry earnings yields among European countries from 1990 to 2016, and they are now further challenged by the fiscal and other crises faced by the Eurozone. Substantial margins with respect to financial market integration can be exploited through CMU, but this will require design breakthroughs in the economic and legal framework, well beyond the sectorial single rule book. There are interesting lessons to be learned from the origins of CMU in the United States, and these are reviewed here.

Part II describes specific opportunities and challenges for CMU to reach its target of transforming the potential of households for economic well-being and of firms for viability and profitability. Among those, perhaps the largest is the informational burden posed by the sheer scale of developments arising from a capital markets union. On the side of households, informational requirements need to be met in the face of financial illiteracy, lack of trust, and conflicts of interest in providing financial advice. With respect to firms, informational problems arise for both sides of the financing arrangement. Differential obstacles faced by core and periphery households and firms coping with the informational and other challenges of CMU should not be allowed to widen gaps in access to financing and investment opportunities. Indeed, the promotion of small and medium-sized enterprises (SMEs) is already acting as a catalyst for European capital markets law, as discussed in this part.

The role that markets, old and new, can play in the future success of CMU are studied in Part III. Developments in fintech, such as crowd funding, peer-to-peer lending, virtual funding, and online investment platforms are described and critically discussed from both an economic and a legal framework. As these markets are novel, regulation should proceed with care: it needs to be permissive so as to learn from the operation of the markets while standing ready to intervene if markets fail to protect consumers adequately. Traditional equity markets will continue to be important, especially given the large role they have already played in promoting growth of SMEs. Adequate supervisory oversight needs to be exercised for activities that are both systemic and demonstrably prone to crises, such as housing finance.

Part IV takes a close look at the state and design of institutions and governance of CMU. The role that loss of confidence played in generating the recent long-lasting recession in the European economy points to the importance of further risk reduction and risk sharing. Shadow banking will also pose significant challenges in view of interconnectedness. While not formally part of CMU, the banking system will likely undergo a transformation with a view to operating seamlessly across international borders. The political system can find in CMU a much-needed instrument for strengthening the Eurozone architecture and regaining confidence after its failure in preventing Brexit. Yet, there are choices to be made—for example, between insisting on ever more complex harmonizing rules and removing obstacles to company mobility across international borders and pan-European transactions.

The set of contributors include authors with various backgrounds and various nationalities that provide a critical view on the list of issues with the goal of informing policy makers and fostering research agendas.

This book was initially planned to go into print almost one year ago. It was delayed to monitor the events following the Brexit vote. This was unfortunate, not so much for the delay that made us think even more carefully about the issues at stake but because of the risk that the union might lose a nation that has been crucial to the creation of Europe and that could bring valuable expertise precisely on the design of financial systems (among other things). However, we have no doubt that CMU can proceed regardless of the United Kingdom's participation.

13 Equity Markets

Marina Brogi and Valentina Lagasio

In all official documentation, the capital markets union (CMU) is considered a key pillar in the European Commission's Investment Plan for Europe and an important part of the work on the completion of the European economic and monetary union.

Through the CMU, the European Commission aims to facilitate firms' financial funding by fostering investments and increasing financial integration in European capital markets.

While the banking union refers to the nineteen euro area countries, at its inception the CMU was envisaged for the twenty-eight members of the European Union (EU28).

This chapter offers insight into two key issues in the potential contribution of public stock markets to the financing of the EU economy as set out in the CMU action plan: (1) whether European stock markets over a long period of time have been a source of funding for listed companies and support small and medium-sized enterprise (SME) growth and (2) whether financing choices and listing decisions reflect company profitability, size, financing structure, and taxation by using a sample of listed firms.

Institutional Background and Related Literature

One of the key objectives of the CMU is to ensure that SMEs have diversified sources of funds and especially have access to public markets as a means to raise equity.

The *action plan* presented in September 2015 "set out the building blocks for putting a well-functioning and integrated Capital Markets Union, encompassing all EU28 member states into place *by 2019*" with an assessment of achievements and priorities in 2017. Equity markets are just one of the many different aspects addressed in the CMU action plan. It originally entailed thirty-three actions with an indicative timeline for achievement. A section is

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dedicated to “Making It Easier for Companies to Enter and Raise Capital on Public Markets” (European Commission n.d.), with three actions aimed at strengthening access to public markets regarding (1) the modernization of the Prospectus Directive (Q4 2015), (2) a review on regulatory barriers to SME admission on public markets and SME growth markets (2017), and (3) a review of EU corporate bond markets (2017). There is one action in the support equity financing work stream aimed at addressing the debt-equity bias, as part of the legislative proposal on Common Consolidated Corporate Tax Base (Q4 2016).

The *CMU Mid-Term Review* (European Commission 2017b), presented in June 2017, showed that twenty of the proposed actions had been achieved. As concerns equity markets, an agreement had been reached in December 2016 regarding the Prospectus Directive, and a proposal on the common consolidated corporate tax base had been adopted in October 2016.

Moreover, as envisioned in the original action plan, the *CMU Mid-Term Review* led to the division of this section into four work streams: (1) prospectuses for public offerings, (2) corporate bond markets, (3) SME listing package, and (4) proportionate listing requirements, and the identification of two further priority actions and two new actions, as noted in table 13.1.

Further progress was made after the *CMU Mid-Term Review*; in December 2017 the European Commission launched a public consultation on building a proportionate regulatory environment to support SME listing to end on February 26, 2018, and published a proposal for more proportionate and risk-sensitive rules for investment firms.

To analyze the contribution of public stock markets to the financing of the EU economy as set out in the CMU action plan, we first adopt an explorative analysis on a large sample of listed firms in the period from 2001 to 2017 and investigate capital markets characteristics throughout the world to assess whether European stock markets, over a long period of time, have been a source of funding for listed companies. Second, we run a logistic regression with the purpose of identifying whether financing choices and listing decisions reflect company profitability, size, financing structure, and taxation.

Methodology

Data

The sources of our data are SDC Platinum Software from Thomson Reuters’s Refinitiv (for market data) and Orbis’s Bureau Van Dijk (for financial statement and firm-level data).

Table 13.1

CMU legislative progress by the European Commission.

Making it easier for companies to enter and raise capital on public markets			
Prospectuses for public offerings	Implementing measures	Follow-up action (L2)	2018–2019
Corporate bond markets	Communication (road map) to propose possible follow-up	Follow-up action (C)	Q4 2017
SME listing package	Explore through an impact assessment whether targeted amendments to relevant EU legislation can deliver a more proportionate regulatory environment to support SME listings on public markets (priority action 2)	Priority action	Q2 2018
	Assessment of the impact of MiFID II level 2 rules on listed SME equity research	New action (NL)	Q1 2019
	Monitor progress on IASB commitment to improve disclosure, usability and accessibility of IFRS	Follow-up action (NL)	Ongoing
	Develop best practices on the use by member states of EU funds to partially finance costs borne by SMEs when seeking admission of their shares on the future SME growth markets	New action (NL)	Q2 2018
Proportionate prudential requirements	Legislative proposal to improve the proportionality of prudential rules for investment firms (priority action 3)	Priority action (L)	Q4 2017

Source: European Commission 2017a.*Note:* MiFID II refers to the Markets in Financial Instruments Directive II; IASB refers to the International Accounting Standards Board; and IFRS refers to International Financial Reporting Standards.

Using the SDC Platinum Software, we extracted the entire population of equity offerings data available on the platform from 2001. Data refers to offerings of the following instruments: common shares and saving shares. It includes initial public offerings (IPOs) and follow-ons of both primary offerings (capital increases) and secondary offerings (share sales). The geographic scope includes all stock exchanges in the world.

For each issue, we collect data on the principal amount (sum of all markets in millions of euros) that is the total principal amount of the entire transaction plus the overallotment amount. This figure represents all tranches of the transaction. For common stock issues, this figure is calculated by accumulating shares plus overallotment shares sold multiplied by the offer price for each tranche within the transaction.

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Using this type of query, we exclude from the final data set firms that did not issue equity, as defined above, in the period of market data extraction.

Under the covered period (January 1, 2001, to December 15, 2017) we found about 250,000 offerings by 85,286 companies in 159 countries, including certain cases of multiple offerings (more than one category of shares or more than one stock exchange) that raised over €13 trillion within the approximately seventeen-year period.

Data as described above are reported below and broken down by the continent in which the operation was based. Table 13.2 shows the geographic breakdown of capital raised, with indication of the countries in which more than €100,000 million was raised.

In order to identify the type of equity offering, the classification considers two categories: (1) IPOs and (2) follow-ons. IPOs represent on average 45% (median 38%) of total issues in terms of amount raised, ranging from a minimum of 0% of total capital raised (in Anguilla, Aruba, Bolivia, Bosnia, Costa Rica, Guam, Macedonia, Montenegro, Dutch Antilles, and Uruguay) to a maximum of 100% (in Angola, Belarus, Brunei, Burkina Faso, El Salvador, Iran, Kyrgyzstan, Libya, Malaysia, Maldives, Moldova, Mozambique, Namibia, Paraguay, Rwanda, and Somalia). The year 2009 had the lowest amount raised from IPOs. The average IPO size is €23,713 million and the median IPO size is €1,486 million.

Seasoned equity offerings raised just under €10 trillion in the period (with an average size of about €71 billion and a median size of €2 billion) and the year 2009 had the highest amount raised from follow-ons.

The geographical breakdown of the total amount raised during the observation period shows that 27% was raised in the United States, 16% in the EU27 (14% in the euro area), and 7% in the United Kingdom. Companies raised €3.5 trillion in the United States as compared to €2.1 trillion in EU27, with IPOs raising €698 billion euro in the United States, €419 billion in the EU27 (of which €360 million in the euro area), and almost €200 million in the United Kingdom. These numbers suggest the underdevelopment of equity markets in the EU, and especially in the euro area.

We ran the same query on the listed companies of Orbis's Bureau Van Dijk. In order to match market, accounting, and firm level data, we decide to exclude cases with missing International Securities Identification Numbers (ISINs).

In this way, we obtain a database with almost 33,000 observations of market operations by 11,834 listed companies from thirty-nine countries that raised approximately €4 trillion on public markets (see tables 13.3 and table 13.4, which respectively show the amount raised on the market and the number of transactions of the "ISIN sample").

In this sample, IPOs represent on average 30% (median 22%) as a fraction of total issues in terms of amount raised, ranging from a minimum of 0% of

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Table 13.2

Amount raised on the market (population).

Continent	Nation	Follow-on		IPOs		Total	
		thEuro	%	thEuro	%	thEuro	%
North America		3,243,613	33.55	823,106	24.44	4,066,719	31.19
Of which:	United States	2,775,528	28.70	697,645	20.72	3,473,172	26.64
	Canada	411,539	4.26	98,704	2.93	510,244	3.91
Europe		2,763,404	28.58	793,960	23.58	3,557,364	27.29
Of which:		736,611	7.62	196,816	5.84	933,427	7.16
Of which:	<i>United Kingdom</i>	<i>712,605</i>	<i>7.37</i>	<i>173,421</i>	<i>5.15</i>	<i>886,025</i>	<i>6.80</i>
EU19 (Euro area)		1,484,635	15.35	359,732	10.68	1,844,368	14.15
Of which:	<i>France</i>	<i>322,834</i>	<i>3.34</i>	<i>74,850</i>	<i>2.22</i>	<i>397,684</i>	<i>3.05</i>
	<i>Germany</i>	<i>312,236</i>	<i>3.23</i>	<i>65,250</i>	<i>1.94</i>	<i>377,486</i>	<i>2.90</i>
	<i>Italy</i>	<i>194,802</i>	<i>2.01</i>	<i>45,933</i>	<i>1.36</i>	<i>240,735</i>	<i>1.85</i>
	<i>Spain</i>	<i>170,456</i>	<i>1.76</i>	<i>66,178</i>	<i>1.97</i>	<i>236,634</i>	<i>1.82</i>
	<i>Netherlands</i>	<i>134,684</i>	<i>1.39</i>	<i>30,951</i>	<i>0.92</i>	<i>165,635</i>	<i>1.27</i>
Other EU27		166,163	1.72	58,664	1.74	224,827	1.72
Non-EU Europe		375,995	3.89	178,747	5.31	554,742	4.26
Of which:	<i>Russian Fed</i>	<i>104,471</i>	<i>1.08</i>	<i>74,869</i>	<i>2.22</i>	<i>179,340</i>	<i>1.38</i>
	<i>Switzerland</i>	<i>138,571</i>	<i>1.43</i>	<i>39,380</i>	<i>1.17</i>	<i>177,950</i>	<i>1.36</i>
Asia		2,654,240	27.45	1,478,462	43.91	4,132,702	31.70
Of which:	China	998,907	10.33	713,574	21.19	1,712,480	13.14
	Japan	383,289	3.96	129,801	3.85	513,091	3.94
	India	257,070	2.66	102,718	3.05	359,788	2.76
	Hong Kong	260,213	2.69	82,072	2.44	342,285	2.63
	South Korea	204,097	2.11	64,079	1.90	268,176	2.06
	Taiwan	134,833	1.39	21,540	0.64	156,373	1.20
Oceania		550,405	5.69	122,161	3.63	672,567	5.16
Of which:	Australia	532,430	5.51	112,922	3.35	645,352	4.95
South America		351,297	3.63	114,897	3.41	466,194	3.58
Of which:	Brazil	201,162	2.08	72,828	2.16	273,990	2.10
Africa		106,469	1.10	34,691	1.03	141,160	1.08
Total		9,669,429	100.00	3,367,277	100.00	13,036,705	100.00

Source: Authors' own calculations.

Note: EU19 = Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia, and Spain; EU27 = Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, and Sweden.

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total capital raised in Belize, Malta, Tanzania, and Thailand to a maximum of 100% in Egypt, Mauritius, and Slovakia. Sixty percent of IPO companies were SMEs (defined according to the EU classification).¹

To investigate the relation between equity issuing, company characteristics, and growth, we gathered from Bureau Van Dijk's accounting data (revenues, number of employees, total shareholders' equity [TSE], total assets [TA], income before tax, taxes, net income, and return on assets [ROA]) and populate a panel data set with more than 100,000 observations.

Model

We considered IPOs as a binary outcome dependent variable and use a logit regression model. Hence, the dependent variable takes on two values: 0 and 1.

$$Y = f(x) = \text{IPO} = \begin{cases} 0, & \text{if no} \\ 1, & \text{if yes} \end{cases}$$

Binary outcome models estimate the probability that $y = 1$ as a function of the independent variables.

$$p = \text{pr}[y = 1 | x] = F(x'\beta)$$

The regression model adopted depend on the functional form of $F(x'\beta)$, where x' is the column vector of the values for the independent variables (see table 13.5) and β is the maximum likelihood estimates of the regression coefficients.

In the logit model, $F(x'\beta)$ is the cumulative distribution function of the logistic distribution. Hence:

$$F(x'\beta) = \Lambda(x'\beta) = \frac{e^{x'\beta}}{1 + e^{x'\beta}} = \frac{\exp(x'\beta)}{1 + \exp(x'\beta)},$$

where the model is estimated using the maximum likelihood method and the predicted probabilities are limited between 0 and 1.

Running the analysis, a relevant issue emerges: we are investigating rare events, since the portion of "ones" of the dependent variable IPO is thirty-three times fewer than "zero" (i.e., non-IPO observation). Thus, a logistic regression can sharply underestimate the probability of rare events.

Following King and Zeng (2001), we apply a prior correction to address this issue and obtain a balanced sample (where the portion of ones is equal to 50%). The sampling correction is randomly generated, in order to generate subsamples with the whole population of IPOs = 1 observation—gathered from the initial sample—and an equal number of randomly chosen IPO observations = 0. We check for the robustness of this subsampling method and compare

Table 13.3

Amount raised on the market (ISIN sample).

Continent	Nation	Follow-on		IPOs		Total	
		thEuro	%	thEuro	%	thEuro	%
North America		1,147,444	35	238,661	34	1,386,105	35
Of which:	United States	1,085,248	33	234,572	33	1,319,820	33
	Canada	62,196	2	4,089	1	66,285	2
Europe		1,575,708	48	359,992	51	1,935,699	49
Of which: UK		421,053	13	94,630	13	515,683	13
Of which:	<i>UK</i>	404,026	12	78,499	11	482,525	12
	<i>Jersey</i>	7,389	0	14,184	2	21,573	1
	<i>Guernsey</i>	7,562	0	1,330	0	8,892	0
	<i>Isle of Man</i>	2,074	0	590	0	2,665	0
	<i>Falkland Is</i>	2	0	26	0	28	0
EU19 (EA)		915,584	28	195,248	28	1,110,833	28
Of which:	<i>France</i>	231,887	7	42,677	6	274,565	7
	<i>Germany</i>	233,986	7	38,227	5	272,214	7
	<i>Italy</i>	83,148	3	23,076	3	106,224	3
	<i>Spain</i>	107,328	3	27,142	4	134,469	3
	<i>Netherlands</i>	105,731	3	24,406	3	130,137	3
	<i>Belgium</i>	19,906	1	7,521	1	27,427	1
	<i>Finland</i>	20,258	1	4,354	1	24,612	1
	<i>Ireland</i>	30,483	1	7,581	1	38,064	1
	<i>Austria</i>	36,841	1	5,817	1	42,659	1
	<i>Luxembourg</i>	12,864	0	10,993	2	23,857	1
	<i>Greece</i>	15,532	0	258	0	15,790	0
	<i>Portugal</i>	17,055	1	2,409	0	19,464	0
	<i>Estonia</i>	102	0	304	0	406	0
	<i>Slovenia</i>	463	0	460	0	923	0
	<i>Slovakia</i>		0	23	0	23	0
Other EU27		108,895	3	36,470	5	145,365	4
Of which:	<i>Sweden</i>	57,217	2	15,096	2	72,313	2
	<i>Poland</i>	20,342	1	13,592	2	33,934	1
	<i>Denmark</i>	28,898	1	6,405	1	35,303	1
	<i>Hungary</i>	710	0	349	0	1,060	0
	<i>Faroe Islands</i>	229	0	331	0	559	0
	<i>Czech Republic</i>	1,499	0	698	0	2,197	0
Non-EU Europe		130,175	4	33,643	5	163,818	4
Of which:	<i>Norway</i>	33,751	1	13,763	2	47,514	1
	<i>Turkey</i>	23,760	1	9,335	1	33,096	1
	<i>Switzerland</i>	70,723	2	10,490	1	81,214	2
	<i>Iceland</i>	1,940	0	55	0	1,995	0

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Table 13.3 (continued)

Continent	Nation	Follow-on		IPOs		Total	
		thEuro	%	thEuro	%	thEuro	%
Asia		307,278	9	82,704	12	389,982	10
Of which:	Japan	260,983	8	73,421	10	334,404	8
	Korea	36,275	1	5,228	1	41,504	1
	Israel	10,020	0	4,054	1	14,074	0
Oceania		221,934	7	14,399	2	236,333	6
Of which:	Australia	216,465	7	12,157	2	228,622	6
	New Zealand	5,468	0	2,242	0	7,710	0
South America		32,575	1	8,327	1	40,902	1
Of which:	Chile	17,685	1	850	0	18,535	0
	Mexico	13,861	0	7,092	1	20,952	1
	Puerto Rico	1,029	0	386	0	1,414	0
Total		3,284,938	100	704,083	100	3,989,021	100

Source: Authors' own calculations.

descriptive statistics of the generated subsamples, in order to assess the viability of our estimation.

Table 13.6 shows the frequency and percentage of IPOs in the unbalanced sample. IPOs are rare events since the percentage of IPOs in the sample is equal to 3.13% (with 3,466 observations that assume the value of IPO = 1) versus a percentage of non-IPO observation that is 96.87% (106,643).

Tables 13.7 and 13.8 report the output that are respectively the logistic regression coefficients and the average marginal effects² (computed with the Delta method). An increase in each independent variable increases/decreases the likelihood that IPO = 1 (makes that outcome more/less likely). In particular, an increase in TA, revenues, employees, and tax makes the outcome of 1 less likely; and vice versa, an increase in TSE and ROA makes the outcome of 1 more likely. This confirms that IPO companies are smaller than those that carry out seasoned equity offerings and that companies that raise capital on public markets subsequently grow.

Lastly, we compute the predict probability for each observation (table 13.9), that is:

$$\hat{p} = \text{pr}[y = 1|x] = F(x'\hat{\beta})$$

The table shows the consistency of the results, since the predicted probability (which indicates the likelihood of $y = 1$) of an IPO is on average very close to the one included in our sample (0.032931 is the estimation vs. 0.0313019 that is the original average computed on the sample).

Table 13.4

Amount raised on the market (ISIN sample, number of transactions).

Continent	Nation	Follow-on		IPOs		Total	
		N	%	N	%	N	%
North America		7,905	29	1,236	24	9,141	28
Of which:	United States	7,401	27	1,213	23	8,614	26
	Canada	504	2	23	0	527	2
Europe		11,256	41	2,275	44	13,531	41
Of which: UK		4,839	17	749	15	5,588	17
Of which:	<i>United Kingdom</i>	4,641	17	692	13	5,333	16
	<i>Jersey</i>	91	0	32	1	123	0
	<i>Guernsey</i>	67	0	16	0	83	0
	<i>Isle of Man</i>	39	0	8	0	47	0
	<i>Falkland Is</i>	1	0	1	0	2	0
EU19 (Euro Area)		3,631	13	887	17	4,518	14
Of which:	<i>France</i>	1,049	4	315	6	1,364	4
	<i>Germany</i>	920	3	161	3	1,081	3
	<i>Italy</i>	289	1	114	2	403	1
	<i>Spain</i>	302	1	49	1	351	1
	<i>Netherlands</i>	262	1	58	1	320	1
	<i>Belgium</i>	172	1	47	1	219	1
	<i>Finland</i>	162	1	38	1	200	1
	<i>Ireland</i>	162	1	23	0	185	1
	<i>Austria</i>	107	0	21	0	128	0
	<i>Luxembourg</i>	67	0	34	1	101	0
	<i>Greece</i>	72	0	11	0	83	0
	<i>Portugal</i>	58	0	6	0	64	0
	<i>Estonia</i>	4	0	7	0	11	0
	<i>Slovenia</i>	5	0	2	0	7	0
	<i>Slovakia</i>		0	1	0	1	0
Other EU27		1,806	7	398	8	2,204	7
Of which:	<i>Sweden</i>	1,109	4	144	3	1,253	4
	<i>Poland</i>	509	2	209	4	718	2
	<i>Denmark</i>	176	1	33	1	209	1
	<i>Hungary</i>	4	0	5	0	9	0
	<i>Faroe Islands</i>	4	0	4	0	8	0
	<i>Czech Republic</i>	4	0	3	0	7	0
Non-EU Europe		980	4	241	5	1,221	4
Of which:	<i>Norway</i>	500	2	87	2	587	2
	<i>Turkey</i>	259	1	109	2	368	1
	<i>Switzerland</i>	212	1	44	1	256	1
	<i>Iceland</i>	9	0	1	0	10	0

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Table 13.4 (continued)

Continent	Nation	Follow-on		IPOs		Total	
		N	%	N	%	N	%
Asia		4,013	15	1,428	28	5,441	17
Of which:	Japan	2,621	9	1,205	23	3,826	12
	Korea	1,125	4	167	3	1,292	4
	Israel	267	1	56	1	323	1
Oceania		4,318	16	196	4	4,514	14
Of which:	Australia	4,179	15	180	3	4,359	13
	New Zealand	139	1	16	0	155	0
South America		174	1	29	1	203	1
Of which:	Chile	101	0	7	0	108	0
	Mexico	66	0	21	0	87	0
	Puerto Rico	7	0	1	0	8	0
Total		27,666	100	5,164	100	32,830	100

Source: Authors' own calculations.

Table 13.5

Descriptive statistics of dependent and independent variables.

Variable	Obs	Mean	Standard Deviation	Min	Max
IPO	110,089	.0313019	.1741333	0	1
TA	110,089	6.58e+10	1.01e+12	-1	9.30e+13
Revenues	110,089	5.48e+10	1.04e+12	-373,452	1.21e+14
Employees	110,088	215,4561	1.06e+07	0	9.99e+07
TSE	110,089	1.89e+10	2.41e+11	-4.12e+11	1.81e+13
ROA	110,089	-549,798.4	6,295,996	-1.00e+08	9.17e+07
Tax	110,089	1,210,760	1.87e+07	-1.99e+08	2.14e+09

Source: Authors' own calculations.

Table 13.6

Frequency and percentage of IPOs, unbalanced sample.

IPO	Frequency	Percent	Cumulative Percent
0	106,643	96.87	96.87
1	3,446	3.13	100.00
Total	110,089	100.00	

Source: Authors' own calculations.

Table 13.7
Logistic regression, coefficients.

IPO	Coefficient	Standard Error	z	$P > z $	[95% Conf. Interval]	
TA	$-2.50\text{e}-12$	$7.88\text{e}-13$	-3.17	0.002***	$-4.05\text{e}-12$	$-9.55\text{e}-13$
Revenues	$-5.73\text{e}-13$	$5.97\text{e}-13$	-0.96	0.337	$-1.74\text{e}-12$	$5.97\text{e}-13$
Employees	$-4.64\text{e}-9$	$1.86\text{e}-9$	-2.50	0.013**	$-8.29\text{e}-9$	$-9.99\text{e}-10$
TSE	$3.34\text{e}-12$	$1.19\text{e}-12$	2.80	0.005***	$1.00\text{e}-12$	$5.68\text{e}-12$
ROA	$1.55\text{e}-8$	$3.55\text{e}-9$	4.37	0.000***	$8.55\text{e}-9$	$2.25\text{e}-8$
Tax	$-2.27\text{e}-8$	$1.45\text{e}-8$	1.56	0.118	$-5.10\text{e}-8$	$5.73\text{e}-9$
cons	$-3.382.125$.017924	-188.69	0.000***	-341.726	$-3.346.993$

Source: Authors' own calculations.

Note: Number of obs = 110,088; LR $\chi^2(3) = 148.22$; Prob > $\chi^2 = 0.0000$; Log likelihood = -15,251.122; Pseudo R² = 0.0048.

Table 13.8
Logistic regression, average marginal effects (Delta method).

IPO	dy/dx	Standard Error	z	$P > z $	[95% Conf. Interval]	
TA	$-7.57\text{e}-14$	$2.39\text{e}-14$	-3.17	0.002***	$-1.23\text{e}-13$	$-2.89\text{e}-14$
Revenues	$-1.73\text{e}-14$	$1.81\text{e}-14$	-0.96	0.337	$-5.28\text{e}-14$	$1.81\text{e}-14$
Employees	$-1.41\text{e}-10$	$5.63\text{e}-11$	-2.50	0.013**	$-2.51\text{e}-10$	$3.02\text{e}-11$
TSE	$1.01\text{e}-13$	$3.62\text{e}-14$	2.79	0.005***	$3.02\text{e}-14$	$1.72\text{e}-13$
ROA	$4.70\text{e}-10$	$1.08\text{e}-10$	4.36	0.000***	$2.58\text{e}-10$	$6.81\text{e}-10$
TAX	$-6.86\text{e}-10$	$4.39\text{e}-10$	-1.56	0.118	$-1.55\text{e}-09$	$1.74\text{e}-10$

Source: Authors' own calculations.

Table 13.9 also shows the results in terms of suitability of the analysis. Running this model, we obtain that predicted variables are correct in almost 97% of cases. This very high value is obtained due to the bias that we outlined above.

Hence, we apply a prior correction to our sample and rerun the model (see tables 13.10–13.13). We find in table 13.11 the same relationship signs in the coefficients of the regression as in the balanced sample, but the estimation results are much more reliable since the proportion of IPOs in the sample is equal to 50%—that is, the same as non-IPO observations. Indeed, table 13.13 shows that the estimation of the dependent variable is likewise very close to the original IPO distribution (4.99 vs. 5), and prediction power (with a significance level of 0.5) shows that our estimation can correctly classify the dependent variable in almost the 70% of the cases. These results are consistent with those we obtained using numerous other randomly generated comparison samples.

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Table 13.9

Logistic regression, estimation results.

Variable	Observations	Mean	Standard Deviation	Min	Max
IPO	110,089	0.0313019	0.1741333	0	1
plogit	110,088	0.0312931	0.0053605	0	0.123395
True					
Classified	<i>D</i>		<i>~ D</i>	Total	
+	0		0	0	
–	3,445		106,643	110,088	
Total	3,445		106,643	110,088	
Classified + if predicted $\Pr(D) \geq 0.5$					
True <i>D</i> defined as IPO != 0					
Sensitivity			$\Pr(+ \mid D)$	0.00%	
Specificity			$\Pr(- \mid \sim D)$	100.00%	
Positive predictive value			$\Pr(D \mid +)$	–%	
Negative predictive value			$\Pr(\sim D \mid -)$	96.87%	
False+rate for true <i>~ D</i>			$-2.50 \Pr(+ \mid \sim D)$	0.00%	
False–rate for true <i>D</i>			$\Pr(- \mid D)$	100.00%	
False+rate for classified +			$\Pr(\sim D \mid +)$	–%	
False–rate for classified –			$\Pr(D \mid -)$	3.13%	
Correctly classified			96.87%		

Source: Authors' own calculations.**Table 13.10**

Frequency and percentage of IPOs, balanced sample.

IPO	Frequency	%	Cumulative %
0	3,446	50.00	50.00
1	3,446	50.00	100.00
Total	6,892	100.00	

Source: Authors' own calculations.**Table 13.11**

Logistic regression in balanced sample, coefficients.

IPO	Coefficient	Standard Error	<i>z</i>	<i>P</i> > <i>z</i>	[95% Conf. Interval]	
TA	–6.53e–12	3.13e–12	–2.08	0.037**	–1.27e–11	–3.89e–13
Revenues	–1.62e–8	4.05e–9	–4.01	0.000***	–2.42e–8	–8.30e–9
Employees	–3.08e–8	2.48e–9	–12.41	0.000***	–3.57e–8	–2.59e–8
TSE	1.35e–8	7.75e–9	1.74	0.081*	–1.68e–9	2.87e–8
ROA	3.77e–8	8.85e–9	4.25	0.000***	2.03e–8	5.50e–8
Tax	–6.77e–8	6.65e–8	–1.02	0.309	–1.98e–7	6.27e–8
cons	0.0421498	0.0269886	1.56	0.118	–0.0107468	0.0950464

Source: Authors' own calculations.

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Table 13.12

Logistic regression in balanced sample, average marginal effects (Delta method).

IPO	dy/dx	Standard Error	z	$P > z $	[95% Conf. Interval]	
TA	$-1.55e-12$	$7.42e-13$	-2.09	0.037**	$-3.00e-12$	$-9.41e-14$
Revenues	$-3.85e-9$	$9.58e-10$	-4.02	0.000***	$-5.73e-9$	$-1.98e-9$
Employees	$-7.31e-9$	$5.66e-10$	-12.91	0.000***	$-8.41e-9$	$-6.20e-9$
TSE	$3.20e-9$	$1.84e-9$	1.74	0.081*	$-3.95e-10$	$6.80e-9$
ROA	$8.93e-9$	$2.09e-9$	4.27	0.000***	$4.83e-9$	$1.30e-8$
Tax	$-1.61e-8$	$1.58e-8$	-1.02	0.309	$-4.70e-8$	$1.49e-8$

Source: Authors' own calculations.

Table 13.13

Logistic regression in balanced sample, estimation results.

Variable	Observations	Mean	Standard Deviation	Min	Max
IPO	6,892	0.5	0.5000363	0	1
plogit	6,891	0.4999274	0.1128982	0.003984	1
True					
Classified		D		$\sim D$	Total
+	3,273			2,168	5,441
-	172			1,278	1,450
Total	3,445			3,446	6,891
Classified + if predicted $\Pr(D) \geq 0.5$					
True D defined as IPO! = 0					
Sensitivity			$\Pr(+ D)$		95.01%
Specificity			$\Pr(- \sim D)$		37.09%
Positive predictive value			$\Pr(D +)$		60.15%
Negative predictive value			$\Pr(\sim D -)$		88.14%
False+rate for true $\sim D$			$-2.50 \Pr(+ \sim D)$		62.91%
False—rate for true D			$\Pr(- D)$		4.99%
False+rate for classified +			$\Pr(\sim D +)$		39.85%
False—rate for classified -			$\Pr(D -)$		11.86%
Correctly classified			66.04%		

Source: Authors' own calculations.

Conclusions

One of the key objectives of the CMU is to ensure that European SMEs have access to public markets to raise equity, which in turn is key to support their growth (Brogi and Lagasio 2017). Our descriptive statistics of IPOs all over the world show considerably lower primary equity offerings on the public markets in the EU27 (and even more so in the euro area) compared to the United States. This confirms the need for a CMU, an even more important imperative considering the exit from the EU of the most active public market in Europe.

Our investigation shows that in IPOs all over the world there is a large portion of SMEs and that, by going public and raising equity on the market, listed SMEs tend to grow.

The results of the logistic regression analysis show that equity and profitability increase the probability of going public, with a high level of significance. This is consistent with Pagano, Panetta, and Zingales (1998), who find that “IPOs ... tend to involve companies that before the IPO grew faster and were more profitable” (p. 29). Conversely, taxation is negatively related to the probability of going public, even though this result is not statistically significant.

More analyses could be conducted on this sample, and in particular, on the growth patterns of SMEs once they are listed. From this standpoint it would be useful to verify if there is a path that starts from a listing on a specialized SME market (a growth multilateral trading facility) and moves on to the full-fledged stock market. If this is not the case, the creation of specialized SME growth markets might represent a further source of fragmentation.

Future research could also investigate the net amount raised on the markets by also considering the flows from the companies to their shareholders (through dividends or buybacks) as in Doidge et al. (2018).

Notes

1. “The category of micro, small and medium-sized enterprises (SMEs) is made up of enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding 50 million euro, and/or an annual balance sheet total not exceeding 43 million euro.” Extract of Article 2 of the Annex of Recommendation 2003/361/EC in European Commission (2011).
2. The marginal effects reflect the change of the probability of $y=1$ given a 1 unit change in an independent variable.

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