CNMV BULLETIN
Quarter IV
2022

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Contents

Initials and acronyms

AA. PP.	Public administration service
ABS	Asset-Backed Security
AIAF	Spanish Market in Fixed-income Securities
AIF	Alternative Investment Fund
ANCV	Spanish National Securities Numbering Agency
APA	Approved Publication Arrangement
APR	Annual Percentage Rate
ASCRI	Spanish Venture Capital & Private Equity Association
AV	Broker
BIS	Bank For International Settlements
BME	Spanish Stock Markets and Financial Systems
CADE	Public Debt Book-entry Trading System
CC. AA.	Autonomous regions
CCP	Central Counterparty
CDS	Credit Default Swap
CFA	Atypical financial contract
CFD	Contract for Differences
CIS	Collective Investment Company/Collective Investment Scheme
CISMC	CIS Management Company
CNMV	(Spanish) National Securities Market Commission
CP	Crowdfunding Platforms
CS	Customer Service
CSD	Central Securities Depository
CSRD	Central Securities Depositories Regulation
CTP	Consolidated Tape Provider
DLT	Distributed Ledger Technology
EAF	Financial advisory firm
EBA	European Banking Authority
EBITDA	Earnings Before Interest, Taxes, Depreciation and Amortisation
EC	European Commission
ECA	Credit and savings institution
ECB	European Central Bank
ECR	Venture capital firm
EFAMA	European Fund and Asset Management Association
EFSM	European Financial Stabilisation Mechanism
EICC	Closed-ended collective investment company
EIOPA	Occupational Pensions Authority
EIP	Public interest entity
EMIR	European Market Infrastructure Regulation
EMU	Economic and Monetary Union
ESEF	European Single Electronic Format
ESFS	European System of Financial Supervision
ESG	Environment, Social and Governance
ESMA	European Securities and Markets Authority
ESRB	European Systemic Risk Board

ETF	Exchange Traded Fund
EU	European Union
EUSEF	European Social Entrepreneurship Fund
FICC	Closed-ended collective investment fund
FII	Real estate investment fund
FIN-NET	Financial Dispute Resolution Network
FINTECH	Financial Technology
FOGAIN	Investment Guarantee Fund
FRA	Forward Rate Agreement
FROB	Fund for Orderly Bank Restructuring
FSB	Financial Stability Board
FTA	Asset securitisation fund
FTH	Mortgage Securitisation Fund
GDP	Gross Domestic Product
HF	Hedge Fund
HFT	High Frequency Trading
IAGC	Annual corporate governance report
IARC	Annual report on director remuneration
IAS	International Accounting Standards
ICO	Initial Coin Offering
IF	Investment Firm / Investment Fund
IFRS	International Financial Reporting Standards
IIMV	Ibero-American Securities Market Institute
IMF	International Monetary Fund
IOSCO	International Organization of Securities Commissions
IPO	Initial Public Offering (for sale/subscription of securities)
IPP	Periodic public information
IRR	Internal Rate of Return
ISIN	International securities identification number
KIID/KID	Key Investor Information Document
LATIBEX	Market of Latin American Securities
LEI	Legal Entity Identifier
LIIC	Spanish Collective Investment Companies Act
LMV	Spanish Securities Market Act
MAB	Alternative Stock Market
MAD	Market Abuse Directive
MAR	Market Abuse Regulation
MARF	Alternative Fixed-Income Market
MBS	Mortgage-Backed Securities
MEFF	Spanish Financial Futures Market
MFP	Maximum Fee Prospectus
MiFID	Markets in Financial Instruments Directive
MiFIR	Markets in Financial Instruments Regulation
MOU	Memorandum of Understanding
MREL	Minimum Requirement for Own Funds and Eligible Liabilities
MTF	Multilateral Trading Facility
MTS	Market for Treasury Securities
NCA	National Competent Authority
NDP	National Domestic Product
OECD	Organisation for Economic Cooperation and Development
OIS	Overnight Indexed Swaps
OTC	Over The Counter
OTF	Organised Trading Facility
PER	Price-to-Earnings Ratio

PRIIP	Packaged Retail and Insurance Based Investment Product
PUI	Loan of last resort
RAROC	Risk-Adjusted Return On Capital
REIT	Real Estate Investment Trust
RENADE	Spanish National Registry for Greenhouse Gas Emission Allowances
RFQ	Request for Quote
RFR	Risk Free Rate
ROA	Return On Assets
ROE	Return On Equity
SAMMS	Advanced Secondary Market Tracking System
SAREB	Asset Management Company for Assets Arising from Bank Restructuring
SENAF	Electronic Trading Platform for Spanish Government Bonds
SEND	Electronic Debt Trading System
SEPBLAC	The Executive Service of the Commission for the Prevention of Money Laundering and Monetary Offences
SGC	Portfolio management company
SGECR	Venture capital firm management company
SGEIC	Closed-ended investment scheme management company
SGFT	Asset securitisation fund management company
SIBE	Electronic Spanish Stock Market Interconnection System (SIBE)
SICAV	Open-ended collective investment company
SICC	Closed-ended collective investment company
SII	Real estate investment company
SIL	Hedge fund with legal personality
SME	Small and Medium Enterprise
SOC	National Electronic Clearing System
SPV/SFV	Special purpose/financial vehicle
SRB	Single Resolution Board
SREP	Supervisory Review and Evaluation Process
STOR	Suspicious Transaction and Order Report
SV	Broker-dealer
T2S	Target2-Securities
TER	Total Expense Ratio
TOB	Takeover Bid
TRLMV	Recast Text of the Spanish Securities Market Act
TVR	Theoretical Value of the Right
UCITS	Undertaking for Collective Investment in Transferable Securities
VCF	Venture Capital Fund
XBRL	Extensible Business Reporting Language

I Market survey (*)

The evolution of national and international financial markets in 2022[1] was conditioned by the largest inflation shock in the last few decades, a shock which led to an abrupt and rapid turnaround in the monetary policy of the main economic areas and caused sharp reductions in growth expectations. Price growth, which had started in 2021 due to the evolution of energy prices and problems in some supply chains, received a new boost in the first months of 2022 when Russia's invasion of Ukraine began. The upswing in inflation rates, reaching levels above 10% in many economies for part of the year, led to a normalisation of monetary policy, which was faster and more intense in the United States and the United Kingdom. In the United States the increase in policy rates was 425 basis points (bp) in 2022, in the United Kingdom 325 bp[2] and in the euro area it was 250 bp. This substantial increase was not enough for rates to exceed the last maximums observed in 2007 and 2008, but it did bring with it a significant tightening of financing conditions for agents and a negative impact on the evolution of activity, which still was in the recovery phase after the consequences of the COVID-19 pandemic.

This environment, marked by unusually high levels of uncertainty, led to significant increases in the yields of fixed-income assets and price falls in most financial assets. Bond markets were affected by the monetary policy turnaround due to both increases in official interest rates and the end of central banks' asset purchase programmes. The yield on long-term public debt assets showed annual increases of between 2.3 and 3.5 percentage points (pp).[3] Risk premiums ended the year with a bullish balance, but the previous highs registered in the COVID-19 crisis were not reached. Equity markets experienced significant falls in prices, especially in US indices, and temporary upswings in volatility, as they gradually incorporated the deterioration in growth expectations. The reversals of the main international equity indices – except the UK's FT 100 – ranged from 5.1% to 33.1%.

The pace of monetary policy tightening, as mentioned above, was particularly intense in the United States and the United Kingdom. The Federal Reserve accumulated an increase of 4.25 pp in the whole of 2022 (in 7 increases), which placed the reference rate in the range of 4.25-4.50% (see Figure 1). For its part, the central bank of England, which had already begun this process of monetary normalisation in December 2021, increased its official interest rate 9 times since then, until it stood at 3.5% at the end of 2022. The ECB did not make any increase in its official interest rates until the end of July, and from then on it carried out 4 increases until it reached the interest rate of the main financing transactions, the marginal credit facility and the credit facility deposit at 2.50%, 2.75% and 2.00%, respectively. Although the increases were substantial throughout the year and in some specific decisions (with 75 bp), a slowdown in the rate of increases was observed in the final stretch of the year. In Japan, the central bank did not change official interest rates, but in the last days of December it announced a measure that was considered the first step in a turnaround in its monetary policy. The monetary authority indicated that it had decided to extend the fluctuation limits of the yield on the 10-year sovereign public debt bond from +/– 0.25% to +/– 0.50%.

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1   The closing date of this note is 31 December, except for the stress indicator which goes to 6 January.
2   The increase rises to 340 bp if the first increase made at the end of 2021 is considered.
3   Except in Japan, where it was 35 bp.

Official interest rates FIGURE 1
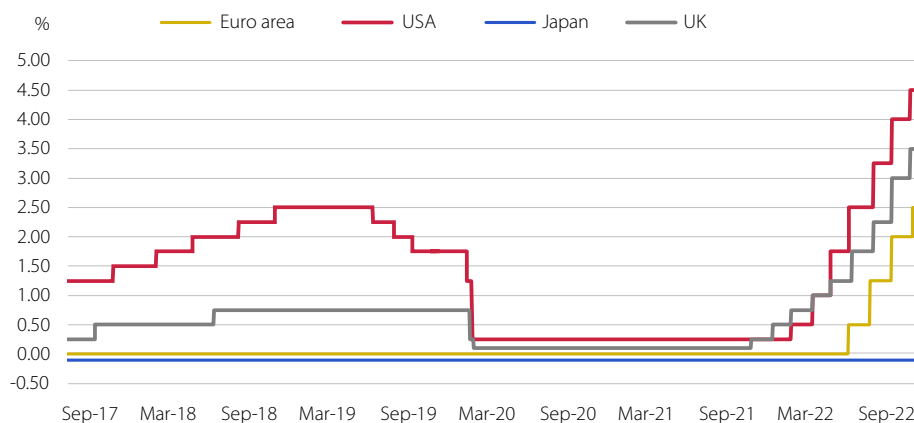
Source: Refinitiv Datastream. Data up to 30 December.

Short-term interest rates in the main advanced economies have maintained an upward trend since the beginning of last year, in line with the rate hikes carried out by central banks. In this context, a sharp increase in 3-month interest rates is observed with respect to 2021, especially during the third quarter of the year, in which the main rate rises were concentrated. In the United States, the annual increase in 3-month interest rates was 453 bp, standing at 4.74% in December (monthly average). In the United Kingdom it rose 362 bp up to 3.8% and in the euro area by 265 bp, ending the year at 2.07%. As a consequence of this evolution, the spread between the 3-month interest rates in the United States and in the euro area expanded from 71 bp on average in 2021 up to 216 bp in 2022.

In Spain, the variation in short-term interest rates was in line with the evolution observed in other countries in the euro area. In the case of public debt, the return on assets at 3, 6 and 12 months ended the year at 1.49%, 2.16% and 2.47% respectively (December average). These figures represent the abandonment of the negative terrain that was observed since the end of 2015, after producing increases that oscillated between 225 bp and 307 bp compared to the closing figures for 2021. The return on short-term private fixed-income assets, which did not start from negative values like that of public debt, also showed a notable increase in 2022, but less intense and concentrated in the 3-month term.[4]

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4   The decrease in the average yield of 6 and 12 month commercial paper in the last quarter of the year responds to the composition of the issuance sample in this period; in particular, the large number of issues by Banco Sabadell in December, an issuer whose interest rates are lower than the average rates for issuers in the third quarter.

Market survey

Short-term interest rates[1]

TABLE 1

%

	Dec-19	Dec-20	Dec-21	Dec-22	Mar-22	Jun-22	Sep-22	Dec-22
Euro area								
Official[2]	0.00	0.00	0.00	2.50	0.00	0.00	1.25	2.50
3-month	-0.40	-0.54	-0.58	2.07	-0.50	-0.24	1.01	2.07
6-month	-0.34	-0.52	-0.54	2.57	-0.42	0.16	1.60	2.57
12-month	-0.26	-0.50	-0.50	3.03	-0.24	0.85	2.23	3.03
United States								
Official[3]	1.75	0.25	0.25	4.50	0.50	1.75	3.25	4.50
3-month	1.91	0.23	0.21	4.74	0.84	1.97	3.45	4.74
6-month	1.90	0.26	0.31	5.16	1.21	2.59	4.00	5.16
12-month	1.97	0.34	0.52	5.47	1.73	3.32	4.52	5.47
United Kingdom								
Official	0.75	0.10	0.25	3.50	0.75	1.25	2.25	3.50
3-month	0.79	0.03	0.16	3.78	0.99	1.57	2.91	3.78
6-month	0.87	0.04	0.36	4.30	1.45	2.13	3.73	4.30
12-month	0.97	0.10	0.72	-	-	-	-	-
Japan								
Official[4]	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10
3-month	-0.06	-0.10	-0.08	-0.04	-0.01	-0.03	-0.02	-0.04
6-month	0.01	-0.06	-0.05	0.05	0.04	0.03	0.05	0.05
12-month	0.11	0.05	0.05	0.05	0.05	0.05	0.05	0.05

Source: Refinitiv Datastream.

1 Monthly average of daily data, except official rates, corresponding to the close of the period. Data up to 30 December.

2 Minimum bid rate at weekly auctions.

3 Federal funds rate.

4 Monetary policy rate.

Short-term interest rates[1]

TABLE 2

%

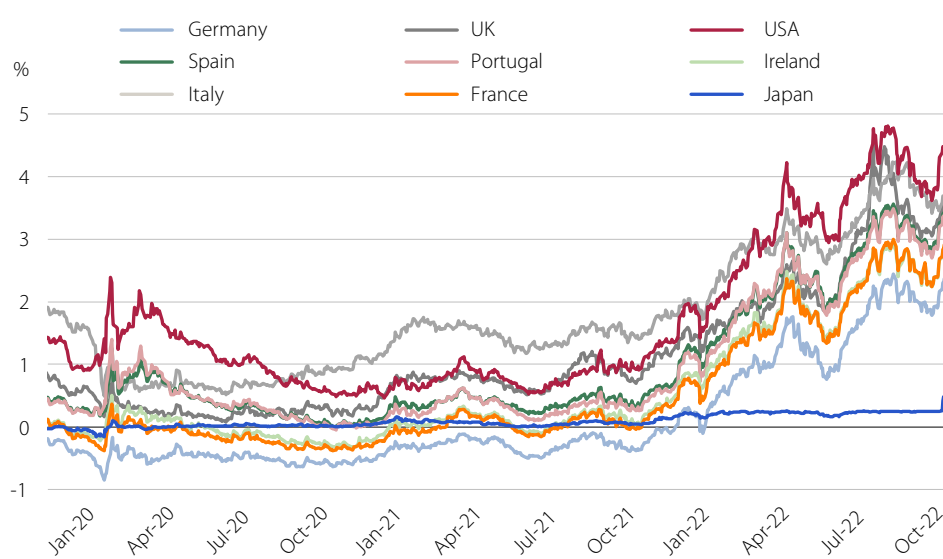|	Dec-19	Dec-20	Dec-21	Dec-22	Mar-22	Jun-22	Sep-22	Dec-22
Treasury bills								
3-month	-0.58	-0.70	-0.77	1.49	-0.66	-0.41	0.49	1.49
6-month	-0.47	-0.59	-0.63	2.16	-0.58	-0.02	0.96	2.16
12-month	-0.48	-0.63	-0.60	2.47	-0.48	0.56	1.60	2.47
Corporate commercial paper[2]								
3-month	0.20	0.49	0.38	2.27	0.21	0.32	0.71	2.27
6-month	0.52	0.55	0.50	0.98	0.45	0.65	1.71	0.98
12-month	0.71	1.44	0.81	1.46	0.68	0.83	2.83	1.46

Source: Refinitiv Datastream and CNMV.

1 Monthly average of daily data.

2 Issue interest rate.

Debt markets reacted to the described scenario with increases of more than 200 bp in the yields of long-term assets. In the United States, the yield on the 10-year sovereign bond increased by more than 230 bp throughout the year, reaching around 3.8% at its close, slightly below the values of over 4% reached in the course of the last quarter. These levels are the highest since 2008. In the United Kingdom the increase was 270 bp, to 3.67%, and in the euro area economies the increases ranged between 274 bp (Germany) and 350 bp (Italy). In Spain, the increase was 305 bp to 3.65%, the highest level since 2014. As a consequence of this upward trend, the level of long-term government bond yields in Europe, which was close to zero or negative in most economies, ended at values ranging from 2.56% for Germany and 4.69% from Italy (see Figure 2). In Japan, the sovereign bond yield ended the year slightly higher (from 0.25% to 0.42%) after the central bank eased its range.

10-year government bond yields   FIGURE 2

Source: Refinitiv Datastream. Data up to 30 December.

Medium- and long-term private fixed income yields[1]   TABLE 3

%

|	Dec-19	Dec-20	Dec-21	Dec-22	Mar-22	Jun-22	Sep-22	Dec-22
Public sector fixed income								
3 years	-0.29	-0.53	-0.46	2.54	0.20	1.58	2.05	2.54
5 year	-0.06	-0.42	-0.18	2.71	0.56	1.99	2.35	2.71
10 year	0.45	0.05	0.43	3.18	1.27	2.65	3.00	3.18
Private fixed income								
3 years	0.20	-0.20	0.12	3.07	0.49	1.26	2.15	3.07
5 year	0.23	-0.13	0.13	2.93	0.78	1.50	1.94	2.93
10 year	0.79	0.41	0.56	3.11	1.46	2.35	3.73	3.11

Source: Refinitiv Datastream, Refinitiv Eikon and CNMV.

1 Monthly average of daily data.

In this context, risk premiums increased in the first half of the year and showed a more irregular pattern in the second half, supported by the evolution of monetary policy and the deterioration of growth prospects. The turnaround in monetary policy in the euro area, in a context of declining activity and high inflation, gave rise to increased tensions in risk premia in some economies in the zone in June, which led to the authority European Monetary Commission to convene an extraordinary meeting of its Governing Council, in which the design of a tool to ensure the correct transmission of monetary policy and avoid market fragmentation was agreed: the so-called TPI[5] (Transmission Protection Instrument). The announcement of the creation of this mechanism allowed the stabilisation of risk premiums, which closed the year in most cases at levels slightly higher than those at the beginning of the year. The annual balance leaves increases of between 13 bp (Ireland) and 77 bp (Italy), which brought risk premiums to levels ranging from 35 bp (Netherlands) to 213 bp (Italy). In Spain, the increase was 31 bp and the sovereign risk premium ended the year at 109 bp.

Sovereign risk premiums in Europe   FIGURE 3
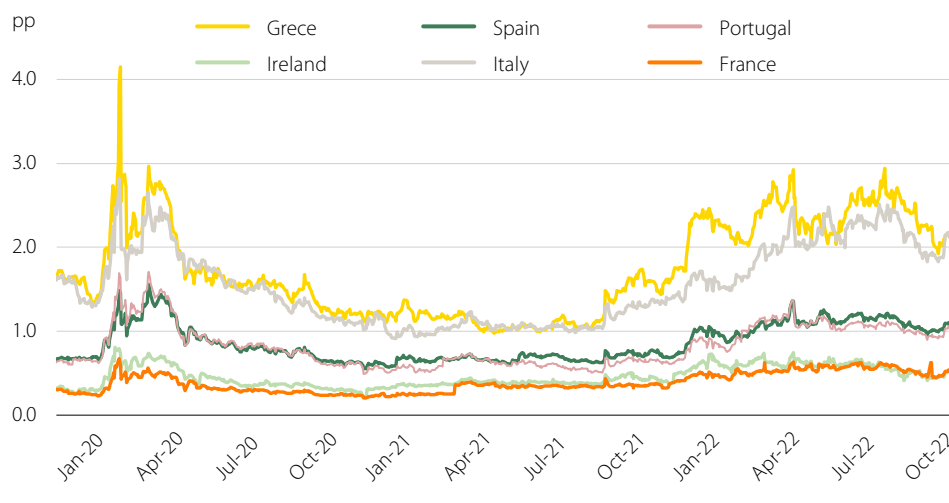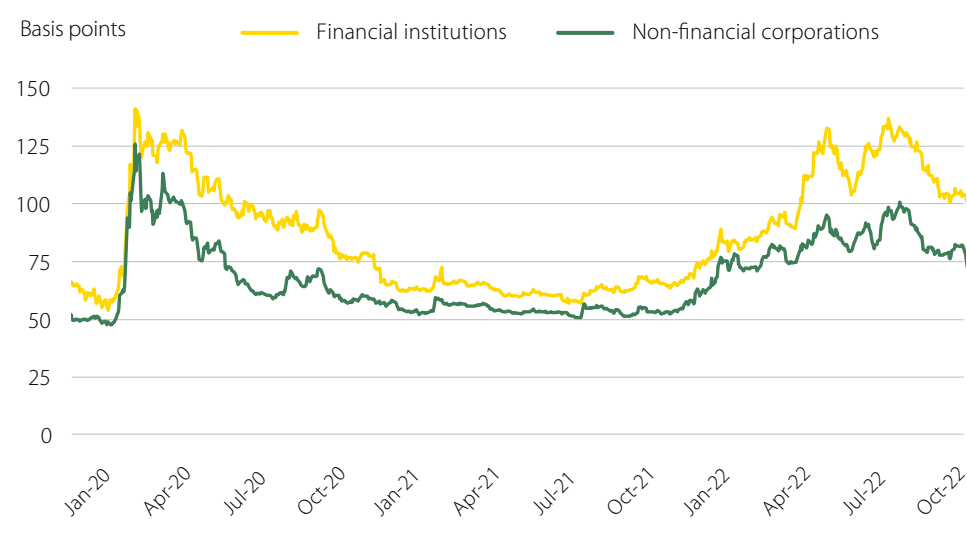

Source: Refinitiv Datastream. Data up to 30 December.

The risk premiums of Spanish issuers in the private sector showed a similar evolution to that of the risk premiums of sovereign debt. Therefore, increases of some intensity were observed in the first half of the year (58 bp in financial institutions and 34 bp in non-financial institutions) and a somewhat more irregular behaviour in the second half, which left a more stable balance in that period of time. The highs reached in the year (137 bp for financial institutions and 100 bp for non-financial ones) were lower than the previous highs recorded during the COVID-19 crisis (see Figure 4). At the end of the year, the average risk premium for financial institutions stood at 104 bp (64.4 bp at the end of 2021) and that of non-financials at 82 bp (53.4 bp at the end of 2021).

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5   The Governing Council of the ECB on 21 July approved the Transmission Protection Instrument (TPI) aimed at ensuring the smooth transmission of monetary policy to all countries in the euro area.

Risk premium paid by Spanish issuers: private sector[1] FIGURE 4

Source: Refinitiv Datastream and own calculations. Data up to 30 December.

1 Simple mean of the 5-year CDS of a sample of entities.

Bond issues made in Spain in 2022 amounted to €112.84 billion, nearly 20% higher than in 2021. The level of debt issuance was similar to what occurred in 2020, in the context of the pandemic, when there was also substantial progress. However, in 2022 the increase in issues was explained almost exclusively by the strong increase in commercial paper, which practically doubled between 2021 and 2022, reaching €39.525 billion (see Table 4). The information collected in the year suggests that the measures derived from Law 5/2021 and others adopted by the CNMV to simplify and expedite the issuance processes seem to have had a positive effect on the amount of commercial paper. The amount of long-term issues registered with the CNMV was close to €60 billion, practically the same figure as in 2021, observing a certain recomposition in favour of covered bonds and asset-backed securities – ABS – (which came to represent the 87% of long-term debt issues), to the detriment of issues of uncovered bonds and regional bonds (which only concentrated 10% of long-term debt issues). For their part, bond issues admitted to trading on the MARF stood at €13.73 billion, 3.9% less than in 2021.

Bond issues made by Spanish issuers abroad in the first 11 months of 2022 stood at close to €103 billion. In the absence of a month of data, this figure is below the €123.25 billion of 2021, but it is slightly higher than its annual average since 2010, which amounts to €88 billion. Of the total amount of issues, €46 billion corresponded to long-term debt assets and close to €57 billion were commercial paper. On the other hand, the issues made by subsidiaries of Spanish companies residing in the rest of the world were €77.8 billion in 2022 (until November), above the figure for the previous year (€69.6 billion). The increase was due to growth in issuance by financial institutions.

The volume of sustainable debt issues (ESG) made by Spanish private sector issuers stood at €15.03 billion in 2022, 10.4% more than in 2021. If the issuances of the public administrations are included, the issuances of this type of debt would amount

to €20.86 billion, which represents a decrease of 10% compared to the figures for 2021. In the private sector, 73% of the issues were green, 17% social, 7% sustainable and the remainder corresponded to debt linked to sustainability. Financial institutions made 69% of the issuances and left the rest to the corporate sector. Within the latter, it is worth noting the increase in emissions from energy companies and utilities and the decline of real estate and construction companies. More than 80% of ESG issuances continued to be made in foreign markets.

Gross private bond issues registered in Spain TABLE 4

Nominal amounts in millions of euros

CNMV	2019	2020	2021	2022	2022 March	June	Sept.	Dec.
Long term[1]	**52,305**	**80,753**	**59,914**	**59,583**	**31,798**	**10,461**	**8,407**	**8,918**
Non-convertible bonds[2]	9,101	5,545	3,680	2,249	137	550	547	1,015
Convertible bonds	0	0	1,210	1,800	300	1,000	0	500
Covered bonds	22,933	22,960	28,700	31,350	14,300	7,000	6,000	4,050
Territorial bonds	1300	9,150	5,500	3,540	3,040	0	500	0
Asset-backed securities	16,471	35,081	18,376	20,645	14,022	1,911	1,359	3,352
Preference shares	1,000	1,750	1,625	0	0	0	0	0
Other issues	1,500	6,266	823	0	0	0	0	0
Short term[1]	**15,085**	**22,301**	**20,180**	**39,525**	**6,824**	**6,743**	**16,288**	**9,669**
Commercial paper:	15,085	22,301	20,180	39,525	6,824	6,743	16,288	9,669
From asset-backed securitisation	0	0	0	0	0	0	0	0
Total	**67,390**	**103,054**	**80,094**	**99,108**	**38,622**	**17,204**	**24,694**	**18,587**
Pro memoria:								
Subordinated issues	3,214	14,312	4,600	2,326	951	745	345	285
Admitted to the MARF	**10,348**	**9,584**	**14,285**	**13,734**	**3,107**	**4,040**	**2,953**	**3,634**
Total	**77,738**	**112,638**	**94,378**	**112,841**	**41,730**	**21,244**	**27,647**	**22,220**

Source: CNMV.

1 The figures for commercial paper issues correspond to the amounts placed.

2 The CNMV registry also incorporates the issues of the SAREB (Sociedad de Gestión de Activos procedentes de la Reestructuración Bancaria), which, as it belongs to the public sector, are not included in this table. The amount of issues of this company in 2022 is €25.28 billion, made in the first quarter (17%) and in the fourth quarter (83%).

In terms of debt asset trading carried out in Spanish trading venues, it is worth noting the sharp increase in trading carried out in organised trading facilities (OTF). The total trading volume in 2022 of the 3 existing venues stood at €1.3 trillion, more than double that of the previous year (€479 billion euros). The increase is explained by the strong expansion of activity in Tradition España OTF,[6] which concentrated 68% of the total trading of these markets. Of the total traded, 29% corresponded to fixed-income assets issued in Spain and 71% to assets issued abroad.

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6   This OTF was authorised at the end of 2021.

Variable income assets reacted to this macrofinancial scenario of rising interest rates and lower growth (even with prospects of recession in some areas) with price falls. These falls were concentrated in the first three quarters of the year, while in the last quarter there was a certain recovery in prices, partially discounting a possible less intense tightening of monetary policy and a somewhat less unfavourable economic situation. In the year as a whole, the biggest falls were observed in the US indices, in which the rate hike process has been faster, standing between 8.8% (Dow Jones) and 33.1% (Nasdaq). The latter also accused the normalisation of some consumption habits that had changed significantly during the pandemic (see Table 5). With the exception of the UK's FTSE 100, which rose 0.9% in 2022, the main European indices also fell, although less sharply than those in the United States. Returns ranged between 5.6% in the Ibex 35 and 13.3% in the Mib 30. In Japan, where the declines of the main indices had been less intense than those of other reference indices for practically all of 2022, there were notable falls in quoted prices in the last days of the year as a result of the announcement of the central bank.[7] Thus, the annual setbacks ended up being between 5.1% and 9.4%.

The indices of the emerging economies showed a more heterogeneous behaviour, although the decreases predominated,[8] especially in the indices of Eastern Europe, strongly affected by the war, and in most of the Asian ones, which suffered the consequences of the restrictions caused by COVID-19 for a good part of the year, as well as other elements of political uncertainty.

Performance of the main stock market indices TABLE 5

%

	2019	2020	2021	2022	Mar-22	Jun-22	Sep-22	Dec-22
Euro area								
Eurostoxx 50	24.8	-5.1	21.0	-11.7	-9.2	-11.5	-4.0	14.3
Dax 30	25.5	3.5	15.8	-12.3	-9.3	-11.3	-5.2	14.9
Cac 40	26.4	-7.1	28.9	-9.5	-6.9	-11.1	-2.7	12.3
Mib 30	28.3	-5.4	23.0	-13.3	-8.5	-14.9	-3.0	14.8
Ibex 35	11.8	-15.5	7.9	-5.6	-3.1	-4.1	-9.0	11.7
United Kingdom								
FT 100	12.1	-14.3	14.3	0.9	1.8	-4.6	-3.8	8.1
United States								
Dow Jones	22.3	7.2	18.7	-8.8	-4.6	-11.3	-6.7	15.4
S&P 500	28.9	16.3	26.9	-19.4	-4.9	-16.4	-5.3	7.1
Nasdaq-Composite	35.2	43.6	21.4	-33.1	-9.1	-22.4	-4.1	-1.0
Japan								
Nikkei 225	18.2	16.0	4.9	-9.4	-3.4	-5.1	-1.7	0.6

Source: Refinitiv Datastream.

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7   The Nikkei 225 Index declined more than 7% in the last 15 days of the year.

8   The MSCI Emerging Markets Index posted a 17.9% drop in 2022.

The Ibex 35 fell 5.6% in the year, the smallest drop in Europe among the large indices except the UK's FTSE 100. However, this better relative performance was not enough to close the gap accumulated after three years of more intense falls in prices with respect to their European counterparts. The lower drop in the Spanish index is explained by the better relative performance of the banking sector (which is the main beneficiary of the context of interest rate rises and has a high weighting in the index), and of the energy and utilities, which also have a significant presence in it. In addition, the companies that have been most affected (cyclical companies and the technology sector) have a lower relevance. Likewise, contrary to what had happened in recent years, the smaller companies presented a worse relative performance (Ibex Small Caps: -13%) than the rest of the companies as they benefited to a lesser extent from the improvement of certain businesses abroad.

In the case of the alternative market, BME Growth, its broadest index,[9] the Ibex Growth Market All Share,[10] fell by 0.9% in the year as a whole, presenting better performance than that of the big companies and the medium and small capitalisation companies. This evolution is explained both by the greater weight and by the better relative performance of renewable energy companies and growing technology sectors in this index. Likewise, the market showed remarkable dynamism throughout the year, with the incorporation of 15 new companies[11] to the same (10 companies in expansion and 5 SOCIMIs), with which the number of companies present in this market grew to 134, of which 56 were companies in expansion and the remaining 78 were publicly traded real estate investment companies (SOCIMIs – Spanish REITs).

Performance of Spanish stock market indices and sectors   TABLE 6

Indices	2019	2020	2021	2022	Mar-22	Jun-22	Sep-22	Dec-22
Ibex 35	11.8	-15.5	7.9	-5.6	-3.1	-4.1	-9.0	11.7
Madrid	10.2	-15.4	7.1	-4.8	-2.3	-4.0	-9.3	12.0
Ibex Medium Cap	8.4	-9.7	8.6	-7.4	-5.9	-1.5	-8.3	9.1
Ibex Small Cap	11.9	18.9	1.8	-12.8	3.1	-6.1	-15.3	6.2
Sectors[1]								
Financial services	-2.6	-26.4	20.3	7.9	6.3	-10.0	-4.0	17.3
Oil and energy	14.4	5.0	-1.6	5.2	-1.1	2.3	-8.5	13.6
Basic mats., industry and construction	24.9	-2.5	9.3	-11.3	-10.2	-3.0	-4.7	6.9
Technology and telecommunications	4.5	-21.9	9.0	-22.8	-0.5	-4.1	-19.4	0.5
Consumer goods	34.8	-15.3	0.9	-14.2	-21.3	6.3	-10.3	14.3
Consumer services	8.6	-36.7	-1.9	-15.9	3.3	-19.0	-13.0	15.6
Real estate services	15.7	-32.1	13.0	-16.0	5.6	-14.5	-15.5	10.2

Sources: BME and Refinitiv Datastream. Data in percentages.

1 Sectors belonging to the IGBM (Madrid Stock Exchange General Index).

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9   The market also has the Ibex Growth Market 15 index, which includes the most liquid values in the segment and which fell 2.1% in 2022.

10   This index is made up of all the securities of the BMW Growth segment of the BME MTF Equity Market.

11   The capital raised by these companies reached €863 million and that of all the companies in this market stood at €2.33 billion.

The falls in the prices of variable income assets were accompanied by a slight upswing in volatility, especially in the first quarter of the year (with maximums of less than 40%). Subsequently, certain ups and downs were observed, but within volatility levels that are considered low (around 20% or below). Equity market liquidity conditions, assessed using the price range bid-ask, were favourable throughout the exercise, even at times of greatest turbulence. Finally, it is worth noting the decline in the price-earnings ratios (PER) of the most relevant indices, which at the end of the year in Europe stood significantly below the historical averages for this indicator and in the United States remained in line with these averages. This evolution reduces the perception of the market risk of this type of asset, a risk that in previous years was estimated to be high, especially in the US indices.

The trading of Spanish shares in BME (admitted to the continuous market) stood at €351.8 billion in 2022, 4.6% less than in 2021. The temporal evolution of trading shows a significant advance in the first half of last year, at times of greater volatility (which are usually accompanied by more trading) and a significant decrease in volumes in the second half of this year, which finally determined the fall for the year. Average daily trading was €1.39 billion in 2022, below €1.45 billion in 2021 and €1.65 billion in 2020.

On the other hand, the trading of Spanish shares carried out in other trading venues experienced growth of close to 19% in 2022, standing at €386.6 billion. The temporal evolution of recruitment in these centres showed significant progress in all quarters of the year except the last, when it fell by 5.8%. Higher volatility environments, such as last year, tend to favour the activity of high frequency traders (HFT), which is usually carried out in these venues. Within these centres, it is worth noting the relevance of the CBOE market, in which the trading of Spanish shares in 2022 was close to €297 billion, 24.7% more than in 2021. As a result of this evolution, BME's trading share of Spanish shares stood at 48% for the year as a whole, 5 points below the proportion in 2021.[12]

On the other hand, the trading of Spanish shares carried out through systematic internalisers represented 5.4% of total trading in 2022.[13] This proportion is slightly lower than that of 2021 (6.5%) and is well below that observed in the previous 3 years (2018-2020), when it was close to 15%. This trend represents a significant advance in fulfilling one of the objectives of the MiFID II regulation, which was to displace part of the trading carried out under discretionary rules governing trading venues that use non-discretionary rules.

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12 Some alternative estimates of BME's share in trading, published by BME and estimated by Liquidmetrix, place this share at 66.9%.

13 Total trading is defined as the sum of trading subject to non-discretionary market rules and that carried out through systematic internalisers.

TABLE 7

Trading in Spanish equities admitted to Spanish stock exchanges[1]

Amounts in millions of euros

	2019	2020	2021	2022	Mar-22	Jun-22	Sep-22	Dec-22
Total	**805,833.0**	**780,343.5**	**693,644.2**	**738,361.6**	**222,262.9**	**208,231.6**	**148,635.0**	**159,231.7**
Admitted to SIBE electronic platform	805,826.6	780,341.0	693,636.7	738,353.3	222,260.7	208,228.6	148,634.3	159,229.7
BME	460267.4	418,512.6	368,608.5	351,801.8	106,560.5	99,333.5	67,831.3	78,076.5
Cboe Equities[2]	256,772.5	275,682.4	238,466.3	297,465.9	90,240.6	84,225.9	58,949.3	64,050.1
Turquoise	30,550.6	23,242.2	23,101.3	19,474.6	5,685.3	5,053.6	4,446.6	4,289.1
Other	58,236.1	62,903.8	63,460.6	69,611.0	19,774.3	19,615.8	17,407.0	12,814.0
Open outcry	6.2	2.5	7.5	8.3	2.3	2.9	0.7	2.0
Pro memoria								
Trading in foreign equities, BME	3,480.5	4,273.8	4,343.6	4,770.9	2,167.5	1,268.4	660.4	674.6
BME MTF Equity[3]	4,007.7	3,929.0	3,559.2	3,837.3	933.0	983.2	759.0	1,160.7
Latibex	136.6	79.5	48.9	93.4	29.4	15.3	21.5	27.2
ETF	1718.0	2,551.1	1,556.0	1,604.8	556.9	428.5	328.5	291.0
Total trading through BME	469,616.6	429,348.5	378,144.4	362,116.5	110,249.5	102,031.8	69,601.4	80,231.9
% Spanish equities traded through BME/ total Spanish equities	57.4	53.9	53.5	48.0	48.3	48.1	46.0	49.5
Systematic internalisers[4]	**141,308.3**	**144,694.4**	**48,469.9**	**42,059.5**	**10,912.6**	**11,124.1**	**9,187.6**	**10,835.2**

Source: Bloomberg and own compilation by the authors.

1 This includes the trading of Spanish equities subject to market rules or MTF (lit plus dark). The Spanish equity on the Spanish exchanges is the one with the Spanish ISIN that is admitted to trading in the regulated BME market, therefore it is not included in the Alternative Stock Market (MAB). Foreign equities are those admitted to trading in the regulated BME market whose ISIN is not Spanish.

2 Includes trading that until 2020 was carried out through Chi-X and BATS, which moved to Amsterdam in January 2021 as a result of Brexit.

3 Called MAB (Alternative Stock Exchange) until September 2020. This MTF has three segments: BME Growth (on which growth companies and Spanish real estate investment funds are listed), BME IIC (on which open-ended collective investment companies (SICAVs) and hedge funds are listed) and BME ECR (on which venture capital firms are listed).

4 Data estimated by the CNMV with data from transaction reporting.

The amount of share issues barely reached €4.7 billion in 2022, well below the figure of more than €17 billion in 2021 and also the records of recent years. The high uncertainty present in the markets in a context of falling prices significantly deteriorated the activity in the primary equity markets both in Spain and internationally. As seen in Table 8, there were no public offerings for sale (IPO) in 2022. Within the capital increases, which in total stood at €4.69 billion in 2022 (€14.94 million in 2021), two trends should be noted: i) the increase in bonus operations, particularly scrip-dividend, whose amount went from €1.24 million in 2021 to €1.5 billion in 2022; This formula tends to become more attractive for companies in times of uncertainty, since it allows them to partially maintain the dividend policy with their shareholders and, at the same time, strengthen their balance sheets, and ii) the relatively high amount of non-monetary counterparty capital increases in the last quarter of the year. This was €1.36 billion, close to 30% of the total issues in the whole year. Most of this amount was due to a single deal (Cellnex Telecom).

TABLE 8

	2019	2020	2021	2022	Mar-22	Jun-22	Sep-22	Dec-22
Number of issuers[1]								
Total	**33**	**28**	**34**	**27**	**9**	**10**	**9**	**12**
Capital increases	33	28	33	27	9	10	9	12
Public offers for subscription of securities	1	1	1	1	0	0	1	0
Initial public offering (IPOs)	0	0	1	0	0	0	0	0
Number of issuances[1]								
Total	**52**	**40**	**52**	**56**	**10**	**12**	**9**	**25**
Capital increases	52	40	51	56	10	12	9	25
Public offers for subscription of securities	1	1	1	1	0	0	1	0
Initial public offerings[2] (IPOs)	0	0	1	0	0	0	0	0
Cash Amount[1] (millions of euros)								
Capital increases with fund-raising	**8,240.6**	**8,903.1**	**13,673.0**	**3,186.4**	**946.1**	**354.1**	**312.3**	**1,573.8**
With pre-emptive right	4,729.8	6,837.2	7,060.4	254.2	0.0	254.2	0.0	0.0
No pre-emptive right	10.0	150.1	100.0	200.0	0.0	0.0	200.0	0.0
Accelerated book builds	500.0	750.0	0	913.5	741.1	82.5	90.0	0.0
Capital increases with non-monetary consideration[3]	2,034.2	233.0	3,525.3	1,381.2	17.4	0.0	0.0	1,363.8
Capital increases via conversion	354.9	162.4	109.5	81.6	0.0	3.1	2.0	76.5
Other	611.8	770.3	2,878.1	355.9	187.7	14.3	20.3	133.6
Scrip issues[4]	**1,565.4**	**1,949.0**	**1,264.9**	**1,503.0**	**422.8**	**347.8**	**694.6**	**37.9**
Of which, scrip dividends	1,564.1	1,949.0	1,243.6	1,501.5	422.8	347.8	694.6	36.4
Total capital increases	**9,806.0**	**10,852.1**	**14,938.1**	**4,689.4**	**1,368.9**	**701.9**	**1,006.8**	**1,611.7**
Public offers for sale	**0.0**	**0.0**	**2,200.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Pro memoria: transactions on BME Growth[5]								
Number of issuers	12	9	44	44	13	13	19	13
Number of issues	17	14	77	88	14	26	30	18
Cash amount (millions of euros)	298.3	238.5	2,440.8	2,329.5	347.0	615.2	643.0	724.3
Capital increases	298.3	238.5	2,440.8	2,329.5	347.0	615.2	643.0	724.3
Of which, public offerings	229.4	173.5	1,654.2	1,487.1	216.5	190.7	399.3	680.7
Public offer for the sale of shares	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Source: BME and authors.

1 Trades registered with the CNMV. Does not include data from MAB, ETF or Latibex.

2 In this section, trades related to the exercise of what is known as a greenshoe option are recorded independently.

3 The non-monetary counterparty capital increases have been accounted for at their mark-to-market value.

4 In these increases, also called scrip dividends, the issuer grants its shareholders rights that allow the collection of a monetary dividend or its conversion into shares in a scrip issue.

5 Trades not registered with the CNMV.

The Spanish financial markets stress indicator presented an upward balance in 2022, going from a level of 0.23 at the beginning of the year to 0.45, passing through different stages. Thus, a strong increase was observed in the first months until reaching a first maximum of 0.47 at the beginning of March, coinciding with the start of the Russian invasion of Ukraine. In the central part of the year there was a decline in the indicator and later it returned to show a new upward trend that brought the stress level to 0.55 in October, in the high risk zone. In the last weeks of the year, a slight downward trend has been observed, leaving the indicator at a medium risk level (0.45).[14] The upswing in the indicator is explained by the price falls, which in 2022 affected all classes of financial assets, by the occasional outbreaks of volatility and by the increases in some risk premiums. At the end of the year, the segments that presented a higher level of stress were those of the bond market (0.70), financial intermediaries (0.67) and the money market (0.64). The system's correlation increased throughout the year until reaching high levels at the end of it.

Spanish financial markets stress indicator FIGURE 5
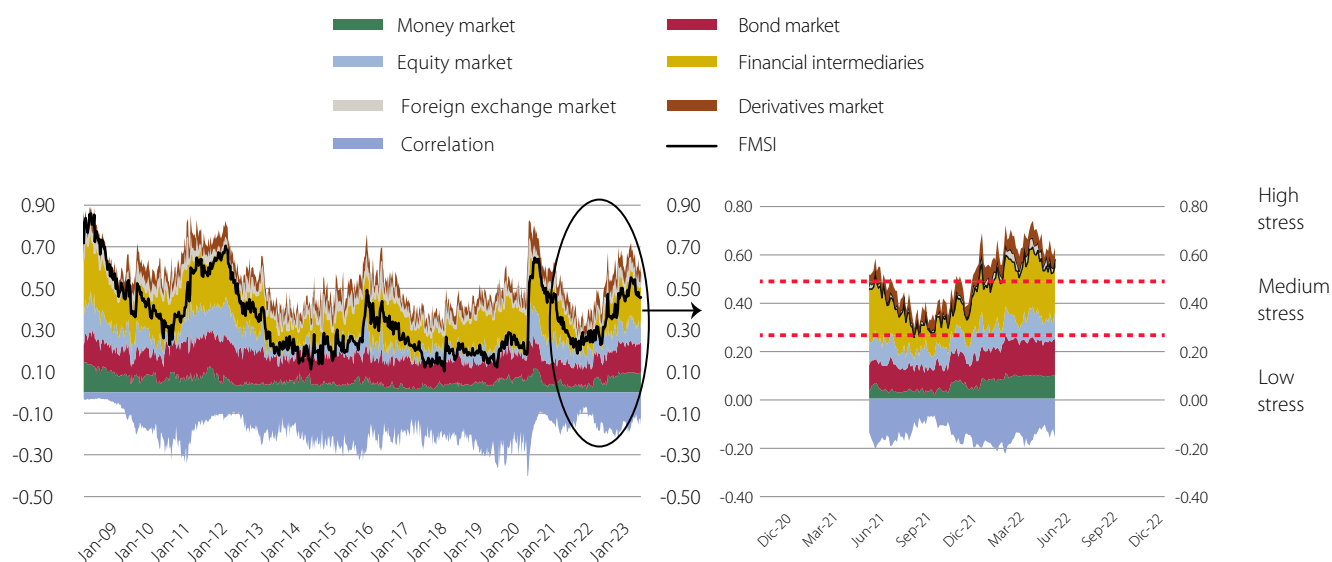
Source: Refinitiv Datastream.

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14   In the first week of 2023 the indicator showed a value of 0.46.

II   Reports and analysis

Determinants and impact of directors' tenure

María Gutiérrez Urtiaga (*)
Maribel Sáez Lacave

Table of contents

Executive summary

This paper presents useful empirical evidence to guide decisions on term limits for directors. Specifically, it investigates, firstly, what factors determine the tenure that directors reach in their position and, secondly, the effects that increased tenure has on the commitment of directors towards the supervisory tasks assigned to them.

For this, an incomplete panel of data is used that combines data from Spanish listed companies and their directors for the period 2013-2020, with a total of 1,061 company-year observations for 171 different companies and a total of 11,297 director-company-year observations.

Among the results, we find a high turnover rate of independent directors during their first years in the position. In addition, the independent directors who are most likely to be replaced at any given time are not those with the longest tenure, but those whose appointments predate the appointment of the CEO (Chief Executive Officer). This indicates that the CEO has considerable influence on the appointment and renewal of directors in their positions, something that may lead to their capture. Additionally, there seems to be a trial period for directors to reach positions of responsibility, since the probability that they will participate in important committees increases with tenure, at least up until 16 years. In the case of independent directors, the probability that those who have been in the company for less time could chair an important committee is low and increases with longer tenure until reaching the highest probability at 13 years.

The results indicate that the independent directors with the longest tenure have a lower commitment to the supervision of the executive directors. Specifically, the independent directors with the longest tenure show lower attendance at Board meetings and reduce the probability that the CEO will be replaced (especially in the case of independent directors who are part of the appointments committee), while the directors whose appointment predated that of the CEO increase it.

Taken together, the results suggest a significant CEO influence on the appointment of independent directors to the position and their tenure in the position, which seems to reduce their commitment to active supervision.

All of this leads us to conclude that, although the issue of tenure for independent directors has been raised out of concern that they remain in the position for too long, it can also be problematic due to the opposite situation, namely that independent directors whose appointments predate that of the CEO remain in the position for too short a time.

1   Introduction

Since their inception, good governance codes, in order to encourage independent judgement, have called upon companies to limit the number of years during which their directors can remain in the position. In Spain, the Spanish Corporate Enterprises Act (LSC) limits the maximum tenure of independent directors to 12 years, although it allows them to continue on the Board in a different category (Article 529 *duodecies* 4 of the LSC). The idea behind this recommendation, initially proposed by Jensen and Meckling (1976), is that independence declines over time and there is a threat of capture of independent directors as their tenure in the position increases. Therefore, the regulation that limits the duration of the mandate tries to prevent the emergence of an understanding over time that favours collusion between the independent and executive directors and the significant shareholders whom they should be supervising.

However, longer tenure can increase the bargaining power of independent directors vis-à-vis the CEO. In particular, longer tenure increases the director's specific knowledge of the company. This will give them greater bargaining power vis-à-vis executives, especially when the director does not owe the position to the current CEO and has worked with previous CEOs. This additional value that experienced directors can have seems to be recognised by the legal regime, by allowing companies to retain directors who can no longer be considered independent as another type. This dispensation at first glance seems designed to allow directors with long experience to be retained while avoiding the threat of capture of independent directors which is inherent in long terms. However, the possibility of extending tenure, passing from one category of director to another, generates an implicit promise of an almost unlimited term, which can have an impact on the independence of directors.

Considering all this, there are two effects to weigh on the scales. On the one hand, the imposition of limits to the duration of the term can have positive effects and increase the independence with which the directors act. But, on the other, it can also be costly and problematic for companies to be forced to part with experienced directors whose appointments predate that of the current management team. Therefore, it is desirable to have empirical evidence to guide decisions on term limits for directors.

To date, the number of empirical studies available in this regard is very limited. Although many exist on the relative efficiency of different Board characteristics (such as size, independence, number of committees, etc.), there is very little empirical evidence on the determinants and effects of director tenure that can guide the legislator on the appropriateness of imposing or recommending term limits. In addition, studying the Spanish case is especially interesting due to the importance that proprietary directors have on our Boards. All studies found have used data from the United States, where it is only possible to separate directors into independent and executive directors. In this context it is difficult to know if the negative effects of greater tenure are really due to problems of capture and loss of independence over time or simply the inherent exhaustion of spending a longer time in the position. However, capture can only be a problem in the case of independent directors and not in the case of proprietary directors. Therefore, studying the Spanish case, the relationship between tenure and capture problems can be better identified.

This study investigates the determinants and effects of tenure of directors in Spain. For this, an incomplete panel is used that combines data from Spanish listed companies and their directors for the period 2013-2020, with a total of 1,061 company-year observations for 171 different companies and a total of 11,297 director-company-year observations.

Three main results are found. In the first place, among the characteristics that determine the probability that a director will leave the position at a given moment, the fact that the director's appointment has predated that of the CEO is of great importance. This indicates that the CEO has considerable influence on the appointment and renewal of directors in their position, something that may lead to their capture. In addition, independent directors are more likely to leave the position at a given time, compared to proprietary, executive and other external directors.

Secondly, the probability of belonging to important committees (those that fulfil supervisory functions in terms of auditing, remuneration and appointments) increases with tenure up until 16 years and is lower for directors whose appointments predate that of the CEO. In the case of independent directors, these results are not significant, due to the need that companies have had during the period studied to incorporate a significant number of independent directors to comply with the new regulations. However, the probability of an independent director chairing a major committee also increases with tenure up until 13 years.

Third, the independent directors with the longest tenure seem to have less commitment to the supervisory tasks assigned to them. Specifically, the presence of older independent directors is negatively related to the level of attendance at Board meetings. In addition, while the tenure of independent directors does not appear to have an effect on compensation, it does reduce the likelihood that the CEO will be replaced, especially in the case of independent directors serving on the appointments committee. Conversely, the presence of independent directors whose appointments predates that of the CEO increases the probability that the CEO will be replaced. Finding these results on independent directors and their tenure is more surprising if one takes into account that in the sample studied the average tenure of independent directors is only four and a half years.

Taken together, the results suggest a significant CEO influence on the appointment of independent directors to the position and their tenure in the position, which seems to reduce their commitment to active supervision. It is conceivable that the directors who maintain a better relationship with the CEO are also those who have a greater probability of remaining in the post and occupying positions on committees and, from these committees, perhaps favouring the interests of the CEO. By contrast, directors whose appointment predates that of the CEO appear to be more committed to overseeing the latter.

All of this leads to the conclusion that, although the issue of tenure for independent directors has been raised out of concern that they remain in the position for too long, it can also be problematic due to the opposite situation: that independent directors not aligned with the CEO stay too little time in the position. This raises the need to carefully consider the procedures for the appointment and re-election of

independent directors. Perhaps the focus should be changed from limiting tenure in the position towards an orderly replacement of independent directors, which does not depend solely on the wishes of the management team, and allows independent directors who may be uncomfortable for management to remain in the position.

The rest of the article is structured as follows: Section 2 contains a review of the legal and financial literature used to build our assumptions. Section 3 explains the sample construction procedure and the variables used. Section 4 then discusses the empirical results and Section 5 presents some further robustness analysis. Section 6 contains some brief conclusions.

2 Review of the literature and formation of assumptions

2.1 Review of the literature

Research on the determinants of director tenure and the consequences of allowing greater tenure is interesting because there are conflicting views on the matter in the academic literature on this topic.

This literature can be classified into two broad categories. In the first, there are studies that focus on how tenure changes the *ability* of the directors to fulfil their function. In the second category, the focus is on explaining how tenure changes the *incentives* of directors to actively supervise managers.

Most of the authors who have studied the impact of tenure on the *ability* of the director to contribute to increase the value of the company have a positive vision. The prevailing idea is that more experienced directors are more competent because they have accumulated important knowledge about the company and its environment. Following this reasoning, Vance (1983), and Kor and Mahoney (2000) state that forcing directors to retire leads to a waste of talent and experience. Increased competition over time may also be related to the length of time it takes to build share capital and learn to interpret input coming from executives or other directors (Fischer and Pollock, 2004; Sundaramurthy and Lewis, 2003; Westphal, 1999). Additionally, Dou, Sahgal and Zhang (2015) argue that most experienced directors are more likely to have worked with multiple CEOs, which should help them better assess the capacity of the current CEO.

Despite the fact that the prevailing view of the effect of tenure on the director's capacity is positive, some authors have argued to the contrary. Their reasoning is that, as time in the position increases, directors will be less open to external information, more committed to a certain vision of the company, and resistant to major changes in its strategic direction (Boeker, 1997; Hambrick and Fukutomi, 1991; Miller, 1991).

In the second category of studies, most authors have a negative view of the impact of tenure on *incentives* of directors to actively supervise managers. The basic

argument is that tenure aggravates the agency problem, as directors develop loyalty towards the executives they are supposed to supervise (Jensen and Meckling, 1976; Vafeas, 2003; Nili, 2017).

However, the view that directors' incentives to be active supervisors increase with longer tenure can also be argued. In particular, Dou, Sahgal and Zhang (2015) maintain that longer tenure can strengthen the position of directors when negotiating with the CEO, equalising their bargaining power, since the latter is considered to have greater influence the longer they have been in the position (Hermalin and Weisbach, 1998), and this idea could be extended to directors. Therefore, the views of a Board member with longer tenure would carry more weight in the Board's final decisions. In relation to these arguments, to find out who has more influence or to determine if the director has lost his/her independence, it is essential to jointly study the tenure of the directors and that of the CEO. Finally, Yermack (2004) states that, when directors receive their compensation in the form of shares that they must keep in their portfolio for a certain time (even if the payment is not related to results), the directors with the longest tenure will have accumulated more shares and this should better align their incentives with those of the shareholders they represent.

It is important to note that almost all of these studies on the impact of tenure on ability and incentives are theoretical, although a small number of empirical studies exist. Most of these studies find negative correlations between directors' tenure and company results, which reinforces the idea that it is desirable to impose a limit of years on directors' tenure. Hermalin and Weisbach (1988) document how the average tenure of directors in the position is negatively associated with the market value of US companies. Mishra and Nielsen (1999), using a sample of North American banks, find that director tenure is negatively correlated with growth opportunities. Vafeas (2003) uses a small sample with one year of observations and divides the companies into two groups according to the average tenure of the directors that are part of the remuneration committee. Their results indicate that committees with longer tenure pay higher salaries to their CEOs, especially when they have been in the position for longer. Nili (2017) shows that, in the United States, the increase in Board independence has occurred concurrently with an increase in tenure that may have compromised the independence of directors.

Among the few positive results in the empirical literature are Dou, Sahgal and Zhang (2015), who use a very long panel with data from US listed companies. These authors find that a higher proportion of non-executive directors with long terms on the Board (more than 15 years) and who have been on the Board longer than the current CEO has important effects. Specifically, they affirm that their presence implies a lower total remuneration of the CEO, a greater sensitivity to the results in cases of dismissal or change of CEO and a higher level of accountability.

Finally, there are few studies that have simultaneously analysed the tenure of directors and the CEO (Coles, Daniel and Naveen, 2014; Core, Holthausen and Larcker, 1999; Landier, Sauvagnat, Sraer and Thesmar, 2013; Dou, Sahgal and Zhang, 2015). Their results indicate that directors whose appointment came after the current CEO joined the company are worse supervisors. This is consistent with the idea that the CEO influences Board appointments and appoints like-minded directors. Therefore, care must be taken when empirically analysing the tenure of directors, as the effects

of a longer tenure can be confounded with the effects of the director having been hired before the current CEO took office.

2.2   Construction of hypotheses

A good starting point for identifying possible effects of tenure is an ideal hiring situation in which directors are selected by shareholders and retained for an optimal time, taking into account the advantages and disadvantages that this may entail, and without agency problems or undue influence from the management team. In this situation, two clear null hypotheses appear. In the first place, in this framework tenure would be totally determined by the characteristics of the director-company pairing. Secondly, when taking into account the characteristics that determine tenure in the position, one would not expect to find any impact of tenure as such on the activity of the Board or on the results of the companies.

However, it is obvious that there are numerous restrictions that lead to doubting the validity of this ideal framework for understanding the true reality. That is, it is expected that there are many constraints that prevent an equilibrium in which the optimum tenure is reached. In fact, when a director leaves the position (for whatever reason), it is necessary to replace them with a new one. The latter, by definition, starts with zero tenure and this automatically alters the average tenure of the Board. And obviously, as explained in the reviewed literature, there may be agency problems and CEO influence in the appointment of directors which move in directions other than purely the interests of shareholders. In this more realistic framework, it is expected that none of the null hypotheses will hold; therefore, the starting hypothesis is restated as explained below.

The first empirically testable hypothesis will be that, although the characteristics of the company and the director influence the determination of tenure, they will have limited power to explain the tenure observed.

The second hypothesis, once we have ruled out that the tenure is optimal, will be that the fact of tenure being above or below this optimal level will affect the activity and results of the Board, but these effects of tenure should be different in the case of independent and proprietary directors, since the latter, although their capacity may be affected over time, will not suffer capture problems.

To investigate these hypotheses, the study is presented in four different parts.

Firstly, we investigate the influence that the characteristics of the director, the Board and the company have on the probability of a director achieving longer tenure. Special attention will be paid to the analysis of the impact that the CEO can have on the maintenance of directors in the position.

Secondly, we study whether tenure affects the functions that the director performs in the company. In particular, we measure the impact of tenure on the probability of belonging to committees and of chairing them, distinguishing according to the type of director.

Third, we analyse whether tenure determines the level of commitment that the director shows with the company, which will be indirectly measured as the level of attendance of independent and proprietary directors at Board meetings.

Finally, we test whether the tenure of the independent and proprietary directors affects the quality of their performance, measuring their impact on the remuneration obtained by the CEO and the probability that he/she will be replaced.

But, before carrying out all these analyses, the next section presents the sample that will be used in the study. As explained below, the particular characteristics of this sample –especially those due to regulatory changes that occurred during the observed period – must be taken into account for a correct interpretation of the results.

3   Construction of the sample and variables used

3.1   Sample

The sample used is an incomplete panel that combines data from Spanish listed companies and their directors for the period 2013-2020. To form this sample, it is necessary to cross-reference the data from the annual corporate governance reports (IAGC) and the annual report on director remuneration (IARC) that Spanish listed companies must submit annually to the CNMV, and complement these data with economic-financial information from the annual financial statements using Osiris.[1]

The starting point is the 1,079 company-year observations for the period 2013-2020 from the IAGC. These data were then crossed with the economic and financial data from the annual financial statements of the companies using the information available in Osiris. As a result, 5 company-year observations were lost.

Lastly, all company-year data are combined with the individual data for directors from the annual reports on director remuneration (IARC) submitted by the companies to the CNMV. As a result, 13 company-year observations were lost.

The result of this process was a database containing 1,061 company-year observations for 171 different companies and a total of 11,297 director-company-year observations.

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1   Osiris is a database of global listed companies, covering more than 190 countries and 55,000 companies.

3.2 Variables measuring tenure and other characteristics of the directors

The main variable of interest for this study is the tenure of the directors in the position, especially in the case of independent directors. But, in order to understand the evolution of this variable and its values in the sample, it is important to first discuss the variations that have occurred in the number and composition of Boards in accordance with the regulatory changes that occurred during the study period.

Figure 1 shows how since 2013, the number of directors having remained stable, there has been a significant substitution of proprietary directors by independent directors as a result of regulatory changes. The Spanish Corporate Enterprises Act of 2014 made mandatory the presence of at least four independent directors on the Board, as well as the presence of at least two independent directors on the audit, remuneration and appointments committees, and one of these committees must be chaired by an independent director and non-executive directors must be the majority. This meant a strong process of entry of independent directors and departure of proprietary directors seems to have stabilised in recent years. The drop in the number of directors observed in 2020 is also noteworthy. It may be related to an increase in sick leave and difficulties in covering them during the pandemic caused by COVID.

Changes in the number and percentage of directors according to their type
FIGURE 1
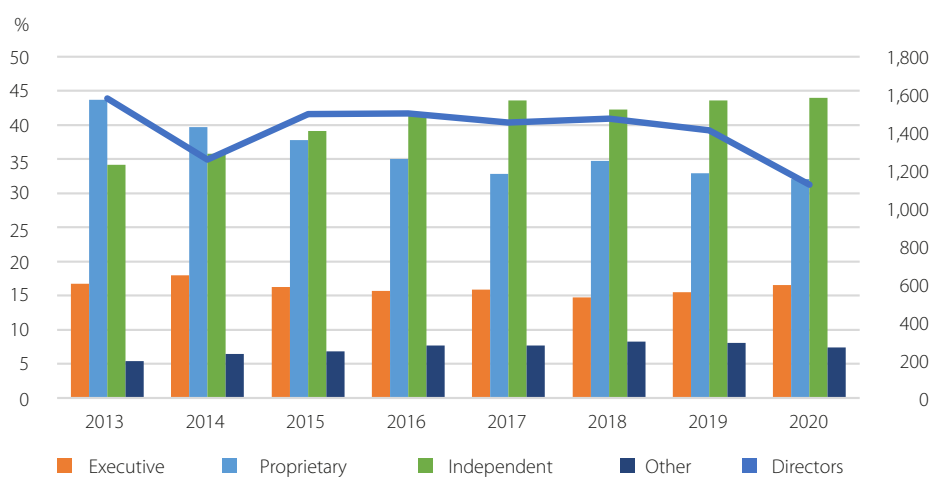
Source: Compiled by the authors.

It is also interesting to see that there is a high turnover of directors. The net increase in the number of independent directors throughout the period is 240, but it corresponds to the addition of 528 and the resignation of 288 independent directors. The average tenure at the time of departure was 7 years and more than 25% of the resignations occurred before completing 3 years in the position. This high turnover of independent and proprietary directors can be seen in Figure 2.

Additions and resignations of directors   FIGURE 2

Addition

Resignation
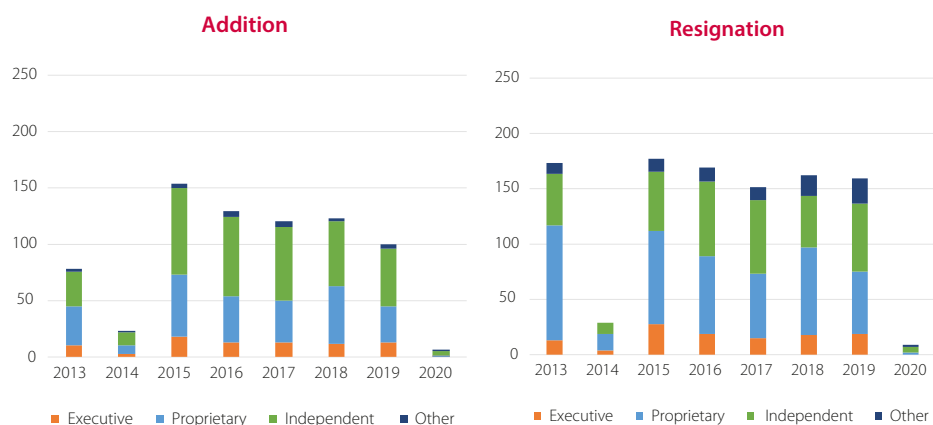
Source: Compiled by the authors.

The replacement of proprietary directors by independent ones has produced changes in tenure, since when new directors join, the average tenure automatically falls, as can be seen in Figure 3. As independent directors are incorporated, the percentage of directors with shorter tenure (less than 4 years) increases and the number of directors with intermediate tenure (between 4 and 8 years) decreases, while there are few changes in the percentage of directors with longer tenure. The change that occurs in the last year of the sample is also noteworthy. During 2020, the percentage of directors with shorter tenure decreases, increasing the percentage of directors with tenure between 4 and 8 years (mostly independent directors, incorporated since 2014 and who have remained in the position).

Percentage of directors with different tenure   FIGURE 3

Source: Compiled by the authors.

Source: Compiled by the authors.

This is confirmed in Figure 4, where it can be seen how independent directors are directors who, for the most part, have a short tenure until 2020, while the tenure of proprietary directors is significantly longer, and that of executives and other directors is equally distributed by age groups.

Another important factor to consider is transitions from one type of director to another. In particular, the "other" category is a residual category that, in principle, includes a wide variety of profiles, such as members of the public administration and presidents or employees of company foundations or companies in the same group. However, for the most part, the "other" category includes directors who were previously in other categories, particularly retired executives or proprietary directors who change categories. Specifically, of the 262 cases of directors classified as "other" in the sample, 174 have come from other categories. The most worrying thing is that this category serves to relocate formerly independent directors. In other words, there are 122 directors who, after having spent a number of years on the Board as independent directors, move to the "other" category, as can be seen in Table 3.1, which shows the transitions between categories and the average tenure with which they these changes occur.

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Reports and analysis. Determinants and impact of directors' tenure

Number of directors who change category and average tenure (in parentheses)

TABLE 3.1

t	Executive	Proprietary	Independent	Other
		t + n		
Executive		0	12 (6.75)	26 (9.3)
Proprietary	51 (10.4)		33 (4.1)	26 (6.09)
Independent	0	0		122 (9.8)
Other	0	0	0	

Source: Compiled by the authors.

Table 3.2 shows the descriptive statistics of the different age variables that will be used in the analysis: *tenure in the position, tenure longer than that of the CEO* and *long tenure* (indicating if the tenure of the director in the post is equal to or greater than 16 years). The results reflect an average tenure of almost 7 years, but with marked differences between types of directors, confirming that the independent directors are the ones with the lowest average tenure and that less than 25% have been appointed before the CEO.

It is also interesting to observe the breakdown for directors who are members of some important committee (audit committee, committee in charge of appointments and committee in charge of remuneration).[2] Since 2014, the legal regime requires that these committees be made up of at least three members, with a minimum of two independent directors and a majority of non-executives. This is reflected in the fact that the data for these committees is more similar to that of independent directors.

Finally, tenure may be related to other characteristics of the directors, including whether they are women, foreigners, and the number of Boards to which they belong. It should be noted that the average tenure of women and, especially, of foreigners, is low compared to the average, while that of directors who provide their services on more than one Board, whether they are cases of interlocking[3] Boards or not, it is only slightly below average.

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2   When there is only one committee that is jointly responsible for appointments and remuneration, the members are considered to be simultaneously on the appointments and remuneration committees.

3   An interlocking position is defined as one in which the director is also a director of another company in which at least one other director, in turn, simultaneously belongs to both.

Tenure in the position	N	%	Average	Median	Standard deviation	1% percentile	99% percentile	Tenure longer than that of the CEO (%)	Long tenure (≥ 16, %)
All directors	**11,056**		**6.85**	**4**	**7.64**	**0**	**32**	**28.20**	**10.19**
According to typology									
Independent	4,507	40.77	4.52	3	4.75	0	23	23.43	2.32
Proprietary	3,949	35.72	7.33	4	8.41	0	34	35.26	11.67
Executive	1,799	16.27	9.43	7	9.18	0	42	16.69	19.28
Other external	801	7.24	11.83	13	8.31	0	32	49.51	26.50
According to membership of committees									
Members of an important committee	5,858	52.98	6.02	5	6.47	0	29	27.67	7.56
Audit	3,744	33.86	5.56	4	5.76	0	25	26.54	6.18
Appointments	3,763	34.04	6.25	4	6.72	0	30	27.74	7.84
Remuneration	3,824	34.59	6.21	4	6.66	0	30	27.68	7.58
They chair an important committee	2,024	18.31	4.93	4	5.16	0	25	24.84	2.76
Audit	1,028	9.30	4.70	3	4.98	0	25	25.76	3.30
Appointments	1,007	9.11	5.26	4	5.40	0	25	23.94	2.48
Remuneration	1,029	9.31	5.16	4	5.37	0	25	23.46	2.43
According to personal characteristics									
Women	1,657	14.99	4.28	3	5.41	0	27	19.38	4.62
Foreigners	1,403	12.69	3.80	2	3.80	0	17	21.09	1.33
They belong to more than one Board	2,271	20.54	6.29	4	6.93	0	30	30.89	8.80
On interlocking Boards	692	6.26	6.66	5	6.89	0	34	34.60	9.53

Source: Compiled by the authors.

3.3 Characteristics of Boards of Directors

The tenure of Board members may be related to other Board characteristics. On the one hand, obviously, the tenure of the Board is the average that adds the tenure of its members and the same occurs with long tenure, which can be aggregated at the Board level. But the average tenure of the Board will also be influenced by the structure of the Board. Especially, as has already been discussed, the Board typology is expected to have a significant impact on average tenure, since the number of independent directors, women and foreigners has increased in recent years as a result of regulatory developments and internationalisation. In addition, there may be selection effects, since, logically, directors who belong to several Boards and especially those of Boards with interlocking positions could be more valuable to companies because of their greater ability to perform networking. This can cause companies to try to retain them longer, thereby increasing their tenure, or that tenure is a necessary characteristic to become on multiple Boards simultaneously. Therefore, it is necessary to control for all these variables in the estimates.

On the other hand, the main hypothesis is that the tenure of directors influences their ability and attitude in performing their duties. A fairly direct way to measure this is through your participation in Board meetings. Therefore, we investigate how the tenure of the Board affects the percentage of meetings attended by all directors (or, alternatively, the percentage attended by at least 80% of directors). And, obviously, the percentage of assistance can be influenced by other variables that must be controlled for. Among them: i) the remuneration paid to directors for their work (measured as the average remuneration of non-executive directors); ii) the number of meetings to attend; iii) the fact that the company pays attendance fees or not and their amount, if any, and, finally, iv) the average importance that the Board has for its members. This last variable is measured by calculating how many Boards each director participates in and the size of each company. If they only participate in one Board, the importance of that Board to that director will be equal to one. If they participate in more Boards, following the methodology of Masulis and Mobbs (2013), the importance of each Board is calculated as the weighted average of the asset value of each company, assuming that directors ascribe more value to participation in Boards of larger companies (they give them more visibility). The more companies that form part of a director's advisory portfolio and the smaller a company is compared to the rest of the companies in its portfolio, the closer to zero will be the importance that said director assigns to that Board.

The descriptive statistics of all these variables related to advice are shown in Table 3.3.

Descriptive statistics of the Boards in the sample   TABLE 3.3

	N	Average	Median	Standard deviation	1% percentile	99% percentile
Average tenure of the Board	1,066	6.73	6.46	4.18	0	18
Directors nominated before the CEO (%)	911	24.40	13.30	27.90	0.00	91.67
Directors with long tenure (%)	1,066	10.49	0.00	14.94	0.00	60.00
Number of directors	1,065	9.90	10	3.57	4	18
Independent directors (%)	1,065	40.90	40.00	16.90	0.00	83.30
Proprietary directors (%)	1,065	34.50	33.30	21.90	0.00	82.30
Executive directors (%)	1,065	16.90	15.30	11.70	0.00	50.00
Other external directors (%)	1,065	7.00	0.00	10.00	0.00	40.00
Female Board members (%)	1,066	14.52	13.33	11.65	0.00	41.67
Foreign directors (%)	1,066	11.57	0.00	16.81	0.00	66.67
Average number of Boards to which directors belong	1,066	1.26	1.19	0.27	1	2.10
Total number of interlocks	1,066	1.54	0	3.54	0	16
Average importance of the Board for its directors	1,066	0.81	0.90	0.27	0	1
Number of meetings	1,065	10.79	11	4.61	4	26
Meetings attended by all directors (%)	1,000	81.75	100.00	26.47	0.00	100.00
Meetings attended by at least 80% of the directors (%)	376	95.42	100.00	12.61	28.71	100.00
Average remuneration of non-executive directors (thousands of euros)	1,066	76.89	37.10	209.59	0	4054.459
Per diem payment	1,065	0.59	1	0.49	0	1
Average annual per diem (thousands of euros)	1,065	13.81	5.83	19.05	0	123.11

Source: Compiled by the authors.

3.4 Economic characteristics of companies

Different characteristics of companies may be correlated with the tenure of their directors. The relationship can be purely mechanical (for example, if the company's creation date is recent, the tenure of the directors is necessarily short), but it can also come from the selection process between directors and companies; Specifically, directors may wish to remain on the Boards of larger companies for longer (measured with the variable *total active logarithm*), more profitable (*5-year average ROA*) or less risky (*std. dev. 5-year ROA*). On the other hand, companies that are growing (companies with higher *Tobin's q*) or investing in intangible assets (companies with high *RandD expense percentage* calculated on the profit of the company) may need to incorporate new knowledge to their Board and this could reduce the tenure of their members. The ownership structure (measured as *percentage of capital concentrated in the hands of significant shareholders*) may also be relevant in this context, since it could affect the tenure of different types of directors differently. For example, it could reduce the tenure of the executive directors, as they are subject to greater control, or of the independent directors, since their impact on the final decisions of the Board will be less relevant and will less favour their reputation.

Descriptive statistics of the companies in the sample and their CEOs TABLE 3.4

	N	Average	Median	Standard deviation	1% percentile	99% percentile
Assets (thousands of euros)	1,052	29,800,000	1,107,760	140,000,000	2,951	732,000,000
Capital held by other significant shareholders (%)	1,066	54.284	58.170	25.562	0.040	99.150
Tobin's q	882	0.961	0.632	1.028	0.041	5.303
R&D expenses/Net result	963	0.006	0.000	0.708	0.000	1.485
ROA- average 5 years	1,056	0.024	0.022	0.096	-0.256	0.280
ROA- std. dev. 5 year	1,056	0.052	0.027	0.076	0.008	0.395
Tenure of CEO	1,066	9.037	6.000	9.126	0.000	39.000
CEO is the chair	1,066	0.312	0.000	0.464	0.000	1.000
Boards that change their CEO during the financial year	1,066	0.045	0.000	0.207	0.000	1.000
Total remuneration of the CEO (thousands of euros)	944	2,368	860	8,302	0	17,782
Variable compensation of the CEO (%)	926	0.229	0.203	0.214	0.000	0.795

Fuente: Compiled by the authors.

Lastly, as already explained, it is very important to understand the influence that the CEO has in keeping the directors in the position. It is to be expected that CEOs want to model the Board according to their preferences, and that the tenure of the directors tends to be less than that of the CEO (to control for this, the *CEO tenure* variable is entered). This may be more relevant when the CEO also chairs the Board (*CEO is the chair*), and especially with regard to executive and independent directors, since the CEO will have more influence on their appointments than on those of proprietary directors. On the other hand, the hypothesis is that the tenure of the directors may influence the supervisory work they carry out. To study this hypothesis, the impact of directors' tenure on the probability that the CEO will be replaced will be

measured (with the indicator variable *CEO change during the year*) and in the remuneration received (measured with a series of variables that capture both total remuneration and its composition).

Observing the descriptive statistics of these variables in the sample, in Table 3.4, it can be seen that the average company in the sample is large and mature, with few growth opportunities and rather low returns during the period.

4   Results

This section presents the results of the analysis of the determinants and the impact of the tenure of the directors.

In the first place, there is a study of which characteristics of each director, Board and company make the directors remain longer in office. In addition to the analysis at the individual level, the variables that explain the average tenure of the Board and its committees are also examined.

Secondly, the impact of tenure on the probability that the director will be appointed as a member or chairperson of the different committees of the Board is investigated.

And, finally, the aim is to know whether tenure determines the results of supervision of the Board. To this end, the impact of tenure on meeting attendance and on CEO remuneration and replacement decisions is investigated.

4.1   Determinants of the tenure of directors and Boards

4.1.1 Determinants of the tenure of directors

In the first place, the characteristics that make it more likely that a director will reach a longer tenure in the position are investigated.

For this, following the methodology of Fahlenbrach, Low and Stulz (2013), a Cox proportional hazard model is used that measures the probability of survival of the director in the position until he/she is replaced (event of interest) or until the company to which the Board belongs leaves the sample (censor event), depending on the personal characteristics of the Board member and those of the Board and the company. The advantage of using the Cox model – versus a standard regression or a logit model – is that observations can also be used for which the event of interest (the replacement of the director) does not occur during the sample time period, although it is known that it will occur at some point in the future.

The results are shown in Table 4.1.a. Since the event of interest is defined as the moment in which the director leaves the position, the variables with positive coefficients are negatively correlated with tenure. Column 1 includes only the director's personal attributes. In column 2 the characteristics of the Board are added and in

column 3 the characteristics of the company are added. In column 4 the tenure variable itself is introduced, to verify that the explanatory variables influence continuity once a certain permanence has already been reached. The last four columns show the results for independent, proprietary, other external and executive directors, respectively. All the independent and dependent variables, both in this estimation and in all the others throughout the work, are winsorised in the 1% and 99% percentiles; that is, the most extreme values are replaced by the value of the variable in these percentiles to prevent some results from biasing the estimate.

The first important result observed is that the directors who are most likely to leave the position at any given time are those whose appointment predated that of the current CEO, which seems to indicate that the latter has influence on Board appointments. This is a significant finding and confirms that the effect of tenure alone must be separated from the impact of the director's tenure compared to that of the current CEO, and the fact that the former was not appointed during the term of the CEO.

The rest of the directors' variables show clear relationships and in the expected direction. For example, non-executive directors (especially independent directors, but also proprietary directors and "others") are more likely to leave the position, which is compatible with the lesser involvement of these directors with the company, given that executive directors have an employment relationship with the company. It is also seen that the probability of remaining in the position is greater for women, which is consistent with the desire of companies to increase the percentage of female directors. The probability of staying longer also increases for directors who belong to more committees (especially if they are important committees), which, in a model of matching or mutual selection of directors and companies, may simultaneously reflect the greater value that these directors have for the company or the greater value that the position on the Board has for them. In line with this last effect, an additional factor that increases the probability of reaching greater tenure is the importance of the Board to the director, which is higher when the latter only serves on one Board or when the size of the company is larger than that of other companies to whose Boards he/she simultaneously belongs.

The Board's own variables are less important, with separation being less likely on small Boards and in those with a higher percentage of other external directors. And, among the company variables, the only important one refers to its profitability, which tends to increase permanence and can be interpreted as a reflection of the mutual satisfaction between the director and the company.

Finally, as might be expected, the probability of separation increases with tenure. However, once a long tenure has been reached (over 16 years), the probability of separation decreases, which seems to indicate a different pattern in the separations of directors with very long tenure.[4]

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4   When the variable of tenure the significance of having been appointed before the CEO decreases. This is because both variables are correlated. This was confirmed in additional analyses in which the interaction term between the two was introduced, finding that both variables are significant and the interaction term is negative.

The results for the different types of directors are similar. The most interesting differences refer to the effect of chairing important committees in the case of proprietary directors (which reduces the chances of permanence). This seems logical within the period studied, which has been characterised by a change in regulations that has led to the replacement of proprietary directors by independent directors in the most important committees. It is also very interesting to verify the different impact of the variables that refer to the average salary of directors, the size of the company and the ownership structure. The effects of salary and size could be due to the different incentives of independent and proprietary directors. The reputational effect (correlated with size) could be expected to be more important for independent directors and to motivate them to stay in their position in larger companies. However, for their part, proprietary directors seem more motivated by the salary received. And, logically, a greater concentration of ownership is positively correlated with the permanence of the proprietary directors, but it is not related to that of the independent directors. The results for other external and executive directors are more difficult to interpret due to the smaller number of observations.

Probability of separation of the director from the position TABLE 4.1.A

Variables	(1)	(2)	(3)	(4)	(5) Independent	(6) Proprietary	(7) Other external	(8) Executive
Tenure of director				0.1621***				
				(0.0191)				
Tenure of director^2				-0.0050***				
				(0.0008)				
Independent	1.2137***	1.1477***	1.1386***	1.2421***				
	(0.1373)	(0.1321)	(0.1471)	(0.1569)				
Proprietary	0.8107***	0.8468***	0.8534***	0.9753***				
	(0.1322)	(0.1298)	(0.1422)	(0.1553)				
Other external	0.9986***	1.0715***	1.0305***	1.0559***				
	(0.1616)	(0.1525)	(0.1717)	(0.1707)				
Prior to CEO	0.7226***	0.7290***	0.6701***	0.1119	0.9831***	0.3361***	0.2738	1.7405***
	(0.0902)	(0.0904)	(0.1038)	(0.1355)	(0.1821)	(0.1201)	(0.2631)	(0.2532)
Foreign nationals	-0.1076	-0.1359	-0.1070	0.0360	-0.0396	-0.2287*	-0.6862	0.9309***
	(0.0971)	(0.0958)	(0.1128)	(0.1104)	(0.1825)	(0.1339)	(0.5112)	(0.3131)
Women	-0.4057***	-0.4180***	-0.4126***	-0.2871***	-0.3718***	-0.5302***	-0.1544	-0.5292
	(0.0814)	(0.0786)	(0.0777)	(0.0824)	(0.0931)	(0.1784)	(0.2907)	(0.4828)
No. of Boards to which they belong	-0.0683	-0.0642	-0.0000	-0.0233	0.0009	-0.0438	0.0507	0.0613
	(0.0677)	(0.0634)	(0.0814)	(0.0826)	(0.1034)	(0.1457)	(0.2221)	(0.3847)
No. of interlocks to which they belong	0.0696	0.0601	-0.0302	-0.0294	-0.0682	-0.0374	-0.7009*	0.0440
	(0.0675)	(0.0672)	(0.0728)	(0.0744)	(0.1093)	(0.1088)	(0.3776)	(0.3326)
Top Board to which they belong	-0.3278***	-0.2805***	-0.3313**	-0.3446**	-0.2948	-0.5397**	0.2369	0.3209
	(0.0911)	(0.0927)	(0.1454)	(0.1402)	(0.1871)	(0.2381)	(0.3197)	(0.5134)
No. of committees to which they belong	-1.1266***	-1.1449***	-1.3027***	-1.3484***	-1.0637***	-1.3333***	-0.9570***	-3.0275***

TABLE 4.1.A

Probability of separation of the director from the position (*continuation*)

Variables	(1)	(2)	(3)	(4)	(5) Independent	(6) Proprietary	(7) Other external	(8) Executive
	(0.1380)	(0.1383)	(0.1626)	(0.1635)	(0.2302)	(0.2655)	(0.3702)	(0.6357)
Belongs to important committee	-0.6217***	-0.5838***	-0.4652***	-0.3975**	-1.0348***	-0.1558	-0.6725	2.8612***
	(0.1599)	(0.1627)	(0.1767)	(0.1811)	(0.2620)	(0.2711)	(0.4586)	(0.9406)
Chairs an important committee	-0.1961	-0.0931	0.0128	0.0456	-0.0775	1.9114***	1.3798*	-30.8173***
		(0.1679)	(0.1718)	(0.1781)	(0.1770)	(0.2230)	(0.5025)	(0.7527)	(1.2523)
No. of directors		0.0498***	0.0806***	0.0894***	0.0519**	0.1000***	0.0358	0.1013***
		(0.0137)	(0.0195)	(0.0198)	(0.0264)	(0.0289)	(0.0418)	(0.0369)
No. of meetings		0.0100	-0.0041	0.0036	0.0008	-0.0232	-0.0390	0.0307
		(0.0116)	(0.0110)	(0.0114)	(0.0190)	(0.0159)	(0.0348)	(0.0278)
% independent		-0.0985	-0.8604	-0.5471	-1.3458	-1.0257	-2.4647	2.6178
		(0.6929)	(0.6636)	(0.7299)	(1.0262)	(0.9000)	(2.8191)	(2.0278)
% proprietary directors		-0.8033	-1.1980**	-1.0600	-0.5157	-1.9029**	-3.4337	1.1100
		(0.5901)	(0.5949)	(0.6461)	(0.8818)	(0.8028)	(2.4628)	(1.7824)
% other external		-1.3450*	-1.9584**	-1.9247**	-1.4450	-2.0584*	-7.8331**	3.2239
		(0.7774)	(0.9072)	(0.9343)	(1.1906)	(1.2040)	(3.6405)	(2.5340)
CEO is the chair		0.2176**	0.0335	0.0777	0.1375	0.0724	0.2615	-0.0406
		(0.1000)	(0.1327)	(0.1310)	(0.1380)	(0.1748)	(0.3497)	(0.3193)
Tenure of CEO		0.0019	0.0031	-0.0147**	0.0044	-0.0051	-0.0054	0.0285**
		(0.0056)	(0.0063)	(0.0069)	(0.0089)	(0.0078)	(0.0188)	(0.0137)
Average remuneration of directors		-0.0004	-0.0007	-0.0010	0.0004	-0.0020**	0.0018	-0.0003
		(0.0004)	(0.0006)	(0.0006)	(0.0007)	(0.0009)	(0.0019)	(0.0018)
% concentrated capital			-0.0033	-0.0016	-0.0029	-0.0108**	0.0027	0.0177**
			(0.0032)	(0.0033)	(0.0037)	(0.0046)	(0.0065)	(0.0072)
Total asset log			-0.0499	-0.0523	-0.1055*	-0.0439	-0.0223	-0.0970
			(0.0413)	(0.0427)	(0.0549)	(0.0561)	(0.0950)	(0.0859)
Tobin's q			-0.0077	0.0042	-0.0952	0.0796	-0.0979	-0.0644
			(0.0584)	(0.0592)	(0.1178)	(0.0761)	(0.1967)	(0.1267)
% R&D costs			0.0685	-0.0039	0.0211	0.1071	-0.1670	0.2330
			(0.1713)	(0.1718)	(0.2483)	(0.2042)	(0.5570)	(0.1872)
ROA (average 5 years)			-0.0331***	-0.0320***	-0.0135	-0.0420***	-0.0158	-0.0794***
			(0.0081)	(0.0085)	(0.0108)	(0.0113)	(0.0154)	(0.0224)
Std. dev. ROA (5 years)			0.0113	0.0128	0.0222**	-0.0036	0.0307**	-0.0118
			(0.0078)	(0.0087)	(0.0100)	(0.0119)	(0.0144)	(0.0170)
No. of observations	9,914	9,906	8,041	8,041	3,220	2,898	570	1,353

This table presents the results of a Cox proportional hazards model that measures the probability of survival of the director in the position until he/she is replaced (event of interest) or until the company to which he/she belongs leaves the sample (censor event) in depending on the personal characteristics of the director and those of the Board and the company. Column (1) includes those of the director in the explanatory variables, column (2) additionally incorporates the characteristics of the Board and column (3) those of the company. Column (4) additionally includes the tenure variable and columns (5) to (8) repeat the central estimate, restricting the sample respectively to independent, proprietary, other external and executive directors. All variables have been winsorised at the 1% and 99% percentiles. The robust errors grouped by company appear in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

4.1.2 Determinants of the average tenure of Boards

Since the Board is a body in which decisions are made by majority, it is important to look not only at the individual determinants of tenure, but also at how aggregation effects determine average Board tenure. For this, a fixed effects model is estimated in which the average tenure of the Board (column 1), the percentage of directors with long tenure, with 16 or more years of service (column 2), and average tenure of the different categories of directors (columns 3, 4, 5 and 6). Explanatory variables include other characteristics of the Board and the company.

The results, shown in Table 4.1.b, indicate that the Boards with the longest tenure also tend to be the smallest, with less activity (fewer meetings), fewer women and fewer foreigners, but with more Board members belonging to the category of other external directors or who have positions in various companies. Furthermore, the Boards with the longest tenure tend to be those of larger companies with more stable results. It is confirmed that the CEO has an influence on the composition of the Board by age, since tenure is positively correlated with the tenure of the CEO. In addition, this influence is greater when the CEO is also the chair. However, the impact in the case of independent directors is not significant, possibly due to the more important effect of the regulatory changes, already mentioned. The results of the categories of other external directors show a very different behaviour, which may be due to the fact that this seems to be a residual category in which directors with very long tenure fall (although in this case the number of observations is small).

Variables	(1) Average tenure of the Board	(2) % with very long tenure	(3) Average tenure of indep. directors	(4) Average tenure of proprietary directors	(5) Average tenure of other external directors	(6) Average tenure of executive directors
No. of directors	-0.1274***	-0.0010	-0.1361***	-0.1751***	0.2756*	-0.1591**
	(0.0382)	(0.0013)	(0.0506)	(0.0473)	(0.1537)	(0.0651)
No. of meetings	-0.0443	-0.0022	-0.0632*	0.0132	0.1919**	-0.0507
	(0.0313)	(0.0013)	(0.0379)	(0.0403)	(0.0767)	(0.0515)
% independent	-1.4087	-0.0383	2.3113	-0.0956	12.8390***	-1.3400
	(1.4261)	(0.0582)	(1.9776)	(2.7692)	(2.9962)	(2.9219)
% proprietary directors	-0.3795	-0.0226	1.7073	-3.8380	11.4888***	0.4129
	(1.2750)	(0.0507)	(1.7572)	(2.8559)	(3.6649)	(2.4492)
% other external	3.1033**	0.0476	-4.1947*	3.0124	11.6908***	1.8786
	(1.4949)	(0.0643)	(2.3250)	(3.7106)	(4.0967)	(2.8190)
% women	-0.7770	-0.1086*	-10.3901***	4.6566**	5.9117**	2.2886
	(1.1883)	(0.0635)	(2.1504)	(2.1140)	(2.8043)	(2.1853)
% foreigners	-2.6851**	-0.0051	-1.3918	-4.0630*	-1.4713	-0.4933
	(1.1399)	(0.0267)	(1.5728)	(2.1506)	(2.6577)	(2.7507)
Average number of Boards to which directors belong	-0.8404	-0.0248	-0.9286	-1.4052	2.2618	0.1811
	(0.8323)	(0.0288)	(0.8894)	(1.3414)	(1.8165)	(0.9216)
No. of interlocks	0.0344	0.0021	0.0204	0.1035	-0.1549*	0.1681***
	(0.0383)	(0.0016)	(0.0649)	(0.0734)	(0.0786)	(0.0586)
Average importance of the Board for directors	-1.5010***	0.0106	-2.3449***	-1.5835*	-1.0358	0.2934
	(0.4921)	(0.0202)	(0.8402)	(0.8677)	(1.7029)	(0.5243)
CEO is the chair	-0.6300*	-0.0173	-0.1452	-1.1434**	-1.1798	-2.6970***
	(0.3345)	(0.0124)	(0.4182)	(0.4624)	(1.0005)	(0.9007)
Tenure of CEO	0.1162***	0.0025**	0.0120	0.0612	0.0486	0.5019***
	(0.0208)	(0.0011)	(0.0269)	(0.0440)	(0.0627)	(0.0683)
Average remuneration of directors	0.0003	0.0000	-0.0017*	0.0011	-0.0016	0.0006
	(0.0005)	(0.0000)	(0.0010)	(0.0011)	(0.0015)	(0.0010)
% concentrated capital	-0.0084	0.0000	-0.0071	-0.0124	0.0296	-0.0046
	(0.0064)	(0.0002)	(0.0093)	(0.0096)	(0.0211)	(0.0110)
Total asset log	0.4576	0.0195**	0.1056	-0.0416	3.0352***	0.7059
	(0.2961)	(0.0093)	(0.3906)	(0.5399)	(1.0715)	(0.5714)
Tobin's q	-0.0461	0.0028	-0.1949	-0.1466	0.0793	-0.1635
	(0.2102)	(0.0070)	(0.2326)	(0.3778)	(0.3645)	(0.2826)
% R&D costs	0.0065	0.0081	-0.1402	-0.6204*	0.8715	0.1221
	(0.2759)	(0.0068)	(0.3740)	(0.3189)	(1.2992)	(0.3356)
ROA (average 5 years)	-0.0009	-0.0000	-0.0325	0.0054	-0.0114	0.0193
	(0.0218)	(0.0009)	(0.0318)	(0.0336)	(0.0527)	(0.0343)
Std. dev. ROA (5 years)	-0.0476*	0.0001	-0.0305	-0.0520*	-0.0399	-0.0353
	(0.0275)	(0.0011)	(0.0404)	(0.0271)	(0.0524)	(0.0292)

Variables	(1) A¡verage tenure of the Board	(2) % with very long tenure	(3) Average tenure of indep. directors	(4) Average tenure of proprietary directors	(5) Average tenure of other external directors	(6) Average tenure of executive directors
Constant	5.5536	-0.0931	9.6066*	14.7009*	-50.1535***	-2.5357
	(4.2365)	(0.1408)	(5.7567)	(8.4054)	(16.7305)	(8.2873)
No. of observations	879	879	868	802	401	785
R^2	0.240	0.082	0.190	0.129	0.221	0.513
Number of different companies	144	144	144	141	100	135

This table presents the results of an estimate of fixed effects where the dependent variable is in column (1) the average tenure of the directors of the company, in column (2) the % of directors with long tenure and in columns (3) , (4), (5) and (6) the average tenure of the independent, proprietary, other external and executive directors. All variables have been winsorised at the 1% and 99% percentiles. The robust errors grouped by company appear in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

4.2 Influence of director's length of tenure on their participation in and chairing of committees

The Board delegates very important supervisory functions to the committees, such as the appointment and remuneration of directors and executives, the verification of the internal control and the choice of external auditors. Presence on a committee entails, on the part of the director, a higher level of commitment to the company and, on the part of the Board, greater confidence in the director's judgment. Therefore, the impact that tenure has on committee membership should be investigated.

Table 4.2.a shows the results of the estimations made with a probit model. In columns 1 to 4, the dependent variable is the total number of committees to which they belong, and the estimate is made with an ordered probit; in column 5, the membership or not of any important committee (committees in charge of audit tasks, appointments or remuneration), and the estimate is made with an ordinary probit model. The last columns of the table repeat the estimate for the number of committees to which one belongs, restricting the sample according to the different categories of director.

In all cases, tenure has a very important impact on membership in committees, furthermore, the impact is not linear. The probability of belonging to a committee increases as tenure increases up to 13-16 years and then decreases. This result holds when restricted to major committees. This could indicate that a number of years of experience in the company is necessary to have sufficient knowledge and competence, but it may also suggest that a probationary period ensuring loyalty is required to obtain the position. However, when we separate by type of director, it is seen that this effect of tenure disappears for independent directors. It does not seem that this result is due to the fact that tenure is immaterial in the case of independent directors, but rather to the specific needs and changes in regulation in the period studied. As already observed in the descriptive statistics, during the years in the sample, companies have had to rapidly increase the number of independent directors to comply with the new legal requirements, especially with regard to the structure of

audit committees, appointments and remuneration, which must be made up of a majority of independent directors. In other words, there are still few independent directors with a long tenure and this interferes with the estimation. This is consistent with the fact that the proportion of independent directors has a negative effect on the probability of belonging to committees.

Effect of tenure on the probability of belonging to committees TABLE 4.2.A

Variables	(1) No. of committees	(2) No. of committees	(3) No. of committees	(4) No. of committees	(5) Important committee	(6) Independ.	(7) Proprietary	(8) Other external	(9) Executive
Tenure of director	-0.0110***	0.0236**	0.0516***		0.0291**	0.0229	0.0856***	0.0315	0.1275**
	(0.0036)	(0.0096)	(0.0121)		(0.0135)	(0.0203)	(0.0190)	(0.0607)	(0.0502)
Tenure of director^2		-0.0014***	-0.0016***		-0.0011**	-0.0009	-0.0024***	0.0007	-0.0034**
		(0.0004)	(0.0004)		(0.0005)	(0.0009)	(0.0007)	(0.0018)	(0.0014)
Tenure 5-8 years				0.1690***					
				(0.0547)					
Tenure 9-12 years				0.2472***					
				(0.0793)					
Tenure 13-16 years				0.3598***					
				(0.0984)					
Tenure 17 years and over				0.1846*					
				(0.0947)					
Independent			1.5955***	1.5915***	3.0591***				
			(0.1029)	(0.1038)	(0.1107)				
Proprietary			0.7632***	0.7566***	2.0286***				
			(0.0892)	(0.0892)	(0.1242)				
Other external			0.8904***	0.8885***	2.0972***				
			(0.1177)	(0.1184)	(0.1396)				
Prior to CEO			-0.1205*	-0.0993	-0.0734	0.0936	-0.2171	-0.3109	-0.8803***
			(0.0708)	(0.0674)	(0.0861)	(0.0888)	(0.1382)	(0.3106)	(0.2877)
Foreign nationals			-0.1852**	-0.1895**	-0.1605	-0.3687**	0.0044	-0.4942	0.8192***
			(0.0825)	(0.0822)	(0.1083)	(0.1453)	(0.1685)	(0.4196)	(0.3139)
Women			-0.1645**	-0.1714**	-0.0145	-0.1599*	-0.2283	0.1898	1.2774*
			(0.0718)	(0.0726)	(0.0914)	(0.0870)	(0.2319)	(0.4095)	(0.7155)
No. of Boards to which they belong			0.0691	0.0705	0.0788	-0.0420	0.2596***	-0.0981	0.0139
			(0.0570)	(0.0566)	(0.0623)	(0.0796)	(0.0887)	(0.1769)	(0.2478)
No. of interlocks to which they belong			-0.0064	-0.0068	-0.0557	-0.1037*	-0.0801	0.0424	0.3211**
			(0.0554)	(0.0554)	(0.0619)	(0.0566)	(0.0991)	(0.1236)	(0.1259)
Top Board to which they belong			-0.0470	-0.0445	-0.0712	-0.1760	0.0815	-0.1412	0.1911
			(0.0899)	(0.0898)	(0.0859)	(0.1170)	(0.1580)	(0.1924)	(0.2388)
No. of directors			-0.0635***	-0.0669***	-0.0791***	-0.1006***	-0.0514***	-0.0701	-0.0335
			(0.0102)	(0.0101)	(0.0115)	(0.0166)	(0.0157)	(0.0474)	(0.0374)
No. of meetings			0.0159*	0.0154	-0.0045	0.0328**	0.0151	0.0062	-0.0268
			(0.0095)	(0.0096)	(0.0088)	(0.0147)	(0.0113)	(0.0326)	(0.0335)
% independent			-0.7695**	-0.7179**	-1.2580**	-1.4450***	0.0346	-0.6048	0.2446
			(0.3654)	(0.3610)	(0.4913)	(0.5039)	(0.7469)	(1.6114)	(1.3715)
% proprietary directors			-0.1838	-0.1307	-0.8101	-0.4436	0.7542	-2.4610	0.4105
			(0.3490)	(0.3482)	(0.5508)	(0.4525)	(0.7494)	(1.8801)	(1.3429)

Variables	(1) No. of committees	(2) No. of committees	(3) No. of committees	(4) No. of committees	(5) Important committee	(6) Independ.	(7) Proprietary	(8) Other external	(9) Executive
% other external			0.1778	0.2237	-0.5657	0.0486	1.0027	1.4816	0.6215
			(0.3996)	(0.3975)	(0.5050)	(0.4994)	(0.7416)	(1.7113)	(1.6005)
CEO is the chair			0.0207	0.0139	0.1109	-0.0077	0.1173	-0.4973	-0.0350
			(0.0737)	(0.0735)	(0.0924)	(0.1243)	(0.1070)	(0.3924)	(0.2880)
Tenure of CEO			0.0001	0.0006	-0.0052	0.0089	0.0043	-0.0272	-0.0127
			(0.0046)	(0.0046)	(0.0053)	(0.0099)	(0.0059)	(0.0259)	(0.0200)
Average remuneration of directors			-0.0002	-0.0002	-0.0004**	-0.0001	-0.0004	-0.0009	0.0011
			(0.0002)	(0.0002)	(0.0002)	(0.0001)	(0.0004)	(0.0009)	(0.0007)
% concentrated capital			-0.0047***	-0.0047***	-0.0001	-0.0033	-0.0056**	-0.0166**	-0.0126*
			(0.0017)	(0.0016)	(0.0018)	(0.0024)	(0.0028)	(0.0081)	(0.0070)
Total asset log			0.0828	0.0881	0.1365	0.2415**	-0.0282	0.5348	-0.5128**
			(0.0644)	(0.0642)	(0.0873)	(0.1038)	(0.1154)	(0.4213)	(0.2409)
Tobin's q			-0.0447	-0.0470	-0.0822	-0.0796	0.0543	-0.0245	-0.2952
			(0.0461)	(0.0455)	(0.0507)	(0.0819)	(0.0629)	(0.2398)	(0.1825)
% R&D costs			0.0719*	0.0619	0.0698	0.0492	0.0837	0.1866	-0.0107
			(0.0373)	(0.0387)	(0.0553)	(0.0513)	(0.0835)	(0.3419)	(0.1277)
ROA (average 5 years)			-0.0009	-0.0012	-0.0040	0.0021	-0.0005	0.0218	0.0018
			(0.0045)	(0.0046)	(0.0054)	(0.0102)	(0.0080)	(0.0220)	(0.0180)
Std. dev. ROA (5 years)			-0.0027	-0.0028	-0.0019	0.0016	-0.0179**	-0.0142	-0.0339
			(0.0047)	(0.0047)	(0.0054)	(0.0073)	(0.0079)	(0.0139)	(0.0214)
Constant					-1.8477				
					(1.3054)				
No. of observations	11,056	11,056	8,041	8,041	8,041	3,220	2,898	570	1,353
Fixed effects no. of committees	YES	YES	YES	YES		YES	YES	YES	YES
Company fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES

This table presents the results of a probit model that measures the probability that a director belongs to Board committees. In columns (1) to (4) the dependent variable is the number of committees to which they belong and the estimate is made using an ordered probit. In column (5) the dependent variable is belonging or not to an important committee (audit, appointments and/or remunerations) and the estimation is made with an ordinary probit. In columns (6) to (9) the estimate for the number of committees is repeated, restricting the sample respectively to independent, proprietary, other external and executive directors. All variables have been winsorised at the 1% and 99% percentiles. The robust errors grouped by company appear in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Therefore, to investigate this problem further, Table 4.2.b repeats the analysis, but focused on the chairing of the committees. The idea is that chairing a committee indicates greater responsibility and involvement. The fact of focusing on the chair makes it possible to elucidate whether, taking into account the restriction imposed by the need to have a sufficient number of independent directors in the committees, it is those with the longest tenure who are most likely to chair them. The dependent variable is a variable that indicates whether or not they chair an important committee of which they are a part. In the last two columns, the sample is restricted to independent and proprietary directors (the measurement is not made for other external directors or for executives, due to the small number of cases of chairs of committees within these categories). The most interesting result is that the probability of chairing a committee also increases with tenure for independent directors.

These results regarding tenure are maintained even when controlling for the variables of the director and the company. As already explained, the regulation means that independent directors are the most likely to form part of the committees and executive directors (reference category in the estimate) the least likely. More unexpected is the fact that foreigners and women are less likely to belong to committees and, while on them, to chair them. There may be several explanations for this. For example, in the case of foreigners, if they live in another country, less involvement on their part would be expected. In the case of women there are two possible interpretations, one on the side of involvement and the other on the side of trust. If it is difficult to find female directors, companies will try to make the position more attractive by demanding less involvement from them. But it is also possible that there is a lack of trust. That is, there could be what is called a token effect (Kanter, 1977), which would have to do with the need to include women on Boards due to external pressures, but without much conviction (Farrel and Hersch, 2005).

The results that have been found so far, both with regard to the importance of the characteristics of the director, the Board and the company in determining the probability of remaining in office and the importance of tenure in the appointment for the committees, suggest that the directors with the longest tenure have a different level of influence on Board decisions. What we want to determine next is what is the meaning of this different influence and its impact on the supervisory tasks that the Board performs.

Reports and analysis. Determinants and impact of directors' tenure

Effect of tenure on the probability of chairing an important committee

TABLE 4.2.B

Variables	(1)	(2)	(3)	(4)	(5) Independ.	(6) Proprietary
Tenure of director	-0.0388***	-0.0121	0.0495**		0.0924***	-0.0920
	(0.0052)	(0.0189)	(0.0211)		(0.0256)	(0.0819)
Tenure of director^2		-0.0012	-0.0017**		-0.0035***	0.0028
		(0.0010)	(0.0008)		(0.0011)	(0.0023)
Tenure 5-8 years				0.2190**		
				(0.0928)		
Tenure 9-12 years				0.1341		
				(0.1198)		
Tenure 13-16 years				-0.0389		
				(0.1911)		
Tenure 17 years and over				-0.1504		
				(0.2043)		
Independent			3.4231***	3.3267***		
			(0.3465)	(0.3337)		
Proprietary			1.0184***	0.9716***		
			(0.3479)	(0.3385)		
Other external			1.2462***	1.2898***		
			(0.3731)	(0.3640)		
Prior to CEO			0.0270	0.1335	-0.0173	0.4681
			(0.1086)	(0.0984)	(0.1282)	(0.4780)
Foreign nationals			-0.3567***	-0.3520***	-0.3226**	-0.0862
			(0.1099)	(0.1089)	(0.1298)	(0.4312)
Women			-0.2303**	-0.2478**	-0.2394*	-0.6067
			(0.1148)	(0.1140)	(0.1240)	(1.3314)
No. of Boards to which they belong			0.0543	0.0558	0.0859	-0.0338
			(0.0773)	(0.0774)	(0.0870)	(0.6286)
No. of interlocks to which they belong			-0.1135	-0.1149	-0.1084	0.1312
			(0.0936)	(0.0923)	(0.1096)	(0.4550)
Top Board to which they belong			-0.1159	-0.1225	-0.1226	0.0285
			(0.1080)	(0.1077)	(0.1219)	(0.6637)
No. of directors			-0.0128	-0.0164*	-0.0149	-0.0782
			(0.0087)	(0.0088)	(0.0103)	(0.0754)
No. of meetings			-0.0010	-0.0006	-0.0009	-0.0392
			(0.0085)	(0.0084)	(0.0103)	(0.0333)
% independent			-1.8227***	-1.7353***	-1.5137***	-1.8895
			(0.4165)	(0.4059)	(0.5041)	(3.2571)
% proprietary directors			0.4144	0.4528	0.5884	-3.3114
			(0.3471)	(0.3432)	(0.4834)	(2.4176)
% other external			0.4511	0.4483	0.5589	2.7724
			(0.4427)	(0.4270)	(0.5204)	(2.6134)

Variables	(1)	(2)	(3)	(4)	(5) Independ.	(6) Proprietary
CEO is the chair			0.0519	0.0548	0.0707	-0.4008
			(0.0681)	(0.0702)	(0.0926)	(0.5976)
Tenure of CEO			-0.0046	-0.0021	-0.0067	0.0112
			(0.0051)	(0.0050)	(0.0063)	(0.0192)
Average remuneration of directors			-0.0002	-0.0002	-0.0002	0.0021
			(0.0001)	(0.0001)	(0.0001)	(0.0019)
% concentrated capital			-0.0013	-0.0016	0.0028	-0.0031
			(0.0014)	(0.0014)	(0.0018)	(0.0056)
Total asset log			-0.1368*	-0.1295*	-0.2539**	-0.4094
			(0.0725)	(0.0729)	(0.1001)	(0.5787)
Tobin's q			0.0109	0.0060	-0.0015	0.4784
			(0.0386)	(0.0368)	(0.0636)	(0.6031)
% R&D costs			-0.0156	-0.0278	0.0171	-23.4996***
			(0.0362)	(0.0353)	(0.0625)	(5.4076)
ROA (average 5 years)			-0.0053	-0.0043	-0.0127*	0.0547**
			(0.0057)	(0.0054)	(0.0072)	(0.0251)
Std. dev. ROA (5 years)			0.0118	0.0104	0.0074	0.0798*
			(0.0081)	(0.0079)	(0.0088)	(0.0439)
Constant	-0.7698***	-0.8223***	-1.0262	-0.9366	3.2880**	8.1866
	(0.0370)	(0.0470)	(1.1060)	(1.1114)	(1.4442)	(8.7790)
No. of observations	7,418	7,418	5,370	5,370	2,666	418
Company fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES

This table presents the results of a probit model that measures the probability that a director chairs a committee to which they belong. We only consider the committees in charge of auditing, appointments and/or remuneration. The dependent variable indicates whether they chair any of these committees. In columns (5) and (6) the central estimate is repeated, restricting the sample respectively to independent and proprietary directors. The robust errors grouped by company appear in parentheses. All variables have been winsorised at the 1% and 99% percentiles. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

4.3   Impact of tenure on attendance at Board meetings

Attendance at Board meetings is essential for the director to be well informed, vote and influence the decisions that are adopted. Directors who attend more meetings show a greater degree of commitment to the company and the aim is to know whether this changes with longer tenure in the position. Data on attendance at Board meetings are not available at an individual level, but rather at an aggregate level, which indicates the percentage of meetings that are held with the attendance of all directors or at least 80%. Therefore, these variables are taken as independent variables and an estimation of fixed effects is made in which the control is carried out according to the characteristics of the Board and the company.

The results are shown in Table 4.3.a. No effect of average tenure is observed on the percentage of meetings with high attendance, whether the percentage is introduced of directors with long tenure or the that of tenure longer than that of the CEO. However, when the effect of tenure is separated for independent and proprietary directors (in Table 4.3.b), it is observed that the tenure of independent directors has a negative impact on attendance. Therefore, it can be said that the independent directors with the longest tenure seem to show a lower degree of commitment to the company.

Some of the results found for certain control variables are also interesting. As might be expected, the larger the Board, the more difficult it is for all the directors to attend. Likewise, it is observed that a greater concentration of ownership has a positive impact on the level of attendance, possibly because in this case[5] proprietary directors are more motivated to attend. An unexpected result is that the average importance of the advice for directors has a negative impact on attendance. It should be remembered that this variable has been calculated for each director as the weighted average of the asset value of each company to which they belong. Therefore, at the aggregate level (mean importance of the Board for its directors), this variable is highly correlated with the size of the company, which indicates that the Boards of larger companies have more attendance problems.

Effect of tenure of the Board on meeting attendance   TABLE 4.3.A

Variables	(1)	(2)	(3)	(4)	(5)	(6)
			% meetings with everyone			% meetings with 80%
Average tenure of the Board	-0.0032	0.0042	-0.0086	-0.0073		0.0014
	(0.0054)	(0.0132)	(0.0083)	(0.0088)		(0.0076)
Average tenure of the Board^2		-0.0005				
		(0.0007)				
% of directors with very long tenure					0.1363	
					(0.1983)	
% directors predating the CEO			-0.0596	-0.0119	-0.0427	0.0249
			(0.0678)	(0.0894)	(0.0796)	(0.0431)
Per diems are paid			-0.0656*	-0.1067**	-0.1157***	-0.0091
			(0.0383)	(0.0438)	(0.0406)	(0.0269)
No. of directors			-0.0177***	-0.0160***	-0.0140***	-0.0104***
			(0.0047)	(0.0057)	(0.0052)	(0.0031)
No. of meetings			0.0006	0.0015	0.0022	0.0001
			(0.0029)	(0.0039)	(0.0041)	(0.0053)
% independent			-0.1249	-0.1831	-0.1868	-0.0114
			(0.1695)	(0.2033)	(0.2069)	(0.4362)

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5   To determine if this is the case, the interaction term between ownership concentration and the percentage of proprietary directors is introduced in additional regressions and found to have a positive impact on attendance.

Variables	(1)	(2)	(3)	(4)	(5)	(6) % meetings with 80%
				% meetings with everyone		
% proprietary directors			-0.1329	-0.1625	-0.1638	0.1048
			(0.1325)	(0.1515)	(0.1528)	(0.3152)
% other external			-0.1603	-0.2191	-0.2685	0.1040
			(0.1985)	(0.2512)	(0.2668)	(0.3796)
% women			0.4874***	0.5493***	0.5615***	-0.1161
			(0.1357)	(0.1606)	(0.1606)	(0.2164)
% foreigners			0.0284	-0.0642	-0.0444	-0.1888
			(0.1629)	(0.1918)	(0.1872)	(0.2353)
Average number of Boards to which directors belong			-0.1102	-0.1297	-0.1275	-0.0982
			(0.0811)	(0.0878)	(0.0887)	(0.0996)
No. of interlocks			-0.0016	-0.0014	-0.0020	0.0037
			(0.0058)	(0.0057)	(0.0057)	(0.0058)
Average importance of the Board for directors			-0.0577	-0.1363*	-0.1327*	-0.0582
			(0.0556)	(0.0764)	(0.0758)	(0.0384)
CEO is the chair			-0.0169	-0.0147	-0.0090	-0.0050
			(0.0404)	(0.0464)	(0.0459)	(0.0279)
Tenure of CEO			0.0016	0.0024	0.0009	0.0013
			(0.0062)	(0.0068)	(0.0066)	(0.0019)
Average remuneration of directors			-0.0000	0.0000	0.0000	-0.0000
			(0.0000)	(0.0001)	(0.0001)	(0.0001)
% concentrated capital				0.0017*	0.0018**	0.0002
				(0.0009)	(0.0009)	(0.0017)
Total asset log				-0.0430	-0.0496	-0.0310
				(0.0484)	(0.0472)	(0.0340)
Tobin's q				0.0081	0.0086	0.0022
				(0.0269)	(0.0265)	(0.0070)
% R&D costs				-0.0238	-0.0220	0.0165
				(0.0464)	(0.0468)	(0.0282)
ROA (average 5 years)				0.0002	-0.0001	0.0042**
				(0.0028)	(0.0029)	(0.0018)
Std. dev. ROA (5 years)				0.0004	0.0004	0.0018
				(0.0023)	(0.0023)	(0.0018)
Constant	0.8388***	0.8195***	1.3285***	1.9279***	1.9418***	1.6193***
	(0.0360)	(0.0516)	(0.1605)	(0.6569)	(0.6686)	(0.5289)
No. of observations	1,000	1,000	853	706	706	270
R^2	0.001	0.001	0.074	0.083	0.083	0.097
Number of different companies	170	170	153	130	130	102

This table presents the results of an estimate of fixed effects where the dependent variable is, in columns (1) to (5), the percentage of Board meetings that are held with all members present and, in column (6), the percentage with at least 80% of its members present. All variables have been winsorised at the 1% and 99% percentiles. The robust errors grouped by company appear in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Effect of tenure of independent and proprietary directors on attendance at meetings

TABLE 4.3.B

Variables	(1)	(2)	(3)
	% meetings with everyone		
Average tenure of independent directors	-0.0098**		
	(0.0039)		
Average tenure of proprietary directors	-0.0012		
	(0.0064)		
% of independent directors with very long tenure		-0.1907**	
		(0.0854)	
% of proprietary directors with very long tenure		0.0926	
		(0.1006)	
% independent directors predating the CEO			0.1091
			(0.1912)
% proprietary directors predating the CEO			-0.2886
Other controls	YES	YES	YES
Constant	1.6734***	1.5919***	1.9696***
	(0.5241)	(0.5612)	(0.6438)
No. of observations	752	756	706
R^2	0.103	0.099	0.088
Number of different companies	138	140	130

This table presents the results of an estimate of fixed effects where the dependent variable is the percentage of Board meetings that are held with all Board members present. To save space, the results of all the control variables are not shown, which are the same as in Table 5.3.a. All variables have been winsorised at the 1% and 99% percentiles. The robust errors grouped by company appear in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Perhaps the most striking result regarding the control variables is that the payment of per diems is negatively related to attendance. This could be interpreted in two different ways. In the first place, it is possible that the companies that pay per diems for attendance are those in which the directors have more difficulties in attending the meetings, for example, because the headquarters are in more distant places or because there is a higher percentage of foreign directors. However, when studying the data, there is no significant correlation between the percentage of foreigners and the payment of per diems or their amount.[6] In addition, if the per diems were paid for having to travel to a more distant headquarters, it seems obvious that the average per diem of €1,280 would be insufficient to overcome this disadvantage, especially when compared with the average annual remuneration of non-executive directors of more than of €76,000.[7] Second, it is possible that per diems, by putting a price on attendance and generating a monetary incentive, reduce the intrinsic motivation of directors (Gneezy and Rustichini, 2000). In addition, the negative impact of the

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6   In additional regressions, the interaction term between the payment of per diems and the percentage of foreigners on the Board is also introduced, which is not significant in any case.

7   The average per diem has been calculated as the average annual per diem per director (€13,810) divided by the average number of annual Board meetings (10.79).

existence of a price could in this case be reinforced by the reduced amount of the per diem. The effect of intrinsic motivation would also be consistent with the fact that Boards with more women have higher attendance. Women's increased motivation to attend may reveal their desire not to be mere token appointments.

4.4 Impact of tenure on CEO remuneration

It is very difficult to determine what the optimal level of CEO compensation is. The high remunerations that are observed could respond to optimal contractual solutions in more complex and risky environments (Gabaix and Landier, 2008; Tervio, 2008), but they could also be due to agency problems and the excessive power of the CEO within the company, which allows you to obtain unjustified remuneration (Bebchuk and Fried, 2003). However, there is more agreement that in order to be better aligned with the interests of shareholders, remuneration should include a high percentage of variable remuneration depending on the results obtained (Jensen and Murphy, 2010; Aggarwal and Samwick, 1999).

The results of the estimation of the impact of tenure of the Board and the remuneration fee on the total remuneration of the CEO are shown in Table 4.4.a and, separately for independent and proprietary directors, in Table 4.4.b. For variable remuneration, the respective tables are 4.4.c and 4.4.d. When considering the group of directors (Tables 4.4.a and 4.4.c) practically no impact of tenure on remuneration is observed, neither in the total nor in the variable. It can only be observed that the directors named before the CEO in the remuneration committee receive less variable remuneration. When the impact of independent and proprietary directors is separated, it can be seen that the average tenure of independent directors is negatively correlated with both total remuneration and the percentage of variable remuneration.

In general, the regressions have little explanatory power and the only significant variables in the case of total remuneration are size (larger companies pay more) and the percentage of ownership concentration (the higher the concentration, the lower the total remuneration). Regarding variable remuneration, perhaps the most interesting result is that it represents a higher proportion of salary in the most profitable companies and with less volatile results, which would indicate that a higher proportion of variable remuneration is set when it is expected that this will benefit the CEO without making him/her bear a high risk (Palia, 2001). This raises questions about the way in which variable remuneration is being used by Spanish companies, which does not seem to align the interests of CEOs and shareholders. In addition, this is in line with the fact that companies with more concentrated ownership pay less variable remuneration and that the largest, least active Boards and with the highest proportion of other external directors are those that offer a higher percentage of variable remuneration. In general, these results go in the same direction as those obtained by Gómez (2019) and Gutiérrez and Sáez (2020), who also find that variable remuneration is low in Spain and is based fundamentally on accounting results and not on market values. This being the case, the fact that the directors who are members of the committee that sets remuneration and who have been appointed before the CEO reduce this type of compensation can be interpreted positively.

Effect of tenure of Board on total CEO remuneration
TABLE 4.4.A

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Log of total CEO compensation				
Average tenure of the Board	0.0060	0.0074	0.0044					
	(0.0044)	(0.0048)	(0.0049)					
% of directors with very long tenure				-0.0452				
				(0.0943)				
% directors predating the CEO					0.0453			
					(0.0530)			
Average tenure of the RC						-0.0016		
						(0.0021)		
% directors with very long tenure on RC							-0.0490	
							(0.0469)	
% directors predating the CEO in CR								-0.0030
								(0.0225)
No. of directors		0.0032	0.0032	0.0023	0.0022	0.0017	0.0020	0.0021
		(0.0033)	(0.0033)	(0.0031)	(0.0032)	(0.0032)	(0.0032)	(0.0032)
No. of meetings		0.0028	0.0016	0.0013	0.0015	0.0017	0.0018	0.0020
		(0.0027)	(0.0031)	(0.0030)	(0.0031)	(0.0033)	(0.0032)	(0.0033)
% independent		-0.2411*	-0.0964	-0.0911	-0.0939	-0.0464	-0.0433	-0.0482
		(0.1296)	(0.1171)	(0.1165)	(0.1162)	(0.1173)	(0.1189)	(0.1170)
% proprietary directors		-0.0099	0.0519	0.0547	0.0533	0.1046	0.1094	0.1060
		(0.0958)	(0.0954)	(0.0951)	(0.0940)	(0.0893)	(0.0916)	(0.0901)
% other external		-0.2393	-0.1075	-0.0762	-0.0818	-0.0369	-0.0369	-0.0389
		(0.1509)	(0.1312)	(0.1246)	(0.1206)	(0.1282)	(0.1294)	(0.1273)
% women		0.1299	0.0637	0.0502	0.0656	0.0277	0.0325	0.0427
		(0.0848)	(0.0694)	(0.0666)	(0.0696)	(0.0725)	(0.0701)	(0.0687)
% foreigners		0.0429	0.0985	0.0874	0.0767	0.0971	0.0968	0.1033
		(0.0709)	(0.0673)	(0.0626)	(0.0628)	(0.0787)	(0.0780)	(0.0769)
Average number of Boards to which directors belong		0.0673	0.0719	0.0717	0.0707	0.0672	0.0694	0.0670
		(0.0431)	(0.0446)	(0.0440)	(0.0440)	(0.0444)	(0.0441)	(0.0445)
No. of interlocks		-0.0007	-0.0018	-0.0017	-0.0013	-0.0014	-0.0015	-0.0015
		(0.0024)	(0.0023)	(0.0023)	(0.0023)	(0.0023)	(0.0022)	(0.0023)
Average importance of the Board for directors		0.0198	0.0179	0.0132	0.0159	0.0100	0.0123	0.0124
		(0.0183)	(0.0220)	(0.0217)	(0.0210)	(0.0220)	(0.0223)	(0.0220)
CEO is the chair		0.0408	0.0326	0.0283	0.0318	0.0329	0.0328	0.0330
		(0.0276)	(0.0267)	(0.0258)	(0.0256)	(0.0267)	(0.0265)	(0.0267)
Tenure of CEO		0.0016	0.0015	0.0022	0.0028	0.0019	0.0017	0.0017
		(0.0021)	(0.0021)	(0.0020)	(0.0022)	(0.0020)	(0.0019)	(0.0020)
Average remuneration of directors		-0.0000	0.0001	0.0001	0.0001	0.0000	0.0000	0.0000
		(0.0000)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
% concentrated capital			-0.0017***	-0.0017***	-0.0017***	-0.0018***	-0.0018***	-0.0017***
			(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0005)
Total asset log			0.0452**	0.0481**	0.0464**	0.0552**	0.0548**	0.0542**
			(0.0206)	(0.0205)	(0.0207)	(0.0221)	(0.0222)	(0.0225)
Tobin's q			0.0034	0.0030	0.0025	0.0039	0.0040	0.0042
			(0.0176)	(0.0184)	(0.0180)	(0.0167)	(0.0166)	(0.0167)
% R&D costs			-0.0261	-0.0272	-0.0272	-0.0299	-0.0305*	-0.0302
			(0.0187)	(0.0185)	(0.0188)	(0.0184)	(0.0183)	(0.0185)

Effect of tenure of Board on total CEO remuneration (*continuation*)

TABLE 4.4.A

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
						Log of total CEO compensation		
ROA (average 5 years)			0.0003	0.0004	0.0005	0.0018	0.0019	0.0018
			(0.0019)	(0.0020)	(0.0019)	(0.0016)	(0.0016)	(0.0016)
Std. dev. ROA (5 years)			-0.0024	-0.0025	-0.0026	-0.0008	-0.0008	-0.0008
			(0.0020)	(0.0021)	(0.0020)	(0.0011)	(0.0011)	(0.0011)
Constant	1.8341***	1.7247***	1.1272***	1.1381***	1.1354***	1.0148***	1.0017***	1.0068***
	(0.0301)	(0.1003)	(0.3036)	(0.3036)	(0.2973)	(0.3298)	(0.3232)	(0.3263)
No. of observations	895	894	750	750	749	725	725	725
R^2	0.008	0.074	0.118	0.116	0.119	0.121	0.122	0.119
Number of different companies	153	153	133	133	132	132	132	132

This table presents the results of an estimate of fixed effects where the dependent variable is the logarithm of the CEO's total compensation. All variables have been winsorised at the 1% and 99% percentiles. The robust errors grouped by company appear in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Effect of tenure of independent and proprietary directors on the total remuneration of the CEO

TABLE 4.4.B

Variables	(1)	(2)	(3)	(4)	(5)	(6)
					Log of total CEO compensation	
Average tenure of independent directors	0.0006					
	(0.0015)					
Average tenure of proprietary directors	0.0024					
	(0.0020)					
% of independent directors with very long tenure		-0.0349				
		(0.0353)				
% of proprietary directors with very long tenure		0.0187				
		(0.0460)				
% independent directors predating the CEO			0.0122			
			(0.0644)			
% proprietary directors predating the CEO			0.0615			
			(0.1029)			
Average tenure of independent directors on RC				-0.0028*		
				(0.0015)		
Average tenure of proprietary directors on RC				0.0004		
				(0.0014)		
% independent directors with very long tenure on RC					-0.0969	
					(0.0746)	
% proprietary directors with very long tenure on CR					-0.1097**	
					(0.0504)	
% independent directors predating the CEO in CR						-0.0072
						(0.0292)
% proprietary directors predating the CEO in CR						-0.0586*
						(0.0313)
Other controls	YES	YES	YES	YES	YES	YES
Constant	1.1399***	1.1803***	1.1216***	1.0570**	0.9973***	1.0313***
	(0.3807)	(0.3785)	(0.2932)	(0.4234)	(0.3200)	(0.3273)
No. of observations	687	691	749	495	726	726
R^2	0.133	0.130	0.117	0.168	0.128	0.123
Number of different companies	129	131	132	108	133	133

This table presents the results of an estimate of fixed effects where the dependent variable is the logarithm of the CEO's total compensation. All variables have been winsorised at the 1% and 99% percentiles. The robust errors grouped by company appear in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Effect of tenure of the Board on the percentage of variable remuneration of the CEO TABLE 4.4.C

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				% of variable compensation of the CEO				
Average tenure of the Board	0.0114	0.0083	-0.0048					
	(0.0073)	(0.0097)	(0.0098)					
% of directors with very long tenure				-0.0594				
				(0.2253)				
% directors predating the CEO					-0.0775			
					(0.0944)			
Average tenure of the RC						-0.0081		
						(0.0061)		
% directors with very long tenure on RC							0.0733	
							(0.1243)	
% directors predating the CEO in CR								-0.1260*
								(0.0680)
No. of directors		0.0237***	0.0179**	0.0187**	0.0192**	0.0159*	0.0183**	0.0174**
		(0.0083)	(0.0084)	(0.0080)	(0.0078)	(0.0087)	(0.0082)	(0.0081)
No. of meetings		-0.0264***	-0.0273***	-0.0271***	-0.0272***	-0.0272***	-0.0256***	-0.0268***
		(0.0077)	(0.0079)	(0.0079)	(0.0078)	(0.0084)	(0.0084)	(0.0085)
% independent		0.0697	0.4570	0.4530	0.4558	0.3957	0.3821	0.3741
		(0.2853)	(0.3306)	(0.3307)	(0.3299)	(0.3619)	(0.3621)	(0.3567)
% proprietary directors		0.1203	0.4187	0.4191	0.4178	0.3887	0.3929	0.3816
		(0.2347)	(0.2612)	(0.2633)	(0.2602)	(0.2759)	(0.2770)	(0.2721)
% other external		0.3891	0.6978*	0.6770*	0.6700*	0.6875*	0.6783*	0.6550*
		(0.2943)	(0.3591)	(0.3573)	(0.3605)	(0.3720)	(0.3649)	(0.3621)
% women		0.4028*	0.2334	0.2387	0.2249	0.1842	0.2808	0.2161
		(0.2042)	(0.2117)	(0.2091)	(0.2114)	(0.2288)	(0.2226)	(0.2217)
% foreigners		-0.3903**	-0.2189	-0.2064	-0.1886	-0.1686	-0.1380	-0.0828
		(0.1927)	(0.1951)	(0.1897)	(0.1876)	(0.1972)	(0.1957)	(0.1982)
Average number of Boards to which directors belong		0.0635	0.0910	0.0919	0.0930	0.0957	0.0916	0.0934
		(0.1242)	(0.1410)	(0.1404)	(0.1401)	(0.1405)	(0.1389)	(0.1382)
No. of interlocks		-0.0067	-0.0097	-0.0097	-0.0105	-0.0092	-0.0093	-0.0101
		(0.0069)	(0.0078)	(0.0078)	(0.0078)	(0.0080)	(0.0076)	(0.0079)
Average importance of the Board for directors		-0.1356*	-0.0821	-0.0746	-0.0822	-0.1000	-0.0861	-0.0997
		(0.0777)	(0.1002)	(0.1006)	(0.0999)	(0.1011)	(0.0999)	(0.1019)
CEO is the chair		-0.0567	-0.0619	-0.0597	-0.0624	-0.0559	-0.0540	-0.0585
		(0.0609)	(0.0604)	(0.0598)	(0.0612)	(0.0622)	(0.0616)	(0.0618)
Tenure of CEO		-0.0008	0.0005	-0.0000	-0.0014	0.0023	0.0018	-0.0005
		(0.0059)	(0.0061)	(0.0058)	(0.0056)	(0.0048)	(0.0046)	(0.0048)
Average remuneration of directors		0.0002	0.0004***	0.0004***	0.0004***	0.0004***	0.0004***	0.0004***
		(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
% concentrated capital			-0.0037***	-0.0036***	-0.0037***	-0.0041***	-0.0039***	-0.0040***
			(0.0013)	(0.0013)	(0.0013)	(0.0014)	(0.0014)	(0.0014)

Effect of tenure of the Board on the percentage of variable remuneration of the CEO (*continuation*) TABLE 4.4.C

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			\% of variable compensation of the CEO					
Total asset log			0.0117	0.0105	0.0109	-0.0004	-0.0067	-0.0028
			(0.0499)	(0.0495)	(0.0495)	(0.0533)	(0.0536)	(0.0527)
Tobin's q			0.0308	0.0315	0.0320	0.0189	0.0208	0.0196
			(0.0265)	(0.0268)	(0.0266)	(0.0327)	(0.0335)	(0.0329)
\% R&D costs			-0.0906	-0.0891	-0.0893	-0.0883	-0.0894	-0.0898
			(0.0725)	(0.0723)	(0.0718)	(0.0718)	(0.0724)	(0.0713)
ROA (average 5 years)			0.0118**	0.0118**	0.0115**	0.0128**	0.0128**	0.0124**
			(0.0048)	(0.0048)	(0.0049)	(0.0053)	(0.0053)	(0.0055)
Std. dev. ROA (5 years)			-0.0088*	-0.0086*	-0.0086*	-0.0084*	-0.0086*	-0.0078
			(0.0045)	(0.0045)	(0.0045)	(0.0050)	(0.0050)	(0.0050)
Constant	0.6194***	0.6036**	0.4044	0.3765	0.4003	0.6762	0.6348	0.6922
	(0.0502)	(0.2693)	(0.7385)	(0.7307)	(0.7288)	(0.8307)	(0.8147)	(0.8071)
No. of observations	894	893	749	749	748	725	725	725
R^2	0.003	0.085	0.128	0.128	0.129	0.130	0.127	0.132
Number of different companies	153	153	133	133	132	132	132	132

This table presents the results of an estimate of fixed effects where the dependent variable is the percentage of variable remuneration of the CEO. All variables have been winsorised at the 1% and 99% percentiles. The robust errors grouped by company appear in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Effect of tenure of independent and proprietary employees on the percentage of variable remuneration of the CEO TABLE 4.4.D

Variables	(1)	(2)	(3)	(4)	(5)	(6)
			\% of variable compensation of the CEO			
Average tenure of independent directors	-0.0036					
	(0.0050)					
Average tenure of proprietary directors	0.0003					
	(0.0057)					
\% of independent directors with very long tenure		-0.0152				
		(0.1181)				
\% of proprietary directors with very long tenure		-0.0992				
		(0.0992)				
\% independent directors predating the CEO			-0.3482			
			(0.2206)			
\% proprietary directors predating the CEO			0.1012			
			(0.1997)			
Average tenure of independent directors on RC				-0.0094**		
				(0.0043)		
Average tenure of proprietary directors on RC				-0.0034		
				(0.0055)		

TABLE 4.4.D

Effect of tenure of independent and proprietary employees on the percentage of variable remuneration of the CEO (*continuation*)

Variables	(1)	(2)	(3)	(4)	(5)	(6)
				% of variable compensation of the CEO		
% independent directors with very long tenure on RC					-0.0930	
					(0.1948)	
% proprietary directors with very long tenure on CR					-0.0479	
					(0.1171)	
% independent directors predating the CEO in CR						-0.1389
						(0.0910)
% proprietary directors predating the CEO in CR						-0.1769
						(0.1226)
Other controls	SI	SI	SI	SI	SI	SI
Constant	0.3575	0.2515	0.3959	0.4697	0.6201	0.7230
	(0.8987)	(0.8911)	(0.7202)	(1.2775)	(0.8151)	(0.8016)
No. of observations	687	691	748	495	726	726
R^2	0.123	0.126	0.134	0.165	0.127	0.134
Number of different companies	129	131	132	108	133	133

This table presents the results of an estimate of fixed effects where the dependent variable is the percentage of variable remuneration of the CEO. All variables have been winsorised at the 1% and 99% percentiles. The robust errors grouped by company appear in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

4.5 Impact of tenure on the probability of replacement of the CEO

The Boards of Directors are in charge of selecting and replacing the CEO when the results are bad (Adams, Hermalin and Weisbach, 2010). Many Board characteristics have proven to be important in determining the outcome of these processes. In particular, the probability that the CEO will be replaced increases when the Board is smaller (Yermack, 1996) or more independent (Weisbach, 1988), when the CEO is not the chair (Goyal and Park, 2002), and when the Board has a higher proportion of women (Adams and Ferreira, 2009).

To study the effect of directors' tenure on the probability that the CEO will be replaced, a probit model has been used in which the dependent variable is an indicator that takes the value 1 for the years in which there is a change of CEO in the company and 0 otherwise.[8] Obviously, there may be situations in which the Board does not decide to remove the CEO, but the CEO leaves voluntarily; and there are also others in which a forced departure is presented as voluntary. Given the difficulty of clearly distinguishing the cases, all CEO changes are included (as in Jenter and Lewellen, 2019; and Adams and Ferreira, 2009), because it is understood that voluntary departures create noise and less precision in the estimate.

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8   The number of observations does not allow entering into the fixed effects probit model of company, but only of year and sector. In additional analyses, the estimation is repeated with a fixed effects model, which confirms the results of the probit.

The key variable that should determine whether a CEO is replaced is performance, and therefore the probability of a CEO being replaced is expected to increase after poor performance. For this reason, the interaction of tenure with results is also introduced. The control variables are the same as in the previous estimates.

The results appear in Table 4.5.a and show that the tenure of the directors has an important influence on the possibility that the CEO will be replaced. Furthermore, the results are similar whether the focus is on the tenure of the entire Board or only on the tenure of the appointments committee. The tenure of the directors reduces the likelihood of replacement, while the fact of having directors whose appointment predated that of the CEO increases it. And, when the interactions with ROA are analysed, it is observed that this is true for any value of this variable. It is also important to note that the effects are practically of the same order of magnitude as the impact of having more independent directors. For example, taking the last estimate in the table as the base model and assigning the variables their mean value, we find a replacement probability of 16.6%. Increasing the percentage of independent directors by 10% (from the average of 40% to 50%) increases the probability to 30%, while increasing the percentage of directors appointed before the CEO on the committee by 10% of appointments (22% average to 32%) increases the probability up to 24%. On the other hand, by increasing the average tenure of the members of the appointments committee by 1 year from their average of 6, the probability of substitution is reduced to 11%. Therefore, the identified effects are important from both a statistical and an economic point of view.

Table 4.5.b repeats the analysis separating independent and proprietary directors, and confirms the results, especially for independent directors. In the case of proprietary directors, the results are less clear. Independent directors are less likely to replace the CEO as their tenure increases, unless they are directors whose appointment predated that of the CEO, in which case they are more likely to replace him.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
								Replacement of the CEO	
Average tenure of the Board	-0.0544**	-0.0884**			-0.2168***				
	(0.0229)	(0.0389)			(0.0686)				
Average tenure of the Board x ROA		-0.0041			-0.0162*				
		(0.0043)			(0.0084)				
% of directors with very long tenure			-1.8728**		-10.081				
			(0.9092)		-16.100				
% directors with very long tenure x ROA			0.0932		0.3949*				
			(0.1086)		(0.2143)				
% directors predating the CEO				1.8876***	2.7904***				
				(0.4537)	(0.5254)				
% directors predating the CEO x ROA				0.0774	0.1091**				
				(0.0597)	(0.0545)				
Average tenure of the AC						-0.0384			-0.2447***
						(0.0319)			(0.0604)
Average tenure of the AC x ROA						0.0063***			0.0042
						(0.0021)			(0.0061)
% directors with very long tenure on AC							-0.4561		22.718
							-11.838		-17.624
% directors with very long tenure on AC x ROA							0.1639		0.0032
							(0.1254)		(0.1807)
% directors predating the CEO on AC								1.9589***	2.8701***
								(0.3750)	(0.4581)
% directors predating the CEO in AC x ROA								0.0286	0.0163
								(0.0512)	(0.0593)
No. of directors		0.1641***	0.1678***	0.1286***	0.1271***	0.1847***	0.1936***	0.1824***	0.1724***
		(0.0347)	(0.0336)	(0.0387)	(0.0402)	(0.0368)	(0.0362)	(0.0430)	(0.0430)
No. of meetings		0.0595**	0.0534**	0.1003***	0.1034***	0.0526*	0.0556*	0.0875***	0.0702**
		(0.0269)	(0.0261)	(0.0291)	(0.0362)	(0.0293)	(0.0290)	(0.0274)	(0.0301)
% independent		2.3205*	2.1428*	4.8703***	5.1178***	18.210	18.368	2.9879**	4.5614***
		-13.174	-12.276	-17.089	-17.189	-13.503	-13.244	-14.977	-16.649
% proprietary directors		0.1264	-0.2063	0.7140	13.694	-0.5902	-0.8389	-0.7826	10.640
		(0.9551)	(0.9112)	-14.014	-13.463	(0.9809)	(0.9640)	-11.897	-13.483
% other external		2.7657*	20.167	4.0117*	5.5723**	17.053	15.755	26.195	4.7141**
		-15.418	-14.569	-22.246	-23.973	-16.612	-16.404	-18.534	-20.326
% women		0.2504	0.8327	0.2551	-0.3893	0.9713	10.138	19.362	10.827
		-10.930	-11.199	-13.216	-11.762	-11.383	-11.393	-12.002	-11.511
% foreigners		-0.0534	0.1695	0.8241	0.2612	0.1574	0.2494	0.5021	0.1983
		(0.6846)	(0.6595)	(0.7083)	(0.7757)	(0.6327)	(0.6211)	(0.6713)	(0.7602)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
						Replacement of the CEO			
Average number of Boards to which directors belong		-0.2858	-0.1489	-0.2828	-0.6136	-0.1647	-0.1551	-0.1634	-0.4432
		(0.6227)	(0.5926)	(0.6929)	(0.8293)	(0.6243)	(0.6111)	(0.6954)	(0.8005)
No. of interlocks		0.0120	-0.0003	0.0133	0.0333	-0.0029	-0.0052	0.0003	0.0186
		(0.0367)	(0.0367)	(0.0455)	(0.0498)	(0.0387)	(0.0387)	(0.0428)	(0.0434)
Average importance of the Board for directors		0.3515	0.4517	0.3861	0.7066	0.8628**	0.8929**	1.4683**	1.6749*
		(0.4137)	(0.4291)	(0.5297)	(0.8078)	(0.3997)	(0.4272)	(0.6756)	(0.9419)
CEO is the chair		-0.0539	-0.0275	0.0345	-0.1000	0.1668	0.1469	0.1839	0.2249
		(0.2826)	(0.2776)	(0.2982)	(0.2861)	(0.2814)	(0.2667)	(0.2873)	(0.2899)
Tenure of CEO		0.0320**	0.0226*	0.0298**	0.0877***	0.0076	0.0035	0.0246*	0.0641***
		(0.0142)	(0.0125)	(0.0143)	(0.0214)	(0.0111)	(0.0107)	(0.0134)	(0.0172)
Average remuneration of directors		-0.0002	-0.0007	-0.0005	0.0005	-0.0005	-0.0006	-0.0007	0.0002
		(0.0006)	(0.0008)	(0.0012)	(0.0009)	(0.0009)	(0.0008)	(0.0011)	(0.0014)
% concentrated capital		0.0157***	0.0172***	0.0204***	0.0194***	0.0168***	0.0177***	0.0237***	0.0190***
		(0.0051)	(0.0051)	(0.0061)	(0.0060)	(0.0059)	(0.0057)	(0.0068)	(0.0073)
Total asset log		-0.1462	-0.1205	-0.1852	-0.2117*	-0.1044	-0.1161	-0.1575	-0.1563
		(0.0950)	(0.0983)	(0.1199)	(0.1244)	(0.0969)	(0.0956)	(0.1045)	(0.1081)
Tobin's q		-0.0921	-0.0902	-0.0900	-0.1277	-0.1657	-0.1261	-0.0709	-0.0832
		(0.0994)	(0.1012)	(0.1338)	(0.1240)	(0.1350)	(0.1255)	(0.1262)	(0.1556)
% R&D costs		0.1964	0.1581	0.0633	0.2679	0.1760	0.1719	0.1622	0.3994
		(0.3430)	(0.3497)	(0.4387)	(0.4371)	(0.4055)	(0.4110)	(0.4949)	(0.4609)
ROA (average 5 years)	-0.0270***	-0.0033	-0.0357***	-0.0737***	-0.0019	-0.0523***	-0.0376***	-0.0565***	-0.0485**
	(0.0090)	(0.0221)	(0.0137)	(0.0204)	(0.0335)	(0.0135)	(0.0121)	(0.0194)	(0.0195)
Std. dev. ROA (5 years)		-0.0032	0.0009	-0.0034	0.0015	-0.0117	-0.0117	-0.0290*	-0.0308**
		(0.0119)	(0.0126)	(0.0165)	(0.0150)	(0.0156)	(0.0158)	(0.0164)	(0.0150)
Constant	-1.7865***	-4.6243**	-5.3485***	-6.6536***	-6.1272**	-5.9054***	-5.9536***	-7.9173***	-8.1751***
	(0.3564)	-19.135	-19.332	-24.541	-25.785	-19.895	-19.716	-22.819	-25.765
No. of observations	918	755	755	645	645	734	734	734	734
Industry fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES

This table presents the results of the estimation of the probability that the CEO will be replaced using a probit model where the dependent variable takes the value 1 if the CEO has been replaced during the financial year and 0 otherwise. All variables have been winsorised at the 1% and 99% percentiles. The robust errors grouped by company appear in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively..

TABLE 4.5.B

Effect of tenure of independent and proprietary directors on the probability that the CEO will be replaced

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
							Replacement of the CEO	
Average tenure of independent directors	-0.0166			-0.0645				
	(0.0271)			(0.0720)				
Average tenure of proprietary directors	-0.0367			-0.1327**				
	(0.0272)			(0.0583)				
% of independent directors with very long tenure		-12.2529***		-12.2466***				
		(3.7914)		(3.7146)				
% of proprietary directors with very long tenure		-0.0105		2.414				
		(0.4957)		(1.3410)				
% independent directors predating the CEO			3.5987***	4.6906***				
			(0.8879)	(1.1492)				
% proprietary directors predating the CEO			0.8480	2.5946**				
			(1.0636)	(1.2348)				
Average tenure of independent directors on AC					-0.1617**			-0.4910***
					(0.0669)			(0.1007)
Average tenure of proprietary directors on AC					0.0394**			0.0028
					(0.0181)			(0.0324)
% independent directors with very long tenure on AC						0.0151		0.0182
						(0.1226)		(0.1546)
% proprietary directors with very long tenure on AC						0.01416		0.0112
						(0.1142)		(0.1271)
% independent directors predating the CEO on AC							2.2247***	5.0276***
							(0.4161)	(1.0532)
% proprietary directors predating the CEO on AC							2.0924**	2.2300***
							(0.8197)	(0.6997)
Other controls	YES	YES	YES	YES	YES	YES	YES	YES
Constant	-4.1966**	-5.0699***	-6.0774**	-7.0929***	-3.0813	-6.0674***	-7.8265***	-5.1866*
	(2.1028)	(1.9643)	(2.4254)	(2.4156)	(2.3039)	(1.9455)	(2.1868)	(2.9905)
No. of observations	685	690	645	592	436	689	734	416
Industry fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES

This table presents the results of the estimation of the probability that the CEO will be replaced using a probit model where the dependent variable takes the value 1 if the CEO has been replaced during the year and 0 otherwise. All variables have been winsorised at the 1% and 99% percentiles. The robust errors grouped by company appear in parentheses. The superscripts ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

5   Additional tests

The results obtained seem to indicate that the presence of independent directors with greater tenure makes effective supervision difficult when their appointment predates that of the current CEO. Fixed effects have been included in all estimates to eliminate unobservable factors as much as possible, but the results may still be due to selection effects. It must be taken into account that tenure is the result of the joint decisions by the director (who decides to remain in the position or not) and the company (which decides to renew them in the position or not), and both decisions are strongly endogenous. In this section we address these problems with several different robustness tests.

5.1   Impact on the results of companies with comparable samples (using propensity score matching)

The first selection effect to consider is that directors prefer to remain on the Boards of certain companies, such as those where supervision is easier because there are no confrontations with management, which requires less effort. In fact, the estimation of the determinants of the tenure of the Boards showed that there are several characteristics of the companies that affect tenure. To minimise this problem, a search procedure for comparable companies is carried out (using propensity score matching). To do this, a Board average tenure prediction model is first used to generate a predicted average Board tenure, as shown in column 1 of Table 4.1.b using ordinary least squares, and then for each company with a real average tenure greater than or equal to 9 years (treatment sample) we identify the company with the closest prediction but with a real value of average tenure of less than 5 years (control sample). All companies for which no control element can be found are then discarded. By following this procedure, the treated and control companies in the final sample are as similar as possible in the observable variables that influence, except for the fact that their actual average tenure is significantly different. With this sample of treated and control companies we then repeat the analyses related to attendance at meetings and remuneration and replacement of the CEO.

With this procedure, the sample is reduced to 524 company and year observations, but the results (available on request) are similar to those of the main analysis, both with respect to the influence of tenure of independent directors on attendance at meetings and on total and variable remuneration, and the replacement of the CEO. Therefore, it can be said that at least part of the effect identified is really due to tenure and not to the self-selection that leads directors to stay longer in companies with certain characteristics.

5.2   Results of directors for a sample of directors with positions in different companies (busy directors)

Selection problems could also be due to the fact that companies can only retain directors with certain characteristics, and it could be more difficult to retain the best directors, who may have offers from other Boards or more job opportunities. If this were the case, tenure would be capturing the lower quality of the director and not really the impact of the years in the position. In order to address this problem, directors who in a given year are on more than one Board and who, on at least one of these Boards, have a tenure longer than 9 years and, on at least another, less than 5, are identified. This way it is known that they are not poor quality directors, that they have been in the company longer simply because they do not have other opportunities. The analysis is repeated with this sample. If the results were due to the quality of the directors, length of tenure should cease to be significant. The results of these estimates (available upon request) confirm that the length of tenure of independent directors hurts attendance, does not appear to have an impact on compensation, and reduces the likelihood that the CEO will be replaced. Therefore, it seems that the results regarding the independent directors are due to capture and not a quality problem.

5.3   Results for the specific versus general experience

Lastly, the interpretation of the results is that tenure does not negatively affect the ability of directors to carry out their supervisory work, but rather generates capture problems. This corresponds to the fact that the negative results related to tenure are limited to independent directors and not to proprietary directors, whose average tenure is much higher (7.3 years compared to 4.5 for independent directors). To further explore this interpretation, an alternative variable of tenure is constructed that measures the total years of experience as a director in any company in the sample, instead of the tenure in the position of director in a particular company. When the analysis is repeated using this variable, it is found that the presence of more experienced independent directors does not reduce attendance at meetings but does reduce total remuneration and the percentage of variable remuneration; that is, their preferences are more similar to those of the directors whose appointment predated that of the CEO (results available on request). However, it is still observed that the independent directors who participate in the appointments committee are more reluctant to fire the CEO than those whose appointment predated that of the latter. In any case, the average tenure in the appointments committee is low (average of 6.25 years and a median of 4), making it difficult for these directors to separate general tenure from tenure in the company. In general, it seems that the fact of finding some different results in relation to meeting attendance and remuneration reinforces the interpretation that the negative results for the tenure of independent directors appear to be the result of capture.

6 Conclusions

In this paper, the determinants and effects of directors' tenure in Spanish companies have been empirically investigated. The exercise yields interesting findings on the corporate governance of Spanish listed companies.

The results indicate that the independent directors with longer tenure have a lower commitment to the supervision of executives. Specifically, independent directors with longer tenure show lower attendance at Board meetings and reduce the probability that the CEO will be replaced, while directors whose appointment predated that of the CEO increase it. These results are similar to those of most of the international literature on the matter and would support the legal limitation on the duration of the mandates of independent directors. However, the interpretation of these data is not based so much on the impact of length of tenure itself, but rather on the influence that CEOs exert on the selection and retention of independent directors. This is consistent with the high turnover of independent directors during their early years and with the result that the directors most likely to be replaced are not the independent directors with the longest tenure, but those whose appointment predated that of the CEO. This suggests that the CEO promotes the replacement of directors who are not close to them with others. In addition, there seems to be a trial period for directors to hold positions of responsibility, since the probability that they will participate in important committees increases with length of tenure, at least up to 16 years. In the case of independent directors, this last effect is difficult to observe in the sample, since many of them have joined recently as a result of changes in the legislation, but there is a lower probability that independent directors who have been with the company for less time would chair an important committee.

Taken together, the results support the existence of a maximum limit for the permanence of independent directors on the Board and, additionally, they suggest that it should not be possible for independent directors to remain on the Board after the maximum period by changing their category to "others". However, the results also draw attention to the influence of the CEO in the selection and maintenance processes of independent directors in the position. The CEO cannot only extend the tenure of directors who are close to him/her, but also shorten, without any minimum term, the tenure of those who are not.

Therefore, in view of the empirical evidence, it seems interesting to propose mechanisms that reduce the observed influence and allow independent directors not aligned with the CEO to be appointed and kept in the position. It would be useful to explore how the independence of the appointments committee can be strengthened and to introduce a minimum time limit during which an independent director cannot be removed without cause. In both cases, the measures could be included as best practices in the Good Governance Code under the "comply or explain" principle, which has proven to be very powerful in improving the level of corporate governance of companies in recent decades.

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Using growth-at-risk to assess the stance of macroprudential policy

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1   Introduction[1]

Effective policy decisions emerge from careful deliberation and thoughtful analysis within a coherent framework. A carefully constructed quantitative and qualitative assessment lends focus to discussions between decision-makers, guides adjustments of instruments, provides for transparency in communication, and enhances accountability. In the familiar case of monetary policy, the analysis of general economic and financial conditions, seen through a lens combining theoretical and empirical models with an agreed-upon objective, produces prescriptions for setting interest rates and adjusting the size and composition of central banks' balance sheets. Typically, a comprehensive framework delivers a normative assessment of policy stance, allowing both decision-makers and observers to determine whether the current settings are either too accommodative or too restrictive to meet policymakers' mandated goals.

Conventional monetary policy, with its generally univariate inflation objective and single interest rate tool, is far less complex than macroprudential policy. Nevertheless, we believe it is useful to start with a practical framework containing the same fundamental ingredients – an objective, a set of tools, and a model linking the two – with the aim of developing a measure of macroprudential policy stance. While it may seem uncharitable to say so, macroprudential policy is currently at the stage (if not worse) monetary policy was at more than half a century ago. In 1960, even though central banking was nearly three hundred years old and there were decades of information on prices, national income and employment, the monetary policy framework was much less developed and less structured than it is today.[2] As economists gradually refined monetary theory, eventually merging original Keynesian, monetarist and real business cycle elements into dynamic stochastic general equilibrium models, central bankers were able to construct a quantitative framework they could use to assess their policy stances. In parallel, academic contributions and institutional experience highlighted the benefits of independent governance structures for monetary policy.[3] Even so, the journey was agonisingly slow, and it took until the mid-1990s for a consensus to emerge.

Surveying the current landscape, we see that a majority of national and supranational jurisdictions have some type of macroprudential authority, often in the form of a board that coordinates responsibilities and policy tools across a suite of regulatory and supervisory authorities.[4] Macroprudential policies have been in place under this name only since the financial crisis of 2007-2009. Partly because this is such a

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2   The Riksbank, founded in 1668, is the oldest central bank in the world. Central banking, however, is really a 20th century phenomenon – in 1900 there were only 18 central banks, by 2000 there were 173. See King (1999).

3   There is an extensive literature on the benefits of central bank independence. See Bernanke (2010) for a survey and Dincer and Eichengreen (2014) for empirical evidence.

4   In the European Union, the coordinating institution is the ESRB.

recent enterprise, there is an active debate over how to formulate objectives, how to use the available tools, and how to structure governance – an especially delicate matter due to the diversity of agencies and tools involved. While the challenge is significant, we hope that the existing breadth of knowledge of economics and finance, as well as cooperation between academics and the authorities, will soon produce a consensus framework for guiding macroprudential policy decisions.

Applying some of the lessons learned from the development of the agreed-upon monetary policy framework, in this paper we discuss the challenges associated with the development of a measure of macroprudential policy stance and propose an approach based on a metric connected to an explicit conceptual framework. We provide an alternative to the current predominantly narrative approach, offering some examples as well as a perspective on how to measure the macroprudential policy stance in a more compact and systematic manner.

As an example of what is currently feasible, we take economic growth as a measure of welfare and then we think of financial distress as shaping the lower tail of the distribution of growth outcomes. This leads us to use the increasingly popular concept of growth-at-risk as a proxy for financial stability and to elaborate on how to build a notion of macroprudential policy stance around such a concept and the empirical techniques available for its implementation. While the analytical framework we propose is implementable (with a precision that will increase in line with the accumulation of modelling expertise, econometric techniques, data and experience), we see it as adding to, rather than replacing, the multi-dimensional monitoring framework currently used by the macroprudential authorities. The approach might indeed be helpful in further improving the difficult task of coordinating and assessing the cumulative effects of policies that, as in the case of the European Union, are commonly decentralised (at least in their implementation) across multiple agencies.

This paper is divided into six sections, including this introduction and some concluding remarks. Section 2 describes a generic macroeconomic policy framework, and includes a discussion of the intrinsically normative notion of a policy stance. In Section 3, we begin by applying this logic to the case of macroprudential policy, explaining why growth-at-risk provides a useful metrics in financial stability context. In Section 4 we present a simple formal model that, relying on the growth-at-risk approach, allows us to draw sharp conclusions with regard to the design of optimal macroprudential policies and the assessment of existing policy settings against such an optimal benchmark. In Section 5 we consider implementation issues. Section 6 concludes.

2   A general framework for macroeconomic and macroprudential policy

To develop a measure of policy stance, we begin with a general macroeconomic framework in which the economic system is characterised by a set of impulses amplified by a propagation mechanism, leading to economic outcomes. The impulses are a set of real sector shocks to productivity or the terms of trade; nominal shocks to the interest rate, exchange rates, or asset prices; and financial shocks including changes in risk attitudes or new information about institutions' exposures and solvency. The propagation mechanism is the structure of the economy and the financial system. The amplification of the shocks depends on a variety of factors, including the structure of household, firm, and bank balance sheets as well as financial markets and infrastructures. There are generally two types of outcome or goal: traditional macroeconomic stability, including stable growth, high employment and stable inflation; and financial stability, understood to be characterised by a low frequency and modest severity of breakdowns in the provision of essential financial services such as payments or credit.

Figure 1 lays out this generic framework. We make no attempt to be exhaustive in our description of the sources of impulses or the conditions which influence the strength or weakness of the propagation mechanism. Instead, we list the components of the system that are the most relevant for examining monetary and prudential policy.

The stability of the system, both macroeconomic and financial, depends on:

i)   The dynamic stochastic properties of the shocks that hit the system.

ii)   The degree to which the various mechanisms amplify and propagate shocks over time and across agents, activities and markets.

Within this context, consider the familiar textbook case of conventional monetary policy – the policymakers' problem has three critical elements. First, express the objective in the form of a loss function to be minimised – for example, the weighted sum of squared deviations of inflation from its target and current output from potential output. Second, specify a policy tool, such as the short-term nominal interest rate. Third, postulate a model connecting the two, embedding a propagation mechanism that links shocks and current and future interest rate movements to inflation and output deviations. Importantly, the model implies a steady-state optimal or long-run equilibrium level of the policy interest rate, as well as an idea of how it should respond to shocks that push inflation and output away from their target levels.[5]

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5   See Svensson (1999) or Woodford (2003) for explicit formulations of the monetary policy design problem.
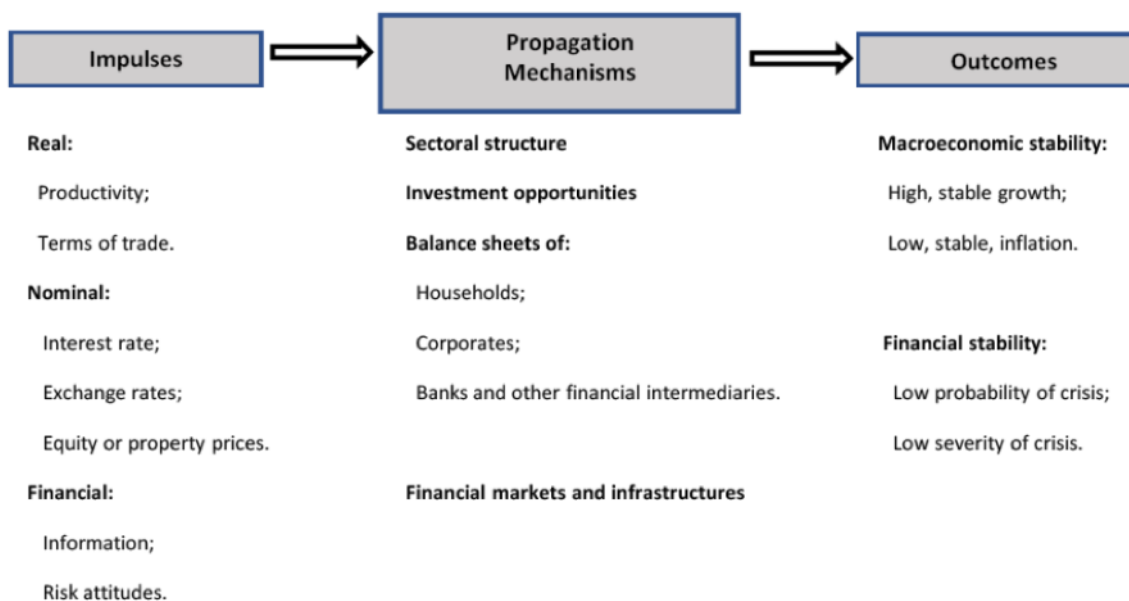
Source: Compiled by the authors.

From the perspective of the generic framework, we generally cast the central bankers' problem as one where they work to meet their stabilisation objective by *reacting* to shocks which, if they were allowed to propagate, would destabilise the system. In other words, monetary policy interventions short-circuit, mitigate or neutralise the impact of otherwise harmful impulses on the targeted outcome.

The typical monetary policy framework yields a natural measure of policy stance: the level of the interest rate relative to its steady-state optimal level ($i*$). If the policy rate exceeds this level, policy is restrictive; if the policy rate is below the steady-state optimal level, policy is accommodative.[6]

Turning to macroprudential policy, following Tucker (2015) we can frame the role of financial stability policymakers as addressing a problem of "the commons" which is analogous to grazing on public lands or fishing in public waters.[7] The "tragedy of the commons" arises when individuals have an incentive to do things that degrade the environment for everyone else. From this perspective, we can interpret financial stability as a common resource that is non-excludable yet rivalrous. If the financial system is stable, no one can be prevented from basking in the glow of its stability.

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6   An alternative, explicitly prescriptive, measure of monetary policy stance compares the level of the interest rate with that implied by the optimal rule at each point in time. That is, minimising the objective, subject to the economy's dynamic path, yields an optimal instrument rule. Using such a reference point, the stance measure would tell us whether policy is optimal, above optimal or below optimal, not just whether it is accommodative or restrictive. Combining the two criteria would allow to us describe policies as optimally neutral, accommodative or restrictive, as well as whether they are insufficiently or excessively accommodative or restrictive.

7   See Cecchetti and Tucker (2016) for more details.

Importantly, individuals can act in ways that reduce systemic resilience. Just as a farmer has the incentive to overgraze, letting their cows eat until the public green becomes bare leading to the starvation of others' herds and eventually their own, an actor in the financial system may have incentives to take risks that, because of spillovers, can deplete systemic resilience putting others at risk. Excessive risk-taking incentives may be exacerbated by the response of a financial firm's owners and managers to the presence of both a social safety net (in the form of deposit insurance, the lender of last resort, and implicit government guarantees) and limited liability. When the risk taken by one agent affects outcomes for others, there is a classic externality: the insolvency of one firm can cascade, creating system-wide runs, fire sales and an economy-wide credit crunch as balance sheets shrink.[8]

Policymakers can use their prudential toolkit to counter these externalities, pushing individual investors and institutions to internalise the costs their actions impose on others. The ESRB (2019) describes this as a process in which calibrating the tools requires policymakers to set their objective in the form of a "net systemic risk" (or "risk-resilience gap") standard, monitor the level of risk and resilience in the system, and then adjust their policy stance to maintain the desired level of net systemic risk in the face of material changes to both the distribution of possible shocks and the fragility of the system.

In principle, financial stability policy and monetary policy are similar. In both cases a policymaker needs a well-defined and measurable goal, a set of tools, and models linking the two. For example, a macroprudential policymaker might focus on preventing acute system-wide disruptions to the provision of financial services that are essential for the proper functioning of the economy. System-wide disruptions in credit intermediation, liquidity and payment services, insurance, asset management, market-making services and the like are a characteristic feature of financial crises.

We now translate this relatively vague mandate to maintain the provision of financial services into an objective notion of what it means to pursue financial stability: acute disruptions of financial services should be infrequent and, when they do occur, the implications for the real economy should not be severely adverse.[9] Given this goal of a low frequency and modest severity of system-wide disruptions, the macroprudential policymaker has a set of tools that might include, in the case of banks, changing the level of capital requirements, imposing maximum loan-to-value ratios for residential mortgages, modifying sectoral risk weights in capital requirements, and defining alternative stress test scenarios, to mention just a few. For

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8   See Hanson, Kashyap and Stein (2011) for a detailed discussion of the externalities that are the basis for macroprudential regulation.

9   This interpretation of financial stability is consistent with the statutory mandate of the ESRB in Regulation (EU) 2019/2176 of the European Parliament and of the Council which reads: "The ESRB should contribute to preventing or mitigating systemic risks to financial stability in the Union and thereby to achieving the objectives of the internal market". The regulation goes on to define term systemic risk as "a risk of disruption in the financial system with the potential to have serious negative consequences for the real economy of the Union or of one or more of its Member States and for the functioning of the internal market".

non-bank financial intermediaries macroprudential tools are less developed but also include or might include stress tests, add-ons to liquidity requirements, and measures aimed to mitigate phenomena such as the destabilising effect of abrupt redemptions in the asset management sector or the procyclical effects of margining practices by central clearing platforms. To achieve their goals, macroprudential policymakers must also have some idea of the conceptual and quantitative link between their tools and their mandated objectives.

In terms of the generic framework presented in Figure 1, we think of macroprudential policy as primarily influencing the propagation mechanism; maintaining financial stability by ensuring that the system remains *resilient* to shocks (e.g., by influencing the buffers through which different agents in the system may be able to absorb shocks). That said, the distribution of shocks likely depends on the state of the economy and the conditions in the financial system, and in particular agents' risk-taking decisions that can, in turn, be shaped by policy. This endogeneity implies that by reducing risk taking throughout the system macroprudential policy may also have an influence on the nature and size of the shocks affecting the system. To illustrate the point, consider the well-known case of booms and busts in property markets that may be caused by bubbles or simply by the evolution of beliefs. Real estate is often leveraged, so when property prices collapse the impact can cascade through the system. Those households that are unable to meet their mortgage payment obligations may cut back on other consumption purchases, reducing aggregate demand. Some borrowers may even default, risking damage to lenders. In this case, there is a potential for a bigger shock in the form of a property price collapse accompanied by balance sheet fragility, which leads to greater amplification. Policymakers could reinforce resilience to such shocks by, for instance, using tools that force agents to operate with lower leverage.

When and how macroprudential policymakers should utilise the instruments at their disposal are the key decisions they face. In the unlikely event that employing macroprudential tools entailed no costs, policymakers would face no trade-off. If they could reduce systemic risk without harming growth or any other relevant measure of social welfare, then maximum resilience would be the target. Unfortunately, however, the most stable financial systems are almost always either small and underdeveloped or repressed. So, while such systems present little risk to stability, they might provide insufficient support to economic wellbeing as measured by economic growth or any other suitable proxy for society's welfare. The stability we seek is not the stability of the graveyard.

3 Macroprudential policy objectives and growth-at-risk

In order to apply the generic framework in Figure 1 to the case of macroprudential policy, the first step is to specify the objective. This is more complex in this case than it is in the case of monetary policy, where there is a broad consensus as to the desirability of some form of flexible inflation targeting in which central bankers seek to minimise an average of squared deviations of inflation from its target and output from potential over a certain time horizon. By contrast, macroprudential policy currently follows a more disaggregated process in which authorities separate the assessment of risks, the design of associated tools, and the implementation of offsetting interventions into a set of categories explicitly linked to intermediate objectives.[10] Current practice identifies the underlying sources of systemic risk arising from the actions of specific entities or the transactions in specific markets, and then fashions dedicated tools to address these risks. For example, bank regulators and supervisors use capital requirements to mitigate banks' solvency risk and loan-service-to-income limits to contain residential real estate risk, while securities markets regulators may demand that asset managers accumulate liquidity buffers to avoid spillovers arising from the fire sale of less liquid assets when facing abnormally high redemptions. This piecemeal approach has a significant appeal. At a theoretical level, it is consistent with the absence of a comprehensive, integrated framework that incorporates all aspects of the financial system and the real economy, combining intermediate objectives and their associated tools into a single policy design problem. On practical grounds, the current system accommodates the dispersion of the governance of macroprudential tools across authorities that exists in many jurisdictions.

Our aim is to explore the possibility of complementing this fragmented methodology with one that relies on a single unified goal for macroprudential policymakers. The logic of our analysis derives from the straightforward proposition that if each intermediate objective could be represented by a single variable, we could produce a solitary, measurable goal that aggregates all these objectives. Such a final objective should combine the welfare benefits of meeting each intermediate objective together with the potential welfare costs of using the available policy tools to influence the intermediate objectives, making it possible to consistently identify optimal macroprudential policy mixes.

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10   The strategy is clearly stated in Recommendation of the ESRB of 4 April 2013 on Intermediate Objectives and Instruments of Macro-prudential Policy (ESRB/2013/1), which states that "intermediate objectives should act as operational specifications to the ultimate objective of macro-prudential policy, which is to contribute to the safeguard of the financial system as a whole, including by strengthening the resilience of the financial system and decreasing the build-up of systemic risks, thereby ensuring a sustainable contribution of the financial sector to economic growth". Besides this, it establishes that in terms of goals, the list of intermediate objectives "should include: (a) to mitigate and prevent excessive credit growth and leverage; (b) to mitigate and prevent excessive maturity mismatch and market illiquidity; (c) to limit direct and indirect exposure concentrations; (d) to limit the systemic impact of misaligned incentives with a view to reducing moral hazard; (e) to strengthen the resilience of financial infrastructures".

While the advantages of having a measurable encompassing goal for macroprudential policy are clear, it is not at all obvious how to formulate such an overarching objective. The reason for this is that macroprudential policy has both aggregate and distributional effects, potentially influencing both the size and the growth of relevant macroeconomic variables such as output and consumption, as well as their distribution across states of nature, across sectors and within the population. While we are aware of these limitations, nevertheless, for the purposes of the remainder of this paper we follow the path of those policymakers who focus on GDP growth as a summary measure of economic wellbeing. If, however, policymakers were to choose an alternative objective to account for additional important determinants of society's welfare, such as the distribution of income, the extent of carbon emissions, or any other feature not adequately captured by GDP growth, then all we would have to change in the analytical framework presented below would be the definition of the variable representing the final objective.

Before turning to specifics, we should emphasise another important difference between monetary policy and macroprudential policy. At a practical level it is possible to change interest rates frequently and quickly, with an almost immediate impact. By contrast, it is not realistic to adjust many (or even most) macroprudential instruments from one day to the next. This likely delays and prolongs the impact of macroprudential policies.

Importantly, while the impact of the instruments may be slow, we can still distinguish their steady-state calibration from their potential time variation. The case of Basel III capital requirements for banks illustrates what we mean. Regulators set a baseline minimum for the ratio of a bank's capital to its risk-weighted assets, while the structural characteristics of the financial system and the authorities' tolerance of the cost of banking crises determine the calibration of both the risk weights and the minimum.[11] In addition to this minimum, authorities have the option to set, among other add-ons, a time-varying countercyclical capital buffer (CCyB). Policymakers can adjust the CCyB to maintain resilience and prevent excess cyclicality in credit supply in the face of changes to economic and financial conditions. While the baseline settings of the instruments are critically important, the focus of our discussion is on the time-varying dimension of macroprudential policies. Specifically, our interest is in measuring the settings of macroprudential policy tools relative to their optimal path in the medium term.

Turning to the distribution of output growth, existing evidence suggests that growth exhibits pronounced negative skewness and that systemic financial distress contributes to explain the frequency and severity of adverse growth outcomes. Figure 2, taken from Cecchetti and Suárez (2021), plots the distribution of normalised average three-year growth in a large cross section of countries for two samples: the first covering years 1870-2017 (long sample) and the second covering years 1960-2017 (short sample).[12] In both cases the black lines display the smoothed frequencies of

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11 The Basel Committee on Banking Supervision (2010) provides the analysis used in the initial calibration of Basel III. Quantitative models addressing such a calibration more recently include Begenau and Langvoigt (2018), Mendicino et al. (2018) and Elenev, Landvoigt and Van Nieuwerburgh (2021).

12 Growth rates are computed from the output per capita of the Maddison Project Database and the dating of banking crises is taken from Baron, Verner and Xiong's (2020) recently published chronology. The full

the three-year average per capita growth rates during normal (non-crisis) periods, while the red lines show the distribution of three-year average per capita growth rates during banking crisis periods. There are two points worth mentioning. First, as we would expect, crises are characterised by lower growth – the red lines are mark-edly to the left of the black ones. Second, the crisis distributions exhibit negative skewness and have more than one mode.[13]

Distribution of normalised average three-year growth (percentages)
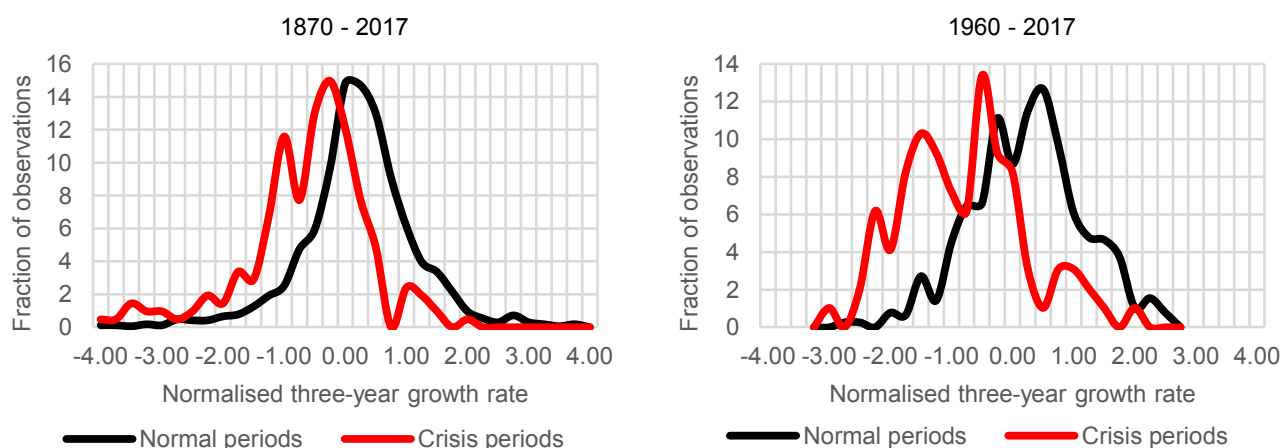
Source: Maddison Project Database (2020); Baron, Verner and Xiong (2020); and authors' calculations.

Notes: Data are deviations from the country mean of non-overlapping three-year average growth rates in standard deviation units. Countries are Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, Colombia, Czech Republic, Denmark, Egypt, Finland, France, Germany, Greece, Hong, Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Malaysia, Mexico, the Netherlands, New Zealand, Norway, Peru, the Philippines, Portugal, the Russian Federation, Singapore, South Africa, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, the United Kingdom, the United States and Venezuela.

Very briefly, looking at information from 46 countries over the period 1960 to 2018, we see there were 97 banking crises. Of these, 13 resulted in three-year average growth that was more than two standard deviations below trend. These findings are consistent with Laeven and Valencia (2018) who identify 151 banking crisis epi-sodes in 119 countries over a period of 47 years. Of these, 83 were associated with output losses of more than 10% of one-year's GDP.

To connect the patterns found in the data to the growth-at-risk approach, consider the stylised distribution of output growth shown in Figure 3. Where Y is the level of output or GDP, define $y_t = ln(Y_t) – ln(Y_{t-1})$ as the one-period growth rate of output and $f(y)$ the probability density function y_t. Label $\bar{y} = E(y)$ as the (positive) mean growth rate (or potential growth rate) of output. For the purposes of discussion,

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dataset covers 46 countries from 1870 to 2018 and includes 207 crisis episodes. To account for system-atic country differences we normalise the data by subtracting each country's mean growth and dividing by its standard deviation (computed over the appropriate sample).

13 The various modes seen during crises may reflect the existence of different types of banking crisis (dis-tinguished by their varying degree of severity, due perhaps to the convolution of these crises with sov-ereign and currency crises). See Cecchetti, Kohler and Upper (2009) for a discussion of the similarities and differences between crises.

consider dividing the growth distribution into two disjoint intervals. The interval to the left of the (negative) level y^R includes severely adverse growth outcomes which we interpret as the typical result of the financial system being under stress or experiencing a crisis. The portion of the distribution to the right of y^R contains more benign growth outcomes which we interpret as most typical of normal, non-crisis times. The threshold y^R has a value-at-risk interpretation. If q is the probability of growth falling in the stress interval, then $y^R(q)$ is the *growth-at-risk* at this probability.[14] For future reference, we also define *growth-given-stress, $y^S(q)$,* as the expected growth rate conditional on being below the threshold $y^R(q)$.

Stylised probability density of output growth FIGURE 3
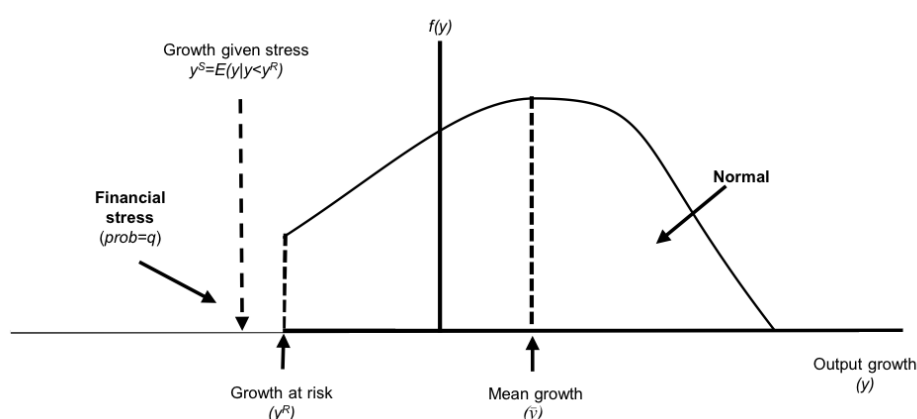
Source: Compiled by the authors.

We note that for a reasonable choice of probability q the growth-at-risk threshold $y^R(q)$ need not separate crisis and non-crisis regimes precisely. For example, there could be severe business cycle downturns that do not qualify as financial crises in the left tail, as well as moderate financial stress episodes in which growth remains close to the mean and therefore remains in the unshaded portion of the distribution (as is the case for the two overlapping distributions in Figure 2). However, measures of financial conditions and stress risk indicators are often constructed for the express purpose of signalling the probability and/or severity of poor growth outcomes over the next few years.[15]

To continue, we can define the distribution and chosen quantile for growth over any horizon in two ways. The first method considers a single period growth h-periods ahead: $y_{t+h} = ln(Y_{t+h}) - ln(Y_{t+h-1})$, while a second option focuses on the average growth over the next h periods: $y_{t,h} = (1/h)\,[ln(Y_{t+h}) - ln(Y_t)]$. In both cases we can construct a density function over the quantity of interest and the corresponding values for both growth-at-risk and growth-given-stress.

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14 See Wang and Yao (2001), Cecchetti (2008), and Adrian, Boyarchenko and Giannone (2019) for seminal applications of the growth-at-risk concept.

15 See, for example, Hatzius, Hooper, Mishkin, Schoenholtz and Watson (2010) and Lang, Izzo, Fahr and Ruzicka (2019).

Reports and analysis. Using growth-at-risk to assess the stance of macroprudential policy

A framework that relies on either growth-at-risk or growth-given-stress as proxies for financial stability has the potential to capture nonlinearities. In other words, it allows for the possibility that policy tools may have a differential impact on different parts of the distribution of the objective – whether this is growth, as in our example, or something else. To see how this might happen, note that standard empirical analyses in other policy fields, including monetary policy, estimate the elasticity of the mean of the policy objective, e.g., inflation, with respect to the policy instrument, e.g., an interest rate. This approach implicitly assumes that either policy actions simply shift the location of the distribution without changing its shape or that the impact on the shape of the distribution may be safely ignored. By contrast, quantile regression – the statistical method used to measure growth-at-risk – expressly allows for changes in the entire shape of the distribution (although analysts normally focus on just a few relevant quantiles).[16] This implies that a framework focusing on growth-at-risk can reveal whether policy, or any other conditioning variable including a measure of financial stress, has a differential impact on different parts of the distribution of the objective. In other words, the approach allows for both translations and deformations in the distribution of growth outcomes. This includes, but is not limited to, cases in which the economic and financial system can shift between regimes that might be more stable or less stable.

4 Welfare foundations and a policy rule: an example

The next step in formulating a measure of policy stance is to construct a model linking policymakers' tools to their agreed-upon objective. The discussion in the previous section leads us to conclude that either growth-at-risk or growth-given-stress might be good candidates for measuring the impact of financial instability on growth outcomes. Additionally, the macroprudential policymaker needs to be alert to the possibility of a trade-off in which actions that reduce the probability and severity of financial stress, raising growth-at-risk, may have a negative effect on average growth. Analogous to the inflation target in a monetary policy framework, a setup could be envisaged in which elected officials provide the macroprudential authorities with a mandate based on striking an appropriate balance between improving growth-at-risk (y^R) or growth-given-stress (y^S) and damage to mean growth. For example, parliamentarians might instruct policymakers to focus on a given threshold probability and target some optimal distance between mean growth and either growth-at-risk (y^R) or growth-given-stress (y^S). Note that a hypothetical distance equal to zero that implies full stability might also imply very low mean growth and will therefore only be socially desirable if society is extremely averse to instability.

Suárez (2022) derives precisely this result for the case in which society's preferences for growth can be represented by a utility function exhibiting constant absolute risk

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16   Recent applications of the growth-at-risk approach and related approaches include Caldera Sánchez and Röhn (2016), De Nicolo and Lucchetta (2017), Duprey and Ueberfeldt (2018), Falconio and Manganelli (2020), Gadea Rivas, Laeven and Perez-Quiros (2020), and Galán (2020).

aversion – growth is normally distributed and the macroprudential instrument has a negative linear impact on average growth and a positive linear impact on growth-at-risk. In this case, an optimal macroprudential policy keeps the gap between average medium-term growth and growth-at-risk constant at a certain target level. That is, $(\bar{y} - y^R)$ is set to a target level that depends on a combination of society's attitudes toward risk and the sensitivity of average growth and growth-at-risk in respect of the macroprudential instrument. Furthermore, when growth is normally distributed the gap between average growth and growth-given-stress is proportional to the gap between average growth and growth-at-risk, so we can express the constant target distance in terms of either quantity. Optimal policy also keeps $(\bar{y} - y^S)$ equal to a constant target – Exhibit 1 provides more details.[17]

Optimal policy in the CARA/normal case EXHIBIT 1

Suárez (2022) examines a stylised one-period model in which the representative agent's preferences for output growth outcomes can be described by a constant-absolute-risk-aversion (CARA) utility function and growth rates are approximately normally distributed. As is well known, if an agent has CARA preferences over normally distributed outcomes, then their objective function may be expressed as the mean outcome less the agent's CARA coefficient multiplied by the variance of the outcomes. Using the fact that the distance between the mean and any quantile of the normal distribution is proportional to the standard deviation of the distribution, Suárez shows that the welfare of the agent (their expected utility) can be written, ignoring the horizon h, as

$$W = \bar{y} - 1/2 \, \omega \, [\bar{y} - y^R(q)]^2, \tag{A.1}$$

where ω is a constant that is increasing in the risk aversion of the representative agent and decreasing in the probability q of the quantile to which growth-at-risk refers.[1] So, welfare equals mean growth minus a term in the squared deviation of the qth quantile from the mean.

To derive the optimal rule, Suárez assumes a linear structure: the mean and the qth quantile of growth depend on a measure of systemic risk, R, and a macroprudential policy tool, τ:[2]

$$\bar{y} = \alpha \, \beta R - \gamma \tau, \tag{A.2}$$

and

$$y^R(q) = -\alpha_q - \beta_q R + \gamma_q \tau, \tag{A.3}$$

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17 Suárez (2022) presents a static model with a single policy tool, thus abstracting from dynamics that may change the policy design problem in a number of important ways. This is especially true in the presence of multiple tools that have different time-series profiles in their impact on the distribution of growth. Two complications are worth noting. First, the optimal distance from mean growth to the growth-at-risk (or growth-given-stress) will likely be time-varying and will depend on the history of shocks to the economy. Second, the optimal path of the various tools will likely depend on a combination of such path of shocks and what may be complex intertemporal interactions between the tools.

where the α's, γ's and β_q are all positive and β can be positive or negative as long as it is greater than $-\beta_q$. The most important property of this system is that policy reduces mean growth while it raises the (negative) q^{th} quantile.[3]

Maximising the quadratic objective (A.1), subject to (A.2) and (A.3), yields a rule in which policy is a linear function of systemic risk:

$$t = \emptyset_0 + \emptyset_1 R. \tag{A.4}$$

Furthermore, following this optimal rule implies keeping the distance between the mean and the qth quantile constant:

$$[\bar{y} - y^R(q)] = 1/\omega \left[1 + \gamma_q/\gamma\right]^{-1} \tag{A.5}$$

Note that this constant optimal distance depends on two factors: the more risk averse society is, the higher ω is, and the smaller the optimal distance is; the more responsive to policy the qth quantile is relative to the responsiveness of the mean (i.e., the bigger γ_q is relative to γ), the smaller the optimal distance is.

We note two points. First, in the case of the normal distribution the optimal distance from the mean to grown-given-stress (y^S) is proportional to the optimal distance from the mean to growth-at-risk (y^R). As a result, we can substitute y^S for y^R in the analysis above, and all the results stand – the only change is that ω differs by a constant factor.

Second, as Suárez shows, it is straightforward to generalise this example to allow τ to be a vector, so the policymaker has more than one tool. In this case tools can be ordered by the ratio of their impact on the qth quantile to their impact on mean growth – the ratio of γ_q to γ for each tool. The most efficient tools are at the top of such a list. Furthermore, optimal policy should aim to keep $(\bar{y} - y^R)$ constant at the optimal distance implied by the most efficient tool.

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1 Suárez (2022), Appendix A.1, derives the exact expression. For a coefficient of relative risk aversion ϱ, and cumulative distribution functions of the standard normal $\emptyset(\cdot)$, then $\omega = \varrho / [\emptyset^{-1}(q)]^2$. For example, when $q = 10\%$, $\emptyset^{-1}(q) = -1281$. So, for $\varrho = 4$, $\omega = 3{,}12$.

2 This formulation abstracts from the case in which non-macroprudential policies have an impact on mean growth and growth-at-risk. One way to integrate such policies into the model is to reformulate the current measure for systemic risk, R, as a vector that includes these additional policies. They would then appear in a more general form of (A.2) and (A.3), as well as the macroprudential policy reaction function (A.4). In a more general discussion of optimal policy coordination, the framework might be further extended to cases in which the objective function W includes terms reflecting the goals of such policies. See Cecchetti and Kohler (2014) for an example that combines conventional monetary policy with capital regulation.

3 A formulation in which policy influences some intermediate objective, which then alters the distribution of growth, is exactly equivalent. Specifically, Section 5.2 of Suárez (2022) also considers a case in which multiple intermediate objectives, each affected by targeted policy variables, have a non-linear effect on growth-at-risk, while policy still has a cost in terms of mean growth. In this case the optimal distance between mean growth and growth-at-risk is not constant but its determinants (and implied intuitions) are the same as in the formulation described here.

At this stage it is worth taking a moment to discuss a key assumption leading to the conclusion that optimal policy targets the distance between mean growth and growth-at-risk, $(\bar{y} - y^R)$, i.e., that policies reducing the probability and/or severity of low growth outcomes (raising y^R) lower average growth ($\bar{y}$). This is a technical requirement in order to arrive at a nontrivial solution to the policy problem analysed in Suárez (2022). In the absence of such a trade-off, if policymakers had a tool that could raise growth-at-risk without lowering mean growth, the optimal policy would be to set policy to minimise the distance between the two. While such tools may exist, we strongly suspect that their ability to reduce financial stability risks without sacrificing growth is a local, rather than a global, property. This means that there may be a range over which the policy tool could both reduce the distance $(\bar{y} - y^R)$ and raise mean growth, but as the tool's setting increases, a trade-off will appear.[18] Thus, we may view the linear equations of the model in Exhibit 1 as an approximation to potentially non-linear relationships in the range over which policy entails a trade-off.

Turning to the stance metric, we start by assuming that the policymaker's focus is on conditions h periods ahead. In other words, they perform what the inflation targeting literature refers to as "forecast targeting" at horizon h. Since the influence of any policy changes takes time to work through the system, it is natural to target forecasts of future levels rather than current levels.[19] Given the horizon, macroprudential policymakers will target the distance either from the mean to the growth-at-risk, $(\bar{y} - y^R)$, or from the mean to the growth-given-stress, $(\bar{y} - y^S)$. For the first of these we label the optimal target distance $(\bar{y} - y^R)^*$, and the stance then depends on the difference between $(\bar{y} - y^R)$ and $(\bar{y} - y^R)^*$. When the current expected difference is positive, $(\bar{y} - y^R)$ exceeds $(\bar{y} - y^R)^*$, policy is overly accommodative, and the tools need to be tightened. Conversely, if the expected difference is negative, policy is overly restrictive, and the tools need to be loosened.

The Suárez (2022) model suggests that the optimal distance $(\bar{y} - y^R)^*$ depends on three factors: i) the benchmark probability of stress (at the chosen horizon), ii) society's risk aversion, and iii) the impact of policy on the lower tail growth relative to its impact on mean growth (the quantity labelled γ_q/γ in Exhibit 1). The optimal distance increases as the probability declines, the risk aversion increases, or the relative impact goes down.

Figure 4 uses the exact expression Suárez derives (equation A.5) to compute the optimal target distance as the various determinants change. In the top panel we fix the threshold probability of stress (q) at 10% and vary the coefficient of relative risk aversion (ϱ) (which is a determinant of ω in equation A.5) from 2 to 6. The horizontal axis shows the relative impact of policy, while the vertical axis is the optimal target distance.

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18 Looking at the model in Exhibit 1, this is a case in which the parameter γ in equation (A.2) is negative until t reaches some critical level, at which point γ turns positive.

19 Svensson (1997) discusses this issue and its implications for policy design in a monetary policy setting.

Reports and analysis. Using growth-at-risk to assess the stance of macroprudential policy

Optimal target distance from mean growth ($\bar{y}$)
to growth-at-risk (y^R)

FIGURE 4

A) Threshold probability of stress $q = 10\%$
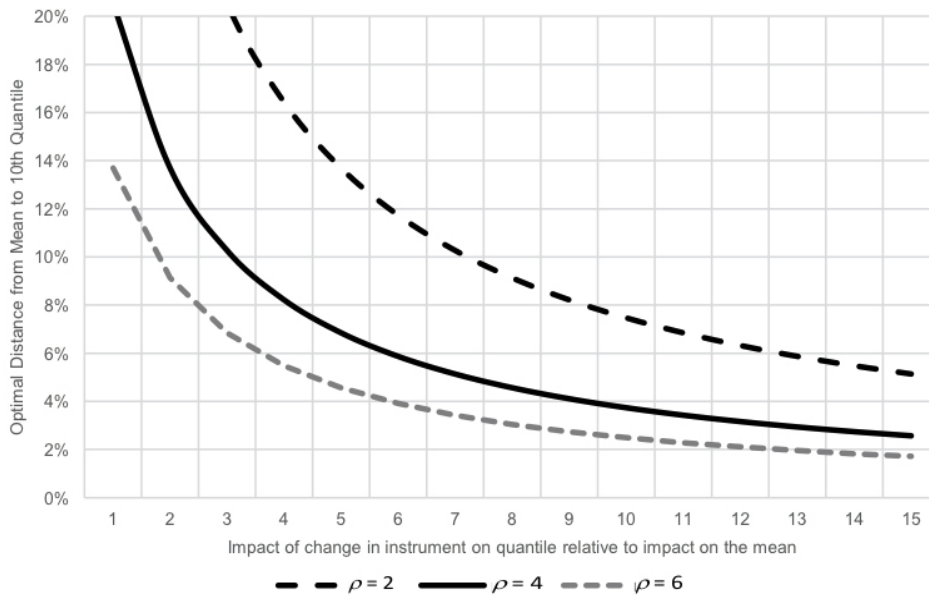
B) Relative risk aversion $\varrho = 4$
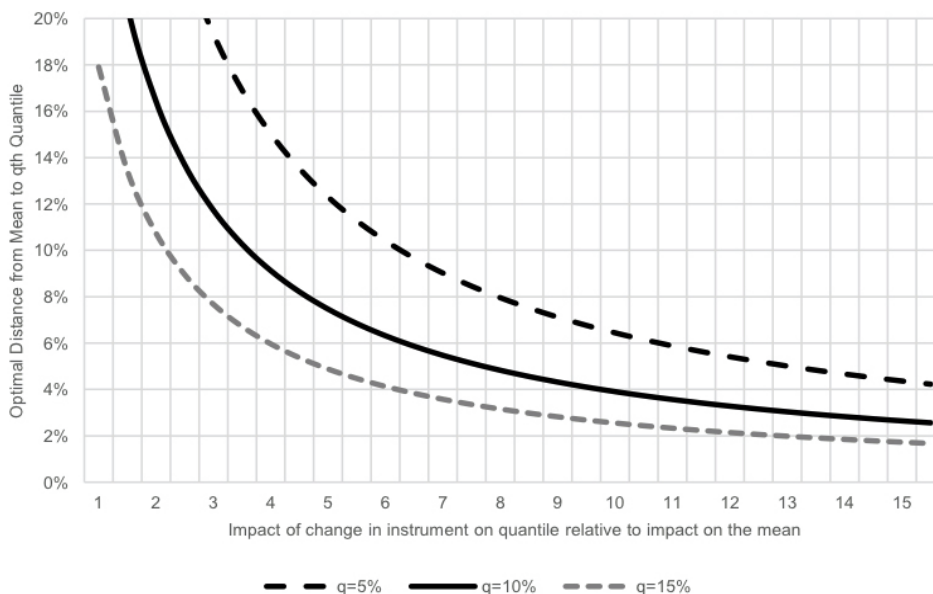
Source: Authors' calculations based on equation (A.5) in Exhibit 1.

When $\varrho = 4$ and the relative impact (γ_q/γ) equals 5 (a value roughly consistent with the results reported in Galán, 2020), the optimal target distance $(\bar{y} - y^R)^*$ is 6.84 percentage points. This number rises as risk aversion declines. When $\varrho = 2$ and the relative impact remains at 5, the optimal target distance rises to 13.69 percentage points. In the bottom panel of Figure 4 we set relative risk aversion (ϱ) to 4 and vary the threshold probability q from 5% to 15%. Unsurprisingly, lowering the probability increases the distance. Focusing again on the case in which the impact of policy

on growth-at-risk is five times as great as it is on long-run average growth, the optimal target distance falls from 11.27 percentage points at $q=5\%$ to 4.48 percentage points at $q=15\%$. The message we take from these very rough calculations is that for plausible parameterisations the optimal target distance implied by conventional relative risk aversion coefficients may be quite large – 10 percentage points or more. This suggests that unless policymakers are very averse to financial instability or have a macroprudential instrument that is extremely effective in improving growth-at-risk relative to its undesirable impact on mean growth (i.e., unless γ_q/γ is relatively large), using the policy tools to counteract the small probability of very large declines in output during crises may not be optimal.

Returning to the issue of policy stance, recall that in the case of monetary policy we define a stance as restrictive or accommodative based on the level of the policy rate relative to its steady-state equilibrium level. Following this same line of reasoning, we posit that macroprudential policy is optimal when it maintains a target distance between mean growth and growth-at-risk (or growth-given-stress) that is consistent with the framework established above. Deviations from the optimal target distance $(\bar{y} - y^R)^*$ imply that a stance is either too tight or too loose. This means that, as is the case for monetary policy, we can evaluate the macroprudential policy stance by looking at the expected future path of relevant endogenous variables – in this case the central moment and the lower tail of the growth distribution.

5   Challenges in the implementation of macroprudential policy

Policy design is an inherently empirical exercise. While we need conceptual models to discipline our thinking and ensure logical consistency, most policy actions involve quantities. Monetary policymakers set policy rates at certain levels, decide on the size and composition of their balance sheet, and so on. Prudential authorities are no different. Microprudential regulators set rules that establish minimal or maximal values for key ratios associated with the operation of individual financial intermediaries. Similarly, the macroprudential policy toolkit contains many quantitative instruments. Determining the appropriate stance requires measurement, evaluation and the calculation of an optimal policy response.

To see how we can proceed with measuring stance, take the case of the European Central Bank's (ECB's) monetary policy framework as a guide. Until July 2021, the ECB stated its objective as price stability, which was defined as inflation (as measured by the year-on-year increase in the Harmonised Index of Consumer Prices for the euro area) of below but close to 2% over the medium term. This involves three essential elements: an index for measuring inflation, a horizon over which to measure it, and a specific number for the target itself. Once these are established, the Governing Council then assesses the policy stance based on whether its tools are set at levels most likely to meet the objective.

Applying this logic to the specific macroprudential policy framework we describe earlier in this paper, there are three categories of input feeding into the construction

of the optimal target distance between mean growth and downside risk that provides the benchmark for measuring stance. These are: i) the index, horizon, and degree of time averaging; ii) the threshold lower quantile and the choice of growth-at-risk or growth-given-stress; and iii) the effectiveness of policy, i.e., the impact of policy on the lower tail of output growth relative to mean growth (γ_q/γ).

We now consider the three categories of necessary inputs from both a conceptual and an empirical perspective. That means we discuss what we *should* measure as well as what we *can* measure.

5.1 The index, the horizon, and the degree of time-averaging

Starting with the index, we should choose an indicator that is closely tied to the general welfare of the society in question. In practice this means focusing on (the growth of) GDP, consumption or employment. The work done so far focuses primarily on the first of these, but we should not rule out alternatives.

Turning to the horizons, we can justify looking forward four, eight, twelve or even sixteen quarters ahead. The choice depends in part on the lag with which policy influences financial risks. For example, for banks, increases in the countercyclical capital buffer (CCyB) have to be announced with a lead time of four quarters and may take an additional four quarters to have any impact. In such a case it only makes sense for the objective to be at a longer horizon than that required to implement the policy and for it to have any impact. In practical terms, the choice of horizon depends on the precision with which we can measure the impact of other required inputs on the target. In securities markets, some polices might have a more immediate impact (e.g., temporary exemptions to clearing duties or changes in rules regarding the acceptability of assets as collateral by central counterparties) but others will similarly affect the system only over time (e.g., modifying underwriting standards in debt markets).

Regarding the degree of time-averaging, policymakers should decide whether to frame their objective in terms of a one-year growth rate *h* years ahead or the average growth rate over the next *h* years. In our view, the latter would be more natural.[20] The rationale for this choice is that average growth takes account of the fact that the costs and benefits of macroprudential policies are almost certainly spread differently over time. To illustrate this point, consider a policy of tightening the maximum loan-to-value ratio requirement for residential mortgages. This could reduce expected growth one and two years out while reducing downside risks three and four years out. In such a case it makes sense to choose an objective based on average

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20 For the sake of simplicity and ease of presentation, the framework we describe here abstracts from dynamics within the specified policy horizon and uses aggregation over such a horizon as a substitute for being explicit about the higher frequency path of the relevant state variables. Detailed articulation of the framework could instead rely on quantile vector auto-regressive models that explicitly capture such dynamics. Such a further evolution of the framework could also take account of (properly discounted) intertemporal trade-offs over the policy horizon (e.g., balancing short-term costs against what may be the medium-term benefits of a policy tool). Section 5.4 in Suárez (2022) provides a simplified treatment of this issue.

growth over the next three or four years. Importantly, such a measure implies less focus on short-lived fluctuations and more on low-frequency, persistent risks.

5.2 The threshold lower quantile and the choice between growth-at-risk and growth-given-stress

Next, consider the choice of quantile and the characterisation of the lower tail of the growth distribution. Starting with the former, should macroprudential policy focus on the 5th percentile of the distribution or, possibly, the 10th or the 15th? At a conceptual level it is reasonable to consider lower quantiles. The Laeven and Valencia (2018) data implies an unconditional probability of a crisis of roughly 4.5% per year, suggesting that we should focus on the 5th percentile of the growth distribution. However, this seems too low for two reasons. First, financial factors play a role in most downturns – even those that are not accompanied by financial crises. Second, we suspect that there are significant barriers to measuring low quantiles with precision. As the quantile declines from the tenth to the fifth to the first, observations around the true quantile are very likely to become increasingly sparse, so the accuracy with which the quantile (and its determinants) can be estimated inevitably declines. In all, this might provide an argument for preferring the 10th to the 5th percentile (and relative to the 15th, which might less clearly reflect the implications of financial stress).

Turning to the measure of the lower tail of growth outcomes: which is better, growth-at-risk or growth-given-stress? From a conceptual perspective the latter might have the advantage of taking the full form of the lower tail of the growth distribution into account and not just the point that corresponds to the reference low quantile. Depending on the shape of the distribution at its tail, a fixed growth-at-risk is compatible with many different values of the growth-given-stress, i.e., the growth conditional on the system being under stress. However, focusing on growth-at-risk can be preferable from a practical empirical perspective. Computing growth-given-stress requires estimating the area under the entire lower tail, and the absence of data to pin down the density at very low quantiles makes this extremely difficult to do with any degree of precision. We cannot measure the frequency or the severity of events we very rarely see. So, much as we might prefer growth-given-stress as a measure of welfare, it seems prudent for policymakers to pay more attention to growth-at-risk.

5.3 The relative effectiveness of policy

The final input into the computation of the macroprudential target is the impact of policy on the lower tail of the growth distribution relative to its impact on mean growth, (γ_q/γ). This requires policymakers to estimate the elasticity of average growth for the chosen low quantile in respect of the array of macroprudential tools over the preferred horizon. Several complex issues arise in this regard. First, the accuracy of these estimates will almost certainly depend on the horizon. This means we will be able to estimate the impact of policy on growth more precisely at some horizons than at others – a fact that plays a role in the choice of the horizon itself. Second, we have more experience with some tools than with others. For example, in the

banking sector, changes in maximum loan-to-value ratios for residential mortgages are more common than adjustments to the CCyB or changes in bank asset concentration limits. If a tool shows no variation, then available data will be silent on its effectiveness. Third, there is a possibility that the assumed policy trade-off may not apply to all settings of each policy tool (e.g., because some tools have a negative impact on mean growth at high levels of activation but not at low ones). Finally, there is the issue of the endogeneity of policy tools. An appropriate treatment of macroprudential instruments' endogeneity is essential if estimates of (γ_p/γ) are to capture the causal effect of policy on the relevant moments of the growth distribution rather than the mere historical correlation between tools and growth outcomes.[21]

These inputs, combined with society's aversion to severely adverse events (the coefficient of relative risk aversion p in the analysis in the previous section), provide a measure of the optimal target distance that is the basis for a macroprudential target. Comparing this optimal target with the distance implied by current policy settings yields a measure of stance. When the current estimate of the distance exceeds the optimal target, policy is too accommodative; when the current estimate of the distance is smaller than the optimal target, policy is too restrictive.

Finally, we note several additional challenges that macroprudential policymakers face during implementation. First, there is the sheer number of tools available. Alam et al. (2019) tabulate 17 separate categories of macroprudential tools. Ideally, we would determine which are substitutes and which are complements, so that we can employ such tools in the best possible combinations, equating their marginal effectiveness.[22] Second, as always, policymakers need to avoid reacting to "noise". Given how underdeveloped data systems are for some parts of the financial system (especially for non-bank intermediaries), this is a particular risk. A related call for caution emerges when we recognise the potential for misspecification and estimation error that could plague the empirical models underpinning the kind of policy calculations envisaged above.[23] Third, as should be clear from our discussion, the policy target is likely to differ across jurisdictions. Attitudes toward risk (or society's aversion to financial instability) will diverge, as will the structure of financial systems and the effectiveness of different policy instruments. So, in a multijurisdictional area such as the European Union, providing a cross-country assessment of policy stance will involve the challenge of treating or accommodating country heterogeneity along some of the dimensions identified above (risk attitudes, effectiveness of available policy tools, etc.).

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21 Addressing this issue may require moving beyond standard reduced-form quantile regressions by adopting either an instrumental-variables approach or a structural approach that explicitly models policy as an endogenous variable in a multi-equational system.

22 See Suárez (2022), Section 4.2 for a general discussion of this problem.

23 Such problems plague many aspects of both public and private decision-making. See, for example, Svensson and Woodford (2003) for a general discussion, Orphanides (2001 and 2003) for an examination of the impact of "noisy" information on monetary policy, and Jorion (1985) for a study of the problem in the context of international portfolio diversification.

6 Concluding remarks

The role of macroprudential policymakers is to ensure that the probability and severity of a crisis is at a level that is consistent with the preferences of the citizens they serve. To fulfil this task they require a measurable objective, a set of tools that can influence their target, and a model linking the two. The problem is analogous to that faced by monetary policymakers as they strive to achieve price stability. Using this as a guide, this paper presents an example of a framework in which optimal macroprudential policy requires policymakers to target the distance between average growth and a low quantile of growth. This distance depends on society's aversion to crisis and the degree to which tools can influence the mean and the lower tail of the growth distribution. Our example yields a normative measure of stance, which tells us whether macroprudential policy is excessively accommodative or restrictive.

Before concluding, it is important that we provide a few warnings. First and foremost, the purpose of this paper is to provide a perspective on the problems faced by macroprudential policymakers – including those related to the existence of several agencies involved in the pursuing of multiple intermediate objectives and the management of many tools. We discuss the necessary elements of a theoretical and empirical framework that could form a basis for constructing a measure of policy stance. We present stylised examples based on a simple model. There is no guarantee that the conclusions we draw will survive in more complex, more detailed, and more realistic models of the economic and financial system. However, it seems likely that a fully articulated macroprudential policy framework will include a horizon for the target, a measure of the lower quantiles of a suitable aggregate indicator of economic wellbeing (possibly GDP growth), and an estimate of the causal effect of the relevant policy tools on that distribution. A combination of data sparsity and the difficulty faced by policymakers in identifying the causal impact of macroprudential tools on their target makes this a challenging task.

Second, our simplified treatment of macroprudential policy abstracts from a well-known danger that plagues all stabilisation policy. When the authorities reduce the likelihood of severely adverse outcomes, attitudes toward risk taking change in ways that could ultimately make the system less resilient. Ironically, policies aimed at mitigating financial stress could sow the seeds of future crises. Some elements of crisis management, in which authorities rescue financial markets and institutions, may further aggravate this problem. Our treatment of the impact of macroprudential policy on systemic risk (proxied by its impact on the low tail of the growth distribution in our example) does not account for this form of moral hazard. That said, if the moral hazard effects were dominant in practice, a suitably estimated measure of the causal impact of policy actions on the relevant low tail of the growth distribution would reflect this by showing an overall negative, rather than positive, effect of crisis mitigation policies on tail outcomes, and the framework envisaged in this paper would advise against such policy actions.

To conclude, the developments summarized in this paper constitute the beginning of a discussion, outlining the challenges that researchers and practitioners face as they set out to construct a macroprudential policy framework. In our view, making progress on the road ahead will take time and will require contributions

from various fields, but there is every reason to believe that these efforts will help to improve the assessment, design and communication of macroprudential policy.

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Resolution instruments of central counterparties. Effectiveness and possible systemic impact

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Acronyms used

BIS	Bank for International Settlements
CCP	Central counterparty
CNMV	Spanish National Securities Market Commission
CPMI	Committee on Payments and Market Infrastructures – Bank for International Settlements
EMIR	European Market Infrastructure Regulation
EU	European Union
FSB	Financial Stability Board
IOSCO	International Organization of Securities Commissions
NCWO	No creditor worse off
OTC	Over the counter
PFMI	Principles for Financial Market Infrastructures
VMGH	Variation margin gain haircutting

1 Introduction

As a continuation of the work published in 2021[1] on the resolution of central coun-terparties (CCP), this article analyses the impact of the application of resolution tools on financial stability in scenarios of member failure, operational failure and systemic crisis.

This analysis will contribute to enriching the work related to the resolution plan of the Spanish CCP and will benefit from the discussions held in the workshops on this matter by the Financial Stability Board, together with CPMI and IOSCO, in which the CNMV has participated.

What has also contributed to enrich this analysis is the Conference on Recovery and Resolution of CCP[2] that the CNMV held on 21 June 2022 with the aim of raising awareness in the financial industry about the new European regulation on the mat-ter and promoting debates on its implications with the financial industry, compe-tent authorities and academics. In particular, the round table dedicated to the effec-tiveness and the possible impact on financial stability of the application of CCP resolution tools has inspired much of this analysis.

2 Systemicity of CCPs and the three essential "Rs"

The systemic importance of CCPs acquired after the global financial crisis is due, to a large extent, to the incorporation of OTC derivatives into centralised clearing, which has made the derivatives market more secure, stable and transparent and, at the same time, it has turned these infrastructures into entities which are too big to fail.

According to the latest report published by the FSB on progress in the reform of OTC derivatives markets,[3] 17 of the 24 FSB member jurisdictions have passed regu-latory measures for mandatory central clearing. Among them, the European Union,[4] Hong Kong, Switzerland, United Kingdom and United States, where the most im-portant CCPs in the world are located, considered by the FSB as systemic clearing houses in more than one jurisdiction.[5]

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1   Gomez-Yubero and Gullón (2020).

2   The video of the conference is available on the CNMV website. The broadcast of the round table on the effectiveness and possible impact on financial stability of the application of CCP resolution tools is avail-able from 2:32:20 (CNMV, 2022).

3   FSB (2022).

4   The European Union encompasses the 27 Member States, of which 5 are FSB member jurisdictions (France, Germany, Italy, the Netherlands and Spain).

5   There are 13 CCP worldwide, of which 6 are from the European Union: BME Clearing (Spain – EU), CC&GB (Italy – EU), CME Inc. (USA), Eurex Clearing (Germany – EU), EuroCCP (Netherlands – EU), HKFE Clearing Corporation (RAE of Hong Kong), Clear Credit (USA), ICE Clear Europe (United Kingdom), LCH Ltd (United Kingdom), LCH SA (France – EU), Nasdaq Clearing (Sweden – EU), Options Clearing Corporation (USA) and SIX x-clear (Switzerland).

According to the latest statistics on OTC derivatives published by the Bank for International Settlements (BIS), 64% of the volume of derivatives contracts in force worldwide (US$632 trillion at the end of the first half of 2022) are cleared through CCP. The largest volume of OTC derivatives is concentrated in interest rate contracts, which represent 80% of the total volume. In this case, the share of centrally cleared contracts was 78% at the end of June 2022.

Proportion of outstanding value of OTC derivatives cleared through CCP FIGURE 1
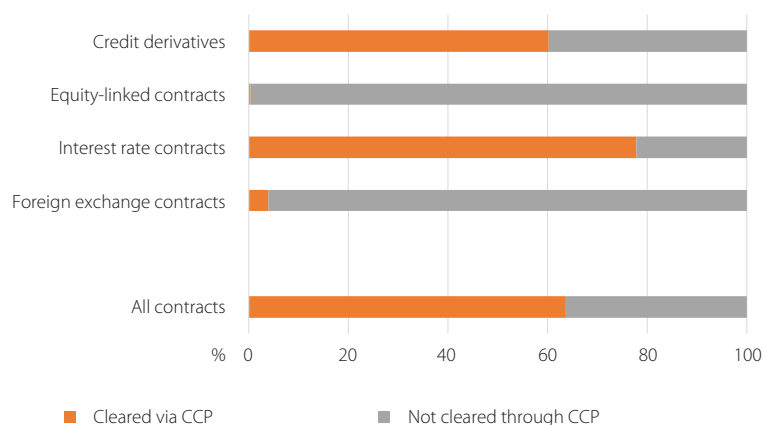
Source: BIS (2022).

In addition, given the transnational nature of the clearing activity and the considerable interdependencies with the rest of the financial system, during the last decade the regulatory agenda has considered strengthening its resilience, its recovery capacity and its resolvability as a priority.

The resilience, recovery and resolution of CCPs are three essential "Rs" for CCPs, which are closely linked: on the one hand, strong resilience mechanisms can reduce the likelihood that recovery and resolution will need to be entered, while recovery and resolution agreements should maintain incentives to ensure resilience in the continuity phase.

Since the implementation of these reforms, significant progress has been made to improve the interaction and effectiveness of the three "Rs", achieving globally harmonised regulation, which is based on international principles adopted after the financial crisis.

On the one hand, the Principles for Financial Market Infrastructures (PFMI, for its acronym in English),[6] which were agreed by CPMI-IOSCO in 2012 and complemented in the following years, address the prudential regime and risk management, and were reflected in Europe in the EMIR Regulation.[7]

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6   CPMI-IOSCO (2012).
7   Regulation (EU) No. 648/2012, of the European Parliament and of the Council, of 4 July, on over-the-counter (OTC) derivatives, central counterparties and trade repositories.

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On the other hand, the key attributes of effective resolution regimes for financial institutions,[8] approved by the FSB in 2011 for the banking system and adapted in 2014 to market infrastructures, address the problem of financial institutions that are too big to fail by defining a resolution framework that allows authorities to manage the failure of this entities, maintaining the continuity of critical functions for the proper functioning of the financial system and without resorting to taxpayer funds.

The European Regulation on recovery and resolution of central counterparties (hereinafter the European Regulation on R&R of CCP)[9] conforms to these principles and with its approval and effective application, as of August 2022, it has been achieved that all CCPs in the world considered by the FSB as systemic in more than one jurisdiction[10] (among them, Spain's BME Clearing) have a recovery and resolution framework adjusted to the international standards approved after the global financial crisis.

At the international level, work continues to further strengthen the three "Rs" of these infrastructures and improve the effectiveness of OTC derivatives market reforms. Among these works, it is worth highlighting the following most recent:[11]

–   In November 2022, CPMI-IOSCO published a report on cyber resilience[12] of financial market infrastructures showing reasonably high adoption of cyber guidance issued in 2016,[13] but highlights that some infrastructures (although in a small number) do not fully meet the expectations regarding the development of recovery plans and cybernetic response to meet the recovery objective in a maximum time of two hours. This report identifies some additional issues: i) related to deficiencies in response and recovery plans in extreme cyberattack scenarios, ii) lack of cyber resilience testing after major system changes, iii) lack of comprehensive evidence-based testing scenarios and iv) insufficient involvement of relevant stakeholders in testing. In view of the potential aggregate impact, relevant financial market infrastructures and their supervisors are urged to address these issues with the highest priority.

–   The CPMI and IOSCO published in September 2022[14] a report on the benefits and challenges derived from the new models of access to centralised clearing, which allow clients to directly access the services of CCPs, and on the effectiveness of the practices of allowing the portability of client positions in case of default of the clearing service provider.

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8   FSB (2014).

9   Regulation (EU) 2021/23 of the European Parliament and of the Council of 16 December 2020 on a framework for the recovery and resolution of central counterparties.

10 See Note 5.

11 Section 3.1 of Gómez-Yubero and Gullón (2020) contains a summary of these advances up to the end of 2020.

12 CPMI-IOSCO (2022d).

13 CPMI-IOSCO (2016).

14 CPMI-IOSCO (2022b).

–   The CPMI and IOSCO have also promoted a reflection and debate with the industry to try to advance the identified problems related to CCP default management auctions,[15] as well as practices to address non-default losses in business as usual, recovery and orderly liquidation scenarios.[16]

–   The FSB, CPMI and IOSCO published in March 2022 an analysis on existing CCP financial resources and tools for recovery and resolution,[17] and highlighted the need to continue working on the resources and instruments available in terms of resolution. The FSB is currently continuing this work, assessing the costs and benefits of potential alternative financial tools and resources for CCP resolution (referred to in Section 5).

–   As part of the FSB programme to improve the resilience of non-bank financial intermediation, CPMI-IOSCO submitted for public consultation in September 2022 a report on margining practices in the central and non-central clearing markets in derivatives and securities,[18] in which it identifies several areas amenable to further analysis and possible future policy directions.

Despite these advances, the growing systemic importance of CCPs and the intensification of their interconnection with banks through clearing and other services (liquidity lines, settlement services, custody and investment) underscores the need to further understand and consider the recovery and resolution of CCPs and their impact on financial stability.

The following sections analyse the different types of instruments that a resolution authority has at its disposal to tackle the failure of a CCP and advance some of the lines of investigation that are being carried out within the scope of the FSB on possible additional resources or alternatives in the event that the existing instruments in the recovery or resolution phases could be insufficient or entail risks that cannot be assumed by the financial system. The table in Annex summarises this analysis.

3   CCP resolution objectives

The failure of entities such as CCPs, which provide time-critical, essential and non-substitutable services, could have systemic implications that cannot be assumed by the financial system, so the resolution of this type of entity that is too important to fail must have as its objective the continuity of the critical functions of the CCP in all the jurisdictions in which these functions are carried out and the search for financial stability without recourse to taxpayer funds.

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15   CPMI-IOSCO (2020).
16   CPMI-IOSCO (2022a).
17   FSB, CPMI and IOSCO (2022).
18   CPMI-IOSCO (2022c).

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Resolution planning should seek to preserve incentives for CCPs, clearing members and market participants to centrally clear and constructively engage in successful risk management and recovery in the event that the CCP should run into financial difficulties and thus reduce the probability of resolution.

The objectives of CCP resolution can be achieved by maintaining or restoring the continuity of critical CCP functions, or ii) ensuring the continued performance of those functions by another entity (either a viable CCP or an established bridge entity by the resolution authority), together with the orderly liquidation of the non-essential activities or parts of the CCP.

The resolution of the CCP must seek to: i) maintain the confidence of the market and the public while minimising the risk of contagion to the members of the CCP or to the financial system in general, including other market infrastructures; ii) avoid any interruption in the operation of the links between the CCP under resolution and other market infrastructures when such interruptions could have a significant negative effect on financial stability or the functioning of the markets, and iii) maintain continuous access of participants to the securities or collateral contributed to the CCP.

To this end, the resolution authorities must have all the powers necessary to carry out the orderly resolution of a CCP, in particular, to: i) enforce any pending contractual obligation by virtue of the operating rules and other contractual provisions of the CCP; ii) continue to manage the CCP; iii) return the CCP to a matched book situation;[19] iv) deal with pending losses, whether due to default by its members or due to other causes; v) replenish financial resources within an appropriate term to a level sufficient to maintain compliance with legal requirements for the CCP to continue operating; vi) write down (fully or partially) the own funds of the CCP and, where applicable, unsecured liabilities and, if applicable, convert the unsecured liabilities into capital or other instruments owned by the CCP or a successor entity; vii) transfer essential functions to another viable CCP or to a bridge CCP, and viii) liquidate assets and transactions that are part of functions that are not considered critical.

The entry into resolution would occur when a CCP ceases to be viable, or it is probable that it will cease to be, in the following cases: i) because it is or probably will be incapable of performing an essential function, ii) because it is or it will probably be unable to pay its debts or other liabilities when due and iii) because it is or will probably be unable to restore its viability by applying its recovery measures and it does not have a reasonable prospect of returning viable within a reasonable period of time through other actions that the CCP could take without compromising financial stability.

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19   Matched book means the situation in which the open position of the CCP is zero, that is, in which long positions are matched by equal and opposite short positions.

4   Review of available tools

As indicated, in the event that the CCP meets the resolution conditions, its resolution authority must have a set of instruments and resolution powers that allow it to deal with situations arising from cases of default by its members, of non-default, or a combination of both, with the primary objective of ensuring the continuity of essential functions, avoiding negative effects on financial stability, and protecting public funds.

To this end, the European Regulation on R&R of CCP defines a set of instruments and competencies that, like a toolbox, are at the disposal of the resolution authority and that grant said authority the necessary flexibility to apply the tools and resources that it deems most appropriate depending on the specific circumstances in which the infeasibility or possible infeasibility of the clearing house occurs, as well as on the corporate, organisational and business characteristics of the CCP.[20]

At European level, four types of instruments have been regulated that the resolution authority can apply, either individually or in combination[21] that it deems most appropriate and effective for the CCP considering the resolution scenario in question:

– Loss allocation instruments.

– Position allocation instruments.

– CCP loss absorption tools.

– Asset transfer instruments.

The rule also contemplates, as a last resort, two financial stabilisation tools that the State[22] could apply in exceptional situations of systemic crisis, as a last resort, once all the resolution tools have been evaluated and fully used, while maintaining financial stability, provided that it has obtained the corresponding approval under the European Union State aid framework and an adequate recovery plan for the public funds used has been provided. To avoid any kind of moral hazard,[23] the resolution plan of the clearing house cannot contemplate in any way the use of public funds.

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20   This open approach is consistent with the FSB's proposal in its Key Attributes of Effective Resolution Regimes for Financial Institutions (FSB, 2014) as well as its Guidance on Central Counterparty Resolution and Resolution Planning (FSB, 2017), which establish that resolution authorities have the necessary powers and tools to achieve specific objectives as part of an orderly resolution, subject to certain safeguards.

21   See section 3.2.3 and Table 1 of Gómez-Yubero and Gullón (2020).

22   In this case, the application of public stabilisation instruments will be carried out under the direction of the competent ministry designated for that purpose, or of the Government itself, in close cooperation with or under the direction of the resolution authority. To guarantee the effectiveness of said instruments, the competent ministry or the Government will have the resolution powers that would correspond to the resolution authority.

23   Moral hazard is understood to mean the result of a situation in which a market agent has the opportunity to take advantage of a situation or financial deal, knowing that all the risks and consequences will fall on another party.

The sources of losses and risks in CCPs can come from two areas, losses due to default by their clearing members and losses for reasons other than default by members, such as situations of fraud or legal, investment or operational risks. Among the latter, cyber risk appears as one of the most imminent issues that could potentially cause long-lasting detrimental consequences, especially with the increasing reliance on the cloud.[24]

In the case of losses due to member default, the resolution authority must rematch the CCP's portfolio through position allocation instruments and allocate outstanding losses through the use of loss absorbing instruments. Non-default losses must be absorbed by shareholders' equity instruments. If these instruments are not sufficient, the resolution authorities can write down the debt and the unsecured liabilities, in accordance with their priority under applicable national insolvency regulations and apply loss allocation instruments to the extent that is necessary and without jeopardising overall financial stability.

In the following sections, these instruments are analysed one by one, using various defining parameters of their effectiveness when it comes to achieving the resolution objectives that are defined in each specific situation, the limitations for their use, both legal and operational, the costs inherent to its application and the impact on the incentive system for market participants to use centralised clearing and members to take part in the recovery phase. Finally, the impact on financial stability is analysed.

4.1 Position allocation instruments

The forced allocation of positions and the total or partial termination of contracts are tools that can be used to return to a CCP matched book situation and stop further losses. To ensure that they are effective and achieve their objective, these instruments must be applicable to the widest possible variety of contracts that create an unmatched book for the non-viable CCP, both the defaulting clearing member contracts and those in the category of affected assets or clearing service of the CCP.

These instruments are suitable for application in loss-by-default scenarios, both when the objective is to maintain essential clearing services within the CCP under resolution and in conjunction with the transfer of essential services to a bridge CCP or a third party, and the subsequent cessation of activities and liquidation of the CCP.

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24 Cyber threats have grown in frequency and sophistication in a context of digital transformation and increased reliance on third-party service providers. Geopolitical tensions and the growing interconnection of the financial system are also factors that increase the probability of cyber incidents in financial institutions. This vulnerability is recognised by the FSB, which works to improve the resilience of the financial system. CPMI and IOSCO have also been paying special attention to these threats (see CPMI-IOSCO, 2022d). The joint analysis of these organisations (FSB, CPMI and IOSCO, 2022) shows that only the cyber risk scenario leads to the resolution of most of the CCPs dealt with in the analysis.

The operational risk related to the use of these instruments is low since they would be easily available in resolution and the resolution authority would have the capacity to measure, through the valuation of the positions, the amount available. In order to guarantee the ability of the resolution authority to apply these instruments to contracts with entities established in third countries, the recognition of such a possibility must be included in the CCP's operating rules.

However, these tools have a high probability of causing systemic consequences related to knock-on effects for the members of the clearing house and, ultimately, their customers, affected by the termination or by the forced allocation of positions by impacting on possible hedging and other chained transactions, which would expose said participants to market risk at a critical time.

This effect could occur if a participant were allocated positions in products or durations in which it does not regularly trade and therefore are not yet within its risk management structure. A partial termination could, for example, result in the removal of one leg of a participant's hedging strategy, which could render the hedge ineffective.

Thus, the resulting positions could, at least until they can be liquidated in the market, exceed their risk tolerance level and their ability to effectively manage the risk of their positions. Furthermore, in a forced allocation, risk exposures would be concentrated in a subset of clearing participants, which could have negative impacts in the event of new defaults.

In both the case of forced allocation and partial terminations, affected participants could end up with more directional portfolios and therefore higher margin demands. Even if the use of such tools would not cause solvency problems for clearing members, it could put significant pressure on clearing members' liquidity management at a very difficult time.

While in the event of partial termination and forced allocations the impact depends on the magnitude of the contracts affected, a complete termination of contracts can lead to highly disruptive side effects at a systemic level and throughout the market, depending on the systemic importance of the CCP in resolution.

The termination of all contracts, whether in one business line of the CCP or all, would have highly relevant effects for financial stability, especially if the unviable CCP is systemic. Therefore, such termination should be avoided as far as possible and should only be applied if the relevant clearing service or CCP is non-critical and full termination would not, in the opinion of the relevant authorities, have systemic consequences for the financial market in general; or if no other option is likely to lead to a better outcome for financial stability.[25]

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25   FSB (2017).

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4.2   Loss allocation instruments

Cash calls to non-defaulting clearing members, variation margin gain haircutting (VMGH) and even initial margin haircuts[26] are instruments that can be used to obtain additional resources to: i) absorb uncovered losses, ii) contribute to recapitalise the CCP, iii) provide the clearing house with the necessary liquidity to restore its ability to meet its payment obligations in resolution and iv) replenish its pre-financed resources, in such a way that it allows it to continue with its essential activities.

4.2.1 Cash calls

Cash calls under resolution must be contemplated in the operating rules and other contractual provisions of the clearing house, which allows the resolution authority to make one or several requests of contributions in cash to the non-defaulting clearing members for a predetermined amount of funds once that the CCP is subject to resolution. Such amount is usually established based on the contributions of the members to the default funds and, in order for the members to know in advance the commitments that they may assume with these contributions, they are usually limited, as in the European Regulation on R&R of CCP, in an amount equal to twice its contribution to the guarantee fund against defaults.

In both cases, their application in resolution is independent and in addition to the contractual right of a CCP to use cash calls and haircuts in the recovery phase, if this is provided for in its operating rules and in its recovery plan.

These instruments are suitable to cover both losses due to member default and other losses, as well as to restore the CCP's ability to meet its payment obligation, replenish pre-funded resources and recapitalise. The usual limit on its amount, although it provides certainty to members, also conditions its application in that in certain situations it may be insufficient to cover losses.

Cash calls present relatively low operational risk in terms of applicability because the maximum amount of cash is generally defined in advance and therefore predictable.

In addition, to guarantee their enforceability, they must be contemplated in the regulations of the clearing house, which allows the resolution authority to apply them to contracts with entities established in third countries.

The use of this instrument would not affect the business models of the CCPs or the incentives of the clearing members to support the recovery and the default management process.

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26   Initial margin haircuts are not allowed under European regulation, so in this analysis they are considered only at a theoretical level in order to obtain a more complete comparison of the risks inherent in loss allocation tools.

Although the maximum amount of cash calls is known in advance, its application has an impact on the liquidity situation of clearing members and could generate knock-on effects, particularly in an already overly-stressed environment. This impact will depend on the amount of the requirement, its size in relation to the clearing member's balance sheet, the cumulative effects of other management and recovery measures already taken by the clearing house, and general market conditions. In a scenario with particularly strained market conditions, the use of cash requests can have a broader impact, so it is essential to consider how it affects members' management of their capital and liquidity buffer.

4.2.2 Gain haircuts

Variation Margin Gains Haircutting is a power by means of which the resolution authority can reduce all or part of the amount of the CCP's payment obligations to non-defaulting clearing members when such obligations derive from profits owed in accordance with the procedures applied by the CCP to pay variation or payment margins that have the same economic effect, so that the net reduction that may be made for each member must be proportional to the amount owed by the CCP. As in the case of cash calls, the rules of operation of the clearing house must include this power of the resolution authority to delay, reduce or cancel payments derived from variations in margins.

The operational risk when applying these haircuts is negligible, since the clearing house controls their execution and clearing members have no way of avoiding a haircut, as the clearing house retains the cash received in compliance with margin variation requests.

This instrument is applicable for absorbing losses, especially in default scenarios, and as a means of providing liquidity.

The haircut allocates costs to members who experience mark-to-market profit on their positions, which, a priori, avoids allocating costs to participants with losses. However, the allocation could occur at a time when members may be under pressure, either from the stress of the crisis or simply because they have previously, in the recovery phase, contributed funds through cash calls and profit cuts.

Therefore, the positive position of a participant in the CCP need not be an adequate indicator of its relative ability to absorb a loss. When assessing the relevance of potential knock-on effects, it is important to take into account, among other things, the amount of the allocated losses and how the possible additional haircuts under resolution could impact the solvency and liquidity situation of clearing members and, where applicable, that of the clients. Market confidence could be especially damaged if the haircut is used on multiple days.

Another drawback of this resource is that it is difficult to estimate a priori the amount that would be available under resolution, so normally the resolution authority will not be able to accurately identify the amount available for resolution planning.

While the haircut would not affect CCP business models, the potential use of this instrument could incentivise clearing participants to reduce exposure to the CCP by closing out their positions.

4.2.3 Collateral haircuts

The potential use of initial margin haircuts presents the highest risk of negative market impact and undermining confidence in the CCP with potential knock-on effects, as many clients would be unwilling – and others legally unable (due to the requirements of banking solvency regulations) – to continue operating in a CCP in which it was possible to cut collateral. In general, this resource is not allowed by the legislation of various jurisdictions, such as the European Union, due to the potential negative impact on financial stability, confidence and incentives for centralised clearing.

In general, the collateral provided by non-defaulting members is protected against CCP bankruptcy situations. Spanish legislation contemplates, in Article 110.7 of the Spanish Securities Market Act (whose consolidated text was approved by Spanish Royal Legislative Decree 4/2015, of 23 October) an absolute right of separation of these elements of collateral in favour of their legitimate owners (members or clients) in the event that the CCP should be liquidated within the framework of a bankruptcy process.

The CCP also enjoys an absolute right of separation with respect to the collateral constituted by members or by their clients who could be subject to bankruptcy proceedings (Article 110.4 of the Spanish Securities Market Act). Likewise, the margins of clients that are in bankruptcy (Article 110.5 of the Spanish Securities Market Act) enjoy this protection in favour of members of the CCP.

As in the haircut, the operational risk when applying this instrument would be negligible because it is a pre-funded resource. However, it would require participants to immediately replace collateral haircuts or liquidate their positions, potentially exacerbating market stress and increasing knock-on effects.

4.3 CCP loss absorption tools

In accordance with the general principles of the resolution,[27] the shareholders of the CCP subject to resolution must assume the first losses after compliance with all the obligations and provisions set forth in the recovery plan, unless the resolution authority deems it more appropriate not to exhaust said provisions.

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27   FSB Attribute 5.1 (2014) and Article 23.1.a) of the European Regulation on R&R of CCP.

4.3.1 Write-down and conversion of equity and debt instruments

The resolution authority may apply the instrument of write-down and conversion of proprietary instruments and debt instruments or other unsecured liabilities issued by the CCP subject to resolution in order to absorb losses, to recapitalise the CCP or a bridge CCP, or to facilitate the implementation of a transfer strategy such as the sale of the business.

The resolution authority must apply the write-down and conversion instrument in accordance with the priority of credits applicable according to the ordinary insolvency procedures, in such a way that it must be the shareholders of the CCP who bear the first losses, and after them the creditors of the CCP subject to resolution, in accordance with the order of priority of their claims under ordinary insolvency proceedings, ensuring that creditors of the CCP in the same category are treated fairly and equitably.

This means that shareholders must be redeemed before the use of loss allocation tools to non-defaulting members or together with said use, unless a different sequence minimises deviations from the No Creditor Worse Off principle of avoiding damages to creditors greater than those they would have suffered in a regular winding-up process (see Exhibit 1) and better achieve resolution objectives.

In any case, it is necessary to exclude from write-down the liabilities contracted with employees and commercial creditors for the supply to the CCP of goods or services that are essential for the daily development of its activities, the liabilities contracted with the Tax Administration or social security, and liabilities owed to clearing and settlement systems or other CCPs, as well as initial margins contributed by members.

The principal write-down and non-excluded liability write-down and conversion instrument provides the resolution authority with a readily available source of funds to absorb losses and recapitalise the CCP, so the operational risk of implementation is relatively negligible. However, it is limited in terms of loss absorption by the amount of liabilities available for write-down.

The impact on the market and public confidence in the CCP will depend on the public perception of the extent to which the loss reflects a material flaw in the CCP's design and its internal controls.

All of the instruments mentioned so far could create liquidity pressures on clearing members. This, in turn, could affect the liquidity of the CCPs themselves, since they depend on the functioning of the markets for their own liquidity. As the severity of the stress intensifies, with multiple CCPs undergoing recovery or resolution, the exponential loss of confidence among market participants could result in a situation where the recovery and resolution tools may not work as intended. Stress on

multiple CCPs at the same time, or sequentially, is arguably the most significant challenge that resolution authorities, clearing members and the market in general could face.

4.4   Asset transfer instruments

Achieving resolution objectives may require the transfer of the essential functions or viable activities of a CCP to a healthy entity, such as a private sector buyer or a bridge CCP. In both cases, the residual part of the CCP must be liquidated within a reasonable period of time, taking into account that the failing CCP will normally have to provide the necessary support to the buyer or the bridge CCP to carry out the activities or provide the services acquired under of said transmission.

4.4.1 Sale of business

Through the application of this instrument, the resolution authority could sell the CCP or parts of its activities to one or several buyers without the consent of the shareholders, within an open, transparent and non-discriminatory process, while trying to maximise the possible sale price.

The funds obtained from the sale of assets or liabilities of the CCP subject to resolution, after deducting the costs derived from the failure of the CCP and the resolution process, must revert to the entity that remains in the liquidation process, while the net income from the transfer of instruments owned by the CCP subject to resolution must revert to the shareholders. In both cases, the consideration paid by the buyer must also benefit the non-defaulting clearing members who have suffered losses, as well as being subject to the full recovery of any possible public financing provided in the framework of the resolution.

The application of this instrument presents relevant operational difficulties since it is necessary to reconcile the necessary speed and confidentiality of the process with the search for buyers willing and able to assume the responsibilities of said acquisition.

To this end, it is likely that the information on the sale as well as on the negotiation process with potential buyers is systemically relevant and that, within the framework of the market abuse prevention regulations, it is advisable to delay its disclosure for the time needed to plan and structure the resolution of the CCP if the authority thereby considers that the achievement of one or more of the resolution objectives could be undermined, in particular by creating a real danger to financial stability.

In scenarios of systemic crisis, the operational complexity of this measure could be aggravated by the liquidity and solvency tensions to which potential buyers could be subjected.

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4.4.2 Bridge CCP

The resolution authority may also transfer to a bridge CCP the proprietary instruments issued by the CCP under resolution or part of its activities for the time necessary to maintain the continuity of the essential functions received. This solution is suitable for situations in which the sale of the business is not possible due to the lack of private buyers, so it could be an alternative to the sale of the business in marked stress scenarios, although it is common for it to require public help in its financing.

The bridge CCP, as it fully or partially belongs to one or several authorities or is controlled by the resolution authority, must have as its main objective the guaranteeing of the continuity of basic financial services for the clearing members and for the clients of the CCP subject to resolution, and the maintenance of essential financial activities. Bridge CCPs must be managed as viable going concerns and be relisted for sale to one or more private sector buyers when conditions are appropriate, or liquidated if they are no longer viable.

The operationalisation of this instrument can become extremely complex from a legal and operational point of view, and costly in terms of time and financing, since the resolution authority must define or approve its constitution rules, appoint or approve the members of the Board of Directors and determine their responsibilities and remuneration, as well as the strategy and risk profile of the bridge CCP, which will assume the authorisations of the CCP subject to resolution to provide the services or carry out the activities derived from the transmission in accordance with Regulation (EU) 648/2012.

To the problems related to the administrative and management difficulties of the bridge vehicle, one could add the problems to identify alternatives in case no buyers are found at the end of the process.

4.5 Government stabilisation tools

Public support for the resolution of a CCP may take the form of financial support for the recapitalisation of a CCP in exchange for ownership instruments, placing the CCP (or a successor entity such as a bridge CCP) under temporary public ownership, or providing extraordinary assistance from liquidity.

The possible application of public support varies depending on the specific legal framework, as well as the social and political environment of each jurisdiction. Following the current European Union CCP resolution regime, government stabilisation tools could be used in very extraordinary situations, for example a systemic crisis, as a last resort to preserve financial stability and, once private sources of funding have exhausted or cannot achieve the objectives of an orderly resolution and under the premise that sufficient measures must be applied to recover public funds, as a preferred creditor, before non-delinquent members and other creditors.

In the event that the CCP's recoveries are not sufficient, extraordinary contributions from the private sector would have to be resorted to in order to avoid consequences for taxpayers.

Under the conditions described, its quantification could be sufficient to cover considerable losses in default and non-default scenarios, so this tool can be a very effective resource to achieve resolution objectives, especially in systemic crises. Temporary public funding may be more cost-efficient than a pre-funded resolution fund for a tail risk event with extremely low probability.

However, resorting to this type of measure may have significant political and media implications. It may also have significant legal and operational limitations, as it could be subject to public budget and borrowing restrictions. The availability of this instrument may not be immediate to the extent that it requires approvals and evaluations from different government or parliamentary bodies.

The main impact that this tool can have refers to the moral hazard that could affect the business of CCPs, by discouraging members from participating in risk management knowing that there is implicit public support. The regulation by the European Union contemplates certain conditions for its use in order to mitigate this moral hazard:

– The provision of this temporary public funding is necessary to preserve financial stability and achieve the objectives of an orderly resolution.

– Private funding sources have dried up or are unable to meet these targets.

– Effective and credible measures to recover losses suffered by the State are in place to minimise the risk of loss to taxpayers and so that incentives to support CCP recovery measures are maintained.

– Measures for the recovery of temporary public funds must be publicly disclosed and contemplated in the regulation to provide clarity and transparency, as well as an adequate legal basis for their collection.

– Resolution planning should not contemplate or rely on public support and should not create an expectation that such support will be available.

5   Analysis of additional or alternative resources

The effectiveness of a resolution regime for CCPs depends on the availability of adequate resources and instruments to absorb losses in order to maintain the continuity of essential functions.

At the international level, the FSB first published guidance on CCP resolution in 2017[28] and, recognising that it was necessary to continue working on the adequacy of the financial resources under resolution, published additional guidance in 2020[29] and at that time announced a commitment to carry out further work jointly with CPMI and IOSCO.

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28   FSB (2017).
29   FSB (2020).

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Thus, throughout 2020 and 2021, the FSB, CPMI and IOSCO held joint workshops on the potential impact on financial stability of CCP recovery and resolution, and in March 2022 jointly published a report on the financial resources of CCPs for recovery and resolution.[30] This report concluded that all the CCPs included in the sample would have had sufficient pre-funded resources in the recovery phase to face uncovered losses in the severe member default stress scenarios analysed, and only in one of the loss scenarios studied not from member default (cyberattack) would it have been necessary to use resolution powers in most CCPs. However, this analysis was conditioned by a series of limitations and hypotheses that make it necessary to interpret the results with caution.

Therefore, following this report, the FSB decided to continue to review from a qualitative point of view the adequacy of the existing toolkit for CCP resolution, focusing in particular on the necessity, costs and benefits (including effectiveness and impact in the incentives) of possible alternative financial resources and tools for the resolution of CCPs. This work is currently in progress and a document is expected to be submitted for consultation in early 2023 and a meeting will be held with the industry to gather their opinion and comments.

And despite the fact that history also corroborates the low probability of occurrence of this type of event, it is important to consider scenarios of "what would happen if something went wrong" and to be prepared for possible failures which, although unlikely, could have a very high impact. Recent and unforeseen geopolitical events demonstrate that the impacts could be even more extreme than past historical events.

For this reason, it is necessary to guarantee that adequate resources and instruments are available to manage the possible non-viability of a CCP, maintaining the continuity of essential functions in the event that resolution is necessary. A lack of suitable resources or tools would probably prevent the resolution authority from achieving its resolution objectives and could lead to greater financial instability.

Bearing in mind that the tools available to a CCP to deal with a recovery largely coincide with those that could be used in the resolution phase,[31] it could happen that once the recovery phase is exhausted, these tools are no longer available to the resolution authority.

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30   FSB, CPMI and IOSCO (2022).

31   According to the guidance on planning the recovery of market infrastructures published by CPMI and IOSCO in 2014, updated in 2017 (CPMI-IOSCO, 2017), CCPs must have: i) tools to allocate uncovered losses caused by the default of participants (such as cash calls, haircuts, and the use of initial margin); ii) tools to address any liquidity shortfalls discovered (such as obtaining liquidity from third parties or from members themselves); iii) tools to replace the financial resources used in recovery (such as cash calls or recapitalisations); iv) tools to restore a matched book after a member's default (such as the forced allocation of contracts or the total or partial termination of contracts), and v) tools to allocate losses not caused by participant default (such as clearing house capital [known as "skin in the game"] and its recapitalisation, insurance or indemnity policies).

Unless resources and tools have been set aside for resolution, or the resolution authority can enter an early phase when adequate resources and recovery tools are available for resolution, it may happen that there are not enough resources and tools available in the CCP to support an orderly resolution without an adverse impact on financial stability.

Even in the situation in which some resources and instruments available to the CCP for recovery continue to be available to the resolution authority, such as variation gain margin reduction, haircuts and cash calls, these could have chain effects and a potentially adverse impact on financial stability, especially in scenarios of systemic crises and high stress. Consequently, even if the CCP or the resolution authority have them, the use of these resources in later phases could become destabilising and inappropriate in certain scenarios.

As part of the ongoing work of the FSB, five possible alternative financial resources and instruments reserved for the resolution of CCPs have been identified and are discussed in the following sections, as well as others that could also be considered.

5.1 Internal recapitalisation debt issuance (bailinable)

This is subordinated debt, ranked lower than other liabilities issued by a CCP, which could be applied to absorbing losses on resolution, both from member and non-member defaults, and to recapitalising the CCP. The CCPs would issue this type of internal recapitalisation debt in periods of business as usual for exclusive use in resolution, which would allow the resolution authority to convert such liabilities into equity or other proprietary instruments in the CCP or a successor entity.

To meet the liquidity needs in resolution, CCPs could additionally be required to keep the proceeds of these issues in highly liquid investments.

In order to avoid concentrating risk and putting further pressure on clearing members, restrictions could be applied to the holders of these products to reduce the risk of contagion and possible adverse effects on financial stability. Expanding the universe of potential investors would reduce procyclicality during periods of stress.

The main advantages of the internal recapitalisation bonds reserved for resolution are that they provide pre-financed resources and, therefore, a high degree of predictability. Its use can be carried out in a timely manner and with relatively little legal and operational risk, which facilitates its use in crisis situations, both idiosyncratic and systemic. The nature of this debt, subordinate to any other credit except the principal, should not alter the NCWO principle. At the same time, it could improve the market's confidence in the ability of the resolution authority to execute the resolution due to the greater security represented by the reinforcement of the CCP's resolvability.

The main drawback is related to the leverage of the CCP through the issuance of this debt, which entails an additional risk that must be adequately managed by the CCP. The cost of issuing internal recapitalisation bonds in amounts sufficient to be feasible for resolution may be too great to be borne by the CCP business. The magnitude

of the cost would vary depending on the amount of the internal recapitalisation bonds issued, the risk-free cost of capital and the market's estimate of the probability that the CCP could enter into resolution. If anything, their impact on fee increases could reduce incentives to centrally clear products for which clearing is voluntary, especially if they are dedicated to covering losses from member defaults.

They may also be detrimental to the willingness of clearing members to engage in voluntary recovery measures, as there is an external level of protection against tail risk, but it would not equally affect the willingness of the clearing member to engage in contractually agreed recovery measures.

Finally, their effect on financial stability could depend on the possible implementation of restrictive measures on holding by clearing members for their protection when under pressure.

5.2 Resolution fund

This is a fund similar to the one existing in the European Union for the banking sector, which could be used to act as backstop in the event that the available resources were not sufficient or were not available on time. Therefore, in theory, it could be applied to absorb losses, recapitalise the entity and provide liquidity. It could also be used to compensate creditors for having suffered greater losses during resolution than during liquidation (NCWO).

The governance structure and design of a supranational fund would entail the participation of all resolution authorities, which could draw on its resources. Its management would be entrusted to a public sector entity with a governance regime similar to that of pre-financed deposit guarantee funds or bank resolution funds.

Both the covered CCPs and their clearing members would participate in its financing, which would contribute financing in a normal situation. The participation of other interested financial institutions and beneficiaries of the proper functioning of the markets and financial stability could also be considered.

5.3 Taking out a specific insurance policy for resolution

The purpose of the resolution insurance policy would be to cover losses and other resolution costs not covered by other financial resources available to the resolution authority. The use of insurance does not seem to be the most suitable tool to obtain liquidity, since its availability is not immediate. In the resolution phase, the insurance policy could be used both for member default loss scenarios and to cover non-default losses. Obviously, the greater the size of the coverage, the higher the premium that the CCP would pay and, therefore, the greater the impact on the business and the possible repercussion on fees and incentives to be centrally cleared.

Currently, most CCPs have insurance to cover losses not arising from member defaults. However, it may be difficult to find insurance companies willing to cover the risks in resolution scenarios, at least with an affordable cost for the CCP business.

To avoid risk concentration in the financial sector most interconnected with CCPs, potential insurers may be financial companies that are not significant participants in the CCP. The downside of this measure would be the possible contagion, especially in high stress scenarios, to sectors not initially affected by the crisis that the resolution measure would have originated.

5.4 Financial support from third parties in resolution

This support would be provided contractually by a third party (a bank or an insurance company), which in some cases could be the parent or another entity of the CCP's group, at the disposal of the resolution authority. These financial resources would be specified in the contractual documentation and could be structured in various ways (intra-group financial support, letters of credit, performance or advance payment guarantees).

As in the case of insurance, obtaining financial support from third parties to be provided in loss scenarios, especially in scenarios that affect the entire system, may not be realistic not only because of the cost that could be involved, but also because of the possible negative reputation regarding the financial soundness of the CCP and the foreseeable requirement of feasibility plans by third parties.

For this reason, intra-group support may be the most viable option, as many CCPs are structured as a subsidiary of a larger group and the CCP is typically not the most capitalised entity, while the parent company may have additional resources.

The parent company would have a significant incentive to support its CCP in order to avoid the reputational risk that the failure of the CCP could generate. However, there are also practical challenges to making this a viable option. If the parent company's support is in the form of a guarantee or compensation, its enforceability is not clear, and even less so if the parent company is not an entity regulated by the financial authorities.

However, its materialisation may mean a route of contagion to group entities that, in many cases, also carry out fundamental functions such as the management of regulated markets or central securities depositories.

Both insurance and third-party financial support can be effective in covering losses, especially those unrelated to member default, in recapitalising the CCP, and, in the case of third-party support, in providing liquidity. However, they have temporary limitations, since they may not have the necessary immediate availability, as well as legal and operational security related to the interpretation of the contract terms and conditions.

These tools offer the advantage that they would not place additional pressure on CCP clearing members, but could nevertheless lead to procyclical effects related to the potential need for insurers or financial support providers to liquidate assets at tense moments. They can also provide a contagion channel to sectors not initially affected by the crisis, by stressing the solvency of insurers and external providers of contractual support, in the event that they have to make significant payments.

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The use of third-party insurance and financial support could increase the costs of centralised clearing and reduce the profitability of CCPs, although the impact on their business model would depend on how markets assess both covered risks and CCP resolution risks.

5.5   Other possible instruments reserved for resolution

The instruments analysed in this section are not the only ones that could be considered. It could also be evaluated, for example, the application of a bad bank scheme. Its main advantage would be its ability to return to a matched book without putting additional pressure on clearing members, because the defaulter position would be transferred to the bad bank. However, problems may arise such as the difficulty to enable its financing, since it is very possible that it required public support, and to estimate the transfer price; the adverse impact on the incentives of clearing members to cooperate in the default management process; the necessary speed to create said entity; the recovery of losses, and the requirement to provide guarantees before the liquidation of the positions.

Cooperation with the central bank as a lender of last resort should also be mentioned, as providing liquidity to the CCP in a crisis can be critical. In the European Union, only CCPs with a banking licence have access to central banks. Even though liquidity risk should be addressed without relying on central bank liquidity support, since ultimately it is the central bank itself that decides if, when and under what conditions to intervene, more standardised access to central bank facilities would help limit certain risks.

6   Conclusions

The change to centralised clearing, promoted since 2009 to improve transparency and mitigate systemic risk, has intensified the systemic importance of CCPs, as well as the interconnection between CCPs and banks through clearing services, among others (liquidity lines, settlement services, custody and investment). This change has promoted improvements in their resilience, recovery and resolvability, underscoring the need to better understand and consider their implications for financial stability.

There are essential differences between banks and CCPs in terms of their functions, structures, resources and risk profile. The main resources of the CCPs come from their participants (banks in general), through the mutualisation of losses, rather than from their own resources.

CCPs can also be very different from one another, either because of their size, business model, markets served or cleared products, or because of their corporate and governance structure, composition, the level of concentration of their clearing members and the interconnections with the financial system, which increase the potential for risk transmission throughout the financial market.

Consequently, it is essential to take into account these differentiating characteristics of CCPs, as well as different risk, idiosyncratic and systemic scenarios, when evaluating the feasibility and credibility, as well as the costs and impacts derived from the use of resolution instruments available in the event of possible non-viability.

Colour map: CCP resolution tools, effectiveness, operational risk and systemic risk FIGURE 2

Tools	Effectiveness	Operational risk	Systemic risk
Cash calls on non-defaulting members	🟩	🟨	🟨
Variation Margin Gains Haircutting	🟩	🟨	🟥
Total or partial termination of contracts	🟩	🟩	🟥
Write-down and conversion of equity and debt instruments	🟨	🟩	🟩
Sale of business	🟩	🟨	🟨
Bridge CCP	🟩	🟥	🟨
Public equity support	🟩	🟥	🟨
Temporary public ownership	🟩	🟥	🟨

High efficiency. Low operational and systemic risk 🟩
Moderate efficacy. Moderate operational and systemic risk 🟨
Low efficiency. High operational and systemic risk 🟥

Source: Compiled by the author.

The analysis carried out in this article shows that, in general, all the resources and tools have strengths and weaknesses, and can be more or less effective in a specific resolution scenario, without any of them, by itself, being able to satisfy all resolution objectives without presenting any type of inconvenience and with various effects for financial stability.

There is a broad international consensus on the appropriateness of making available to the resolution authorities a combination of non-prescriptive application resources and instruments, which provides flexibility to the authorities to determine the most appropriate solution based on the specific characteristics of the CCP in difficulties and the crisis that motivates it.

It is also possible that a consensus is reached on the appropriateness of having complementary tools to those up to now provided for in international principles and in regulations on the matter, to allow greater optionality to the authorities and, therefore, more opportunities to achieve better the resolution objectives through greater possibilities of combining instruments, such as the use of non-prefunded resources, less expensive at times of normality, with other pre-funded liquid resources, more reliable but also more expensive.

Given the potential impact that the definition of alternative or additional resolution resources to the current ones may have for the incentives during the recovery phase, as well as for the business models of the CCPs, this evaluation must take into account the perspective of both the resolution authorities as well as supervisors and

the industry itself, in order to prevent adverse spillover effects and achieve a consistent and credible position regarding private sector resolution financing.

In the coming months, the FSB, in close cooperation and coordination with the CPMI-IOSCO, will continue to analyse this situation in order to improve knowledge of the implications and interactions between the different resources and instruments in order, where appropriate, to consider a possible revision proposal of the current principles or guidelines, always counting on the consultation of the industry, the interested parties and the academic world and with their participation.

Annex

TABLE 1

Summary table: CCP resolution tools, efficacy, limitations, and potential systemic risk

	Definition	Effectiveness	Limitations	Potential systemic risk
Loss allocation tools				
Cash calls on non-defaulting members	Cash contributions provided for in the CCP's operating rules to cover default and non-default losses. Normally included in the regulations of the CCP and subject to limits (twice the default fund contribution), which provides certainty to members.	**High efficiency** Provides additional non-prefunded resources to absorb losses, restore the CCP's ability to meet its payment obligation, replenish prefunded resources and recapitalise the CCP.	**Low/moderate operational risk** Normally its amount is limited, so it may be insufficient. Moral hazard for CCPs, which discourages risk management. Strain on member incentives if used to recapitalise the CCP with no compensation to members.	**Low/moderate systemic risk, but can become high in high-stress scenarios** Solvency and liquidity problems for members. Chain effects in stressed market conditions. Market liquidity stresses. Risk of contagion.
Variation Margin Gains Haircutting	Reduction of the payment obligations of the CCP in favour of the members with profit by market price. To cover losses in default and non-default scenarios. Listed in the CCP regulations, with temporary, quantitative or other limitations (one-time contribution to the default fund to cover non-default losses).	**High efficiency** It facilitates immediate access to liquid resources to absorb losses and provide liquidity.	**Low operational risk** Does not allow the CCP to meet its objective of ensuring compliance with obligations. Puts pressure on member and customer incentives. Hard to estimate a priori. Difficult to apply to clients. It can cause members and clients to seek an alternative CCP.	**Moderate/high systemic risk** Liquidity problems for members and clients. Risk of contagion. May trigger a liquidity spiral. Loss of confidence. Procyclical effects.

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	Definition	Effectiveness	Limitations	Potential systemic risk
Position allocation tools				
Total or partial termination of contracts	Termination of contracts affected by the default, or if necessary, of all contracts, to restore a matched book in default loss scenarios.	**High efficiency** Allows a matched book to be restored. Avoids the forced allocation of positions.	**Low operational risk** Does not allow the CCP to meet its objective of ensuring compliance with obligations. Exposes members and clients to uncovered risks and position replacement costs.	**High systemic risk** Solvency and liquidity problems for members. Loss of confidence. Market liquidity stresses. Risk of contagion.
CCP loss absorption tools				
Write-down and conversion of equity and debt instruments	To absorb losses, recapitalise the CCP or the bridge CCP, or support the sale of business instrument. Shareholders' instruments should be written down prior to the use of loss allocation tools in favour of non-defaulting members or in conjunction with this measure, unless a different sequence is able to minimise deviations from the NCWO principle and better achieves the resolution objectives.	**Moderate efficacy** Contributes to loss absorption and recapitalisation of the CCP. Limited effectiveness, as the CCP's equity is relatively low and it does not have a significant volume of debt.	**Low operational risk** Funds readily available, though limited. If all the capital is not written down, there may be conflicts of interest between new and old shareholders that may jeopardise the resolution objectives.	**Low systemic risk** The impact on the market and on confidence depends on public perception of the design and controls of the CCP.
Asset transfer tools				
Sale of business	Sale of all or part of the CCP to another entity.	**High efficiency** To ensure the continuity of essential functions. It may be necessary to combine with loss absorption tools.	**Moderate operational risk** It is necessary to combine speed and a complex buyer search process.	**Moderate systemic risk** It will normally be necessary to maintain the confidentiality of the negotiation process.

	Definition	Effectiveness	Limitations	Potential systemic risk
Bridge CCP	The authority creates a bridge CCP to which the essential functions would be transferred. This could be sold at a later date. Non-essential functions would be wound down.	**High efficiency** To ensure the continuity of essential functions. It may be necessary to combine with loss absorption tools.	**High operational risk** Difficulties due to the necessary speed of the process and legal and financial complexity. May require transitory public support.	**Moderate systemic risk** The complexity of the process and the risk of not finding alternatives at the end of it can cause a loss of confidence.
Government stabilisation tools				
Public equity support	Public financial support for the recapitalisation of a CCP in exchange for instruments of ownership. Last resort. At the same time, the write-down and conversion of equity and debt must be implemented. Credible recovery plan by the State.	**High efficiency** Facilitates loss absorption and recapitalisation. Stabilises the CCP. Facilitates the instrumentation of transfer tools.	**High operational risk** Last resort measure that is temporary and conditional on recoverability. Puts stress on the incentives system to encourage members to participate in the lines of defence of the CCP and on the CCP itself to manage its risk.	**Moderate systemic risk** Puts resolution goals at risk. Moral hazard. Generates losses for taxpayers.
Temporary public ownership	The CCP would move into temporary public ownership through the transfer of instruments to the State. At the same time, the write-down and conversion of equity and debt must be implemented. Credible recovery plan by the State.	**High efficiency** Facilitates the instrumentation of transfer tools such as the bridge CCP.	**High operational risk** Last resort measure that is temporary and conditional on recoverability. Puts stress on the incentives system to encourage members to participate in the lines of defence of the CCP and on the CCP itself to manage its risk.	**Moderate systemic risk** Puts resolution goals at risk. Moral hazard. Generates losses for taxpayers.

Source: Compiled by the author.

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III   Legislative Annex

Since the publication of the *CNMV Bulletin* for the third quarter of 2022, the following legislative developments have taken place:

Spanish legislation

– Royal Decree-Law 18/2022, of 18 October, approving measures to reinforce the protection of energy consumers and to contribute to the reduction of natural gas consumption in application of the "More safety for your energy plan (SE)", as well as measures regarding the remuneration of personnel at the service of the public sector and the protection of temporary agricultural workers affected by the drought.

Among other measures, an additional 1.5% rise in the salaries of public sector personnel has been approved in order to offset the effects of inflation. Thus, for the year 2022 the salary increase for public employees will be a maximum of 3.5% on a consolidable basis, with effect from 1 January 2022.

The resulting difference between the approved salary increase and the one that had already been made with the entry into force of the General State Budget Law for the year 2022, of 2%, will materialise as from November, paying as arrears the increase corresponding to the months of January to October of this year.

A new Eighth Additional Provision is added to Law 39/2015, of 1 October, on the Common Administrative Procedure of Public Administrations, with the following wording: "In the case of systems established by Resolution of the General Secretariat for Digital Administration of the Ministry of Economic Affairs and Digital Transformation for its area of competence in order to determine the circumstances in which an electronic signature system not based on electronic certificates will be considered as valid in the relations of the interested parties with the administrative bodies of the Central Government Administration, its public bodies and public law entities linked or dependent, the period of two months will not be necessary for the legal effectiveness of the system to which it is applied refers to Article 10.2.c) of this Law, acquiring legal validity the day after the publication of the Resolution, unless otherwise provided".

– Royal Decree-Law 19/2022, of 22 November, which establishes a Code of Best Practice to alleviate the rise in interest rates on mortgage loans on habitual residence, modifies Royal Decree-Law 6/2012, of 9 March, on urgent measures to protect mortgage debtors without resources, and other structural measures are adopted to improve the mortgage loan market.

The purpose of this Royal Decree-Law is the adoption of measures to deal with the situation of households with debt instrumented as loans or credits with real estate mortgages on primary residences generated by the accelerated rise in interest rates.

A new Code of Best Practice is established, temporary and transitory in nature, with a duration of 24 months, for the adoption of urgent measures for mortgage debtors at risk of vulnerability. The term of validity of this new code will begin to be computed from the day following the publication of the agreement of the Council of Ministers referred to in Article 3 of this Royal Decree-Law.

Credit institutions and other entities or individuals that, professionally, carry out the activity of granting loans or mortgage credits may voluntarily adhere to this code.

It will be applied to natural persons who are holders of loans or credits guaranteed with a real estate mortgage on the habitual residence of the debtor or the non-debtor mortgager, whose acquisition price does not exceed 300,000 euros, constituted until 31 December 2022.

– Law 27/2022, of 20 December, on institutionalisation of the evaluation of public policies in the Central Government Administration.

The purpose of this Law is to structure the public system for evaluating public policies in the Central Government Administration in order to institutionalise evaluation as a tool for collective and organisational learning, for improving public service, accountability and transparency, contributing to the effectiveness and efficiency of public action.

The provisions of the Law will be applied to the evaluation of public policies developed by the Central Government Administration and its related or dependent public bodies.

The audit of the economic-financial activity of the Central Government Administration corresponding to its public policies is carried out by the Court of Auditors. Regarding the *ex post* evaluations of review of public spending that are considered necessary, will be carried out by the Independent Authority for Fiscal Responsibility (AIReF) in the terms established in its regulatory regulations.

Excluded from the scope of application of this Law are all auditing actions, effectiveness control, continuous supervision and internal control of economic and financial activity and quality of services, as well as any other evaluation activity that is subject to specific regulation.

This Law has a supplementary nature with respect to those aspects of public policy evaluation activities not provided for in the specific regulations. The State Agency for the Evaluation of Public Policies, in collaboration with the National Institute of Public Administration and, where appropriate, with the Institute of Fiscal Studies, will identify the necessary competencies for the performance of the evaluation function and will design specific training plans on the evaluation of public policies for public employees.

On a four-year basis, the Council of Ministers will approve and publish, at the proposal of the person in charge of the competent ministry in matters of public

service, a Strategic Evaluation Plan prepared by the State Agency for the Evaluation of Public Policies. On a biennial basis, each department will prepare a Departmental Evaluation Plan for the following two years.

– Law 28/2022, of 21 December, to promote the ecosystem of emerging companies.

The purpose of this Law is to establish a specific regulatory framework to support the creation and growth of emerging companies in Spain, taking into account the distribution of powers on the matter between the State and the autonomous communities, as well as establishing a monitoring and evaluation system of their results on the Spanish ecosystem of emerging companies.

– Law 38/2022, of 27 December, for the establishment of temporary taxes on energy and credit institutions and financial credit establishments and by which the temporary solidarity tax for large fortunes is created, and certain tax regulations are modified.

– Royal Decree-Law 20/2022, of 27 December, of response measures to the economic and social consequences of the Ukrainian War and support for the reconstruction of the island of La Palma and other situations of vulnerability.

Regarding foreign investments: Article 61 is included on the modification of Law 19/2003, of 4 July, on the legal regime of capital movements and economic transactions abroad, to modify Section 1 of Article 7 *bis* of Law 19/2003, of 4 July (suspension of the liberalisation regime for certain foreign direct investments in Spain), and Article 62 on the modification of Royal Decree-Law 34/2020, of 17 November, on urgent support measures to business solvency and the energy sector, and in tax matters, which modifies the single transitory provision (the regime for the suspension of liberalisation of certain foreign direct investments in Spain regulated in Sections 2 and 5 of Article 7 *bis* of Law 19/2003, of 4 July, will be applied until 31 December 2024).

Regarding the incorporation of modifications in Law 22/2015, of 20 July, on Auditing of Accounts, Article 59 incorporates the Corporate Information Council, competent in corporate information on sustainability.

Spanish National Securities Market Commission

– Resolution of 17 November 2022, of the Spanish National Securities Market Commission, on the delegation of powers of the Chair in matters of contracting, service fees, allocation of expenses, ordering of payments and personnel.

– Circular 4/2022, of 22 December, of the Spanish National Securities Market Commission, on the accounting standards, annual financial statements and interim financial statements of the infrastructures of the Spanish stock market.

Other

– Resolution of 20 October 2022, of the General Secretariat of Digital Administration, which modifies the one of 14 July 2017, which establishes the conditions of use of the non-cryptographic electronic signature, in the relations of the interested parties with the administrative bodies of the Central Government Administration and its public bodies.

– Resolution of the Council of Ministers of 22 November 2022, by which the Code of Best Practice for urgent measures for mortgage debtors at risk of vulnerability is approved.

– Resolution of 23 November 2022, of the Secretary of State for the Economy and Business Support, publishing the Resolution of the Council of Ministers of 22 November 2022, which approves the Code of Best Practice for urgent measures for mortgage debtors at risk of vulnerability.

– Order PCM/1237/2022, of 15 December, publishing the Resolution of the Council of Ministers of 13 December 2022, adopting measures contained in Article 10 of Royal Decree-Law 38/2020, of 29 December, to adapt to the status of the United Kingdom of Great Britain and Northern Ireland as a third country after the end of the transition period provided for in the agreement on the withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union and the European Atomic Energy Community, on 31 January 2020.

European Securities and Markets Authority (ESMA)

– Guidelines on the equivalence of confidentiality and professional secrecy regimes of third-country authorities. (03.05.2022) European Banking Authority (EBA).

– Guidelines on the criteria for the exemption of investment firms from the liquidity requirements in accordance with Article 43(4) of Regulation (EU) 2019/2033. (29 July 2022) European Banking Authority (EBA).

– Guidelines on the data collection exercises regarding high earners under Directive 2013/36/EU and Directive (EU) 2019/2034. (30 June 2022) European Banking Authority (EBA).

– Guidelines on the benchmarking exercises on remuneration practices and the gender pay gap under Directive (EU) 2019/2034. (30 June 2022) European Banking Authority (EBA).

EU legislation (in order of publication in the *OJEU*)

–   Commission Delegated Regulation (EU) 2022/1959, of 13 July 2022, which completes Regulation (EU) No. 596/2014 of the European Parliament and of the Council with regard to the regulatory technical standards that establish a contract model for liquidity contracts relating to the shares of issuers whose financial instruments are admitted to trading on an SME growth market.

    Published in the *OJEU* (L) No. 270, of 18 October 2022, pp. 4-11.

–   Commission Delegated Regulation (EU) 2022/2328, of 16 August 2022, which supplements Regulation (EU) No. 575/2013 of the European Parliament and of the Council with regard to the regulatory technical standards that specify exotic underlyings and instruments subject to residual risks for the purposes of calculating own funds requirements for residual risks.

    Published in the *OJEU* (L) No. 308, of 29 November 2022, pp. 1-4.

–   Directive (EU) 2022/2464 of the European Parliament and of the Council, of 14 December 2022, amending Regulation (EU) No. 537/2014, Directive 2004/109/CE, Directive 2006/43/CE and Directive 2013/34/EU, regarding the presentation of information on sustainability by companies.

    Published in the *OJEU* (L) No. 322, of 16 December 2022, pp. 15-80.

–   Regulation (EU) 2022/2554 of the European Parliament and of the Council, of 14 December 2022, on the digital operational resilience of the financial sector and by which amendment takes place of Regulations (EC) No. 1060/2009, (EU) No. 648/2012, (EU) No. 600/2014, (EU) No. 909/2014 and (EU) 2016/1011.

    Published in the *OJEU* (L) No. 333, of 27 December 2022, pp. 1-79.

–   Commission Delegated Regulation (EU) 2022/2553, of 21 September 2022, which modifies the regulatory technical standards established in Delegated Regulation (EU) 2019/815 with regard to the 2022 update of the taxonomy for the single electronic format for the presentation of information.

    Published in the *OJEU* (L) No. 339, of 30 December 2022, pp. 1-1,251.

IV Statistics Annex

1 Markets

1.1 Equity

Share issues and public offerings[1]

TABLE 1.1

	2020	2021	2022	2021 IV	2022 I	II	III	IV
NO. OF ISSUERS								
Total	28	34	27	8	9	10	9	12
Capital increases	28	33	27	8	9	10	9	12
Primary offerings	1	1	1	0	0	0	1	0
Bonus issues	12	14	12	5	4	5	4	3
Of which, scrip dividend	12	13	11	4	4	5	4	2
Capital increases by conversion	2	4	4	0	0	1	1	3
For non-monetary consideration	1	4	2	0	1	0	0	2
With pre-emptive subscription rights	5	4	2	1	0	2	0	0
Without trading warrants	9	12	10	2	5	3	3	5
Secondary offerings	0	1	0	0	0	0	0	0
NO. OF ISSUES								
Total	40	52	56	9	10	12	9	25
Capital increases	40	51	56	9	10	12	9	25
Primary offerings	1	1	1	0	0	0	1	0
Bonus issues	17	20	16	5	4	5	4	3
Of which, scrip dividend	17	19	15	4	4	5	4	2
Capital increases by conversion	2	4	14	0	0	1	1	12
For non-monetary consideration	2	5	5	0	1	0	0	4
With pre-emptive subscription rights	5	4	2	1	0	2	0	0
Without trading warrants	13	17	18	3	5	4	3	6
Secondary offerings	0	1	0	0	0	0	0	0
CASH VALUE (millions of euros)								
Total	10,852.1	17,138.3	4,689.4	321.7	1,368.9	701.9	1,006.8	1,611.7
Capital increases	10,852.1	14,938.1	4,689.4	321.7	1,368.9	701.9	1,006.8	1,611.7
Primary offerings	150.1	100.0	200.0	0.0	0.0	0.0	200.0	0.0
Bonus issues	1,949.0	1,264.9	1,503.0	165.5	422.8	347.8	694.6	37.9
Of which, scrip dividend	1,949.0	1,243.6	1,501.5	144.2	422.8	347.8	694.6	36.4
Capital increases by conversion	162.4	109.5	81.6	0.0	0.0	3.1	2.0	76.5
For non-monetary consideration[2]	233.0	3,525.3	1,381.2	0.0	17.4	0.0	0.0	1,363.8
With pre-emptive subscription rights	6,837.2	7,060.4	254.2	21.2	0.0	254.2	0.0	0.0
Without trading warrants	1,520.3	2,878.1	1,269.4	135.0	928.7	96.8	110.3	133.6
Secondary offerings	0.0	2,200.2	0.0	0.0	0.0	0.0	0.0	0.0
NOMINAL VALUE (millions of euros)								
Total	1,282.0	5,021.7	530.2	188.5	131.9	174.3	116.5	107.5
Capital increases	1,282.0	4,939.4	530.2	188.5	131.9	174.3	116.5	107.5
Primary offerings	7.8	5.4	0.8	0.0	0.0	0.0	0.8	0.0
Bonus issues	799.6	796.2	334.4	165.3	68.3	149.6	111.5	4.9
Of which, scrip dividend	799.6	774.9	332.9	144.0	68.3	149.6	111.5	3.4
Capital increases by conversion	1.7	46.3	6.5	0.0	0.0	0.0	0.0	6.4
For non-monetary consideration	68.0	3,289.0	19.3	0.0	8.7	0.0	0.0	10.6
With pre-emptive subscription rights	370.9	98.8	22.9	21.2	0.0	22.9	0.0	0.0
Without trading warrants	34.1	703.7	146.2	1.9	54.9	1.7	4.1	85.5
Secondary offerings	0.0	82.3	0.0	0.0	0.0	0.0	0.0	0.0
***Pro memoria*: transactions BME Growth[3]**								
No. of issuers	9	44	44	14	13	13	19	13
No. of issues	14	77	88	19	14	26	30	18
Cash value (millions of euros)	238.5	2,440.8	2,329.5	434.7	347.0	615.2	643.0	724.3
Capital increases	238.5	2,440.8	2,329.5	434.7	347.0	615.2	643.0	724.3
Of which, primary offerings	173.5	1,654.2	1,487.1	379.1	216.5	190.7	399.3	680.7
Secondary offerings	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

1 Registered transactions at the CNMV. Does not include data from BME Growth, ETF or Latibex.
2 Capital increases for non-monetary consideration are valued at market prices.
3 Unregistered transactions at the CNMV. Source: BME and CNMV.

Companies listed[1]

TABLE 1.2

	2020	2021	2022	2021 IV	2022 I	II	III	IV
Total electronic market[2]	126	123	121	123	123	121	121	121
Of which, foreign companies	7	6	6	6	6	6	6	6
Second market	0	0	0	0	0	0	0	0
Madrid	0	0	0	0	0	0	0	0
Barcelona	0	0	0	0	0	0	0	0
Bilbao	0	0	0	0	0	0	0	0
Valencia	0	0	0	0	0	0	0	0
Open outcry	11	10	9	10	9	9	9	9
Madrid	3	3	3	3	3	3	3	3
Barcelona	6	6	6	6	6	6	6	6
Bilbao	2	2	2	2	2	2	2	2
Valencia	2	1	0	1	0	0	0	0
BME MTF Equity[3]	2,580	2,432	1,349	2,432	2,402	2,350	2,093	1,349
Latibex	19	19	19	19	18	19	19	19

1 Data at the end of period.
2 Without ETFs (Exchange Traded Funds).
3 Alternative Stock Market.

Capitalisation[1]

TABLE 1.3

Millions of euros

	2020	2021	2022	2021 IV	2022 I	II	III	IV
Total electronic market[2]	690,101.6	781,805.0	724,476.0	781,805.0	749,196.8	706,766.8	645,678.0	724,476.0
Of which, foreign companies[3]	113,478.9	147,213.9	141,178.4	147,213.9	143,841.7	121,487.2	115,485.5	141,178.4
Ibex 35	424,167.3	475,870.0	438,222.8	475,870.0	460,787.9	432,155.2	391,213.3	438,222.8
Second market	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Madrid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barcelona	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bilbao	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Valencia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open outcry	1,053.6	1,319.3	1,227.9	1,319.3	1,222.1	1,118.0	1,153.2	1,227.9
Madrid	30.9	23.1	32.8	23.1	24.2	25.8	37.5	32.8
Barcelona	956.0	1,258.7	1,201.5	1,258.7	1,202.9	1,097.1	1,122.2	1,201.5
Bilbao	20.6	19.2	0.0	19.2	16.2	16.2	14.7	0.0
Valencia	76.0	45.3	0.0	45.3	0.0	0.0	0.0	0.0
BME MTF Equity[4, 5]	43,595.5	48,656.9	39,070.4	48,656.9	47,115.3	45,612.4	41,877.1	39,070.4
Latibex	177.2	196.1	228.5	196.1	281.9	187.1	203.4	228.5

1 Data at the end of period.
2 Without ETFs (Exchange Traded Funds).
3 Capitalisation of foreign companies includes their entire shares, whether they are deposited in Spain or not.
4 Calculated only with outstanding shares, not including treasury shares, because capital stock is not reported until the end of the year.
5 Alternative Stock Market.

Trading

TABLE 1.4

Millions of euros

	2020	2021	2022	2021 IV	2022 I	II	III	IV
Total electronic market[1]	422,786.4	372,972.8	356,572.7	107,010.8	108,728.0	100,601.9	68,491.7	78,751.1
Of which, foreign companies	4,273.8	4,343.6	4,770.9	1,118.3	2,167.5	1,268.4	660.4	674.6
Second market	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Madrid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barcelona	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bilbao	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Valencia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open outcry	2.5	7.4	8.3	1.6	2.5	2.9	0.8	2.0
Madrid	0.1	0.1	0.6	0.0	0.4	0.1	0.1	0.0
Barcelona	2.4	7.4	7.7	1.6	2.1	2.9	0.8	2.0
Bilbao	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Valencia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BME MTF Equity[2]	3,929.0	3,559.2	3,837.3	1,110.4	932.7	984.9	759.0	1,160.7
Latibex	79.5	48.9	93.4	21.7	29.4	15.4	21.5	27.2

1   Without ETFs (Exchange Traded Funds).
2   Alternative Stock Market.

Trading on the electronic market by type of transaction[1]

TABLE 1.5

Millions of euros

	2020	2021	2022	2021 IV	2022 I	II	III	IV
Regular trading	405,120.5	355,841.2	342,364.3	100,331.1	106,941.7	95,453.0	66,656.5	73,313.2
Orders	278,516.1	237,430.5	247,439.8	60,141.9	77,695.7	64,453.9	52,307.0	52,983.3
Put-throughs	42,666.5	40,006.0	35,058.8	10,431.7	10,938.1	9,408.9	6,932.9	7,779.0
Block trades	83,938.0	78,404.7	59,865.7	29,757.6	18,308.0	21,590.2	7,416.7	12,550.9
Off-hours	4,174.3	4,890.0	3,873.0	1,763.2	964.2	1,772.6	343.2	792.9
Authorised trades	2,001.4	1,213.3	867.1	371.1	80.3	464.6	212.8	109.4
Art. 36.1 SMA trades	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tender offers	5,250.9	5,306.1	5,125.0	3,214.0	0.0	1,787.8	184.2	3.153.1
Public offerings for sale	967.8	1,723.2	467.5	0.0	75.0	172.5	220.0	0.0
Declared trades	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Options	3,369.1	2,787.7	2,458.4	1,005.6	327.2	599.7	551.1	980.4
Hedge transactions	1,902.4	1,211.5	1,417.5	325.7	339.5	351.9	323.9	402.2

1   Without ETFs (Exchange Traded Funds).

1.2 Fixed income

Gross issues registered at the CNMV

TABLE 1.6

				2021	2022			
	2020	2021	2022	IV	I	II	III	IV
NO. OF ISSUERS								
Total	47	34	29	13	13	10	7	11
Mortgage-covered bonds	14	7	8	2	6	3	1	2
Territorial-covered bonds	3	3	3	1	3	0	1	0
Non-convertible bonds and debentures	11	10	7	5	3	3	4	3
Convertible bonds and debentures	0	3	2	3	1	2	0	1
Backed securities	15	12	11	1	4	2	2	4
Commercial paper	11	7	2	1	0	1	0	1
Of which, asset-backed	0	0	0	0	0	0	0	0
Of which, non-asset-backed	11	7	2	1	0	1	0	1
Other fixed-income issues	2	1	0	0	0	0	0	0
Preference shares	2	3	0	1	0	0	0	0
NO. OF ISSUES								
Total	244	156	129	18	27	30	29	43
Mortgage-covered bonds	26	16	21	2	8	4	5	4
Territorial-covered bonds	6	3	4	1	3	0	1	0
Non-convertible bonds and debentures	143	81	45	6	4	10	8	23
Convertible bonds and debentures	0	4	4	4	1	2	0	1
Backed securities	52	41	53	3	11	13	15	14
Commercial paper[1]	11	7	2	1	0	1	0	1
Of which, asset-backed	0	0	0	0	0	0	0	0
Of which, non-asset-backed	11	7	2	1	0	1	0	1
Other fixed-income issues	4	1	0	0	0	0	0	0
Preference shares	2	3	0	1	0	0	0	0
NOMINAL AMOUNT (millions of euros)								
Total	132,120.7	101,170.7	124,391.4	27,319.5	42,857.7	17,204.1	24,694.5	39,635.2
Mortgage-covered bonds	22,960.0	28,700.0	31,350.0	6,750.0	14,300.0	7,000.0	6,000.0	4,050.0
Territorial-covered bonds	9,150.0	5,500.0	3,540.0	2,000.0	3,040.0	0.0	500.0	0.0
Non-convertible bonds and debentures	33,412.5	24,756.7	27,532.2	12,774.4	4,371.8	549.5	547.4	22,063.5
Convertible bonds and debentures	0.0	1,210.0	1,800.0	1,210.0	300.0	1,000.0	0.0	500.0
Backed securities	36,281.0	18,375.7	20,644.7	488.0	14,021.8	1,911.4	1,359.1	3,352.4
Commercial paper[2]	22,301.0	20,180.0	39,524.5	3,597.1	6,824.1	6,743.2	16,288.0	9,669.3
Of which, asset-backed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Of which, non-asset-backed	22,301.0	20,180.0	39,524.5	3,597.1	6,824.1	6,743.2	16,288.0	9,669.3
Other fixed-income issues	6,266.2	823.3	0.0	0.0	0.0	0.0	0.0	0.0
Preference shares	1,750.0	1,625.0	0.0	500.0	0.0	0.0	0.0	0.0
Pro memoria:								
Subordinated issues	14,312.1	4,599.5	2,326.3	563.4	951.3	745.2	345.1	284.7
Underwritten issues	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

1 Shelf registrations.
2 The figures for commercial paper refer to the amount placed.

Issues admitted to trading on AIAF[1]

TABLE 1.7

Nominal amount in millions of euros

				2021	2022			
	2020	2021	2022	IV	I	II	III	IV
Total	119,230.2	113,205.9	136,273.0	20,115.9	40,160.8	30,703.6	23,469.8	41,938.9
Commercial paper	22,293.8	20,190.1	39,334.4	6,189.7	5,272.3	8,029.1	13,566.4	12,466.6
Bonds and debentures	20,407.1	37,664.0	40,403.9	2,135.0	15,926.6	1,363.1	1,044.3	22,069.9
Mortgage-covered bonds	23,058.3	29,020.0	31,350.0	7,750.0	14,300.0	7,000.0	6,000.0	4,050.0
Territorial-covered bonds	9,150.0	5,500.0	4,540.0	2,000.0	3,040.0	0.0	1,500.0	0.0
Backed securities	36,281.0	18,375.7	20,644.7	1,541.2	1,621.8	14,311.4	1,359.1	3,352.4
Preference shares	1,750.0	1,625.0	0.0	500.0	0.0	0.0	0.0	0.0
Matador bonds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other fixed-income issues	6,290.1	831.0	0.0	0.0	0.0	0.0	0.0	0.0

1 Only corporate bonds are included.

TABLE 1.8

	2020	2021	2022	2021 IV	2022 I	II	III	IV
NO. OF ISSUERS								
Total	321	292	272	292	284	278	275	272
Corporate bonds	289	257	236	257	248	241	238	236
Commercial paper	8	40	6	7	6	6	5	6
Bonds and debentures	41	39	31	39	35	31	32	31
Mortgage-covered bonds	29	27	23	27	27	26	25	23
Territorial-covered bonds	8	6	4	6	5	4	4	4
Backed securities	222	198	187	198	192	190	187	187
Preference shares	5	5	5	5	5	5	5	5
Matador bonds	5	3	3	3	3	3	3	3
Government bonds	32	35	36	35	36	37	37	36
Letras del Tesoro	1	1	1	1	1	1	1	1
Long government bonds	1	1	1	1	1	1	1	1
Regional government debt	13	13	13	13	13	13	13	13
Foreign public debt	10	13	13	13	13	13	13	13
Other public debt	8	8	9	8	9	10	10	9
NO. OF ISSUES								
Total	2,610	2,451	2,353	2,451	2,415	2,391	2,337	2,353
Corporate bonds	1,655	1,465	1,370	1,465	1,401	1,375	1,334	1,370
Commercial paper	53	54	121	54	45	53	49	121
Bonds and debentures	589	481	367	481	440	411	380	367
Mortgage-covered bonds	200	183	156	183	181	177	174	156
Territorial-covered bonds	22	18	13	18	19	17	14	13
Backed securities	777	715	699	715	702	703	703	699
Preference shares	9	11	11	11	11	11	11	11
Matador bonds	5	3	3	3	3	3	3	3
Government bonds	955	986	983	986	1,014	1,016	1,003	983
Letras del Tesoro	12	12	12	12	12	12	12	12
Long government bonds	231	233	232	233	236	235	234	232
Regional government debt	167	171	155	171	170	167	165	155
Foreign public debt	533	558	560	558	572	574	564	560
Other public debt	12	12	24	12	24	28	28	24
OUTSTANDING BALANCE[1] (millions of euros)								
Total	6,297,532.5	6,261,335.6	6,036,311.1	6,261,335.6	6,311,600.3	6,191,763.7	6,099,991.9	6,036,311.1
Corporate bonds	464,170.7	456,613.9	384,144.5	456,613.9	419,260.8	421,386.1	409,648.5	384,144.5
Commercial paper	4,812.4	5,688.6	8,715.2	5,688.6	5,092.2	5,278.4	4,833.2	8,715.2
Bonds and debentures	53,696.1	68,584.8	37,838.3	68,584.8	39,352.9	36,685.9	37,359.7	37,838.3
Mortgage-covered bonds	199,054.1	199,681.7	175,698.3	199,681.7	206,148.4	202,387.6	200,556.4	175,698.3
Territorial-covered bonds	18,262.3	17,544.0	12,585.0	17,544.0	19,694.0	19,220.0	14,585.0	12,585.0
Backed securities	181,341.0	156,695.2	140,888.0	156,695.2	140,553.8	149,394.6	143,894.7	140,888.0
Preference shares	6,690.0	8,225.0	8,225.0	8,225.0	8,225.0	8,225.0	8,225.0	8,225.0
Matador bonds	314.8	194.6	194.6	194.6	194.6	194.6	194.6	194.6
Government bonds	5,833,361.8	5,804,721.7	5,652,166.6	5,804,721.7	5,892,339.5	5,770,377.7	5,695,638.7	5,652,166.6
Letras del Tesoro	79,765.7	79,409.6	74,881.0	79,409.6	79,174.4	76,799.5	76,859.5	74,881.0
Long government bonds	1,026,625.5	1,094,574.1	1,184,497.3	1,094,574.1	1,156,820.9	1,145,533.0	1,177,934.7	1,184,497.3
Regional government debt	32,775.5	36,131.2	35,109.3	36,131.2	36,099.7	36,134.3	40,889.9	35,109.3
Foreign public debt	4,692,674.9	4,592,786.5	4,339,951.8	4,592,786.5	4,579,819.9	4,470,006.7	4,359,064.7	4,339,951.8
Other public debt	1,520.2	1,820.2	17,727.1	1,820.2	40,424.6	41,904.1	40,889.9	17,727.1

1 Nominal amount.

AIAF. Trading

TABLE 1.9

Nominal amount in millions of euros

				2021	2022			
	2020	**2021**	**2022**	**IV**	**I**	**II**	**III**	**IV**
BY TYPE OF ASSET								
Total	140,509.4	47,659.3	18,782.9	2,766.8	5,178.6	6,219.2	3,222.3	4,162.8
Corporate bonds	170.2	174.3	106.7	50.7	32.1	30.9	18.4	25.4
Commercial paper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bonds and debentures	169.4	174.3	105.8	50.7	32.1	30.9	18.4	24.5
Mortgage-covered bonds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Territorial-covered bonds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Backed securities	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.9
Preference shares	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Matador bonds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Government bonds	140,339.2	47,485.0	18,676.2	2,716.1	5,146.5	6,188.3	3,203.9	4,137.5
Letras del Tesoro	27,975.5	5,186.3	730.3	50.3	50.0	305.0	170.3	204.9
Long government bonds	83,478.8	21,997.4	5,623.7	1,026.1	1,996.3	2,238.3	501.4	887.6
Regional government debt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Foreign public debt	28,884.9	20,301.3	12,322.3	1,639.7	3,100.2	3,645.0	2,532.1	3,044.9
Other public debt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BY TYPE OF TRANSACTION								
Total	140,509.4	47,659.3	18,782.9	2,766.8	5,178.6	6,219.2	3,222.3	4,162.8
Outright	140,509.4	47,659.3	18,782.9	2,766.8	5,178.6	6,219.2	3,222.3	4,162.8
Repos	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sell-buybacks/Buy-sellbacks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

AIAF. Third-party trading. By purchaser sector

TABLE 1.10

Nominal amount in millions of euros

				2021	2022			
	2020	**2021**	**2022**	**IV**	**I**	**II**	**III**	**IV**
Total	140,495.9	47,564.1	18,771.9	2,757.2	5,175.5	6,214.1	3,219.9	4,162.4
Non-financial companies	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Financial institutions	140,495.9	47,564.1	18,771.9	2,757.2	5,175.5	6,214.1	3,219.9	4,162.4
Credit institutions	176.6	278.3	92.6	37.5	23.0	25.4	18.0	26.2
CIS, insurance and pension funds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other financial institutions	140,319.3	47,285.8	18,679.3	2,719.7	5,152.5	6,188.7	3,201.9	4,136.2
General government	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Households and NPISHs[1]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest of the world	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

1 Non-profit institutions serving households.

Equity markets. Issuers, issues and outstanding balances

TABLE 1.11

	2020	2021	2022	2021 IV	2022 I	II	III	IV
NO. OF ISSUERS								
Total	11	10	8	10	10	10	10	8
Private issuers	4	4	4	4	4	4	4	4
Non-financial companies	0	0	0	0	0	0	0	0
Financial institutions	4	4	4	4	4	4	4	4
General government[1]	7	6	4	6	6	6	6	4
Regional governments	2	2	2	2	2	2	2	2
NO. OF ISSUES								
Total	44	49	40	49	48	45	43	40
Private issuers	11	11	11	11	11	11	11	11
Non-financial companies	0	0	0	0	0	0	0	0
Financial institutions	11	11	11	11	11	11	11	11
General government[1]	33	38	29	38	37	34	32	29
Regional governments	18	26	24	26	26	25	25	24
OUTSTANDING BALANCES[2] (millions of euros)								
Total	6,158.4	8,399.3	7,717.5	8,399.3	8,397.0	8,206.2	7,886.8	7,717.5
Private issuers	366.3	319.4	273.3	319.4	307.9	297.3	283.4	273.3
Non-financial companies	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Financial institutions	366.3	319.4	273.3	319.4	307.9	297.3	283.4	273.3
General government[1]	5,792.2	8,079.9	7,444.2	8,079.9	8,089.1	7,908.8	7,603.3	7,444.2
Regional governments	5,179.3	7,549.3	7,338.6	7,549.3	7,549.3	7,398.6	7,398.6	7,338.6

1 Without public book-entry debt.
2 Nominal amount.

SENAF. Public debt trading by type

TABLE 1.12

Nominal amount in millions of euros

	2020	2021	2022	2021 IV	2022 I	II	III	IV
Total	120,706.0	174,959.0	100,432.0	36,783.0	28,045.0	26,974.0	20,829.0	24,584.0
Outright	120,706.0	174,959.0	100,432.0	36,783.0	28,045.0	26,974.0	20,829.0	24,584.0
Sell-buybacks/Buy-sellbacks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0,0
Others	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0,0

1.3 Derivatives and other products

1.3.1 Financial derivative markets: MEFF

Trading on MEFF

TABLE 1.13

Number of contracts

	2020	2021	2022	2021 IV	2022 I	II	III	IV
Debt products	0	0	0	0	0	0	0	0
Debt futures[1]	0	0	0	0	0	0	0	0
Ibex 35 products[2, 3]	6,395,357	5,547,599	5,693,086	1,423,426	1,664,446	1,375,678	1,303,319	1,349,644
Ibex 35 plus futures	5,905,782	5,260,568	5,445,516	1,344,510	1,587,224	1,314,389	1,258,725	1,285,178
Ibex 35 mini futures	154,351	92,657	93,450	22,896	33,042	23,030	20,341	17,037
Ibex 35 micro futures	0	0	0	0	0	0	0	0
Ibex 35 dividend impact futures	91,571	45,450	19,708	15,218	4,320	1,240	1,650	12,498
Ibex 35 sector futures	0	0	0	0	0	0	0	0
Call mini options	104,132	69,667	42,485	10,020	11,728	11,292	9,023	10,441
Put mini options	139,521	79,257	91,927	30,781	28,131	25,727	13,580	24,490
Stock products[4]	30,313,892	25,434,719	25,333,109	5,772,331	6,925,765	4,746,892	5,283,881	8,376,571
Futures	10,968,411	11,346,047	10,313,726	1,463,869	3,919,655	956,444	1,549,644	3,887,983
Stock dividend futures	130,055	2,100	12,550	1,700	25	75	6,050	6,400
Stock plus dividend futures	7,752	20,800	13,510	4,159	9,040	0	0	4,470
Call options	8,564,019	6,131,488	7,900,379	1,630,386	1,499,642	2,069,208	1,969,545	2,361,984
Put options	10,643,655	7,934,284	7,092,944	2,672,217	1,497,403	1,721,165	1,758,642	2,115,734

1 Contract size: €100,000.
2 The number of Ibex 35 mini futures (multiples of €1) and micro futures (multiples of €0.1) was standardised to the size of the Ibex 35 plus futures (multiples of €10).
3 Contract size: Ibex 35, €10.
4 Contract size: 100 stocks.

1.3.2 Warrants, option buying and selling contracts, and ETF (Exchange-Traded Funds)

Issues registered at the CNMV

TABLE 1.14

	2020	2021	2022	2021 IV	2022 I	II	III	IV
WARRANTS								
Premium amount (millions of euros)	1,151.8	2,142.7	5,233.0	510.4	1,236.0	1,498.2	1,289.1	1,209.7
On stocks	429.7	792.8	1,595.9	202.7	289.7	575.7	344.1	386.3
On indexes	674.0	1,258.6	3,014.2	289.5	868.8	671.1	754.5	719.8
Other underlyings[1]	48.1	91.3	622.9	18.2	77.4	251.4	190.5	103.6
Number of issues	3,081	4,581	7,383	1,010	2,299	1,765	1,819	1,500
Number of issuers	5	3	2	2	2	2	2	1
OPTION BUYING AND SELLING CONTRACTS								
Nominal amounts (millions of euros)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On stocks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
On indexes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other underlyings[1]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Number of issues	0	0	0	0	0	0	0	0
Number of issuers	0	0	0	0	0	0	0	0

1 It includes the following underlying: baskets of stocks, exchange rates, interest rates and commodities.

Equity markets. Warrants and ETF trading

TABLE 1.15

	2020	2021	2022	2021 IV	2022 I	II	III	IV
WARRANTS								
Trading (millions of euros)	319.7	289.2	599.6	76.3	106.0	159.7	161.4	172.4
On Spanish stocks	121.1	123.3	86.0	22.7	23.0	21.9	20.8	20.3
On foreign stocks	26.0	18.2	26.4	5.6	6.0	7.5	4.4	8.5
On indexes	161.7	143.4	436.8	47.3	73.6	114.4	119.8	129.1
Other underlyings[1]	10.9	4.3	50.4	0.8	3.4	15.9	16.5	14.6
Number of issues[2]	3,785.0	3,249.0	764.0	779	1,126	1,078	970	764
Number of issuers[2]	7	4	2	4	2	2	2	2
CERTIFICATES								
Trading (millions of euros)	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Number of issues[2]	1	1	0	0	0	0	0	0
Number of issuers[2]	1	1	0	0	0	0	0	0
ETFs								
Trading (millions of euros)	2,548.1	1,549.0	1,604.8	398.7	556.9	428.5	328.5	291.0
Number of funds	5	5	5	5	5	5	5	5
Assets[3] (millions of euros)	241.5	259.8	241.2	274.1	256.7	225.6	206.7	241.2

1   It includes the following underlying: baskets of stocks, exchange rates, interest rates and commodities.
2   Issues or issuers which were traded in each period.
3   Only assets from national collective investment schemes are included because assets from foreign schemes are not available.

2 Investment services

Investment services. Spanish firms, branches and agents

TABLE 2.1

	2019	2020	2021	2021 IV	2022 I	II	III	IV
BROKER-DEALERS								
Spanish firms	39	38	33	33	33	32	34	34
Branches in Spain	19	14	13	13	14	12	15	15
Agents operating in Spain	1,944	1,407	1,359	1,359	1,149	1,180	1,194	1,222
Branches in EEA[1]	9	8	4	4	4	4	4	5
Firms providing services in EEA[1]	25	25	20	20	21	21	21	23
Passports to operate in EEA[1,2]	205	205	161	161	173	173	192	204
BROKERS								
Spanish firms	56	57	58	58	60	61	62	61
Branches in Spain	23	24	21	21	22	22	19	20
Agents operating in Spain	361	353	729	729	887	1,063	1,102	1,246
Branches in EEA[1]	1	0	4	4	6	5	6	6
Firms providing services in EEA[1]	24	30	30	30	32	32	34	32
Passports to operate in EEA[1,2]	144	205	200	200	200	214	211	211
PORTFOLIO MANAGEMENT COMPANIES								
Spanish firms	1	1	0	0	0	0	0	0
FINANCIAL ADVISORY FIRMS								
Spanish firms	140	140	140	140	140	142	144	143
Branches in Spain	22	23	21	21	21	21	21	21
Branches in EEA[1]	2	2	1	1	1	1	0	0
Firms providing services in EEA[1]	29	27	26	26	26	25	25	23
Passports to operate in EEA[1,2]	51	47	49	49	48	48	48	46
CREDIT INSTITUTIONS[3]								
Spanish firms	112	110	108	108	108	109	109	108

1 EEA: European Economic Area.
2 Number of passports to provide services in the EEA. The same entity may provide investment services in one or more Member States.
3 Source: Banco de España [Bank of Spain] and CNMV.

Investment services. Foreign firms

TABLE 2.2

	2019	2020	2021	2021 IV	2022 I	II	III	IV
Total	3,567	3,617	1,369	1,369	1,413	1,422	1,430	1,432
Investment services firms	3,088	3,131	952	952	963	971	974	974
From EU Member states	3,085	3,128	947	947	958	966	969	968
Branches	65	66	41	41	42	43	43	43
Free provision of services	3,020	3,062	906	906	916	923	926	925
From non-EU States	3	3	5	5	5	5	5	6
Branches	0	0	2	2	2	2	2	2
Free provision of services	3	3	3	3	3	3	3	4
Credit institutions[1]	479	486	417	417	450	451	456	458
From EU Member states	473	480	412	412	445	446	450	452
Branches	54	50	52	52	52	51	52	52
Free provision of services	419	430	360	360	393	395	398	400
Subsidiaries of free provision of services	0	0	0	0	0	0	0	0
From non-EU States	6	6	5	5	5	5	6	6
Branches	3	4	3	3	3	3	3	3
Free provision of services	3	2	2	2	2	2	3	3

1 Source: Banco de España [Bank of Spain] and CNMV.

Intermediation of spot transactions[1]

TABLE 2.3

Millions of euros

	2019	2020	2021	2021 III	IV	2022 I	II	III
FIXED INCOME								
Total	3,222,363.2	3,782,640.8	2,878,970.7	472,152.2	765,546.2	1,461,771.6	4,030,581.9	5,864,465.1
Broker-dealers	2,263,416.4	3,345,439.9	2,865,236.9	470,699.2	758,238.6	1,457,060.8	4,022,815.3	5,854,145.5
Spanish organised markets	909,992.9	1,261,885.8	1,199,193.3	250,039.0	195,093.3	338,104.3	1,031,483.2	1,495,607.6
Other Spanish markets	1,012,359.1	1,721,922.5	1,006,802.5	134,635.1	282,867.6	863,779.6	2,122,886.2	2,831,274.5
Foreign markets	341,064.4	361,631.6	659,241.1	86,025.1	280,277.7	255,176.9	868,445.9	1,527,263.4
Brokers	958,946.8	437,200.9	13,733.8	1,453.0	7,307.6	4,710.8	7,766.6	10,319.6
Spanish organised markets	17,314.9	1,229.4	1,307.0	160.0	617.0	382.8	596.9	816.2
Other Spanish markets	803,742.9	405,199.7	80.2	10.4	32.8	41.8	264.9	586.6
Foreign markets	137,889.0	30,771.8	12,346.6	1,282.6	6,657.8	4,286.2	6,904.8	8,916.8
EQUITY								
Total	1,213,388.9	1,816,691.4	1,220,967.9	135,718.3	59,953.7	38,266.9	89,105.1	136,716.7
Broker-dealers	1,194,473.3	1,793,180.4	1,195,799.7	131,370.6	50,183.9	31,152.3	76,578.8	117,321.8
Spanish organised markets	329,666.8	261,188.7	86,911.0	6,346.7	22,507.0	15,078.2	39,586.3	55,980.1
Other Spanish markets	1,771.0	5,938.7	8,150.6	1,055.1	2,088.0	995.4	429.6	2,593.4
Foreign markets	863,035.5	1,526,053.0	1,100,738.1	123,968.8	25,588.9	15,078.7	36,562.9	58,748.3
Brokers	18,915.6	23,511.0	25,168.2	4,347.7	9,769.8	7,114.6	12,526.3	19,394.9
Spanish organised markets	7,712.5	7,137.8	10,221.7	1,155.7	5,579.5	3,164.2	7,443.6	11,454.5
Other Spanish markets	1,006.8	1,094.9	1,501.6	404.4	299.8	313.4	259.5	412.6
Foreign markets	10,196.3	15,278.3	13,444.9	2,787.6	3,890.5	3,637.0	4,823.2	7,527.8

1 Period accumulated data. Quarterly.

Intermediation of derivative transactions[1,2]

TABLE 2.4

Millions of euros

	2019	2020	2021	2021 III	IV	2022 I	II	III
Total	10,807,586.8	11,557,923.7	9,509,509.7	2,182,511.2	2,223,001.2	2,916,659.6	4,027,795.4	4,521,418.7
Broker-dealers	10,523,995.1	11,261,186.5	9,372,575.4	2,173,689.4	2,209,947.6	2,618,051.4	3,229,828.1	3,014,835.0
Spanish organised markets	5,058,147.9	3,839,450.0	4,280,290.6	1,081,941.0	1,041,657.9	1,215,920.1	1,179,609.6	736,828.3
Foreign organised markets	4,160,941.8	5,884,599.5	4,135,376.7	917,068.7	1,067,723.1	1,280,776.1	1,757,023.1	1,891,529.6
Non-organised markets	1,304,905.4	1,537,137.0	956,908.1	174,679.7	100,566.6	121,355.2	293,195.4	386,477.1
Brokers	283,591.7	296,737.2	136,934.3	8,821.8	13,053.6	298,608.2	797,967.3	1,506,583.7
Spanish organised markets	29,601.4	12,975.9	6,858.9	672.8	63.7	5,702.7	13,355.0	17,603.4
Foreign organised markets	116,038.0	195,686.4	126,635.7	7,987.5	10,932.4	291,509.7	781,588.8	1,480,302.6
Non-organised markets	137,952.3	88,074.9	3,439.7	161.5	2,057.5	1,395.8	3,023.5	8,677.7

1 The amount of the buy and sell transactions of financial assets, financial futures on values and interest rates, and other transactions on interest rates will be the se-curities nominal or notional value or the principal to which the contract applies. The amount of the transactions on options will be the strike price of the underlying asset multiplied by the number of instruments committed.
2 Period accumulated data. Quarterly.

Portfolio management. Number of portfolios and assets under management[1]

TABLE 2.5

				2021		2022		
	2019	2020	2021	III	IV	I	II	III
NUMBER OF PORTFOLIOS								
Total[2]	25,388	44,982	89,646	75,875	89,646	115,246	100,549	101,970
Broker-dealers. Total	3,219	3,585	19,317	13,246	19,317	38,571	21,949	22,161
CIS[3]	40	42	38	38	38	39	39	37
Other[4]	3,179	3,543	19,279	13,208	19,279	38,532	21,910	22,124
Brokers. Total	22,169	41,397	70,329	62,629	70,329	76,675	78,600	79,809
CIS[3]	79	82	64	65	64	63	60	64
Other[4]	22,090	41,315	70,265	62,564	70,265	76,612	78,540	79,745
ASSETS UNDER MANAGEMENT (thousands of euros)								
Total[2]	4,925,671	6,098,558	8,088,415	7,230,753	8,088,415	8,345,884	7,843,069	8,165,778
Broker-dealers. Total	2,266,997	2,687,786	2,907,767	2,551,997	2,907,767	3,056,177	2,714,109	2,834,296
CIS[3]	1,059,718	1,280,966	592,849	598,536	592,849	408,400	402,884	403,677
Other[4]	1,207,279	1,406,820	2,314,918	1,953,461	2,314,918	2,647,777	2,311,225	2,430,619
Brokers. Total	2,658,674	3,410,772	5,180,648	4,678,756	5,180,648	5,289,707	5,128,960	5,331,482
CIS[3]	1,346,615	1,256,276	1,125,208	1,096,336	1,125,208	1,083,627	864,387	1,231,823
Other[4]	1,312,059	2,154,496	4,055,440	3,582,420	4,055,440	4,206,080	4,264,573	4,099,659

1 Data at the end of period. Quarterly.
2 Data at the end of period. Quarterly.
3 It includes both resident and non-resident CIS management.
4 It includes the rest of clients, both covered and not covered by the Investment Guarantee Fund – an investor compensation scheme regulated by Royal Decree 948/2001.

Financial advice. Number of contracts[1, 2]

TABLE 2.6

				2021		2022		
	2019	2020	2021	III	IV	I	II	III
NUMBER OF CONTRACTS								
Total[3]	26,561	31,169	34,006	32,296	34,006	49,082	49,475	50,157
Broker-dealers. Total	6,163	8,721	9,727	9,537	9,727	17,009	17,300	17,502
Retail clients	6,115	8,670	9,674	9,481	9,674	16,950	17,243	17,442
Professional clients	31	45	48	50	48	54	48	52
Eligible counterparties	17	6	5	6	5	5	9	8
Brokers. Total	20,398	22,448	24,279	22,759	24,279	32,073	32,175	32,655
Retail clients	20,125	22,128	24,007	22,515	24,007	31,776	31,858	32,329
Professional clients	229	282	235	203	235	256	279	287
Eligible counterparties	44	38	37	41	37	41	38	39
Pro memoria: **commission received for financial advice**[4] (thousands of euros)								
Total[3]	37,583	39,803	48,086	19,595	48,086	6,176	24,373	37,106
Broker-dealers	23,400	5,813	7,944	4,315	7,944	1,633	3,248	4,989
Brokers	14,183	33,990	40,142	15,280	40,142	4,543	21,125	32,117

1 Data at the end of period. Quarterly.
2 Quarterly data on assets advised are not available since the entry into force of CNMV Circular 3/2014, of 22 October.
3 Only data on broker-dealers and brokers are shown.
4 Accumulated data from the beginning of the year to the last day of every quarter. It includes companies removed during the year.

Aggregated income statement. Broker-dealers

TABLE 2.7

Thousands of euros[1]

	2019	2020	2021	2021 IV	2022 I	II	III	IV[2]
I. Interest income	38,125	35,957	41,565	41,565	2,543	28,205	43,362	54,792
II. Net commission	279,650	310,868	265,790	265,790	47,003	95,650	141,271	155,846
Commission revenues	427,813	525,812	481,945	481,945	73,205	147,660	218,557	241,130
Brokering	164,606	254,307	164,293	164,293	26,620	52,868	78,952	87,146
Placement and underwriting	8,849	5,279	86,324	86,324	2,640	5,384	7,358	7,494
Securities deposit and recording	42,643	39,260	36,880	36,880	9,711	18,425	25,234	27,372
Portfolio management	15,102	13,128	15,860	15,860	3,532	6,669	10,150	11,292
Design and advice	34,751	16,282	20,316	20,316	4,165	8,797	12,759	14,243
Stock search and placement	1,302	1,960	5,306	5,306	261	883	977	977
Market credit transactions	0	0	0	0	0	0	0	0
CIS marketing	53,506	50,985	64,608	64,608	15,977	31,693	47,478	52,699
Other	107,055	144,611	88,356	88,356	10,298	22,941	35,647	39,908
Commission expenses	148,163	214,944	216,155	216,155	26,202	52,010	77,286	85,284
III. Financial investment income	29,452	97,113	32,733	32,733	14,434	24,760	37,641	55,753
IV. Net exchange differences and other operating products and expenses	29,066	91,278	35,370	35,370	360	1,384	1,890	1,559
V. Gross income	376,293	535,216	375,458	375,458	64,340	149,999	224,164	267,950
VI. Operating income	55,978	124,993	88,966	88,966	12,537	46,277	67,909	92,053
VII. Earnings from continuous activities	54,528	102,928	93,481	93,481	12,478	45,703	66,992	91,292
VIII. Net earnings from the period	54,528	102,928	90,708	90,708	12,478	45,703	66,992	91,292

1   Accumulated data from the beginning of the year to the last day of every quarter. It includes companies removed during the year.
2   Available data: October 2022.

Results of proprietary trading. Broker-dealers

TABLE 2.8

Thousands of euros[1]

	2019	2020	2021	2021 III	2021 IV	2022 I	2022 II	2022 III
TOTAL								
Total	101,039	221,894	108,249	81,777	108,249	17,333	54,477	83,012
Money market assets and public debt	2,625	23,229	3,039	3,271	3,039	-442	-558	-467
Other fixed-income securities	27,811	18,457	19,224	14,438	19,224	10,438	19,341	28,736
Domestic portfolio	13,186	11,796	4,920	3,354	4,920	2,586	5,475	7,203
Foreign portfolio	14,625	6,661	14,304	11,084	14,304	7,852	13,866	21,533
Equities	8,009	21,860	6,845	5,097	6,845	3,936	4,943	8,131
Domestic portfolio	7,006	22,859	5,281	4,359	5,281	3,310	3,757	5,855
Foreign portfolio	1,003	-999	1,564	738	1,564	626	1,186	2,276
Derivatives	-3,873	28,367	-21,138	-20,864	-21,138	351	646	1,010
Repurchase agreements	-3,492	-6,851	-6,446	-6,470	-6,446	-21	-48	-83
Market credit transactions	0	0	0	0	0	0	0	0
Deposits and other transactions with financial intermediaries	1,084	-6,207	3,177	2,139	3,177	1,146	2,643	5,065
Net exchange differences	118	-981	971	585	971	102	485	1,158
Other operating products and expenses	28,949	92,259	34,398	33,372	34,398	258	900	732
Other transactions	39,808	51,761	68,179	50,209	68,179	1,565	26,125	38,730
INTEREST INCOME								
Total	38,127	35,957	41,564	23,449	41,564	2,542	28,205	43,362
Money market assets and public debt	1,027	922	804	643	804	113	236	340
Other fixed-income securities	3,319	1,347	732	749	732	56	84	136
Domestic portfolio	734	556	81	179	81	18	30	43
Foreign portfolio	2,585	791	651	570	651	38	54	93
Equities	2,767	962	973	798	973	723	1,113	1,452
Domestic portfolio	2,456	766	539	470	539	131	292	528
Foreign portfolio	311	196	434	328	434	592	821	924
Repurchase agreements	-3,492	-6,851	-6,446	-6,470	-6,446	-21	-48	-83
Market credit transactions	0	0	0	0	0	0	0	0
Deposits and other transactions with financial intermediaries	1,084	-6,207	3,177	2,139	3,177	1,146	2,643	5,065
Other transactions	33,422	45,784	42,324	25,590	42,324	525	24,177	36,452
FINANCIAL INVESTMENT INCOME								
Total	29,451	97,113	32,734	25,905	32,734	14,436	24,762	37,642
Money market assets and public debt	1,598	22,307	2,235	2,628	2,235	-555	-794	-807
Other fixed-income securities	24,492	17,110	18,492	13,689	18,492	10,382	19,257	28,600
Domestic portfolio	12,452	11,240	4,839	3,175	4,839	2,568	5,445	7,160
Foreign portfolio	12,040	5,870	13,653	10,514	13,653	7,814	13,812	21,440
Equities	5,242	20,898	5,872	4,299	5,872	3,213	3,830	6,679
Domestic portfolio	4,550	22,093	4,742	3,889	4,742	3,179	3,465	5,327
Foreign portfolio	692	-1,195	1,130	410	1,130	34	365	1,352
Derivatives	-3,873	28,367	-21,138	-20,864	-21,138	351	646	1,010
Other transactions	1,992	8,431	27,273	26,153	27,273	1,045	1,823	2,160
EXCHANGE DIFFERENCES AND OTHER ITEMS								
Total	33,461	88,824	33,951	32,423	33,951	355	1,510	2,008
Net exchange differences	118	-981	971	585	971	102	485	1,158
Other operating products and expenses	28,949	92,259	34,398	33,372	34,398	258	900	732
Other transactions	4,394	-2,454	-1,418	-1,534	-1,418	-5	125	118

1 Accumulated data from the beginning of the year to the last day of every quarter. It includes companies removed during the year.

Aggregated income statement. Brokers

TABLE 2.9

Thousands of euros[1]

	2019	2020	2021	2021 IV	2022 I	II	III	IV[2]
I. Interest income	1,252	932	454	454	72	975	960	959
II. Net commission	130,293	143,162	173,785	173,785	36,111	86,222	128,015	139,839
Commission revenues	150,842	165,094	202,333	202,333	43,561	100,861	150,324	164,277
Brokering	23,194	22,035	14,140	14,140	4,591	8,349	13,239	14,843
Placement and underwriting	580	2,157	1,481	1,481	15	362	428	503
Securities deposit and recording	879	754	425	425	80	155	219	239
Portfolio management	14,890	14,554	22,874	22,874	5,921	11,812	18,245	19,637
Design and advice	14,426	34,128	40,421	40,421	4,648	21,619	32,640	34,145
Stock search and placement	0	0	0	0	0	0	0	0
Market credit transactions	0	0	0	0	0	0	0	0
CIS marketing	62,866	62,134	91,375	91,375	22,325	45,929	68,553	75,967
Other	34,008	29,331	31,617	31,617	5,981	12,634	17,000	18,943
Commission expenses	20,549	21,932	28,548	28,548	7,450	14,639	22,309	24,438
III. Financial investment income	910	-5,562	666	666	-658	-1,195	-1,861	-1,736
IV. Net exchange differences and other operating products and expenses	1,194	-968	-776	-776	384	1,066	899	860
V. Gross income	133,648	137,564	174,129	174,129	35,910	87,068	128,013	139,923
VI. Operating income	9,284	3,339	26,155	26,155	2,039	4,890	4,736	4,271
VII. Earnings from continuous activities	6,163	2,836	22,802	22,802	2,213	7,666	6,664	6,215
VIII. Net earnings of the period	6,163	2,836	22,802	22,802	2,213	7,666	6,664	6,215

1   Accumulated data from the beginning of the year to the last day of every quarter. It includes companies removed during the year.
2   Available data: October 2022.

Capital adequacy. Broker-dealers and brokers[1, 2, 3]

TABLE 2.10

	2018	2019	2020	2021
TOTAL[3]				
Own fund surplus (thousands of euros)	915,187	1,165,522	1,026,770	612,842
Surplus (%)[4]	429.56	486.61	277.64	541.03
Number of companies according to surplus percentage				
≤ 100%	20	23	26	25
> 100-≤ 300%	28	30	29	35
> 300-≤ 500%	10	10	12	12
> 500%	15	13	10	19
BROKER-DEALERS				
Own fund surplus (thousands of euros)	874,235	1,118,273	960,720	506,721
Surplus (%)[4]	464.51	520.42	285.14	654.90
Number of companies according to surplus percentage				
≤ 100%	7	7	9	4
> 100-≤ 300%	10	14	11	12
> 300-≤ 500%	7	4	8	5
> 500%	14	11	8	12
BROKERS				
Own fund surplus (thousands of euros)	40,952	47,249	66,051	106,121
Surplus (%)[4]	164.84	191.77	200.79	295.60
Number of companies according to surplus percentage				
≤ 100%	13	16	17	21
> 100-≤ 300%	18	16	18	23
> 300-≤ 500%	3	6	4	7
> 500%	1	2	2	7

1 From 2014 to 2020 this table only includes the entities subject to reporting requirements according to Regulation (EU) No. 575/2013, of the European Parliament and of the Council, of 26 June 2013, on prudential requirements for credit institutions and investment firms.

2 From II-2021 onwards there are no quarterly data available, due to regulatory changes made by Regulation (EU) 2019/2033 of the European Parliament and of the Council, of 27 November 2019, on the prudential requirements of investment firms; and Directive (EU) 2019/2034 of the European Parliament and of the Council, of 27 November 2019, on the prudential supervision of investment firms.

3 Only data on broker-dealers and brokers are shown.

4 Average surplus percentage is weighted by the required equity of each company. It is an indicator of the number of times, in percentage terms, that the surplus contains the required equity in an average company.

Return on equity (ROE) before taxes[1]

TABLE 2.11

				2021		2022		
	2019	2020	2021	III	IV	I	II	III
TOTAL[2]								
Average (%)[3]	9.22	18.71	13.68	11.79	13.68	9.81	19.33	17.89
Number of companies according to annualised return								
Losses	32	32	30	33	30	35	35	41
0-≤ 15%	22	15	20	16	20	15	10	15
> 15-≤ 45%	18	20	14	15	14	15	18	9
> 45-≤ 75%	7	9	9	7	9	11	7	11
> 75%	12	15	17	20	17	16	22	19
BROKER-DEALERS								
Average (%)[3]	8.87	19.72	11.48	9.18	11.48	10.34	20.26	19.58
Number of companies according to annualised return								
Losses	13	12	13	14	13	12	8	12
0-≤ 15%	13	6	8	8	8	8	9	10
> 15-≤ 45%	7	9	6	7	6	7	7	3
> 45-≤ 75%	1	6	4	2	4	2	3	4
> 75%	2	2	1	1	1	3	4	4
BROKERS								
Average (%)[3]	12.05	12.48	23.97	23.92	23.97	7.71	15.23	10.41
Number of companies according to annualised return								
Losses	19	20	17	19	17	23	27	29
0-≤ 15%	9	9	12	8	12	7	1	5
> 15-≤ 45%	11	11	8	8	8	8	11	6
> 45-≤ 75%	6	3	5	5	5	9	4	7
> 75%	10	13	16	19	16	13	18	15

1 ROE has been calculated as:

$$ROE = \frac{Earnings\ before\ taxes\ (annualized)}{Own\ Funds}$$

Own funds= Share capital + Paid-in surplus + Reserves – Own shares + Prior year profits and retained earnings – Interim dividend.

2 Only data on broker-dealers and brokers are shown.
3 Average weighted by equity, %.

Financial advisory firms. Main figures[1]

TABLE 2.12

Thousands of euros

	2017	2018	2019	2020	2021
ASSETS UNDER ADVICE[2]					
Total	30,790,535	31,658,460	21,627,677	17,423,050	19,263,515
Retail clients	9,096,071	10,281,573	8,313,608	6,907,284	8,858,793
Rest of clients and entities	21,694,464	21,376,887	13,314,069	10,515,766	10,404,722
Professional	6,482,283	7,052,031	–	–	–
Other	15,212,181	14,324,856	–	–	–
COMMISSION INCOME[3]					
Total	65,802	62,168	56,963	45,782	56,190
Commission revenues	65,191	61,079	56,029	45,153	55,657
Other income	611	1,088	934	629	532
EQUITY					
Total	32,803	33,572	32,089	30,177	34,140
Share capital	8,039	6,894	5,770	5,454	6,125
Reserves and retained earnings	13,317	15,386	17,260	18,979	21,245
Income for the year[3]	11,361	10,626	8,172	4,837	7,456
Other own funds	86	666	888	907	-686

1 Annual frequency since 2015 (CNMV Circular 3/2014, of 22 October).
2 Data at the end of each period. Since 2019, due to the entry into force of CNMV Circular 4/2018, there is no disaggregated information of non-retail clients.
3 Accumulated data from the beginning of the year.

3 Collective investment schemes (CIS)[a]

Number, management companies and depositories of CIS registered at the CNMV TABLE 3.1

	2019	2020	2021	2021 IV	2022 I	II	III	IV[1]
Total financial CIS	4,233	4,018	3,815	3,815	3,785	3,677	3,304	2,911
Mutual funds	1,595	1,515	1,452	1,452	1,455	1,450	1,447	1,474
Investment companies	2,569	2,427	2,280	2,280	2,244	2,140	1,770	1,346
Funds of hedge funds	7	7	10	10	10	9	8	8
Hedge funds	62	69	73	73	76	78	79	83
Total real estate CIS	5	5	4	4	4	4	4	4
Real estate mutual funds	2	2	2	2	2	2	2	2
Real estate investment companies	3	3	2	2	2	2	2	2
Total foreign CIS marketed in Spain	1,033	1,048	1,074	1,074	1,069	1,077	1,082	1,093
Foreign funds marketed in Spain	399	407	416	416	411	412	412	425
Foreign companies marketed in Spain	634	641	658	658	658	665	670	668
Management companies	123	123	123	123	123	123	122	123
CIS depositories	36	35	33	33	33	34	35	34

1 Available data: November 2022.

Number of CIS investors and shareholders TABLE 3.2

	2019	2020	2021	2021 IV	2022 I	II	III	IV[1]
Total financial CIS	12,132,581	13,015,104	16,160,034	16,160,034	16,597,453	16,480,209	16,355,169	16,299,244
Mutual funds	11,734,029	12,654,439	15,810,134	15,810,134	16,306,045	16,268,335	16,180,878	16,140,827
Investment companies	398,552	360,665	349,900	349,900	291,408	211,874	174,291	158,417
Total real estate CIS[2]	799	798	691	691	691	691	690	697
Real estate mutual funds	483	483	482	482	482	482	482	482
Real estate investment companies	316	315	209	209	209	209	208	215
Total foreign CIS marketed in Spain[3]	3,361,901	4,312,340	6,073,537	6,073,537	6,120,550	6,377,747	6,510,617	–
Foreign funds marketed in Spain	521,648	592,053	776,206	776,206	782,936	846,890	872,941	–
Foreign companies marketed in Spain	2,840,253	3,720,287	5,297,331	5,297,331	5,337,614	5,530,857	5,637,676	–

1 Available data: October 2022.
2 Investors and shareholders who invest in different sub-funds from the same CIS have been taken into account once. For this reason, investors and shareholders may be different from those in Tables 3.6 and 3.7.
3 Only data on UCITS are included. From I-2018 onwards data are estimated.

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a Information about mutual funds and Investment companies contained in this section does not include hedge funds or funds of hedge funds. The information about hedge funds and funds of hedge funds is included in Table 3.12.

CIS total net assets

TABLE 3.3

Millions of euros

				2021	2022			
	2019	2020	2021	IV	I	II	III	IV[1]
Total financial CIS	308,170.1	306,654.5	353,203.3	353,203.3	343,159.8	326,391.0	319,630.5	327,265.9
Mutual funds[2]	279,377.4	279,694.5	324,701.0	324,701.0	316,020.4	302,684.2	299,627.1	308,041.1
Investment companies	28,792.7	26,960.0	28,502.3	28,502.3	27,139.4	23,706.8	20,003.4	19,224.8
Total real estate CIS	1,072.9	1,218.0	1,224.3	1,224.3	1,258.6	1,262.9	1,291.5	1,304.4
Real estate mutual funds	309.4	310.8	311.0	311	312.5	312.6	313.4	314.8
Real estate investment companies	763.5	907.1	913.2	913.2	946.1	950.2	978.1	989.6
Total foreign CIS marketed in Spain[3]	178,841.5	199,419.3	276,231.9	276,231.9	227,194.6	209,314.4	204,425.1	–
Foreign funds marketed in Spain	30,843.4	27,355.5	36,662.6	36,662.6	32,253.8	30,442.1	29,612.8	–
Foreign companies marketed in Spain	147,998.1	172,063.8	239,569.4	239,569.4	194,940.8	178,872.3	174,812.3	–

1   Available data: October 2022.
2   Mutual funds investment in financial mutual funds of the same management company reached €8,789.1 million in September 2022.
3   Only data on UCITS are included. From I-2018 onwards data are estimated.

Asset allocation of mutual funds

TABLE 3.4

Millions of euros

				2021		2022		
	2019	2020	2021	III	IV	I	II	III
Asset	279,377.4	279,694.5	324,701.0	315,632.6	324,701.0	316,020.4	302,684.2	299,627.1
Portfolio investment	256,750.7	256,257.2	299,434.9	288,531.1	299,434.9	291,983.4	280,372.8	280,711.5
Domestic securities	66,520.4	54,587.8	54,715.8	56,360.1	54,715.8	50,851.1	49,626.0	51,177.3
Debt securities	44,637.7	38,394.5	35,648.2	34,914.9	35,648.2	32,823.9	32,086.7	6,147.4
Shares	9,047.9	6,185.3	6,828.5	6,833.9	6,828.5	6,472.4	6,314.9	5,562.3
Collective investment schemes	8,581.9	8,511.0	11,396.5	13,050.0	11,396.5	10,499.3	10,141.3	9,616.3
Deposits in credit institutions	4,004.8	1,341.5	627.2	1,349.0	627.2	888.7	928.2	407.2
Derivatives	243.2	140.9	168.3	174.8	168.3	114.1	97.2	130.6
Other	4.9	14.6	47.1	37.5	47.1	52.8	57.7	59.6
Foreign securities	190,224.5	201,664.8	244,715.5	232,167.3	244,715.5	241,128.5	230,741.8	229,529.5
Debt securities	83,817.5	86,151.5	95,131.8	92,917.5	95,131.8	99,183.7	102,155.0	105,119.9
Shares	33,115.9	33,886.1	46,254.3	42,944.2	46,254.3	44,921.3	41,171.1	40,119.8
Collective investment schemes	73,054.4	81,358.2	103,089.9	96,006.2	103,089.9	96,972.6	87,306.3	84,093.3
Deposits in credit institutions	4.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Derivatives	231.3	268.0	238.6	282.9	238.6	50.2	108.8	196.0
Other	0.9	0.8	1.0	16.5	1.0	0.6	0.6	0.6
Doubtful assets and matured investments	5.8	4.6	3.5	3.8	3.5	3.8	5.0	4.7
Intangible assets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net fixed assets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cash	21,735.1	22,203.0	23,950.8	25,805.1	23,950.8	23,728.2	20,480.2	16,774.6
Net balance (Debtors - Creditors)	891.6	1,234.3	1,315.3	1,296.4	1,315.3	308.7	1,831.3	2,140.9

Asset allocation of investment companies

TABLE 3.5

Millions of euros

	2019	2020	2021	2021 III	2021 IV	2022 I	2022 II	2022 III
Asset	28,792.7	26,960.0	28,502.3	28,089.6	28,502.3	27,139.4	23,706.8	20,003.4
Portfolio investment	25,940.3	24,548.9	25,729.9	25,317.6	25,729.9	23,556.8	17,719.0	14,487.3
Domestic securities	4,588.3	3,419.9	3,525.2	3,460.0	3,525.2	3,637.6	3,828.0	3,118.1
Debt securities	1,217.1	734.3	734.3	630.9	734.3	972.8	1,510.1	1,044.9
Shares	1,982.8	1,601.2	1,633.7	1,636.2	1,633.7	1,541.6	1,260.8	928.7
Collective investment schemes	1,232.2	967.7	1,067.4	1,092.5	1,067.4	1,036.4	982.4	1,090.5
Deposits in credit institutions	98.6	47.7	19.1	30.6	19.1	19.5	15.4	4.1
Derivatives	0.8	3.2	-0.4	1.4	-0.4	-1.2	-1.2	-1.0
Other	56.8	65.9	71.1	68.4	71.1	68.4	60.5	50.9
Foreign securities	21,348.2	21,125.7	22,202.8	21,855.4	22,202.8	19,917.9	13,889.9	11,366.6
Debt securities	4,617.7	3,243.8	2,683.8	2,822.6	2,683.8	2,294.7	1,893.4	1,812.7
Shares	6,133.8	6,548.1	7,157.9	6,943.3	7,157.9	6,501.0	4,761.4	4,151.5
Collective investment schemes	10,549.0	11,297.4	12,335.3	12,050.8	12,335.3	11,085.2	7,212.2	5,383.9
Deposits in credit institutions	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Derivatives	34.1	23.8	8.3	23.5	8.3	18.5	4.5	0.6
Other	12.5	12.6	17.5	15.2	17.5	18.5	18.5	17.8
Doubtful assets and matured investments	3.8	3.2	1.8	2.2	1.8	1.3	1.1	2.6
Intangible assets	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net fixed assets	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Cash	2,659.8	2,219.3	2,476.4	2,517.3	2,476.4	3,239.8	5,592.3	5,176.0
Net balance (Debtors - Creditors)	192.1	191.4	295.5	254.2	295.5	342.2	395.0	339.7

Financial mutual funds: number, investors and total net assets by category[1, 2]

TABLE 3.6

				2021	2022			
	2019	2020	2021	IV	I	II	III	IV[3]
NO. OF FUNDS								
Total financial mutual funds	1,710	1,644	1,611	1,611	1,622	1,625	1,625	1,651
Fixed income[4]	281	276	266	266	264	268	274	284
Mixed fixed income[5]	173	174	181	181	180	175	168	171
Mixed equity[6]	185	186	192	192	195	198	197	201
Euro equity	113	104	94	94	92	89	85	85
Foreign equity	263	276	307	307	319	328	329	333
Guaranteed fixed income	66	55	43	43	43	42	46	46
Guaranteed equity[7]	155	133	114	114	111	102	101	100
Global funds	255	248	263	263	275	280	284	286
Passive management[8]	133	118	88	88	81	81	85	88
Absolute return	84	72	61	61	60	60	54	55
INVESTORS								
Total financial mutual funds	11,739,183	12,660,100	15,816,557	15,816,557	16,314,155	16,276,281	16,188,727	16,143,468
Fixed income[4]	3,668,324	4,135,294	5,476,096	5,476,096	5,483,985	5,517,117	5,530,370	5,528,648
Mixed fixed income[5]	1,087,881	1,203,280	1,459,004	1,459,004	1,412,031	1,222,259	1,256,457	1,234,869
Mixed equity[6]	707,159	745,112	721,346	721,346	731,053	715,504	705,131	699,560
Euro equity	598,901	530,107	778,138	778,138	864,790	875,675	852,841	843,808
Foreign equity	2,655,123	3,043,542	3,882,184	3,882,184	4,342,851	4,294,359	4,239,517	4,197,777
Guaranteed fixed income	154,980	135,320	77,430	77,430	74,099	81,826	99,959	121,153
Guaranteed equity[7]	428,470	356,439	265,043	265,043	235,945	202,655	204,133	198,302
Global funds	1,359,915	1,409,759	1,989,428	1,989,428	1,992,279	2,179,303	2,111,670	2,087,927
Passive management[8]	429,428	511,251	505,514	505,514	494,585	494,942	512,763	562,566
Absolute return	646,042	587,040	659,411	659,411	679,573	689,677	672,922	665,894
TOTAL NET ASSETS (millions of euros)								
Total financial mutual funds	279,377.4	279,694.5	324,701.0	324,701.0	316,020.4	302,684.2	299,627.1	308,046.3
Fixed income[4]	78,583.2	81,015.9	88,422.8	88,422.8	90,688.1	92,858.9	93,280.9	95,766.1
Mixed fixed income[5]	40,819.9	43,200.4	50,869.7	50,869.7	46,975.3	39,139.4	39,147.9	38,650.4
Mixed equity[6]	28,775.8	30,432.7	28,141.1	28,141.1	27,072.9	24,638.2	23,812.0	24,185.9
Euro equity	10,145.1	7,091.1	8,279.6	8,279.6	7,650.0	7,366.7	6,764.1	7,153.0
Foreign equity	34,078.9	37,722.5	51,222.2	51,222.2	50,254.2	45,344.7	44,650.5	46,424.4
Guaranteed fixed income	4,809.3	4,177.0	2,346.7	2,346.7	2,166.9	2,458.4	3,323.4	4,413.7
Guaranteed equity[7]	13,229.1	11,037.1	8,094.9	8,094.9	7,054.3	6,089.1	6,082.6	6,020.2
Global funds	43,041.9	40,944.5	67,591.0	67,591.0	65,204.9	66,365.4	64,401.4	64,517.8
Passive management[8]	14,073.8	14,014.3	12,500.4	12,500.4	11,570.7	11,336.4	11,470.4	14,250.6
Absolute return	11,818.3	10,057.4	7,231.2	7,231.2	7,382.7	7,086.8	6,693.5	6,663.9

1   Sub-funds which have sent reports to the CNMV excluding those in process of dissolution or liquidation.
2   Data on side-pocket sub-funds are only included in aggregate figures, and not in each individual category.
3   Available data: October 2022.
4   It includes: public debt constant net asset value short-term money market funds (MMFs), low volatility net asset value short-term MMFs, variable net asset value short-term MMFs, variable net asset value standard MMFs, euro fixed income and short-term euro fixed income.
5   It includes: mixed euro fixed income and foreign mixed fixed income.
6   It includes: mixed euro equity and foreign mixed equity.
7   It includes: guaranteed equity and partial guarantee.
8   It includes: passive management CIS, index-tracking CIS and non-guaranteed specific return target CIS.

Financial mutual funds: detail of investors and total assets by type of investors

TABLE 3.7

	2019	2020	2021	2021 IV	2022 I	II	III	IV[1]
INVESTORS								
Total financial mutual funds	11,739,183	12,660,100	15,816,557	15,816,557	16,314,155	16,276,281	16,188,727	16,143,468
Natural persons	11,534,957	12,437,954	15,541,300	15,541,300	16,034,295	15,994,598	15,909,624	15,863,472
Residents	11,440,086	12,339,829	15,427,337	15,427,337	15,917,149	15,876,177	15,789,576	15,743,024
Non-residents	94,871	98,125	113,963	113,963	117,146	118,421	120,048	120,448
Legal persons	204,226	222,146	275,257	275,257	279,860	281,683	279,103	279,996
Credit institutions	1,928	1,403	746	746	903	907	872,00	856,00
Other resident institutions	201,408	219,849	273,421	273,421	277,849	279,658	277,116	278,026
Non-resident institutions	890	894	1090	1,090	1,108	1,118	1,115	1,114
TOTAL NET ASSETS (millions of euros)								
Total financial mutual funds	279,377.4	279,694.5	324,701.0	324,701.0	316,020.4	302,684.2	299,627.1	308,046.3
Natural persons	231,434.8	230,573.8	264,075.7	264,075.7	258,828.7	247,585.8	246,633.7	254,045.4
Residents	228,214.4	227,444.5	260,321.1	260,321.1	255,130.5	244,052.6	243,098.7	250,376.8
Non-residents	3,220.4	3,129.3	3,754.6	3,754.6	3,698.2	3,533.2	3,535.0	3,668.6
Legal persons	47,942.6	49,120.7	60,625.3	60,625.3	57,191.7	55,098.4	52,993.4	54,000.9
Credit institutions	523.7	480.0	472.5	472.5	518.5	324.7	291.4	504.3
Other resident institutions	46,628.9	47,995.2	59,288.6	59,288.6	55,835.3	53,941.7	51,901.1	52,687.1
Non-resident institutions	790.0	645.4	864.2	864.2	837.8	832.0	800.9	809.5

1   Available data: October 2022.

Subscriptions and redemptions of financial mutual funds by category[1,2]

TABLE 3.8

Millions of euros

	2019	2020	2021	2021 III	IV	2022 I	II	III
SUBSCRIPTIONS								
Total financial mutual funds	156,702.7	113,265.7	149,415.0	27,554.9	35,082.0	41,176.0	41,415.0	27,024.0
Fixed income	91,050.8	51,487.7	58,255.2	11,740.5	15,696.3	18,575.6	19,905.2	14,439.8
Mixed fixed income	14,154.1	15,496.2	21,134.0	3,653.1	4,895.4	4,314.9	2,506.1	2,976.4
Mixed equity	11,156.0	8,861.2	11,113.2	2,078.5	3,029.9	2,478.3	1,658.0	1,141.0
Euro equity	2,998.4	2,232.1	3,005.8	467.4	553.0	786.1	1,235.3	587.2
Foreign equity	16,864.0	15,974.8	19,019.8	3,526.1	4,416.3	8,535.0	4,803.0	2,900.1
Guaranteed fixed income	854.1	424.7	9.0	0.7	1.3	2.1	437.5	1,033.7
Guaranteed equity	898.2	74.2	86.8	11.7	11.6	13.6	61.1	208.9
Global funds	12,713.7	11,391.1	30,193.0	5,197.2	4,954.4	4,239.9	8,438.0	2,262.3
Passive management	2,261.9	4,944.6	2,827.9	374.8	453.5	1,303.2	1,671.8	1,123.6
Absolute return	3,751.5	2,379.0	3,770.3	505.1	1,070.4	927.4	698.7	351.0
REDEMPTIONS								
Total financial mutual funds	154,273.0	112,634.4	121,839.9	21,214.5	31,446.3	39,216.8	37,376.8	24,555.9
Fixed income	80,046.4	47,611.0	49,850.1	9,133.2	13,217.9	14,617.7	15,545.9	12,540.9
Mixed fixed income	16,004.2	14,974.6	13,671.0	2,972.4	2,962.9	4,253.2	7,929.2	2,383.7
Mixed equity	7,943.7	7,667.5	14,639.8	979.20	1,603.1	2,101.3	2,274.2	1,474.8
Euro equity	6,540.2	4,205.3	2,979.1	546.2	668.8	846.7	1,031.8	633.0
Foreign equity	12,963.1	13,449.4	13,586.3	2,974.9	3,097.5	7,185.0	4,157.4	2,651.5
Guaranteed fixed income	1,136.7	1,030.6	1,720.9	229.5	997.6	122.8	91.8	40.3
Guaranteed equity	2,739.2	2,245.2	2,914.0	832.6	311.5	920.7	862.6	99.7
Global funds	15,133.7	12,743.7	15,234.6	2,404.0	6,679.7	6,935.7	3,680.6	3,293.5
Passive management	5,272.0	4,985.6	4,372.9	869.4	1,496.1	1,648.5	1,175.5	771.7
Absolute return	6,493.7	3,721.4	2,871.1	273.1	411.2	585.2	627.6	666.8

1   Estimated data.
2   Data on side-pocket sub-funds are only included in aggregate figures, and not in each individual category.

Millions of euros

				2021		2022		
	2019	2020	2021	III	IV	I	II	III
NET SUBSCRIPTIONS/REDEMPTIONS								
Total financial mutual funds	2,467.5	660.3	27,620.3	6,337.3	3,639.6	1,952.9	3,943.9	2,503.9
Fixed income	10,732.6	2,062.6	7,674.2	2,632.1	2,480.2	3,801.7	4,461.7	1,708.7
Mixed fixed income	-1,506.1	2,619.5	6,574.7	761.9	1,728.9	-2,338.6	-5,840.5	743.9
Mixed equity	3,288.8	1,601.4	-4,179.3	1,091.9	1,632.7	132.2	-620.5	-284.2
Euro equity	-3,588.2	-2,007.7	13.8	-88.8	-115.3	-164.4	202.8	-53.0
Foreign equity	4,113.8	2,633.1	5,260.9	600.9	1,320.5	1,402.6	603.8	276.5
Guaranteed fixed income	-282.6	-707.4	-1,787.1	-228.7	-996.8	-120.6	345.6	933.1
Guaranteed equity	-1,857.0	-2,254.2	-2,949.3	-943.3	-299.9	-906.8	-831.3	108.8
Global funds	-2,553.9	-1,501.2	22,755.0	4,878.0	-1,725.3	378.4	5,158.6	-983.4
Passive management	-3,026.8	-23.8	-2,700.6	-500.6	-1,043.0	-523.0	516.6	412.2
Absolute return	-2,852.9	-1,761.9	-3,041.9	-1,866.2	657.6	291.3	-52.8	-358.7
RETURN ON ASSETS								
Total financial mutual funds	18,002.8	-310.6	17,471.5	260.2	5,483.3	-10,623.0	-17,270.1	-5,549.2
Fixed income	961.9	371.5	-265.8	38.4	-230.3	-1,536.0	-2,290.9	-1,285.8
Mixed fixed income	1,866.9	-220.0	1,160.1	5.4	284.3	-1,549.8	-1,990.7	-731.3
Mixed equity	2,231.0	55.5	1,890.4	-14.1	538.5	-1,199.6	-1,814.0	-541.9
Euro equity	1,556.4	-1,044.9	1,176.4	37.3	215.1	-464.8	-485.7	-548.7
Foreign equity	5,561.1	1,012.7	8,242.5	151.6	2,687.0	-2,370.0	-5,511.9	-970.1
Guaranteed fixed income	204.4	75.2	-43.3	-0.1	-13.3	-59.1	-54.1	-68.1
Guaranteed equity	530.0	62.2	7.2	-1.9	0.7	-133.9	-133.9	-115.3
Global funds	3,460.8	-595.3	3,894.8	-7.1	1,535.1	-2,764.3	-3,996.0	-980.6
Passive management	1,133.2	-28.7	1,192.9	55.0	406.1	-404.5	-750.9	-272.9
Absolute return	498.7	1.7	216.5	-4.3	60.2	-139.8	-241.9	-34.6

1 Data on side-pocket sub-funds are only included in aggregate figures, and not in each individual category.
2 A change of category is treated as a redemption in the original category and a subscription in the final one. For this reason, and the adjustments due to deregistrations in the quarter, the net subscription/refund data may be different from those in Table 3.8.

Return on aasets in financial mutual funds. Breakdown by category[1] TABLE 3.10

% of daily average total net assets

	2019	2020	2021	2021 III	IV	2022 I	II	III
MANAGEMENT YIELDS								
Total financial mutual funds	7.67	0.85	6.81	0.36	1.97	-3.14	-5.38	-1.58
Fixed income	1.83	0.99	0.15	0.16	-0.15	-1.63	-2.41	-1.28
Mixed fixed income	5.75	0.50	3.37	0.23	0.80	-3.04	-4.68	-1.61
Mixed equity	9.79	1.60	8.43	0.26	2.35	-4.10	-6.75	-1.86
Euro equity	16.01	-12.72	16.30	0.81	2.99	-5.64	-5.96	-7.11
Foreign equity	21.00	4.76	19.98	0.85	5.85	-4.41	-11.10	-1.68
Guaranteed fixed income	4.52	2.18	-0.85	0.10	-0.43	-2.51	-2.31	-2.47
Guaranteed equity	4.20	1.00	0.59	0.11	0.20	-1.70	-2.04	-1.77
Global funds	9.24	-0.30	8.04	0.40	2.56	-3.85	-5.55	-1.15
Passive management	7.88	0.29	9.61	0.53	3.38	-3.39	-6.63	-2.21
Absolute return	4.93	0.87	3.78	0.08	1.04	-1.79	-3.23	-0.39
EXPENSES. MANAGEMENT FEE								
Total financial mutual funds	0.85	0.83	0.86	0.21	0.22	0.20	0.20	0.21
Fixed income	0.44	0.42	0.40	0.10	0.10	0.09	0.09	0.09
Mixed fixed income	0.92	0.88	0.88	0.21	0.22	0.21	0.22	0.22
Mixed equity	1.29	1.28	1.28	0.29	0.33	0.28	0.29	0.29
Euro equity	1.49	1.45	1.30	0.32	0.32	0.31	0.30	0.30
Foreign equity	1.41	1.31	1.31	0.30	0.34	0.29	0.29	0.29
Guaranteed fixed income	0.36	0.36	0.36	0.09	0.09	0.09	0.08	0.09
Guaranteed equity	0.47	0.44	0.44	0.11	0.11	0.10	0.10	0.10
Global funds	1.03	1.07	1.15	0.28	0.29	0.29	0.29	0.29
Passive management	0.42	0.41	0.37	0.09	0.09	0.09	0.09	0.08
Absolute return	0.81	0.78	0.68	0.14	0.15	0.13	0.13	0.13
EXPENSES. DEPOSITORY FEE								
Total financial mutual funds	0.07	0.08	0.07	0.02	0.02	0.02	0.02	0.02
Fixed income	0.06	0.06	0.06	0.01	0.01	0.01	0.01	0.01
Mixed fixed income	0.08	0.08	0.08	0.02	0.02	0.02	0.02	0.02
Mixed equity	0.10	0.10	0.09	0.02	0.02	0.02	0.02	0.02
Euro equity	0.10	0.10	0.09	0.02	0.02	0.02	0.02	0.02
Foreign equity	0.09	0.09	0.08	0.02	0.02	0.02	0.02	0.02
Guaranteed fixed income	0.05	0.05	0.05	0.01	0.01	0.01	0.01	0.01
Guaranteed equity	0.05	0.05	0.05	0.01	0.01	0.01	0.01	0.01
Global funds	0.08	0.08	0.09	0.02	0.02	0.02	0.02	0.02
Passive management	0.05	0.05	0.04	0.01	0.01	0.01	0.01	0.01
Absolute return	0.06	0.07	0.06	0.01	0.01	0.01	0.01	0.01

1 Data on side-pocket sub-funds are only included in aggregate figures, and not in each individual category.

Mutual funds, quarterly returns. Breakdown by category[1] TABLE 3.11

%

	2019	2020	2021	2021 IV	2022 I	II	III	IV[2]
Total financial mutual funds	7.12	0.78	6.31	1.81	-3.16	-5.38	-1.81	1.61
Fixed income	1.38	0.62	-0.31	-0.28	-1.71	-2.51	-1.39	0.04
Mixed fixed income	4.75	-0.03	2.49	0.56	-3.18	-4.76	-1.8	0.72
Mixed equity	9.25	0.59	7.18	2.05	-4.21	-6.81	-2.2	1.95
Euro equity	14.27	-8.75	16.72	2.66	-5.62	-6.06	-7.55	7.35
Foreign equity	22.18	2.83	21.14	5.77	-4.11	-10.67	-1.98	5.33
Guaranteed fixed income	3.98	1.68	-1.29	-0.54	-2.55	-2.35	-2.44	0.12
Guaranteed equity	3.62	0.70	0.06	0.01	-1.79	-2.08	-1.82	0.59
Global funds	8.45	-0.31	7.90	2.32	-3.90	-5.61	-1.5	1.04
Passive management	7.45	0.44	9.82	3.48	-3.38	-6.62	-2.53	3.34
Absolute return	3.94	0.94	3.02	0.95	-1.88	-3.27	-0.52	0.41

1 Data on side-pocket sub-funds are only included in aggregate figures, and not in each individual category.
2 Available data: October 2022.

Hedge funds and funds of hedge funds

TABLE 3.12

				2021		2022		
	2019	2020	2021	III	IV	I[1]	II[2]	III
HEDGE FUNDS								
Investors/shareholders[3]	7,548	7,961	8,786	8,450	8,786	9,033	9,444	9,538
Total net assets (millions of euros)	2,832.4	2,912.6	3,543.4	3,352.5	3,543.4	3,543.1	3,435.3	3,451.6
Subscriptions (millions of euros)	1,290.0	454.5	845	157.5	307.6	257.3	209.7	169.8
Redemptions (millions of euros)	937.0	407.2	409.2	62.8	126.8	143.2	141.1	89.1
Net subscriptions/redemptions (millions of euros)	353.0	47.3	435.8	94.6	180.8	114.0	68.7	80.7
Return on assets (millions of euros)	217.2	27.7	193.1	-16.4	9.7	-114.4	-177.6	-64.8
Returns (%)	10.37	1.75	6.47	-0.98	0.46	-2.92	-4.89	-1.95
Management yields (%)[4]	9.94	2.35	7.39	-0.41	0.57	-2.99	-4.80	-1.58
Management fees (%)[4]	1.19	1.43	1.47	0.26	0.34	0.21	0.22	0.21
Financial expenses (%)[4]	0.00	0.02	0.14	0.03	0.05	0.08	0.04	0.05
FUNDS OF HEDGE FUNDS								
Investors/shareholders[3]	2,859	2,858	5,385	4,457	5,385	5,379	5,309	5,330
Total net assets (millions of euros)	566.7	652.8	831.0	676.1	831.0	889.6	681.3	727.6
Subscriptions (millions of euros)	72.3	32.4	237.8	26.8	160.5	41.7	8.6	32.8
Redemptions (millions of euros)	0.3	3.1	121.8	91.4	18.5	-2.3	222.8	0.0
Net subscriptions/redemptions (millions of euros)	71.4	29.3	116.0	-64.6	142.0	44.0	-214.2	32.8
Return on assets (millions of euros)	26.5	56.8	62.2	13.4	12.9	14.6	5.9	13.5
Returns (%)	5.23	3.71	9.35	1.78	1.94	1.63	0.92	1.93
Management yields (%)[5]	6.32	4.24	10.68	2.53	2.26	2.24	1.60	2.41
Management fees (%)[5]	1.63	1.39	1.37	0.38	0.37	0.39	0.59	0.42
Depository fees (%)[5]	0.06	0.06	0.06	0.02	0.02	0.02	0.01	0.01

1 Return (%) revised and modified in October 2022.
2 Subscriptions, Net subscriptions/redemptions and Return on assets revised and modified in January 2023.
3 Data on sub-funds.
4 % of monthly average total net assets.
5 % of daily average total net assets.

Management companies. Number of portfolios and assets under management

TABLE 3.13

				2021	2022			
	2019	2020	2021	IV	I	II	III	IV[1]
NUMBER OF PORTFOLIOS[2]								
Mutual funds	1,595	1,515	1,452	1,452	1,455	1,450	1,447	1,459
Investment companies	2,560	2,421	2,275	2,275	2,239	2,135	1,765	1,580
Funds of hedge funds	7	7	10	10	10	9	8	8
Hedge funds	62	69	72	72	75	77	78	78
Real estate mutual funds	2	2	2	2	2	2	2	2
Real estate investment companies	3	3	2	2	2	2	2	2
ASSETS UNDER MANAGEMENT (millions of euros)								
Mutual funds	279,377.4	279,694.5	324,701.0	324,701.0	316,020.4	302,684.2	299,627.1	308,046.3
Investment companies	28,385.5	26,564.8	28,049.3	28,049.3	26,710.5	23,307.8	20,687.9	18,827.1
Funds of hedge funds	566.7	652.8	831.0	831.0	889.6	681.3	727.6	–
Hedge funds	2,832.4	2,912.6	3,543.4	3,543.4	3,543.1	3,288.6	3,279.7	–
Real estate mutual funds	309.4	310.8	311.0	311.0	312.5	312.6	313.4	314.8
Real estate investment companies	763.5	907.1	913.2	913.2	946.1	950.2	978.1	989.6

1 Available data: October 2022.
2 Data source: registers of CIS.

Foreign Collective Investment Schemes marketed in Spain[1]

TABLE 3.14

	2019	2020	2021	2021 III	2021 IV	2022 I	2022 II	2022 III
INVESTMENT VOLUME[2] (millions of euros)								
Total	178,841.5	199,419.3	276,231.9	261,733.8	276,231.9	227,194.6	209,314.4	204,425.1
Mutual funds	30,843.4	27,355.5	36,662.6	34,459.8	36,662.6	32,253.8	30,442.1	29,612.8
Investment companies	147,998.1	172,063.8	239,569.4	227,274.0	239,569.4	194,940.8	178,872.3	174,812.3
INVESTORS/SHAREHOLDERS[2]								
Total	3,361,901	4,312,340	6,073,537	5,609,293	6,073,537	6,120,550	6,377,747	6,510,617
Mutual funds	521,648	592,053	776,206	723,358	776,206	782,936	846,890	872,941
Investment companies	2,840,253	3,720,287	5,297,331	4,885,935	5,297,331	5,337,614	5,530,857	5,637,676
NUMBER OF SCHEMES[3]								
Total	1,033	1,048	1,074	1,068	1,074	1,069	1,077	1,082
Mutual funds	399	407	416	424	416	411	412	412
Investment companies	634	641	658	644	658	658	665	670
COUNTRY[3]								
Luxembourg	462	472	501	493	501	497	498	497
France	222	225	222	228	222	220	219	219
Ireland	220	222	231	225	231	232	240	246
Germany	48	45	50	50	50	50	52	53
United Kingdom	23	23	0	0	0	0	0	0
The Netherlands	4	3	3	3	3	3	3	3
Austria	30	32	33	33	33	33	33	33
Belgium	5	5	5	5	5	5	3	3
Denmark	1	1	1	1	1	1	1	1
Finland	11	13	14	14	14	14	14	14
Liechtenstein	4	4	5	4	5	5	5	4
Portugal	3	3	0	3	0	0	0	0
Sweden	0	0	9	9	9	9	9	9

1   Only data on UCITS are included.
2   Investment volume: participations or shares owned by the investors/shareholders at the end of the period valued at that time.
3   UCITS (funds and societies) registered at the CNMV.

Real estate investment schemes[1]

TABLE 3.15

	2019	2020	2021	2021 IV	2022 I	2022 II	2022 III	2022 IV[2]
REAL ESTATE MUTUAL FUNDS								
Number	2	2	2	2	2	2	2	2
Investors	483	483	482	482	482	482	482	482
Assets (millions of euros)	309.4	310.8	311.0	311.0	312.5	312.6	313.4	314.8
Return on assets (%)	-0.02	0.47	0.07	0.01	0.47	0.04	0.22	0.48
REAL ESTATE INVESTMENT COMPANIES								
Number	3	3	2	2	2	2	2	2
Shareholders	316	315	209	209	209	209	208	215
Assets (millions of euros)	763.5	907.1	913.2	913.2	946.1	950.2	978.1	989.6

1   Real estate investment schemes which have sent reports to the CNMV, excluding those in process of dissolution or liquidation.
2   Available data: October 2022.