THE RISK CONTROLLERS
Central Counterparty Clearing in Globalised Financial Markets

PETER NORMAN
Further praise for *The Risk Controllers*

"The fallout from the 2008 financial crisis is forcing the world of clearing and settlement out of its traditional back-office obscurity into the limelight. Peter Norman’s book presents an invaluable view of the history, operations and strategic issues relevant to this world. At a time when market infrastructure is undergoing the most fundamental change in living memory, his book is an essential companion to anybody involved in helping to shape the new landscape."

—Richard Berliand, former Head of Prime Services and Market Structure at J.P. Morgan

"The Risk Controllers is an invaluable historical and investigative work about one of the more arcane, yet critical parts of the financial industry. As a result of the financial crisis, Central Counterparty Clearing is now full square at the centre of the global financial repair agenda, especially for derivatives markets, which makes this book particularly timely and welcome. This book will be the reference work on this subject for years to come."

—David Wright, Deputy Director General, Internal Market, European Commission (2007–2010)

"A must-read for all involved in the development, implementation and oversight of new clearing regulations following the recent financial crisis. Peter has presented a rich history of clearing in a concise and significant manner for those who must seize the successes of the past in putting today’s new clearing regimen in place. All should thank Peter for creating this important work which is so relevant in today’s world."

—Dennis Dutterer, Retired CEO, President and Director of The Clearing Corporation; former General Counsel of the CFTC

"The Risk Controllers provides a welcome insight into the world of central clearing. A timely exercise as legislators around the world pin their hopes on CCPs to plug the deficiencies in risk management identified in the global derivative markets. By explaining the history, exposing the limitations and describing the myriad of vested interests involved in central clearing, Peter Norman has clearly outlined the possible pitfalls we must all now try to avoid. A very concise and engaging book on a complex topic."

—Dr Kay Swinburne, Member of the European Parliament, ECR Coordinator for Economic and Monetary Affairs
The Risk Controllers

Central Counterparty Clearing in Globalised Financial Markets

Peter Norman
To Janice
and in memory of Frank Norman
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Preface

This history and account of central counterparty clearing is my second book dealing with an important financial infrastructure and covers a business that has shot to prominence since the bankruptcy of Lehman Brothers.

The Risk Controllers was conceived before the cataclysmic events of September 2008. As with my previous book – Plumbers and Visionaries: Securities settlement and Europe’s financial market – the present volume is the result of a three-way collaboration between Chris Tupker, the former chairman of LCH.Clearnet, John Wiley & Sons, Ltd and myself.

Like the previous book, the origins of The Risk Controllers can be traced back to a lunch – this time in March 2008 – when I met Chris Tupker to chew over our experiences that resulted in the publication of Plumbers and Visionaries a few months before.

He suggested that I prepare a synopsis for a companion volume that would deal with the little known and rather abstruse business of CCPs, which ensure that trades in derivatives and securities markets will be completed in cases where one of the parties to a trade defaults.

As with the previous book, Chris Tupker’s ambition was to have a book that would explain the business of clearing and how it worked to a wider audience and how an important but little known part of the financial world had developed over time in the context of society, politics and regulation.

After some hesitation, prompted mainly by a non-specialist’s concern that clearing involved some highly technical issues, I agreed. On balance, we both thought that writing The Risk Controllers would be a relatively easy task, given that it would build on insights gained writing the earlier book.

That was six months before the bankruptcy of Lehman Brothers, which turned the financial world upside down and propelled the business of clearing from the back office to the front pages.

The Lehman bankruptcy and its aftermath made the subject of clearing topical but added greatly to the complexity of this book. The result is a work that is much bigger than originally envisaged, with a case study of how clearing houses in general and LCH.Clearnet in particular handled the Lehman default in Chapter 3. Part V of the book deals with the political, regulatory and corporate developments since September 2008, which will shape the business of clearing for years to come. The book covers developments up to the middle of October 2010, with some late updates inserted in March 2011. It therefore takes into account the post-crisis legislative initiatives to reform the US, EU and global financial systems.

While paying due attention to the events of the past three years, the book has tried to stay true to its original goal of providing a description and history of clearing. This too has made
for an ambitious project as the subtitle ‘Central Counterparty Clearing in Globalised Financial Markets’ implies. As the reader will discover, CCPs are complex businesses, deeply rooted in history and in several continents.

As far as I can tell, this is the first attempt in many years to write a general account and empirical history of clearing. Clearing houses attracted a good deal of attention during the two decades after they were introduced in Europe in the 1880s. Attention waned for much of the 20th century, however, as they shrank in importance with the global economy under the impact of two World Wars and the Great Depression. A considerable literature on CCPs and clearing has built up since the early 1980s, but this appears largely to consist of official reports and specialist studies of aspects of clearing rather than any general history.

Although I hope that this book will appeal to specialists, I especially hope it will bring the world of the CCP to a wider audience, including readers with a general interest in economics, finance and business and how these interact with politics and regulation.

The book itself cannot possibly claim to be the definitive account of CCPs and central counterparty clearing. Wars, technological advance and office relocations have conspired against the retention of the records necessary to produce such a work, if ever one were possible. CCPs, like many other IT-related businesses, have tended to show scant regard for their roots or history. In my experience, the first thing to disappear into a skip, if space is in short supply or an office is being moved, is the company archive.

Yet, I am convinced there is much more to be discovered about the history of clearing, in archives that may be half forgotten or are waiting to be catalogued. It is encouraging that some companies, such as ICE Futures in Canada, have donated historical material obtained through corporate acquisitions to university archives. If such acts, or indeed this book, encourage other companies to follow suit or researchers to take up the history of financial infrastructures, it will be all to the good.

This book has been made possible by the support of LCH.Clearnet Group, which provided financial backing without which the research would have been impossible. The story of the clearing houses that eventually merged to form LCH.Clearnet forms part of the narrative. But the book is not an official history of LCH.Clearnet or any other clearing house. My relationship with the LCH.Clearnet Group has been at arm’s length throughout.

Books are never written without the assistance of many people and this is especially true of *The Risk Controllers*. The list of individuals and institutions who helped me research this book is long. They are mentioned, with thanks, in the following Acknowledgements.

However, there are some without whom this book could not have been produced. Special thanks go to Chris Tupker, whose patience, encouragement and guidance proved a great support at all times. I am also grateful to Rory Cunningham, who helped me understand, if not master, some of the technicalities of modern day clearing. Dennis Dutterer unselfishly shared documents from his own collection of papers covering the early history of the Board of Trade Clearing Corporation, read some of the early draft chapters and provided valuable insights into the development of clearing in the US. Michael March, Natasha de Terán, Rory Cunningham, Ed Watts, Andrea Schlaepfer, Peter McLaren, David Wright and Ben Norman took the time and the trouble to read parts of the text and made helpful comments. After all that input, it goes without saying that any errors in the pages that follow are mine as are the judgements.

Finally, there would be no *The Risk Controllers* without Janice, my wife, whose patience, good humour and support sustained me as I researched and wrote this book.
Acknowledgements

I am indebted to many people who helped me research and prepare this book. Some I have already thanked in the Preface. There are many more whom I met and who gave generously of their time and wisdom. Others responded helpfully to e-mailed queries, shared their thoughts over the telephone or swapped ideas on the margins of conferences and seminars. Some were happy to be quoted in the text. Others preferred to discuss matters on a background basis. Without their help The Risk Controllers would never have been written.


One of the challenges of this book was to keep up with unfolding events at the same time as researching the past. It helped greatly to attend some of the more important conferences that bring clearing professionals, regulators and policy makers into contact. I am especially grateful to the CSFI; Eurofi; FESE; the FIA; the Financial Markets Group of the London School of Economics; the FOA; Forum Europe; ICBI, Mondo Visione and the SFOA for making me welcome at their events.

To build a picture of clearing before modern times meant rediscovering the delights of digging around in libraries and archives. The British Library, the Library of Congress, the
 Acknowledgements

New York and Chicago Public Libraries yielded valuable background and source material. London’s Guildhall Library, with its helpful staff, was an important source of information about LPCH.

I gained access to other information because several organisations kindly allowed me to study material in their possession. These included the Archives municipales du Havre; the Bank of England; Czarnikow in London; the CFTC and Federal Trade Commission in Washington DC; the Museum of American Finance, New York; The National Agricultural Library, Beltsville, Maryland; the Special Collections Department of the Richard J Daley Library of the University of Illinois at Chicago and the Stichting Vereniging voor de Effectenhandel (VvdE) of Amsterdam.

There were some collections and archives that I was unable to visit but which responded helpfully to e-mailed requests for assistance. I am especially grateful to Brian Hubner of the University of Manitoba Archives & Special Collections in Winnipeg; Alison Purgiel of the Minnesota Historical Society Library in St Paul, and Rita Maloney and Eric Grover of MGEX in Minneapolis. My thanks go also to David Boutros of the Western Historical Manuscript Collection-Kansas City and Heather Paxton in Kansas City, Missouri.

Helping inform this book have been insights and contacts gained over 40 years in journalism, many of them writing on economic and financial affairs, with 22 of those years based on the European mainland. This book has also benefited from work I did for Plumbers and Visionaries, my book on securities settlement in Europe, which was published in December 2007.

The Internet was also an essential tool for researching this book. Quite apart from making ‘on the record’ announcements of companies, regulators and policy makers instantly accessible, the web has made available a phenomenal and ever growing amount of historical and archive material. In researching this book two services were especially useful: the WorldCat online library catalogue service and the San Francisco-based Internet Archive.

Preparing the Risk Controllers necessitated learning some new skills: my thanks go to Vida Yirenkyi at LCH.Clearnet in London for giving me a crash course on how to create graphics using a computer. I am also grateful to Kate McAusland, who as assistant to Chris Tupker was always helpful.

Finally, my thanks go to John Wiley & Sons, Ltd the publisher of this work, and in particular to Aimee Dibbens, Caitlin Cornish, Pete Baker, Viv Wickham and Lori Boulton for their guidance and help through the gestation of The Risk Controllers, and also to Andy Finch, who as copyeditor helped clean up and prepare my text ready for typesetting.
Part I

Clearing up the Crisis
Crises create unlikely heroes. The bankruptcy of Lehman Brothers on 15 September 2008 was no exception.

When Lehman sought protection from its creditors in the US that day, a small number of specialist financial institutions sprang into action to keep the world’s securities and derivatives exchanges at work.

First in Europe, and later around the globe, central counterparty clearing houses (known as CCPs) stepped in to rescue trillions of dollars worth of trades caught up in the Lehman collapse. Without their action, the global financial meltdown threatened by the failure of the 158 year old investment bank would have been an instant reality.

These little known organisations fulfilled their emergency role of successfully completing trades for which they had assumed responsibility. Therefore they ensured that the world’s securities and derivatives exchanges could continue to function and handle trading volumes that leapt into the stratosphere as prices for shares, bonds and other exchange-traded instruments gyrated wildly in the crisis.

The collapse of Lehman Brothers changed the world in many ways. The petition for Chapter 11 protection, filed by Lehman Brothers Holdings Inc. with the US Bankruptcy Court for the Southern District of New York, turned a steadily escalating international financial crisis into a global economic cataclysm. The investment bank’s failure put paid to any prospect of orderly management of the financial turmoil that started during the summer of 2007 as a result of growing losses in the subprime sector of the US housing market. The bankruptcy shattered confidence in market-based finance. The lending between banks that lubricated transactions in the global economy jammed as trust drained away. Money became scarce. Its cost soared.

The decision of the US authorities to let Lehman fall shattered a widespread belief that large institutions of importance to the global financial system were simply too big to fail. That the same authorities decided within 24 hours to prop up the crippled AIG insurance group only added to the convulsions. No-one was left with a clear idea of what would or would not be saved. The issue of ‘counterparty risk’ – whether it was safe or not to do business with another financial institution, no matter how great or low its standing might be – assumed an overwhelming importance.

In the following weeks, governments in the US, Britain and continental Europe were forced to prop up banking and financial systems with rescue packages costing billions of dollars, pounds and euros. Interest rates tumbled. Budget deficits soared. Many leading banks survived solely because taxpayers’ funds were committed to their recapitalisation. In a few frantic weeks mighty financial structures created over the previous three decades either crumbled away or sought to survive as subsidiaries of stronger rivals or wards of the state. The market-based financial systems that had spread from the US around the world since the early 1980s now hosted banks that were either partly or wholly state-owned.
Lehman’s bankruptcy placed in jeopardy trillions of dollars worth of transactions conducted by and through the investment bank and its many subsidiaries. Assets were caught in limbo, spreading financial hardship, and in some cases collapse, to companies at the other end of these trades. As became clear when bankruptcy administrators on both sides of the Atlantic tried to make sense of the wreckage, assets worth many billions of dollars would be out of reach for creditors for months if not years.

But the story was very different for those trades transacted on derivatives and stock exchanges and even for a minority of the huge volume of specialised transactions negotiated among financial institutions bilaterally on the ‘over-the-counter’ (OTC) markets between buyers and sellers. These trades escaped the Lehman catastrophe for the simple reason that they were cleared by central counterparty clearing houses. The CCPs covered for losses after Lehman’s default, having stepped in as the buyer to every seller and the seller to every buyer in the markets that they cleared.

Within a week of the Lehman bankruptcy, most outstanding open positions relating to these trades had been neutralised or ‘hedged’ so that they no longer threatened further losses to creditors or to add more chaos to the world financial system.

Within two weeks, most of Lehman’s customer accounts were transferred to other investment companies.

By late October 2008, CCPs in most leading financial markets had reported success in managing the biggest default in financial history without cost to their member companies.

The performance of these unglamorous institutions permitted some rare outbursts of satisfaction in a business where sober understatement is the norm.

In New York, Don Donahue, the Chairman and Chief Executive of the Depository Trust and Clearing Corporation of the US, reported that DTCC was ‘able to ensure reliability and mitigate risk across the industry’ despite ‘unprecedented volatility and shaken confidence’ in the financial services sector.1

Terrence A. Duffy, Executive Chairman of the Chicago-based CME Group of derivatives exchanges, declared that ‘no futures customer lost a penny or suffered any interruption to its ability to trade’ when Lehman Brothers filed for bankruptcy. ‘The massive proprietary positions of Lehman were liquidated or sold, with no loss to the clearing house and no disruption of the market. This tells us that our system works in times of immense stress to the financial system,’ Duffy told a Senate committee.2

In London, where LCH.Clearnet Ltd, the UK operating subsidiary of the multinational LCH.Clearnet Group, declared Lehman in default shortly after the start of trading on 15 September 2008, Group Chairman Chris Tupker recalled how: ‘At the moment Lehman sought Chapter 11 protection, every exchange in London was clearing through us. No other CCP had the variety and size of positions on its books that we did. I shudder to think what might have happened to the marketplace if we had failed.’3

The ability of LCH.Clearnet and other clearing houses successfully to manage the Lehman default helped enable the City and other leading financial centres to survive one of the darkest chapters in the global economic crisis. Thanks to CCPs, the world’s securities exchanges have continued to raise capital for enterprises while futures and options exchanges

1 DTCC (29 October 2008), Addressing the DTCC Executive Forum 2008. DTCC provides clearing, settlement and other post-trade services for companies trading on US stock markets and other financial markets.
2 Testimony before the Senate Committee on Agriculture, Nutrition and Forestry, 14 October 2008.
3 Conversation with the author, 12 January 2009.
continue to provide investors, traders and entrepreneurs with the means to protect themselves against risk.

The events of September 2008 changed fundamentally the status of CCPs in financial markets and the priority they are accorded on the agenda of policy makers. After years spent in obscurity, central counterparty clearing houses emerged from the days of chaos among very few organisations in the global financial system with a good story to tell.

This book takes up the story of central counterparty clearing by examining in detail how CCPs functioned in the emergency that followed Lehman’s bankruptcy petition.

Chapter 3 places special emphasis on the successful responses of the LCH.Clearnet Group despite serious, unexpected problems faced by its CCPs in London and Paris. The multinational CCP operator was the first big clearing house to declare Lehman companies in default on 15 September. It cleared for a wider range of markets and asset classes than any other CCP. It broke new ground in closing down very large open positions in the interest rate swap market, where over the previous 10 years SwapClear, its specialist clearing service, had built up unique experience in clearing these OTC instruments.

Having demonstrated the value of CCPs in a crisis, the book explores how central counterparty clearing houses grew out of techniques rooted in antiquity and developed from the late 19th century into the institutions on which many hopes are pinned today.

Part II of the book shows how clearing house pioneers in the globalising world of the late 19th and early 20th centuries adopted different systems of governance and ownership, strung along a spectrum from mutualised utility to for-profit, listed corporations, and faced challenges that would be familiar to some of today’s CCP managers. Then, as now, technological change – notably in the field of communications – and political developments shaped their decisions.

Part III tells of the emergence of modern CCPs amid the turmoil of the late 20th century and their increased interaction with policy makers and regulators.

Part IV brings the story of CCP clearing to the point of Lehman’s default in September 2008 as the optimism engendered by economic globalisation gave way to the global financial crisis.

Part V examines how clearing and CCPs have shot up the public policy agenda as a result of their successes in dealing with the Lehman default and some of the lessons learned from the crisis.

The final part of the book reviews the initiatives by industry and governments to use CCPs to bring transparency and mitigate risks in financial markets and so help ensure that the worst global economic crisis since the Great Depression of the 1930s is not repeated. These include a central role for CCPs in the markets for OTC derivatives, the financial instruments that caused massive losses at AIG, the US insurance group rescued by the US taxpayer immediately after the Lehman bankruptcy. Great hopes are being pinned on CCPs. The big question is whether too much is being expected of institutions that concentrate as well as mitigate risk.

The story of central counterparty clearing in globalised financial markets is a story of constant change, made difficult at times by the absence of a common vocabulary. The terminology of clearing has changed as the business has developed over the past century and a quarter. The terms ‘central counterparty clearing’ and ‘CCP’ are relatively recent, and only in common use since the early 1990s.

In examining CCPs and their history, this book covers institutions which existed before the phrase ‘central counterparty clearing’ and the abbreviation ‘CCP’ were invented and which nonetheless performed similar functions. It also provides a review of earlier forms of clearing to provide some context for the eventual emergence of CCPs. But it does not claim to be a comprehensive history of all forms of clearing.
CCP-type institutions first existed in 18th century Japan, where they were part of the infrastructure of the Dojima rice market of Osaka. However, today’s CCPs trace their lineage back to clearing systems that guaranteed against counterparty risks in commodity futures trading in late 19th century Europe.

During the 1880s, in the historic trading cities of continental Europe and the UK, techniques foreshadowing central counterparty clearing appeared in support of traders who were developing futures and options to manage and exploit the vagaries of the seasons and the cycles of investment, production and trade in markets for agricultural commodities and raw materials.

Soon afterwards, new style clearing practices appeared in North America, where ‘complete clearing’ houses took on the role of buyer to every seller and seller to every buyer in the nation’s commodity exchanges. After a slow start, partly reflecting anti-gambling sentiment, complete clearing became firmly established as the norm for US commodity exchanges in the years of rapid growth between the end of the First World War and the Great Depression.

The importance of central counterparty clearing has grown exponentially in the past 40 years. Human-made uncertainty arising from the shift to floating exchange rates in the early 1970s gave a huge boost to derivatives trading – and by extension to CCPs. The invention of financial futures that facilitated speculation and the management of risks inherent in currencies, securities and interest rates created markets that dwarf the commodities exchanges that CCPs were originally created to serve.

Ever greater computer power has supported the development of CCPs. An important influence was the Wall Street Crash of 1987, which highlighted the growing importance of clearing houses and the risks that attached to them and brought in its wake greater regulatory involvement with CCPs.

Also crucial has been the realisation, during the past two decades, that CCPs have a capacity to add value in the chain of transactions between the buyers and sellers of securities and futures contracts. This gave an impetus to the drive to demutualise exchanges and the infrastructures that support them.

Until recently, it was axiomatic that CCPs dealt only with standardised commodities or financial instruments. CCPs are still used mainly in support of transactions in bonds, shares and futures and options contracts that are listed and traded on regulated exchanges. As initiatives to create CCPs for credit instruments traded over-the-counter show, the role of central counterparty clearing in financial markets stands on the threshold of a new era.

But before exploring the role of CCPs in the past, present and future, the following chapter offers an overview of the modern CCP, how it works and the special features that define central counterparty clearing and its place in today’s financial markets.
2 The Modern Central Counterparty Clearing House

2.1 THE CCP’s UNIQUE SELLING POINT

The near meltdown of the global financial system following the bankruptcy of Lehman Brothers refocused the attention of markets and policy makers on the original and unique purpose of CCPs.

Just as the forerunners of today’s CCPs were set up in the 19th century to neutralise counterparty risk in commodity markets, the core responsibility of today’s central counterparty clearing house is again to ensure that a security or derivatives trade between two of its users will not fail because the buyer or the seller are unable to fulfil their side of the bargain. By becoming the buyer to every seller and the seller to every buyer, the CCP assures completion of the trade if a trading partner defaults.

The trade might take place on an exchange, an alternative electronic trading platform or be bilaterally negotiated in an OTC trade. The legal substitution of the clearing house as the counterparty in two new trades, in which the seller sells to the clearing house and the buyer buys from the clearing house, is generally known as novation.

Thanks to advanced technology, modern CCPs clearing for exchanges novate and become counterparties to trades instantaneously at the time of their execution. Under traditional methods – still used for OTC trades – novated trades are registered on the CCP’s books just after the trade and the details of the original bargain have been verified or matched. Novation takes place before the completion or settlement of trades, which in many cases is handled by a different institution.

Counterparty risk was relatively low among the concerns of financial markets in the decade and a half before Lehman’s collapse. Most users in those years probably placed more value on the ability of CCPs greatly to minimise costs and maximise efficiency by netting the positions of counterparties to trades and to provide anonymity for their trades.

If users valued the guarantee function of a CCP it was probably because it also reduced their costs. Under internationally agreed bank capital rules, the substitution of a CCP, with its high credit rating, meant the original counterparties to a trade no longer had to hold capital in respect of their open positions.¹

Before the Lehman weekend, CCPs appeared worthy at best: little known companies that combined some of the attributes of a bank, a post office and an insurer. In fact, after computers began to take over the processes of registration, novation and netting in the 1960s, the capacities

¹ For details, see Section 2.5.
of CCPs increased exponentially in scope as well as scale so that today, for example, the LCH.Clearnet Group clears more than 2 billion trades a year.\(^2\) Thanks to their technical capabilities and risk-management techniques, CCPs were the circuit breakers that stemmed financial rout and stopped the crisis of 15 September 2008 turning into a wholesale collapse of the global economy.

### 2.2 TRADING VENUES AND CLEARING MARKETS

Modern day clearing houses are therefore vitally important participants in the complex network of institutions, intermediaries and regulators that interact in today’s wholesale financial markets.

‘We allow the City to sleep at night,’ was how Chris Tupker once described the job of LCH.Clearnet and other clearing houses. It is a sentiment now echoed in financial markets around the world.

In order to function, CCPs must have very close relationships with the exchange, trading platform or other venue where the trades they clear take place. A central counterparty clearing house will be contracted to register and novate the trades agreed by buyers and sellers on the given trading venue and rely on a ‘feed’ of trade information from there to be able to carry out its tasks.

The CCP will provide the services of guaranteeing and netting trades to a relatively small group of financial companies among the trading venue’s users. For the most part, these ‘clearing members’ of the modern CCP are large investment banks or commercial banks. Only market participants approved by the CCP have a contractual relationship with the clearing house.

There are two broad categories of clearing member licensed by CCPs to be their counterparties: general clearing members (GCMs) and direct clearing members (DCMs). A GCM is able to clear its own trades, those of its clients and the trades of non-clearing member firms (NCMs), which are market participants of the trading venue where the GCM trades but which do not have direct access to the CCP.

The definition of a DCM is less straightforward and depends on the rules of the individual clearing house or exchange. According to some definitions, a DCM clears only its own trades with the CCP.\(^3\) In the case of Eurex Clearing AG, by contrast, a direct clearing member may clear trades with the Frankfurt-based CCP on its own account, for its customers and for clients of NCMs that are affiliated to the DCM.

The banks or brokerages that choose, as clearing members, to clear for other firms act as a conduit between the clearing house and a far greater population of banks, brokerages and financial intermediaries – which in the case of some big GCMs may run into hundreds. A clearing member’s clients may trade on their own account or act for end-investors when buying or selling the securities or derivatives contracts that are cleared by the CCP.

Significant shifts have taken place in the make-up and interests of clearing members and investors during the history of clearing and these have been reflected in the business of CCPs.

The explosive growth of financial futures from the 1970s onwards turned banks and investment banks into the dominant group among clearing members – even in commodity markets

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\(^2\) 2 023 838 000 transactions in 2008, consisting of exchange traded derivatives, energy, freight, interbank interest rate swaps, equities, commodities, and euro and sterling denominated bonds and repos.

\(^3\) This definition appears, for example, in the glossary of the March 1997 Bank for International Settlements report ‘Clearing Arrangements for Exchange Traded Derivatives’.
where they displaced traditional traders and merchants. In the early years of this century, hedge funds emerged as major clients of clearing members and in some cases, as they grew in size, became clearing members in their own right. In more recent years, specialist, high volume algorithmic traders and liquidity providers have become increasingly important at the trading level and as clients of clearing members.

It is the duty of the clearing member to meet the outstanding obligations of its customers if they default. But if client defaults are so big that they put the clearing member into default, the CCP steps in.

The clearing house is therefore the backstop for the failure of its clearing members. It is because CCPs manage and, if necessary, absorb these risks that they have become of such interest to policy makers and regulators following the Lehman bankruptcy.

According to Andrew Haldane, Executive Director for Financial Stability at the Bank of England, CCPs can hinder the spread of a financial crisis as effectively as targeted vaccination programmes can curtail epidemics or firebreaks restrict forest fires. According to Haldane, CCPs can deal ‘at a stroke’ with the complexity that has contributed to the fragility of modern financial systems. By interposing CCPs in every trade, ‘a high-dimension web is instantly compressed to a sequence of bilateral relationships with the central counterparty – a simple hub-and-spokes. The lengthy network chain is condensed to a single link.’ Provided the hub’s resilience is beyond question, ‘counterparty uncertainty is effectively eliminated’. Figure 2.1 illustrates this situation.

### 2.3 MANAGING RISK

CCPs lower risk in markets by cutting the danger of defaults leading to a chain reaction. But in so doing, they concentrate risk in themselves, becoming potentially a single point of failure in a financial system.

This ‘CCP paradox’ means they are systemically important, of growing public policy concern and subject to very strict regulation, which will get stricter as policy makers require CCPs to mitigate risks in a growing number of financial market places.

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The value of trades on a CCP’s books can be awe-inspiring. According to the LCH.Clearnet Group’s annual accounts for 2009, the fair value of the clearing members’ trades with the group’s CCPs in London and Paris amounted to €419 billion on 31 December. Entered on both sides of the balance sheet, this huge sum was simultaneously owed by the group to the clearing members and by the clearing members to the group as a result of the CCPs in London and Paris being buyers to every seller and sellers to every buyer. The €419 billion were equivalent to three months’ output of UK goods and services as measured by GDP.

To be an effective neutraliser of counterparty risk, a CCP must be above any suspicion that it might itself default on its obligations. As Haldane remarked on another occasion: ‘Because a CCP represents a single point of failure, it needs to be bullet proof.’

Achieving this objective involves a cooperative effort with the clearing members, which mutualise the risk of a default of one of their number and so accept responsibilities that go well beyond the payment of fees to the CCP for its services.

Clearing members must help to provide and finance the resources and instruments needed by the CCP to manage risk. The CCP then deploys a cascade of tools and measures to make its activities as secure as possible in the face of any conceivable market crisis. Its armoury includes the following:

- Marking to market, so that each day – and increasingly during the trading day as well – the clearing house can take account of changes in the value of the trades on its books.
- Margining, or the process of taking and holding a portion of the value of the trade from buyer and seller as collateral against one or the other failing to complete the deal.
- Setting criteria to ensure that clearing house members have the financial solidity needed to enable the CCP and the market or markets that it serves to function.
- Setting strict rules for clearing members that include sanctions such as the compulsory closure by the clearing house of any open trades in the event of default.
- Prudent governance: for example, at LCH.Clearnet the risk-management staff are separated completely from the clearer’s commercial division and take no instructions from it.
- A default fund to which clearing members contribute and which can be drawn upon by the CCP if it uses up a defaulting member’s margin when closing out its positions. In some cases, CCPs contribute to the default fund on the grounds that having ‘some skin in the game’ underlines the shared responsibility of a clearing house and its members for its successful operation.
- Specified powers giving the CCP rights to liquidate, transfer or otherwise safeguard its exposures in the event of a default.
- Insurance to cover against further losses, although this form of protection is now less prevalent because of the withdrawal of providers from the market.
- Other lines of financial support, such as a guarantee from a parent company or contractual rights to tap clearing members for additional capital.
- Its own capital as a final financial backstop.

Margins are the CCP’s first line of defence in case of a default. When responsibility for a trade is accepted by the clearing house, clearing members provide the CCP with ‘initial’

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2 For example, ICE, an operator of trading platforms and clearing houses, contributes to the default funds of ICE Clear Europe, its London-based CCP, and ICE Trust, its CCP for Credit Default Swaps, which it began clearing in 2009. See Sections 17.4 and 19.2.
margin, or a portion of a trade’s value, to cover its risks until the contract is completed or closed out. The actual sum deposited will vary according to what is traded, the length of time a trade remains open and the clearing house’s own margin methodology. The initial margin required to manage a futures contract will generally be greater than that required for clearing an equity which on most stock exchanges is settled on the third day after the bargain is agreed.

The CCP will also pay and collect ‘variation’ margins. As the name implies, variation margin changes with the value of the trades that the CCP has registered and which remain open. The idea of variation margin is to compensate for all losses and gains of the CCP’s counterparties to ensure that none runs up losses that it cannot cover before its trade is settled or closed. Variation margins will be levied on clearing members on a daily basis if prices move adversely against them. On the other hand, CCPs will credit a clearing member with variation margin should the price of the security or futures contract move in the member’s favour.

During volatile trading, the CCP may call for additional variation margin to protect itself against sudden and adverse price movements during the business day. Additional intra-day variation margin calls can come frequently during the trading day and woe betide any clearing member or investor who fails to meet them. The CCP will not hesitate to declare the offender in default and liquidate or transfer its remaining open positions. The CCP’s clearing members will in turn usually be entitled to take similar action when their own clients fail to produce additional funds.

Margin calls by CCPs increased sharply in the final quarter of 2008 after the bankruptcy of Lehman Brothers. This was reflected at the LCH.Clearnet Group by a jump in the daily average of assets managed by its treasury teams to €48 billion in October against €26 billion throughout the year.7

In November 2010, a margin call gave a new twist to the eurozone sovereign debt crisis, when LCH.Clearnet Ltd increased the margin required for Irish government bonds cleared through its RepoClear service by 15% of net exposure. From being of interest only to financial professionals, margins suddenly became headline news.

To be allowed to join a CCP, potential clearing members must demonstrate that they have sufficient financial strength and technical capacity in their back offices to conduct their business without risk of default. The CCP will stipulate robust capital requirements for clearing members reflecting the riskiness of the business that the clearing member undertakes. So a company that does equity trades, which settle within three days, needs a much lower level of capital than one engaged in interest rate swap transactions, where the notional sum at risk runs to trillions of dollars and there may be many months or years before the position expires.8

The trading positions and broader business activities of clearing members will also be subject to close monitoring so that the CCP can discover at the earliest possible time any development that may threaten the ability of a member firm to meet its obligations.

In return, CCPs must ensure that the services they provide are attractive enough to win the support of their clearing members which in turn are competing for investors’ business. While taking responsibility to complete trades and preserve the marketplace from the risk of counterparty default, clearing houses do everything in their power to protect the margins and default monies of their members and, indirectly, of their members’ clients.

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7 According to the LCH.Clearnet Group annual report for 2008.
8 The Committee on Payment and Settlement Systems of the Bank for International Settlements reported in March 2007 in ‘New developments in clearing and settlement arrangements for OTC derivatives’ that SwapClear members must have US$5 billion of Tier 1 capital and a swap portfolio of US$1 trillion outstanding. By contrast, Eurex in the final quarter of 2008 stipulated that a company applying for a licence to act as a general clearing member on the Frankfurt Stock Exchange required a minimum capital of €25 million.
In the case of Lehman, where subsidiaries of the investment bank were clearing members of CCPs around the world, the margins provided by the subsidiaries proved sufficient to protect nearly all the clearing houses from the effects of Lehman’s default. As will be discussed in the next chapter, only in one known case – a clearing house in Hong Kong – was a CCP obliged to dip into the guarantee fund provided by its members.

### 2.4 CLEARING DERIVATIVES AND SECURITIES

CCPs have evolved over the past century and a quarter to provide security and transparency in futures and options markets. They are essential for safe and efficient trading of derivatives contracts listed on exchanges. Thanks to computer technology, CCPs have been instrumental in the rapid growth in size and numbers of derivatives exchanges around the globe and the proliferation of contracts that investors can trade.

Following the Lehman collapse, the world’s leading legislatures are mandating an increasingly important role for CCPs in the world of OTC derivatives.9

Long ubiquitous in derivatives markets, CCPs are a relatively recent innovation in markets for cash securities such as stocks or bonds. They became established in US stock markets in the 1970s following a major reform of financial markets. It is only since the 1990s that they have played a significant role in European stock markets, following the introduction of an equities CCP for the Paris stock exchange.

These contrasting histories reflect some important differences between derivatives and securities in terms of what they represent and how they are traded and cleared.

As the name implies, a derivative derives its value from some other product, asset or price. It may relate to any one of a vast number of underlying assets or instruments, including commodities such as oil or sugar, foreign currencies, company shares, government bonds or the price of money as expressed by interest rates.

A derivative might be a future, which is a legally binding agreement to buy or sell a specified amount of a pre-defined asset at an agreed price at or by a set date in the future. It may be an option giving the holder the right, but not the obligation, to buy or sell a specified underlying asset at a pre-arranged price at or by a fixed point in the future. It could be a swap agreement by which two counterparties agree to exchange one stream of income against another arising from the same principal amount of two financial instruments.10 It might be a hybrid: for example, an option on a future.

Derivatives vary greatly in complexity. One characteristic shared by all derivatives is that they are contracts, created to meet demand, in which seller and buyer agree detailed commitments. They are traded on an exchange in the case of standardised, listed derivatives or negotiated bilaterally among counterparties in the case of OTC derivatives. Another important characteristic of derivatives contracts is that they are margined instruments requiring the investor to pay only a small portion of the value of the trade to the clearing house at the time of registration.

Unlike stocks – where trades to buy or sell are ‘settled’ with delivery versus payment within days – it may be weeks, months, years or even decades before a derivatives contract is due

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9 See Part V of this book.
10 A simple example of a swap involves the exchange between counterparties of income at a fixed interest rate for income at a floating rate.