LSE Research Online

THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

Eva Micheler

Intermediated securities from the perspective of investors: problems, quick fixes and long-term solutions

Book section (accepted version)

Original citation:
Originally published in Gullifer, L. and Payne, J., *Intermediation and beyond*. Oxford: Hart Publishing, 2019.

© 2019 Bloomsbury Publishing Plc

This version available at: http://eprints.lse.ac.uk/89187/
Available in LSE Research Online: July 2018

LSE has developed LSE Research Online so that users may access research output of the School. Copyright © and Moral Rights for the papers on this site are retained by the individual authors and/or other copyright owners. Users may download and/or print one copy of any article(s) in LSE Research Online to facilitate their private study or for non-commercial research. You may not engage in further distribution of the material or use it for any profit-making activities or any commercial gain. You may freely distribute the URL (http://eprints.lse.ac.uk) of the LSE Research Online website.

This document is the author's submitted version of the book section. There may be differences between this version and the published version. You are advised to consult the publisher's version if you wish to cite from it.

http://eprints.lse.ac.uk

14

INTERMEDIATED SECURITIES FROM THE PERSPECTIVE OF INVESTORS: PROBLEMS, QUICK FIXES AND LONG-TERM SOLUTIONS

Eva Micheler

I. Introduction

The infrastructure underpinning financial markets is important. It affects us individually as pension investors. It is also important from a macro-economic perspective. Financial markets and their infrastructure underpin capitalism – the fundamental idea which our society is built on. In this system investors provide finance to issuers. Financial markets support this by providing an exit route for investors. They supply issuers with open-ended equity finance, termed debt finance or something in between and, at the same time, enable investors to flexibly determine their own time horizon.

The financial markets infrastructure also supplies plumbing. Payment systems transfer money. Custodians 'look after' assets. They keep records of who owns what. They organise securities lending and that opens up an additional source of income for investors. It also enables borrowers of securities to obtain finance.

In addition the infrastructure supports the provision of pensions. With good reasons governments have retreated from providing state pensions and are instead encouraging the private provision of pensions. They, however, continue to fund this by granting workers tax breaks that make it attractive for them to invest their pension savings in financial assets.

All of this is good and worth having. This paper is written firmly on the basis that capitalism and securities markets are beneficial. The criticism is that the current infrastructure does not serve the interests of investors.

Infrastructure related cost is a longstanding problem troubling securities markets. The cost of settlement was lamented in the Lamfalussy report in 2001.[1] This triggered the Giovannini process and informed the work of the Legal Certainty Group.[2] Most recently Benos, Garratt and Gurrola-Perez analyse the economics of distributed ledger technology and also refer to the cost associated with securities settlement. There are estimates that the revenue from settlement, custody and collateral management amounts to 13 % of the total trade value chains (from execution to

[1] Alexandre Lamfalussy, *Final Report of the Committee of Wise Men on the Regulation of European Securities Markets* (Brussels 15 February 2001) <http://ec.europa.eu/internal_market/securities/docs/lamfalussy/wisemen/final-report-wise-men_en.pdf> accessed 26 June 2018.

[2] Legal Certainty Group, *EU Clearing and Settlement Advice* (Brussels 11 August 2006) and Legal Certainty Group, *Solutions to Barriers Related to Post Trading with the EU* (Brussels August 2008) both reports are available from <https://ec.europa.eu/info/publications/advice-legal-certainty-group-2006-2008_en> accessed 26 June 2018.

settlement).[3] That is a high price for the processing of transactions. In addition to the cost associated with the process spanning from execution to settlement there is the cost associated with holding securities. Benos, Garratt and Gurrola-Perez mention the cost of reconciliations and other compliance processes that need to be carried out by in custody chains.[4] These are reflected in the fees that investors pay for the holding of assets. Adding to this visible service charge, custody chains have an effect on assets and their value.[5]

In the remaining parts of this chapter, first the characteristics of this infrastructure are briefly described (part II). Then four recent examples where these characteristics have affected the value of assets are analysed (part III). Part IV explains the perspective of the providers of the current infrastructure. In part V the perspective of investors is analysed. The problems analysed in this paper only arise because investors permit custodians to outsource custody and accept that they bear the risk associated with sub-custodians. At an international level custody chains do not need to be as long as they currently are. It will be shown that there are good reasons to assume that there is a market failure and that behavioural patterns can explain that investors do not appreciate the implications of the current framework and are also not able to put in place a more cost effective contractual framework that better suits their financial interests. There are quick fix alternatives (part VI). Investors with bargaining power can insist on better custody terms or on holding UK securities directly. International investors can also avoid English law. It will be argued in part VII that the availability of distributed ledger/blockchain technology is unlikely to remedy the problems associated with custody chains. The chapter will point towards longer term solutions available to the government (part VIII). It concludes by tentatively observing that we may have reached a point where property rights in securities no longer exist, where client asset rules are no longer sufficient to ensure financial stability and where custody should be treated in the same way the taking of deposits (part IX).

II. Characteristics of the current infrastructure

At a positive level the current infrastructure is characterised by complexity. This has been explained in more detail elsewhere.[6] For the purposes of this chapter a summary of the points made there will be helpful.

The current infrastructure for transferring and holding securities operates on the basis of custody chains. There are frequently several custodians inserted between issuers and investors. Only one of these has an immediate connection with the investor/ultimate account holder. From the perspective of investors custody chains set out in the introduction of this book[7] look like this:

---

[3] Evangelos Benos, Rod Garratt and Pedro Gurrola-Perez, 'The economics of distributed ledger technologies for securities settlement', Bank of England Staff Working Paper No 670 (August 2017) 4 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3023779> accessed 26 June 2018.

[4] ibid, 4.

[5] Eva Micheler, 'Custody Chains and Asset Values' (2015) *Cambridge Law Journal* 505, also available on http://eprints.lse.ac.uk/62609/.

[6] ibid.

[7] See the Introduction to this volume, ch 1.II.

Ultimate account holder

Custody contract

Custodian 3

Custody Contract

Custodian 2

Custody Contract

Custodian 1

Custody contract

CSD

Issuer

The effect of this structure is thatultimate account holders, while enjoying some benefits,[8] are exposed to a number of risks. By having accepted this form of holding the terms offered by the issuer are reduced by the terms that operate between the custodians that form part of the chain. Ultimate account holders do not receive the benefit of the full terms associated with the instrument they have bought.

In chapter six of this volume case law was examined in which a custody chain made it impossible for investors to sue an issuer for reasons of mis-selling.[9] Custody chains can also prevent ultimate account holders from exercising voting rights including rights to object to the company being delisted. For example, in *Eckerle v Wickeder,*[10] the claimants held shares in a UK registered public limited company through a chain of intermediaries. The shares were listed on the German stock exchange. The company delisted from that exchange and resolved to transform itself from a public to a private company. The claimants objected to both the delisting and the transformation on the basis that these reduced the value of their investment. Because their shares were issued by a UK registered company, but only listed on a German exchange, they were unable to rely on UK takeover regulation. Under section 98 of the Companies Act 2006 holders of not less than 5% of the shares of a company may apply to court to either have the shareholder resolution authorising the transformation cancelled or to receive an order making an arrangement for the purchase of the interest of the dissentient members. The claimants held 7.2% of the company's share capital and so thought that they would be entitled to a remedy under section 98. Their claim failed because their names were not entered on the shareholder register. Norris J concluded that they held the 'ultimate economic interest in underlying securities', but that was not sufficient to entitle them to exercise

[8] See Christopher Twemlow's chapter in this volume 'Why are securities held in intermediated form?'

[9] *Secure Capital SA v Credit Suisse* AG [2017] EWCA Civ 1486; [2017] 2 Lloyd's Rep. 599, discussed in Ray Cox's chapter in this volume [add title] and Richard Salter's chapter in this volume, 'Enforcing debt securities'.

[10] *Eckerle v Wickeder* [2013] EWHC 68 (Ch), [2014] Ch 196.

rights under the Companies Act 2006.[11] He was conscious that his reading of the Act deprived indirect investors (that is, those who held securities through the intermediated system) of the sort of protection which those who formulated the Act would have extended to minority shareholders and was not 'particularly comfortable' with the solution he had to arrive at, but felt that the any other conclusion would have amounted to an 'impermissible form of judicial legislation'.[12] The indirect holding system thus deprived the ultimate account holders of a remedy that would be available to an investor holding shares directly.

The rights of ultimate account holders are affected by charges that are contained in contracts between custodians.[13] If a sub-custodian grants a security interest to another sub-custodian over all securities held by him, that interest, if not limited, affects all the securities held by the first sub-custodian. Such a security interest may thus affect securities held for ultimate account holders. This is not a hypothetical problem. In a recent Final Notice the Financial Conduct Authority (FCA) fined Barclays Bank because investor securities had been at risk of being affected by such charges arising out of contracts that Barclays had entered into with sub-custodians. It was held that Barclays had not give proper consideration as to whether to restrict the right of the third-party sub-custodians to exercise rights of 'lien', that is, the right ot create a security interest in the relevant assets.[14]

Ultimate account holders are also affected by securities financing transactions that are organised by sub-custodians.[15] These are contracts whereby the holder of securities transfers them to a third party. The third party undertakes to return securities of the same kind at a later point in time. Examples of such transactions are securities lending or repurchase agreements. They transform a legal or equitable interest into a contractual right.[16] That contractual right is sometimes secured by collateral.[17] Securities financial transactions can be a source of income for an ultimate account holder.[18] Custodians help to arrange such transactions. In a custody chain it is possible that an ultimate account holder has not authorised the use of his assets for financing purposes, but that at the level of a sub-custodian such a use is permitted. Regulatory prohibitions notwithstanding investor securities can become affected by securities financial transactions that occur without the ultimate account holder's consent or knowledge at the level of sub-custodians. Ultimate account

---

[11] ibid, [14g] and [20]-[23].

[12] ibid, [31].

[13] Micheler (n 5) at 519-521.

[14] FCA Final Notice, Barclays Bank PLC (122702) 23 September 2014. This conduct resulted in a breach of Principle 3 and CASS 6.2.2R, which states '*A firm must introduce adequate organisational arrangements to minimise the risk of the loss or diminution of clients' safe custody assets, or the rights in connection with those safe custody assets, as a result of the misuse of the safe custody assets, fraud, poor administration, inadequate record-keeping or negligence*.' In addition, CASS 6.3.3G (which is a matter of guidance) states '*A firm should consider carefully the terms of its agreements with third parties with which it will deposit safe custody assets belonging to a client. The following terms are examples of the issues firms should address in this agreement… (4) the restrictions over the third party's right to claim a lien, right of retention or sale over any safe custody asset standing to the credit of the account'.*

[15] Xx this paragraph to JB/LG.

[16] Joanna Benjamin, *Financial Law* (OUP, 2008) ch 13: Philip Paech, *Shadow Banking: Legal Issues of Collateral Assets and Insolvency Law* (European Parliament IP/A/ECON/NT/2012, 30 June 2013) 33-35.

[17] Hugh Beale, Michael Bridge, Louise Gullifer and Eva Lomnika, *The Law of Security and Title Based Financing* 3rd edn (OUP, 2018) [2.34], [7.65] and [7.73].

[18] Xx this paragraph to JB/LG.

holders can become exposed to risks of which they are not aware without being able to evaluate if the income generated by the third party arrangement is reflected in their own terms.[19]

The interests of ultimate account holders are diluted by shortfalls that may occur at the level of sub-custodians. Under English law ultimate account holderswho hold securities through custodians have an equitable interest in the securities held by their custodian. That interest is, however, only of value if the custodian holds sufficient assets in a way that earmarks them for the benefit of the ultimate account holder. In a custody chain an ultimate account holder only has a full entititlement if all custodians in the chain hold a sufficient amount of earmarked securities. A shortfall at any level will reduce the proprietary rights of the ultimate account holders.[20]

The accountability for negligent services is underminded by a custody chain. If securities disappear as a result of the negligence or fraud of a custodian who has a direct contractual relationship with the ultimate account holder that custodian will be liable to the ultimate account holder. By agreeing to the outsourcing of custody the ultimate account holder bears the risk of the sub-custodian's negligence or fraud, but does not necessarily receive a contractual right to claim against them. The ultimate account holders' immediate custodian is very likely to have limited his liability to providing adequate oversight over the next sub-custodian.[21] Examples of terms limiting liability for sub-custody can be found in the standard terms of Euroclear and Clearstream Banking Luxembourg (CBL). Euroclear is 'not liable for the acts or omissions of…any…subcustodian'.[22] CBL also excludes liability for the 'acts or omissions of…any of CBL's…Sub-custodians'.[23]

The risk emanating from the intermediated holding structure falls on ultimate account holders who are deemed to have accepted this risk. They give permission to their custodians to delegate custody.[24] They also allow their custodians to instruct sub-custodians 'upon such terms as may be customary' and to 'from time to time, determine the terms and conditions of arrangement' with sub-custodian. [25]

III. Implications of current outsourcing arrangements for asset values

The effect of ultimate account holders giving extensive permission for outsourcing to their custodians is a reduction of the rights of these ultimate account holders. Their rights are reduced in

[19] Micheler (n 5) at 521-523.
[20] ibid, 523-525.
[21] ibid, 525-528. The CASS rules on shortfalls specify that a firm does not need to make good a shortfall when it concludes that another person is responsible (FCA Handbook, CASS 6.6.54(3) R). The firm must take all reasonable steps to resolve the situation without undue delay with the other person. It must also consider whether it would be appropriate to notify the affected clients (CASS 6.6.54(3)).
[22] Euroclear Terms and Conditions governing the use of Euroclear (https://my.euroclear.com/dam/EB/Legal%20information/Terms%20and%20conditions/public/LG310-terms-and-conditions-governing-use-of-euroclear.pdf), Art 12(e); see also Art 17(e): For securities that are mutilated, lost, stolen or destroyed Euroclear has no obligation to but can "elect" to obtain reissuance. If instructed by a participant they will obtain reissuance, but only "to the extent practicable"; see also Clearstream Banking Luxembourg, General Terms and Conditions, Art 48 <http://www.clearstream.com/blob/11088/aa624aadbd37147f75e57591378cf9f6/migrated-8ffbcl196nsgden-terms-and-conditions-cbl-en-pdf-data.pdf> accessed 27 June 2018. It is understood that the terms of custodians who hold for ultimate account holders include similar terms.
[23] Clearstream Banking Luxembourg, General Terms and Conditions, ibid, Art 48, sentence 5.
[24] Micheler (n 5) at 509-511.
[25] ibid, 509-511.

a way that has an effect on the value of assets. They are saddled with custody risk which accumulates as the chain grows longer. Both points have been set out fully elsewhere.[26] In this part two examples where custody chains have affected the value of securities portfolios are examined. In addition,two UK-based cases are discussed in which the regulator intervened to prevent a possible loss of client securities.

When Bear Stearns was restructured in 2008 an excess of 28% of shares compared to the shares issued by the company was discovered. In the discussion paper justifying the Regulation of Central Securities Depositories the European Commission wrote: 'Fortunately, Bear Stearns was rescued through a takeover by JP Morgan which bailed out the excess of securities.'[27] In reality this meant, of course, that the price JP Morgan was prepared to pay was distributed between all indirect investors, diluting each of their holdings.

Along similar lines shares issued by Dole Foods were affected by the intermediated holding infrastructure. Following a class action shareholders came forward claiming in relation 49,164,415 shares. The company had issued only 36,793,758 shares.[28] The excess of shares compared to shares issued in this instance was therefore 33.6%.

In both of these cases we can observe that the excess arose on a self-reported basis. This amplifies the importance of the result. The issuers made a public announcement and invited investors to come forward and identify themselves. Assuming that not all investors can be reached by/will respond to such an announcement, one would expect the result to be that not all issued shares are claimed by investors. Instead a shortfall of securities revealed itself.

Shortfalls are not a phenomenon limited to the US market. The FCA fined Bank of NY Mellon and Barclays Bank in 2015 because they did not keep accounts for client assets on an entity basis. This meant that they did not ensure that each member of the group had sufficient assets to correspond to the promise they made to their respective clients. They also used assets of clients without their consent to settle trades of other clients.[29] The FCA noted that the irregularities happened throughout a period of significant market stress when the regulator would have expected regulated firms to have heightened regard to the requirements of client asset protection.[30] Furthermore, Barclays Bank was fined in 2014 because it had not adequately restricted the rights of third party sub-custodians which exposed client assets to the risk of being subject to an interest arising for the benefit of sub-custodians without the clients' agreement.[31] These could have resulted in shortfalls.

[26] ibid, 515-519.

[27] Commission Staff Working Document Impact Assessment accompanying the document 'Proposal for a Regulation of the European Parliament and of the Council on improving securities settlement in the European Union and on Central Securities Depositories (CSDs) and amending Directive 98/26/EC /* SWD/2012/0022' – COD 2012/0029 para 8.9.Annex 9

[28] *In Re Dole Food Company, Inc Stockholder Litigation Consolidated* CA No 8703-VCL Memorandum Opinion of the Court of Chancery of the State of Delaware February 15, 2017 available from http://courts.delaware.gov/Opinions/Download.aspx?id=252690.

[29] FCA Final Notice, The Bank of New York Mellon London Branch (122467) The Bank of New York Mellon International Limited (183100) 15 April 2015, [2.3], [4.8] - [4.10] and [4.17] – [4.20].

[30] ibid, [2.10(5)], [6.11(6)] and [6.30(1)].

[31] FCA Final Notice, Barclays Bank PLC (122702) 23 September 2014, [4.11].

IV. Explaining the infrastructure from the perspective of custodians

To understand why this complex structure has emerged it is useful to remember that complexity suits custodians. Custody chains enable each of the custodians to operate a relatively simple regime. This reduces costs for each custodian.[32] But these savings do not add up to the benefit of investors.[33] On the contrary, the savings of the custodians are passed on to investors as a cost.

We have seen that custody chains reduce the liability exposure of custodians. Custodians holding securities in house are liable for the full range of custody services provided by their staff. Custodians who outsource custody contract limit their liability. They only accept the risk of having adequately identified and monitored their respective sub-custodian. They are unlikely to accept responsibility for custodians operating elsewhere in the chain. For the individual custodians this is attractive and a benefit associated with the existing infrastructure. Investors experience the reduction of liability as an increase in risk. It has been mentioned elsewhere in this book that custody chains make it possible for investors to hold securities from different jurisdictions through one account.[34] This is, for course, an operational benefit, but the convenience comes at a price and investors need to determine if, on balance, that benefit outweighs the potential reduction in value.

Complexity also hinders competition. This infrastructure is held together by a web of bilateral contracts that custodians have set up between them. Neil Flingstein has put forward a theory that explains markets from a political-cultural perspective.[35] He writes that the social structures of markets are best viewed as an attempt to mitigate the effects of competition between firms. The main goal of firms is to ensure their own long-term survival. To this end they strive to be internally efficient. They also act politically by creating relationships and networks with other firms and customers. Market participants such as custodians operate with a view to reducing their exposure to competition with other firms.

It is easy to understand why custodians would benefit from operating in a complex environment that makes it difficult for customers to view and therefore compare the services that are provided and the income that is generated by the participating firms.

V. The perspective of investors

Why do investors (that is, those who are ultimate account holders) accept this? Intermediation and outsourcing are common in many industries. In the construction industry, main contractors operate on the basis of sub-contractors to whom they outsource elements of the project. In the manufacturing sector, products are assembled with parts that are sometimes sourced through long and complicated supply chains. In both examples, however, the main contractor/vendor of the final product assumes full liability for the contributions made by the members of the chain.

In custody chains this is different. The terms referred to above have an unusual effect when compared to other industries. Ultimate account holders not only provide custodians with permission to use sub-custodians. They also agree to be affected by risk that operates at the sub-custody level.

[32] See Christopher Twemlow's chapter in this volume, 'Why are securities held in intermediated form?' at ch 4.III.C

[33] For more detail on this see Micheler (n 5) at 508 and 531-532.

[34]See Christopher Twemlow's chapter in this volume, 'Why are securities held in intermediated form?' at Ch 4.III.A. .

[35] Neil Flingstein, 'Markets as Politics – A Political-Cultural Approach to Market Institutions, (1996) 61(4) *Amercian Sociological Review* 656, 657.

This is unusual. The vendor of a product would not normally have a contractual right to reject liability because a defect was caused by a part supplied by a sub-contractor.

Also alternatives exist. UK domestic securities can be held directly with the CSD. For international securities economies of scale may explain why some intermediation exists. In the *Eckerle* case, for example, the custody chain, again as viewed from the perspective of the ultimate account holder , concerned consisted of

Mr Eckerle

Postbank

Clearstream Banking Luxembourg

Bank of NY Mellon

Crest (Euroclear)

Mr Eckerle held his shares through Postbank. It may not be economical for Postbank to have a direct link with Crest. Economies of scale may therefore explain why Postbank uses Clearstream. What scale does not explain, however, is the presence of BNY Mellon. Does Clearstream Banking Luxembourg really not have enough UK connected business to pay for a direct link with Crest?

In the *Secure Capital* case the chain consisted of

Secure Capital

RBS Global Banking (Luxembourg) SA

Clearstream Banking Luxembourg

Bank of New York Mellon

The bond was a bespoke re-insurance product. Secure Capital held all units. Access to a trading facility was presumably not important. The amount of money invested was substantial. It would have been possible for Secure Capital to be issued with one paper certificate which they could have kept with one custodian.

A. Market for lemons

Neoclassical economics assumes rational actors. Resources are allocated through price.[36] In this world asset prices reflect all risk associated with an asset. They reflect issuer risk and also custody risk.

We all know that actors are not rational,[37] but the neoclassical perspective can nevertheless provide us with an explanation for the current infrastructure. This infrastructure is not only complex, it is

[36] Thorsten Veblen, 'Preconceptions of Economic Science' (1900) 14 (2) *Quarterly Journal of Economics* 240.

[37] See, for example, Gerd Gigerenzer and Reinhard Selten (eds), *Bounded Rationality: The Adaptive Tool Box* (Cambridge Massachuests 2001) or Daniel Kahneman, *Thinking Fast and Slow* (New York 2011).

also opaque. Ultimate account holder may know that there are sub-custodians, but they do not know who these sub-custodians are. The do not know how many there are. They do not know the terms that they are affected by. They cannot evaluate the infrastructure risk that affects their investment.[38]

Under such circumstances a market for lemons emerges.[39] This is a type of market failure. Because they are unable to evaluate the infrastructure risk for individual assets rational investors assume a 'worst case' risk discount. In this framework investors are aware of infrastructure risk, care about it and protect themselves. The mechanism through which they look after their interests is price.

From the perspective of this framework there is no need to worry about investors. There is nevertheless a problem. Infrastructure risk reduces the price that rational investors pay for assets. That has a knock-on effect on issuers for whom the cost of borrowing increases accordingly. Resources are allocated inefficiently. Issuers pay too much for plumbing. They subsidise an inefficient infrastructure.

The classical remedy is transparency/disclosure.[40] To be able to adequately price infrastructure risk rational investors need to know who the sub-custodians are and on what terms securities are held in sub-custody. Once transparency is established resources are allocated efficiently and issuers no longer have to swallow the cost associated with the infrastructure. It will be suggested below that a longer term solution to the problems analysed in this chapter would be to increase disclosure requirements.

B. Imbalances of bargaining power

Even in an economy with rational actors market friction can occur. One example of market friction is an imbalance in bargaining power. Such an imbalance can be found here.

According to a survey published by the Department for Business Innovation and Skills in relation to the Intermediated Shareholding Model in January 2016, there are 6 types of investors in equity securities (two individual and four institutional[41]): individual equity investors; individual equity investors with an association to an interest group such as ShareSoc or the UK Shareholders

[38] Micheler, (n 5) at 509-511 and Eva Micheler and Luke von der Heyde, 'Holding, clearing and settling securities through blockchain/distributed ledger technology: creating an efficient system by empowering investors' (2016) 11 *Journal of International Banking and Financial Law* 652 at 656 <http://eprints.lse.ac.uk/68792/1/Micheler_Holding%2C_clearing_and.pdf>, accessed 27 June 2018.

[39] The market for lemons argument was first made by George A Ackerlof, 'The Market for Lemons: Quality Uncertainty and Market Mechanism' (1970) 84 (3) *Quarterly Journal of Economics* 488. In 2001 the author, together with Joseph Stiglitz and Michael Spence jointly received the Nobel Memorial Prize in Economics Sciences for their research on issues related to asymmetric information.

[40] Jennifer Payne and Louise Gullifer, *Corporate Finance Law: Principles and Policy* 2nd edn (Hart Publishing 2015) 489-495 and 524-528; Luca Enriques and Sergio Gilotta, 'Disclosure and Financial Market Regulation' in Niamh Moloney, Eilis Ferran and Jennifer Payne, *The Oxford Handbook of Financial Regulation* (OUP, 2015) 512; John Armour, Dan Awrey, Paul Davies, Luca Enriques, Jeffrey N Gordon, Colin Mayer and Jennifer Payne, *Principles of Financial Regulation* (OUP, 2016) 160.

[41] Department for Business Innovation and Skills, Exploring the Intermediated Shareholding Model, BIS Research Paper 261, available from https://www.gov.uk/government/publications/shareholding-the-role-of-intermediaries, for individual investors see pages 27- 37; institutional investors are listed on page 86.

Association (UKSA); pension funds; insurance companies; open-ended and closed funds offered to both retail and institutional investors; and charities, sovereign wealth funds and foundations.

The bargaining power of individual equity investors is limited. For institutional investors it is worth pointing out that these are not necessarily ultimate investors. For funds, including pension funds, the ultimate investors are pensioners and savers. These delegate the administration of their assets to trustees or asset managers.[42] They authorise these service providers to appoint custodian and accept custody terms at which point they connect to custody chains and accept the inherent erosion of their rights. The bargaining power of these investors (who are, in the terminology of this book, ultimate account holders) is limited in the same way as the power of individual equity investors.

To restore the efficient allocation of resources, the law can help to overcome imbalances in bargaining power. Rules that require custodians to ask for the signature of retail investors in order to be able to engage in lending arrangements are an example of such an intervention. The Client Asset Rules drawn up by the FCA (CASS) state that a firm must not enter into arrangements for securities financing transactions in respect of safe custody assets unless the client has given express prior consent.[43] This also applies to assets held in omnibus accounts.[44] For the purpose of obtaining consent from a retail client their signature or an equivalent alternative mechanism is required.[45] It has been pointed out elsewhere that even where an ultimate account holder (including an individual investor) has not explicitly approved such transactions, the opacity of the chain and the terms used to authorise delegation make it nevertheless possible for sub-custodians to use retail securities for lending.[46] The regulatory prohibition does not invalidate the securities financing transactions entered into by custodians and their sub-custodians. The delegation terms referred to above facilitate the erosion of legal requirements such as the requirement for a signature.[47] The ultimate account holder 's main custodian, having authority to delegate and on the terms they think fit, only needs to adequately oversee the one custodian they appoint as a sub-custodian. There is no requirement for the ultimate account holder's custodian to oversee that any arrangements that operate below[48] their immediate sub-custodian are in compliance with legal requirements.[49]

C. Agency problems

Retail investors who buy funds not only have limited bargaining power, they are also exposed to an agency problem. Their connection to the custody chain is established and managed by asset managers who, in the case of pension funds, will have been appointed by trustees. It has been

[42] Xreference to Paul’s chapter.

[43] FCA Handbook, CASS 6.4.1(1) R.
[44] ibid, CASS 6.4.1(2) R.
[45] ibid, CASS 6.4.1(3) R and CASS 6.4.1A G – 6.4.2 G.
[46] Micheler (n 5) at 521-523; FCA Final Notice, The Bank of New York Mellon London Branch (122467) The Bank of New York Mellon International Limited (183100) 14 April 2015.
[47] See Xreference above [].

[48] In this chapter, the chain is depicted the other way up from the other chapters in this book. To relate this point to figure 2 in the introduction, ST1 is under a duty to oversee the arrangements between it and FT1, but not to oversee the arrangements between FT1 and the CSD.
[49] See for example Article 3 of the Commission Delegated Directive (EU) 2017/593 OJ 2017 L 87/500.

pointed out that this structure incorporates multiple agency conflicts.[50] These affect investors as well as issuing companies. Pension trustees and asset managers are positioned to analyse and predict the effect of terms of custody contracts but they also act as agents. In addition back office is often only an afterthought. It is possible that both pension trustess and asset managers acting for investors focus their attention on the terms that set out investment decisions and that custody contracts do not receive a sufficient amount of scrutiny.[51]

D. Tax

It is also worth remembering that investment strategies of both individual equity investors and fund based pension investors are also informed by taxation. The government subsidises pension investments through tax breaks. When all qualifying investments instantly produce a return of 20% or more in tax savings, investors would be forgiven for placing less of a focus on investment return and fees. This would have to be tested empirically, but it is possible that government subsidies have the unintended effect of discouraging some investors to oversee the financial market infrastructure.

E. Behavioural explanations

It would be wrong to end the analysis here. Actors are not rational and there are several behavioural factors that may help to explain why the current infrastructure has emerged. In a world of bounded rationality investors are affected by certain biases. Some of these may operate here.

Careful consideration and evaluation of custody terms takes time. Human actors are time poor and tend to prioritise short term problems and suffer from a bias of underestimating the likelihood of long term risks factors materialising.[52] This also applies to those investors who, in principle, are able to appreciate the effect that contractual terms have on their investment.

Perhaps retail investors accept the currently prevailing outsourcing arrangements because they habitually do not invest the time required to evaluate the risk associated with current market infrastructure? The BIS study provides some empirical evidence pointing towards the conclusion that the investment chain and its effect is poorly understood.[53]

There are also limitations on the cognitive ability of human actors to anticipate problems. It is impossible to anticipate all future events that a contract will have to absorb.[54] In addition the human mind has limited analytical power. Investors or their lawyers are unable to fully appreciate all

---

[50] Alicia Davis Evans, 'A requiem for the retail investor?' (2009) 95 *Virginia Law Review* 1105; Kathryn Judge, 'Intermediary Influence' (2015) *The University of Chicago Law Review* 573; Ronald J Gilson and Jeffrey N Gordon, 'The agency cost of agency capitalism: Activist Investors and the Revaluation of Governance Rights' (2013) 113 *Columbia Law Review* 863.

[51] [Xref to Paul].

[52] Amos Tversky and Daniel Kahneman, 'Judgement under uncertainty: Heuristics and biases' (1974) 185 (4157) *Science* 1124–1131.

[53] Department for Business Innovation and Skills, Exploring the Intermediated Shareholding Model, BIS Research Paper 261, 45-51 <https://www.gov.uk/government/publications/shareholding-the-role-of-intermediaries> accessed 27 June 2018.

[54] Sanford J Grossman and Oliver D Hart 'The costs and benefits of ownership: A theory of vertical and lateral integration' (1986) 94 *Journal of Political Economy* 691; Oliver D Hart and John Moore, 'Property Rights and the Nature of the Firm' (1990) 98 *Journal of Political Economy* 1119.

problems that will arise when terms that allow for a sub-custody arrangements are applied in those future events that are foreseeable. Legal analysis, like all human analysis, is limited by past experience. We suffer from a bias that assumes that the future will be like the past.[55] It is possible that lawyers that advised investors on custody terms before *Eckerle* and *Secure Capital* may not have placed sufficient weight on the question of enforcement. This may help to explain why even investors who are rich in time and resources would not have been aware of the effects highlighted by these two cases.

F. Market failure

A lot more can be and needs to be said about the causes of the current infrastructure.[56] On the basis of this chapter the preliminary conclusion is that it is possible that the infrastructure is the product of a market failure. Behavioural considerations may explain that investors are unaware of the nature and scale of custody risk. We can also conclude that, even if they were aware, direct and indirect retail investors do not necessarily have the bargaining power to protect themselves through contract law.

VI. Quick fixes – holding directly and avoiding English law.

Investors with bargaining power such as high net worth individuals, sovereign wealth funds or wellendowed foundations are in a position to re-think their custody arrangements. In *Eckerle* the investors could and should have held the securities directly. In *Secure Capital* there was no need for a custody chain either. Secure Capital could have requested the issue of a certificate evidencing its holding.

More generally from the perspective of those advising investors, and from the perspective of trustees holding assets for beneficiaries, the effects of custody chains on the rights of investors need to be taken into consideration when arrangements are made for the holding of securities. Those looking after portfolios of substantial value have significant bargaining power. They can use this bargain power to insist on holding securities directly. If they reach the conclusion that indirect holdings give them operational benefits they can and should nevertheless limit the ability of their custodian to out-source custody. They should ensure that they know who the sub-custodians are that operate in the chain and on what terms the securities are held by them. This would enable them to evaluate if they receive adequate return for any lending arrangements that occur. They should also ensure that they have rights to claim for negligence or fraud against sub-custodians and are able to claim against issuers directly. International investors with bargaining power can opt out of English law.

---

[55] Tversky et al (n 49) at 1127-1128.

[56] The custody industry is also highly concentrated and interconnected. On this, see for example: Nikolaus Hautsch, Julia Schaumburg and Melanie Schiele, 'Financial Network Systemic Risk Contributions' (2015) 19(2) *Review of Finance* 685.

VII. The role of technology

It has been suggested elsewhere that technology may help to overcome the problems currently troubling the infrastructure for securities markets.[57] The author of this chapter continues to believe that computer scientists are able to develop and deliver solutions that connect investors better with issuers while at the same time ensuring that investors are unaffected by the terms prevailing in sub-custody arrangements.[58] One example would be to colour or electronically earmark securities so as to associate them with individual investors or to identify them as securities that must not be subject to lending or charges by sub-custodians. It would seem that this can be done with standard database technology.

To predict the impact of new digital technology it is worth looking back at the effect that technological changes have had in the past. A recent example is computerisation in the UK. In many areas of our lives computers have provided us with better direct connections. A little more than ten years ago the author of this paper used a highly intermediated postal network (not to mention the intermediated structure that operated to develop the film and print the pictures) to send photographs of her children to family members abroad. Now she posts on social media and grandma can and does immediately send her likes and offer comments.

Yet for securities the arrival of direct and electronic links has coincided with intermediation. Easy direct connections have created a web of intermediaries. By providing better links intermediation has become easier and the providers of the infrastructure for financial markets have used the technology to organise the services that they provide. This is not a result that those setting up the computerised settlement system would necessarily have predicted.

With distributed ledger or blockchain technology a new method for maintaining securities registers has become available. The technology has been said to make it possible for trading, clearing and settlement to merge into one real time process that does not involve relationships with multiple intermediaries. There is no need for separate trading, clearing and settlement venues. There is no exposure to the risk of any one central provider failing. Buyer and seller can interact directly with each other. They can exchange securities and cash directly and in real time. The cost of securities settlement could be reduced as a result.[59]

In terms of user interface not much needs to change. Investors would access their portfolio as they do now, electronically or through paper statements. But while at present they receive an interest in an asset kept by an intermediary who is connected to another intermediary who is connected to yet another intermediary, what they could see in a distributed ledger/blockchain environment would be the master record. The same could become true on the money side. At present investors view a balance of an account held by a bank. In the future their view could be of a master record of money held at the central bank. The Bank of England has concluded that it will not use distributed ledger

[57] Micheler (n 5).

[58] Philipp Paech has explored the regulatory reasons that will make it difficult for financial markets to adopt blockchain/distributed ledger technology (Philipp Paech, 'Blockchain Financial Networks' (2017) 80 (6) *Modern Law Review* 1073).

[59] Benos et al (n 3) at 4; see also Sarah Green and Ferdisha Snagg's chapter in this volume, 'Intermediated Securities and Distributed Ledger Technology'. .

technology for its payment system. It is, however, ensuring that its new upgraded payment system is compatible with the requirements of distributed ledger technology.[60]

It has been suggested elsewhere that the providers of the incumbent market infrastructure will struggle to fund such a development.[61] They are limited by the boundaries of their current business model.[62]

Moreover it is worth observing that a blockchained distributed ledger can also be operated on an intermediated basis. Bitcoin are an example.[63] The main Bitcoin blockchain has yet to be hacked. Nevertheless the bitcoins have been lost and stolen. The vulnerable point are the private keys. These are necessary for users to send bitcoins to other users. Like passwords these need to be kept safe and can become the subject of a hack.

In addition not all bitcoin holders download the main bitcoin blockchain to their computer. For users that are not interested in becoming nodes, wallet providers have emerged. These providers connect individuals to the main software. There are two options: hosted and non-hosted wallets. The holder of a non-hosted wallet stores her private key: on a computer that is connected to the internet (hot storage and perhaps not the safest option); on a computer that is not connected to the internet (safer but a backup is recommended); or perhaps even on a piece of paper that she keeps in a vault or under her mattress (cold storage and the safest option?). A hosted wallet is an intermediated option where the client does not have access to their private key. At a functional level hosted wallets operate in a way that is similar to intermediated securities. A wallet provider promises to hold private keys for users. It is then, of course, possible for wallet providers to make too many promises to customers and not to have enough private keys. This is what happened in the insolvency of Mt Gox where wallet holders discovered a shortfall of bitcoin (or better private keys).[64] The author knows of no evidence of wallet chains in the bitcoin environment.

Against this background it is possible to predict that a blockchained distributed ledger environment will not necessarily lead to less intermediation.[65]

VIII. Pointers towards long-term solutions

A situation where investors are exposed to infrastructure risk that they are unaware of is unappealing. The current arrangements prevent the ultimate bearers of the risk inherent in the infrastructure from effectively overseeing this infrastructure. This creates moral hazard for the service providers. It has led to a situation where service levels are so poor that shortfalls of 30% come to light in the restructuring of blue chip companies listed in the United States.

---

[60] For more information see <https://www.bankofengland.co.uk/research/fintech/proof-of-concept> accessed 14 June 2018.

[61] Micheler et al (n 38).

[62] Benos et al (n 3) at 4.

[63] For are more detailed analysis of this see Eva Micheler and Luke von der Heyde, 'Holding, clearing and settling securities through blockchain/distributed ledger technology: creating an efficient system by empowering investors' (2016) 11 *Journal of International Banking and Financial Law* 652.

[64] Mt Gone: Bitcoin's woes, *The Economist* (London) 25 February 2015.

[65] Chris's paper: what he will say is that ultimate account holders want the functionality which is given by intermediaries (as with bitcoin wallet holders) and so even if the securities are held on a blockchain, there will be a (short) chain of intermediation below that level, as there is with CREST. [Xreference].

The complexity of the infrastructure also prevents competition. Governments need to consider if and how to intervene. This is particularly true in circumstances where the government subsidises investments in financial markets.

The solution to the problems analysed in this paper is remarkably simple. To avoid the diluting effect of custody chains investors can reject certain delegation clauses and opt to hold assets directly. This can be done for the domestic UK equity market without a change of the current framework.[66] Custodians sometimes point out that direct holdings are more costly. This argument had significant force when securities were held through negotiable paper certificates. Individual holdings required a manual sorting process. It has less force in an electronic environment. Is it possible that a chain of accounts maintained by several service providers, who all have a cost base and all need to comply with regulation and pay their shareholders, can be provided at a lower cost than one electronic account maintained by one provider?

The government can intervene through legislation. There are a number of options available which will be set out below.

A. Section 28 of the Companies Act 2006

The problem that arose in *Eckerle* can be resolved by amending section 98 of the Companies Act 2006. At present a shareholder cannot claim under that section if he voted in favour of the resolution authorising a transformation of a public company into a private company. This means that the section is unavailably in cases of indirect holdings. In *Eckerle* Bank of New York Mellon was the shareholder whose name was registered with the company. It voted for indirect investors who were in favour of the transformation as well as for those who opposed it. Even if they had wanted to they would have been unable to claim on behalf of Mr Eckerle under that section. The Jenkins Committee pointed out this problem and recommended reform which has, however, not yet been implemented.[67] It would be possible to remedy this particular problem by allowing registered shareholders who hold shares on behalf of indirect investors and voted in favour of as well as against the resolution to claim under section 98 of the Companies Act 2006.

B. Disclosure of custody arrangements

Disclosure of the identity of the sub-custodians and on what terms they operate will help investors who are rich in time and resources and who have the bargaining power to operate a strategy that is rational if only in a bounded way. It will put the ball in the court of pension trustees and asset managers who, in light of the decisions in *Eckerle* and in *Secure Capital*, are well advised to take a closer look at the custody contracts they accept on behalf of investors. In particular they need to decide if the benefits of operational convenience delivers sufficient cost savings from the perspective of the beneficiaries they look after to outweigh the risks posed by custody chains on asset values.

[66] Euroclear UK and Ireland, Personal Membership Brochure <https://www.euroclear.com/dam/Brochures/Personal-membership-EUI.pdf>, accessed 27 June 2018. [Xreference] The problem, however, is that the ultimate account holder may want to deal with all its (international) portfolio in one place. Xx CT, GM and others.

[67] *Eckerle v Wickeder* [2013] EWHC 68 (Ch), [2014] Ch 196 [32].

C. Regulating outsourcing

Disclosure does not assist investors who are time and resource poor, nor those with limited bargaining power. Rules that limit the contractual freedom of custodians help from their perspective.

At present the law does not limit the ability of custodians to seek authority for out-sourcing.[68] CASS 6.2.3(2)d R explicitly permits the outsourcing of custody. The CASS rules instruct custodians not to use certain terms in sub-custody arrangements. They also stipulate a list of topics that should be covered in the contract with a third party without prescribing the content of the arrangement.[69] But this does not prohibit custodians from agreeing with their customers that they determine the content of sub-custody terms. There also exists a general clause expressing the level of skill and care that is to be applied by a custodian when contracting with a sub-custodian. A custodian must exercise 'all due skill, care and diligence in the selection…and periodic review…of the arrangements for the holding and safekeeping' of client assets'.[70] This also does not prohibit custodians from receiving from their clients permission for setting such terms and it does not prevent investors from being affected by those terms.

This has created a situation where any provision that is contained in the investor's custody contract, - including those that are required by law to have a signature - can be eroded by delegation. The regulator can limit the ability of custodians to outsource custody by specifying a service level that custodians need to deliver. One such example would be a requirement to ensure that outsourcing occurs on terms that enable investors to exercise any rights they have against their immediate custodian also against any sub-custodian. Another example would be a requirement to ensure that investors can exercise rights against issuers.

D. Mandatory liability rules

It would be possible to tighten the liability regime for custodians who act either for retail investors directly or for funds that serve the retail sector. The suppliers of goods who also benefit from outsourcing bear the full risk of problems arising in their supply chain. Custodians should do the same. They should be responsible for the full risk arising from any of their sub-custodians.

Custodians sometimes mention that they are unable to carry this risk. Their point is that the market works in a certain way and so their hands are tied. This appears to be an argument designed to protect the benefits the current model has for custodians. Custodians outsource through contract law. The market is fairly concentrated.[71] The participants are large financial institutions with bargaining power. They do and can control who to outsource to. They are also able to negotiate terms on which such outsourcing occurs. It is within their gift to ensure that the infrastructure provides a reliable connection between investors and issuers. At present their incentives steer them towards creating an opaque and complex infrastructure and passing the risk of that on to investors.

[68] Micheler (n 5) at 512-513.

[69] FCA Handbook, CASS 6.3.4B G and the recently introduced requirement for written documentation CASS 6.3.4.A R.

[70] ibid, CASS 6.3.1 R and CASS 6.3.2G.

[71] Nikolaus Hautsch, Julia Schaumburg and Melanie Schiele, 'Financial Network Systemic Risk Contributions' (2015) 19(2) *Review of Finance* 685.

These incentives should be reversed. The law should put them in a position where they benefit from enabling investors to exercise their rights against issuers.

The strategy of shifting the risk of outsourcing to custodians has been applied in relation to Alternative Investment Funds. The AIFM Regulations 2013 provide that a depositary shall be liable for the loss by the depositary or a 'third party' to whom the custody of financial instruments has been delegated.[72] If the instruments have been lost, the depositary shall return a financial instrument of identical type or corresponding amount to the Alternative Investment Fund without undue delay. The liability is independent of the depositary's negligence. It can only be avoided if the depositary can prove that the loss has arisen as a result of an external event beyond its reasonable control, the consequences of which would have been unavoidable despite all reasonable efforts to the contrary.

The liability of the depositary, however, only arises when the financial instruments are lost and the term 'loss' is defined narrowly.[73] For the liability to arise the loss has to be 'certain' or 'definite'. In the event of the insolvency of a custodian, for example, the loss will have occurred at the latest at the end of the insolvency proceedings.[74] Time is an important factor in this area of the law. Insolvency proceedings for financial services providers can span many years during which there may not be certainty as to whether securities have been lost to investors.[75]

Moreover, the remedy provides for securities of the same type to be returned. It is possible that, by the time certain conclusions can be drawn as to whether they have been lost, they no longer have value to the Alternative Investment Fund. These rules should be tightened. Custodians should be liable for the full risk arising out of their respective supply chains.

E. Syncronising reconciliations

Custodians need to carry out internal reconciliations of the safe custody assets held for each client with the safe custody assets held by the custodian and its sub-custodian.[76] Reconciliations are designed to reduce mistakes and protect client assets in the insolvency of a firm. A custodian must also conduct external reconciliations between its internal accounts and those of any third party by whom those safe custody assets are held.[77] CASS auditors test reconciliations and obtain external confirmations.[78]

Each custodian needs to reconcile its records with his immediate sub-custodian's records. All custodians need to reconcile, but this does not fully protect investors. Custodians other than the investor's immediate service providers only have information about their two immediate contractual partners. They cannot verify if there are sufficient securities to satisfy the interest of the investor.

---

72 Alternative Investment Fund Managers Regulations 2013 SI 1773/2013 (AIFM Regulations) paras 29-31, implementing the Alternative Investment Fund Managers Directive (EU) No 61/2011 (OJ 2011 L 174 p 1) Art 21(12).

73 AIFM Regulations, para 30, referring to Commission Delegated Regulation (EU) No 231/2013 of 19 December 2012, supplementing Directive 2011/61/EU of the European Parliament and of the Council with regard to exemptions, general operating conditions, depositaries, leverage, transparency and supervision, Art 100.

74 Commission Delegated Regulation, ibid, Art 100(4).

75 Micheler (n 5) at 528-530.

76 FCA Handbook, CASS 6.6.13 R – 6.6.14 R.

77 Ibid, CASS 6.6.33R – 6.6.46R.

78 FCA Handbook, SUP 3.10; CASS 6.6.58 G.

Moreover, reconciliations are carried out at each level at a different time. No one checks if, at a given point in time, the numbers add up at all levels starting from the investor and following through the records of all custodians operating between him and the issuer. This can mask irregularities which can remain unnoticed for a significant period of time. In the final notice served on Barclays Bank PLC, the FCA dealt with a situation where a regulated firm had not noticed irregularities in third party arrangements that persisted for over three years.[79] In the case of Bank of New York Mellon, inadequate record keeping and reconciliations remained unnoticed for a period of five years and nine months.[80] In both cases investors who used the two custodians, as well as those investors who used a different custodian but where Barclays or BNYM acted as sub-custodians at some other level in the chain, would have been affected by the shortfalls.

Regulators could intervene to require reconciliations to span the chain, requiring custodians and their auditors to verify the availability of securities along the chain rather than on a bilateral basis. They could also require computer systems in custody chains to operate on the basis of an earmarking facility. Earmarking of client assets along the custody chain should certainly be part of any new technological solution.

F. Addressing regulatory capture

One important point needs to be made from the perspective of policy making. Policy makers tend to consult with market participants through an open tender process. They invite all to contribute. This works well for the custody industry. They are well funded and organised. They can research and articulate their points with a high degree of sophistication. This makes it possible for service providers to be over-represented in policy making processes. The phenomenon of intermediary influence has been observed across a number of areas of the financial services industry.[81] One example is worth mentioning here. The Legal Certainty Group, which assisted the European Commission in developing legislation for intermediated securities, had a significant number of representatives from custodians and law firms advising the custody industry. They also had independent experts including academics. It did not have any member, however, that was associated with a shareholder association or an association of pension fund trustees.[82] It would seem that regulators need to adopt a more proactive approach to consultation and reach out beyond the custody industry, the legal profession and academia to facilitate contributions from individuals who are closer to the retail perspective.

G. Custody accounts as bank deposits

It may be worth rethinking this area at a more fundamental level. Perhaps we need to give up on the idea that custody chains supply property rights? Maybe computerisation has made delegation so easy and the ability of custodians to generate income by organising the lending of securities has

---

[79] FCA Final Notice, Barclays Bank PLC (122702) 23 September 2014 para 2.7.

[80] FCA Final Notice, The Bank of New York Mellon London Branch (122467) The Bank of New York Mellon International Limited (183100) 14 April 2015 para 2.10 (4).

[81] Kathryn Judge, 'Intermediary Influence' (2015) *The University of Chicago Law Review* 573.

[82] Register of Commission Expert Groups available from <http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetail&groupID=1444> accessed 27 June 2018.

made it so attractive that interests in securities no longer exist? Perhaps custodians, by participating in lending markets, are becoming increasingly similar to banks? This would require a fuller analysis than is possible in the context of this chapter, but it is possible that we have reached a point in time where client asset rules no longer suffice to ensure financial stability in the sector and the custody business needs to be subject to the same requirements as the taking of deposits.

IX. Conclusions

This chapter has developed explanations for the distinctive characteristics of the infrastructure underpinning securities markets. It has advanced the thesis that this infrastructure is the product of market failure. This market failure has resulted in investors/issuers paying too high a price for the services underpinning securities markets. The government is subsidising this by providing retail investors with tax breaks that make it attractive for them to invest pension savings in securities markets rather than save for retirement in other ways.

The chapter concludes that distributed ledger technology is unlikely to fix the problem. A quick fix solution consists in holding securities directly and in avoiding English law. There are also longer term solutions available for government intervention. These are: reforming section 98 of the Companies Act 2006, allowing registered shareholders to claim for indirect investors; a requirement for disclosure of the identity and the terms operated by sub-custodians; limitations on the ability of custodians to outsource custody; a requirement to synchronise the reconciliation of holdings along the chain; a requirement for computer systems to earmark client securities; and a more pro-active approach in relation to consultation exercises. Finally the author tentatively observes that we may have reached a point where property rights in securities no longer exist, where client asset rules are no longer sufficient to ensure financial stability and where the custody business should be treated in the same way as the banking business.