

Buying time: futures trading and telegraphy in nineteenth-century global commodity markets*

Alexander Engel

Institut für Wirtschafts- und Sozialgeschichte, Georg-August-Universität Göttingen, Platz der Göttinger Sieben 5, 37073 Göttingen, Germany
E-mail: AEngel@wiwi.uni-goettingen.de

Abstract

Adapting the dictum that ‘time is money’, Western merchants have long promoted and welcomed technologies to accelerate commerce. Thanks to revolutionary changes in communication in the nineteenth century, including the telegraph, information could for the first time travel much faster around the globe than goods. This asymmetric time–space compression created new problems for agents of global trade, as transactions could occur faster than the handling of the goods. Yet this problem also presented an opportunity to establish new forms of trading and ways of thinking about time. In the case of world markets for primary products such as grain or cotton, the new technique of futures trading at commodity exchanges became a tool to redress the time differential between the movement of goods and information. It pushed the commercial community to think in a ‘double time’ of a dematerialized present and a material future with physical goods, and centred global commodity markets on a few marketplaces. The article thus argues that historians need to examine economic understandings of the future alongside political, cultural, and social understandings.

Keywords commodities, futures trading, markets, time–space compression, telegraph

In 1866, the year when the first permanent transatlantic telegraph was laid, a twenty-six-year-old political economist from West Prussia named Gustav Cohn successfully finished his PhD at the Philosophy Department of Leipzig University.¹ A few months later, the full text of the thesis, entitled ‘Time bargains and speculations on differences’, appeared as a fifty-two-page article in the *Jahrbücher für Nationalökonomie und Statistik*,

* I owe a debt of gratitude to Heidi Tworek and Simone Müller for the sheer amount of patience and constructive advice they provided in the different stages of developing this contribution. The text further profited from a number of remarks by two anonymous reviewers, whom I would also like to thank.

1 On Cohn, see Walter Braeuer, ‘Cohn, Gustav’, in *Neue Deutsche Biographie*, vol. 3, Berlin: Duncker & Humblot, 1957, pp. 315–16; Ernest Hamburger, *Juden im öffentlichen Leben Deutschlands: Regierungsmitglieder, Beamte und Parlamentarier in der monarchischen Zeit 1848–1918*, Tübingen: Mohr, 1968, pp. 93–5.

a key journal of the historical school of economics.² True to the principles of the historical school, which saw economics as culture-specific and not generalizable over space and time, Cohn did not derive theoretical principals or devised models but discussed the historical, theoretical, and moral dimensions of an emergent economic phenomenon: he studied what became known as futures trading. In several other contributions following his PhD, Cohn actually became the first economist properly to treat this new way of dealing, this new kind of market.³ After a few peripatetic years of university teaching in Heidelberg, Riga, and Zurich, and serving as a sociopolitical editor at the illustrious *Frankfurter Zeitung*, he became a professor at Göttingen University in 1884. He was regarded as one of the foremost experts on public finance, transportation, and commodity and stock exchanges until his death in 1919.

In 1866, the young Cohn expressed a deep-seated feeling of living in an age that had witnessed a fundamental transformation of the economy through a process combining globalization and acceleration with economic integration and concentration. For him, nothing symbolized these changes more accurately than price convergence through exchanges. His stagist conception of the economy foresaw that the telegraph would enable the creation of unified national, then European, and, finally, world prices. Exchanges constituted the iconic institution of an emergent commercial order in which trading took an ideal, abstract form and prices converged:

The mighty centralisation of prices, not for a single country alone, but for the whole of Europe, and in the end the whole world (just while I wrote this, the Queen of England has exchanged greetings with the US President through the transatlantic telegraph); the rapid alignment of prices in all directions; the linking of what lies behind and ahead in lightning-fast projections of things to come, from the interaction of countless news items and opinions, which confront each other to settle – with all these aspects, the ‘exchange’ is a shortened expression of the very idea of trading.⁴

What is curiously absent from that picture, and absent from the exchange as a marketplace, is the very good that was traded. It could not keep pace with the circulation of telegraphed information and prices, and remained in a circulation of its own that hardly ever touched the exchange. In Cohn’s view, the bridge that linked both circulations – and, by preserving the link, disentangled the flow of information and prices from the flow of material goods in the first place – was the new commercial technique of futures trading, namely the very topic of his dissertation.

2 Gustav Cohn, ‘Zeitgeschäfte und Differenzgeschäfte’, *Jahrbücher für Nationalökonomie und Statistik*, 7, 1866, pp. 377–428. On the historical school, see Quinn Slobodian, ‘How to see the world economy: statistics, maps, and Schumpeter’s camera in the first age of globalization’, in this issue, pp. 307–32.

3 Gustav Cohn, ‘Nachtrag zu dem Aufsätze über Zeitgeschäfte und Differenzgeschäfte’, *Jahrbücher für Nationalökonomie und Statistik*, 9, 1867, pp. 73–7; Gustav Cohn, *Die Börse und die Spekulation*, Berlin: Lüderitz, 1868; Gustav Cohn, ‘Statistische Untersuchungen über die Wirksamkeit der Spekulation im Berliner Roggenhandel während der Jahre 1850–1867’, *Zeitschrift des Königlich Preußischen statistischen Bureaus*, 8, 1868, pp. 20–4; Gustav Cohn, ‘Ueber Wesen und Wirkungen der Creditgeschäfte’, *Zeitschrift für die gesamte Staatswissenschaft*, 24, 1868, pp. 572–600; Gustav Cohn, ‘Ein weiterer Beitrag zur Statistik der Spekulation’, *Jahrbücher für Nationalökonomie und Statistik*, 16, 1871, pp. 282–95; Gustav Cohn, ‘Ueber Differenzgeschäfte’, in Gustav Cohn, ed., *Volkswirtschaftliche Aufsätze*, Stuttgart: Cotta, 1882, pp. 669–704.

4 Cohn, ‘Zeitgeschäfte und Differenzgeschäfte’, pp. 380–1.

This article follows Cohn in proposing that the nineteenth-century Western system of commodity futures trading developed (not only, as Cohn suggested, but to a considerable extent) because of the challenges of an asymmetrical acceleration of the flow of goods and information. This is an explanation rather at odds with most of the literature on the history of futures trading, which will be discussed more extensively in the next section. Unlike Cohn's dissertation, however, this article puts the advent of telegraphy and futures trading in historical perspective.

The article first explores the background nexus of telegraphy, trading, and concepts of time in the global world after 1850. I then examine how both the problem of asymmetric acceleration and the principal methods to handle it had already developed in the decades predating the emergence of global telegraphy through samples. Telegraphy did not come out of the blue, nor did it trigger unforeseen changes in age-old methods of commercial interaction. Instead, it fitted into a broader process of transforming commercial organization and practices and the mercantile organization of time that had started in the eighteenth century. Next, the article considers the principles and properties of futures trading as it emerged in the middle of the nineteenth century. It lays out the abstract principles of futures trading as contemporaries understood the practice and examines how these built upon principles of securities trading that had existed since the seventeenth century. The article then addresses how merchants used futures trading to tackle the asymmetric acceleration of the transatlantic trade in particular. Finally, I put the seemingly Western system of commodity futures trading into a global perspective.

Telegraphy, trading, and time

The urge to accelerate trade existed long before telegraphy.⁵ Parts of European and North American business communities had shown strong inclinations to speed up commercial exchange since the late eighteenth century. The commercial elite increasingly advocated a more self-interested, less regulated economic competition, which would appear so forcefully in the writings of economic liberalism. This idea combined with a commodification of time and an inclination to efficiency: 'remember that Time is Money', and 'Waste neither Time nor Money, but make the best Use of both', as Benjamin Franklin famously put it.⁶ But this commodification of time made speed 'an absolute and unassailable imperative for business' and, in turn, made 'time compression and the intensification of processes seem inevitable'.⁷

Businessmen increasingly saw the ability to (re)act first as an important competitive advantage, and in their growing desire for speedy exchange they readily devoted themselves to supporting technologies of acceleration – a process that has continued until the present day. Consequently, the improvement of transportation infrastructure stepped up the

5 For theoretical background, see Hartmut Rosa, *Social acceleration: a new theory of modernity*, New York: Columbia University Press, 2013. On the roots of modern acceleration in the *Sattelzeit* around 1800, see Reinhart Koselleck, *Futures past: on the semantics of historical time*, Cambridge, MA: MIT Press, 1985. For a descriptive examination of historical accelerations, see Peter Borscheid, *Das Tempo-Virus: eine Kulturgeschichte der Beschleunigung*, Frankfurt am Main: Campus, 2004.

6 Benjamin Franklin, 'Advice to a young tradesman', in *The American instructor or young man's best companion*, 9th edn, Philadelphia, PA: Franklin and Hall, 1748, pp. 375–7.

7 Barbara Adam, 'Comment on "social acceleration" by Hartmut Rosa', *Constellations*, 10, 1, 2003, p. 50.

rhythm of economic activity by shortening transfers of material goods (and information in written form) from months to weeks and from weeks to days. The attempts to establish organized, affordable foreign postal services to overcome the weaknesses of the irregular and unsteady exchange of international correspondence, as discussed by Peter Shulman in this special issue, fell perfectly in line with the needs of commercial communities.

With telegraphy, however, the acceleration of the market gained an entirely new quality. Gustav Cohn depicted 'the exchange' as a place solely devoted to information processing, devoid of material goods that are actually handled. Directly connecting these abstract marketplaces to the telegraph allowed the exchange markets to work more quickly and with greater volume, as they joined more forcefully and directly in the fast global circulation of information and opinion which became ever more independent of the slow global circulation of actual goods. For Cohn, physical goods seemed to hinder the smooth functioning of trade: 'The object of trade – the goods brought here and sent away, by sea and land, in toils and danger through streets and waterways – trailed far behind the exchange of views and the resulting agreement on price, owing to its torpid materiality, regardless of all the channels and railways.'⁸ Cohn fixated on price and information as the fastest and smoothest part of global trade over and above the burden of comparatively slow-moving physical goods.

Cohn's high regard for speed and acceleration was typical for his age. The first transatlantic cable inspired numerous exaggerated articles, cartoons, and academic works proclaiming the 'annihilation of time and space'.⁹ The electric telegraph was, in the contemporary words of the *Belfast Newsletter*, the 'Ariel of the 19th century' and had 'put a girdle around the globe'.¹⁰ Although space and time were by no means 'annihilated', contemporaries' perceptions changed considerably. For the first time in history, information could travel much faster over vast distances than goods and people. Until the opening of transatlantic telegraphic communications in the 1860s, surface mail between Europe and North America took a fortnight, between Europe and South America a month, and between Europe and East Asia from one to two months. Australia and New Zealand were seventy days away from Europe. These figures changed radically after the introduction of the telegraph, when the maximum time was shortened to five days between Japan and Europe.¹¹

This deepened what Anthony Giddens has termed 'time-space distanciation – the conditions under which time and space are organized so as to connect presence and absence'.¹² Social action appeared unbound from the 'here and now' of a certain location; it could take place anywhere across space and, independently, across time. For contemporaries, it appeared as if time-space was compressed to bring what was distant into arm's reach.¹³

8 Cohn, 'Zeitgeschäfte und Differenzgeschäfte', p. 381.

9 Simone Müller, *Wiring the world*, New York: Columbia University Press, forthcoming; Roland Wenzlhuemer, *Connecting the nineteenth-century world: the telegraph and globalization*, Cambridge: Cambridge University Press, 2013.

10 *Belfast Newsletter*, 28 July 1866.

11 Simone Müller-Pohl, "'By Atlantic Telegraph": a study on Weltcommunication in the 19th century', *Medien & Zeit*, 25, 4, 2010, pp. 40–54.

12 Anthony Giddens, *The consequences of modernity*, Cambridge: Polity Press, 1991, p. 14.

13 David Harvey, *The condition of postmodernity: an enquiry into the origins of cultural change*, Cambridge, MA: Blackwell, 1990; Barney Warf, *Time-space compression: historical geographies*, London: Routledge, 2008.

This acceleration also promoted standardization, particularly of time. Although many resisted the imposition of Western time regimes, standardized time emerged in the 1880s with the adoption of Greenwich Mean Time, and was extended at further conferences in the late nineteenth and early twentieth centuries.¹⁴ But the ways to trade through time had already been standardized in Western merchant communities, as beside (and often replacing) different more-or-less individual forward deliveries and time bargains, the exceptionally uniform and regulated system of futures trading had emerged.

Historians have approached the history of futures trading in quite different ways. The American historians William Cronon and Jonathan Levy have treated futures trading primarily as a regional or national phenomenon that developed first and specifically, but almost accidentally, in the context of the Midwestern grain trade when it became centred on Chicago.¹⁵ Futures trading then financialized the commodity trade, opening it up for purely speculative interest, which became communicated in telegraphic networks of increasingly transatlantic dimensions.¹⁶ This approach elides the parallel or even earlier developments in Europe and elsewhere in the world, however; it also ignores the fact that the rise of global trade was one of the driving forces behind the rise of futures trading, and vice versa.

In histories of global trade, commodity exchanges and futures trading rarely take centre stage. If they are mentioned at all, scholars usually note that they facilitated trade by providing more continuous, better-defined markets and price signals.¹⁷ Accounts of the emergence of any futures exchange often emphasize the group interest behind it, generally providing an informative social history of a group of merchants who chose to organize themselves in a certain way, excluded others, and tried to gain as a group from developing a powerful institution.¹⁸ Such findings add to our understanding of the role of commodity exchanges in the nineteenth-century transformation of global trading, but more in terms of protagonists and power relations than in terms of mercantile practices in a changing world. By examining the practical problems of everyday business that these exchanges could address, histories of futures trading usually argue that it enabled those who produced,

14 On different global time regimes, see Vanessa Ogle, 'Whose time is it? The pluralization of time and the global condition, 1870s to 1940s', *American Historical Review*, 118, 5, 2013, pp. 1376–1402.

15 William Cronon, *Nature's metropolis: Chicago and the Great West*, New York: Norton, 1991; Jonathan Levy, *Freaks of fortune: the emerging world of capitalism and risk in America*, Cambridge, MA: Harvard University Press, 2012.

16 On how opening commodity markets became speculative markets for investors through futures trading and the telegraph, see David Hochfelder, "'Where the common people could speculate": the ticker, bucket shops, and the origins of popular participation in financial markets, 1880–1920', *Journal of American History*, 93, 2006, pp. 335–58.

17 For instance, Steven C. Topik and Allen Wells, *Global markets transformed, 1870–1945*, Cambridge, MA: Harvard University Press, 2014. Kevin H. O'Rourke and Jeffrey G. Williamson, in their seminal monograph *Globalization and history: the evolution of a nineteenth-century Atlantic economy*, Cambridge, MA: MIT Press, 1999, do not even mention commodity exchanges and futures markets, though they discuss transatlantic price developments. This might not come as a surprise, however, given Quinn Slobodian's observation in this special issue that thinking about economic globalization is usually divided into marginalist and more institutionalist approaches – O'Rourke and Williamson clearly represent the former.

18 Jonathan Lurie, *The Chicago Board of Trade, 1859–1905: the dynamics of self-regulation*, Urbana, IL: University of Illinois Press, 1979; Kenneth J. Lipartito, 'The New York Cotton Exchange and the development of the cotton futures market', *Business History Review*, 57, 1983, pp. 50–72; Julia Laura Rischbieter, *Mikro-Ökonomie der Globalisierung: Kaffee, Kaufleute und Konsumenten im Kaiserreich 1870–1914*, Cologne: Böhlau, 2011.

stored, or processed primary goods to insure – ‘hedge’ – against price changes a few months ahead.¹⁹ This allowed businesses to calculate and plan ahead with more certainty.

I wish to reappraise the history of futures trading through the lens of commercial acceleration and changing mercantile concepts of time. Futures trading in the nineteenth century aimed more at intermediaries than at producers and processors. Rather than a tool to plan economic activities months ahead, it provided an important instrument to bridge the fast circulation of information and the slow circulation of goods in the ongoing everyday business of middlemen. Since the end of the eighteenth century, the flow of information had gradually separated from the flow of goods, as the former could be more easily and effectively accelerated than the latter. Earlier practices of trading through time, which ultimately developed into the system of futures trading, enabled the separation of the two flows, as it provided a flexible bridge between them, and thus between two layers of time.

Commerce became invested with a new ‘double time’ of present and future that separated information from goods. Information circulated in the present, turning immediately into prices and transactions, while the physical movement and actual exchange of commodities occurred in the future. While historians have become increasingly interested in the future, they have generally examined the political, military, social, and cultural aspects rather than the economic consequences of new understandings of that future.²⁰ In the framework of futures trading and telegraphy, time horizons shifted alongside expectations about the future itself, and especially about the way to handle and employ these expectations. Future and present became intertwined through capitalist markets.

From samples to words

The most basic form of long-distance trade occurs when owners do not send commodities but rather transport them personally. Travelling vendors both buy and sell their goods in person, giving them maximum control over both transactions. When, in the twelfth and thirteenth centuries, many European merchants retreated to an office to manage their trade from a distance, they needed to entrust other people both to carry the goods and to execute buying and selling according to their wishes. The Hanseatic, Venetian, Genoese, and other commercial communities spanned trust-based networks of exchange over the world they knew.²¹ As information travelled largely at the same speed as the goods themselves, agents were unable to ask their principal for advice in the moment of a transaction. They had to rely on a broad set of instructions and to decide themselves within the pre-defined boundaries set for them.

Apart from the well-known problems of trust and uncertainty accruing from the principals’ low level of control over their agents, long-distance trade (and especially global trade) also occurred under considerable uncertainty about potential profits. New and unusual commodities from one side of the globe might or might not find a market on the other, so the safest bet was trading in well-established goods for which there existed a

19 Jeffrey C. Williams, ‘The origins of futures markets’, *Agricultural History*, 56, 1982, pp. 306–16.

20 See David C. Engerman, ed., ‘AHR forum: histories of the future’, *American Historical Review*, 117, 5, 2012, pp. 1401–60.

21 Geoffrey Vaughn Scammell, *The world encompassed: the first maritime empires, c. 800–1650*, Berkeley, CA: University of California Press, 1981.

continuous demand, to at least ensure that they could be sold at all. The interplay of unsteady demand and unsteady supplies remained a problem, however, and resulted in often wildly fluctuating prices. When goods were procured at one end of the world, the price that they could fetch a few months later at the other end was fairly uncertain. To minimize the likelihood of loss-making trades, it was wise to focus on well-established goods with relatively reliable margins between buying and selling price.

Long-range trade on a more extensive scale – beyond the peddling of luxuries and oddities that in the end find a curious buyer – thus trended towards stability and steadiness in the assortment of goods traded. Market-related uncertainty (as opposed to the logistical uncertainty of shiploads reaching their destination at all or at least intact) largely came down to an uncertainty about prices. To address this, over the course of the seventeenth century, Amsterdam, Hamburg, London, and other commercial hubs started to issue price currents: lists of officially or semi-officially determined quotations of the local wholesale prices of more or less all established goods.²² Such price currents, issued on a weekly basis, became one of the key media of commercial communication in early modern Europe. In the eighteenth century, the practice spread to European colonies as well.²³ Ships brought news of transatlantic trade, prices, and shares, along with reporting that started to speculate about future share prices.²⁴ The price currents circulated widely, allowing merchants to keep track, if not of short-term, then at least of medium-term changes in the markets. While prices were updated weekly, the list of goods for which prices were quoted remained almost unchanged for years, often decades. Although a specific layout and uniform procedures of collecting and establishing the set of prices were adopted only slowly, price currents nonetheless provide strong evidence for the structural stability of long-distance trade.

As commodities such as sugar, coffee, cotton, indigo, dyewoods, and the like were far from homogeneous, the price currents often had to relate a span of prices rather than a well-defined single price for a certain commodity. In order to constitute meaningful information, the price span could not be too wide. Consequently, quotations were sorted, especially according to origin and grades of quality of a commodity (which sometimes came down to the same thing). The differentiation of a commodity into a number of varieties proved to be very stable over many decades as well; it was reiterated in the price currents, explicated in mercantile encyclopaedias, and solidified in the everyday judging of merchandise.²⁵ Buyers benefited from the breakdown of a non-homogeneous commodity into a standing set of more homogeneous varieties, as this reduced uncertainty and enabled buyers to purchase again a variety that they preferred, whether for their own use or to sell on.

22 John J. McCusker and Cora Gravestijn, *The beginnings of commercial and financial journalism: the commodity price currents, exchange rate currents, and money currents of early modern Europe*, Amsterdam: NEHA, 1991. See also Joad Raymond, ed., *News networks in seventeenth-century Britain and Europe*, London: Routledge, 2006.

23 John J. McCusker, 'The demise of distance: the business press and the origins of the information revolution in the early modern Atlantic world', *American Historical Review*, 110, 2005, pp. 295–321.

24 Will Slauter, 'Forward-looking statements: news and speculation in the age of the American Revolution', *Journal of Modern History*, 81, 4, 2009, pp. 759–72.

25 See, for instance, Jacques Savary des Bruslons, ed., *Dictionnaire universel de commerce*, Paris: Estienne, 1723–30; Johann G. Jacobi, *Neues vollständiges und allgemeines Waaren- und Handlungs-Lexicon*, 3 vols., Heilbronn: Claß, 1798–1800; John Ramsay MacCulloch, ed., *Dictionary, practical, theoretical and historical of commerce and commercial navigation*, 3rd edn, London: Longman, 1844.

Such preferences, in turn, created incentives for the producers and suppliers to stick to established varieties. When, for example, British planters in India attempted to create an indigo production aimed at European markets in the 1780s and 1790s, massive efforts were undertaken to emulate well-established varieties, namely to copy the quality and outer appearance of sorts and grades of indigo from French and Spanish America, which already had a market.²⁶

Although buyers understood the varieties of a commodity and the properties of these varieties, they still needed to check any lot that they wished to buy, in order to relate this specific lot to the conceptual system of qualities and grades and their current market values. When a seller offered a chest of indigo to a potential buyer, the buyer had to check the indigo in order to determine if it would be useful for his purpose, and, if so, what he would be willing to pay for it. Was it high-quality Guatemalan Flora indigo of the first, second, or third grade? A clear blue or rather copperish sort of fine or middling indigo from Saint Domingue? The most ordinary Carolina indigo? Or, in the worst case, just a useless fake made from blue chalk or bird droppings? Judgement took place by drawing a sample from the lot in question and examining its outer appearance, or, in some cases, by trials such as dissolving or burning the sample.²⁷

If a more continuous exchange developed, in which the same set of persons engaged in repeated transactions and built trust, the vendor and purchaser might develop a more convenient method of negotiating a transaction, instead of the more cumbersome joint drawing of a sample while inspecting the whole lot. This became especially expedient in larger commercial hubs, where the sheer number of daily transactions and resident merchants made it feasible to have daily gatherings matching buyers and sellers. From the sixteenth and seventeenth centuries onwards, commodity trading as well as financial business in the larger commercial cities of Europe took place at securities and commodities exchanges that were provided, maintained, and regulated by local merchants' associations and boards of trade. By setting up an exchange organization, merchants established and self-regulated the infrastructure to trade with each other in an organized way, which excluded third parties from that trade. While brokers became increasingly central for gathering market information and facilitating transactions, the actual commodities never found their way into and out of the exchange building. Trading occurred through samples, and moving the merchandise itself between places of storage became a mere logistical appendix to the transaction as such; if it was stored with a third party, the merchandise did not move at all, with only a warehouse receipt changing hands. Even beyond the exchange, trading by samples became a more familiar practice. For cotton, it became the custom at the end of the eighteenth century.²⁸

26 Alexander Engel, 'Selling Indian indigo in traditional and modern European markets, 1780–1910', in Hartmut Berghoff, Philip Scranton, and Uwe Spiekermann, eds., *The rise of marketing and market research*, Basingstoke: Palgrave, 2012, pp. 27–47.

27 *Ibid.*, p. 31. For more on the creation of markets for dyestuffs, see Alexander Engel, *Farben der Globalisierung: die Entstehung moderner Märkte für Farbstoffe*, Frankfurt am Main: Campus, 2009.

28 Carl Johannes Fuchs, 'Die Organisation des Liverpools Baumwollhandels in Vergangenheit und Gegenwart', *Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft im Deutschen Reich*, 14, 1890, p. 109. On cotton, see Sven Beckert, 'Emancipation and empire: reconstructing the worldwide web of cotton production in the age of the American Civil War', *American Historical Review*, 109, 5, 2004, pp. 1405–38.

By the 1820s, British wholesalers traded all major commodities by sample, and enforceable rules were in place whereby the buyer could reject the delivery of goods if the goods did not correspond to the sample.²⁹

Sidelining a small fraction of goods in the form of samples created a more pronounced difference between the logistics of moving goods around and the actual buying and selling process. This also accelerated transactions, as samples could be moved faster than whole lots, at least over shorter distances, and it became possible to sell some of a ship's cargo while or even before it was unloaded. Samples were even sent ahead of the main load in faster ships, so that the cargo was sold at its destination before it had actually arrived. This system became known as 'to arrive' trade.³⁰ Further research is necessary to outline when and where this practice emerged, but it was in place for many commodities by the early nineteenth century. Initially, sending samples ahead in faster ships only saved a few days, but when the new technology of steam-shipping started to cut oceanic passage times dramatically in the 1840s, the 'to arrive' trade flourished.³¹

In 'to arrive' trading, a shipload might have been sold not just once before it reached its destination but even several times. The 'to arrive' trade was soon accompanied by a 'for shipment' trade, in which merchants only distributed samples and stored the commodities themselves at the place of origin, until sold.³² This allowed for more flexibility in finding a suitable destination, although it was a rather drawn-out exercise with much time wasted in transmitting the samples, sending back a written order, and finally transporting the full load of goods.

The reliance on samples had initially greased the wheels of commerce, but in the new environment of global telegraphic communication, samples constituted the main cause of friction. Transoceanic orders could be given in hours, while transporting samples beforehand still took days and weeks, and involved considerable effort. A more regular system of international parcel post would only develop from the 1880s, as Léonard Laborie demonstrates in his contribution to this special issue.

One could trade without the samples, however, provided that three conditions were met. First, sellers and buyers needed to share well-defined ideas about the different varieties of a commodity and their values. Second, the lots actually traded could not differ substantially from the ideal standard, although deviations from the standard, even frequent ones, were not problematic as long as routines of evaluating differences were in place. Third, the degree of trust and enforceable rules had to be reasonably good at preventing fraud and dealing with eventual disputes between buyers and sellers.

Beginning in the mid nineteenth century, local merchants' associations increasingly attempted to standardize varieties of certain commodities and to install procedures and enforceable rules to enable sample-less trading. One prominent example is Chicago's system

29 'Sample', in MacCulloch, *Dictionary*, p. 1085.

30 Fuchs, 'Organisation', p. 115.

31 Yrjö Kaukiainen, 'Shrinking the world: improvements in the speed of information transmission, c. 1820–1870', *European Review of Economic History*, 5, 2001, pp. 1–28.

32 Fuchs, 'Organisation', p. 115.

of grading grain, which developed in the 1850s.³³ In the US Midwest, a system of grain storage emerged in which the provider of storage was independent from both producers and merchants. The operators of so-called elevators collected grain from different producers without storing them separately. This enabled a more efficient, large-scale system of storage, but it meant that a farmer could not take out exactly the same grain that he put into an elevator, but only grain of similar quality. In order for the system to work, participants in the trade had to agree upon reliable grades. The Chicago Board of Trade, initially a chamber of commerce that later became the largest grain exchange in the world, instigated a system of grain inspection that provided well-defined and certified grades of grain. This standardization of products would enable futures trading by making commodities more interchangeable and information about them more uniform.

As a consequence of these and similar attempts, commodity transactions became independent of the actual circulation of goods. Merchants eschewed samples, trusting in the standardization of commodities and in a commonly shared reference system to ascertain the properties of a specific lot of a commodity using nothing but words. Commodity transactions rested solely on the circulation of information. The introduction of telegraphic communication therefore built upon these practices, rather than completely revolutionizing trade. Telegraphy emerged coincidentally with the creation of sample-less trading, but it fed into and accelerated merchants' attempts to speed up commodity trading across the globe. The future became more present than ever before.

However, the stream of information, prices, and transactions had accelerated to such a degree that the effective handling of goods took more time than the new telegraphic markets allowed. Merchants and brokers juggled daily with current prices and uncertainties about future prices, customers, and delivery locations. For everyone involved in commodity trading, the 'double time' of future and present seemed to make profits less likely, rather than more. Both buyers and sellers, then, needed to buy time. The solution came from the new system of trading without samples itself, or rather from an even more advanced system that grew out of this.

Futures markets

Eschewing the use of samples not only accelerated commodity trading but also changed the very nature of the business in the mid nineteenth century. A transaction based on a sample always referred to a specific lot of the commodity, a lot that was simply in a different location but was at least represented in the form of the sample when the transaction occurred. In the process of buying and selling, the lot could not be exchanged for any other lot of the same good. With a transaction based on a mere description of what kind of good was to change hands, this was no longer the case. The good had been rendered fungible: in other words, the seller could deliver any lot of the commodity exhibiting the defined characteristics. For instance, if a Liverpool merchant contracted to buy a certain amount of cotton of a specific grade to be delivered in the following month, this did not entail the right to a specific lot already at the disposal of the seller. The seller was free to deliver any lot from

33 Cronon, *Nature's metropolis*, pp. 109–19. See, more generally, Lowell D. Hill, *Grain grades and standards: historical issues shaping the future*, Urbana, IL: University of Illinois Press, 1990.

any producer that fitted the grade for which the Liverpool merchant had contracted, and did not even have to possess any cotton before the day he had to fulfil his obligation to deliver some of a specific quality.

By rendering commodities fungible, commodity trading came to resemble securities trading, and exchanges consciously built upon these practices to create the new system of futures trading.³⁴ Securities such as government bonds and company stocks are, by definition, fungible goods. The different shares in a company are numbered, but they are completely interchangeable – the owner of share number 21 might swap with the owner of share number 22, without either of them having any advantage or disadvantage whatsoever. As a consequence, trading of stocks and bonds took on a particular form at securities exchanges. Rather than exchanging tangible, concrete shares in the process of buying or selling, trading was already done ‘for the books’ in the early years of securities trading in seventeenth-century Amsterdam and London.³⁵ Securities became entirely detached from their materiality: in the course of a trading day, all the transactions were protocolled and journalized but not immediately fulfilled by delivery and payment. Only at the end of the day – or, at most exchanges, only at the end of each month (‘ultimo’) – were all the transactions registered in the books aggregated, and delivery was due to close all open positions. These kinds of delayed transactions became known as ‘time bargains’.

The system of ‘time bargains’ was advantageous for those who speculated, rather than invested, in securities. Investors sought to buy and keep a security to reap dividends, while speculators bought and sold with a view to cash in on the difference between buying and selling price. By closing positions only once in a while, far fewer stocks (or bonds) had to be exchanged in reality. Imagine that, in the course of a month, a speculator who already owned thirty shares in a company bought an additional twenty, resold fifteen, bought another twenty-five, and then sold forty, keeping only twenty. All in all, one hundred shares were transacted, but, adding up all the transactions, the speculator ended up with twenty instead of thirty shares, so in effect only ten shares had to be delivered. Accounting for all the transactions of all the market participants, most cancelled each other out in the course of the month. Clearing systems had to be devised to keep track of all this on paper, but the inconvenience of the additional paperwork was small compared to the effort of actually moving all the shares of all transactions back and forth.

Holding up delivery until a settlement date not only reduced transactions costs but also enabled investors to speculate on declining prices through short selling. One could sell shares that one did not own, and buy the same amount of shares later (but before the settlement date) to close the position. If prices declined between selling and buying, a gain occurred from first selling and then buying. In addition, the volume of the speculative market was no longer confined to the actual amount of securities available, as investors could trade in

34 The following description of the working of futures trading will not be referenced in detail. It is primarily based on the study of different contemporary accounts of futures trading, most of which were published in Germany, including Carl Johannes Fuchs, *Der Waren-Terminhandel, seine Technik und volkswirtschaftliche Bedeutung*, Leipzig: Duncker & Humblot, 1891; Max Weber, *Die Börse, II: der Börsenverkehr*, Göttingen: Vandenhoeck & Ruprecht, 1896; Henry Crosby Emery, *Speculation on the stock and produce exchanges of the United States*, New York: Columbia University Press, 1896.

35 Oscar Gelderblom and Joost Jonker, ‘Amsterdam as the cradle of modern futures trading and options trading’, in William N. Goetzmann and K. Geert Rouwenhorst, eds., *The origins of value: the financial innovations that created modern capital markets*, Oxford: Oxford University Press, 2005, pp. 189–205.

securities in the time span between two settlement dates without needing the securities themselves. Finally, hardly any initial capital was required for speculation as, until settlement day, the buying and selling was only for the books, and neither securities nor money was exchanged. Imagine a speculator who has £10, enough money to buy ten shares. He can still buy one hundred shares for delivery at the end of the month, as the bill for £100 will also only be presented at the end of the month. Before the end of the month, the share goes up 10%, and he sells all one hundred shares again, for £110. On settlement day, he therefore receives no shares but he will receive £10 for the difference between the buying and selling price. If the shares have gone down 10%, he would have to pay £10, the cost of his original shares.

In a similar fashion, the emergence of 'to arrive' commodity trading enabled investors to buy and resell a commodity, maybe even many times, before the good actually arrived and delivery to the ultimate owner was due. The temporary owners received a cash settlement for the differences between buying and selling prices. Just as in the securities markets, postponing the settlement date opened a window for 'easy' forms of speculation. Nevertheless, 'to arrive' trading only facilitated speculation on specific, existing, yet absent lots of a commodity, which very much limited the market. In addition, in contrast to securities markets, it was impossible to speculate on declining prices, as one could not sell a consignment before buying it.

However, when the eschewal of sample trading and the increasing standardization of commodities made the commodities fungible, the methods of securities trading at exchanges lent themselves to commodity trading as well. One obstacle remained: investors could make 'a time bargain' with any quantity of the commodity and any imaginable delivery date. Other than two stocks of the same company, time-bargain contracts concerning the same commodity were not like two peas in a pod. One might call for the delivery of 62,837 bushels of a certain grade of grain on 22 July, and another for 713 bushels at some day between 1 September and 31 October. Under these circumstances, no single market price could emerge, as both the difference in volume and the difference in delivery called for different prices, even if this was exactly the same commodity. The specific oddities of individual contracts could also make it difficult to find a buyer happy with these exact specifications: 62,837 bushels of grain would make for a very large consignment, which would only interest a small number of persons; among those few, it was unlikely that any would be interested in receiving it exactly on 22 July.

Consequently, in order to have a working, liquid market for commodity time-bargaining, contracts for future delivery had to be as fungible as the commodities themselves, which led to the development of standardized contracts. Such contracts seem to have emerged for markets of different agricultural goods at commodity exchanges in Berlin, Hamburg, Amsterdam, Paris, and maybe elsewhere at the end of the 1840s.³⁶ Regular price quotations of time bargains in the Berlin rye market started in 1850, which indicates the use of uniform contracts, instead of non-comparable, tailor-made contracts. In 1866, Cohn reproduced pre-printed forms used during the 1860s in the Berlin rye trade and the Hamburg wheat trade.³⁷

36 Cohn, 'Statistische Untersuchungen', p. 21.

37 Cohn, 'Zeitgeschäfte und Differenzgeschäfte', pp. 420–8.

These developments formed part of a broader growth of pre-printed forms for accounting and trade; similar pre-printed forms emerged around the same time to help with slave accounting in the American South, making people into countable commodities.³⁸ The futures forms specified the rules under which the transaction took place, and the quality (grain of certain properties) as well as the quantity (always exactly 1,000 hundredweight). The contract left two blank spaces for the price and the delivery date, as well as the two contractual parties. The rules for transactions at Hamburg contain many stipulations that are more or less identical to those of the exchange in Berlin, hinting at a process of convergence in the search for best practices. Other commodity exchanges similarly standardized contracts, including potential delivery dates. The resulting type of contracts became known as ‘futures contracts’, or simply ‘futures’.

This standardization of contracts resulted in an immediate commercial acceleration. As the futures contract had minimal degrees of freedom, extremely swift transactions could occur on the exchange floors. Within the few well-defined trading hours, buyers and sellers agreed on transactions at utmost speed, shouting information of the briefest kind or – to counter the level of noise – simply using a code of hand signals. Transactions were protocolled only briefly, to be spelled out after trading hours. This form of trading meant the greatest conceivable acceleration of market activity until information technologies such as the computer and programme-trading were introduced to the exchanges in the twentieth century.

More importantly, the conversion of individual time bargains into schematized futures contracts led to the emergence of a new kind of market with very specific properties. When the delivery contracts themselves became fungible goods, individual transaction prices converged towards one well-defined market price, and continuous, liquid futures markets evolved. Alongside the old-style spot market in which goods were bought and sold for immediate delivery, there emerged a futures market for delivery next month, one for delivery in the month after that, and so forth (‘September wheat’, ‘October wheat’, November wheat’, etc.). Futures contracts defined the future in a new, punctuated commercial rhythm.

However, the interaction between spot and futures markets created new commercial interchanges between present and future. Because of the possibility of arbitrage transactions, the spot market and different futures markets did not develop independently. If, for example, the spot price for a good sank far below the futures price, investors could profit from buying in the spot market and instantly selling in the futures market. The good had only to be stored safely until the futures contracts were due and delivery ensured a profit. Every time the difference between spot and futures prices grew larger than the cost of transporting the good, such arbitrage transactions became theoretically profitable, though storing goods could create practical issues or unforeseen costs. Some market participants seized the chance of a relatively sure profit, and thus closed the gap between the spot price and the futures price again, as buying in the spot market increased the spot price and selling in the futures markets depreciated the futures price. The reverse principle applied if the spot price got too close or even above the futures price. Consequently, any action in the futures markets that changed prices should theoretically also change prices in the spot market and vice versa. In essence,

38 Caitlin Rosenthal, ‘From memory to mastery: accounting for control in America, 1750–1880,’ *Enterprise & Society*, 14, 4, 2013, pp. 732–48.

the spot market and the different futures markets of a good formed different ends of a single market spanning time. In almost all instances, the futures markets were many times bigger than the corresponding spot market, or more precisely, the nominal value of futures markets was usually a multiple of the spot-market volume. Consequently, the pricing of a commodity became for the most part accomplished through futures trading, namely through the 'future ends' of the good's market.

Different degrees of convenience for their participants explain the difference in market size. Futures markets were much more easily accessible than spot markets, attracting an enormous number of transactions that could not easily, or even at all, occur in a spot market. Participating in the spot market always involved the buying or selling, and consequently handling, of the actual commodity. In futures markets, however, investors could generally avoid handling the commodity itself, especially when both parties agreed to close out a maturing contract not by effective delivery of the good but by a cash settlement, in which the parties transferred the difference between contracted price and current price. This allowed either party to attend the spot market for buying or selling the actual commodity, without paying any more or less than stated in the futures contract. Convenient trading meant postponing materiality to the future.

Furthermore, trading on the future decoupled the volume of trade from the volume of material goods by adopting features of securities markets. In particular, the actual availability of a commodity did not limit the volume of a futures market, and capital requirements to take a market position were dramatically lower than in the spot market. Both the delivery of goods and their payment would occur in the future, so that, at the time of agreeing on a transaction, only the so-called margin had to be deposited with a third party. The margin was about 5–10% of the contract value, and its depositing assured that the losing party could not avoid paying the difference between contract and market price in a cash settlement on the day that the contract matured. In most cases, 5–10% proved enough to cover the price difference that actually emerged; in case the markets began to drift extraordinarily, an increase of the margin could be demanded.

While margins were initially deposited with third parties such as banks, commodity exchanges institutionalized the process with the establishment of clearing houses. Clearing houses were already used in banking and the railway business to settle accounts when the first clearing house for the coordination of futures trading was set up by the cotton exchange in Liverpool in 1876. Most other futures exchanges followed suit before the end of the century. The primary function of the clearing house was to aid the settlement of contracts, and to offset the different transactions in a futures market. All participants were required to engage directly with the clearing house: that is, any transaction between two parties A and B was split into two complementary transactions, between A and the clearing house, and between B and the clearing house. Both A and B deposited their margins at the clearing house, according to rules and instructions at the discretion of the exchange. Consequently, A was shielded from any potential default of B and vice versa.

The systems of margin deposition added security only insofar as futures contracts were settled by cash payments rather than actual delivery. In case a party defaulted on its contract, the clearing house never delivered (or took over) the commodity, but settled the contract in cash; in other words, it put the other party in a position to buy (or sell) the commodity in the spot market, if the party really intended to deliver or receive the commodity as specified in

the contract. However, because in almost all futures markets, only a few contracts were actually settled by delivery, and the vast majority of transactions ended in cashing in, or losing on, price differences, the clearing-house system was indeed a fitting and effective institution.

The almost exclusive focus on cash settlement instead of delivery might indicate that, while futures markets were highly attractive to speculators, they were of little use to actual vendors of the commodity. The standardization of futures contracts rendered them extremely inflexible, and most of the 'real' trading in the commodity could not be satisfactorily modelled on them. It would have been unfeasible to construct futures markets for all the established varieties of a good, as this would have resulted in a fractured, complex, confusing landscape of small markets with low liquidity. But the well-defined quality and grade specified in the contract meant that futures contracts could not encompass transactions in other varieties.

Activities in the futures markets were not purely speculative, however. Precisely because the futures markets had an extremely narrow focus on very specific varieties of a commodity, futures prices proved to be a clear-cut point of reference for all the trading in all comparable varieties of the commodity. The price currents' quotations from the seventeenth, eighteenth, and nineteenth centuries judged specific lots of a commodity to be sold and bought according to an ideal, average quality for which the prices were quoted. Similarly, futures markets could use the price of some standard quality as a basis, from which price differences with other qualities could be established. On the one hand, futures and spot markets were interrelated (with the pricing of the futures markets dominating); on the other, prices for different lots of a commodity (each positioned somewhere in the field of different comparable varieties and qualities) also moved in unison to a certain extent. So the spot and futures prices generated at the commodity exchanges for a very specific form of a commodity could act as an extremely well-defined, highly visible representative for a more or less stable price structure spanning both time and the spectrum of different grades and qualities. In turn, expectations about changing supply or demand of the commodity as a whole found their way into the pricing of the very specific reference quality.

Futures markets were intimately connected with the underlying 'real' trade in the commodity, but at the same time they were clearly detached from it. Like securities markets on stock exchanges, they existed as a system of interrelated expectations and information that became expressed and circulated in a space of trading floors and telegraph wires. As such, stock and commodity exchanges became the focal points of telegraphic world markets. Futures markets for a specific variety of a commodity became both the standard point of observation for the entire market landscape of the whole commodity, and also the point where the joint system of futures and spot markets could be most effectively engaged with. Hence they provided an immensely important tool for those who bought and sold commodities effectively, especially if on a larger scale, over longer distances, and in the specific new setting of telegraphic markets.

Futures and telegraphs: navigating the space–time of global markets

Futures markets and telegraphy emerged largely in interaction with each other. The evolution of prototypical futures markets in grain and other agricultural commodities in

Europe coincided with the establishment of basic intra-European electric telegraph lines between the 1830s and 1850s.³⁹ Fully fledged futures markets for globally traded articles such as cotton, coffee, and sugar emerged in the late 1860s and early 1870s, concurrently with the establishment of transcontinental telegraphic communication. Cotton markets formed the vanguard. Markets for the other so-called ‘soft commodities’ followed suit in the 1880s. The demand for ‘instant’ business communication created by the trading at securities and futures exchanges incentivized the expansion of the system of electric telegraphy. For the telegraph companies, merchants were the most important customer group. More importantly, contemporary observers of the global economy felt that futures markets were an indispensable tool given the condition of telegraphic communication.

Cohn suggested that futures trading at commodity exchanges explicitly developed as an answer to the revolution in communication: ‘The substantial advancing of messages across countries (which in our days is progressing ever more magnificently due to the telegraph) has increased the speculative element in trading so decisively that it suggests that it has a form of realizing speculative intentions which corresponds to the electric speed of the reports and the combinations’ of news and opinions.⁴⁰ This form was the futures contract, which ‘left open only one thing: the price, which presents itself anew in constantly varying cyphers, moment by moment – almost an abstraction of the undertakings which only materialize long after the heat of the moment has gone’.⁴¹

Practitioners shared Cohn’s theoretical perspective on the development of futures trading. In 1882, a committee of the Senate of the State of New York held what were probably the earliest public hearings on the new phenomenon of futures markets. At the outset, legislators regarded futures markets as an opaque system of unproductive gambling and manipulating markets, to the detriment of society.⁴²

The secretary of the New York Cotton Exchange, George Edward Moore, argued instead that ‘this age of telegraphs and cables and quick communications between the various parts of the world has made this quick way of trading a necessity’.⁴³ He elaborated on why futures trading had become indispensable in the transatlantic cotton trade. Until the 1860s, steamships brought orders for cotton from Europe only once or twice a week. The order remained valid until further notice, so at least until the arrival of the next ship three to six days later. Thus the broker had a few days to ‘go through the market, examine the various lots offered and make his purchases of the lots best suited to his purposes and cheapest; but after the cable had been working for some time, the orders from abroad began to come in an entirely different form’.⁴⁴ Now potential European buyers knew about the current prices in

39 Daniel Headrick, *The tools of empire: technology and European imperialism in the nineteenth century*, New York: Oxford University Press, 1981; Pascal Griset and Daniel R. Headrick, ‘Submarine telegraph cables: business and politics, 1838–1939’, *Business History Review*, 75, 3, 2001, pp. 543–78.

40 Cohn, ‘Zeitgeschäfte und Differenzgeschäfte’, p. 382.

41 *Ibid.*

42 Document 45, ‘Testimony and report of the Special Senate Committee appointed to investigate the system of making corners and dealing in futures’, in *Documents of the Senate of the State of New York: one hundred and sixth session*, vol. 5, Albany, NY: Weed, Parsons and Company, 1883.

43 *Ibid.*, pp. 713–14.

44 *Ibid.*, p. 709. See also Fuchs, ‘Organisation’, pp. 114–15.

New York. They offered to buy a certain amount of a certain grade of cotton for a certain price, and demanded a quick answer: first two days, then one day, half a day, and finally two hours or less. Actually inspecting lots no longer seemed an option in this age of acceleration.⁴⁵ If the broker accepted the offer before examining a suitable lot, however, he ran the risk that the market appreciated during his search, making the transaction unprofitable.

The futures market – which in the case of the New York Cotton Exchange was set up in 1870 – offered a solution.⁴⁶ If the broker found the current futures price attractive enough to engage in the business, he instantly bought the cotton demanded from Europe in the futures market – or, rather, he bought the right to receive a delivery of a certain amount of cotton at some point next month for the contracted price, and he telegraphed his acceptance of the order to Europe. However, as New York futures contracts allowed sellers delivery of different grades of cotton (although the offer from Europe had asked for a specific one), and as the delivery date could be too far ahead to actually wait for it, the broker did not rely on the future delivery to meet the offer from Europe that he had accepted. Instead, Moore explained, the broker used the ‘old-fashioned’ way of trading. Just as before the Atlantic cable had been laid, the broker sought a suitable lot in the spot market. Once he found it, he immediately sold the same amount of cotton in the futures market as he had bought before, thereby offsetting the first transaction. Compared to the day when he had actually accepted the offer from Europe, the cotton prices could have changed markedly. If the price had increased, the broker needed to pay more for the actual lot than he had originally anticipated. However, he had also bought in the futures market when the prices were lower, and now sold in the futures markets at a higher price, making a gain. This gain would approximately offset the loss incurred from buying the actual lot at a higher price. One might say that the broker prevented his operation from becoming unprofitable by betting in the futures markets that it would become unprofitable – and winning the bet. Similarly, a decrease in price would mean a gain in the actual purchase of the lot, which again would offset a loss in the futures market. In both cases, unexpected gains and losses cancelled each other out, effectively eliminating the unexpected: the broker remained comparatively unaffected by market movements, after quickly accepting the offer from Europe. In their market behaviour, brokers easily switched back and forth between present and future, mixing both times.

In the case of the broker, the sale of a good became fixed before the buying was arranged. For merchants, the opposite was usually true: they bought goods without certainty about when, to whom, and for what price they would sell them. Here, as well, futures trading allowed the intermediary to buy time – only this time to organize the selling, not the buying. Siegmund Aron, a merchant from Königsberg who in 1875 published one of the first defences of futures trading from a practitioner’s point of view, gave an example that mirrored Moore’s case of the New York cotton broker. He imagined an importer from Bremen or Hamburg who received a friend’s telegraphic offer from New York to buy 2,000 barrels of petroleum, for a fixed price including freight and insurance: ‘The man from

45 ‘Testimony and report of the Special Senate Committee’, p. 709.

46 Lipartito, ‘New York Cotton Exchange’.

Hamburg or Bremen finds the offer enticing enough to engage the transaction, as the current price, at his place as well as the one in Stettin or Königsberg, for which he has yesterday's telegraphic price quotations of the exchanges, ... leaves him a sufficient gain, IF those prices are still THE SAME when the consignment arrives.⁴⁷ While prices in the present were stable, the arrival of material goods occurred at an uncertain point in the future. The importer could count on the dematerialized present price, but not on future delivery of material goods: 'Wind and weather, accidents at sea or in a port might postpone the arrival of the American shipment even beyond what is required by the distance between America and Europe anyway.'⁴⁸ So the importer covered the transaction at the futures market in the same way as the cotton broker, in order to buy time, wait for the consignment, and sell it, while being assured of the selling price in advance.

The cotton broker and the petroleum importer faced the same problem. Trading involved a pair of transactions (buying a lot and selling it again). One half of the operation was fixed in the present; the other half was open in the future. In both cases, futures trading allowed the investors to fix the price of the open transaction in the present as well, by mirroring the ongoing spot-market transaction in the futures markets. This is known as 'hedging': a fence is put around the open price to keep it from going anywhere.

For intermediaries, the main advantage of futures markets lay not in signalling the expected future state of the market but in two quite different features. First, transactions could occur at any time and with the utmost speed. In other words, as the futures markets were always buzzing, one could always find another person to trade with, and, thanks to standardized contracts and simplified procedures, this trade could be concluded very quickly. The speed of futures trading matched the telegraphic speed of the transatlantic market. Second, the futures market sufficiently shared the ups and downs of the spot market, so that it could be used as a vehicle to navigate through time – a vehicle that could be instantly boarded and left at one's own discretion because the market was so liquid.

The pair of transactions through space (buying and selling in spot markets) became accompanied by a pair of transactions through time, rearranging the sequence of events. The transactions occurred prior to the logistical preparation for these transactions: in other words, the buying and selling happened before finding a suitable lot to acquire or, respectively, a suitable customer. Present trading in futures postponed the interaction with physical goods to the future.

This rearrangement of time in trading had two consequences. First, the fast commercial rhythm of trading goods became ever more disentangled from the slower logistical rhythm of actually handling goods. This accelerated the trade in dematerialized information, leaving the trade in physical goods at its own speed. Both suited the logic of competitive business: while it was an advantage for traders to buy and sell as quickly as possible, in order to profit from opportunities before others, it was also an advantage not to be overly pressed in their actual handling of goods.

Second, the fixing of buying and selling prices at the outset of a pair of transactions relieved the intermediaries from price risks. This freed capital that would otherwise have to

47 Siegmund Aron, *Ueber Lieferungsgeschäfte und kaufmännischen Schwindel*, Berlin: Lüderitz, 1875, p. 19.

48 *Ibid.*

be retained to offset unexpected losses. Too many transactions at the same time bore the risk of uncontrollably accumulating losses. Futures trading, however, allowed investors to determine the profit of an operation at the outset, instead of discovering it only at the end. This allowed intermediaries to execute trade after trade immediately without waiting for the ongoing half of the two transactions of each operation to conclude. This contributed to the acceleration of business in yet another way, and it also resulted in an expansion of business. The commercial technique of futures trading, in other words, allowed intermediaries to turn the ability of the telegraph to accelerate the flow of information into the ability to expand, accelerate, and also steady the flow of goods.

It is hardly possible to determine (let alone quantify) the relative importance of different, interdependent factors that caused the late nineteenth-century global trade boom. Were steamships more important than railways, or was the telegraph more important than advances in the international monetary system? Still, it is at least worth considering the exact mechanisms that integrated different developments into the growth of world trade and the world economy. Lew and Cater proposed that the increased use of telegraphy expanded the volume of trade by enhancing the efficiency of shipping.⁴⁹ But telegraphy did not just change shipping practices. It also facilitated the growth of futures trading as a new way to commoditize time. In connection with futures trading, telegraphy enabled a potentially even more effective way of turning the increased speed of communication into an increased volume of trade.

The telegraphic system of futures trading in global perspective

This article has studied a system of commodities futures trading that coevolved with the system of accelerated, and ultimately telegraphic, commercial communication. This system of futures trading emerged in Europe and North America, and remained firmly in the hands of the European and North American commercial communities that organized it at different commodity exchanges. Organized time-bargaining, like futures trading, was not only a Western institution and concept, however, but emerged at different places from the seventeenth to the nineteenth century.

The most notable example outside European influence is the Dojima Rice Market in Osaka.⁵⁰ Osaka had developed into Japan's central marketplace for rice by the beginning of the seventeenth century. A system of warehouses emerged in which private merchants stored surplus rice. Local wholesale trading in rice occurred through buying and selling warehouse receipts, the so-called rice bills, to save transaction costs. When rice changed owner, it was not necessarily moved from its storage. To a certain degree comparable to the evolution of Chicago's futures trading in the 1850s and 1860s (which built on the circulation of elevator receipts), trading in unbacked rice bills and trading for the books to speculate on price

49 Byron Lew and Bruce Cater, 'The telegraph, co-ordination of tramp shipping, and growth in world trade, 1870–1910', *European Review of Economic History*, 10, 2006, pp. 147–73.

50 Ulrike Schaede, 'Forwards and futures in Tokugawa-period Japan: a new perspective on the Dojima rice market', *Journal of Banking and Finance*, 13, 1989, pp. 487–513; Mark D. West, 'Private ordering at the world's first futures exchange', *Michigan Law Review*, 98, 2000, pp. 2574–2615.

differences had emerged by the end of the seventeenth century. In the 1690s, the island of Dojima became the marketplace for this kind of trade. In 1730 the market was officially acknowledged and regulated by the authorities. By then, a continuous futures market had developed. However, the unbacked rice bills seem not to have emerged with that purpose in mind but as an instrument of credit, for rice had the properties of a currency in Tokugawa Japan. Apart from the creation of credit, the Dojima futures market served both to speculate on rice prices and to hedge inventories of rice, shielding them from future price movements during storage, but played no role in facilitating long-distance trade, let alone accelerating commerce.

The same appears to be true for early systems of futures trading in Europe itself. Such trading in different commodities from herring to coffee occurred in seventeenth- and early eighteenth-century Amsterdam; for the most part, however, these markets seem to have been fads, flaring up from time to time only when prices became more volatile, creating bursts of speculative activities, often bordering on gambling.⁵¹ Eighteenth-century practices of time bargains in peas and mackerel, for example, clearly qualified as pastimes of stock-jobbers during the off-season of the stock markets.⁵²

As these examples illustrate, a coevolution with commercial communication is not necessary for futures trading and similar practices to emerge. Two other factors contribute to establishing organized time-bargaining markets. Both of them are local, and thus unrelated to the commercial exchange with other, distant markets, though they still played a role – albeit minor – in the emergence of nineteenth-century telegraphic futures markets. The first factor is gaining credit and hedging inventories in a local warehouse system, such as those in Dojima and Chicago. The second factor is facilitating forms of speculation or even gambling, by (at least temporarily) detaching the transactions from the actual exchange of goods, as in the case of the European securities exchanges.

Regardless of whether such practices were more speculative or used to promote trade, whenever and wherever an organized system of futures trading or time-bargaining came under the public spotlight, the allegation that the practice qualified as an economically useless or even harmful instance of gambling was never far behind. The British authorities at the end of the nineteenth and beginning of the twentieth centuries, for instance, sought to curb vernacular forms of speculative trading in India, by denouncing them as demoralizing forms of gambling.⁵³ These included practices such as time-bargaining and trading in differences that had developed in the early and mid nineteenth-century grain and opium trades without developing into fully fledged futures trading.⁵⁴

In other instances, practices of time-bargaining seemed more in line with the economic interests of the authorities. Consequently, they were allowed or at least tolerated, even if often closely monitored. This was the case with the most prominent example of a futures market in the Islamic world, the cotton futures market of Alexandria. This developed

51 Jean Pierre Ricard, *Le négoce d'Amsterdam*, Amsterdam: Lucas, 1722, pp. 52–61.

52 Thomas Mortimer, *Every man his own broker: or, a guide to exchange-alley. In which the nature of the several funds, vulgarly called the stocks, is clearly explained*, London: Hooper, 1765, pp. 92–9.

53 Ritu Birla, *Stages of capital: law, culture, and market governance in late colonial India*, Durham, NC: Duke University Press, 2009, ch. 4.

54 *Ibid.*, pp. 152–3.

concurrently and with a view to Western cotton futures markets in the 1860s, when Egyptian cotton production became increasingly integrated into the world economy and internal and international telegraph connections had been established.⁵⁵ Despite waves of criticism, mostly worded in reference to Islamic law, the institution was left free to prosper until the mid twentieth century.

The Alexandria futures market was influenced to some degree by Western markets, but this brief discussion has shown that comparable practices of trading through time had emerged independently within commercial communities of different times, places, and cultures. There may have been more instances that occurred under the radar or were never written down. On some occasions, the practices became more continuous, abstract, and formalized. They turned into manifest systems of time-bargaining or even futures trading that sooner or later caught the wary eye of the authorities. There were many attempts to curb those practices and systems but, upon closer examination, almost any such attempt proved more or less fruitless, at least before the twentieth century.

Nevertheless, different degrees of acceptance for practices of trading through time might account for the fact that more elaborate systems of time-bargaining and futures trading only developed in certain societies. In an environment in which moral authorities were less opposed to those concepts, it might have been easier to put forward more intricate and publicly visible institutions and organizations for trading through time. Even in the case of Europe, the principle of such trading was positively at odds with two fundamental convictions. First, the principle usually created situations in which the seller did not own what he sold, and a buyer never wanted what he bought. This detachment of financial transactions from a ‘real economy’ triggered, and still triggers, a strong impulse of rejection in many people, as is evident from contemporary publications and press articles, and from various public hearings on futures trading that have occurred across Western countries since the 1880s. Second, the idea of buying time and rearranging sequences of events contradicted the theological view that time belonged to God, and only to God. This notion had been part of the opposition to interest rates, but applied to futures trading as well. However, this theological notion lost much of its sway in the nineteenth century, when it became effectively superseded by the commercial notion that ‘time is money’.

This latter notion might then be the decisive factor to explain why the elaborate telegraphic system of futures markets developed as a distinctly European project, driven by a motivation different from all other historic instances of time-bargaining markets. Recent research in global history has focused on the plurality of orders and norms of time, especially pointing to the tensions between vernacular concepts of time and the new Western concept of seemingly objective, dislocated uniform time, which was projected onto imperial contexts at the end of the nineteenth century.⁵⁶ What matters here is not the transition to uniform time, however – the telegraphic system of futures markets developed in the 1840s, well

55 Edward R. J. Owen, *Cotton and the Egyptian economy, 1820–1914: a study in trade and development*, Oxford: Clarendon Press, 1969; Ellis Goldberg, ‘Marketing commodities does not happen on commodity markets: the Egyptian Bursat Al-Uqud and oil futures markets’, in Clement M. Henry and Rodney Wilson, eds., *The politics of Islamic finance*, Edinburgh: Edinburgh University Press, 2004, pp. 81–103; Samir Raafat and Abbas Hilmi, *The Egyptian bourse*, Cairo: Zeitouna 2010.

56 Adam Barrows, *The cosmic time of empire: modern Britain and world literature*, Berkeley, CA: University of California Press, 2011; Ogle, ‘Whose time is it?’

before the concept of uniform time rose to prominence – but the fact that there were different orders and norms of time. Futures trading is all about price differences and time differences at a certain location, and also, in the case of telegraphic futures markets, about price and time differences between locations: it is conceptualized in terms of relative, not absolute, time.

Conclusion

The nineteenth-century Western system of commodity futures trading was unique, and different from the other instances of trading because it was conceived to accelerate business. This is true not only for the ultimate, telegraphic form of the system, for the decisive step was the transition from trading by samples to trading by words. While trading in samples is an instrument to ease and accelerate trade, it nevertheless preserves the fact that any transaction involves a specific lot of the good that is en route and will ultimately be delivered. Trading by word snaps this rubber band between transaction and actual good: if any lot of a specific commodity will do for delivery, then the action in the market becomes shockingly independent of the circulation of actual goods. The system of futures trading seemed to participants merely a tidy and efficient way to organize action in the market under these circumstances. For the system to work in principle, information needs to travel considerably faster than goods, which already happened in the Western world before telegraphy. Yet the telegraph then widened the speed gap between goods and information so much that futures markets, even with their bizarre features, seemed so promising and useful an institution that they were installed in many places after the marketplace there had been telegraphically connected to other important places.

Commercial acceleration became possible only under the conditions of wide-ranging market integration and telecommunication, and it depended on a specific concept of time held by the commercial community that began to think in the ‘double time’ of an informational present and a material future. Time had become a resource to use efficiently in the eighteenth century. The Franklin equation of time and money put both under the imperative of maximization, leading to the imperative of acceleration. Ultimately, this culminated in a capitalist business stripped down to a core nexus of money and time. The creation of futures made time itself a trade arena, in which money and information circulated, temporally detached from the actual circulation of goods. Prices and dematerialized information confronted market participants in the present, while physical goods and transportation became concerns for the future. Time, too, was subjected to commercial logic.

This logic, however, was not universally valid. It applied to the comparatively small community of futures market participants. Rather than eradicating middlemen, the telegraphic integration of global commodity markets centred them on the exchanges, and thus put market power in the hands of a relatively small group of merchants and investors, who had what it took to participate in the futures markets: sufficient financial and social capital, as well as a comprehension of this intricate and turbulent form of market. This integrated residents of metropolises with telegraph connections into the global economy, while ironically further separating remote producers (often in colonial territories) from taking part in the process of pricing their own goods. Finally, futures trading created greater

divides between Western and other markets, where the very concept garnered less attention. Futures trading, then, facilitated the emergence of different trading regimes that relied upon different interactions with time and technology.

Alexander Engel teaches at the Institute for Economic and Social History at Göttingen University. His research interests include the history of markets and prices, business and marketing history, globalization, and the history of knowledge and economic thought. He is currently working on a history of futures exchanges and risk in the nineteenth and twentieth centuries.