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From traders to planters: the evolving role and importance of trading companies in the 19th century Anglo-Indian Indigo trade.

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Abstract

Globalization in the late 19th century was driven by expansion of global commodity trades. These processes are predominantly explained as the result of changes in technology and policy. Less attention is paid to the trading companies undertaking these activities. To understand their importance in global trade this article examines their role in the significant Anglo-Indian indigo trade. It reveals they innovated their organization and structure of the trade to lower a range of transaction costs and improve market coordination, leading to an expansion in the trade. Explanations of globalization can be improved by accounting for the evolving role of trading companies.

Key words: Globalization, Indigo, Long-distance trade, Trading Companies, Transaction Cost Economics

Introduction

The first wave of globalization has been identified as a function of the rapid expansion of global trade in the second half of the 19th century (Daudi et al., 2010). Between 1870 and 1913, commodity markets became significantly more integrated, and trade accounted for an increasing share of global output (Findlay and O'Rourke, 2003). These outcomes have been explained as functions of dramatic improvements in transport and communication, and institutional developments related to changes in trade policies and tariffs (Jacks, 2006).

Whilst telegraphs and tariffs were important factors these explanations have tended to ignore or downplay the role of the actors who actually conducted global trade in the 19th century (Dejung and Peterson, 2013:1). Global commodity markets were coordinated by a range of intermediaries such as trading companies, brokers, agents, and auctioneers. They faced a wide range of market coordination problems. Distance between participants disrupted flows of goods, finance, information, and expertise. Trading companies played a crucial role in facilitating these flows. They acted as intermediaries, but also diversified to provide services such as banking, insurance, and shipping (Aldous, 2019; Dejung, 2018; Jones, 1998 & 2000).

These functions were crucial in coordinating markets. Further examination of the evolving role of trading companies can improve understanding of their importance in processes of 19th century globalization. In turn, this raises questions about the timing and causality of globalization proposed in the current literature.

This article examines the role of British trading companies in the production and marketing of Indian indigo, a major commodity trade in the 19th century. As a dye stuff indigo was an important component in textile production, and demand for it increased in concurrence to the growth in European manufactured textiles. A reduction in tariffs saw cultivation boom in Bengal, and by the end of the 18th century, India replaced the West Indies as the main source of Britain's indigo (Chowdhury, 1964). By the 1820s, growing demand saw indigo become India's most valuable export crop, and it remained amongst the highest valued British imports from India across the 19th century (Chaudhuri, 1971).

The Anglo-Indian indigo trade encapsulated many of the problems faced by participants in 19th century commodity markets. Separated by 10,000 kilometres, the distance between the main centres of London and Calcutta made market coordination difficult. Bengal's financial markets were thin, and racked by credit crises. Whilst the production of indigo was capricious, heavily dependent on weather conditions (Tripathi, 1980; Chowdhury, 1964).

To address these challenges trading companies, known as Agency houses, and indigo factory owners, known as planters (in the rest of the article these terms are used interchangeably), experimented and innovated both the organization of the trade and the method of production (Ray, 2011: Chapter 7). Various authors have described the changing role of the Agency houses in relation to indigo, noting how they evolved from intermediaries to diversify into banking and integrated into production (Chapman, 2004: Chapter 4; Singh, 1966; Webster, 2007: Chapter 3).

This article reassesses why the Agency houses diversified beyond their core intermediation activities. It addresses three questions: How did the structure of the industry change? How, and why, did the role of these trading companies evolve in response to these developments? How important were they in enabling the growth of the industry?

Analysis of these questions draws on Transaction Cost Economics (TCE), a widely used theoretical foundation for explaining industry organisation and the organisation of international business in both contemporary and historical settings (Carlos and Nicholas, 1988; Dye, 1994; Hennart, 1998; Williamson, 1992). The key proposition being that a transactions' characteristics determines how firms organize to undertake them. Transactions undertaken without the need of specific assets, and with low bounded rationality or threats of opportunism, will be made through the market. Conversely, transactions with high asset specificity, bounded rationality, and opportunism, will be internalised within the firm. Whilst contracting can provide an intermediate mechanism to govern transactions (Williamson, 1985: Chapter 3).

Analysis of trading companies' operations and organization can be made through the transactions they undertake. Pirrong (2014: 6-7) assigns contemporary commodity trading firms three key functions,

“transforming commodities in space (logistics), in time (storage), and in form (processing).” Van Driel (2003: 81) extended these transformative functions to include: Quantity, matching the volume of flows and transactions through coordination of buyers and sellers; Quality, by processing, assorting and screening, trading firm standardise and classify goods.

The simple purchase of goods to intermediate between buyers and suppliers indicates the predominant use of market transactions as this does not entail the use of specific assets. Yet, more specific assets may be required to perform functions related to logistics, storage, processing, and standardisation. The characteristics of the commodity and its supply chain shapes the nature of these assets and levels of uncertainty, bounded rationality, and opportunism. Jones and Khanna (2006) discuss how these factors motivated British trading companies to diversify and internalise various transactions, which led to the emergence of innovative organisational forms.

Importance is also attached to the role of trading companies in coordinating and controlling flows of finance and knowledge. Although information and finance can be acquired through the market, transaction costs can be high, whilst internalisation of such flows require investment in intangible assets such as human capital. The capacity by which trading companies could improve these flows is a significant factor in explaining both their development and the evolution of the markets in which they operated (Casson, 1998; Casson, 1997:3-6; Hennart, 1994; Jones, 2000: 3-8).

Finally, as global trade is underpinned by complex networks of contractual relationships, legal and political institutions that enforce contracts and property rights influence the characteristics of transactions (Dejung and Peterson, 2013: 1-12). The extent to which contracts can be enforced determines levels of uncertainty and opportunism. TCE analysis should, therefore, account for the role of actors in shaping these institutions (Williamson, 2000). This article considers the role and relative power of the British colonial state in defining the institutional framework under which the transactions for indigo occurred, and how institutional changes affected the roles of indigenous and British actors within the market.

To systematically identify the transactions in the production and marketing of indigo, an adapted form of commodity chain analysis is used (Hopkins and Wallerstein, 1986). This identifies the actors in the chain, the flows of products, finance, and information, and the ‘make or buy’ decisions encountered (Topik, et al., (eds) 2006; Hunter, 2005). This also shows the location of the costs and profits, and allows consideration of levels of uncertainty and opportunism in the chain.

The relationship between the various transactions and firms’ organisational structure is examined through a range of archival sources from three trading companies with extensive involvement in the indigo trade; John Palmer and Co., Gisborne and Co., and Ogilvy, Gillanders and Co. The analysis focuses on identifying organizational adaptations, such as diversification and integration, and examining the extent to which these responses lowered transaction costs. Due to the presence of multiple types of transactions and organizational responses, the analysis also considers the relative importance of different transactions in shaping these decisions.

The article finds that the trading companies evolved through diversification into banking functions, and vertical integration into indigo production. Through these processes they lowered multiple transaction costs, which reshaped and expanded a key global commodity market. Much of this innovation predated 1870, the often ascribed start of globalization’s first wave. This indicates that firm level factors were important in enabling the take-off in 19th century global trade. Market integration required improvements in market coordination and trading companies were critical to these processes.

The periodization of the article encompasses the rescinding of the East India Company’s (EIC) monopoly in 1813 and the emergence of private trade, and finishes prior to the take-off in the use of synthetic indigo in the last quarter of the 19th century, when the indigo industry in India slid into decline (Engel, 2012; Kumar, 2012). This encompasses a significant transition in the method of production around the 1860s, allowing for analysis of the effects on transactions and the organization of the trade.

Whilst the analysis of the article focuses on the Anglo-Indian elements of the indigo trade it is important to note that indigo was a global commodity, both in production and consumption. Imports into Britain came from other markets, particularly of Spanish and Dutch origin, and Indian indigo was also imported

via France (BA HC 2. 364 Report by John Richmond, November 1850). Conversely, Indian indigo was traded to other world markets; in 1830, 17 per cent of the total crop went to Europe, 5 per cent to the USA, and 9 per cent to the Persian Gulf. (BA HC 2. 255 Bengal Indigo Crops, their distribution, 1830-1848). Recent scholarship emphasises the importance of Non-British firms in the Indian economy, and other European trading companies and planters were active participants in indigo (Dejung, 2018; Lubinski, 2014 & 2015). However, Britain remained the dominant destination for Indian indigo, with its share of the crop rising from 69 to 79 per cent between 1830 and 1850. This trade was dominated by British firms and planters, hence the focus of this article (BA HC 2. 255 Bengal Indigo Crops).

The paper proceeds in three parts; first commodity chain analysis identifies the structure of the indigo industry and the key transactions undertaken by the trading firms, highlighting changes in the nature of production. Second, innovations in the organization and operations of the trading companies are identified. Finally, the paper discusses the key factors that encouraged integration, and considers how this analysis improves understanding of 19th century globalisation.

Indigo production and marketing after 1813

At the beginning of the 19th century the majority of indigo in Bengal was produced under the *ryoti* system. This was undertaken by thousands of peasants (known as *ryots*) who contracted with the European planters to deliver an agreed amount of leaves at a fixed price. The peasant provided all the means of cultivation, enabled through advances made by the planters. The indigo leaves were planted in December and harvested in June when the peasants brought the leaves to the factories.

Once the leaves were delivered to the factory the extraction of indigo dye commenced. This process involved packing the leaves into tanks and fermenting them with water to siphon out the dye, which was then dried and cut into 'cakes'. In 1831, an estimated 829 factories in Bengal were involved in the production of indigo, with a number of large firms and many small concerns often made up of a single factory (Ray, 2011: 223).

Quality was determined by colour and fixedness of the dye. Four main grades were used: ordinary, middling, good and fine. Although the differential in price between the grades fluctuated, better

qualities provided consistently higher returns (1833 Report from the Parliamentary Select Committee on Manufactures, Commerce, and Shipping; with the minutes of evidence, 133). To improve quality, however, planters needed to use better quality leaves, and invest in better facilities, machinery, and processes (Nadri, 2016: 36-60).

On completion of production the factory owners transported the indigo cakes to Calcutta for sale at auction.¹ By the early 1820s this process was mainly conducted by specialised auctioneers and brokers. Firms such as William Moran and Co. coordinated regular auctions and were responsible for determining the grades of quality of the different batches (Aldous, 2017; Roy, 2014: 34).

In the period between 1830 and 1850, the majority of indigo exported to Britain was purchased by 30 or so trading companies in Calcutta (BA HC2 259, Comparative details of the Indigo harvest 1840/41 and 41/42.). The trading companies stored, and arranged for the indigo to be shipped to Britain, where it was received by a similar number of counterparties (BA HC2 2.142 Indigo report Nov 29th 1837, List of unsold Indigo in the hands of importers). These firms arranged for storage and distribution to wholesalers through sales by specialised brokers and auctioneers. A proportion of the imports to Britain were also re-exported for sale in Europe and elsewhere.

Costs and profits in the ryoti system

As shown in table 1, the costs of planting, cultivating, and harvesting the leaves were borne by the peasants. Cultivation accounted for around 36 per cent of the total costs per finished maund. The *ryots* extracted 11 per cent of the total profits, but this was split between many individuals. It was generally estimated that each peasant would make a surplus of 13 annas per maund (there were 16 annas to the rupee) through each harvest cycle.

The costs of the production process included fixed investments in the factory assets and related financing costs, as well as the annual variable costs which consisted of wages and resources used in production. The planters also had to ensure that the finished indigo cakes reached the auction in

¹ At auction indigo was sold in units known as maunds. A maund was a unit of weight that had various definitions around India. In this paper the 'bazaar maund' has been used which equated to around 83 lbs or 37.6 kg.

Calcutta, incurring transport costs and brokerage fees. These accounted for 44 per cent of the total costs, and in return the factory owners received 46 per cent of the profits. The planters' profit margin was around 30 per cent; potentially a good return.

Relatively small fixed investments were required to set-up an indigo factory. This was required for infrastructure, including the vats, drying rooms and equipment such as water pumps, steam engines, and presses. Although the buildings required little maintenance the machinery needed repair and replacement, and could be upgraded to improve quality (Prakash, 2004: 32-33). A factory capable of producing 500 maunds per annum would require an investment of around Rs. 11,500 or just over £1,000 (Ray (2011: 226-227). The potential profits, and low start-up costs, explain the large numbers of European planters who entered the sector in the early nineteenth century. Based on table 1, however, variable costs amounted to Rs. 55,000 (£5,500) per annum for 500 maunds. Start-up costs may have been low, but substantial working credit was required.

The trading companies purchased the indigo in Calcutta and had to bear the remaining costs of getting it to auction in London. This accounted for roughly 20 per cent of the total costs, made up from storage, shipping, tariffs, insurance, and brokerage fees. For this relatively small sum, the trading companies received around 43 per cent of all the profits generated through the chain.

The split of costs and profits apparently favoured the trading companies, who with minimal input could obtain a significant proportion of the profits. The *ryots* provided all the means of cultivation and stood to generate a small surplus. Likewise, the planters had to undertake two significant transactions, making advances to the *ryots* and coordinating the sale in Calcutta, whilst investing in the fixed assets of the factory and financing the annual variable costs. In a good year there were profits to be made, but a bad harvest, or oversupply in the market, could easily bankrupt factory owners who often had large outstanding debts (Roy, 2011).

Table 1. Transactions and costs in the *Ryoti* system c.1835

Process	Actors and transactions	Costs	Profits
Indigo leaf cultivation (December)	Peasant cultivators	1 maund of middle quality leaves Rs. 51	
Harvest and sale of leaves (June)	Peasants to Factory owners	Price estimated at Rs. 66.	Profit to peasants is Rs. 66 - Rs. 55 = Rs. 11
Manufacturing of indigo cakes	Factory owners	1 maund: Rs. 66 (leaves) + 23 (fixed costs) + 10 (finance costs) + 34 (variable costs) = Rs. 133	
Transport to Calcutta	Factory owner	Freight costs: Krishnangar (area of highest indigo production in Bengal) to Calcutta Rs. 1.	
Public auction or private sale (September)	Brokers and auctioneers coordinating sales with the Trading Company	Rs. 180 for middling quality. Brokerage fees of 1% or Rs. 2 per maund.	Profit to Factory owner is Rs. 180 - 136 = Rs. 44
Storage	Trading Company		
Shipping to Britain (start to arrive around February)	Trading Company consign to corresponding firms	Insurance, freighting and storage estimated at 10% of the final London price: Rs. 25 per maund from the sale price of Rs. 249.	
Storage	Corresponding firms		
Public auction	Brokers and auctioneers coordinate sale to wholesalers	Rs. 249 middling quality indigo. Brokerage fees of 1% or Rs. 2.8 per maund.	Profit to the agency houses is Rs. 249 - 207.8 = Rs. 41.3
		Total costs Rs 148.8	Total profits Rs 96.3

Sources: BA HC2 188 170 and BA HC2 2.352, Chowdhury, *Growth of Commercial Agriculture*, Roy, *Indigo and the law*, Ray, *Bengal industries and the British industrial revolution*, Chilos, and Federico, "Asian globalisations: market integration, trade and economic growth, 1800-1938," Kumar, et al eds. *The Cambridge economic history of India*.

Table 2. Transactions and costs in the *Zerat* system c.1855

Process	Actors and transactions	Costs	Profits
Indigo leaf cultivation	Factory owner	1 maund of middle quality leaves Rs. 88.	
Manufacturing of indigo cakes	Factory owner	1 maund: Rs. 88 (leaves) + 23 (fixed capital investments) + 7 (finance costs) + 30 (variable costs) = Rs. 148	
Transport to Calcutta	Factory owner consigns crop to Trading company	Freight costs: Purnea (area of highest indigo production in Bihar) to Calcutta Rs. 1.8 by steam boat.	
Storage	Trading Company	Insurance, freighting, tariffs and storage costs estimated at 8% of the final London price: Rs. 17 per maund from the sale price of Rs. 219.	
Shipping to Britain	Trading Company		
Storage	Trading Company		
Public auction	Brokers and auctioneers coordinate sale to wholesalers	Rs. 219 middling quality. Brokerage fees of 1% or Rs. 2.2 per maund.	Profit to the trading partnership is Rs. 219 - Rs. 169 = Rs. 50.
		Total costs Rs. 169	Total Profits Rs. 50

Sources: BA HC2 188 170 and BA HC2 2.352, Chowdhury, *Growth of Commercial Agriculture*, Roy, *Indigo and the law*, Ray, *Bengal industries and the British industrial revolution*, Chilos, and Federico, "Asian globalisations: market integration, trade and economic growth, 1800-1938," Kumar, et al eds. *The Cambridge economic history of India*.

Changing to the *zerat* system of production

By 1860, it was estimated that 30 per cent of indigo production in East India was undertaken through the *zerat* system. This, subsequently, became the dominant mode of production (Ray, 2011: 224). There was little difference in the production method, which still required the harvesting of leaves and factory processing. This system was, however, entirely operated by planters who purchased or leased land for cultivation, directly hired labour, and subsequently undertook both cultivation and production.

The trading companies contracted loans with the planters, or directly invested in the factories themselves. Much of the indigo was owned by trading companies on leaving the factory gates and could be taken for direct sale in London, rather than purchased through the Calcutta auctions. Once the indigo was sold in London, the value of the loan, interest, and other commission fees were deducted and the remaining profit remitted back to the planter.

The widespread adoption of the *zerat* system is often explained as a result of the breakdown in the relationship between *ryots* and planters (Roy, 2011). The low margins available to the *ryots* encouraged them to take the advances for indigo leaves but switch to grow more valuable crops instead. When the leaves were not delivered by the *ryots* it left the planters severely compromised. This led to brutal efforts to compel fulfilment of the contracts, and in response saw violent protests erupt in 1860, known as the ‘Blue mutiny’ against the planters. It was claimed this led to the rapid breakdown of the *ryoti* system in Bengal, and the widespread adoption of the *zerat* system

Yet, other factors have been identified in driving a more gradual process of change. First, contract law remained problematic across the period. Enforcement through a mix of indigenous and British systems proved uneven and inconsistent (Roy and Swamy, 2016: Chapter 7). Roy (2011: 62) claims the problems of contracting between planters and *ryots* was the key factor in reshaping the industry. The choice between the production methods is described as a ‘make-or-buy’ decision, with the contracting (buy) *ryoti* system initially offering superior returns than the *zerat* (make) method, and thus preferred by the planters. Yet, problems in enforcing the contracts encouraged the shift to the *zerat* system as it functioned on directly employed wage labour and eliminated the problems of contracts and advances.

Second, access to Bengal and land ownership laws changed. The 'Permanent Settlement' of 1793 had enshrined property rights in Bengal for the *zamindars*; indigenous land-owners who tax farmed on behalf of the EIC. They sat at the apex of a complex agrarian hierarchy, eventually reaching down to the *ryots* (Swamy, 2011). European planters required a license from the EIC to operate in Bengal's interior and rights to land ownership were restricted. The planters were reliant on the *zamindars* to provide land and labour. The rights of the EIC to control access to India were, however, removed by the Charter Act of 1833. This allowed planters to freely settle and improved the security of property rights (Nadri, 2016: 178-179). This encouraged larger direct investments, and enabled wider use of the *zerat* system.

The integration of the cultivation process by the planters significantly changed the commodity chain and the transactions undertaken by the participants, as well as the distribution of costs and profits. The results of these changes are shown in table 2. The integrated cultivation process now accounted for 52 per cent of the total cost of a maund out of the factory, and the production process 36 per cent. The financing costs declined as the lower costs of credit were passed on to the planters through direct contracts with the trading companies.

Comparing the two estimates for 1835 and 1855, the cost per maund once it reached London for sale had increased, whilst the price per maund had decreased. The profits generated in London, however, increased from Rs. 41 to Rs. 54 per maund, as transaction costs were removed or lowered. The trading companies, once it had taken its repayments and fees ensured that much of this profit remained theirs. Yet, changes in the costs and financing of the industry increased the risks faced by the trading companies.

Financing the industry

British planters had two common characteristics: first the industry tended to attract individuals looking to 'get rich quick' and were devoid of capital. Second, those planters who were successful normally repatriated the profits to Britain (Kling, 1992: 228; Kumar, 2004: 26). Most planters were reliant on accessing capital and credit from external sources, whilst capital flowed out of India rather than allowing for local capital formation and subsequent reinvestment.

How, then, was the capital and credit required by the planters obtained? In early 19th century Bengal access to credit was limited. Although the Bank of Calcutta (subsequently the Bank of Bengal) had been launched in 1806, the scope of its activity was principally linked to funding the EIC. Whilst local credit systems were well-developed in various parts of India, they were predominantly absorbed by the agricultural sector (Kulkarni, 2002). Little credit was available for other sectors that functioned with different terms and lending structures. As such, these systems remained distinct from the European presidency cities.

Local sources of trade credit in the presidency cities was limited, and predominantly provided by local money lenders known as shroffs. It was relatively expensive, often bearing interest between 10 and 15 per cent, and almost solely short-term (Select Committee on Manufactures, 1833: 129-130). This encouraged the trading companies to take on deposit and lending functions, with deposits taken from resident Europeans and wealthy Indian families. The larger trading companies used the deposits to circumvent the local credit market, and they became the dominant source of credit, through advances, and capital, through longer term loans, to the indigo industry (Webster, 2005; 2007). In 1827, of the £2,000,000 required by planters for advances, £1,600,000 was provided by the six largest trading companies (Chowdhury, 1964: 83).

Around 1830, the banking system in Calcutta became an increasingly important source of short-term credit. The Bank of Bengal, and the newly-founded Union Bank, offered credit for indigo production through loans on the deposit of collateral in the form of indigo, or rights to crops (Bagchi, 1987; Kling, 1992). However, the rate of interest was volatile, ranging from 6 to 12 per cent throughout the 1840s and 1850s. In the case of the Union Bank, there were also a clear preference towards insider lending with large loans advanced to directors and large shareholders, and limited provision for smaller planters. Dependence on the indigo sector left the bank over exposed to fluctuations in price, which ultimately ruined the bank in 1847, further weakening Bengal's financial markets (Kling, 1992: 212-214).

The thin nature of the financial markets saw the Bengal economy racked by financial panics in the 1830s and 1840s. Structural weaknesses in the credit system in Calcutta, and overinvestment in the volatile indigo market led to the collapse of the principal Calcutta trading companies in the early 1830s.

This led to a local credit crisis which severely affected investment and trade for several years (Select Committee on Manufactures, 1833). Whilst the panic in British financial markets in 1847 saw contagion and failure amongst Calcutta's banks, including the Union Bank, and numerous trading companies (Bagchi, 1987: Chapter 6-8).

The limitations of Calcutta's financial system, particularly the slow and uneven development of local banking functions, encouraged the trading companies to look to external sources for cheaper, more reliable lines of credit. The interest rates in Britain were generally lower than in India (Bagchi, 1987: Appendix 7.1; Clapham, 1966: 429-432). Relationships with British-based trading companies gave access to the developed financial markets in London. Similarly, British Merchant banks, such as Baring Brothers and N.M.Rothschild and Sons, also provided short-term trade credit and longer-term funds for investment (Ziegler, 1988; Chapman, 1984: Chapter 2). These arrangements created a cycle of credit, with advances made to the trading companies in Calcutta, subsequently used to fund advances to the indigo industry, and goods including indigo consigned back to London. In this way, the trading companies remained central to the supply of finance throughout the indigo chain.

Key transactions in the indigo industry

The commodity chain analysis identifies four key transactions. First, the purchase of leaves between the planters and *ryots*. Second, the purchase of finished indigo between the planters and the trading companies. Third, the transactions for credit and capital throughout the chain. Finally, the effective coordination of the market required information on production, quality and prices to be exchanged between all participants.

The nature of these transactions was influenced by the physical, economic and political environments of Bengal. The harvest was dependent on weather conditions which led to high volatility in indigo production. Levels of production could double or halve within the space of a year, which fuelled periods of under and oversupply (BA HC 2 255, Imports, deliveries and stocks of East India indigo). This made coordination of supply and demand difficult, particularly amongst the geographically distant

participants, resulting in speculation and price volatility. This raised levels of uncertainty and created threats of opportunism throughout the chain.

The thinness of Calcutta's finance markets raised the cost of capital and credit, in part due to problems of asymmetric information created by the conditions described above. This increased the probability of defaults or opportunistic behaviour and subsequently raised transaction costs due to the need to screen, monitor, and enforce risky loans. (Hennart, 1994).

Weaknesses in the contract law regime affected all transactions as the participants had to negotiate contracts in the knowledge that enforcement was problematic, increasing the scope for default and opportunism. The problems of contracting affected the planters who potentially faced a hold-up problem when investments were made in facilities, machinery, and expertise to produce higher quality indigo. This increased the asset-specificity of the transaction and severely compromised the planters when high quality leaves were unsupplied. Similarly, the trading companies faced significant threats of opportunism if the planters failed to supply indigo or to pay back loans.

How did the trading companies respond to these challenges? By 1840, a stable number of around 30 trading companies in Calcutta, with a corresponding number of firms in Britain, coordinated indigo sales, between hundreds of producers in Calcutta and buyers in Britain. They fulfilled the established commodity trading roles of transforming indigo in terms of space and time, conducting the wholesale purchase, storage and shipping between Calcutta and London. Yet, the analysis shows that their role evolved beyond these functions in response to the challenges of financing the chain, and the shift to the *zerat* system of production fundamentally changed the structure of the industry. Detailed case studies reveal how the trading companies sought to lower transaction costs through a series of experiments and innovations with organizational and ownership forms.

Indigo traders as intermediaries

John Palmer and Co. (Palmer), was amongst the leading British agency houses between 1813 and 1830 (Webster, 2007). The firm had a range of trade interests in India, regularly purchasing sugar, cotton, textiles, indigo and opium. Initially, the majority of indigo transactions were made through the purchase at auction in Calcutta. Acting with a corresponding houses in Britain, Cockerell and Co. (Cockerell), much of this trade was conducted on behalf of the manufacturers for a commission percentage, although an increasing amount was made on their own account (Select Committee on Manufactures, 1833: 136).

The indigo was consigned to Cockerell who undertook sales in the UK. To coordinate these transactions the firms exchanged extensive amounts of correspondence with information on production, demand, and prices. Credit was also extended, and to manage these transactions each firm kept 'exchange accounts', which were periodically reconciled (Webster, 2007: 52). The balance was almost always in favour of Cockerell, the source of much of Palmer's credit and capital (BoL MS Eng Letter C90, 15th May 1820, Calcutta).

Palmer had to ensure remittances to pay down the balance. Bills of exchange were widely used, but the most secure, issued by the EIC, were limited in supply and the discount rate fluctuated (BA HC631, 24th November 1836). This incentivized the shipment of goods, with the revenue raised from sales in the UK used to rebalance the accounts. This often led to Palmer making indigo shipments in spite of adverse market conditions (BoL MS Eng Letter C90, 15th May 1820, Calcutta).

The other mechanism used to address challenges of local credit was to operate deposit banking functions. Holding deposits at interest meant Palmer needed to find investments that generated returns in excess of the rates paid out. The indigo sector was a prime destination (Select Committee on Manufactures, 1833: 134). Numerous loans were made to planters, with repayment primarily secured through the hypothecation of indigo crops.

The volatility of the harvest saw many defaults on the loans. In these circumstances, the factories, often used as collateral, were taken over by the lender. In 1829, Palmer was in direct possession of 22 indigo factories and a part-owner in a further 20 (Webster, 2007: Appendix 8). The factories controlled by the

firm accounted for 13 per cent of the total indigo crop produced in 1823, and 16 per cent in 1829 (Chowdhury, 1964: 83; Webster, 2005: 115).

The decision to diversify into banking can be explained by characteristics of the transactions for finance. In part, the high rates of borrowing reflected the costs of screening, monitoring, and enforcing loans, determined by the high risk of default and opportunism prevalent in the indigo industry. This incentivized efforts to reduce the transaction costs through organizational innovation. Initially, the larger trading companies were able to use their status and reputation in Calcutta to obtain better rates. Monitoring and enforcement costs for these firms were significantly lower than for individual planters.

However, borrowing costs remained relatively high and the recurrent nature of these transactions encouraged further innovation. One decision was for trading companies to internalise the transactions through the establishment of deposit banking operations. Taking deposits on fixed terms at an interest rate lower than those in the market, reduced costs and secured supply. Another was to access lower cost credit in London by leveraging the relationships with partner firms such as Cockerell. In effect, the firms contracted for the supply of credit.

Although providing much needed credit this system created significant problems for the trading companies, who now required capabilities to screen, monitor and enforce the loans to planters. They also had to coordinate assets and liabilities with different term structures. The loans and repayments were linked to the indigo season, whilst the deposits and their interest obligations were not. Synchronising these flows was challenging. Finally, they had to develop mechanisms for managing the relationship and flows of credit with the partner firms in Britain.

Explaining the integration into indigo production is more complex. Recurrent purchases and sales of indigo, were transactions initially undertaken through the market, using the regular auctions in Calcutta and London. As shown in the earlier analysis, this could be highly profitable and relatively low risk. To ameliorate the increased threats of uncertainty and opportunism caused by the distance between buyers and sellers, the trading companies developed networks of informants including planters, auctioneers,

and textile manufacturers, to secure access to information. These networks rapidly circulated information, allowing the trading companies to better coordinate supply and demand.

Why, then, did the firm integrate into production? This has predominantly been explained as an ‘accidental’ outcome of the credit system, with the trading companies reluctantly taking over the factories as their owners defaulted. Palmer certainly became a factory owner in this way. Yet, the scale of the firm’s indigo holdings is indicative of a more purposeful strategy.

Contemporaries identified three factors which complicated the use of the market and encouraged the trading companies to reconsider the governance of these transactions. First, the role of the firm as a distributor of credit increased liabilities. As noted previously, the loans held by the planters were difficult to monitor creating prime conditions for opportunism and default. Second, the importance of indigo went beyond its profitability as a trade product due to its use as a remittance instrument. Speculation in Calcutta could dramatically increase the cost of remittance at inopportune moments. Indigo stocks had to be secured to complete the credit cycles with British partners, and ensure future supply of credit. Third, the volatility of the production process increased uncertainty, and offered scope for opportunistic behaviour if actors chose to exploit information asymmetries in the chain (Bagchi, 1987: 125).

Integration could guarantee supply of indigo for remittances, offsetting some of the uncertainty inherent in the production process. Similarly, it removed the need to monitor and enforce the loans and subsequent opportunistic threats from the factory owners. The decision to directly own and manage factories did, however, result in a high level of exposure to a highly-volatile sector, and locked up growing amounts of capital. This left Palmer increasingly reliant on the external financing arrangements with Cockerell. Yet, the contracting arrangements between the firms were informal and dependent on personal relationships. In 1829, their interests diverged and Cockerell recalled their loans leaving an irrevocable hole in Palmer’s financing which resulted in bankruptcy. Whilst contracting offered a more robust solution to using the market for finance it came with challenges that required further innovation.

From traders to plantation owners, managers and agents

The vexed issue of financing, and the increased risks and costs caused by integration in the indigo sector were critical problems that successors to the Agency houses had to address. Firms including Gisborne and Co. (Gisborne), founded in 1830, and Ogilvy, Gillanders and Co. (Gillanders), founded in 1825, both entered the Indian market as agents importing British textile goods to India (Chapman, 2004: 84-85; GG 2749, The History of Gillanders: 5-6). Yet, like Palmer before them, the decision to provide credit to the volatile indigo sector resulted in ‘accidental’ integration into production (BA HC631, 6th June 1834; Gladstone, 1910: 93). Both experimented with organizational solutions to address the challenges of the transactions for indigo, finance, and information.

There were notable structural differences between these new entrants and the Agency house model. Gillanders was centre to a network of firms in key markets including Liverpool, Manchester, Calcutta and Bombay, linked together by partnership contracts and interlocking directorates. In the case of Gisborne, instead of working with a corresponding firm in Britain, an agreement was reached with the merchant bank Baring Brothers (Barings) (BA HC631, 31st December 1830; BA HC631, 19th October 1832). Gisborne received trade credit, whilst Barings used the relationship to trade on their own account for cotton and indigo (BA HC631, 13th January 1836).

Although accidental integration characterised their first forays into ownership, several organizational innovations were undertaken by both firms. In the late 1840s, Gisborne took a 20 per cent stake in the Tirhoot Indigo Company, a privately held multiple-shareholder firm comprised of five indigo factories operating under the *zerat* system (BA HC631, 20th March 1846). Barings provided annual credit and the season’s crop was hypothecated to them, the revenues paying down the loans (BA HC638, 19th July 1848).

A second attempt at direct ownership was a joint-venture between Gisborne and Barings, called the Ganges Indigo Company (BA HC631, 7th April 1853). Founded in 1853, it sought to operate Gisborne’s existing indigo factories more effectively by converting them into a fully-fledged indigo company (BA HC631, 9th May 1848). Again, Barings advanced annual credit to fund the venture.

It is clear from the ledgers and correspondence that Gisborne changed form and focus after 1855. The ledgers show a remarkably quick downturn in the size of the firm's trade accounts as they increasingly focused on the ownership and management of the indigo operations (BA Ledgers 1850, 1854, 1864 and 1874, Gisborne and Co. accounts).

Partners at Gillanders also sought solutions to the problems of direct factory ownership. The accidental takeover of indigo factories was a source of concern due to the risks of capital being locked-up, and that management of the factories was beyond the scope of the firm. A strong desire was professed to sell the factories, but the crisis of 1847 made a profitable exit impossible (GG 2714, 1873 Chancery Court Correspondence, 23rd October 1847). This stirred interest in finding ways to balance the risks caused by direct ownership. In particular, they sought an ownership structure that would allow the firm to pursue profitable opportunities in industries that required capital investment whilst retaining financial flexibility.

One option, discussed but not pursued, was to follow Gisborne and combine indigo factories into a directly owned multiple-shareholder firm (GG 2714 1873, Chancery Court Correspondence, 2nd November 1859). Alternatively, they considered offers to act as an agent for other indigo ventures. The scope of the agents' activities were legally contracted. The agent acted as legal secretary for the represented firm, and used their position in Calcutta to contract flows of credit, labour, and indigo. These arrangements often included the provision of managerial expertise to manage the factories. In return, the agent received annual fees, but also commission on sales and interest on loans. The agent often took a minority shareholding in the managed firm and a proportionate profit share (Lokanathan, 1935: 8-13). Beginning in the late 1840s, by the end of the 19th century, Gillanders had over 40 agency agreements in indigo (GG 2714 1873, Chancery Court Correspondence, 6th October 1852; GG 2749, The History of Gillanders: 93).

This experimentation with organizational forms can be analysed as efforts to lower a range of transactions costs. Access to information and credit remained critical. Both Gisborne and Gillanders utilised relationships in the UK to improve their capacity to coordinate these flows. These transactions

were, however, underpinned by formal legal contracts, securer arrangements than the informal relationships that defined Palmer and Cockerell's relationship.

Whilst these contracting arrangements eliminated the need for local deposit banking, the trading companies still bore the transaction costs and growing risks of financing the industry as they coordinated loans with the planters. These costs and risks were increased in the *zerat* system as the capital requirements for investments in fixed assets grew. The growing preference for direct ownership can be explained as a switch from intermediary to hierarchical modes of financing, in the form of direct equity investment in indigo factories and companies. The internalisation of these transactions reduced the costs of monitoring and enforcement (Hennart, 1994).

Transaction cost analysis also offers an alternative explanation for the transition to the *zerat* system. Integration removed two significant transactions, those between *ryots* and planters, and those between planters and trading companies. As discussed by Roy (2011), removing the first transaction can be understood as a response to the problematic contracting environment. Direct ownership of the land and employment of labour removed the need to enforce these contracts, reducing the potential for hold-up when planters choose to invest in more asset-specific assets to improve the quality of the indigo.

This development reflects on both the power and limitations of the British colonial state. Reforms to market access and the security of property rights reflected the growing power of the colonial state which enabled European planters to extend their operations within Bengal, and further afield, through direct ownership of land. Indeed, the integration of the factories and trading operations significantly reduced the influence of indigenous actors, as *zamindars* and independent Indian intermediaries were squeezed from the indigo trade. Yet, in part, these developments reflected the state's weakness due to its inability to embed a robust contracting regime, which incentivised the internalisation of transactions.

Removing the second transaction offered trading companies direct control over the production process. This potentially enabled economies of scale, particularly when factories were combined, but also offered better control over the quantity and quality of output (GG 2714, 1873 Chancery Court Correspondence, 2nd November 1859). Problems of market coordination could also be better addressed

through integration as it improved access to information, allowing better specification of the likely production for the season and subsequent impact on prices (BA HC638, 10th October 1848; GG 2714 1873, Chancery Court Correspondence, 6th October 1852). Internalisation, and the removal of both transactions, contributed to the reduction of uncertainty and opportunism throughout the chain.

Whilst efforts to lower transactions costs for finance led to the growth in direct ownership of production, and the challenges of contracting saw the prevalence of the *zerat* system, trading companies now had to grapple with increased exposure to the risky indigo industry. This encouraged further organizational innovations. In the 1840s and 1850s, the experiments with private multiple-shareholder companies, and joint-stock companies, were efforts to find mechanisms to deepen capital reserves and diversify risk in response to the new market structure shaped by the *zerat* system (Rungta, 1970: Appendix 8).

Yet local sources of capital, credit, and managerial expertise, required to manage these companies remained scarce. Individual planters or company owners continued to face high transaction costs, due to difficulties with monitoring, enforcement, and opportunism, when trying to access international markets for these resources. Yet, the trading companies could utilise their international networks to more efficiently access these markets and intermediate flows to the managed firms. This innovative hybrid organizational form combined agency contracts with joint-stock equity. It allowed trading companies to lower multiple transaction costs for critical resources. Equally it diversified risk and provided flexibility when integrating production and marketing functions. This became known as the Managing Agent system and it came to dominate the Bengal economy by the second half of the 19th century.

The result of these innovations in organization and ownership was a reduction in scale and volatility in the market. The total Bengal crop declined to an annual level of production of between 100,000 and 120,000 maunds throughout the 1850s. Trends in imports and consumption became more closely correlated, reducing the conditions of over-supply that bedevilled the market in the 1840s (BA HC2 188 170, BA HC2 2.462, BA HC 2.432.). The experimentation with business forms in the 1850s and 1860s can also be correlated to the wider expansion of the Anglo-Indian trade. In 1838 the total value of the trade was £22 million, by 1848 there had been little growth, yet by 1858 it almost doubled to £41

million, and in the following decade doubled again to £96 million (DSAL statistics section, No. 27 and 31 (1840–1865) and No. 18 and 24 (1860–69)).

Conclusions

The Indian indigo industry was characterised by the thin credit markets of Bengal, volatility in production, and reliance placed on indigo as a remittance instrument. These features raised transaction costs and caused problems in coordination, further complicated by the distance between buyers and sellers. Trading companies experimented with a full-range of governance mechanisms to lower transaction costs and improve coordination. This resulted in changes to organizational and market structures.

The shift from the disaggregated *ryoti* system of production to the integrated *zerat* system can be reassessed through transaction cost analysis. Integration strengthened control over production which reduced uncertainty, opportunism, and improved market coordination. The upstream integration did, however, create a more asset intensive business model with increasing capital intensity. The decisions to internalise required innovations in ownership and organization to diversify risk. This led to experiments with joint-stock ownership and the proliferation of the managing agent system, as innovations that reduced multiple transaction costs and diversified risk.

These findings show that trading companies fulfilled their expected functions, transforming goods in terms of space, time, and form, as well as matching quantities and sorting quality. As expected the coordination of information was also an important element of their role. What is notable in these findings is the critical influence of the thin capital and credit markets on the decisions to diversify and integrate functions. Indeed, the various organizational adaptations, both in terms of diversification and integration, can be readily explained as responses to lower the transaction costs for finance.

Similarly, the role of the state and strength of institutions in enforcing contracts affected the responses of the trading companies, and resulted in significant changes to indigo's market structure. Bayly (1983) identified the limited scope of European incursions into the Northern Indian economy in the 18th and early 19th centuries, with many aspects of trade and production remaining within the sphere of Indian

control. Yet, institutional changes and the responses of European actors to these opportunities and constraints in Bengal saw the emergence of different market structures. This strengthened the role of Europeans, whilst weakening those of indigenous actors by the middle of the 19th century. The relative power of the state is important in explaining variations in institutions and market structure over time and geography.

The adaptation and innovation of organizational forms shown by trading companies in the indigo trade also occurred in other global commodity chains in the second half of the 19th century. Yet, the market structure and role of trading companies in commodities such as cotton, jute, rubber, and tea, show distinct differences. Dejung's (2013) analysis of the Indian cotton industry found that a *ryoti* system of production persisted, and little vertical integration occurred. The characteristics of transactions varied due to differences in the nature of the product, system of production, availability of finance, costs of transportation, and legal and political institutions. These contingencies incentivized different organizational responses.

As such, the article makes no claims that indigo provides a generalizable account of change in 19th century commodity markets. Rather, it reinforces the utility of TCE as a theory with good explanatory power in identifying a rationale for change in the organization of trading companies and the structure of global commodity chains.

The processes highlighted in this article through which trading companies' adapted and reconfigured market structures to find new ways to create value conform to the patterns of evolution identified by Jones et al (1998). Across the 20th century, many trading companies followed pathways of integration into production, or fully diversified into services such as banking or shipping, whilst others continued to find profitable opportunities within intermediation. Far from being anachronisms, and exemplars of early modern forms of business, the adaptability of commodity trading companies such as Louis Dreyfus Company, Cargil Incorporated, and Glencore Plc., has seen them survive and thrive to this present day.

The importance of the trading companies' organizational experiments can be seen in their correlation with the take-off in the value of the Anglo-Indian trade in the 1850s. These early 19th century innovations in business ownership and organization predated many of the major changes in technology that affected the Anglo-Indian trade, such as the telegraph and Suez Canal, completed in 1870. The capabilities developed in the first half of the 19th century enabled trading companies to leverage the benefits wrought by the late 19th century transportation and communication revolution. Explaining patterns in the growth of global trade and market integration in the second half of the 19th century would benefit from accounting more fully for the role played by trading companies in improving market coordination.

Bibliography and Sources

Barings Archive (BA) HC2 Statistics of General Trade series and HC6 correspondence relating to Gisborne and Co. in the Indian subcontinent, Far East and Australasia series.

Bodleian Library (BoD) John Palmer's correspondence located in the Ms Eng Letters Series C68 – C126.

British Library (BL) Shelf mark OIR 954.14 ST 1216 CH Calcutta and Bengal Commercial registers.

Digital South Asia Library (DSAL), various series taken from the statistical abstracts relating to British India from 1840 to 1865, and from 1860 to 1869.

Glynne-Gladstone (GG) Papers related to Ogilvy, Gillanders and Co. and Arbuthnot, Gillanders and Co. located in the series GG 2548 – GG 2729.

HC 690 1833 Report from the Parliamentary Select Committee on Manufactures, Commerce, and Shipping

Aldous, M., Forthcoming. "Trading Companies." In *The Routledge Companion to Makers of Global Business*, edited by da Silva Lopes, T., Lubinski, C., Tworek, H. Abingdon: Routledge.

———. 2017. "Rehabilitating the intermediary: Auctioneers and brokers in the 19th century Anglo-Indian trade." *Business History* 59/4: 525-553

Bagchi, A., 1987. *The evolution of the state bank of India, Part 1 1806 – 1860*. Delhi: Oxford University Press.

Bayly, C., 1983. *Rulers, Townsmen and Bazaars: North Indian Society in the Age of British Expansion, 1770-1870*, Cambridge: Cambridge University Press.

Carlos, A., and Nicholas, S., 1988. "'Giants of an Earlier Capitalism': The Chartered Trading Companies as Modern Multinationals." *The Business History Review* 62 (3) pp. 398-419.

Casson, M., 1997. *Information and Organisation, A new perspective on the theory of the firm*. Oxford: Clarendon Press.

———. 1998. "An economic theory of the Free-Standing company." In *The Free-Standing Company in the World Economy, 1830 to 1996*, edited by Mira Wilkins and Harm Schröter. Oxford: Oxford University Press.

Chapman, S., 2004. *Merchant Enterprise in Britain: From the Industrial Revolution to World War I*. Cambridge: Cambridge University Press.

———. 1984. *The rise of merchant banking*. London: George Allen and Unwin.

Chaudhuri, K., (ed.), 1971. *The Economic Development of India under the East India Company 1814-58; a Selection of Contemporary Writings*. London: Cambridge University Press.

Chilosi, D., and Federico, G., 2013. "Asian globalisations: market integration, trade and economic growth, 1800-1938." *Economic History Working Papers, 183/13*. London School of Economics and Political Science.

- Chowdhury, B., 1964. *Growth of Commercial Agriculture in Bengal*. Calcutta: Quality Printers.
- Daudi, G., O'Rourke, K., and Prados de la Escosura, L., 2010. "Trade and Empire," in *The Cambridge Economic History of Modern Europe, Vol. 1, 1700–1870*. Broadberry, S., and O'Rourke, K., (eds.). Cambridge: Cambridge University Press.
- Dejung, C., (2018). *Commodity Trading, Globalization and the Colonial World. Spinning the Web of the Global Market*, Abingdon: Routledge.
- Dejung, C., (2013). "The Boundaries of Western Power. The Colonial Cotton Economy in India and the Problem of Quality", in: Dejung, C., and Petersson, N., (Eds.), *Foundations of World-Wide Economic Integration. Power, Institutions and Global Markets, 1850-1930*, Cambridge and New York: Cambridge University Press, pp. 133-157.
- Dejung, C., and Petersson, N., (Eds.), *Foundations of World-Wide Economic Integration. Power, Institutions and Global Markets, 1850-1930*, Cambridge and New York: Cambridge University Press, pp. 133-157.
- Dye, A., 1994. "Avoiding holdup: Asset specificity and technical change in the Cuban sugar industry 1899 – 1929," *Journal of Economic History* 54 (3) pp.628-53.
- Engel, A., 2012. "Colouring markets: The industrial transformation of the dyestuff business revisited," *Business History*, 54:1, 10-29.
- Findlay, R., and O'Rourke, K.H., 2003. "Commodity market integration, 1500–2000." In: Bordo et al. (Eds.), *Globalization in Historical Perspective*. Chicago: UC Press.
- Hennart, J-F., 1994. "International Financial Capital Transfers: A Transaction Cost Framework", *Business History*, 36(1) pp. 51-70.
- . 1998. "Transaction-cost theory and the Free-Standing Company", In *The Free-Standing Company in the World Economy, 1830 to 1996*, Mira Wilkins and Harm Schröter (eds.). Oxford: Oxford University Press, 1998.
- Hopkins, T., and Wallerstein. I., 1986. "Commodity chains in the world economy," *Review*, X (1) pp. 157-170.
- Hunter, I., 2005. "Commodity Chains and Networks in Emerging markets New Zealand 1880 – 1910," *Business History* 79 (2) pp.275-304.
- Jacks, D., 2006. "What drove 19th century commodity market integration?" *Explorations in Economic History* 43 pp.383–412.
- Jones, G., 1998. *The Multinational Traders*. Routledge: London.
- . 2000. *Merchants to Multinationals: British Trading Companies in the 19th and 20th Centuries*. New York: Oxford University Press.
- Jones, G., and Khanna, T., 2006. "Bringing History (Back) into International Business." *Journal of International Business Studies* 37(4) pp.453–468.
- Jones, G., and Wale, J., 1998. "Merchants as Business Groups: British Trading Companies in Asia before 1945." *Business History Review* 72 (3) pp.367–408.

Kaukiainen, Y., 2001. "Shrinking the World: Improvements in the Speed of Information Transmission, 1820–1870." *European Review of Economic History* 5 (1) pp.1–28.

Kling, B., 1992. *Partner in Empire: Dwarkanath Tagore and the Age of Enterprise in Eastern India*. Los Angeles: University of California Press.

———. 1966. "The Origin of the Managing Agency System in India." *The Journal of Asian Studies* 26 (1) pp. 37–47.

Kulkarni, A.R., 2002. "Money and Banking under the Marathas: Seventeenth century to AD 1848," in *Money and credit in Indian History*, Amiya Kumar Bagchi (ed.). Delhi: Tulika Books.

Kumar, P., 2004. *Facing competition: The history of indigo experiments in colonial India, 1897-1920*. Dissertation for Georgia Institute of Technology.

———. 2012. *Indigo Plantations and Science in Colonial India*. Cambridge: Cambridge University Press.

Lokanathan, P., 1935. *Industrial Organization in India*. London: George Allen and Unwin.

Lubinski, C., 2014. "Liability of Foreignness in Historical Context: German Business in Preindependence India (1880–1940)." *Enterprise & Society*, 15(4), 722-758.

———. 2015. "Global Trade and Indian Politics: The German Dye Business in India before 1947." *Business History Review*, 89(3), 503-530.

Nadri, G., 2016. *The Political Economy of Indigo in India, 1580-1950*. Boston: Brill.

O'Rourke, K and Williamson, J., 1999. *Globalization and history: The evolution of a nineteenth-century Atlantic economy*. Cambridge MA: MIT Press.

Pirrong, C., 2014. "The Economics of Trading Companies." *Trafigura*.

Ray, I., 2011. *Bengal Industries and the British Industrial Revolution*. New York: Routledge.

Rungta, R., 1970. *The Rise of the Business Corporation in India 1851–1900*. Cambridge: Cambridge University Press.

Roy, T., 2011. "Indigo and the Law." *Economic History Review* 64 (1) pp.60–75.

———. *India in the World Economy*. New York: Cambridge University Press, 2012

———. 2014. "Trading firms in Colonial India," *Business History Review* 88 (1) pp.9-42.

Roy, T., and Swamy, A., 2016. *Law and the Economy in Colonial India*. Chicago, Chicago University Press.

Singh, S.B., 1966. *European Agency Houses in Bengal 1783 – 1833*. Calcutta: Firma K.L. Mukhopadhyay.

- Swamy, A., 2011. "Land and Law in Colonial India" in Ma, D., and Luiten van Zanden, J. *Law and Long-Term Economic Change: A Eurasian Perspective*, Stanford: Stanford University Press), pp.139–157.
- Topik, S., Marichal, C., and Zephyr F., (eds.), 2006. *From Silver to Cocaine: Latin American Commodity Chains and World History*. Durham NC: Duke University Press.
- Tripathi, A., 1980. *Trade and Finance in the Bengal Presidency 1793–1833*. Calcutta: Oxford University Press.
- Van Driel, H., 2003. "The role of middlemen in the international coffee trade since 1870: The Dutch case," *Business History* 45 (2) pp.77-101.
- Webster, A., 2005. "An Early Global Business in a Colonial Context: The Strategies, Management and Failure of John Palmer and Co of Calcutta." *Enterprise and Society* 6 (1) pp.98–133.
- . 2007. *The Richest East India Merchant, the life and business of John Palmer of Calcutta 1767–1836*. Woodbridge, UK: Boydell Press.
- Williamson, O., 1981. "The Modern Corporation: Origins, Evolution, Attributes." *Journal of Economic Literature* 19 (4) pp.1537–1568.
- . 1985. *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting*. New York: The Free Press.
- . 1992. "Market, hierarchies, and the modern corporation," *Journal of Economic Behaviour and Organization* 17 pp.335-352.
- . 2000. "The New Institutional Economics: Taking Stock, Looking Ahead," *Journal of Economic Literature*, 38 (3) pp.595-613.
- Ziegler, P., 1988. *The Sixth Great Power: A History of One of the Greatest Banking Families, The House of Barings, 1762–1929*. New York: Knopf.