Monarchs, institutions, and the East Indies trade[*]

Dan Bogart[†]and Marco Del Angel[‡]

This draft, October 19 2019

Abstract

The role of the monarchy and institutional change in England's precious development is one of the most debated topics in economic history. We provide new insights by studying the trade of the English East India Company. Our key premise is that changes in the English monarchy shocked the quality of political governance when the monarch was unconstrained in the 1600s, but not in the 1700s when it was constrained by parliament. If that is correct then the growth of English East Indian trade should have been systematically different before and after changes in the monarchy, especially before 1700. We test this hypothesis using data on English Company and Dutch Company trade values and shipping decisions starting as early as 1601. The data show growth in English Company exports, shipping capacity, and ship exits were systematically different across monarchs before 1700, but not after 1700. Also pre-1700 differences were much larger for the English than the Dutch. The latter suggests that monarch changes mainly shocked the English Company and not all Companies in the East Indies trade. More broadly, our evidence shows the effects of monarchs differed greatly across institutional environments, and they mattered much less in the context where monarchs were constrained.

Keywords: Institutions, Expropriation risk, Investment, East India Company.

JEL Codes: N4, P1, L9

[†]Professor, Dept. of Economics, UC Irvine, Email:dbogart@uci.edu
[‡]Assistant Professor, Dept. of Economics, Cal State LA, Email:mmart129@calstatela.edu

1 Introduction

England's precocious economic development during the first industrial revolution is one of the most cited examples of how institutions matter for economic development. For example, in a text on why some nations fail Acemoglu and Robinson (2012) argue that England became rich because it had a Glorious Revolution in 1688 which transformed its politics and economics. Despite such claims, there is much disagreement on how to interpret English development. One view is that political governance was poor in the seventeenth century because the monarchy could not commit to secure property rights or sound fiscal policies. But then due to a series of political changes, like 1688, the monarchy became more constrained by parliament and hence property rights became more secure, fiscal policies were more sound, and the economy began to grow more regularly.[1] A second view argues that the monarchy played no direct role in England's development because its actions were irrelevant to most economic actors, who were well protected by Common Law. Institutional changes constraining the monarchy were of minor importance in this second view.[2]

These divergent views persist in part because scholars have not agreed on a good empirical test of the hypothesis that the monarchy or constraining institutions affected investments and innovation. In this paper, we provide a rigorous empirical test by analyzing how the shipping and trade of the English East India Company was affected by political shocks under different institutional settings. The English East India Company or EIC serviced all trade between England and Asia for over two centuries starting in 1601 and it played a pivotal role in establishing the British Empire in India. Besides being an important company in world history, the EIC is ideal for studying the effects of the monarchy and institutional change in England. Its operations spanned the reigns of more than 10 English monarchs between

---

[1]See North and Weingast (1989), Acemoglu, Johnson, and Robinson (2005), and Cox (2016) for three prominent studies making this argument.

[2]The studies by Clark (1996), Quinn (2001), Bogart (2011), Jha (2015), and Murrell (2017) all speak to the monarchy and risks to different economic actors.

1601 and 1833 and key events like the Civil War, the Restoration of the Monarchy, and the Glorious Revolution. Also the EIC was highly dependent on the monarchy up to the end of the seventeenth century. Through a royal charter, the EIC was granted a monopoly over all trade between England and Asia, meaning no other English trader could legally enter the market. The problem was that the monarch could renegotiate the terms of the charter without cause. The EIC's legal position changed profoundly in the wake of a fierce political conflict over its monopoly in the 1690s. Its charter gained formal recognition by parliament and was then better protected in law until its end over a century later.

The main premise of our paper is that changes in the monarchy shocked the quality of political governance when the monarch was unconstrained in the seventeenth century, but not later when it was constrained. As support there is evidence that some monarchs extracted from the EIC by demanding loans or presents in return for renewing or honoring the monopoly in the 1600s. Some monarchs also encouraged 'interlopers' to enter the EIC's market, making their extraction threats more credible.

Our empirical analysis studies whether the growth of EIC trade and shipping capacity was systematically different across monarchs. We build on Jones and Olken (2005)'s methodology for studying whether leaders matter. Their main idea is that the effects of leaders can be identified by comparing growth rates shortly before and shortly after leaders change. If there are systematic differences in growth rates then this provides evidence that leaders mattered. We implement this methodology by examining whether the growth of EIC exports, tonnage added, and the probability of EIC ship exit were significantly different before and after all monarch changes. We then study differences from monarch changes in the pre 1700 period versus the post 1700. We choose 1700 as our break point because the EIC's charter was protected by an act of parliament for the first time in 1698.

We also implement a difference and difference test using the Dutch East India Company as the comparison group. The Dutch Company, also known as the VOC, is a useful com-

parison group for several reasons. Political institutions were relatively stable in the Dutch Republic, despite facing substantial threats from Spanish and French monarchs. Reflecting this stability, the VOC gained formal recognition as a corporation in the 1620s and its charter was rarely challenged for most of its history (Dari-Mattiacci et. al. 2018). The EIC and VOC had broadly similar business models for most of their history. Both purchased silver and other precious metals in Europe and exported them to Asia, where they purchased imports like spices, tea, and cotton textiles, often in similar markets. Their imports were brought back to Europe and sold at a profit in domestic markets protected by monopoly grants. In order to conduct their trade both companies needed large and specialized ships. Here the companies differ in one aspect: the VOC built and owned the ships in its trade. The EIC leased most from individuals with an understanding that new ships would be hired for multiple journeys.

Our analysis starts with the business activity common to both companies: exporting goods (esp. precious metals) to Asia. Here we face some data limitations because EIC export values are available starting in 1660 and VOC export values are restricted to precious metals and omit manufactured goods. We first show that the level of EIC exports differed substantially in the years before and after the major transition from King James II to King William in 1688. In fact, there were zero EIC exports in 1691. Then we show that levels of VOC precious metals exports were unchanged across the 1688 transition. Furthermore, monarch changes after 1700 were associated with small differences in exports between the two companies.

Shipping offers better context to study EIC and VOC responses to monarch changes. First, the data is extraordinary rich starting with the first ships utilized by both companies. We create a new integrated database on individual ships using Sutton (1981), Bruijn, Gaastra, and Schöffer (1987), Farrington (1999), Hackman (2001). These published sources provide details on each voyage, including date of sailing to Asia from England or the Dutch

Republic and the date of return from Asia. We create a series for the tonnage of new ships sailing to Asia (or shipping tonnage added) in each month and year between 1601 and 1833 for the EIC and between 1601 and 1794 for the VOC. Our statistical tests indicate that EIC tonnage added differed significantly across monarchs and that the effect was much larger before 1700. It is possible that monarch changes affected all European companies in the East Indies trade, including the Dutch. If so that would cast doubt on the argument that monarch changes affected the political governance of the EIC. However, in our comparison of the two companies, we find that changes in the monarch had a much larger effect for the EIC than the VOC.

The last analysis focuses on ship's exiting the East Indies trade. First we show that EIC ships exited after fewer voyages in the 1600s compared to the 1700s. The high exit rate is not due to sinking or attacks from pirates or foreign navies. To study this issue, we create an outcome variable identifying whether the ship permanently exited the trade or sailed again. We also create a variable identifying whether a ship last returned to England one to three years before a monarch changed versus one to three years after a monarch changed. The last two variables serve as a pre and post exposure to monarch change. Using regressions that control for ship-level unobservables and number of previous voyages, we show that the probability of exit was systematically different before and after monarch changes pre 1700, but not post 1700.

The main contribution of this paper concerns the effects of the monarchy and institutional change in England's development. There is a huge economic history literature examining this issue and it has been the basis for developing broader theories of economic development (see Acemoglu and Robinson 2012). Nevertheless it is quite polemical and many well known economic histories of the industrial revolution have downplayed the role of the monarchy and institutional change (Clark 2008, Allen 2009, Mokyr 2010). We would argue that the economic importance of the monarchy and institutional change is still debated because

quantitative evidence has been limited. For example, there is no research examining the effects of political risk on firm-level investment, entry, and exit decisions in England during the seventeenth and eighteenth centuries. This paper provides such evidence, in showing that the exit decisions of firms directly dependent on the monarchy for their rights were affected by shocks to monarchy.

Our results are also consistent with scholars, like Jha (2015) who argue for the centrality of executive discretion in overseas trading companies. Jha (2015) argues that investors in overseas companies believed that executive discretion was contributing to expropriation risk. Their concerns were so great, they were willing to support a Civil War against the monarch. Our findings push this argument further by demonstrating that shocks to monarchy affected trading decisions for the most important overseas trading company.[3]

This paper also contributes to a vast literature focusing on East Indian Companies and their effects on the global economy.[4] A series of papers analyze the role of English politics in determining EIC's trading privileges (Sutherland 1962, Philips 2013, Bogart 2017) and studying its business and trading decisions (Chaudhuri 1978, 1993, Erikson 2014). Our paper adds to the literature in two ways. First, we digitize published sources on EIC ships and combine them existing databases, including VOC ships. Second, this paper is the first to empirically analyze the effects of the monarchy on EIC and VOC shipping and trade. We think their history provides more general insights because it reflects how institutional evolution affects political governance, specifically the enforcement of rights in organizations.

The rest of the paper is organized as follows. Section 2 provides more background on the EIC and its relations with the English monarchy. Sections 3 studies the effects of monarch changes on EIC and VOC trade. Section 4 does the same for shipping. Section 5 concludes.

---

[3]The history of infrastructure improvement companies like turnpike trusts and river navigation companies provide another example of how executive authority affected investment (see Bogart 2011).

[4]See Scott (1912), Chaudhuri (1965, 1978, 1993), Sutherland (1962), Horwitz (1978), Watson (1980), Desai (1984), Carlos and Nicholas (1991), Lawson (1993), Bowen (2005), Hejeebu (2005), Robins (2006), Webster (2009), Stern (2011), Philips (2013), Solar (2013), Erikson (2014), and Bogart (2017) for works on the EIC. See De Vries (2003, 2010), Rei (2011), Gelderblom et. al. (2013), and Dari-Mattiacci et. al. (2014) for comparative works, especially relating to the Dutch Company.

2   Background

The English East India Company or EIC was one of several European trading companies operating in the East Indies (i.e. modern day China, India, and Indonesia). They were all involved in a triangular trade, in which new world silver was brought to Europe, and then purchased as 'exports' to Asia. After arriving in Asia, approximately six months to one year later, the exports were sold and the proceeds were largely used to purchase 'imports', like cotton textiles, spices, tea and other goods.

In Asia and the wider European market, the EIC competed with Dutch, Portuguese, French, Danish, and Swedish East India companies. All were monopolies because the prevailing view was that trade between Europe and Asia required large fixed investments and scale economies favored a single firm or government provider (Chaudhuri 1978). Table 1 reports the total shipping tonnages bound for Asia for all companies in each European country. The Portuguese were the leaders in the 16th century. The Dutch leapfrogged the Portuguese in the early 17th century. The English emerged as well, but are in second place. From 1630 to 1730, English shipping tonnage grew, but its share of total tonnage falls. This was mainly due to the continued growth of the Dutch and the emergence of the French trade. The turning point for English trade was the mid-18th century. English tonnage grew faster at that point and was the clear leader in the 1820s.

Table 1: Asian Bound Shipping Tonnage Among European Companies

Period	English	Dutch	Portuguese	French	Danish	Swedish	England % of Total
1581-90	0	0	55,419	0	0	0	0
1631-40	31,179	63,970	20,020	3000	4000	0	25.5
1681-90	47,879	130,849	11,650	17,500	4000	0	22.6
1731-40	67,880	280,035	13,200	53,891	12,267	7,368	15.6
1781-90	228,315	243,424	8,250	130,490	63,461	0	33.9
1820-29	859,090	178,000		168,180	22,770	6730	60.0

Source: De Vries (2003, pp. 46-49), Solar (2013, p. 649).

The history of the EIC has been written from many different perspectives. Part of the

literature focuses on the role of the EIC within India with a focus on the rise of the British Empire.[5] The EIC's control over India began in 1757 with the Battle of Plassey. By the early nineteenth century it controlled most of the major ports and interior areas near major rivers like the Ganges. While the EIC's control of India was clearly significant, it will not be the main focus of this paper. Instead, we will focus on the business and trade aspects of the EIC and its relations with the English monarchy and parliament.

2.1   Background on business and trade

There is a substantial literature on the various markets in which the EIC operated.[6] Perhaps most famously, the EIC had a monopoly over all Asian goods imported to England and Wales between 1601 and 1813. It would have a monopoly over imports into Scotland after the early 1700s. For ease of exposition we call these English markets. Asian goods were defined as any products produced in economies east of the Cape of Good Hope and west of the Pacific, but principally India and China. Asian goods brought the EIC profits, estimated between 5 to 20% of nominal share capital in the mid-eighteenth century (Chaudhuri 1978). When the EIC's profits were high, there was an incentive for others to enter and indeed groups known as interlopers tried exactly that. In practice, interlopers should be denied entry into English ports by customs officers, but enforcement was not perfect. Moreover, interlopers were sometimes encouraged by the monarchy, which was a major source of contention for the EIC in the 1600s. The monopoly over Indian imports ended in 1813 and over the rest of Asian imports in 1833. Both of these changes occurred through acts of parliament and are discussed more below.

Exports from England were used to purchase goods in Asia. The only alternative was for the EIC to sell services, but this appears to have been more important after 1800. Using a combination of econometrics and archival records, Chaudhuri (1978) argues that EIC

---

[5]See Bowen (2005), and Stern (2011) for prominent examples.
[6]See Chaudhuri (1965, 1978, 1993), Watson (1980), Carlos and Nicholas (1991), Hejeebu (2005), Webster (2009), Solar (2013), and Erikson (2014).

directors set the level of exports with the aim of maximizing import revenues one or two years later. In particular, there is evidence directors used current prices of Asian goods in England to judge how valuable it would be to send more or less exports to Asia (p. 300).

Silver and other precious metals, collectively called treasure, were the most common export. The EIC would purchase treasure from suppliers in England. These markets appear to be competitive because there were many buyers. In fact, the EIC was consciously trying to find alternative sources of revenue. In particular, after the 1760s there was a shift to procuring treasure in India and using that to purchase additional Asian goods. While Indian tribute was important, exports of treasure and other goods from England continued to be high through the early 1800s.

In order to move goods and commodities between England and Asia, the EIC needed shipping services. Originally the EIC built its own ships. but from the mid 1600s it leased ships from private owners. The shipowners would hire the captain and crew and provision the ship.[7] In return, shipowners were paid a freight for each voyage based on the tonnage of their ship. There was an agreed upon return date to England, after which shipowners would be paid an additional fee for each day.

EIC ships were were generally larger than other ships in the English fleet and thus were not as economical in other trades. In fact, they were called 'East Indiamen' because of their distinctive size. This created a hold-up problem because EIC ships could not easily transfer to other trades. Several solutions were developed. First, shipowners were drawn from a narrow circle of large merchants, giving them extra bargaining power. Second many were large shareholders in the EIC. Third, as Chaudhuri (1993) notes there was an agreement that ships would be hired for multiple voyages, generally four. It does not appear that the multi-voyage agreement was specified in a contract. It also seems to be the case that shipowners could opt out prior to four voyages and leave the trade. It also appears the

---

[7]This policy was based on the view that outsourcing shipping services was more profitable to the trading company. This view may have been wrong however because its major competitor, the Dutch Company, generally owned their ships.

EIC could renege on the agreement to give four voyages. Thus it is best to think of the multi-voyage agreement between shipowners and the EIC as an implicit contract.

Each voyage in the Asian-European trade began with a departure from England. Ships generally departed England during the season which lasted from November to May. There was a main destination port in Asia, where the ship was supposed to deliver exports and pick up Asian imports. But ships would stop in other Asian ports to accumulate more imports. These extra stops would allow ship captains to engage in local trade, which represented a highly profitable side business for captains (Erikson 2015). Since captains were hired by shipowners, local trade was likely to be an important income source for the latter too. In some cases, it was so valuable that ships chose to remain in Asia, permanently engaging in local trade, rather than to return to the Asian-English trade.

EIC ships could encounter several problems while sailing, many of which were fatal. First, some ships were sunk or badly damaged by storms. Second, some ships were damaged due to errors by the captain and crew. For example, they might sail into a sand bar or rocks. Third, some ships were attacked by enemies and either taken or damaged beyond repair. The enemies could be pirates, rival companies, or foreign navies, most commonly the Dutch and French. Sinking by enemy attack was particularly problematic during wars between European powers and wars between the EIC and Asian polities.

2.2 Background on relations with the monarchy

The English monarch was the most important political actor for the EIC during its early history. Its monopoly over Asian imports originated with a charter from Queen Elizabeth in 1601.[8] The charter granted other valuable privileges, like corporate powers, rights to export silver, and assistance from the Royal Navy when needed. In return, the charter stated that the monarch had the right to collect special duties on East Indian imports. Importantly, the charter also allowed the monarch to void any provision with three years notice, simply

---

[8]For more details on the significance of the monarchy see Scott (1912), Sutherland (1962), Horwitz (1978), Philips (2013), and Bogart (2017).

if it was deemed not profitable to the current monarch, its heirs and successors, or to its realm (see Hill 1887 for details on the charters).

Several histories argue that monarchs in the seventeenth century extracted from the EIC by exploiting their authority over the charter.[9] The charter was renegotiated numerous times including 1609, 1657, 1661, 1669, 1674, 1677, 1683, 1686, 1693, and 1694. Some of these expanded the EIC's powers. For example, the new charter of 1657 helped to reformulate the EIC as a joint stock company. But, many repeated the provisions of previous charters and were accompanied by payments, new taxes, or loans to the monarch. We interpret these events as 'extractions,' in which the monarch was using its authority to cancel provisions of the charter. For example, the new charter of 1677 was accompanied by £150,000 in loans to Charles II, which represented nearly half of EIC import revenues in that year.

A key fact is that forced loans, new taxes, bribes, and interloper threats were more common in the seventeenth than eighteenth century. In the appendix we list all known forced loans, taxes, and bribes paid by the EIC to the monarchy from 1601 to 1760. We also list all the major interloper challenges or threats also up to 1760. The frequency of these events was highest from the mid seventeenth century to the early eighteenth century.

A second key fact is that several forced loans, new taxes and interloper challenges were made in the wake of executive power changing. Here we use the term executive power because some extractions occurred in the Interregnum (1649-1659) when the monarchy was abolished. The following are examples of forced loans occurring around major changes in executive power: (1) the loan to Charles I just before the Civil War in 1641, (2) the loan to the Long Parliament in 1643 just after the start of the Civil War, (3) the loan to the Council of State in 1659 just after the death of Oliver Cromwell, (4) the loan to Charles II in 1662 two years after the Restoration of the Monarchy. Examples of new taxes include the additional import duties imposed by King James II, King William, and Queen Anne shortly after taking the throne.

---

[9]See Scott (1912), Philips (2013), Bogart (2017).

The monarch's support or tolerance of interlopers was another tool of extraction. Several interlopers in the seventeenth century offered bribes to the monarch in order to gain market access. The monarch would then leverage these bribes to extract more from the EIC. The Glorious Revolution of 1688 is perhaps the best example of the link between changes in the monarchy and interloper threats. The Revolution saw the overthrow of King James II by William of Orange, who received the help of English elites hostile to James II's rule. As one consequence, several interlopers became influential in parliament. Starting in 1689, they lobbied the new King William to enter the East Indian trade and even to cancel the monopoly. Scott (1911, p. 150) explains that the treat was serious. "The [Glorious] Revolution of 1688 shattered the influence that [Director] Child had been building up during the previous seven or eight years. The position of the company had been made to depend on upon a sovereign now in exile...and many of the interlopers were exceedingly powerful in the convention parliament....it was rumored in the City as early as June 16 1689 that the Company was likely to be dissolved."

The interlopers were at first unsuccessful in gaining access to the market. The EIC was able to maintain its monopoly up to 1695 by making significant bribes to the monarch and government ministers. In 1697 the interloper challenge re-emerged when King William desperately needed a war-time loan. The EIC offered the King £0.7 million at 4% interest. An interloper syndicate offered £2 million at 8% interest with the expectation that they would get the monopoly. To put these figures into perspective, the net value of the EIC's assets were a little over £1 million in 1695, and its annual exports plus import revenues were approximately £0.5 million.[10] King William accepted the larger offer of the interlopers, and, by an Act of Parliament in 1698, monopoly rights over the trade were given to a 'New' East India Company. However, the 'Old' EIC began a successful lobbying campaign to re-establish its trading rights. Early in 1702, King William approved a merger between

---

[10]Assets and liabilities are taken from Scott, Constitutions and Finance, (1912 Vol II, pp. 123-128, 177-179). Chaudhuri (1978) provides data on export and import revenues, which together I define as sales.

the New and Old Companies. The merger took several years to implement and was only finalized in 1709 following an EIC loan of £1.2 million to Queen Anne.[11]

The conflict over the monopoly in the 1690s led to important institutional changes concerning the EIC's charter. At issue was whether parliament needed to sanction a monopoly in order to be legal. Powerful parliamentarians argued strongly for this view in the 1690s and they were ultimately successful. In 1698, Parliament sanctioned the East India monopoly for the first time when it established the New East India Company. In 1712 another act of parliament stated that the monopoly would last at least until the year 1733. Several more Acts in the eighteenth century would extend the monopoly to longer terms. These legal developments, starting around 1700, had two important consequences. First, the monarch could no longer unilaterally threaten to end the EIC's monopoly as in the seventeenth century. Now the monarch would need to gain the consent of the House of Commons and House of Lords. Second, if the law was followed, the EIC monopoly could only be ended when its charter was set to expire. This restricted the ability for the monarch or parliament to renegotiate opportunistically.

The EIC's trading monopoly proved to be very secure for the rest of the eighteenth century. The monopoly over Indian trade lasted until 1813 and for all other Asian markets until 1833. Importantly, these years coincided with the expiration of the EIC's charter as defined by acts of Parliament. At these moments, the monarchy and its government still mattered, but their actions were conditioned by the rule of law. The details behind the charter act of 1833 is informative in this regard.[12] In 1829 the government, led by the Duke of Wellington, signaled an interest in ending the China monopoly when the charter expired. Then King George IV died in June 1830, leading to the formation of a new government under Lord Grey. The new government under Grey worked with its majority in the House of Commons to pass a bill ending the EIC as a commercial body.

---

[11]For a full discussion of events after the Glorious Revolution see Scott (1912, pp. 150-189).
[12]This case is discussed by Phillips (1961), Webster (2009), and Kumagi (2012).

3   Monarch changes and EIC trade

The key premise of our analysis is that changes in the monarchy represented an important shock to political governance in the unconstrained institutional context of pre-1700, but not in the constrained context post-1700. We now test whether the EIC's trade and shipping were influenced by the different institutional contexts in England and also whether the EIC responded differently than the VOC which operated in similar Asian markets but with a stable institutional setting for most of its history. As a first step we use simple model to illustrate how changes in the monarchy could influence the level of exports. As noted above, exports were one of the main factors influencing EIC's trade by partly determining the amount of imports purchased in Asia. The expected risk of extraction will be the key channel linking changes in the monarchy and exports. Later we will discuss another channel: the threat from interlopers.

It is useful to first define some notation. Let x_t be the value of exports in year t and assume through its trading process, the EIC brings back $f_{t+1}(x_t, \theta)$ imports in year $t+1$. The function f_{+1} is similar to a production function. It increases in exports and the elasticity w.r.t. exports depends on parameters represented by θ. Note that f_{t+1} could be subject to shocks like war. We ignore these for now, but they will be addressed in the empirical analysis. Asian imports are assumed to be sold in $t+1$. Suppose the expected selling price of imports in year t is p_{t+1}^e and that the EIC has no influence over this price. In reality, the EIC could influence the expected import selling price with its level of exports, but this feature is not crucial to our argument so it is ignored. The cost of obtaining exports is simply x_t, which means the EIC's expected pre-tax profit from exporting is $p_{t+1}^e f_{t+1}(x_t, \theta) - x_t$. EIC imports paid duties per the charter, but our focus is on new or extraordinary taxation. Suppose the EIC may have to pay a share of its revenues to the monarchy say because of a forced loan or a related threat from the monarch. For simplicity we will call the share τ the tax rate. The EIC does not know what tax rate will be in $t+1$ when the Asian imports

arrive for sale and therefore it has to form an expectation. Let τ_{t+1}^e be its expected tax rate in year t. Putting all these elements together the EIC chooses a level of exports x_t that maximizes expected 'after tax' profits: $(1 - \tau_{t+1}^e)p_{t+1}^e f_{t+1}(x_t, \theta) - x_t$.

The EIC's optimization problem has a well defined solution as long as $f_{t+1}(x_t, \theta)$ is continuous and differentiable in x_t, and if $f'_{t+1}(x_t) > 0$ and $f''_{t+1}(x_t) < 0$, which are the usual assumptions for a production function. The optimal exports $x_t^* = g(\tau_{t+1}^e, p_{t+1}^e, \theta)$ will decrease in the expected tax rate τ_{t+1}^e. Moreover, after tax profits can be negative if the expected tax rate is sufficiently high. Under those expectations, exports should be zero. With respect to the other variables, exports will decrease with a lower expected price p_{t+1}^e or any negative shocks to $f_{t+1}(x_t, \theta)$ operating through θ.

How will changes in the monarchy influence the expected tax rate? We suggest that changes in the monarchy marked a transition in the expected tax rate τ_{t+1}^e since monarchs differed in their type. For example, the EIC might believe the new monarch is less likely to impose an extraordinary tax, which would mean that exports should increase. The opposite could also occur. If the new monarch is believed to be more likely to increase taxes then exports should decrease. This leads to our main hypothesis: EIC exports grew at systematically different rates before and after monarchs changed.

Note that our hypothesis only applies to an environment when the monarchy was unconstrained. If the monarch could not exploit its legal power to claim a share of the EIC's revenues, then expected tax rates would be relatively similar across monarchs and hence exports should not systematically change with a monarch change. It is also worth noting that besides the tax rate, changes in the monarchy could affect other variables. If a change in the monarchy led to an increased interloper threat then greater competition for Asian imports could lead to a lower expected price p_{t+1}^e and hence a similar decline in exports. Therefore our theory linking changes in the monarchy to exports encompasses several channels.

We test these hypotheses using trade data from Chaudhuri (1978) and Bowen (2005).

14

Chaudhuri (p. 507) provides an annual series on EIC export values from 1660 to 1760 and EIC import values from 1664 to 1760. The export values are reported separately for treasure, cloth, draperies, and lead. These series represent the quantity of goods purchased in England times the price paid in England. The imports values are also broken down by commodity. They represent the quantity of goods purchased in Asia times the price in Asia plus a mark-up which appears to be 10%. Bowen (2005) provides the same annual series for the EIC from 1760 to 1834. Bowen does not provide a series on treasure, but has separate series on silver, copper, and coin, which we combine to create a treasure export series.

As Bowen and Chaudhuri worked independently, it is important to check the comparability of their series. Chaudhuri and Bowen's export series share one observation in 1760. The figures are fortunately close. The import series do not overlap in time, but the numbers in neighboring years are similar. This gives confidence that a combined EIC series on exports and imports is suitable for econometric analysis. Also since there was a substantial inflation during the early nineteenth century, we use Broadberry et. al.'s (2015) GDP deflator to convert all export series into constant 1700 prices.

The series for EIC constant price export values between 1660 and 1832 is plotted in figure 1 in logs. The years with a monarch change between 1662 and 1830 are also shown (exact dates are given below). There is a noticeable drop in exports following the transition from Charles II to James II in 1685. But even more striking, there was an extraordinary drop in exports following the transition from James II to William in 1688 (i.e. the Glorious Revolution). In fact exports were zero in 1691 (for the figure we give a value of 1). What led to such a large drop? The history of the EIC suggests that the EIC faced severe political governance problems after the Glorious Revolution, which could have greatly reduced the incentive to purchase exports. That said, other factors might have been at work too. In 1686 the EIC's director, Sir Josiah Child, launched a war against the Mughal Emperor which lasted until 1690. The war was a disaster for the EIC and it might have disrupted

Figure 1: Monarchs and EIC export values in logs, 1660-1833

Sources: Authors calculations based on Chaudhuri (1978) and Bowen (2005).

trade for several years. Perhaps the drop in the late 1680s was the product of war or a general downward trend in growth. A methodology is need to identify the isolate the effects of monarch changes.

We build on the methodology developed by Jones and Olken (2005). They specify tests to identify whether national leaders mattered for economic growth in the post-World War II era. They develop a model, where leaders have some inherent quality that affects the growth rate. When the leader changes in a country, its economy gets exposed to a new governance quality. If the change in quality is large enough, then the economy's growth rate should change as a result.

Jones and Olken develop a test statistic to analyze quality. They estimate a country-level panel growth regression with indicators for t-k to t-1 years before a leader changed and indicators for t+1 to t+k years after. The test statistic takes the difference in post and pre indicators for each leader and country and combines them into a single test statistic.

We modify their test since we are examining a small number of leader changes. For each monarch m we define a pre-exposure variable Pre_t^m equal to one in the first and second years before a monarch change $(t+2, t+1)$. We also define a post exposure variable $Post_t^m$ equal to one the first and second years after a monarch changed $(t-1, t-2)$. These regression specification is shown in equation (1)

$$y_t = \alpha + \sum_m \beta_m^{pre} Pre_t^m + \sum_m \beta_m^{post} Post_t^m + \varepsilon_t \tag{1}$$

where $y_t = ln(exports_t/exports_{t-1})$ is growth in real export values. Notice that the year of the monarch change (t) does not have a variable in this specification. It captures the short-run or transitory effect of a change in the monarchy. The emphasis in this specification is on post and pre differences just outside of the immediate transition period. Towards that aim, we calculate test-statistics for the hypothesis that $\widehat{\beta_m^{post}} - \widehat{\beta_m^{pre}} = 0$ for each monarch change m and jointly across all monarch changes. We can interpret the absolute value of the difference $\widehat{\beta_m^{post}} - \widehat{\beta_m^{pre}}$ as the magnitude of the transition from monarch $m-1$ to m. If we reject the hull of equality of the post minus pre exposure variables, then there is evidence of a significant transition between monarchs. We are also interested in differences over time, especially around 1700 when the monarch became constrained. Therefore we also test for the joint significance of $\widehat{\beta_m^{post}} - \widehat{\beta_m^{pre}}$ in the pre 1700 and post 1700 periods. The main limitation of this analysis in the case of annual exports is the small number of monarch changes pre 1700. Also the pre period for the transition from James II to William (1686-87) is identical to the post period for the transition from Charles II to James II (1686-87). Nevertheless as exports as so important, the results are informative.

The coefficients on the pre and post variables are shown in table 1. The last column reports the post minus pre difference for each monarch and whether it is statistically significant. There is a large post pre difference from James II to William, indicating a longer-term transition in expectations surrounding this event. There are smaller but still significant

17

post pre differences following the transitions from Anne to George I and from George II to George III. Thus while James II to William marked the largest shift in EIC exports, monarch changes after 1700 were still significant.

Table 1: Pre and post effects for Monarchs and EIC exports

	Pre	(t+1 & t+2)	Post	(t-1 & t-2)	Post-Pre
Monarch change	Coeff.	(Std. Err.)	Coeff.	(Std. Err.)	
Charles II to James II, 1685	-0.245	(0.062)***	-0.271	(0.074)***	-0.026
James II to William, 1688	-0.271	(0.074)***	-1.537	(0.570)***	-1.266**
William to Anne, 1702	0.131	(0.079)*	0.049	(0.147)	-0.082
Anne to George I, 1714	-0.337	(0.084)***	0.066	(0.105)	0.403***
George I to George II, 1727	-0.068	(0.067)	-0.006	(0.108)	0.062
George II to George III, 1760	-0.379	(0.062)***	-0.013	(0.074)	0.366***
George III to George IV, 1820	0.000	(0.141)	-0.190	(0.062)***	-0.19
George IV to William IV, 1830	-0.281	(0.069)***	-0.254	(0.065)***	0.027
Constant	0.045	(0.062)			
F-stat all post pre diff.			12.17		
P-value			0.000		
F-stat post pre diff. before 1700			2.74		
P-value			0.068		
F-stat post pre diff. after 1700			15.32		
P-value			0.000		

Notes: The dependent variable is log difference in export values in constant 1700 prices. Newey West standard errors with 4 lags are reported. *, **, *** indicates significance at 10%, 5%, and 1%

While there is evidence that monarch changes were associated different growth in EIC exports, it is still not clear whether they were due to domestic policies like the likelihood of extraordinary taxation or interloper threats. One way of identifying domestic for versus international effect is to use the export series for the Dutch East India Company (VOC) as a comparison group. This strategy will be employed throughout this paper. Unfortunately, we only have the VOC series on precious metal exports between 1600 and 1795. This annual series comes from Bruijn, Gaastra, and Schöffer (1987). They report the invoice value of different metals in Dutch Florins. We used the exchange rate of 0.086 pounds to 1 Florin to make this series comparable to the EIC treasure export values which are reported in

Figure 2: Monarchs, EIC, and VOC treasure exports in logs, 1660-1833
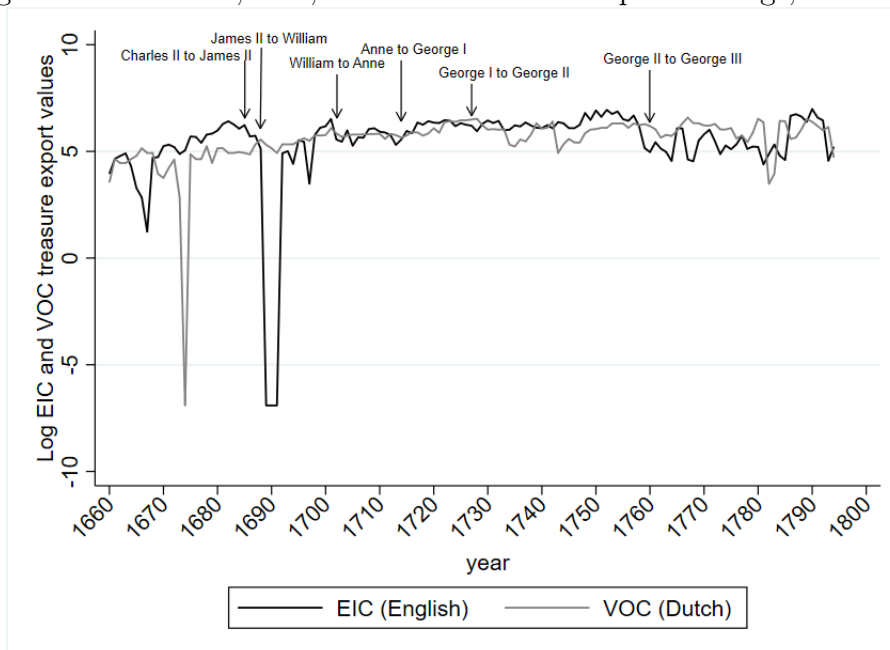
Sources: authors calculations based on Chaudhuri (1978), Bowen (2005), and Bruijn, Gaastra, and Schöffer (1987).

pounds.[13]

The annual value of EIC and VOC treasure exports between 1660 and 1794 are plotted in figure 2 in logs. The large decline in EIC treasure exports between 1689 and 1691 is striking. In those years EIC treasure exports were zero. The VOC exported a normal amount of treasure in those years indicating that it did not experience the same shock following the Glorious Revolution. The VOC exported zero treasure in only one year 1674, which coincided with the end of the Third Anglo Dutch War.

We now use the differential growth of EIC and VOC treasure exports around monarch changes to identify the effects that were specific to EIC. The specification is the following

$$y_{it} = E_i + \sum_m \beta_m^{pre} Pre_t^m + \sum_m \beta_m^{post} Post_t^m + E_i * (\sum_m \lambda_m^{pre} Pre_t^m + \sum_m \lambda_m^{post} Post_t^m) + \delta_t + \varepsilon_t \qquad (2)$$

[13]We use the Historical Currency convert, http://www.historicalstatistics.org/.

where the index i refers to EIC or VOC and $y_{it} = ln(treausre_t/treasure_{t-1})$ is the log difference in treasure exports. E_i is an indicator for the EIC observations and it enters alone and interacted with the pre and post indicators. Finally, δ_t are fixed effects for each decade, which allows for the possibility of medium term cycles in growth rates common to both companies. In this specification, we calculate test-statistics for the hypothesis that $\widehat{\lambda_m^{post}} - \widehat{\lambda_m^{pre}} = 0$, which captures the differential growth in treasure exports for the EIC versus the VOC. Note this regression includes only 6 monarch changes because the VOC data ends in 1794.

The results are shown in table 2. In magnitudes they are similar to the specification focusing only on the EIC. For example, they show the largest quantitative effect from James II to William transition. However, the differences pre-1700 are not statistically significant, perhaps due to the small number of observations. The only statistically significant transition occurs from George II to George III. We now turn to an analysis of EIC shipping where there is arguably better data to test for transition effects, pre and post 1700.

Table 2: Pre and post effects for Monarchs: contrasting EIC versus VOC treasure

	Pre	(t+1 & t+2)	Post	(t-1 & t-2)	Post-Pre
Monarch change	Coeff.	(Std. Err.)	Coeff.	(Std. Err.)	
Charles II to James II, 1685	-0.317	(0.204)	-0.572	(0.359)	-0.255
James II to William, 1688	-0.572	(0.359)	-5.928	(4.079)	-5.356
William to Anne, 1702	-0.086	(0.256)	0.147	(0.327)	0.233
Anne to George I, 1714	-0.499	(0.264)*	-0.100	(0.282)	0.399
George I to George II, 1727	-0.125	(0.220)	0.058	(0.335)	0.183
George II to George III, 1760	-0.867	(0.283)***	0.234	(0.365)	1.101***
Constant	0.045	(0.062)			
F-stat all post pre diff.			2.55		
P-value			0.020		
F-stat post pre diff. before 1700			1.32		
P-value			0.270		
F-stat post pre diff. after 1700			3.17		
P-value			0.014		

Notes: The dependent variable is log difference in export values in constant 1700 prices. Newey West standard errors with

4   Monarch changes and EIC shipping

If changes in the monarchy affected EIC exports then they should also affect the shipping services demanded by the EIC. The margins of adjustment were a little different because ships lasted several years and the EIC generally promised to employ ships for multiple years. In this section, we study how changes in the monarch affected the amount of shipping tonnage added and the probability that ships exited the trade.

The analytical framework for shipping is similar to that for exporting. We assume s_t is the amount of new shipping capacity added in year t and that $zs_t = x_t$, where z is the amount of exports delivered by each ton of shipping. That implies imports delivered by a newly hired ship in a future period $t + k$ are $f_{t+k}(zs_t, \theta)$. Suppose further that the EIC pays the shipowner a per ton rate r every time the ship sails. Therefore the cost to the EIC is rs, where $rs_t = (r/z)x_t$. If ships operated for only a single year, then in theory the decision to hire one more unit of shipping capacity is isomorphic to the decision to purchase one more unit of exports. Building on this insight, we can generate predictions even though ships lasted several years. Suppose the EIC could commit to the freight rate it paid to shipowners in all future periods, and that expectations about prices, taxes, and trading in year t are the same as in all subsequent years over the life of the ship. Then all of the previous theoretical results concerning tax rates and exports apply to hiring new shipping capacity as well. The yields one hypothesis: the EIC will add more or less new shipping capacity after the monarch changes because this event implies different expected tax rates.

Naturally the political and economic environment did not stay constant over the lifetime of a ship. If the monarch changed and expectations were altered then the EIC may want to renege on its agreement to hire the ship for future seasons, or at the freight rate initially

21

agreed upon. To illustrate suppose ships live for two periods and just before the ship is to sail the second time, expectations change such that the EIC expects to lose money in the second period: $(1 - \tau^e)p^e_{t+1}f_{t+k}(zs_t, \theta) - rs_t < 0$. The EIC might insist on paying a final freight rate no more than $\bar{r} = (1 - \tau)p^e_{t+1}f_{t+k}(zs_t, \theta)/s_t$ which is less than r. If the new freight rate $\bar{r}$ is less than the outside option for the shipowner, then the latter should exit the trade.

There is another possible channel affecting exit which involves monarch changes, interlopers and the side profits shipowners earned from local trade in India. Suppose monarch changes led to increased entry by interlopers and that more interlopers reduced the local trading profits of shipowners. That would mean that shipowners would be more likely to end their trading agreement with the EIC and exit the trade when the monarch changed. this leads to another hypothesis: monarch changes may lead to a different probability that individual ship's exit the trade.

We test these hypotheses concerning shipping by constructing a new data set. There are three published works detailing the histories of most EIC ships: Sutton (1981), Farrington (1999), and Hackman (2001). All three have some useful information. Farrington (1999) lists departure and arrival dates for 1,484 ships in the service of the EIC between 1601 and 1834. Data is given on when each ship departed England on its first voyage and when it returned to England. If the ship had subsequent voyages, Farrington generally records the departure and return dates in England for all subsequent voyages. However, in some cases Farrington does not record a ship's return to England and does not explain why it did not return.

Hackman's (2001) information is similar to Farrington, but it is especially detailed on the reasons for ship exit. Hackman identifies whether ships were sunk or lost due to weather, accidents, or attacks by foreign navies, pirates, and privateers. Hackman also often records the owners and whether a ship was scrapped or whether it transferred to another trade or

remained in India. Unfortunately, Hackman is only detailed on ship ownership and ship transfers to other trades after 1708, so it cannot be used to assess the 17th century.

Finally Sutton (1981) is less detailed than the other sources on voyages. Sutton identifies only the first and last sailing season for each ship. But Sutton provides an estimate of tonnage for nearly every listed ship. This is not always the case in Farrington or Hackman.

The starting point for our analysis is Farrington's list of 1,484 ships in part because it is very detailed and has been used by previous scholars like Erikson (2014).[14] After dropping 161 ships whose first departure was from Asia and 9 ships with missing information, we have 1,314 'Farrington' ships to study. Next we match Farrington ships to Hackman based on name and dates of first sail. The match rate is 91%, which means we code exit reasons for most of the Farrington ships and we can code ownership partially up to 1708 and almost fully after 1708. Next we match to Sutton again on name and dates of first sail. The match rate is 87%, which means we have tonnage for most Farrington ships. For those still without tonnage information, we estimate it based on the average tonnage across time.

The shipping data is useful for us because it begins in 1601 when the EIC was founded. Also we often know the day, month, and year the ship departed from England and returned. Therefore we can precisely analyze the relationship between the timing of monarch changes and the timing of ship entry and exit.

The dates of monarch changes are listed in table 3 and are based on political histories (Holmes 1993, Holmes and Szechi 1993, Evans 2014). Dating is straightforward in many cases because they are due to deaths. But others like the Civil War, Restoration, and Glorious Revolution are more complex. The Civil War (1642-1648) and Interregnum (1649-1659) periods are particularly difficult because it is not clear who held executive power. In the baseline specification, we code the monarchy as changing with the beginning of the Civil War on 22 August 1642 and the execution of Charles I on 30 January 1649. The Restoration of the Monarchy is dated as our next monarch change, occurring on 4 April 1660 when

---

[14]I thank Emily Erikson for kindly sharing the first digitized version of Farrington's data on ships.

Charles II issued the Declaration of Breda. The reign of King William is assumed to start on 23 December 1688 when James II fled England. In all subsequent cases, the monarchy changed with deaths due to ill health. Note the establishment of Oliver Cromwell as Lord Protector on 16 December 1653 is not coded as a monarch change. However, we do analyze this event in robustness checks. We now turn to an analysis of total tonnage added from new ships and then we study ship exit.

Table 3: Dates of monarchy change, 1625 to 1830

Date	Description
3/27/1625	Death of King James I
8/22/1642	Start of the English Civil War
1/30/1649	Execution of King Charles I
4/4/1660	Restoration of Charles II, specifically the Declaration of Breda
2/6/1685	Death of King Charles II
12/23/1688	Glorious Revolution, specifically King James II flees England
3/8/1702	Death of King William III
8/1/1714	Death of Queen Anne
7/27/1727	Death of King George I
10/25/1760	Death of King George II
1/29/1820	Death of King George III
6/26/1830	Death of King George IV

Source: Dates are derived from Holmes (1993), Holmes and Szechi (1993, and Evans (2014).

4.1   New shipping capacity

The total amount of new EIC shipping capacity in tons can be calculated monthly using the exact date of the first sailing and the tonnage of all ships. The monthly amount of new EIC shipping capacity is shown in figure 3 between 1601 and 1833. The months when the monarch changed are shown with the dashed lines. There are several patterns to note. First, the amount of tonnage added was seasonal, peaking at the beginning and end of the year. Second, tonnage added trended upwards over time, but there was much variation and even regression across decades. For example more tonnage was added in the 1620s than 30s. Third, some of the variation in tonnage added appears to be linked to monarch changes.

Figure 3: Monarchs and EIC shipping tons added, 1601-1833
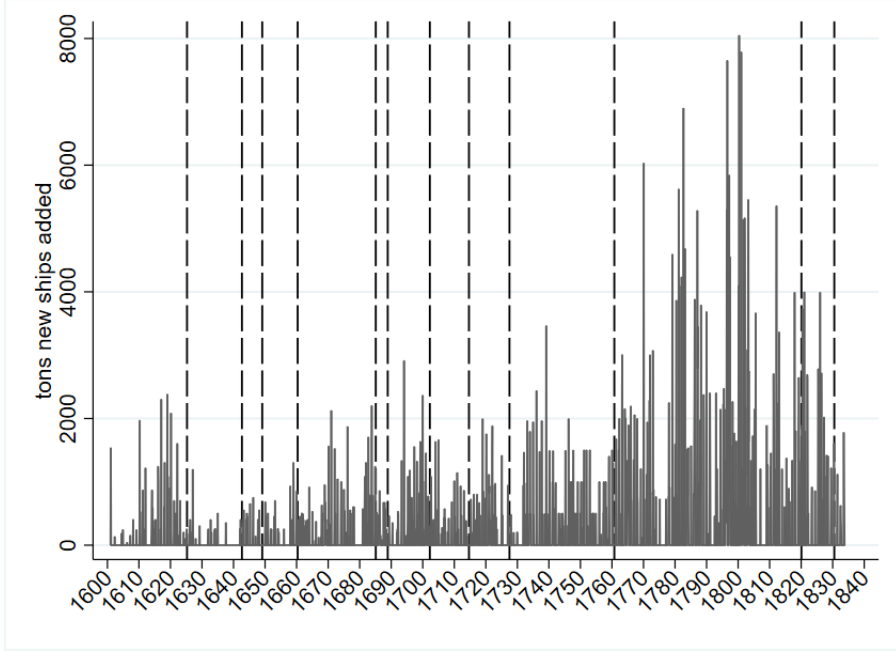
Sources: authors calculations based on Farrington (1999), Hackman (2001), and Sutton (1981).

The start of the Civil War in 1642 and the Restoration of the monarch in 1660 appear to be associated with higher amounts of tonnage added.

We test for the effects of monarchs on new tonnage added using a similar specification as for exports. The specification is shown in equation 3

$$y_{mt} = \alpha + \sum_m \beta_m^{pre} Pre_t^m + \sum_m \beta_m^{post} Post_t^m + \theta_m + \delta_t + \varepsilon_t \tag{3}$$

where y_{mt} is number of tons added in month m in year t, Pre_{mt}^m is an indicator the 24 month period before monarch m changed, $Post_{mt}^m$ is an indicator for 12 to 36 month period after monarch m changed, θ_m are fixed effects for the month m, and δ_d are decade associated with year t. The month fixed effects are added to capture the seasonality of added tonnage. The decade fixed effects are meant to capture the variation in the EIC's demand for shipping over the longer term. As before we calculate test-statistics for the hypothesis that $\widehat{\beta_m^{post}} - \widehat{\beta_m^{pre}} = 0$

for each monarch change m and jointly across all monarch changes. Note that we treat the 12 months after the monarch change as a transition period. Expectations about the monarch may have been uncertain initially and therefore behavior could be different and arguably less predictable.

The results are shown in table 4. The estimates are from a negative binomial model. A count model is appropriate since the number of tons added is often zero, especially in the 1600s. Moreover there is evidence for over-dispersion which rules out the Poisson. The estimates show substantial changes in shipping tonnage added around several monarch changes. The most significant were associated with the start of the Civil War (1642), the transition from William to Anne (1702), the transition from James II to William (1688), and the transition from George II to George IV (1820). We can reject the null that all post pre differences were zero and the same for the periods before and after 1700.

Is there evidence for a larger response to monarch changes pre 1700? The answer is. The average absolute post pre difference is 0.94 before 1700 and 0.62 after 1700. If one includes the transition from William to Anne (1702) in the pre 1700 group then the transitions pre-1700 become even larger relative to those that follow 1702.

Table 4: Pre and post effects for Monarchs and EIC tons added

Monarch change	Pre Coeff.	-24 to 0 months (Std. Err.)	Post Coeff.	-12 to -36 months (Std. Err.)	Post-Pre
James I to Charles I, 1625	-1.237	(0.812)	-0.519	(0.699)	0.718
Start of Civil War, 1642	-0.522	(0.875)	1.156	(0.764)	1.678*
Execution Charles I, 1649	1.046	(1.015)	0.999	(0.658)	-0.047
Restoration, 1660	1.923	(0.510)***	1.148	(0.538)**	-0.775
Charles II to James II, 1685	0.552	(0.710)	-0.502	(0.644)	-1.054
James II to William, 1688	-0.223	(0.635)	-1.578	(0.605***	-1.355**
William to Anne, 1702	1.362	(0.544)***	-0.187	(0.599)	-1.549***
Anne to George I, 1714	-0.291	(0.745)	0.254	(0.470)	0.545
George I to George II, 1727	-1.606	(0.616)***	-1.500	(0.769)*	0.106
George II to George III, 1760	-0.185	(0.427)	0.041	(0.493)	0.226
George III to George IV, 1820	-0.030	(0.449)	-1.227	(0.491)**	-1.197*
George IV to William IV, 1830	-0.086	(0.486)	-0.179	(0.709)	-0.093
F-stat all post pre diff.			23.47		
P-value			0.024		
F-stat post pre diff. before 1700			11.42		
P-value			0.076		
F-stat post pre diff. after 1700			11.97		
P-value			0.062		

Notes: Estimates from Negative binomial. The dependent variable is tons added. Robust standard errors are reported. *, **, *** indicates significance at 10%, 5%, and 1%

The regressions focusing on tonnage added by the EIC are informative but there is a concern that monarch changes are associated all types of shocks to the economic environment. As before we use the VOC or Dutch Company as a comparison group. Fortunately the Dutch Shipping data has been digitized by Bruijn, Gaastra, and Schöffer (1987) and it accessible online.[15] Moreover Bruijn, Gaastra, and Schöffer is the main accepted source for Dutch ships and so matching across sources is not needed. Like EIC ships we observe the tonnage and the month and year of each ship's first sailing. We create a monthly series for tonnage added from January 1601 to December 1794.

The specification for analyzing EIC and VOC is similar to that used for exports of treasure

---

[15]http://resources.huygens.knaw.nl/das/index_html_en

$$y_{imt} = E_i + \sum_m \beta_m^{pre} Pre_t^m + \sum_m \beta_m^{post} Post_t^m + E_i * [\sum_m \lambda_m^{pre} Pre_t^m + \sum_m \lambda_m^{post} Post_t^m] + \theta_m + \delta_t + E_i * \theta_m + Post1700_t * \theta_m + \varepsilon_t$$

where y_{imt} is number of tons added in month m in year t for either the EIC or VOC and E_i is an indicator for the EIC. All other variables are the same as in equation (3). We also include interactions between the EIC and the month FEs and a post 1700 indicator and the month FEs. This creates a flexible specification to capture various trends across time and across companies. Our main interest is the difference in the coefficients $\lambda_m^{post} - \lambda_m^{pre}$ on the interaction terms for post and pre monarch changes.

The estimates for the interaction terms $\lambda_m^{post}, \lambda_m^{pre}$ and post pre differences are shown in table 5. There are large differences in tonnage added across monarchs which are specific to the EIC. The main one was the start of the Civil War 1642, but there are several others. We can reject the null that all the transitions were no different across the EIC and VOC, but if we look across periods we can only reject the null for monarch transitions pre 1700. Moreover, if we include the transition surrounding Anne in the pre-period the difference would be even larger. It appears the EIC responded to monarch shocks much more than the VOC and much more before the early 1700s.

Table 5: Pre and post effects for Monarchs and tons added in the EIC vs. VOC

Monarch change	Pre Coeff.	-24 to 0 months (Std. Err.)	Post Coeff.	-12 to -36 months (Std. Err.)	Post-Pre
James I to Charles I, 1625	-0.316	(1.054)	-0.895	(0.722)	-0.579
Start of Civil War, 1642	-2.800	(0.803)***	1.045	(0.957)	3.845***
Execution Charles I, 1649	0.061	(1.033)	0.588	(0.691)	0.527
Restoration, 1660	1.092	(0.479)**	1.233	(0.607)**	0.141
Charles II to James II, 1685	1.431	(0.582)**	0.887	(0.735)	-0.544
James II to William, 1688	1.555	(0.840)*	0.462	(0.845)	-1.093
William to Anne, 1702	1.834	(0.409)***	0.526	(0.554)	-1.308*
Anne to George I, 1714	-0.007	(0.738)	-0.321	(0.436)	-0.314
George I to George II, 1727	-0.708	(0.646)	-0.813	(0.844)	-0.105
George II to George III, 1760	0.581	(0.581)	1.698	(0.702)	1.117
F-stat all post pre diff.			16.95		
P-value			0.075		
F-stat post pre diff. before 1700			11.50		
P-value			0.074		
F-stat post pre diff. after 1700			5.38		
P-value			0.250		

Notes: Estimates from Negative binomial. The dependent variable is tons added. Robust standard errors are reported.

*, **, *** indicates significance at 10%, 5%, and 1%

4.2 Ship exit

For the analysis of ship exit we again use Farrington ships supplemented with information drawn from Hackman and Sutton. After dropping ships with missing observations, our sample includes 1,311 ships. It is useful to first summarize the patterns of exit. We classify ships into two general types based on their type of exit. Group 1 contains ships that exit after returning to England on their last voyage. Group 2 contains ships that exit but do not return to England on their last voyage. Group 2 is further separated into four sub-groups based on information in Hackman: (i) ships that were sunk or lost due to weather or crew error, (ii) ships that were sunk or taken by enemies, (iii) ships that stay in Asia, and (iv) ships where Hackman does not identify why they did not return to England.

The number and percent of ships exiting according to each group and sub-group is shown in table 6. Just over two-thirds (68%) of ships fall into group 1, meaning most exit after

Figure 4: Survival and hazard rate for ships based on past voyages
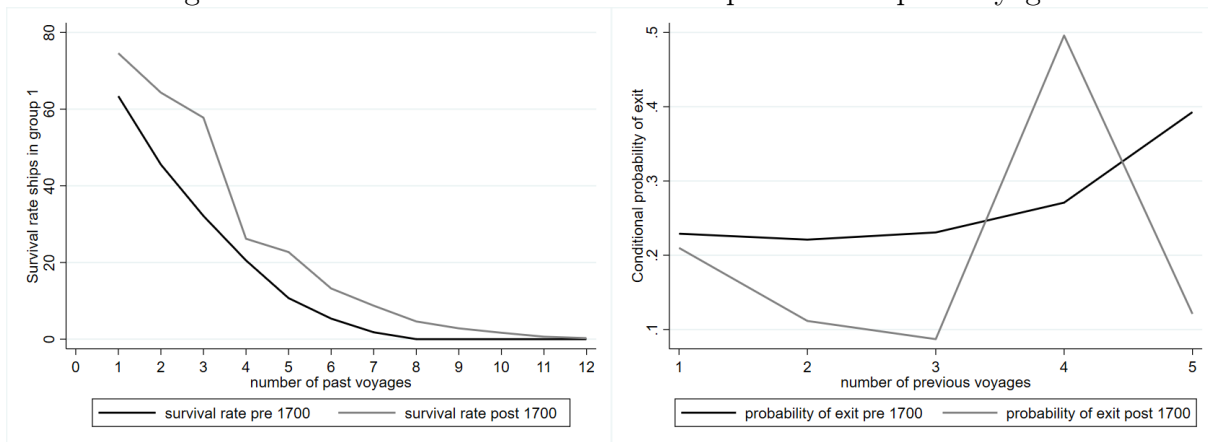
Source: Author's calculations based on Farrington (1999) and Hackman (2001).

returning to England on their last voyage. In group 2, the most common outcome is for ships to exit because of damage due to storms or accidents (13%). The next largest group is the ships that exit for unknown reasons (9.6%)

Table 6: Classification of ship exit

Exit types	Number	Percent
1. Ships that exit after returning to England on their last voyage	891	68.0
2. Ships that exit but do not return to England on their last voyage	420	32.0
from 2. (i) ships that exit because of damage due to storm or accident	170	13.0
from 2. (ii) ships that exit due to being attacked by enemies	77	5.9
from 2. (iii) ships that exit by remaining in Asia	47	3.6
from 2. (iv) ships that exit for unknown reasons	126	9.6

Source: Author's calculations based on Farrington (1999) and Hackman (2001).

Exit became increasingly likely as the number of past voyages increased. To illustrate this pattern, we calculate the survival rate of ships as a function of their past voyages for group 1 ships. The survival rate is shown in figure 4 for two periods, 1601 to 1699 and 1700 to 1833. The survival rate falls steeply after 2 or 3 voyages in both periods. But note the pre 1700 survival rate was lower after 1 or 2 voyages. Also no ship survived beyond 8 voyages pre 1700.

We also calculate a hazard rate, or the probability of exiting conditional on completing

1, 2, 3, 4, or 5 previous voyages in the pre and post 1700 period. This is shown in the right hand graph of figure 4. The probability of exit is around 0.23 for all ships that completed one voyage before 1700. It rises steadily for 2, 3, 4, and 5 voyages. After 1700 the probability of exit is very low for ships completing 2 or 3 voyages. Then it rises significantly after 4 voyages. Recall that per the agreement with shipowners, the EIC promised at least 4 voyages. This arrangement mainly applied to ships sailing after 1700.

Our hypothesis is that monarch changes led to a positive or negative transition in the probability of exiting. In order to test this hypotheses, we define pre and post exposure windows based on when the ship returns to England. Our pre exposure window ship is coded as 1 if the ship's return date to England was between one and three years before the monarch changed. Our post exposure window is coded as 1 if the ship's return date to England was between one and three years after the monarch changed. Note that one year before and one year after the monarch change are not included in either. We regard this as the transition period, where behavior is hard to predict.

The main outcome variable in the exit analysis is an exit indicator equal to 1 if the ship exited the EIC trade after returning to England and 0 if it sailed to Asia again. Note the exit variable is always coded 0 if the ship was in group 2, where exits occurred because of weather, crew error, attack, or a decision to remain in Asia. Arguably these ships did not exit by the choice of the shipowners or EIC. They are included in the baseline and attrit at some point in their history. Our analysis excludes all ships returning to England after 1832 because in 1833 the EIC ended as a commercial company due to an Act of Parliament. These years were extraordinary in that nearly all returning ships exited the trade. In other words, there was no real possibility of sailing again as an EIC ship.

The regression specification is a fixed effects linear probability equation,

$$y_{ikt} = \alpha_i + \sum_m \beta_m^{pre} Pre_{it}^m + \sum_m \beta_m^{post} Post_{it}^m + x_{ikt} + \varepsilon_{ikt} \qquad (4)$$

where the dependent variable y_{ikt} is the 0 or 1 exit indicator, α_i is a ship fixed effect, Pre_{it}^m and $Post_{it}^m$ are the exposure indicators for each monarch change m, and x_{ik} are the fixed effects for $k = 1, ..11$ previous voyages, the decade of last return, and the month of last return. The ship fixed effects capture ship-specific unobservables that might be associated with changes in the monarchy (i.e. some selection effect of who sails in unstable times). The number of previous voyages captures the different hazard rates displayed in figure 4 and ship aging effects more generally. The decade fixed effects capture general trade and technology effects that evolve with time and were possibly correlated with the monarch change. The month of last arrival fixed effects allow for exit to be influenced by the seasonality of returns. As above, the emphasis in this specification is on pre post differences. We calculate the F-statistic for the joint hypothesis test that $\widehat{\beta_m^{post}} - \widehat{\beta_m^{pre}} = 0$ for all monarch changes jointly and separately in the pre 1700 and post 1700 periods.

Table 7 reports the coefficients for the pre and post effects of monarch changes. There are several findings. The death of James I led to a large decrease in the probability of exit as did the Restoration of the monarchy in 1660. The death of Charles II and the Glorious Revolution were both associated with a large increase in the probability of exit. The null hypothesis test that exit rates were all similar before and after monarch changes is strongly rejected before 1700. By contrast, there are no significant differences in exit rates across monarch changes after 1700. Moreover, the magnitudes of the differences in exit probabilities is very small after 1700 compared to before 1700.

Table 7: Pre and post effects for Monarchs and EIC ship exit

Monarch change	Pre Coeff.	+3 to +1 year (Std. Err.)	Post Coeff.	-1 to -3 months (Std. Err.)	Post-Pre
James I to Charles I, 1625	0.207	(0.108)*	-0.139	(0.153)	-0.346***
Start of Civil War, 1642	-0.298	(0.172)*	-0.007	(0.405)	0.291
Execution Charles I, 1649	0.381	(0.393)	0.260	(0.217)	-0.121
Restoration, 1660	1.163	(0.307)***	-0.088	(0.232)	-1.251***
Charles II to James II, 1685	-0.306	(0.078)***	0.279	(0.206)	0.585**
James II to William, 1688	-0.252	(0.198)	0.432	(0.319)	0.684*
William to Anne, 1702	0.018	(0.114)	-0.174	(0.129)	-0.192
Anne to George I, 1714	-0.100	(0.111)	0.062	(0.767)	0.162
George I to George II, 1727	-0.080	(0.045)*	-0.079	(0.059)	0.001
George II to George III, 1760	-0.018	(0.068)	-0.022	(0.050)	-0.004
George III to George IV, 1820	0.107	(0.064)	0.095	(0.047)**	-0.012
George IV to William IV, 1830	-0.309	(0.059)	-0.160	(0.121)	0.149
F-stat all post pre diff.			2.65		
P-value			0.001		
F-stat post pre diff. before 1700			4.54		
P-value			0.000		
F-stat post pre diff. after 1700			0.720		
P-value			0.632		

Notes: The dependent variable is 1 if the ship exits after returning to England and 0 otherwise. The standard errors are clustered on ships. *, **, *** indicates significance at the 10%, 5%, and 1%.

5 Conclusion

This paper examines the trade of the English East India Company under different institutional contexts. The English monarch gave the EIC a valuable trading monopoly, but for much of its history, the monarch could renegotiate the EIC's charter unilaterally. Some monarchs exploited their power by demanding loans, levying extraordinary taxes, and allowing interlopers to enter the EIC's market. The monarchy's power was greatly limited after 1700 however. After that parliament had powers to regulate the EIC and its charter became well defined in law. Thus there was a crucial change in the institutions surrounding the EIC, which mirrors broader arguments about how institutions changed in England around 1700.

The key premise of our paper is that changes in the monarchy represented a shock to

quality of political governance when the monarch was unconstrained in the seventeenth century, but not later when it was constrained. In order to test how responses to monarch changes differed across companies and institutional environments we focus on exports and ships. Our first finding is that EIC exports were systematically different across monarchs, especially surrounding the transition from James II to William in 1688. The Dutch Company or VOC did not see such a large change in its exports before and after 1688.

Our second finding is that tonnage added by the EIC was systematically different before and after monarch changes. The differences are largest before 1700. Importantly, the difference in tonnage added across monarchs was significantly larger for the EIC than VOC and especially before 1700.

Our third main result is that before 1700 the probability of ship exit differed across monarchs, but after 1700 the probability of exit differed little across monarchs. This finding suggests that shipowners behaved as though changes in the monarchy represented a fundamental change in their profits, we think through the channel of political governance.

The main implications of our results concerns the effects of the monarchy and institutional change on England's development. Through a detailed study of the EIC, we provide new evidence that the investments of firms directly dependent on the monarchy for their rights were hindered by shocks to political governance. Such micro-level evidence is important because the alternative view is that monarchs and political institutions had little effect on decisions crucial to economic growth and the industrial revolution. This paper also contributes to a vast literature focusing on the EIC, VOC, and the emergence of the global economy.

The paper offers lessons beyond the EIC. It is novel in analyzing the same investment activity surrounding a company for over 200 years. It shows the relevance of policy risk and uncertainty over the long-run, especially for companies involved in prominent partnerships with government. For economic history, this paper illustrates a different approach to

studying policy risks. It treats policy risks as constantly evolving and sometimes uncertain due to changing governments and political circumstances. Studying how corporations and other actors responded to political shocks and government changes can reveal more about the dynamics of growth in many historical contexts.

References

1. Abel, A. B. and J. C. Eberly (1994), "A unified model of investment under uncertainty", American Economic Review, 84(5), 1369-1384.

2. Acemoglu, Daron, and James A. Robinson. Why nations fail: The origins of power, prosperity, and poverty. Crown Books, 2012.

3. Acemoglu, Daron, Simon Johnson, and James Robinson. "The rise of Europe: Atlantic trade, institutional change, and economic growth." American economic review (2005): 546-579.

4. Alesina, Alberto, and Roberto Perotti. "Income distribution, political instability, and investment." European economic review 40.6 (1996): 1203-1228.

5. Allen, Robert C. The British industrial revolution in global perspective. Cambridge University Press, 2009.

6. Baker, Scott R., Nicholas Bloom, and Steven J. Davis. "Measuring economic policy uncertainty." The Quarterly Journal of Economics 131.4 (2016): 1593-1636.

7. Bloom, Nicholas. "The impact of uncertainty shocks." Econometrica 77.3 (2009): 623-685.

8. Bloom, Nick, Stephen Bond, and John Van Reenen. "Uncertainty and investment dynamics." The Review of Economic Studies 74.2 (2007): 391-415.

9. Bogart, Dan. "Party connections, interest groups, and the slow diffusion of infrastructure: Evidence from Britain's first transport revolution." The Economic Journal (forthcoming).

10. Bogart, Dan. "The East Indian Monopoly and the Transition from Limited Access in England, 1600-1813," in Lamoreaux, Naomi and John Wallis, eds. Organizations, Civil Society, and the Roots of Development, University of Chicago Press, 2017.

11. Bond, Stephen R., and Domenico Lombardi. "To buy or not to buy? Uncertainty, irreversibility, and heterogeneous investment dynamics in Italian company data." IMF Staff Papers (2006): 375-400.

12. Bowen, Huw V. The Business of Empire: The East India Company and Imperial Britain, 1756–1833. Cambridge University Press, 2005.

13. Bowen,H. (2007). East India Company: Trade and Domestic Financial Statistics, 1755-1838. [data collection]. UK Data Service. SN: 5690, http://doi.org/10.5255/UKDA-SN-5690-1

14. Broadberry, Stephen N., Bruce MS Campbell, Alexander Dr Klein, Mark Overton, and Bas van Leeuwen. "British economic growth: 1270-1870." Working Paper, 2011.

15. Caballero, Ricardo J. "On the sign of the investment-uncertainty relationship." The American Economic Review (1991): 279-288.

16. Carlos, Ann M., and Stephen Nicholas. '"Giants of an Earlier Capitalism": The Chartered Trading Companies as Modern Multinationals." Business history review 62.03 (1988): 398-419.

17. Carruth, Alan, Andy Dickerson, and Andrew Henley. "What do we know about investment under uncertainty?." Journal of Economic Surveys 14.2 (2000): 119-154.

18. Chaudhuri, Kirti N. The English East India Company: The Study of an Early Joint-Stock Company 1600-1640. Frank Cass, 1965.

19. Chaudhuri, Kirti N. The Trading World of Asia and the English East India Company: 1660-1760. Cambridge University Press, 1978.

20. Chaudhuri, K. N. "The English East India Company's Shipping (c.1660-1760)." In Bruijn, Jaap R., and Femme S. Gaastra, eds. Ships, sailors and spices: East India Companies and their shipping in the 16th, 17th and 18th centuries. Vol. 20. Amsterdam: Neha, 1993.

21. Cox, Gary W. Marketing sovereign promises: Monopoly brokerage and the growth of the English state. Cambridge University Press, 2016.

22. Cruickshanks, Eveline, Stuart Handley, and David Hayton. The History of Parliament: The House of Commons, 1690-1715. Cambridge University Press, 2002.

23. Dari-Mattiacci, Giuseppe, Oscar Gelderblom, Joost Jonker, and Enrico C. Perotti. "The emergence of the corporate form." Amsterdam Law School Research Paper (2014).

24. De Vries, Jan. Connecting Europe and Asia: a quantitative analysis of the Cape-route trade, 1497 – 1795 .In D.O.Flynn, A.Giráldez and R.Von Glahn (eds.), Global Connections and Monetary History, 1470 – 1800 . Aldershot: Ashgate, 2003.

25. De Vries, Jan. "The limits of globalization in the early modern world." The Economic History Review 63.3 (2010): 710-733.

26. Desai, Tripta. The East India Company : a brief survey from 1599 to 1857. New Delhi, 1984.

27. Dincecco, Mark. Political Transformations and Public Finances: Europe, 1650–1913. Cambridge University Press, 2011.

28. Dixit, Avinash K. and Robert Pindyk. Investment under uncertainty. Princeton university press, 1994.

29. Erikson, Emily. Between Monopoly and Free Trade. Princeton University Press, 2014.

36

30. Evans, Eric J. The forging of the modern state: early industrial Britain, 1783-1870. Routledge, 2014.

31. Farrington, Anthony. Catalog of East India Company Ships' Journals and Logs, 1600-1834. London: British Library, 1999.

32. Feng, Yi. "Political freedom, political instability, and policy uncertainty: A study of political institutions and private investment in developing countries." International Studies Quarterly 45.2 (2001): 271-294.

33. Fernández-Villaverde, J., Guerrón-Quintana, P., Kuester, K., & Rubio-Ramírez, J. Fiscal volatility shocks and economic activity. The American Economic Review, 105(11) (2015): 3352-3384.

34. Fisher, Michael H. The politics of the British annexation of India, 1757-1857. Oxford University Press India, 1994.

35. Fuss, Catherine, and Philip Vermeulen. "Firms' investment decisions in response to demand and price uncertainty." Applied Economics 40.18 (2008): 2337-2351.

36. Gelderblom, Oscar, Abe De Jong, and Joost Jonker. "The Formative Years of the Modern Corporation: The Dutch East India Company VOC, 1602–1623." The Journal of Economic History 73.04 (2013): 1050-1076.

37. Guasch, J. Luis. Granting and renegotiating infrastructure concessions: doing it right. World Bank Publications, 2004.

38. Gulen, Huseyin, and Mihai Ion. "Policy uncertainty and corporate investment." Review of Financial Studies 29.3 (2016): 523-564.

39. Hackman, Rowan. Ships of the East India Company. World Ship Society, 2001.

40. Handley, Kyle, and Nuno Limao. "Trade and investment under policy uncertainty: theory and firm evidence." American Economic Journal: Economic Policy 7.4 (2015): 189-222.

41. Hejeebu, Santhi. "Contract enforcement in the English East India company." The Journal of Economic History 65.02 (2005): 496-523.

42. Henisz, Witold J. "The institutional environment for infrastructure investment." Industrial and corporate change 11.2 (2002): 355-389.

43. Hill, R. Charters Relating to the East India Company from 1600 to 1761, Government Press, 1887.

44. Holmes, Geoffrey S. The making of a great power: late Stuart and early Georgian Britain, 1660-1722. London and New York: Longman, 1993.

45. Holmes, Geoffrey S., and Daniel Szechi. The age of oligarchy: pre-industrial Britain, 1722-1783. London: Longman, 1993.

46. Horwitz, Henry. "The East India trade, the politicians, and the constitution: 1689-1702." The Journal of British Studies 17.02 (1978): 1-18.

47. Jha, Saumitra. "Financial Asset Holdings and Political Attitudes: Evidence from Revolutionary England." The Quarterly Journal of Economics (2015).

48. Jones, Benjamin F., and Benjamin A. Olken. "Do leaders matter? National leadership and growth since World War II." The Quarterly Journal of Economics 120.3 (2005): 835-864.

49. Julio, Brandon, and Youngsuk Yook. "Political uncertainty and corporate investment cycles." The Journal of Finance 67.1 (2012): 45-83.

50. Krishna, Bal. Commercial Relations Between India and England 1601-1757. Krishna Press, 2007.

51. Kumagai, Yukihisa. Breaking into the monopoly: provincial merchants and manufacturers' campaigns for access to the Asian market, 1790-1833. Brill, 2012.

52. Laffont, Jean-Jacques. Regulation and development. Cambridge University Press, 2005.

53. Lawson, Philip. The East India Company: A History. Routledge, 1994.

54. Leahy, J. and Whited, T., "The Effects of Uncertainty on Investment: Some Stylized Facts", Journal of Money Credit and Banking (1996) 28, 64–83.

55. Mc Donald, R. and D. Siegel (1986), "The value of waiting to invest", Quarterly Journal of Economics, 101, 707-728.

56. Modelski, George, and William R. Thompson. Seapower in global politics, 1494–1993. Springer, 1988.

57. Mokyr, Joel. The Enlightened economy an economic history of Britain 1700-1850. Yale University Press, 2010.

58. Newberry, David M. Privatization, restructuring, and regulation of network utilities. Vol. 2. MIT press, 2002.

59. North, Douglass C., and Barry R. Weingast. "Constitutions and commitment: the evolution of institutions governing public choice in seventeenth-century England." The journal of economic history 49.04 (1989): 803-832.

60. Persson, Torsten, and Guido Enrico Tabellini. Political economics: explaining economic policy. MIT press, 2002.

61. Philips, Cyril Henry. The East India Company 1784-1834. Read Books Ltd, 2013.

62. Rei, Claudia. "The organization of Eastern merchant empires." Explorations in Economic History 48.1 (2011): 116-135.

63. Robins, Nick. The corporation that changed the world: how the East India Company shaped the modern multinational. London: Pluto Press, 2006.

64. Rodrick, Dani. "Policy uncertainty and private investment in developing countries." Journal of Development Economics 36.2 (1991): 229-242.

65. Scott, W. R. The Constitution and Finance of English, Scottish, and Irish. Joint-Stock Companies to 1720. Cambridge University Press, 1912.

66. Solar, Peter M. "Opening to the East: Shipping Between Europe and Asia, 1770–1830." The Journal of Economic History 73.03 (2013): 625-661.

67. Stein, Luke, and Elizabeth Stone. "The effect of uncertainty on investment: evidence from equity options." Working paper 2013.

68. Stern, Philip J. The Company-State: Corporate Sovereignty and the Early Modern Foundations of the British Empire in India. Oxford: Oxford University Press, 2011.

69. Sutherland, Lucy Stuart. The East India Company in eighteenth-century politics. Clarendon Press, 1962.

70. Sutton, Jean. Lords of the East: The East India Company and Its Ships. London: Conway Maritime Press, 1981.

71. Svensson, Jakob. "Investment, property rights and political instability: Theory and evidence." European Economic Review 42.7 (1998): 1317-1341.

72. Watson, Ian Bruce. Foundation for empire: English private trade in India, 1659-1760. New Delhi: Vikas, 1980.

73. Webster, Tony. The twilight of the East India Company: the evolution of Anglo-Asian commerce and politics, 1790-1860. London: Boydell Press, 2009.

6 Appendices

6.1 Key extraction events

Appendix table 1 lists what can be termed 'forced loans' from 1641 to 1744. Appendix Table 2 shows all tax levies, financial demands, and known bribes paid to the monarch by the EIC from 1620 to 1730. A list of all documented interloper cases prior to 1760 is provided in appendix table 3. They are all described in Bogart (2017).

Appendix Table 1: Forced Loans and Repayments to the EIC before 1750

Year	Amount	Description
1641	£63,283	Charles I forces Company to give its pepper stock. £31,500 unpaid
1643	£6,000	Loan to Committee of Navy in Long Parliament. Repayment unknown
1655	£50,000	Loan to Council of State. £46,000 unpaid
1659	£15,000	Loan to Council of State. Canceled at Restoration
1662	£10,000	Loan to Charles II. Repayment unknown
1666	£50,000	Loan to Charles II. Repaid in 1667
1667	£70,000	Loan to Charles II. Repayment unknown
1676	£40,000	Loan to Charles II. Repaid in 1678
1678	£110,000	Loan to Charles II. Repaid in 1679
1698	£2,000,000	Loan to William by New East India Company. Redeemed in 1793
1708	£1,200,000	Loan to Anne. Redeemed in 1793
1744	£1,000,000	Loan to George II. Redeemed in 1793

Source: Loans are described in Bogart (2017).

Appendix table 2: Financial demands, bribes, and tax levies on the EIC before 1730

Year	Description
1620	James I demands £20,000 payment following the Company's capture of Ormuz
1636	Duties on pepper imports increased by 70%
1660	Gift of £4000 to Charles II and James II at Restoration
1681-88	Annual Gift to King of 10,000 guineas
1685	Additional duty of 10% on imports of Indian linens and silks
1690	Additional duty of 20% on East Indian imports
1692	Tax of 5% on value of Company's stock
1692-95	Gifts to King and bribes to MPs estimated at £200,000
1697	Additional duty of 5% on imports of Indian linens and silks
1703	Additional duty of 5% on imports of Indian linens and silks
1730	Payment of £200,000 to government to renew charter

Source: Financial payments are described in Bogart (2017).

Appendix Table 3: Interloper Challenges to the Monopoly

Year	Description
1604	James I gives charter to interlopers to trade in Asia
1607	James I gives interlopers license to discover Northern passage to Asia
1617	James I gives Scottish East India Company charter to trade in Asia
1635	Charles I gives Courteen Association license to trade in Asia
1637	Charles I gives Courteen Association charter to trade in places with no EIC factories
1649	Assada Adventurers appeal to Council of State for voyage to Asia
1658	Richard Cromwell gives interloper license to trade in Asia
1681	Interlopers linked to Whigs petition Charles II to form a rival joint stock company
1689	Interlopers led by Papillion petition William to dissolve EIC and incorporate new
1695	Act of Scottish Parliament gives Darien Company license to trade in Asia
1698	Act of Parliament authorizes new East India Company with monopoly trading rights
1730	Interlopers petition Commons to form company licensing trade to India for a fee
1758	Tea dealers petition Treasury for licenses to import tea from China

Source: Interloper cases are described in Bogart (2017).