'There can be no partnership with the king': policy uncertainty and the performance of the English East India Company, 1600-1760*

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Abstract

Policy uncertainty has a long history affecting some of the most important firms in the past. This paper studies the English East India Company and argues that policy uncertainty hindered its performance for much of its early history. The empirical analysis focuses on Company investments in shipping capacity over a 100 year period. Drawing on the history of realized policy events, I use indicators for new monarchs in Britain, elections to the House of Commons, and the ratio of British government deficits to tax revenues as proxies for policy uncertainty. The results show all three were negatively associated with the growth of shipping capacity. They also rule out confounds between policy uncertainty variables and the trading environment in Asia, general uncertainty involving the Company, and the direct effects of policy events. The paper offers unique insights on the effects of policy uncertainty, and it gives new evidence on the role of institutions in explaining economic performance within Europe before 1800.

Keywords: Policy Uncertainty, Investment, East India Company, Monopoly, Political Instability, Fiscal Crises.

JEL Codes: N43, P16, D72

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1 Introduction

In 1624 the English East India Company was in dire straights. It had just suffered a crushing military defeat by the Dutch East India Company in Asia. The court of directors of the English Company expressed hope that King James I would seek reparations against the Dutch but they soon realized that the King could not or would not deliver assistance. Some investors suggested it was time to exit the Asian trade and close the Company. Shortly thereafter King James I offered to become an investor and sail ships under the royal flag of England. The directors of the Company were faced with a choice. Become a full fledged partner with the King or continue to operate as a private company with a royal charter. The directors discreetly refused King James I offer. The Company's legal councilors advised that 'the whole undertaking would revert to the Crown, since there can be no partnership with the King'(Scott 1912, p. 108).

The English East India Company or EIC as it is known avoided an effective nationalization in 1624 but it would continue to struggle with the English government for the next 125 years. The EIC's charter was renegotiated by the monarch or parliament on several occasions resulting in forced loans and higher import duties on Asian goods. The government also authorized traders known as 'interlopers' to enter the EIC's market in violation of its monopoly trading privileges. At the same time the EIC lost market share to its leading competitor in Europe, the Dutch East India Company or VOC. The EIC accounted for 25% of the shipping tonnage from Europe bound for Asia in the 1630s, but by the 1680s it accounted for 22% and by the 1730s it was down to 15% (de Vries 2003).

For much of its early history the EIC operated under what observers today refer to as 'policy uncertainty.' Firms are uncertain about who will be making policy decisions, what policy decisions will be made by those who end up in charge, and how those policies will affect profits for firms (Mordfin 2014). This paper argues that the EIC's performance was hindered by policy uncertainty, and that two important sources were political instability and fiscal crises. It also provides evidence that policy uncertainty contributed to lower investment by the EIC. More generally it offers a historical perspective on a current issue which is receiving greater attention in an era of heightened polarization and political instability.[1] History offers unique insights on the effects of policy uncertainty, especially among the most important firms in the past. The English East India Company was arguably the most important company in the world during its peak in the nineteenth century because it laid the foundation for British colonial rule in India.

[1] see Bloom (2009, 2013) and Baker et. al. (2013) among other works.

The analysis below proceeds in three parts. First, I list the main regulatory and policy events which affected the EIC. These include renegotiation of its charter, challenges to its monopoly from interlopers and the government, forced loans, and fiscal extractions. The general theme is that the EIC's privileges and property were far from secure well into the eighteenth century. Second, I study the two decades following the Glorious Revolution of 1689 to illustrate how political instability and fiscal crises contributed to uncertainty. Third, I show that greater uncertainty lowered EIC investment in shipping tonnage. The last result is the most important finding of the paper. I use a reduced form investment model to examine the factors affecting the annual growth of EIC shipping capacity.[2] The model includes standard variables like the sales revenues of the EIC and other macro-economic controls. More novel are the variables for uncertainty. In the baseline, I use political regime changes and the ratio of fiscal deficits to total revenues as proxies for policy uncertainty. The political regime changes include new monarchs, new government ministers, and elections for the House of Commons mandated by law. Mandated elections have a cleaner interpretation because they are not endogenous to economic events. As alternative measures of uncertainty, I use EIC stock price volatility and the share of all books published in English which contain the words East India or East Indies in the title. The East India book title index peaks in periods of known uncertainty like the 1690s and early 1700s.

The results point to a negative effect of policy uncertainty on the growth of shipping tonnage. In the year following a change in the monarchy or mandated election tonnage declined by around 7%. Deficits had similar effects. A typical increase in the deficit during a time of war lowered tonnage in the following year by 5%. For comparison a one standard deviation decrease in the growth of EIC sales is estimated to decrease tonnage by 8%. Thus the average shock to policy uncertainty had a similar effect to a typical negative shock to the EIC's demand, indicating the former was a quantitatively significant factor.

A series of robustness checks confirms or extends the key findings. First, the effects of different types of elections are examined, including those that were not mandated or that changed the majority party in the Commons. There is no effect from non-mandated elections, even if they changed the majority party, but there is a larger effect for mandated elections that changed the majority party. These results are expected as elections which resulted from the monarch's dissolution of parliament are potentially endogenous, and moreover elections changing the majority party should generate more policy uncertainty.

In a second robustness check, the baseline model is estimated after replacing the dependent variable, the growth of EIC shipping tonnage, with the growth of Dutch East India

[2]The data on shipping capacity is new and is drawn from Sutton (2001).

Company shipping tonnage.[3] This 'placebo' test shows no significant coefficients on the main variables of interest, suggesting there are unlikely to be omitted factors relating to the Asian trade environment or European-wide demand that are driving the results. Third, I use changes in the monarch or ministers due to natural deaths or illness as an exogenous regime change. In this specification, the coefficient for new monarchs is larger in magnitude and remains significant. Fourth, I examine the growth of shipping between 1 and 4 years after regime changes and higher deficits allowing for a possible 'rebound' effect once policy uncertainty is lessened. The estimates show no rebound. Moreover, the cumulative effects of regime changes and fiscal crises over a four year period are estimated to be larger than the cumulative effects of shocks to sales growth.

A fifth extension includes the two alternative measures of uncertainty in the model. The results show that more stock price volatility and a higher share of books with East India in the title lowers investment, but it does not eliminate the effects of new monarchs, elections, and deficits. The implication is that the policy uncertainty variables are not simply capturing general uncertainty. In a final extension I consider whether variables for policy uncertainty are correlated with policy events. Specifically I include indicator variables for years where there was an interloper attack on the monopoly, a forced loan, a general fiscal extraction, and a renegotiation of the charter. The results show that the political regime changes and deficits are not masking these policy events.

This paper adds to a large literature studying the English East India Company, and similar trading companies operating throughout Europe.[4] A contribution here is to show that policy uncertainty was one of the reasons the English Company's slow growth from the early 1600s through the mid 1700s. By contrast the Dutch East India Company operated in a more certain policy environment due to the stability of its domestic political system. In this respect, the paper makes larger points about the factors that led to the economic divergence within Europe before 1800. The literature emphasizes a variety of factors including differences in wages, endowments, culture, trade, and institutions.[5] With respect to institutions, the literature rarely tunnels down to the firm-level and the policy environment they faced.[6] This paper provides the most direct evidence to date on how political instability and fiscal crises influenced firm-level outcomes like investment.

Another larger point concerns British institutions specifically. It has been argued that

[3]The data on VOC shipping capacity is drawn from Bruijn, Gaastra, and Schöffer (1979).

[4]see Chaudhuri (1965, 1978), De Vries (2003), Bowen (2005), Stern (2011), Solar (2013), Gelderblom, de Jong, and Jonker (2013), and Erikson (2014) to name a few.

[5]A sample of the important contributions in this large literature include North and Thomas (1973), Mokyr (1990), Grief (2006), Allen (2009), Acemoglu, Johnson, and Robinson 2005).

[6]Some exceptions include Temin and Voth (2013), Bogart (2011).

the security of property rights (and economic policies more generally) improved substantially after the Glorious Revolution of 1688-89.[7] The findings in this paper suggest an important qualification needs to be made to this view. The case of the EIC reveals that in some sectors a more certain policy environment emerged slowly. The policy environment was more favorable to the EIC only by the mid-eighteenth century, which is also when its investment in shipping capacity rises. In sum, the conventional story that the Glorious Revolution made property rights secure in Britain and encouraged investment does not apply to the EIC.

This paper also contributes to the broader literature on policy uncertainty and investment.[8] A number of empirical works find a negative relationship between investment and uncertainty.[9] The most closely related papers examine the effects of policy uncertainty using proxy variables like elections or shocks to government finances.[10] This paper is novel because it offers a historical perspective from one of the most important firms in the global economy. It also analyzes different types of uncertainty shocks on the same investment activity including regime changes and fiscal crises. Lastly, this paper is unique in the way it formulates tests for omitted variable bias and confounds between policy uncertainty, general uncertainty, and policy events. The approaches taken here can be employed more broadly in the study of policy uncertainty.

The paper is organized as follows. Section 2 provides historical background. Section 3 explains the empirical framework for studying investment. Section 4 describes the data. Section 5 shows the results. Section 6 concludes.

2 Background on the EIC and Policy Environment

The English East India Company was founded in 1600 at a time when several European countries were competing for trade in Asia. It was the usual practice for European monarchs to give an East India Company monopoly rights over all trade with Asia. The monopoly was generally most effective on imports into the home country, which is one reason why most of these companies were controversial in their domestic political scene. According to contemporaries, like Adam Smith, the monopoly powers given to the English East India Company were inefficient because they restricted trade. There is a counter-argument that monopoly encouraged investment in shipping and fortifications and generated new tax revenues. For

[7] See North and Weingast (1989), Pincus (2009), Cox (2012), Acemoglu, Robinson, Woren (2012).

[8] See McDonald and Siegel (1986), Rodrick (1991), Dixit and Pindyck (1994) Abel and Eberly (1994), and Bloom et. al. (2007) for theoretical models

[9] See Bloom et. al. (2007), Bond and Lombardi (2006), Fuss and Vermeulen (2008), and Stein and Stone (2013) among others.

[10] See Feng (2001), Henisz (2002), Julio and Yook (2012, 2014), Durnev (2010), Gulen and Ion (2013), Fernández-Villaverde (2011), Guasch, Laffont, and Straub (2007).

the purposes of this paper it is not necessary to take a stand on whether monopoly was efficient or not. What is at stake is whether the performance of monopoly companies were undermined by uncertainty.

The performance of the various Companies associated with each country can be seen in total shipping tonnages bound for Asia (see table 1). English shipping tonnage fell behind the Dutch in the seventeenth century and continued through the mid eighteenth century. The English take leadership after the 1780s, and continue to grow in market share over the following decades. The focus of this paper is on the period before 1760 when the English were far less successful. The pre-1760 period is also instructive because the business model of the EIC is relatively constant. After the battle of Plassey in 1757 the EIC became a territorial authority in India and its relationship with the British government changed in significant ways.[11]

Table 1: East Asian bound Shipping Tonnage Among European Powers

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).

As was alluded to in the opening passage, the EIC and the British monarchy or parliament did not always have a stable relationship. In fact, the evidence suggests that the EIC faced an uncertain policy environment for much of its early history. One indication is given by the renegotiation of the EIC's charter. The first from Queen Elizabeth in 1600 granted powers for a term of 15 years, but it was renegotiated by King James I in 1609. The new charter gave the EIC an indefinite term, but the monarchy could renegotiate key provisions at any moment if they were deemed unprofitable to the monarchy or to the realm.[12] The monarch exercised this option in 1661, 1669, 1674, 1677, 1683, 1686, 1693, 1694, and 1698. The Lord Protector, Oliver Cromwell, did the same in 1657. After 1700 the EIC was promised a fixed term before its monopoly trading privileges could be altered. Those terms were respected, but other aspects of the Company's charter were renegotiated at the will of

[11] see Chaudhuri (1978), Bowen (2005), and Stern (2011) for a discussion of this issue.

[12] For the details on renegotiation see Bogart (2015).

the monarchy and parliament. Renegotiation occurred in 1708, 1730, 1744.[13]

Protection of its trading monopoly was one of the key policy issues from the perspective of the EIC. Its trade monopoly was unpopular with some interest groups, especially merchants that were outside the EIC's directorship. The monarchy and parliament sometimes authorized trading groups, known as 'interlopers,' to enter the EIC's market in violation of its monopoly privilege. To give one example, in 1617 King James I granted the Scottish East India Company rights to trade in the East Indies, and other locations like the Levant, Greenland, and Muscovy. James I exploited the fact that he was also the King of Scotland and chose to charter the rival company under the Scottish law. The EIC protested and ultimately purchased the Scottish Company's trading rights (Bruce 1810, pp. 193-194; Scott 1912, p. 104).

Drawing on the rich historical literature surrounding the EIC, I document all the interloper events and challenges to its monopoly from 1600 to 1760. They are listed in table 1. It was not uncommon for the monarchy and parliament to authorize interlopers to enter, especially between 1600 and 1698.

Table 1 Interloper Events and 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 Assoc. 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: see Bogart (2015) for details.

Forced loans by the monarchy further illustrate the uncertain policy environment facing the EIC. One example occurred at the close of Charles I's reign in 1641. The King forced the EIC to hand over its stock of pepper which was valued at £63,283. The so-called 'pepper-

[13]Renegotiation also occured in 1773, 1781, 1784, 1793, and 1813. The most significant were Pitt's India Act (1784), which increased government control, and the Charter Act of 1813, which permanently ended the EIC's monopoly on trade to India.

loan' was to be repaid in four installments. The Company recovered around £21,000 by the late 1640s, but at this point Charles I was executed and the Monarchy was abolished. The remainder of the pepper loan was only partly recovered in the 1660s (Foster 1929 p. 463).

The pepper loan of 1641 was not an isolated example. Drawing on the historical literature relating to the EIC I document all forced loans involving the Company from 1600 to 1760. They are listed in table 2. There were forced loans in 12 separate years between 1641 and 1744. The frequency was greatest in the mid-seventeenth century, but the largest loans happened in 1698, 1708, and 1744. The repayment of forced loans was least likely before 1660. For three out of the four loans from 1641 to 1660 the Company suffered a loss in principal.

Table 2 Forced Loans

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. Payment 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. Payment unknown
1666	£50,000	Loan to Charles II. Repaid in 1667
1667	£70,000	Loan to Charles II. Payment 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: see Bogart (2015) for details.

Besides forced loans there were other instances where the government extracted revenues from the EIC. Table 3 lists the major cases of 'fiscal extraction'. Customs duties on East India goods were raised on several occasions from 1636 to 1703. From 1660 to 1695 it was common for the Company to offer gifts to the King. For example, a large gift was made to King George II's treasury in 1730 following a threat from interlopers.

Table 3 Fiscal Extractions

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 on 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: see Bogart (2015) for details.

3 The drivers of policy uncertainty

The history of the EIC suggests that policy uncertainty was driven in large part by political instability and fiscal crises. Their role is especially evident in the two decades following the Glorious Revolution of 1689. This section reviews this period with the aim of motivating the empirical analysis of investment in the following section. A thorough analysis linking political instability, fiscal crises, and uncertainty would require a longer work.

In 1685 King James II came to the throne amidst controversy over his leanings to Catholicism and his support for absolutism. James I was forced to abdicate by leading Protestants and Whigs in 1688 which led to a new King, William of Orange. In the first year after taking the throne, King William increased the EIC's customs duties by 30% (O'Brien, Griffith, and Hunt 1991, p. 400). The Company was also subject to a one-time tax of 5% on the value of its stock in 1692, which represented a payment around £35,000 (Dowell 1884, p. 63). Also in 1690 and 1692, a former Company director, Thomas Papillion, led an interloper syndicate and petitioned the King to dissolve the EIC and to incorporate a new one. As it had done in its past, the EIC was able to defeat the interlopers in 1692 by getting a new charter from King William confirming its monopoly. But the EIC reportedly spent more than £200,000 to sway the King and Members of Parliament (Scott 1912, p. 160).

As it turned out, the EIC's victory in 1692 was temporary. In 1697 William needed loans to help finance the ongoing Nine Years War with France. It was a moment of fiscal crisis as the deficit was 1.4 times the King's annual tax revenue. The EIC offered King William a loan of £500,000 at 4% interest. A rival syndicate offered £2,000,000 at 8% interest with the expectation that they would get the Company's exclusive trading rights

to the East Indies. The rival syndicate was led by former interlopers and supported by the Whig minister Charles Montagu. The end result was that the King and Parliament accepted the offer of the rival syndicate. An act of Parliament (9 William III, c. 44) in 1698 authorized the formation of the 'New' East India Company. The act gave the New Company exclusive rights and required the 'Old' East India Company to cease trading by September 1701 (Scott 1912, pp. 165-68).

The story does not end in 1698. There was an election in February 1701 and the Whig party lost seats in the Commons. The Old Company also got several of its own MPs into the Commons, many of whom were linked with the rival party, the Tories. The Old Company began a successful campaign to re-establish its trading rights through a merger with the New Company. In 1701 the merger was approved by King William and was set to be completed by 1709. A few months later in 1702 King William died and Queen Anne came to the throne. During Anne's reign the Whigs and Tories entered into a period of intense rivalry, and Britain again went to war on the European continent. Facing another fiscal crisis, Queen Anne turned to the Companies for a loan totaling £1,200,000. In 1709 the merger was completed and a 'United' East India Company was created. It would last for the next 150 years.

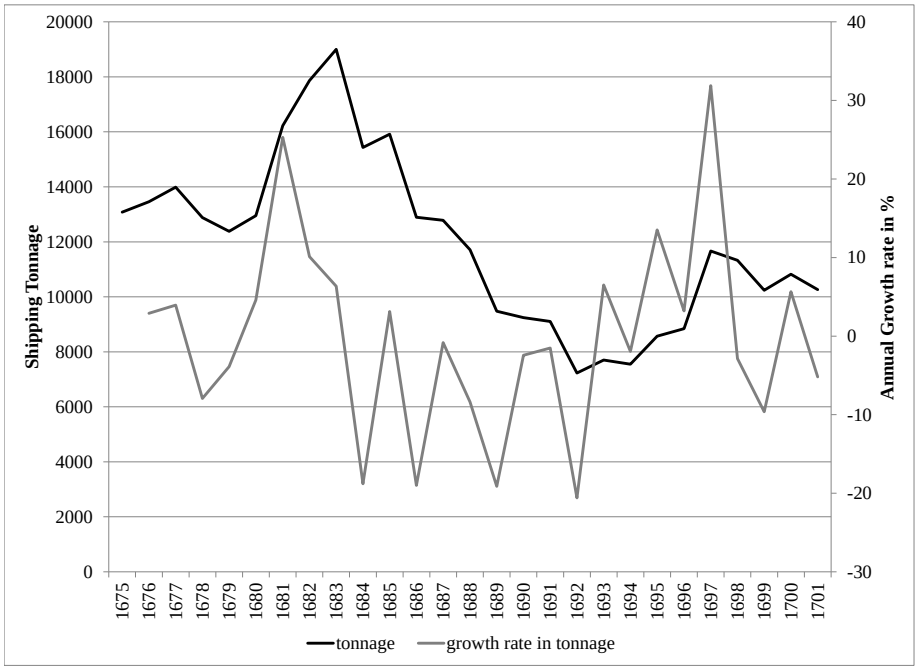
Although the Old East India Company survived these episodes it suffered large losses. In 1685 the Old EIC's share price was 95% of the Dutch East India Company. The EIC's share price fell to 35% of the Dutch Company's price in 1691, 16% in 1694, and 11% in 1697.[14] In the same period, the Old EIC's net assets fell by £1.2 million (Scott 1912).

The events following the Glorious Revolution were somewhat extraordinary but they point to changes in political regimes and fiscal crises as being two general factors influencing policy uncertainty. The EIC could not fully understand the policy priorities of a new monarch when they took the throne. Also the EIC could not easily predict which ministers and parties would have influence over the monarch's decisions. Furthermore, the EIC could not always know how a government would react when faced with a crisis. A government might force loans from the EIC, tax the Company, or leave it alone.

In such an uncertain environment one could imagine that the EIC would reduce its investments in fixed capital, like shipping capacity. As a preview of the results to follow it is useful to briefly examine how the EIC's shipping tonnage evolved around the Glorious Revolution. Figure 1 shows the evolution of Old EIC shipping tonnage from 1675 to 1701

[14]The share prices for the Company are taken from Scott, Constitutions and Finance, Vol II, pp. 123-128, 177-179. The Dutch share price data come from Lodewijk Petram, downloadable at: http://dare.uva.nl/document/201694 .

Figure 1: Evolution of Old English East India Company Shipping Tonnage, 1675-1701



Source: see text.

using sources that will be described below.[15] Note that tonnage represents capacity not the weight of freight shipped.

Based on these figures, the peak for EIC tonnage between 1675 and 1701 was in 1683. For the next ten years after 1683 tonnage declined significantly reaching just under 40% of its peak value by 1692. The fall in tonnage in this period is clearly linked with the uncertainty surrounding James II and the Glorious Revolution. As we saw above the EIC's monopoly was under significant threat from interlopers and it was subject to extraordinary taxation. Recall that the EIC won a temporary victory in 1692 when William confirmed its charter. Notably its tonnage grew again starting in 1692. However, tonnage declined once again in 1697 which is coincident with the deliberations in parliament which eventually gave the New East India Company monopoly rights to the trade.

4 Empirical Framework

The empirical framework draws on the literature studying uncertainty and investment.[16] Many studies start with an error correction investment model which allows for a flexible adjustment of the capital stock to its long-run equilibrium. Variables for uncertainty are then added. The following is a common specification:

$$\Delta k_t = \alpha_1 + \beta_1 \Delta k_{t-1} + \beta_2 \Delta y_t + \beta_3 \Delta y_{t-1} + \beta_4 \sigma_t + \beta_5 \Delta \sigma_t + \theta (y-k)_{t-2} + \nu y_{t-2} + \varepsilon_t \tag{1}$$

where k_t is the natural log of the capital stock, y_t is the natural log of firm sales, and Δ represents the difference in logged variables from year t to $t-1$. σ_t and $\Delta\sigma_t$ measure the level of uncertainty and changes in uncertainty in year t. $(y-k)_{t-2}$ is the error correction term, or the logged difference between sales and the capital stock. [17]

Measuring uncertainty is one of the main challenges in the literature. One approach uses the volatility of company stock market returns (Leahy and Whited 1996). While informative stock price volatility captures many factors, and for the purposes of studying policy uncertainty alternative measures have been used in the literature. Some use indicators for years leading up to elections, especially close elections, because they capture uncertainty about who will be making policy decisions (See Julio and Yook 2012, 2014, Durnev 2010, and Gulen and Ion 2013). Others use variables for fiscal rules and capacity because it captures uncertainty about government spending and borrowing policies (See Feng 2001 and Fernández-Villaverde 2011).

Following these approaches and drawing on the history of the EIC I create several variables to capture policy uncertainty. The first is the ratio of government deficits to revenues in the previous year, or $deficits_{t-1}$. It capture fiscal crises, and as I will show below the deficit ratio was almost entirely driven by warfare and its associated costs. I code years where there was a mandated election to the House of Commons, incorporating separate indicators

[15] Tonnage is constructed from data in Sutton (2001). See section 4 below..

[16] See Bloom et. al. (2007), Bond and Lombardi (2006), Fuss and Vermeulen (2008), and Stein and Stone (2013) among others.

[17] The key coefficients, β_4 and β_5, identify whether higher uncertainty or changes in uncertainty lower the growth of investment respectively. The coefficient β_1 captures dynamics, in which the growth of the firm's capital stock last year influences this years growth. The coefficients β_2 and β_3 capture the investment response to demand shocks, represented by the growth in sales. The coefficient θ is multiplied by the error correction term and measures the speed of adjustment to the long run-equilibrium. θ should be positive because when the log of sales exceeds the log of the capital stock then capital should grow to restore the long-run relationship.The coefficient ν allows for a non-unitary long-run elasticity between capital and sales.

for the year before the election, the year of the election, and the year after ($election_{t+1}$, $election_t$, and $election_{t-1}$). I also code changes in the monarchy and key government ministers in the previous year ($newmonarch_{t-1}$ and $newministers_{t-1}$). Lastly, I incorporate dummy variables for each monarch or political party in power. Such variables are collectively labeled $Regime_t$. The interpretation of political regime indicators is complicated as they could reflect differences in the *level* of uncertainty across regime types, or simply differences in the policies enacted by various regimes. Below I treat $Regime_t$ as a summary effect of the political environment associated with a monarch or majority party.

The baseline specification analyzed below is the following:

$$\Delta k_t = \pi_1 deficits_{t-1} + \pi_2 \cdot \sum_{j=-1}^{1} election_{t+j} + \pi_3 newmonarch_{t-1} + \pi_4 newministers_{t-1} + \pi_5 regime_t + \beta x_{t-j} + \varepsilon_t \quad (2)$$

where Δk_t is the natural log of tonnage employed by the EIC and x_{t-j} includes the standard control variables in the error correction model shown in equation (1) plus other controls described below.

Omitted variables are the main concern in estimating this model. Specifically there could be omitted factors correlated with the variables for policy uncertainty including changes in the trading environment in Asia or general uncertainty coming from the domestic economy in Britain. Below I address these issues in several ways. First, the tonnage of the Dutch East India Company is used as a placebo test. Second I use changes in the monarchy and government ministers caused by deaths as exogenous regime changes. Third, more general measures of uncertainty based on stock price volatility and books written about the EIC are compared with the variables for regime changes and deficits. Fourth, confounds are examined by adding variables for forced loans and other policy events. The following section describes the data and sources for the variables. It begins with background on EIC shipping.

5 Data

5.1 Background on EIC Shipping

Shipping was the core business activity of the EIC, especially before 1760. Company ships were loaded in Britain with cargo that included new world silver and some manufactured goods. They then sailed for Asia arriving at Company factories in diverse locations such as India and China (Erikson 2014). There the ships would be unloaded and after a period of time they would be reloaded with various Asian goods like pepper, tea, and textiles. The

ships would then set sail for Britain and would arrive approximately one to two years after they originally left. One important point is that ships sailing to East Asia were specially designed and were larger than ships in other trades. Therefore if East Indian ships retired from the trade, say because of a loss of the monopoly, their value was then much lower.

Early in the EIC's history it built and owned its ships, but from around 1660 it instead hired ships owned by others. Under the so-called chartering system, the EIC would pay a fixed freight rate for a voyage plus an additional daily fee if the ship stayed in India beyond an agreed upon date.[18] The chartering system suggests that ship owners bore the costs of uncertainty, but it is more likely that the EIC and especially its directors bore most of the costs. Many ship owners were large shareholders and directors in the EIC, and thus were not independent of the Company. The long-term nature of the chartering contracts also suggests that the EIC bore some risks. In the late seventeenth century, the EIC contracted to employ a ship for no less than 14 to 16 years depending on two size classes. In the eighteenth century the standard contract employed a ship for four voyages, which usually meant 8 to 10 years. If the EIC chartered a ship and conditions then changed for the worse they were still liable to pay fees for the duration of the charter contract. The EIC might default of course, in which case the independent shipowners would lose. However, in times of war or political conflict the shipowners could incorporate this risk by charging the Company a higher freight rate.

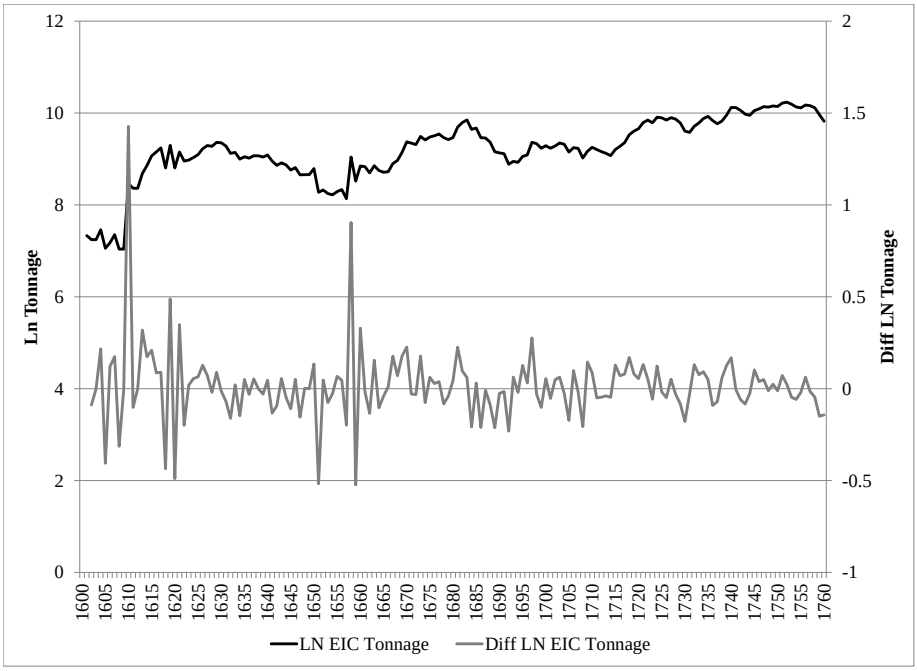
5.2 Data on EIC Shipping and Sales

Sutton (2000) provides summary data on all the ships employed by the EIC. The Sutton data includes the name of every ship, its tonnage, the first and last year of the season it set sail from Britain, and whether the ship had a special ownership status as a merchant ship, a private ship, a ship sailing under permission of the Company, or a New Company ship. I estimate the stock of shipping tonnage employed by the Company in each year from 1601 to 1820 using Sutton's data on the tonnage of each ship and the first and last year of its sailing season.[19] An example illustrates the calculation, the African was a 240 ton ship which first sailed from London during the season starting in 1660 and for the last time in the season starting in 1664. I record the EIC as employing the African's 240 tons in 1660,

[18] See Chaudhuri (1993) and Sutton (2000) for a discussion of the chartering system.

[19] Before 1709 the series is based on the Old Company's shipping tonnage. After 1709 the series is based on the United East India Company's shipping tonnage. I also have data on the New Company's shipping tonnage but it is not included as it represented a small amount and the New Company was not the incumbent which is the firm of interest here.

Figure 2: English East India Company Shipping Tonnage in Logs and Log Differences, 1601-1760



Source: see text.

1661, 1662, 1663, and 1664. Note that the saling season often starts in December so a ship like the African may not actually sail until early in 1661. I retain the sailing season dating in Sutton to lessen measurement error.

The resulting series on shipping tonnage from 1602 to 1760 is shown in figure 2 in logs (black) and yearly log differences (gray). The most notable feature of the series is the higher volatility of shipping growth in the 1600s. Higher volatility is consistent with the more uncertain policy environment of this period.

Chaudhuri (1978) provides high quality data on revenues from goods imported to Britain and revenues on goods exported to Asia. Chaudhuri's import revenue series covers 1664 to 1760 and the export revenues series covers 1660 to 1760. I sum the two to produce a series on sales revenues from 1664 to 1760. For the four years from 1660 to 1663 I use an index of export revenues to estimate sales revenues. In the empirical analysis below I focus on the period from 1660 to 1760 as it is difficult to contruct an earlier sales series without introducing strong assumptions. The resulting series for the log of EIC sales is shown in

Figure 3: English East India Company Sales and Shipping Tonnage in Logs, 1660-1760

Source: see text.

figure 3 (gray) along with the log of shipping tonnage (black) for comparison. Note that the sales series is converted into constant 1700 prices using Broadberry et. al. (2011)'s GDP deflator. A close relationship between sales and shipping tonnage is evident throughout.

5.3 Political Regimes and Regime Changes

The monarchy had a large influence on the policy environment facing the EIC. Using standard political histories of Britain (Holmes 1993, Holmes and Szechi 1993), I code the identity of the monarch and the years the monarch changed. I also code whether the monarch changed because of a natural death. From 1661 to 1760 the Glorious Revolution was the only case where the monarchy changed for reasons other than death.

Government ministers were appointed by the monarchy and were important actors in any government. The Lord Treasurer was head of the treasury and from the time of Robert Walpole (1721-1742), the officeholder was considered to be the Prime Minister. The Lord Chancellor was a leading figure in the judiciary which is potentially relevant because many of the EIC's disputes with interlopers were resolved in the courts. The individuals holding the position of Lord Treasurer and Chancellor sometimes changed due to deaths, but more often

they were dismissed by the monarchy. Using the same political histories, I code years with new Lord Treasurers and Chancellors and distinguish those who came into office because of a death.

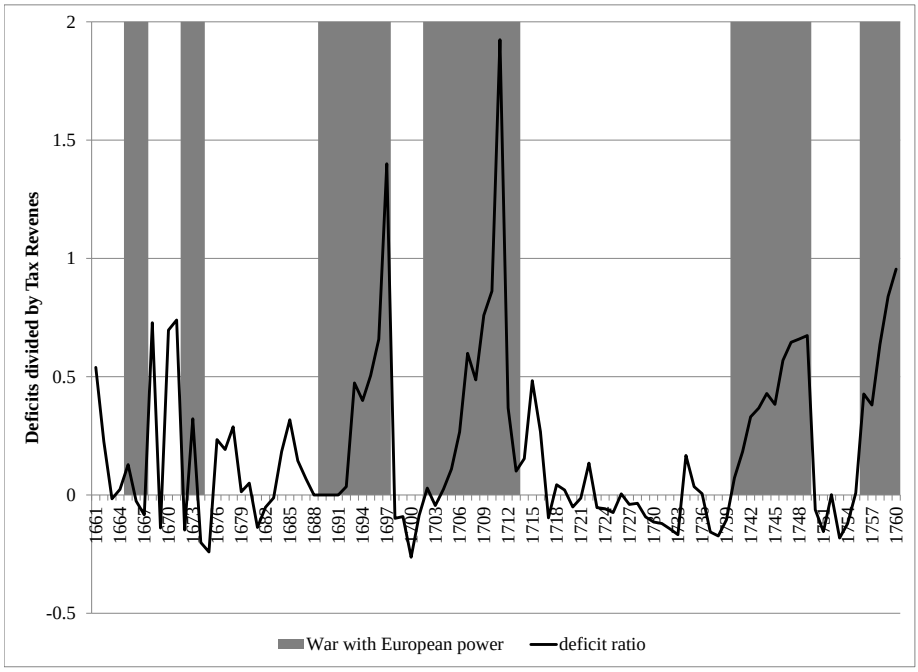
Elections are potentially important events because they changed the composition of the House of Commons. I code all years with an election from 1660 to 1760 using the standard histories listed earlier. I also account for different timing and types of elections. The Triennial Act in 1694 and the Septennial Act in 1716 required elections at least every 3 and 7 years respectively. However, sometimes elections happened earlier because the monarch died or because the monarch dissolved parliament before 3 or 7 years. Dissolution usually occurred when the monarch was unsatisfied with their current government. The monarch would select new ministers and begin a campaign to get their coalition or party elected in the Commons. I code elections that were required by the Triennial Act and the Septennial Act, and call them 'mandated' elections. An election is mandated if there were three legislative sessions since the last election from 1694 to 1715 and seven legislative sessions since the last election from 1716 to 1760. Before 1694 there were no mandated elections.

I also separately code the identity of the majority party in the Commons and the elections which changed the majority party in the Commons. The Whigs were an identifiable party from the 1670s to late 1760s, and held a majority in most of these years. The other party was the Tories, who held a majority in most of the years between 1690 and 1715. In the ealier period from 1661 to 1679 parties had not yet formed but there was a 'Court' coalition in the Commons that resembled a party. Drawing on the standard histories of parties (Holmes 1993, Cruickshanks, Handley, and Hayton 2002), I create an indicator variable for years with Whig majorites and Tory majorities. The era of the Court party in the 1660s and early 1670s is the omitted period.

5.4 Fiscal Crises and War

Government deficits are a natural measure of fiscal crises. The deficit ratio, defined as (expenditure-revenue)/revenue, is available for Britain from 1661 onwards (see Dincecco 2011). In modern contexts, deficits are often linked to recessions, but historically deficits were almost entirely driven by the cost of warfare. I code years when there was a war with a European power using standard histories of Britain listed above. I also code the first year of a European or American war to capture potential changes in uncertainty associated with entry into military conflict. The level of deficits and its link with European wars are shown in figure 4. Deficits clearly rise towards the end of wars. The relationship between deficits

Figure 4: Deficit Ratios and Wars, 1661-1760

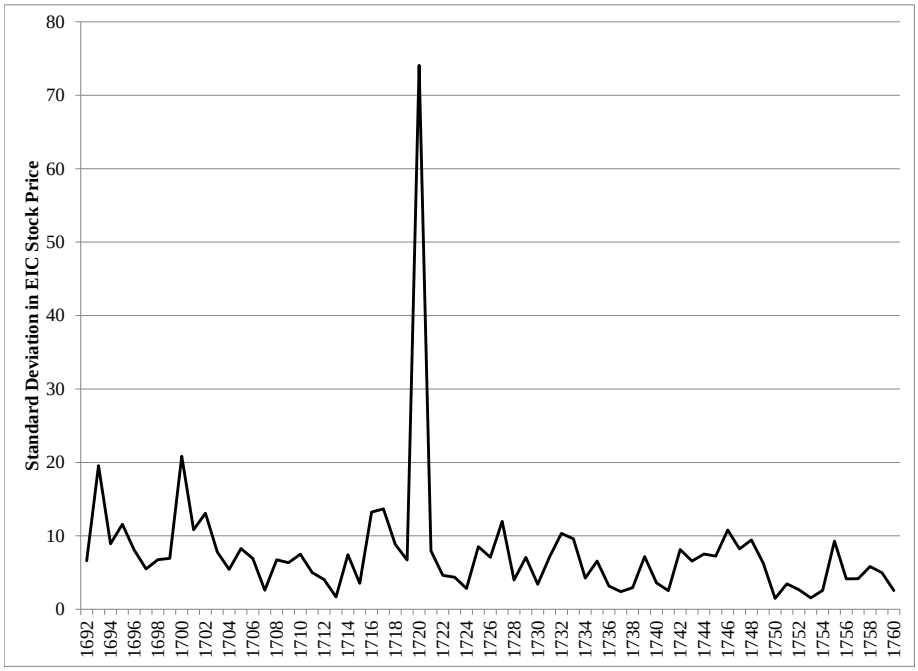


Source: see text.

and wars complicates their link with uncertainty. Wars disrupt foreign trade, and thus they could lower the EIC's investment by depressing sales. In the analysis below I control for EIC sales and years of war. Thus the estimated effect of deficits is conditional on the existence of wars and the spillover effects of war on EIC sales.

Deficits might also depend on the fiscal capacity of the government. I measure fiscal capacity using the detrended ratio of government tax revenues to GDP. The series on tax revenues is taken from O'Brien and Hunt (1993) and is available from 1600 onwards. It includes the sum of direct taxes (mostly land), indirect taxes (customs and excise), earnings from the mint, and earnings from Crown assets. Loans are not included. I use Broadberry et. al. (2011)'s GDP deflator to transform the revenue series into constant 1700 prices. I also use Broadberry et. al. (2011)'s constant price GDP series as the denominator in the ratio of tax revenues to GDP.

Figure 5: Volatility of EIC share price, 1660-1760



Source: see text.

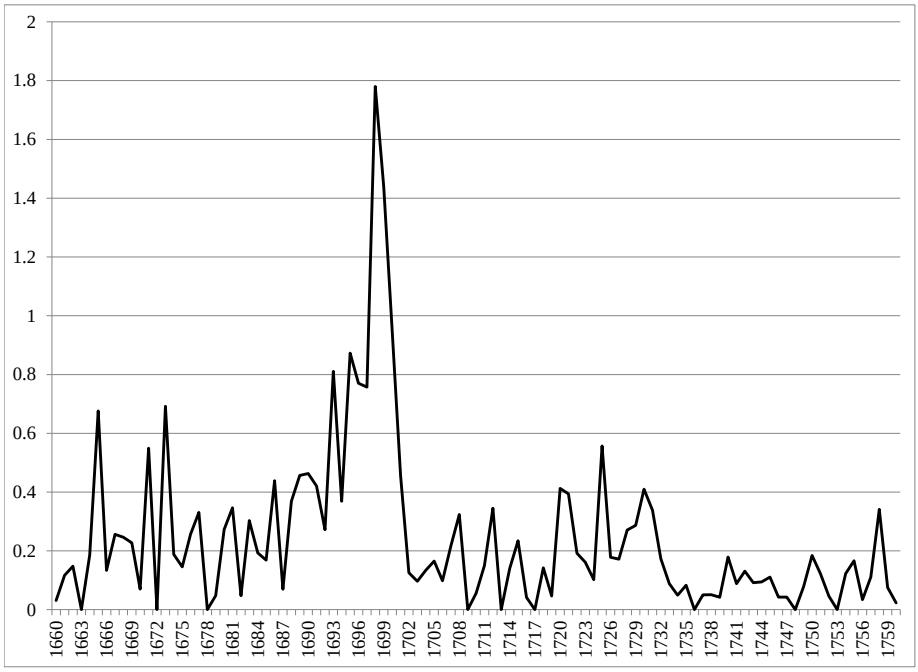
5.5 Alternative Measures of Uncertainty

Previous studies in the economics literature use volatility in stock market returns as a measure of uncertainty (see Leahy and Whited 1996). I also implement this approach for comparison. There is weekly stock price data for the EIC from 1692 to 1697 and daily stock price data from 1698 to the mid nineteenth century.[20] I calculate the standard deviation in weekly or daily stock prices over the calendar year as one measure of volotility. The trends are shown in figure 5. The peak in 1720 reflects the famous South Sea Bubble, where the EIC share price rose and then declined along with other corporations.

Recent studies have also used newspapers articles on the economy as an indicator for uncertainty in the US or globabl economy (Baker e. al. 2013). I follow this approach here and use counts of the number of books printed in English with East Indies or East India in the title. The data come from the English Short Title Catalogue which identifies all printed

[20]East India Company Stock price data are available from Global Financial Data, https://www.globalfinancialdata.com/index.html

Figure 6: Percentage of Books Published in English that have East India in Title, 1660-1760



Source: see text.

books from the 1500s through 1800.[21] I scale the number of East India books by the total number of books printed as there was an upward trend in book publishing. Figure 6 shows the percentage of all books in English that included East India in the title. East India books are a high percentage of the total in the 1660s and again in the 1690s. The peak year is 1698 which is when the New East India Company was founded. The coincidence with known periods of uncertainty suggests the share of East India book titles contains useful information.

5.6 Additional Variables

Several more variables are added which could potentially influence the growth of shipping tonnage through channels other than policy uncertainty. One variable is an indicator for years with military conflicts that took place in India involving the EIC or the British army. Indian military conflicts are identified from Riddick's (2006) chronology of British India.

[21] For the English Short title Catalogue see http://estc.bl.uk

The effect of Indian conflict is less straightforward as they were were fought against other European Companies or local powers like the Mughals. Thus they were potentially linked with the value of Indian trade and may not capture the negative effects of conflict. The growth of British GDP could influence the growth in demand for EIC imports. I use Broadberry et. al.'s (2011) constant price GDP series to calculate the yearly log difference as a measure of annual GDP growth. While I lack annual data on Indian GDP or population, there is information on shocks to Indian demand coming from famines. However according to Riddick (2006) there are no major famines in India from 1660 to 1760. The production of silver in the Americas could also influence the growth of shipping because it was the main export for the EIC in Asia. I use Garner (1988)'s series on total silver production in the Americas, which includes the outputs of the major mines in Mexico and Peru measured in kilograms. I use the yearly log difference in American silver production as a measure of the growth in export supplies. Domestic investments like land and buildings were the main alternative to investing in EIC ships (government debt becomes important after 1700). I use Clark's (2001) series on returns for land and buildings held by charities. I calculate the average rate of return across all asset observations in each year to estimate the annual domestic rate of return.[22]

Another useful variable comes from the Dutch East India Company or VOC. The shipping records of the VOC are very detailed and have been complied by Bruijn, Gaastra, and Schöffer (1979).[23] I create a variable for shipping tonnage employed by the VOC which is similar to that of the EIC based on the tonnage of ships sailing. The Dutch ship-level data is comparable to the English data except for some differences in timing. A ship enters the Dutch data the calendar year it sails, while an English ship enters during the sailing season which generally starts in December, the calendar year before. Thus below I consider the Dutch series in its sailing year and one year forward to examine the comparability with the English data.

5.7 Summary Statistics

All the variables are summarized in table 2. The first variable the growth of EIC tonnage is the log difference in shipping tonnage, or $ln(tonnage_t) - ln(tonnage_{t-1})$. It has a mean of 0.010 which implies the average growth rate was 1.0%. The growth rate in sales is larger

[22]For details on the charity records see the description by Clark, http://www.econ.ucdavis.edu/faculty/gclark/papers/reh.pdf

[23]Bruijn et al.'s data are now available through http://resources.huygens.knaw.nl/das/index_html_en

on average but also more variable. The remaining variables come under the headings of Regime Change and Fiscal variables (Panel B), Regime variables (Panel C), and Additional Variables (Panel D). In the last group note that the mean growth of VOC shipping is 0.012 which implies a higher growth rate than for EIC shipping (1.2% versus 1.0%). The VOC growth rate is also less variable.

Table 2: Summary Statistics

Panel A: Baseline Variables	Mean	Stand. Dev.	Min.	Max	N
Growth of EIC Tonnage	0.010	0.104	-0.231	0.276	99
Growth in EIC Sales	0.019	0.342	-1.578	1.088	99
(Growth in EIC Sales)^2	0.117	0.324	0.000	2.490	99
Ln EIC Sales	13.66	0.777	10.74	14.73	99
Ln EIC Sales - Ln EIC Tonnage	4.114	0.495	2.030	4.826	99
Panel B: Regime Change and Fiscal Variables					
Deficit Ratio	0.187	0.363	-0.263	1.924	99
Tax to GDP Ratio Detrended	0.031	0.013	0.002	0.060	99
New Monarch or Executive	0.060	0.239	0	1	99
New Lord Chancellor	0.161	0.369	0	1	99
New Lord Treasurer	0.232	0.424	0	1	99
Election	0.202	0.403	0	1	99
Election (mandated)	0.091	0.289	0	1	99
Election (majority party changes)	0.101	0.303	0	1	99
Panel C: Regime Variables					
Reign of James II (1685-87)	0.030	0.172	0	1	99
Reign of William & Mary (1689-1701)	0.141	0.350	0	1	99
Reign of Anne (1702-14)	0.131	0.339	0	1	99
Reign of George I (1715-26)	0.121	0.328	0	1	99
Reign of George II (1727-1760)	0.333	0.473	0	1	99
Years with Whig Majority	0.616	0.488	0	1	99
Years with Tory Majority	0.212	0.411	0	1	99
Panel D: Additional Variables					
Share of East Indian tiltles in all books	0.248	0.287	0	1	99
Standard deviation in EIC share price	7.778	8.929	1.492	74.08	69
War in India	0.202	0.403	0	1	99
War in Europe or America	0.424	0.496	0	1	99
First year of War in Europe or America	0.060	0.239	0	1	99
Growth of Amer. Silver Prod.	0.007	0.078	-0.256	0.197	99
Growth of British GDP	0.008	0.067	-0.179	0.174	99
Return on land and buildings	4.83	0.568	3.724	7.283	99
Growth of VOC Tonnage	0.012	0.075	-0.197	0.236	99

Sources: see text.

6 Results

6.1 Baseline Model

It is useful to begin with the estimates for a baseline investment model without the variables for regime changes, regimes, and fiscal factors. The results for all variables are included in table 3.[24] Briefly the results do not show a strong reversion process where higher growth in tonnage in t-1 lowers the growth in tonnage in t. The error correction term, Ln EIC Sales - Ln EIC Tonnage, has a positive sign indicating that when sales exceeds tonnage by a larger amount, the long-run equilibrium is restored by a higher growth in tonnage. Also a higher sales growth in t and t-1 leads to higher tonnage growth in t. The effect of sales growth is convex based on the positive sign for the square of sales growth. Later it will be useful to compare the effects of a one standard deviation increase in EIC sales growth allowing for the convex effect as well. According to the estimates in table 2 it would increase shipping tonnage by 12.3% which is 119% of the standard deviation in yearly shipping growth of 10.3%.

Note that few of the additional control variables shown in column 2 of table 3 are significantly related to EIC shipping growth. Only the indicator for the first year of an European war is large and significant. The indicator for being in a European war is negative but not precisely estimated. Note that part of war's impact is captured through sales growth. Despite the low joint significance of the additional controls, I include them all subsequent specifications to minimize concerns about omitted factors.

[24] Newey-West standard errors are reported to address auto-correlation. I use 4 lags based on the Stock and Watson default formula for m lags, $m = 0.75T^{1/3}$

Table 3: Baseline regression results

	(1)		(2)
	Coefficient		Coefficient
Variable	(Stand. Err.)	Variable	(Stand. Err.)
Growth of EIC Tonnage t-1	-0.095	War in Europe, t-1	-0.032
	(0.101)		(0.025)
Ln (EIC Sales t-2/EIC Tonnage t-2)	0.169	War in Europe, First Year, t-1	0.104
	(0.046)***		(0.041)**
Ln EIC Sales t-2	-0.057	War in India, t-1	-0.010
	(0.035)		(0.024)
Growth in EIC Sales t	0.157	Return on land, t-1	0.003
	(0.027)***		(0.028)
Growth in EIC Sales t-1	0.091	Growth British GDP, t-1	-0.131
	(0.035)**		(0.151)
(Growth in EIC Sales t)^2	0.124	Growth Silver Production, t-1	0.086
	(0.022)***		(0.111)
Constant	0.077		
	(0.446)		
N			99
P value F-Stat			9.15

Notes: Newey West Standard Errors are reported. *, **, *** indicates statistical significance at the 10%, 5%, and 1% level respectively.

The next models add the regime change, regime, and fiscal variables to the baseline model just analyzed (see table 4). The deficit ratio has a negative and statistically significant effect on shipping growth. In terms of magnitude, consider that in periods of war the deficit ratio increased by an average 1.2. According to the estimates shipping tonnage would fall by 9.3%. The effect of new monarchs is negative and significant (albeit at the 10% level). A new monarch is estimated to lower the shipping tonnage by approximately 8.1% in the following year. Mandated elections are also found to have a negative and significant effect. In the year of a mandated election tonnage is estimated to fall by 7.2%. Overall the deficits, elections, and new monarch variables have sizeable effects when compared to the variation in sales growth which captures general shocks.

Other noteworthy results concern the variables for fiscal capacity and new government ministers. None of these coefficients are large or significant. They do not appear to be key drivers of policy uncertainty. Also noteworthy is that all regime variables are insignificant. Whig or Tory majorities do not lead to different outcomes compared to the pre-1679 period where the Commons was run by a loose coalition of court interests. Also note that none of the monarchs after Charles II (1660-1685) is associated with a higher average growth

in tonnage. This provides one indication that the policy environment in the early to mid eighteenth century was not significantly more favorable for EIC investment compared to the mid to late seventeenth century.

Table 4: Model with Policy Uncertainty

	(1)		(2)
	Coefficient		Coefficient
Variable	(Stand. Err.)	Variable	(Stand. Err.)
Deficit Ratio t-1	-0.078	Whig Majority t	-0.007
	(0.029)**		(0.044)
Tax to GDP ratio detrended t-1	-2.045	Tory majority t	-0.018
	(1.556)		(0.053)
New Monarch t-1	-0.081	Reign of James II	0.021
	(0.045)*		(0.052)
New Lord Chancellor t-1	-0.015	Reign of William & Mary	-0.017
	(0.024)		(0.053)
New Lord Treasurer t-1	0.007	Reign of Anne	-0.021
	(0.024)		(0.062)
Elections (mandated), t+1	0.008	Reign of George I	0.066
	(0.039)		(0.059)
Elections (mandated), t	-0.072	Reign of George II	0.041
	(0.033)**		(0.056)
Elections (mandated), t-1	-0.016		
	(0.038)		
Baseline Variables Included?			Yes
N			99
F-Stat			7.31

Notes: Newey West Standard Errors are reported. *, **, *** indicates statistical significance at the 10%, 5%, and 1% level respectively.

6.2 Robustness and Extensions

There are several robustness checks that support or extend the previous results. First, I examine the effects of all elections as well as those that changed the majority party. The previous model used mandated elections and excluded elections that came from the premature dissolution of a parliament by a monarch. There is a potential bias in studying such elections because dissolution may be correlated with economic conditions that could influence shipping growth. The second column of table 5 shows estimates when all elections are used. For comparison column 1 shows the estimates for mandated elections from the

previous model. There is no significant effect from all elections suggesting there is a bias from dissolution.

There is a further possiblity that elections changing the majority party in the Commons had a greater effect on uncertainty compared to other elections. The results in column 3 show that the coefficient estimates on elections changing the majority party are not significantly different from zero. However, one concern again is that the timing of these elections was endogenous. In column 4 results are shown for mandated elections and those that changed the majority party. Here I find the largest negative effects on shipping growth. Following such elections shipping tonnage fell by 14%.

Table 5: Effects of Elections

	Elections mandated	Elections all	Elections change party	Elections mandated & change party
	(1)	(2)	(3)	(4)
	Coefficient	Coefficient	Coefficient	Coefficient
Variable	(Stand. Err.)	(Stand. Err.)	(Stand. Err.)	(Stand. Err.)
Elections, t+1	0.008	-0.006	-0.057	-0.064
	(0.039)	(0.027)	(0.040)	(0.039)
Elections, t	-0.072	0.001	-0.002	-0.139
	(0.033)**	(0.027)	(0.041)	(0.040)***
Elections, t-1	-0.016	-0.008	0.000	0.057
	(0.038)	(0.027)	(0.042)	(0.038)
uncertainty variables included?	Yes	Yes	Yes	Yes
Baseline Variables Included?	Yes	Yes	Yes	Yes
N	99	99	99	99
F-Stat	7.31	6.29	5.44	11.83

Notes: Newey West Standard Errors are reported. *, **, *** indicates statistical significance at the 10%, 5%, and 1% level respectively.

As noted earlier one of the main identification issues concerns unobservable factors related to the trading environment in Europe or Asia. I address this issue by replacing EIC shipping growth with the Dutch East India Company's (VOC) shipping growth as the dependent variable. The VOC and the EIC had similar trading activities. They both brought goods like pepper and tea from Asia back to Europe for sale. If there was a common negative shock to Asian supply or European demand, then one would expect that the two companies would adjust their shipping tonnage in similar ways. Thus if a variable, like new monarchs, happened to be correlated with shocks to Asian supply or European demand then the

coefficients on the monarch variable should have the same sign and significance for the EIC and VOC. If the variable for the new monarch is orthogonal to demand or supply shocks then the coefficient should be insignificantly related to VOC shipping growth.

The results in column 2 of table 6 show estimates when VOC shipping growth is the dependent variable and all esle is kept the same. For comparison column 1 shows the baseline coefficients using EIC shipping growth as the dependent variable. The main finding is that the coefficients for deficits and new monarchs are not significant for VOC shipping growth. However, the variable for a mandated election in the coming year has a negative and significant effect. The timing is curious because it is not clear why the VOC would react one year in advance (year t+1) to an election and the EIC would react immediately (t). The difference is possibly due to the way new ships are recorded for the EIC based on the sailing season and for the VOC based on the calendar year of their first season. To explore this issue, I regress the VOC shipping growth one year forward on the same variables which would assign all ships saling in the current calendar year to the previous year which was generally the start of the English saling season. Column 3 shows the results. Again they show no effect from deficits or new monarchs. There is small positive effect of mandated elections in the year prior (t-1), but as it is not the same sign as the coefficient for the EIC it does not suggest any correlation between elections and negative shocks to the trading environment in Asia which is the main concern.

Table 6: Placebo test with VOC shipping growth

	(1) EIC	(2) VOC	(3) VOC One year forward
Variable	Coefficient (Stand. Err.)	Coefficient (Stand. Err.)	Coefficient (Stand. Err.)
Deficit Ratio t-1	-0.078	-0.038	-0.010
	(0.029)**	(0.031)	(0.028)
Tax to GDP ratio detrended t-1	-2.045	-0.108	2.086
	(1.556)	(1.078)	(1.471)
New Monarch t-1	-0.081	-0.010	-0.006
	(0.045)*	(0.033)	(0.039)
New Lord Chancellor t-1	-0.015	0.040	-0.015
	(0.024)	(0.026)	(0.015)
New Lord Treasurer t-1	0.007	-0.027	0.004
	(0.024)	(0.018)	(0.024)
Elections (mandated), t+1	0.008	-0.049	-0.004
	(0.039)	(0.024)**	(0.027)
Elections (mandated), t	-0.072	-0.014	0.017
	(0.033)**	(0.026)	(0.025)
Elections (mandated), t-1	-0.016	0.006	0.036
	(0.038)	(0.031)	(0.020)*
Baseline Variables Included?	Yes	Yes	Yes
Regime Variables Included?	Yes	Yes	Yes
N	99	99	99
F-Stat	7.31	2.8	1.85

Notes: Newey West Standard Errors are reported. *, **, *** indicates statistical significance at the 10%, 5%, and 1% level respectively.

Deaths of monarchs and ministers provide another approach to the omitted variables problem. As the EIC was important in British politics, revolutions and conflict that led to the ouster of the monarchy or ministers could be driven by unobservable economic factors linked to the EIC's trading environment. I address this issue using only those changes in the monarchy and leading ministers that were caused by natural deaths. In essence these represent exogenous changes in government leaders. I estimate the models in table 3 after replacing the dummy variables for changes in the Monarchy, Lord Chancellor, and Lord Treasurer with their equivalent due to deaths. All other variables remain the same. The results are shown in table 7. None of the earlier conclusions changes. The coefficient for new monarch goes from -0.081 to -0.112 using deaths. Thus if anything the endogeneity of

changes in the monarchy biases the estimates downward.

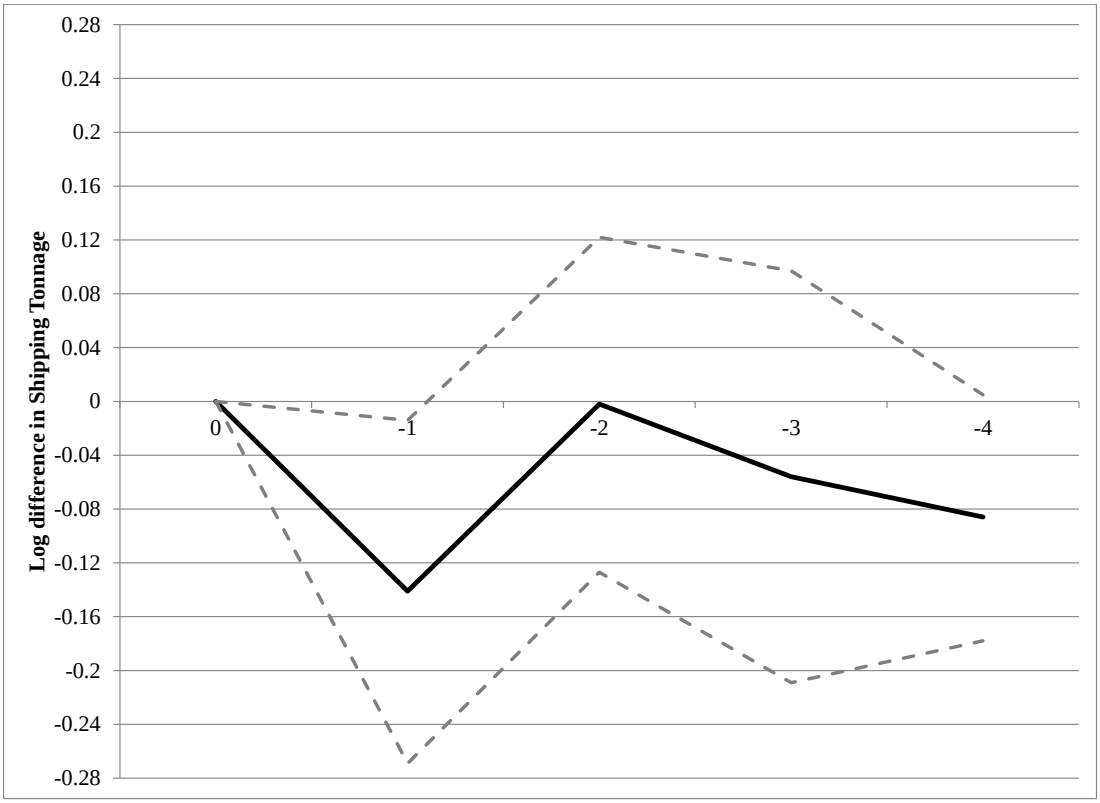
Table 7: Deaths and Regime Changes

	all changes	deaths only
	(1)	(2)
	Coefficient	Coefficient
Variable	(Stand. Err.)	(Stand. Err.)
New Monarch t-1	-0.081	-0.112
	(0.045)*	(0.061)*
New Lord Chancellor t-1	-0.015	-0.026
	(0.024)	(0.062)
New Lord Treasurer t-1	0.007	-0.004
	(0.024)	(0.056)
Baseline Variables Included?	Yes	Yes
Regime Variables Included?	Yes	Yes
N	99	99
P value, F-Stat	7.31	9.87

Notes: Newey West Standard Errors are reported. *, **, *** indicates statistical significance at the 10%, 5%, and 1% level respectively.

The previous models assume regime changes and fiscal variables have effects on shipping growth only in the following year. While this timing assumption is reasonable they could have lagged effects over several years. Moreover, there is a possible 'rebound effect,' where investment first decreases when uncertainty rises and then increases once uncertainty is resolved. With a strong rebound effect, uncertainty shocks have little net effect. I test for dynamic effects on shipping growth by including the deficit ratio and indicators for new monarchs with four yearly lags in t-1, t-2, t-3, and t-4. Also sales growth and all the additional controls are included over the same 4-year time span. Indicators for each monarch, majority party, elections, and the error correction term are included only once and in the same year as previously. Rather than show the coefficients for all variables, I focus on the deficit ratio and indicators for new monarchs. Figure 7 shows the coefficients for new monarchs in each year along with 95% confidence intervals around each year estimate. Consistent with earlier results, shipping tonnage falls by 14% in the year immediately after a new monarch. Notably there is no large rebound effect either as shipping growth never turns significantly positive. Note also that the cumulative effect of a new monarch are now larger than in the model with one yearly lag. Over the four years following a new monarch shipping tonnage is estimated to decline by 28.5%. For comparison over 4 years the cumulative effect of a one standard deviation increase in the growth of EIC sales is around 14%. Thus a new

Figure 7: Coefficients for New Monarch 1, 2, 3, and 4 year lags



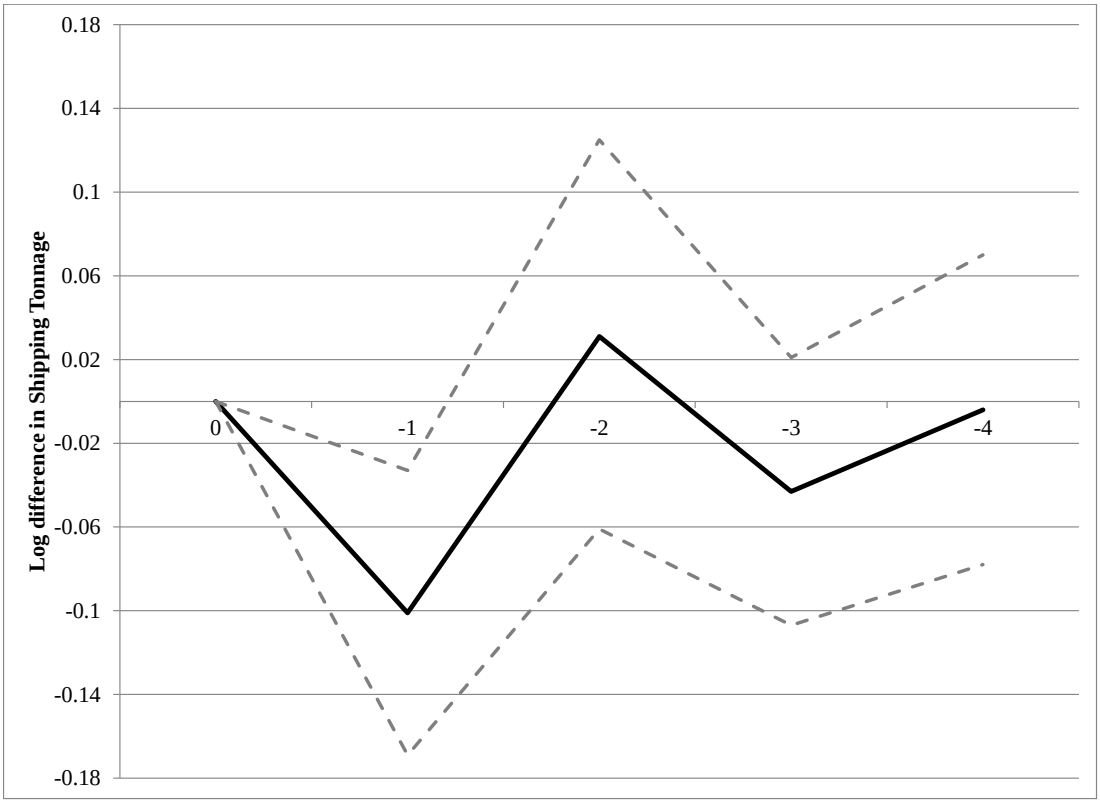
Source: see text.

monarch lowers shipping growth by more than twice as much as a one standard deviation decline in sales growth.

Figure 8 shows that shipping tonnage also falls by 10.1% in the year after the deficit ratio rises to one, as generally occurred during years of war. Again there is no rebound effect. The cumulative effect of deficit ratios is also larger in the dynamic model. Shipping tonnage declines by 11.7% in the four years after the deficit ratio rises by one.

I interpret regime changes and the severity of fiscal crises as indicators for greater policy uncertainty. However, it is possible they are linked with more general uncertainty. To address this issue I follow two approaches. First, I examine the potential correlation with general uncertainty using the share of all books published in English with East India or East Indies in the title. Note that EIC titles rose during periods of policy uncertainty, like the 1690s, but they also potentially rise with other types of uncertainty. Thus if the

Figure 8: Coefficients for Deficit Ratio 1, 2, 3, and 4 year lags



Source: see text.

effects of new monarchs, elections, and deficits are absent once book titles are included that would suggest the policy uncertainty variables are really capturing general uncertainty. The results of adding the share of EIC book titles in the regression as an additonal variable is shown in column 2 of table 8. Column 1 shows the baseline model with variables for policy uncertainty. There is a negative effect from the share of EIC book titles, suggesting a negative effect from general uncertainty. The other main variables retain their sign and significance. In terms of magnitudes they fall a bit, but not enough to suggest they no longer matter.

Table 8: Adding other Measures Uncertainty

Variable	(1) Coefficient (Stand. Err.)	(2) Coefficient (Stand. Err.)	(3) Coefficient (Stand. Err.)
Share of EIC book titles in all titles t-1		-0.081	
		(0.044)*	
Standard Deviation EIC Stock t-1			0.002
			(0.001)
Change in Standard deviation EIC Stock t-1			-0.002
			(0.000)**
Deficit Ratio t-1	-0.078	-0.073	-0.083
	(0.029)**	(0.030)**	(0.048)*
Tax to GDP ratio detrended t-1	-2.045	-1.387	-5.260
	(1.556)	(1.505)	(2.869)*
New Monarch t-1	-0.081	-0.077	-0.057
	(0.045)*	(0.045)*	(0.072)
New Lord Chancellor t-1	-0.015	-0.010	-0.015
	(0.024)	(0.024)	(0.021)
New Lord Treasurer t-1	0.007	0.001	0.003
	(0.024)	(0.026)	(0.029)
Elections (mandated), t+1	0.008	0.015	-0.008
	(0.039)	(0.039)	(0.048)
Elections (mandated), t	-0.072	-0.063	-0.102
	(0.033)**	(0.033)*	(0.045)**
Elections (mandated), t-1	-0.016	0.005	0.026
	(0.038)	(0.040)	(0.036)
Baseline Variables Included?	Yes	Yes	Yes
Regime Variables Included?	Yes	Yes	Yes
N	99	99	99
F-Stat	7.31	7.47	10.47

Notes: Newey West Standard Errors are reported. *, **, *** indicates statistical significance at the 10%, 5%, and 1% level respectively.

The second approach to investigating policy versus general uncertainty incorporates the volatility of the EIC stock price, which is a standard measure for firm-level uncertainty. I include the standard deviation of the EIC stock price during the previous year and the difference in the standard deviation between t-1 and t-2 along with all the policy uncertainty variables and controls. The results are shown in column 3 of table 8. The standard deviation in the stock price has no significant effect, but changes in the standard deviation have a negative and significant effect on shipping growth. The latter is consistent with results in

the literature (see Bloom et. al. 2007). Of more interest here is whether the estimates for new monarchs, elections, and deficits change when stock prices are included. In column 3, the coefficients for the deficit ratio and mandated elections retain their sign and significance. But the new monarch variable is now smaller and insignificant. However, it is important to note that the new monarch variable loses significance in part because of the time frame 1693-1760. If the model is run excluding the years 1660 to 1692 and the stock price variables the new monarch variable has the same insignificance. This is not surprising as the transition from King Charles II to James II in 1685 and then to William in 1688 were associated with substantial uncertainty.

The final specification investigates whether the variables for new monarchs, elections, and deficits are capturing the effects of policy changes, rather than policy uncertainty. The history of the EIC suggests that its monopoly was sometimes violated or its charter renegotiated in the wake of political changes and fiscal crises. The same could be said of forced loans and extractions. Each of these policy changes may have reduced expected profits and thus directly affected investment. I examine this possibility by including indicators for policy events as explanatory variables. I code as 1 all years where the king or parliament authorized interlopers to enter the market. Likewise I code as 1 all years where there was a forced loan, all years where there was a fiscal extraction, and all years where the charter was renegotiated. These policy events are all described in tables 1-3 and section 2.

The results from adding indicators for policy events are shown in table 9. The time coverage is from 1660 to 1760 as in most specifications above. Interloper events are found to be negatively and significantly associated with shipping growth, while the other policy events are not. The variables for new monarchs, elections, and deficits retain their sign, significance, and magnitude. Overall the evidence suggests that the negative link between shipping growth and regime changes and fiscal crises mainly reflects the effects of policy uncertainty, rather than policy effects like forced loans.

Table 9: Adding Policy Events

	(1)	(2)
	Coefficient	Coefficient
Variable	(Stand. Err.)	(Stand. Err.)
Interloper events t-1		-0.065
		(0.028)**
Forced loan t-1		0.051
		(0.055)
Other Extraction t-1		0.032
		(0.044)
Charter renegotiated t-1		-0.020
		(0.033)
Deficit Ratio t-1	-0.078	-0.075
	(0.029)**	(0.031)**
Tax to GDP ratio detrended t-1	-2.045	-1.749
	(1.556)	(1.509)
New Monarch t-1	-0.081	-0.086
	(0.045)*	(0.044)*
New Lord Chancellor t-1	-0.015	-0.004
	(0.024)	(0.024)
New Lord Treasurer t-1	0.007	-0.002
	(0.024)	(0.022)
Elections (mandated), t+1	0.008	-0.002
	(0.039)	(0.038)
Elections (mandated), t	-0.072	-0.077
	(0.033)**	(0.035)**
Elections (mandated), t-1	-0.016	-0.020
	(0.038)	(0.038)
Baseline Variables Included?	Yes	Yes
Regime Variables Included?	Yes	Yes
N	99	99
F-Stat	7.31	12.75

Notes: Newey West Standard Errors are reported. *, **, *** indicates statistical significance at the 10%, 5%, and 1% level respectively.

7 Conclusion

This paper studies the link between policy uncertainty and investment in the important historical case of the English East India Company. It argues that the EIC's peformance was hindered by policy uncertainty driven by political instability and fiscal crises. The results from a reduced form investment model point to a negative effect of policy uncertainty on the

growth of shipping tonnage. In the year following a change in the monarchy or mandated election tonnage declined by around 7%. Deficits had similar effects. A typical increase in the deficit during a time of war lowered tonnage in the following year by 5%. A series of robustness checks confirms or extends these key findings. In terms of magnitudes the results sugges that policy uncertainty was a quantatively significant factor in the EIC's slow growth during the 1600s and early 1700s. The estimates show that the average shock to policy uncertainty had a similar effect to a typical negative shock to the EIC's demand.

This paper makes several contributions. The first concerns role of institutions in explaining the economic divergence within Europe before 1800. In comparison to other studies, it provides the most direct evidence on how political instablity and fiscal crises influenced firm-level outcomes. Also in relation to the literature on British institutions, it also suggests a more certain policy environment emerged slowly after the Glorious Revolution. There is evidence that the policy environment was only marginally better for the EIC in the mid eighteenth century compared to the mid to late seventeenth century. Lastly, this paper contributes to the broader literature on policy uncertainty and investment. In terms of data and methodology it is novel in analyzing different types of uncertainty shocks on the same investment activity, and by formulating tests for omitted variable bias and confounds between policy uncertainty, general uncertainty, and policy events. In short, we learn that policy uncertainty matters affected some of the most important global firms in the past.

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