

Revolution, Restoration, and Debt Repudiation:
The Jacobite Threat to England's Institutions and Economic Growth.

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Abstract: This paper provides an empirical test of North and Weingast's theory of capital market development in post-Glorious Revolution Britain. Evidence is provided that is consistent with the hypothesis that institutional innovation in the 1690s led to the dramatic growth in London capital markets and that threats to these institutions caused financial turmoil. In addition, economic motivation for these innovations consistent with the work of Ekelund and Tollison is identified.

“The first visible eruption, or even immediate danger, of public disorders must alarm all the stockholders, whose property is the most precarious of any... whether menaced by Jacobitish violence or democratical frenzy.” David Hume, 1752¹

Introduction

Historians and economists consider the Glorious Revolution of 1688 as a significant turning point in the development of modern Great Britain. This revolution deposed a monarch, ended the notion of “divine right of Kings,” and led to the eventual establishment of a supreme Parliament. The resulting changes in the governing

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¹ Hume, “Of Public Credit” p. 95.

institutions ushered in financial developments that laid the foundations for the industrial revolution and ultimately established Great Britain as a world power.

Two major theoretical works analyzing the impact of these institutional changes are *Constitutions and Commitment: the evolution of institutions governing public choice in seventeenth-century England* by North and Weingast and *Politicized Economies: Monarchy, Monopoly, and Mercantilism* by Ekelund and Tollison.² North & Weingast concentrate on the specific changes that directly led to the dramatic development of capital markets within a decade after the Glorious Revolution. Ekelund & Tollison explore the long-term impact that a supreme parliament had on rent-seeking behavior and the subsequent decline in mercantilism.

While the analyses differ in emphasis and scope, they are largely complementary works emphasizing the role of institutions on economic performance. However, neither work provides an empirical test nor provides particularly compelling reasons for the timing of the changes. Both these weaknesses are addressed by incorporating the effects of a threat to these institutions.

The source of this threat was the deposed monarch, James II, and then later his son James III, who never renounced their claim to the English throne.³ With their supporters within Great Britain, known as Jacobites, and the active support of France, the deposed Stuarts spent the rest of their lives trying to regain the English crown. It is argued that this threat plays a critical role in the development of the post-revolutionary world because neither the revolution nor the corresponding institutional changes were

² The latter work is an update of Ekelund and Tollison, *Mercantilism as a Rent-Seeking Society*.

³ James III is more commonly known as the Pretender.

believed *at the time* to be irreversible. This episode in English history also serves as a parable on economic development in general, as it underscores the vulnerability of new market institutions and the gradual nature of institutional legitimization.⁴

By linking Jacobite activity with price changes in capital markets, a new empirical test of North & Weingast is provided. If they are correct about the importance of the new institutional arrangements, then it follows that any activity that threatened those arrangements would significantly affect the value of the financial assets based on these institutions. Specifically, any Jacobite activity that changed the probability of a restoration would have an immediate, persistent, and *predictable* affect on capital prices.

Furthermore, the Jacobite threat or, more accurately, the existence of a viable alternative regime provides a stronger reason for *why* the state introduced the necessary institutional changes than that provided by either North & Weingast or Ekelund & Tollison. Immediately after the revolution, the credibility problems of the crown were further compounded by the existence of an alternative regime. Given the change in goals of the new regime, both Parliament and the Crown had to develop new institutional arrangements to overcome these credibility problems.

The paper develops as follows. First, the institutional changes of the revolution are outlined and the arguments of both theoretical works concerning the importance of those changes summarized. The implications of the Jacobite threat will then be incorporated into the respective works of North & Weingast and Ekelund & Tollison. The case is then made that for nearly three decades following the revolution individuals took

⁴ We thank an anonymous referee for helping us clarify this context.

the Jacobite threat very seriously. The basis for the econometric test is then developed followed by empirical results.

The Glorious Revolution

In June 1688, a male heir to the crown was born to the Catholic James II. Prior to this, James' Protestant daughter, Mary, was next in line to the throne. The prospect of a Catholic succession merged two powerful interests that combined to bring the end of the reign of James II. A chronology of events leading up to and subsequent to James' departure from England is found in Table 1.

James was a strong advocate of Catholicism and the divine right of kings; he appointed Catholics to high office and actively sought to restore the acceptance of the old faith.⁵ When Parliament disapproved of his actions, he prorogued Parliament and then sought to pack it with pro-Catholics. While these activities were unpopular, it was widely considered a temporary problem because a Protestant succession seemed assured with Mary as the next in line for the throne. With the birth of a Catholic heir and the threat of a permanent Catholic monarchy, the elite quickly responded. Within a month of the birth, seven prominent Whigs and Tories “unofficially” invited William of Orange to invade England.⁶

The Stadholder of Holland, William of Orange, was not only the primary defender of Protestantism in Europe against the expansionist Louis XIV but he was the husband of Mary, James' Protestant daughter. The birth of the Catholic heir not only cut his wife off

⁵ O’Gorman, *The Long Eighteenth Century*, p. 29.

⁶ *Ibid.*, p. 31

from inheriting the English crown but it ensured the long run alliance of England and France. By the time William received the aforementioned invitation, preparations were already well underway to invade England to prevent this alliance.⁷

In the autumn of 1688, William launched a naval invasion with the declared purpose of securing the Protestant succession in England and the establishment of a free parliament.⁸ William's primary interest was not necessarily to obtain the crown but to keep England from entering European wars on the side of the French. It is unclear whether there was any intent of removing James II from the throne.⁹

In early November, William landed with an army of 21,000.¹⁰ James was indecisive in responding and through inaction and poor decisions dissipated any military superiority he may have had. With morale of the army evaporating and important individuals supporting William, James negotiated. William offered to allow James to retain his throne conditional on him barring Catholics from office and summoning a free Parliament. Upon refusing and facing the prospect of jail, James fled to France.

A special convention Parliament in January 1689 declared that James II had abdicated and then offered the crown to William and Mary. Parliament passed a Declaration of Rights stating that free elections ought to be held frequently and that all Roman Catholics were barred from the line of succession. Except for the public

⁷ For an excellent discussion of the Dutch involvement in the invasion see, *The Anglo-Dutch Moment* edited by Jonathan Israel.

⁸ Claydon, *William III and the Godly Revolution*, p. 25.

⁹ *Ibid.*, p. 27.

¹⁰ Israel ed., *Anglo-Dutch Moment*; Israel, *Dutch Role in the Glorious Revolution*, p. 106.

acknowledgement in the coronation oath that the Crown was subject to the statutes of Parliament, the Glorious Revolution was little more than a change in leadership. It was not considered at the time to have permanently weakened the monarchy; in fact, William was not even required to accept the aforementioned Declaration of Rights as a condition of accepting the Crown.¹¹ However, over the course of the next two decades a very different set of political and financial institutions evolved as a direct consequence of this change. These institutions shifted the balance of power toward Parliament.

The first serious reduction in Royal prerogative came in the Triennial Act of 1694. Now, Parliament had to be called at least every three years and its life should not last more than three years.¹² Parliament established the right to audit Crown expenditures, established the authority to restrict how the Crown used funds, and put the Crown on annual budgets. In the Act of Settlement of 1701, the Crown lost the right to dismiss judges unilaterally, thus laying the groundwork for an independent judiciary.

One of the most significant developments was the creation of the Bank of England. This accomplished two important goals toward the security of property rights. First, as a condition for approving the creation of the bank, Parliament obtained the right of approval on any borrowing by the Crown. As North & Weingast point out, this improved creditors' security on default. Second, having the Bank of England organize the government's borrowing and manage much of its financial affairs gave creditors a mechanism to coordinate their response in case of a default. This coordination allowed

¹¹ O'Gorman, *Long Eighteenth Century*, p. 33.

¹² *Ibid.*, p. 37.

creditors to inflict greater punishment on the state and thus improved the ability of the state to borrow.¹³

Capital Markets

North & Weingast focus on how the changes introduced after the Glorious Revolution affected the development of capital markets, especially in relation to government borrowing. One necessary condition for modern economies to develop is the ability to engage in secure contracting across time and place. The security from arbitrary seizure of assets is particularly important with respect to the sovereign; indeed, it is one role of constitutions to place such restrictions on the state. When sovereigns have been ‘above the law,’ they have had a difficult time borrowing because they cannot credibly commit to repayment. History is replete with examples of sovereigns reneging on their debts. This was particularly relevant during this period of English history. In 1672, the brother of James II, Charles II, partially stopped payments on government debts resulting in the bankruptcies of many of the largest creditors in London.

With self-imposed constraints, the state can improve its ability to borrow. However, these constraints must be time consistent or self-enforcing in that it must be in the interest of the state to honor its commitments at all points in time. North & Weingast

¹³ Weingast, “Political Foundations of Limited Government.” These institutional changes also involve the game-theoretic notion of ‘delegation.’ Delegation can relax binding incentive constraints where credibility problems exist. In this context, oversight by both the Parliament and the Bank can be viewed as a form of the conservative central banker in Rogoff “Optimal degree of commitment.” See also Bulow and Rogoff “Sovereign debt” on the importance of legal sanctions in the prevention of sovereign default.

argue that the developments after the revolution accomplished this and led directly to the dramatic increase in credit markets in England.

The restriction on the Crown from unilaterally altering the terms of any loan agreement was essential as it gave Parliament as well as creditors greater control over the revision of loan contracts. Furthermore, this institutional development did not provide Parliament with the same incentives as the Crown to renege on debt. “As a consequence the new institutions produced a marked increase in the security of private rights.”¹⁴

Rent-Seeking

In Ekelund & Tollison’s analysis of this period, they attempt, among other things, to explain the rise and fall of mercantilism in England. They argue that mercantilism was not a tissue of inconsistencies but the rational pursuit of profits (rent-seeking) given the constraints existing at the time. Firms attempted to obtain legislation to protect them from competition; this took the form of either internal regulation or monopoly charters of overseas trading rights (e.g. East India Company, Hudson’s Bay Company, etc.). The selling of protective legislation was an effective way to raise revenue. Tax collection during this time provided low returns as there was a great deal of barter, an inefficient collection system, poor coinage, and relatively crude record keeping.¹⁵

The long battle for supremacy between the Crown and Parliament was not, as it is often depicted, a battle between regulation (Crown) and free trade (Parliament). It was a

¹⁴ North and Weingast, “Constitutions and Commitment,” p. 804.

¹⁵ Ekelund and Tollison, *Mercantilism*, p. 50.

battle over *who* was going to be the monopoly supplier of regulation.¹⁶ The revolution of 1688 plays a critical role in this story because it was the key turning point on the road to parliamentary supremacy. This change eventually brought about the end of mercantilism, *not because Parliament was an advocate of free trade*, but because it was a high cost provider of monopoly rights. Competition within Parliament made rent-seeking more costly; interests were more diverse and, for the same reason, favorable regulation was less secure.¹⁷ It was more costly to lobby Parliament and when special legislation was obtained, the length of time it was effective was far less certain. As such, the returns from rent-seeking fell relative to private unregulated investments. Therefore, the free trade era was an unintentional by-product of the competition to supply regulation.

Motivation for Institutional Changes

If the Glorious Revolution established Parliament as supreme, “...why would it not then proceed to act just like the King?”¹⁸ Ekelund & Tollison argue that it could not because the inherent structure of Parliament made it a high cost provider of protective legislation. North & Weingast agree and offer the additional arguments that a politically independent judiciary as well as a political preference for limited government further constrained Parliament’s behavior.

Without disputing the importance of the institutional changes, an examination of the historical record casts doubt on these arguments. As noted above, relatively little

¹⁶ Ibid., p. 81.

¹⁷ Ibid., p. 223.

¹⁸ North and Weingast, “Constitutions and Commitment,” p. 817.

changed at the time of the revolution. The Crown still had the right to summon, prorogue, and dissolve Parliaments, veto legislation, dismiss judges, and declare war.¹⁹ Yet, over the next twenty years the balance of power significantly shifted toward parliament.

These changes took place at this time for two distinct yet related reasons -- the change in policies of the new monarch combined with the existence of a viable alternative regime. William's interest in England lay in using its resources to maintain the balance of power in Europe and restricting the expansionist policies of Louis XIV. To do that he required resources far more than that needed for domestic policies; this necessitated cooperation from Parliament and a financial system capable of producing such amounts. He was willing to trade off Royal prerogatives, if that was necessary, even if that meant shifting the balance of power to Parliament over domestic matters. This is exactly why James II was not willing to develop the same institutions.

Parliament, particularly the Whig party, was willing to accommodate William's European ventures in exchange for more control and the establishment of a Protestant succession. The more successful William was in his fight with Louis XIV the more secure was the Protestant succession. As long as the Jacobite threat existed, both Parliament and the Crown had an interest in cooperating and developing the necessary institutions.²⁰

These circumstances put the new regime in a position where it had to borrow. However, to borrow amounts sufficient to fight France and secure the Protestant

¹⁹ Ogg, *England*, p. 488.

²⁰ See Rosenthal, "Political Economy of Absolutism" for a model of the effect on institutions when the Crown and the elite (Parliament) cooperate.

succession, it had to improve its credibility. Here in lies the motivation to adopt the measures North & Weingast argue were necessary for the development of capital markets. Just as the free trade era was an unintentional by-product of the fight between Parliament and the Crown, capital market development was an unintentional by-product of measures undertaken to help the new regime survive.

Ekelund & Tollison argue that Parliament could not continue to act like the King in the provision of preferential legislation because it was a high cost provider of this regulation due to competition *within* the legislature. However, while Parliament may have won the battle to be the monopoly supplier of regulation, until it could establish that it had won the war, i.e. that there was no competitor, it was not a credible seller of that regulation. As such, the value of any grants from Parliament was discounted accordingly. Therefore, the Jacobite threat, which represented competition from *without*, was the initial reason for the reduction in returns to rent-seeking behavior.

The Jacobite Threat

While traditional Whig histories of England downplayed the extent of Jacobite support, recent scholarship has recognized its significance and acknowledged it as a threat to the Protestant succession right through to Hanoverian Britain.²¹ “Jacobitism ... was regarded by its contemporaries as a major military, political and religious threat to the existence of the state itself, not least because the rescissory legislation of a Stuart Parliament (as in 1660) might undermine the new financial, political and religious

²¹ Pittock, *Jacobitism*, p. 8; Israel, “Dutch Role,” p. 10.

settlement.”²² Events following the Revolution justify these contemporary fears, as will be seen below.

After fleeing England, James II immediately set up court in France and actively sought to regain his throne. Within months, he invaded Ireland with the intent to establish a base from which to attack England. With French military and financial support, he occupied much of Ireland until 1691. William himself went to Ireland to fight and he eventually succeeded in pushing James out of the country. Nonetheless, there were numerous assassination plots against William in the 1690s and the French again supported invasion plans in 1692 and 1696.²³

Within England, the original supporters of the Jacobite cause were Catholics and those in favor of hereditary succession. Many who initially supported William’s invasion did not endorse his ascension to the Crown.²⁴ Even if one accepts that James II abdicated, then his son was the rightful heir followed by Mary, then Anne. In addition to William’s illegitimacy, many did not approve of his military activities in Europe nor, for that matter, the continued presence of Dutch troops in London. Over time, however, the Jacobite cause came to be more of an opposition cause. Irrespective of religious differences, many prominent Tories became Jacobites because of William’s European interventionism. Both Ireland and Scotland had huge Jacobite followings, as it was a focus for anti-English sentiments. By the 1700’s, many debtors also backed a Stuart restoration based on the belief that the Pretender would repudiate debts.²⁵

²² Pittock, *Jacobitism*, p. 2.

²³ Claydon, *William III*, p. 11.

²⁴ Israel, “Dutch,” p. 126.

²⁵ O’Gorman, *Long Eighteen Century*, p. 154.

Outside of England, Louis XIV supported the male Stuarts. This assistance was based not only on their common religion but also by European politics. If Louis could help restore either Stuart to the crown, then England would be a reliable ally of France in any European conflict. Indeed, preventing this was the prime motivation for William's invasion of England.²⁶

James II hopes for a restoration ended with the Treaty of Ryswick in 1697. This treaty not only ended the Nine Years' War, but also contained Louis' explicit recognition of William as the King of England and his pledge that France would no longer provide support for James in his quest to regain the English throne. Nevertheless, the security of the Protestant succession was so precarious that William offered to raise James III in England on the condition he become a Protestant.²⁷

Jacobite hopes revived in September 1701 when, upon the death of James II, Louis renounced his recognition of William and declared James III as the legitimate King of England. The Pretender never gave up his claim on the English throne and actively sought to restore the Stuart dynasty after his father's death. He continually worked behind the scenes orchestrating support, particularly during the months leading up to Anne's death, and twice he attempted to invade the British Isles.

The most serious military threat by the Pretender during this time came in 1708. In 1707, the union of England and Scotland generated a great deal of animosity amongst many sectors of the Scottish populace. The Pretender tried to exploit this resentment into creating a general uprising supporting the Stuart crown. Plans for the invasion of

²⁶ Israel, "Dutch," p. 120.

²⁷ Pittock, *Jacobitism*, p. 27.

Scotland began as early as the spring of 1707 but the strain of the War of Spanish Succession restricted France's ability to commit resources to the operation. By the time the invasion force set sail in March 1708, the British had learned of the plan and sent a Navy squadron sufficient to defend Scotland against the French force. The entire operation turned out to be a complete fiasco and eventually the French fleet returned to France without landing a single person. The invasion attempt was successful, however, in conveying to the English government and populace Louis' continued commitment to restoring a Stuart to the British throne.²⁸

The greatest potential danger to the Protestant Succession would come when Queen Anne died. The line of succession to the House of Hanover was weak and there was still considerable support for the Stuarts²⁹ -- especially if the Pretender became an Anglican. His failure to convert combined with Anne removing suspected Jacobites from important government positions just before her death hurt the Jacobite cause. Furthermore, when Anne died Louis XIV was financially depleted, on the verge of defaulting on his debt, and thus unwilling actively support James III. When Louis recognized Anne's successor, George I, as the King of England it all but ended the hopes of a peaceful Stuart restoration.

So serious was the Jacobite threat, however, that Parliament and Crown often went to extraordinary lengths to minimize the probability of a restoration. Any alliance or treaty entered into by England during this period required the other party to acknowledge

²⁸ Frey and Frey, *Treaties*, pp. 165-167.

²⁹ Queen Anne and Mary, William's wife, were both daughters of James II but had been raised as Protestants. At the time of Anne's death, neither woman had any living children.

William, then Anne, as the rightful sovereign of the country. In 1702, an oath was required of every person in power in England stipulating that William was the rightful and lawful King and that the pretender had no right whatsoever to the Crown.³⁰ In 1706, England entered negotiations with the Dutch that would have bound the Dutch to defend the Protestant succession by force of arms. The Treaty of Utrecht and Anglo-Dutch treaties in 1713 all contained clauses recognizing the Protestant succession. Even the contentious and costly union with Scotland was largely motivated on the basis of allowing the government to gain greater control over Scottish Jacobites.³¹

The amount of effort expended to ensure the succession is one indication that the Jacobite cause was not seen as an empty threat. Indeed, a restoration would have seriously jeopardized the institutions that North & Weingast argue were necessary for the economic development of England as support for James rested largely on the opposition of many of the reforms introduced after his deposing. Irish Jacobites desired Catholic rule while Scottish Jacobites wanted their own parliament and the restoration of the Episcopal Church. English and Welsh Jacobites disliked the financial reforms, higher taxes, and foreign policy of the new regime. Many Jacobites opposed land enclosure and increased emphasis on property rights.³²

Furthermore, there was a real possibility the Pretender would repudiate the national debt. The belief that a repudiation would be used as a ‘sponge’ in the hand of the Pretender and the implications that a restoration would have on English institutions is the

³⁰ Thompson, “Safeguarding,” p. 241.

³¹ See Coward, *The Stuart Age*, pp. 417-18.

³² Pittock, *Jacobitism*, p. 2.

topic of many political tracts during this period. In particular, a tract written by Daniel Defoe argues that distrust of James III

...[I]s mightily increased by an ugly discourse now too frequent amongst those who are impatiently waiting for a thorough alteration, concerning a political sponge to wipe out the debts of the nation, and at one dash the very memorial, if possible, of the demands of those who have been too forward to place a confidence in Parliamentary security...How acceptable it may be to some landed-men, I know not: but they may depend upon it, they who can thus cancel the strictest obligations of justice and honesty in one instance, may with as good a grace, and as little guilt, invade their lands and estates. What can be secure? What can be a title or a right? Or, what can become of property, in so public an instance, against the strongest obligations, and most solemn security, and under the highest aggravations, it shall be invaded, and destroyed?.³³

The national debt that had accumulated since the Revolution was primarily used to prevent a Stuart restoration and to fight France.³⁴ Moreover, even if the Pretender had no intention of renegeing on the debt or altering institutions, he had no credible way to commit to such a policy.

Hence, the Revolution initiated not only institutional changes, but also established an alternative regime that was understood to threaten the existence of these very institutions. Furthermore, the alternative regime had considerable support in England, Scotland, Ireland, and France, while the incumbent regime was only weakly linked to the English throne. As will be made clear below, the precarious nature of the Revolutionary Settlement will provide the opportunity to test whether investors at the time considered threats to the new institutions as important as the theoretical work implies they should.

³³ Defoe, *Fears*, pp. 8-9. Also see Scott, *Somers*.

³⁴ Carruthers, *City of Capital*, p. 87.

Econometric Methods to Determine Threats to the Institutions

The preceding sections have emphasized that the political and institutional changes brought about by the Glorious Revolution faced tremendous internal and external threats during the early stages of the regime. Just as the success of these new institutions was played out in English capital markets, threats to the stability of these institutions should also be revealed in the behavior of the markets. Such dangers would cause private investors to change their expectations regarding the security of the new institutions on which the Revolution was based. And herein lies our test of North & Weingast.

As North & Weingast argue, “Since capital markets are especially sensitive to the security of property rights, they provide a unique and highly visible indicator of the economic and political revolution that took place. Indeed, they are one of the few means for empirically evaluating the effects of the Glorious Revolution.”³⁵ If it was the post-revolution institutional changes that fostered the development of English financial markets, then events that undermined these institutions should have destabilized the financial markets. Indeed, private capital markets would have reacted negatively to events that threatened the future viability of the institutional innovations established after the Revolution. Any events that strengthened these institutions, in contrast, would have had a positive impact on the value of assets trading in these markets.

Hence, the test of the North & Weingast hypothesis involves identifying and dating instances in which market participants significantly reevaluated their expectations regarding the viability of assets traded in English markets. By examining these shocks, or

³⁵ North and Weingast, “Constitutions and Commitment,” p. 819.

periods of discrete movements in asset prices, specific events that caused this reassessment to take place are identified. If significant movements in the market were a result of events affecting the security of the new institutions, evidence consistent with the North & Weingast hypothesis is found.

As indicated above, one of the greatest threats to England's embryonic institutions during this period resulted from the Jacobite opposition and the possible return of the Stuart dynasty. Table 1, in fact, identifies 12 specific events that are either related to Jacobite activity or that directly affected the probability of a Stuart restoration.³⁶ If North & Weingast are correct about the importance of the institutional innovations, then any change in the probability of a Stuart restoration should immediately be reflected in financial markets.

In order to understand how the effects of political events on financial markets are uncovered, note that it is common in time series analysis to think of economic variables as being subject to shocks having different degrees of persistence. These shocks may also vary in their nature, being specific to a particular variable or possibly affecting all variables simultaneously. This concept is illustrated in Figure 1 where two of the more important variables for our study are graphed. These are the daily prices of Bank of England and (Old) East India Company stocks as recorded in the London market over the period 1698 to 1714.

³⁶ Several of the events in Table 1 are rumors of incidents that in fact did not take place at the time they were spread. Because of their nature it is expected that the effect of these events should be purely temporary, having no long-term impact on financial markets. Nonetheless, evidence that such events resulted in short-term movements in the London market would indicate the fragility of the Revolutionary settlement and the items of concern to investors at the time. See below.

Note that there are occasions in which the prices of these stocks exhibit discrete changes that cause them to move up or down together for several months or even years. It seems appropriate to model these market trends with deterministic components that are constant for extended periods of time, but which occasionally experience discrete changes. The vertical lines in this figure designate such discrete changes, also known as “breaks” or mean-shifts, as identified by the econometric techniques described below.³⁷ These variables also display erratic movements as the stock prices move up and down with no systematic direction. These latter irregular movements are more frequent, short-term in nature, and are not usually related to any easily identifiable events. Such movements typically do not affect all stocks simultaneously and may be caused by firm-specific innovations.

To uncover the effects of events on financial markets, an econometric methodology is required that allows us to distinguish between long-lasting discrete movements that impinge upon the market as a whole and short-run, irregular fluctuations specific to a particular variable. A simple procedure appropriate in this context is based on techniques developed by Banerjee, et al. and Willard, et al., and extended to a multivariate context by Bai, Lumsdaine, and Stock.³⁸ The latter authors introduce techniques for constructing asymptotically valid confidence intervals for the date of a

³⁷ The numbers used in this figure correspond to breaks presented in Table 2. Note, however, that these breaks are computed using at least two additional variables. Hence, the breaks in the graph may not appear closely related to individual movements in the two variables shown. Graphing all the variables would make the figure difficult to read. We thank a referee for suggesting this alternative.

³⁸ Banerjee, Lumsdaine, and Stock, “Recursive”; Willard, Guinnane, and Rosen, “Turning”; and Bai, Lumsdaine, and Stock, “Testing.”

single break in a vector autoregression model (VAR). Interestingly, they demonstrate that the width of the asymptotic confidence interval around the mean-shift date does not improve as the sample size increases, but instead is inversely related to the number of series that share a common break date. Hence, a multivariate model, which allows a number of series to break simultaneously, provides substantial gains to inferences regarding the dating of mean shifts.

Given there are several data series in the sample, the multivariate approach is more powerful in detecting and dating economy-wide mean-shifts than the univariate methods. However, the multivariate tests were developed in the case of a single mean shift in the vector of variables. To uncover multiple shifts, the same approach employed in the univariate models of Willard, et al. is used, except in the VAR developed by Bai, et al.³⁹ This works as follows; let Y_t be a $n \times 1$ vector of the logarithms of stock prices. This has a p th-order vector autoregressive representation with mean shifts at dates s , i.e.,

$$Y_t = A_0 + \sum_{i=1}^p A_i Y_{t-i} + B_s \theta_{st} + E_t . \quad (1)$$

The parameters A_0 and B_s are $n \times 1$ vectors, $\{A_i\}$ are $n \times n$ matrices of autoregressive coefficients, E_t is a $n \times 1$ vector of white noise disturbances, and θ_{st} is a dummy variable equal to zero up to the period of the shift date, s , and equal to one thereafter.

The main issue here is to identify the shift date as well as the sign and significance of the parameter vector B_s , which indicates the break in the mean of the Y_t . If there is only one shift date in the series, one could locate this date by estimating

³⁹ Willard, Guinnane, and Rosen, "Turning"; Bai, Lumsdaine, and Stock, "Testing."

equation (1) repeatedly over the whole sample of data, letting s be a different date for each estimation. The possibility of a mean shift could be determined by computing an F statistic for the significance of B_s for each s . This would produce a series of F statistics with the maximum F statistic designating the most likely date of the mean shift.

However, when one is interested in the possibility of multiple mean shifts, Willard, et al. suggest using the above estimation technique on small, overlapping sections of the data in a two-step procedure.⁴⁰ This is the method employed here.

This algorithm is capable of distinguishing between short-term fluctuations and long-term mean shifts, and can identify the dates at which these shifts occur. It also incorporates an important restriction that arises in our context; our theory concerning the effects of threats to the new regime imposes the restriction that events that impinge upon the viability of this regime will affect all series similarly and simultaneously. It is this restriction which can be exploited to obtain improved inferences about the dates of the mean shifts in a multivariate context.⁴¹

The system of equations in (1) can be written in their stacked form as,

$$Y_t = (I \otimes Z_t')\Lambda + E_t \quad (2)$$

⁴⁰ Willard, Guinnane, and Rosen, "Turning."

⁴¹ The model does not prevent series from moving in opposite directions on a particular break date. It does however minimize the impact of variable-specific innovations and is therefore superior to univariate models.

where $Z_t'=(1, \theta_{st}, Y'_{t-1}, \dots, Y'_{t-p})$, $\Lambda=\text{Vec}(\Gamma')$, and $\Gamma=(A_0, B_s, A_1, \dots, A_p)$. The null hypothesis of no mean shift at date s is $B_s=0$. The F statistic for testing $B_s=0$, $F(s)$, and the OLS estimator for B_s are

$$\hat{F}(s) = \{R\hat{\Lambda}(s)\}' \{R(\hat{\Sigma}_E \otimes (Q^{-1} \sum_{t=q}^Q Z_t Z_t')^{-1})R'\}^{-1} \{R\hat{\Lambda}(s)\} \quad (3)$$

$$\hat{B}_s = R\hat{\Lambda}(s), \quad \hat{\Lambda}(s) = \left\{ \sum_{t=q}^Q (I \otimes Z_t Z_t') \right\}^{-1} \sum_{t=q}^Q (I \otimes Z_t') Y_t \quad (4)$$

with $R=I \otimes r$, I is an $n \times n$ identity matrix, and $r=(0,1,0, \dots, 0)$, a vector conformable to Z_t .

In searching for breaks in the vector process (2), a sample size, Q , is chosen which is a small enough proportion of the data to isolate persistent shifts in the mean of the variables but is large enough to avoid picking up short-term fluctuations. A Q size equal to 200 was used with the daily data, which allowed the identification of mean shifts in the data that lasted for 4 months or more. Matching these dates to the events that occurred around the time of the breaks then yields clues as to what events the public viewed as important.

Results

To distinguish periods in which market participants significantly revised their expectations of the future from other movements in the data, a series of four different VARs were estimated and the statistics in equations (3) and (4) were computed for each.

Our data consists of the two stock prices graphed in Figure 1 and the prices of four other stocks that are not shown. These include the Royal African Company, Million Bank, New East India Company, and the South Sea Company stocks. Not all of these

prices are available for every period. Our first VAR, estimated from January 1697 to September 1700, is therefore only for the Bank of England and the Old East India Company.⁴² Starting in 1700, these two stocks are joined by the Royal African Company, New East India Company, and Million Bank stocks. This second model is estimated through mid-1708 after which the two East India stocks are merged into one stock (which continues to be denoted as Old EIC). From August 1708 to January 1712, the focus is on these four stocks until the inclusion the South Sea stock from 1712 to 1715.⁴³

For the most part, the companies represented by these stocks owed their existence to monopolies granted to them by the crown. Of the six examine here, the East India Company is the oldest having begun trading in the early 1600s. The others all began in the 1690s or the early 1700s. They each issued equity, but several also owned large amounts of government debt. Each are expected to be heavily influenced by the political events of the time.

Our sample for the years 1697 to 1715 comprises 5,893 daily observations. The prices over this period are very close to stationary, thus the VARs are estimated in log

⁴² The beginning of 1697 is chosen as the starting point because the set of institutions existing by this time was sufficiently different from what would have existed in the event of a Stuart restoration. In addition, this date allows us to avoid large gyrations in the data caused by the Recoinage Act.

⁴³ The source for most of the data used in this paper is the ICPSR data tape at the University of Michigan. Larry Neal collected this daily data from *The Course of the Exchange*. Data for 1697 is weekly and obtained from Houghton *Collection*. For information on these stocks and the London market in general, see Scott, *Constitution*; Dickson, *Financial Revolution*; Neal, *Rise of Financial Capitalism*; and Dempster, Wells and Wills, “Common Features.”

levels with a time trend.⁴⁴ The four models identified a total of 17 break dates over this period. These break dates are summarized in Table 2 along with the movement in the individual stock prices, the 90 percent confidence interval around the break, and the maximum Wald statistic for the break from equation (3). Breaks associated with Jacobite events are highlighted in bold.

Most of the breaks in Table 2 are commingled with positive as well as negative shifts. The shocks causing these breaks, whatever they were, appear to have only changed the relative values of the assets while leaving the security of the underlying institutional arrangements unchanged. Additionally, the majority of these mixed breaks seem to be driven by a shift in the price of a single stock large enough to produce a significant Wald statistic.⁴⁵ Because of this, the only concern is with finding the source of those breaks in which a majority of the stocks are significantly affected in the same direction.

The results in Table 2 indicate that Jacobite activity was an important determinant of market activity and had a consistent and persistent effect across most financial assets. Note that in all but two cases, stock prices break in the same direction in the context of such activity. This suggests that it was not purely an issue of debt repudiation that was driving market responses, as assets not directly tied to government debt (i.e., African and Million Bank stocks) reacted significantly to these events. Indeed,

⁴⁴ See Mirowski “What do markets do?” for similar statements regarding the stationarity of this data. But note as well that the concern is with movements in the *level* of prices, not in modeling stock returns. Hence, a model in levels is appropriate in this context.

⁴⁵ For example, unreported t-statistics reveal that break number four is caused by a large movement in the price of Royal African Co. stock as none of the other stocks have significant breaks on this date. Several of the mixed breaks also seem to be the result of feuds between the Old and New East India companies.

investors seem to have responded to fears that the institutional structure of the economy was at risk. The paper now turns to a discussion of these individual breaks.⁴⁶

Events that Lead to Breaks

(1) *September 1697 -- Treaty of Ryswick*

On September 10, 1697, news reached England of the signing of the Treaty of Ryswick. This treaty not only ended the costly Nine Years' War, but also included a pledge by Louis XIV acknowledging William as King and removing his support for the enemies of England. This accomplishment garnered William much personal support and all but ended any hope that James II would regain the English throne. Given the significance of this event, and the implications it had for English institutions, it is not surprising that there is a strong positive break on this date.

(2) *January 1701—Louis XIV Occupies Spanish Netherlands*

At the death of Charles II of Spain on November 1st, 1700, the Spanish Crown became the possession of Louis' grandson, Philip V. This created considerable worry that Louis would try to unite the two crowns despite the fact that Charles' will strictly forbade this from occurring. Indeed, all of Europe understood that such a union would create a Catholic super-state and dash any hopes of stemming French ambitions on the rest of the

⁴⁶ To test for the robustness of these breaks univariate break-point tests were also run on each of the stock prices individually using the procedure in Willard et al. "Turning Points." These results, available from the authors, generated many more breaks. However, eight of the univariate breaks occurred on or near the same dates in all the variables and all of these breaks show up in the multivariate results in Table 2 as well. Interestingly, seven of the univariate breaks are directly related to the Jacobite dates highlighted in Table 2. Hence, the results in this paper do not seem to be affected by the particular algorithm used.

continent. On the 25th of January, Europe's worst fears were realized when Louis and his forces marched into the Spanish Netherlands. This was an obvious sign of a Franco-Spanish alliance.

Although this event is not explicitly related to Jacobite activity, it is largely understood to have started the War of Spanish Succession and many English investors may have interpreted such actions by the French as destabilizing. Whatever their reasoning, once news of this event reached London it spurred a large and significant fall in stock prices across the whole market culminating in a run on the Bank of England.

(3) October 1701-- French Recognition of the Pretender

During the first week of October 1701, Louis XIV renounced his recognition of William and recognized James III as King of England. The gesture was a strategic attempt by Louis designed to win the support of Pope Clement XI other Jacobites throughout Europe.⁴⁷ Although the Pretender was relatively young at this date, this recognition guaranteed the Jacobite cause was not going to die with James II.

This continued the threat to the new British institutions and raised the probability of future succession crises in England. As such, a negative break is expected from this event, and one is observed for October 7th.

(4) September 1706 -- Riots in Scotland

During the autumn of 1706, the debate over whether to unite with England caused unrest in Scotland. Riots were common and often had Jacobite overtones. The riots revealed the extent of Jacobite support in Scotland and were a great source of alarm in London. As Scott describes, the situation in Scotland during this time was very serious.

⁴⁷ Frey and Frey, *Treaties*, p. 252.

Riots were frequent towards the end of October 1706, and it may have been thought in London that the Jacobite faction in Scotland would take advantage of this state of feeling, and that there might be an insurrection, assisted by French troops. The reason that an invasion, in the interests of the exiled family, was dreaded was not only on account of the evils of a civil war, but because it was believed that it was the policy of the Pretender to repudiate the existing National Debt.⁴⁸

Significant negative breaks are picked up on September 24, 1706 for both the Bank of England and the Million Bank -- both of which Scott discusses in detail.

Although no invasion occurred in the fall of 1706, a persistent revaluation of stock values could be explained by investor surprise that Jacobite support was so strong in Scotland.⁴⁹

(5) *March 1708 -- Pretender's Invasion of Scotland*

An invasion of Scotland by the Pretender did eventually take place in March 1708. Luttrell provides a running commentary of this event starting with his entry on March 4th that alludes to a rumor that James III is soon to sail for Scotland in hopes of starting a rebellion to regain the crown. It is only on March 11, the point estimate of our break date in Table 2, that Queen Anne addresses Parliament and verifies that James, with French assistance, is indeed sailing from Dunkirk for Scotland. Stocks fall to such an extent that by the 20th the Commons resolves to charge anyone who reduces public credit of a high crime and misdemeanor, “especially when the Kingdom is threatened by an invasion.”⁵⁰

⁴⁸ Scott, *Constitution*, p. 222.

⁴⁹ The positive sign on the New East India stock may be explained by the fact that the stock goes ex-dividend after a fall in price on September 23rd. This continues until mid November when the stock price shoots up. The positive coefficient is not significantly different from zero.

⁵⁰ Luttrell, *Brief Historical Relation*, p. 281.

The resolution does not arrest the decline, however, as stocks continue to falter even after the invasion attempt is repulsed. A foreign-backed Jacobite invasion, even though unsuccessful, demonstrated the extent to which France was willing to back a Stuart restoration. In fact, this very event serves to further alert capital owners to the fragility of their institutions and is the *sine qua non* of the theory. As alluded to earlier, it was believed that the Pretender, once in power, would cancel all public debts and negate the institutional reforms born of the Revolutionary settlement. Public credit was heavily invested in both the debts and institutions of the Settlement.⁵¹ That faith in credit was shaken is indicated by the fact that the government would continue from this point to the end of the war to have great difficulty marketing its debt.⁵²

(6) *October 1710 -- Tory election victory*

In the autumn election the Tory party, including many real and suspected Jacobites were swept into power. The Whigs, who represented the 'moneyed interests' in London, were voted out of office by more than a two-to-one margin. The Tory ministry that replaced them was both anti-Dutch and pro-Jacobite and thus did not command the

⁵¹ Many of the joint-stock companies of the time were intimately involved in the public finances of the British government. From the early 1700s until the War of Austrian Succession (1739-48), the Bank of England, United East India and the South Sea companies held nearly all of the government's funded debt. Hence, the financial markets had reason to fear a restoration of the Stuart Monarchy and the subsequent refusal of James to pay off the debts owed by the previous administration.

⁵² Scott *Constitution*, p. 375, notes that, "The problem of providing money was becoming increasingly difficult, since the crisis had restricted borrowing by the State, in fact the total funded debt at the end of 1708 was only slightly in excess of what it had been in 1701."

confidence of investors. Invasion rumors began again and there was an immediate run on the Bank of England.⁵³

Although an invasion failed to materialize, the establishment of a more sympathetic Jacobite government certainly improved the probability of a Stuart restoration; or at least it was perceived as so at the time. As is expected, a significant negative break occurs on October 24, 1710, right on the heels of the election.⁵⁴

(7) September 1711 -- Peace Treaty

The British began unilateral negotiations with the French in an attempt to end the war in August of 1711. Though Britain and her allies imposed harsh terms on France and Spain, the Tories were simultaneously engaged in separate talks with France in order to obtain more favorable terms. These negotiations produced two important agreements. The first was a treaty listing French and Spanish concessions to Britain which led to an armistice between the three countries. In particular, Louis acknowledged Anne and the Protestant Succession. This agreement was to be kept secret. The second contained only a very general statement of terms and was to be made public. The British allies, in

⁵³ Scott, *Constitution*, p. 229. On the events leading up to the election as well as Tory sentiments, see Coombs, *Conduct of the Dutch*. Carruthers, in *City of Capital*, explains that the Tories were influenced by an extremist Jacobite faction known as the “October Club” who pushed their leader into secret negotiations with the Pretender. Thus, the reaction of investors to the election results was not unreasonable.

⁵⁴ The positive breaks in the African and EIC stocks are difficult to explain in this context, even though neither coefficient is significant. All the stocks begin falling at the start of the elections in early October, yet the African and EIC prices turn up rapidly in mid November only to plunge downward again in December. The volatility in these two stocks during this period obviously complicates any attempts to clarify this break and may point to alternative conclusions than those that we have reached here. Nonetheless, this volatility also indicates the uncertainty existing in the market at the time.

particular the Dutch, complained bitterly about the agreement indicating that it was too "general" and too "obscure" to serve as a basis for peace and argued for specific negotiations to take place at a later date. These subsequent negotiations started in Utrecht in January of 1712 and would continue until the end of the war. But as a result of the secret agreement, troops under English command would not face French or Spanish armies again in this War, while the other allies would continue fighting for several more years.

The treaty was signed on September 27, 1711 although it officially remained a secret until early 1712. These events should produce a positive break on or around this date. A positive break is observed at this time but on September 22 1711, five days *before* the agreement. Whether this break reflects insider trading, speculators anticipating an agreement, or is unrelated to the event is impossible to determine at this point.

(8) *July/August 1714 -- Death of Queen Anne*

As explained above, the issue that provided the greatest potential danger of Jacobite success concerned the succession to Queen Anne. This issue also provides one of the most interesting episodes in English financial history as well as the strongest evidence in support of our approach.

In late January 1714, a rumor was spread that indicates the degree of public concern associated with the death of Anne; a "well-dressed man, having all the appearance of a person of importance, rode furiously down the Queen's Road, shouting that the Queen was dead."⁵⁵ A period of political confusion then ensued in which "the

⁵⁵ Scott, *Constitution*, p. 232.

gravest national dangers were anticipated.” There was a run on the bank and all public stocks fell precipitously.⁵⁶

Stock prices quickly recovered during February as the attempted fraud was exposed. Still, all of England understood the possible consequences of the unavoidable event and the financial market braced for its arrival. However, when the Queen does pass away, on August 1st of the same year, stock prices *increase* dramatically. The fact that a rumor about Anne’s death caused such a financial disruption in January while her actual death seven months later was associated with a rally on the markets produced an outcry against the London financial sector from Johnathan Swift and other members of the Tory party. But since the point estimate for this break indicates that the rally began on the 31st, a day before the Queen’s death, this is strong evidence that it was not the demise of the Queen that investors were responding to in January and July. Instead, differing expectations regarding the probability of a restoration and the resulting institutional instability can explain these contradictory events. Specifically, actions taken by the Queen just before she died made institutions more secure than perhaps they ever had been during her reign.

⁵⁶ This was not the only time a rumor impacted the financial market. Rumors regarding Jacobite invasions caused temporary havoc in July 1710 and May 1711. In May 1712, rumors circulated throughout London that the Pretender had died causing a brief upsurge in prices. At the end of December 1712, prices fell as rumors swept through London that Queen Anne had died. This came on the heels of reports that the Pretender would renounce Catholicism thus clearing much of the opposition to a restoration. See Scott, *Constitution*, p. 229; Luttrell, *Brief Historical Relation*, p. 605; Coombs, *Conduct*, p. 242; and Laprade, *Public Opinion*, pp. 115-138. None of these events show up as breaks since their influence on prices was temporary.

As she lay on her deathbed during the last week of July, Anne made substantial changes to her ministry and orders were given to four regiments of soldiers to march up to London and Westminster. Seven British battalions in the Netherlands were directed to embark for England and orders were given for the equipping of all the ships of war that could be brought into service. At the same time instructions were dispatched to the States-general to be ready to perform the guarantee of the Protestant succession. The heralds at arms were kept in waiting with a troop of horse-guards, to proclaim the new king as soon as the throne was vacant. Precautions were also taken to secure the ports and to subdue the Jacobites in Scotland.⁵⁷ These preparations, taken on July 31, were sufficient to ease the fears of investors and stand in sharp contrast to the events in January that caught the country off guard. August 1st finds the Jacobites unprepared and unable to take advantage of the opportunity provided by the Queen's death.

Conclusion

The arguments and evidence provided in this paper support the theories of Ekelund & Tollison and North & Weingast regarding the importance and implications of the institutional changes ushered in by the Glorious Revolution in 1688. The Jacobite threat provided the motivation for Parliament and the Crown to introduce these changes. The rise of the capital market and the decline of the mercantilist order in England were unintentional byproducts of these innovations.

In addition, by linking Jacobite activity with movements in the capital market, this paper provides the first direct test of the hypotheses of North & Weingast. The evidence

⁵⁷ Smollett, *History of England*, p. 464.

presented here is consistent with their argument that it was the institutional changes that were critical for capital market development.

The markets themselves, though caught in their infancy in this study, seem remarkably capable of reacting in the appropriate direction when events threaten or support their underlying values. Although the resulting market volatility caused some contemporaries, such as Jonathan Swift, to question the rationality of investors, that volatility clearly reflected the insecurity of the embryonic institutions. Indeed, in our efforts to stabilize modern capital markets, the lessons of perhaps the first “emerging market” serve to remind us that new market institutions can be easily undone and that economic development is a gradual process that requires constant reinforcement.

FIG. 1. Bank of England and East India Co. Stock Prices
1698-1714

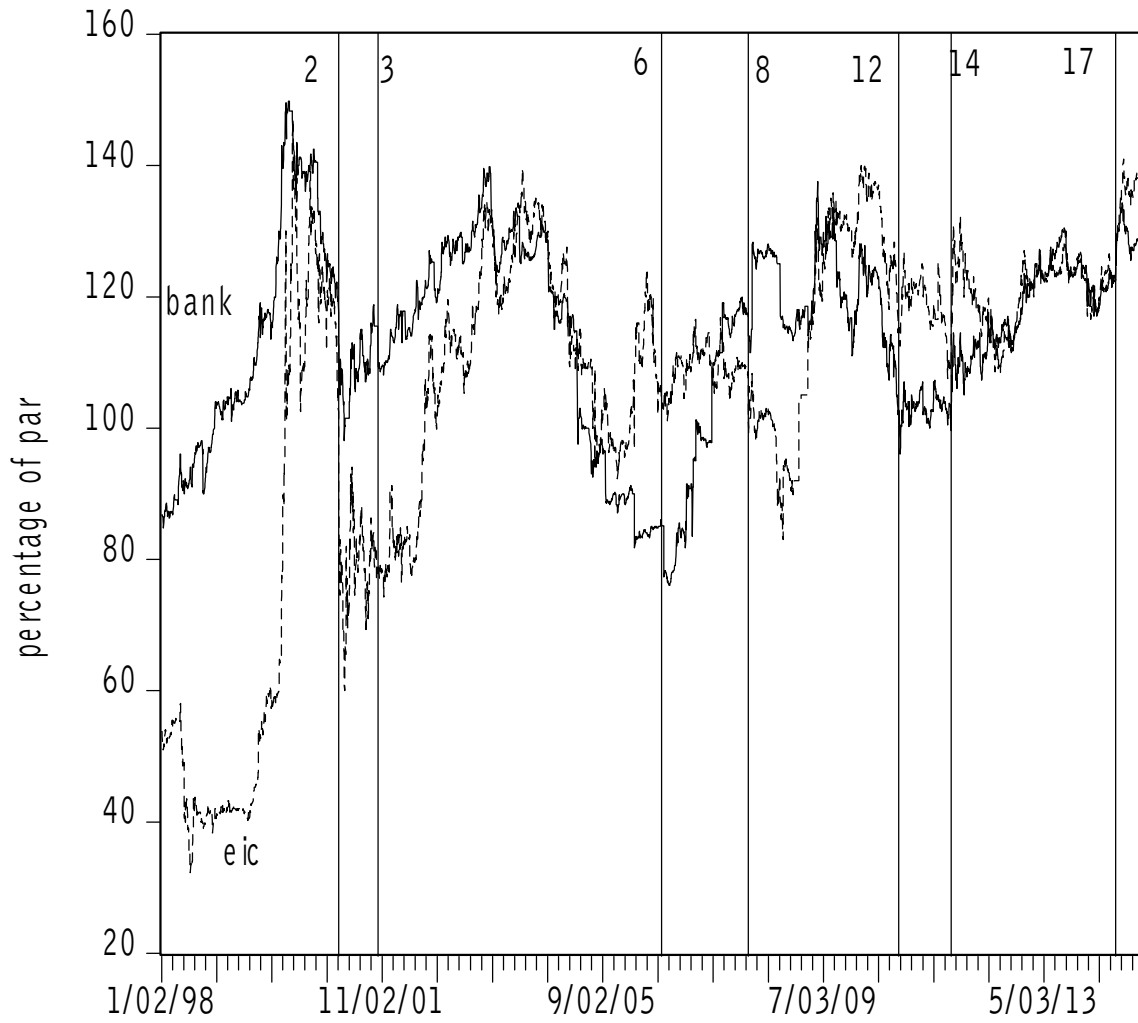


TABLE 1.

CHRONOLOGY OF EVENTS FROM THE REVOLUTION TO
THE DEATH OF ANNE (O.S. Dates)

1. June 30, 1688: Admiral Russell takes an invitation to invade England, signed by seven nobles, to William of Orange. William sets sail from Holland on November 1st and lands in southwestern England on the 5th.
2. December 23, 1688: James II flees England to end his days in France. On January 22, 1689, Convention Parliament meets and draws up Bill of Rights. William and Mary accept the throne on February 13. Parliament passes the Mutiny Act, Toleration Act.
3. May 7, 1689: William declares war against Louis XIV. Start of Nine Years' War.
4. July 1, 1690: Battle of Boyne River in Ireland marks defeat of James' attempt to return, safeguards the Revolution.
5. May 19, 1692: Battle of La Hogue thwarts invasion attempt by James II.
6. 1694: Triennial Act is passed by Parliament. July 1694, Bank of England opens for business at Mercers' Hall in Cheapside.
7. February 1696: Invasion attempt in conjunction with the Assassination Plot against William.
8. September 10, 1697: Matthew Prior, the plenipotentiary of England, returns to London with news of the signing of the Treaty of Ryswick. Ends the Nine Years' War and includes a pledge by Louis XIV to recognize William and end support for England's enemies.
9. November 1, 1700: Death of Charles II of Spain. Leaves throne to Philip V of France.
10. 1701: Act of Settlement passed by Parliament.
11. January 25, 1701: Louis marches into the Spanish Netherlands and precipitates a run on the Bank.
12. October 1701: Death of James II and Louis' recognition of the Pretender, James III, as the rightful King of England.
13. January 1702: Parliament passes the Abjuration Act requiring all Englishmen to repudiate the Pretender and swear fealty to William III and his heirs.
14. February 25, 1702: Death of William III, Anne takes throne.
15. May 15, 1702: The Emperor, the States-General of the United Provinces, and the Parliament of England simultaneously declare war upon France.
16. September-October 1706: Jacobitish riots in Scotland.
17. March 12, 1708: Jacobite invasion attempt at Firth of Forth, Scotland.
18. July 1710: Rumors of a Jacobite invasion.
19. October 1710: Tory election victory incites fear of restoration.
20. May 1711: Rumors of an impending Jacobite invasion.
21. September 27, 1711: Preliminary articles for peace signed as well as secret Mesnager Agreements between France and England. Peace conference at Utrecht opens in January 1712.
22. May 1712: Pretender death rumor.
23. December 1712: Queen Anne death rumor.
24. April 1, 1713: Peace of Utrecht signed, ending War of Spanish Succession.
25. January 1714: Baseless announcement of the death of Queen Anne culminates in a run on the Bank.
26. July 31, 1714: Death of Queen Anne and ascension of George I to the throne.

Notes: Table represents authors' reading of events relating to a possible Stuart restoration. Sources are Andreades *History*, Brownstone and Frank *Timelines*, Carruthers *City of Capital*, Clark *Later Stuarts*, Coombs *Conduct*, Cruickshanks "Attempts", Frey and Frey *Treaties*, Hatton and Bromley *William III*, Laprade *Public, London Gazette* (1689-1714), Luttrell *Historical*, Ogg *England*, Rogers *First Nine*, Scott *Constitution*, and Trevelyan *History*.

TABLE 2. Break Dates for Stock Prices from VAR

DATES (Old Style)	BANK	MILLIO N	OLD EIC	NEW EIC	AFRICA N	SOUTH SEA	Inter val	Wald
1. sept 10, 1697	0.212		0.105				1.02	307.669
2. jan 29, 1701	-0.007	-0.011	-0.036	-0.012	-0.050		1.29	55.377
3. oct 7, 1701	-0.013	-0.012	-0.011	-0.005	-0.007		1.39	51.009
4. june 23, 1702	-0.002	0.008	0.015	-0.012	0.046		1.17	57.743
5. sept 23, 1703	-0.011	-0.000	0.009	0.007	-0.003		1.19	73.771
6. sept 24, 1706	-0.028	-0.006	-0.001	0.001	-0.009		1.12	101.968
7. mar 26, 1707	0.022	0.000	0.003	-0.001	0.009		1.38	55.027
8. mar 11, 1708	-0.012	-0.003	-0.008	-0.007	-0.019		1.02	252.562
9. oct 2, 1708	-0.022	-0.006	0.007		-0.001		1.09	105.359
10. jan 28, 1709	-0.002	-0.001	0.017		-0.069		1.53	55.645
11. july 20, 1709	-0.007	0.007	0.007		-0.016		1.58	49.153
12. oct 24, 1710	-0.004	-0.007	0.002		-0.001		1.68	42.482
13. mar 24, 1711	-0.008	-0.007	-0.005		0.019		1.79	48.901
14. sept 22, 1711	0.017	0.006	0.013		0.039		1.71	44.342
15. sept 18, 1713	-0.010	-0.001	-0.004		0.010	-0.006	1.21	55.666
16. mar 12, 1714	-0.014	0.005	0.003		0.005	-0.011	1.20	61.950
17. july 31, 1714	0.011	0.004	0.012		0.008	0.018	1.18	82.922

Notes: Summary of breaks found in four different vector autoregressions using lag lengths of 12. Break dates correspond to the Old Style or Julian Calendar. Stock prices are quoted as a percentage of par and are as follows (designations and mean of the stocks over the period are in parenthesis): The Bank of England (*Bank*, 113.9), Million Bank (*Million*, 74.3), Old East India Company (*Old EIC*, 105.4), New East India Company (*New EIC*, 180.4), African Adventurers (*African*, 15.7), and the South Sea Company (*South Sea*, 85.2). The 'interval' corresponds to the 90 percent outer-confidence interval around the break date. The 'Wald' is the maximum F statistic computed according to equation (4) using a 10% critical value. The critical values listed in the working paper version of Bai, et al. "Testing" are not appropriate in the context of multiple breaks. We performed a small Monte Carlo with 1000 observations and 1000 replications on a 4 variable VAR. The 10% critical value obtained from this exercise was 42.23. We used this number for all our tests, though the 10% critical value for the 5 variable case would be slightly larger.

REFERENCES

- Andreades, A. *History of the Bank of England 1640 to 1903*. 2nd Ed. P.S. King & Son. 1924.
- Bai, Jushan, Lumsdaine, Robin L., and James H. Stock. "Testing for and dating breaks in multivariate time series." *Review of Economic Studies* (July 1998): 395-432.
- Banerjee, Anindya, Lumsdaine, Robin L., and James H. Stock. "Recursive and sequential tests of the unit-root and trend-break hypotheses: Theory and international evidence." *Journal of Business & Economic Statistics* 10, (1992): 271-87.
- Brownstone, David, and Irene Frank. *Timelines of War*. New York: Little, Brown and Co. 1994.
- Bulow, Jeremy, and Kenneth Rogoff. "Sovereign debt: Is to forgive to forget?" *American Economic Review* 79, (1989): 43-50.
- Carruthers, Bruce G. *City of Capital: Politics and markets in the English financial revolution*. Princeton, N.J.: Princeton University Press, 1996.
- Clark, G.N. *The Later Stuarts 1660-1714*. Oxford: Clarendon Press, 1934.
- Claydon, Tony. *William III and the Godly Revolution*. Cambridge: Cambridge University Press, 1996.
- Coombs, Douglas. *The conduct of the Dutch: British opinion and the Dutch alliance during the War of the Spanish Succession*. The Hague, Netherlands: Martinus Nijhoff, 1958.
- Coward, Barry. *The Stuart Age: England, 1603-1714* 2nd Ed. London: Addison Wesley Longman, Ltd., 1994.
- Cruickshanks, Eveline. "Attempts to Restore the Stuarts, 1689-96" in *The Stuart Court in Exile and the Jacobites*. Edited by Eveline Cruickshanks and Edward Corp, 1-14. London: Hambledon Press, 1995.
- Defoe, Daniel, *The Fears and Sentiments of all True Britons with respect to National Credit*, 1710.
- Dempster, Greg, John M. Wells, and Douglas T. Wills, "A Common Features Analysis of Amsterdam and London Financial Markets during the 18th Century." *Economic Inquiry*, forthcoming.
- Dickson, P.G.M. *The Financial Revolution in England: A Study in the Development of Public Credit, 1688-1756*. London: Macmillan, 1967.

- Ekelund, R. B., Jr. and R. D. Tollison. *Mercantilism as a Rent-Seeking Society: Economic Regulation in Historical Perspective*. College Station: Texas A&M University Press, 1981.
- _____. *Politicized Economies: Monarchy, Monopoly, and Mercantilism*. College Stations: Texas A&M University Press, 1997.
- Frey, Linda, and Marsha Frey. *The treaties of the War of the Spanish Succession: An historical and critical dictionary*. Westport, Conn.: Greenwood Press, 1995.
- Hatton, Ragnhild, and J.S. Bromley. *William III and Louis XIV: Essays 1680-1720 by and for Mark A. Thomson*. Liverpool: Liverpool University Press, 1968.
- Houghton, John. *A Collection of Letters for the Improvement of Husbandry and Trade*. London: Woodman and Lyon, 1728.
- Hume, David. *Writings on economics*. Edited by Eugene Rotwein. Madison: University of Wisconsin Press, 1970.
- Israel, Jonathan, "General Introduction." In *The Anglo-Dutch Moment: essays on the Glorious Revolution and its World Impact*, edited by Jonathan Israel, 1-46. Cambridge, Cambridge University Press, 1991.
- _____, "The Dutch role in the Glorious Revolution." In *The Anglo-Dutch Moment: essays on the Glorious Revolution and its World Impact*, edited by Jonathan Israel, 105-162. Cambridge, Cambridge University Press, 1991.
- Laprade, W.T. *Public opinion and politics in Eighteenth Century England*. New York: Macmillan, 1936.
- Luttrell, Narcissus. *A brief historical relation of state affairs from September 1678 to April 1714*. Reprint of the Oxford University Press edition, 1857. Farnborough, Hants. : Gregg International Pub. Ltd., 1969.
- Mirowski, Philip "What do markets do? Efficiency tests of the 18th-Century London stock market." *Explorations in Economic History*. 24 (1987): 107-29.
- Neal, Larry. *The rise of financial capitalism: International capital markets in the Age of Reason*. Cambridge: Cambridge University Press, 1990.
- North, Douglass C. and Barry R. Weingast. "Constitutions and Commitment: The Evolution of Institutions Governing Public Choice in Seventeenth-Century England." *this JOURNAL* 49 1989: 803-32.

- O’Gorman, Frank. *The Long Eighteen Century: British Political and Social History, 1688-1832*. London: Arnold Press, 1997.
- Ogg, David. *England in the Reigns of James II and William III*. Oxford: Clarendon Press, 1955.
- Pittock, Murray G. H. *Jacobitism*. London, MacMillan Press, 1998.
- Rogers, J.E. Thorold. *The first nine years of the Bank of England*. Oxford: Clarendon Press, 1887.
- Rogoff, Kenneth. “The optimal degree of commitment to an intermediate monetary target.” *Quarterly Journal of Economics*. 100 (1985): 1169-90.
- Rosenthal, Jean-Laurent, “The Political Economy of Absolutism Reconsidered.” in *Analytical Narratives*.” Bates et al. pp. 64-108. Princeton, Princeton University Press, 1998.
- Scott, Walter. *The Somers Collection of Tracts*. New York: AMS Press, 1965.
- Scott, William Robert. *The constitution and finance of English, Scottish and Irish joint-stock companies to 1720*. Cambridge: Cambridge University Press, 1912.
- Smollett, Tobias G. *The history of England from the Revolution in 1688 to the death of George the Second*. Philadelphia: Thomas Davis, 1844.
- Thompson, Mark A. “The Safeguarding of the Protestant Succession.” in *William III and Louis XIV*, Ragnhild Hatton and J.S. Bromley, Editors. Toronto: University of Toronto Press, 1968.
- Trevelyan, G. M. *History of England*. London: Longmans, Green, and Co. 1937.
- Weingast, Barry R. “The Political Foundations of Limited Government: Parliament and Sovereign Debt in 17th and 18th Century England.” In *The Frontier of the New Institutional Economics*, edited by Droback, J. and J. Nye, pp. 213-246. San Diego: Academic Press, 1997.
- Willard, Kristen L., Guinnane, Timothy W., and Harvey S. Rosen. “Turning points in the Civil War: Views from the Greenback market.” *American Economic Review*. 86 (1996): 1001-18.