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# Quiet Revolutions in Early-Modern England

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## Abstract

Revolutions are invariably viewed as the violent replacement of an existing political order. However, many social innovations that result in fundamental institutional and cultural shifts do not occur via force nor have clear beginning and ending dates. Focusing on early-modern England, we provide the first-ever quantitative inquiry into such quiet revolutions. Using existing topic model estimates that leverage caselaw and print-culture corpora, we construct annual time series of attention to 100 legal and 110 cultural ideas between the mid-16<sup>th</sup> and mid-18<sup>th</sup> centuries. We estimate the timing of structural breaks in these series. Quiet revolutions begin when there are concurrent upturns in attention to several related topics. Early-modern England featured several quiet, but profound, revolutionary episodes. The financial revolution began by 1660. The Protectorate saw a revolution in land law. A revolution in caselaw relating to families was underway by the early 18<sup>th</sup> century. Elizabethan times saw an increased emphasis on basic skills and showed signs of a Puritan revolution affecting both theology and ideas on institutions. In the decade before the Civil War, a quiet revolution of dissent preceded the turmoil that led to a king's beheading.

Keywords: quiet revolutions, text-as-data, machine-learning, time series, caselaw, culture, early-modern England

JEL Classifications: C80, C22, K00, Z10, N43, P10

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Here's fine revolution if we had the trick to see't.

Hamlet, V, i, 85

## 1. Introduction

In popular parlance, the word 'revolution' is inextricably associated with events comparable to the French and the Russian revolutions, with the connotation of a violent replacement of an existing political order by a new one. In economics, political science, and to some extent history, a similar assumption pervades. Goldstone (2014, p. 4) provides a definition reflecting that literature: "Revolution is the forcible overthrow of a government through mass mobilization (whether military or civilian or both) in the name of social justice, to create new political institutions."<sup>1</sup> With this focus, some historians have even had no problem classifying the English Civil War as a non-revolution because it left few traces in the constitutional arrangements that were in place after the restoration of the monarchy (McInnes, 1982).

In discussion of conceptual (e.g., scientific) changes, as well, the tendency has been to follow the spirit of the political-revolutions-as-sudden-overthrow view. Thus, Thagard (1992, pp. 3-6) counts "conceptual changes as revolutionary if they involve the replacement of the whole system of concepts and rules by a new system", by "analogy with political upheavals".

Nevertheless, one does not stumble when countenancing the thought of an industrial revolution. The Industrial Revolution spanned a century or more and occurred below the commanding heights of society, with even the central contributors unaware that they were overthrowing some existing order. Nevertheless, this revolution had, and is still having, epochal effects on world political and economic development.

Analogously, the term 'quiet revolution' rolls smoothly off the tongue in English and many other languages.<sup>2</sup> The listener will have the visceral sense that this implies large-scale socioeconomic change, not necessarily involving the political order, and with no beginning and ending years that are easily discernible from the historical record. Indeed the notion of an industrial revolution falls into this category.

Quiet revolutions are often about changes in ideas—ideas about how to live one's life, how one comprehends God, how society should be structured, how the physical world and technology work,

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<sup>1</sup> Earlier, Goldstone (2009) identifies a popular myth that revolutions are sudden expressions of widespread discontent, bringing about social change. But later, Goldstone points out that there are examples where this characterization does not fit, for example, the Meiji Restoration or the Chinese Revolution of 1911. However, all the revolutions he considers do happen very quickly, have political change at their core, and begin with intra-elite conflict. For Skocpol (1979), revolutions form an even smaller set: "Social revolutions have been rare but momentous occurrences in modern world history. From France in the 1790s to Vietnam in the mid-twentieth century, these revolutions have transformed state organizations, class structures, and dominant ideologies."

<sup>2</sup> The Oxford English Dictionary defines a quiet revolution as "a major social or political change achieved without violence or upheaval", but then specifically connects the term to a period of social, economic, and educational reforms in Quebec. Web searches confirm that this is the most common usage of the term 'quiet revolution', even though it has been used sporadically throughout the past centuries. For example, in *The (London) Times* of May 18, 1859, page 10, the Turin correspondent, after opening with a comment on the weather, reports on the military and political situation in Rome, which is predicted to have a "quiet revolution" similar to the one that occurred in Florence.

and how individuals and social structures relate to each other. Quiet revolutions are therefore often about institutions, both formal and informal. Quiet revolutions can result in the overthrow of an existing institutional order, without any associated cataclysmic political event. This reverses the causality implicit in Goldstone's (2014) definition.

We contend that legal and cultural revolutions, the two areas that we examine below, can occur in exactly this, quiet, way. Moreover, they can be every bit as momentous in historical development as adjectival-less revolutions. Changes in law and culture are most important when they conquer a large segment of the population. And although this inevitably happens slowly, it can be revolutionary. A nation that begins with unanimous support for the divine right of kings but loses 2% of adherents every year will be majority non-adherents after 35 years, creating the possibility of enormous political change, such as the judicial beheading of a monarch.

Why, then, does the economics and political science literature focus so intently on revolutions-as-forcible-overthrow? Part of the reason must surely be that wars, violent strife, and new constitutions are so easy to observe. In law there is an analogous phenomenon where parliamentary acts and single landmark cases are usually the center of attention, interpreted as marking the time when the world changed. In culture, there is a similar focus on the few Newtons and Luthers rather than on the many Taylors and Schneiders. However, these focal events and people are merely straightjackets that constrain the way history is told. One plausible explanation for this constraint lies in the inherent difficulty in analyzing the voluminous but decentralized and disaggregated information that drips constantly from the myriad contributions (e.g., court cases and texts) that together could produce quiet legal and cultural revolutions.

This paper produces a quantitative account of quiet revolutions in the formative years of English development, which ran from the mid-1500's to the mid-1700's.<sup>3</sup> The tasks we face in creating this picture are four-fold. First, find suitable data sources to drive the investigation. Second, create a numerical record from the data that can drive the quantitative analysis. Third, face up to Hamlet's problem: find the trick to see the quiet revolutions. Fourth, interpret our findings once we have developed plausible candidates to label as quiet revolutions. The remainder of this introduction provides more details on these steps, guiding the reader through the paper.

As we describe in Section 2, in previous work (Grajzl and Murrell, 2021a, 2021b, 2023c) we prepared two large machine-readable corpora for the application of machine-learning methods. These corpora are on caselaw and print culture. In those papers, we then proceeded to develop

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<sup>3</sup> Our reference to England in the paper's title and throughout the paper's text is less than precise but is the most accurate term for the geographical coverage of our paper. We study corpora on law and on culture. England was united with Wales in the 13<sup>th</sup> century, but it was only in 1830 that Wales was fully assimilated into the assize (or circuit) system from which important cases filtered into the top courts, and hence our database. Scotland retained its own legal system after its 1707 unification with England and Wales. Our culture corpus does include documents from Wales and Scotland. But Welsh-language and Scots Gaelic works would have been eliminated in our corpus pre-processing (see Section 2). Of course, English-language works produced by Welsh or Scottish authors are included. Nevertheless, the culture corpus is dominated by English works, and therefore a combination of parsimony and rough accuracy indicates our use of 'English' and 'England'. Given the way in which these names are usually used in the literature, listing the other countries would imply an emphasis that we do not have in the paper.

quantitative summaries of the core ideas contained in the corpora. This involved the application of topic modeling, an unsupervised machine-learning technique. We produced and interpreted the estimates of 100 topics for caselaw and 110 for culture (e.g., Claims from Financial Instruments; French Romance; Petitions, Protests, & Proposals). Most importantly, we generated the information necessary to produce time series of the yearly attention to each topic.

We use these data to detect the onset of quiet revolutions, the time that is equivalent to 1789 (in France) or 1917 (in Russia) for more well-known events. The onset would be marked by a conspicuous upturn in the attention to the specific topics that relate to some particular sets of ideas. In Section 3, we identify when such events occur. We do so by constructing the relevant time series of attention to the caselaw and culture topics and then using standard econometric tools for estimating unknown structural breaks in the resulting series.

We find evidence of breaks signifying a large increase in attention in 41% of the caselaw series and in 60% of the culture series. We are able to summarize all our core results with two figures, each showing the timing of the applicable breaks and the names of the corresponding topics.

Yet, one break does not a revolution make. It would be implausible to talk about a revolution occurring if we relied on just one upturn in attention. We must examine whether several related upturns in attention occurred around the same time. This involves deliberations on the substantive content of the corresponding topics in the light of the historical context. We do so in Sections 4 (for caselaw) and 5 (for culture), which present our main substantive results.

We find, for example, that a (quiet) revolution in the caselaw relevant to finance began in the third quarter of the 17<sup>th</sup> century, much earlier than assumed by most scholars. This was followed by a revolution in family caselaw that appeared in the first decade of the 18<sup>th</sup> century, a revolution that increased the scope of the property rights of women and made it easier for patriarch landowners to control the disposition of their estates far into the future.

We find several quiet revolutions in culture. In the Elizabethan era (1558-1603), for instance, there are three broad areas that show large increases in attention. The largest set contains mundane skills, the "counting, classifying, and cataloging", or 3 C's, of Mokyr (2016). There is also a cluster of religious topics, together with a smaller cluster of topics on politics and institutions.

Strikingly, all three areas contain signatures of Puritanism: the Puritans, more so than other Protestant sects, used rigorous, organized lessons for instructions in the scripture (the 3 C's in religion); they emphasized decentralized governance in the church, one of the areas receiving increased attention; and most of the religious topics highlighted in the Elizabethan era reflect themes associated with Puritanism. The phrase 'Puritan Revolution' is almost universally associated with the events surrounding the Civil War (1642-1649), both in common parlance and in historical studies. Our analysis suggests its cultural imprint appears already in the Elizabethan period.

There are dozens and dozens of estimates of facts appearing below in this paper. Thus, we could make many more comments of critique or corroboration on the existing literature had we

the space to do so. But we do not. Instead, we highlight in a few cases our agreements and disagreements with two of the most celebrated recent works in economics that cover the types of terrain on ideas that we examine here—McCloskey (2016) and Mokyr (2016). Indeed, this paper can be viewed as taking up one of the challenges that McCloskey forcefully presents. Economists and economic historians need to look more at word-evidence: "We need verbal thermometers..." (McCloskey, 2016, p. 236).<sup>4</sup> This paper takes the approach of text-as-data very seriously.

## 2. Data on early-modern English caselaw and print culture

The variables we use in our analysis are drawn from two datasets, generated by applying unsupervised machine-learning methods to two major text corpora: the English Reports (Renton, 1900-1932; hereafter ER) and the Text Creation Partnership (2022; hereafter TCP). In the following, we describe each of the two corpora. We then outline how we generated the datasets using machine-learning tools.

### 2.1. *The caselaw corpus: the English Reports (ER)*

The ER constitutes the definitive set of 129,042 reports on decisions rendered in the English courts of law between the early 13<sup>th</sup> century and the mid-19<sup>th</sup> century. While coverage is sparse for the early years, the number of reports becomes substantial by the mid-16<sup>th</sup> century. We use the reports on cases heard before 1765. This year marks the approximate onset of the Industrial Revolution and also a time when the style of law reporting changed, becoming more standardized and methodical than previously.

The ER constitutes neither the population nor a random sample of cases adjudicated in the English courts. Rather, the ER includes a subset of the cases considered by the superior courts.<sup>5</sup> Reporters were especially keen on providing a record of cases that highlighted unsettled or new aspects of law, that is, cases that gave rise to legal development (Grajzl and Murrell, 2021a). However, there is no precise record of how cases were chosen for inclusion in the collections of reports that were later consolidated in the ER.

The ER became the de facto record of court cases that the English legal profession used as its authoritative source for legal precedent. Thus, although the ER do not include all judgments made in the superior courts, they provide a record of the bulk of cases that came to influence the law. In this sense, the ER provide unique insight into the nature of English caselaw development between the mid-16<sup>th</sup> and late 18<sup>th</sup> centuries. No comprehensive exploration of English legal history during the early modern era could be conducted without the ER. No alternative machine-readable legal-historical corpus of comparable depth and breadth exists for the preindustrial era.

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<sup>4</sup> "We are just beginning in economic history to take seriously ideas and their trace in language. But economists and economic historians...had a hard time of it" (McCloskey, 2016, p. 253).

<sup>5</sup> These include the King's (or Queen's) Bench, the Court of the Common Pleas, the Exchequer, and the Chancery.

## 2.2. *The culture corpus: the Text Creation Partnership (TCP)*

The TCP is a machine-readable corpus of 60,331 texts that capture aspects of pre-1700 English print culture. The texts were prepared by the Text Creation Partnership and included in Early English Books Online (EEBO). TCP (2022) provides a wealth of information about the process underlying the assembling of the corpus. Here, we only emphasize key features.

The starting point of the creation of the texts for the EEBO-TCP project were catalogs that "trace the history of English thought from the first book printed in English in 1475 through to 1700" (TCP, 2022). The TCP corpus comprises about one half of the texts listed in a master catalog of works known to still exist. The selection of texts to be included in the TCP corpus was based on a number of ex-ante rules. These generally reflected two elements: first, texts were chosen in an attempt to create a representative corpus and, second, a small set of choices reflected bibliographic and purely practical considerations (e.g., quality of physical copies, identifiability of the author, existence of collected works that incorporate individual texts).<sup>6</sup> The underlying vision was "to key as many different works—as much different text—as possible" (TCP, 2022), that is, to build a corpus that approximated a random sample of available works. However, the TCP corpus cannot be viewed as providing a random sample of English culture in the relevant time period. The texts reflect the culture contained in printed text, not broad popular culture. The included texts are the surviving ones, with survival depending on how much subsequent generations valued the texts. And the project emphasized first editions: TCP is therefore more likely to reflect the production of culture than the consumption of culture. This is analogous to the ER, which reflects the production of caselaw rather than its overall use.

Nevertheless, the TCP corpus is unique in offering insight into English print culture before the 18<sup>th</sup> century. No alternative machine-readable corpus covering a very broad spectrum of texts has been assembled that could be used as the basis of a quantitative approach to pre-1700 English culture.<sup>7</sup>

## 2.3. *Dispelling selection concerns*

The ER and the TCP together offer the most comprehensive machine-readable overview of English caselaw and print culture during the early-modern era. On these grounds alone, a quantitative exploration of the ER and the TCP is warranted. Indeed, an empirical analysis of the ER and the TCP promises to deliver entirely new insights into fundamental changes in English legal and cultural thought during a period that immediately preceded the era of England's uniquely early political and economic development.

As emphasized in the immediately preceding subsections, neither the ER nor the TCP corpus should be viewed as comprising a random sample of legal and cultural documents. However, we now argue that the peculiarities of the processes of selection of documents for inclusion in the ER

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<sup>6</sup> This was confirmed via our personal correspondence with Paul Schaffner, a TCP production manager.

<sup>7</sup> Google books might be the one competitor. However, transcription quality in that corpus does not approach that of TCP and machine-readable versions of the Google-books texts are not generally available.

and the TCP should not fundamentally bias our findings. As we explain in Section 3 below, our empirical approach to identifying quiet revolutions rests on detecting sudden increases in the attention paid to specific sets of ideas contained in the corpora. For such increases to be a mere artifact of document selection, as opposed to reflecting underlying legal or cultural change, the selection process would have had to entail changes in the composition of the corpus that simultaneously occur at the same time and are large and enduring so that they would be identified by our empirical analysis. This is particularly unlikely to be the case for the ER, the assembly of which proceeded gradually over many centuries, relied on a decentralized approach, and involved generations of legal professionals (Grajzl and Murrell, 2021a: Appendix A). Individual editorial preferences would have therefore necessarily played a much more limited role than would be necessary to produce bias in our findings. Nothing in the historical record suggests that the definitive version of the ER (Renton, 1900-1932) deviated significantly from the principles of the original compilers of the cases.

Similarly, for the TCP, the entire project was run in a manner in which individual preferences of project partners (e.g., libraries), paid staff (e.g., keying vendors), and editors had a negligible impact on text selection.<sup>8</sup> Occasionally, a project partner or an editor selected a particular small set of texts in which they were more interested, texts that focused on some specific subject in a specific time period. However, idiosyncratic selection decisions of this type would not result in a persistent rise in attention within the corpus to those specific subjects. With the focus of the project partner or editor being on a specific time period, increases in the relative attention of the corpus to that subject would soon be followed by a subsequent decline. Our empirical method will, by design, therefore not identify such changes as an element of a quiet revolution.<sup>9</sup> Moreover, given the large number of documents in the corpus and given that most of the attention to a specific subject arises from its use across many documents, rather than in the few that focus directly on the subject itself, it is highly improbable that a group of project participants could significantly affect the results from our machine-learning model (see Section 2.4).

Last but not least, as we explain in Section 3, our approach to identifying quiet revolutions in caselaw and print culture rests on identifying increases in attention to multiple sets of thematically related, but substantively distinct, ideas: genuine quiet revolutions entail more than a single instance of change. For our approach to incorrectly identify a quiet revolution because of the processes of document selection, therefore, analogous selection patterns would have had to have

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<sup>8</sup> In personal correspondence with us, Paul Schaffner, a TCP production manager, noted that "personal preferences of any kind had virtually no influence on selection". The reason is that "[the] selector's job was to go through [the tracking database] picking unique works in English, picking the earliest copy (assuming it was complete), avoiding Latin, and so forth. There was simply no room to introduce personal preference into this mechanical and tedious task. This was not a 'craft' operation; it was a 'production' shop."

<sup>9</sup> Anticipating our findings discussed in Sections 4 and 5, the sets of ideas captured by Keble-Style Reporting, Modern-Style Reporting and Coke-Style Procedural Rulings provide a case in point. The temporal evolution of relative attention to each of these three sets of ideas evidences a sharp rise at some point that is soon followed by a rapid decline (see Appendix C). But our empirical analysis, quite appropriately, does not estimate any breaks in the corresponding time series (see Table E1).

arisen in the context of multiple sets of distinct ideas and within the same time period. This is simply unlikely. For all these reasons, the selection issues underlying the assembly of the ER and TCP corpora should not skew our findings about the incidence and nature of quiet revolutions.

#### *2.4. Machine-learning digests of the ER and TCP corpora*

To generate measures of relative attention to specific sets of ideas found in the ER and TCP corpora, we drew on our own earlier structural topic model (STM) estimates. In what follows, we lay out the details of how we build on those earlier efforts. In this subsection, we focus on a brief summary of those earlier efforts in order to provide as complete a picture as possible of how the estimates in this paper were produced. For those interested in further details, we direct the reader to the original research papers that introduce the pertinent STMs. Grajzl and Murrell (2021a, 2021b) explain, justify, and interpret the estimates of a 100-topic STM using the ER corpus. Grajzl and Murrell (2023c) provide similar details for the estimates of a 110-topic STM using the TCP corpus. For a less technical introduction in the context of the topic modeling of the ER corpus, the reader is directed to Grajzl and Murrell (2022b). Grimmer et al. (2022, Ch. 13) provide a broad introduction to topic-modeling.

Prior to estimating the STMs, the ER and the TCP corpora had to be carefully preprocessed. The non-standardized orthography of many centuries of English was converted into standard modern orthography. Older-style inflections were modernized. Those words that could not be found in a modern English dictionary and were readily identified as Latin were translated on a word-by-word basis. We dropped from the corpora documents that contained either an especially small number of words or an uncharacteristically high share of words that could not be matched to any word in the English dictionary even after the processing. We then identified the year of all case reports in the ER and texts in TCP. For ER, we were able to use 52,949 reports on cases heard before 1765, a corpus of more than 31 million character strings. For TCP, we use 57,863 texts that together comprise more than 1 billion character strings.<sup>10</sup>

Topic modeling is a machine-learning (ML) technique that exploits patterns in the co-occurrence of word-use across documents to produce a concise summary by identifying the salient emphases in the corpus. These are referred to as topics (Blei, 2012; Grimmer et al., 2022). It is as if the computational methods had produced a new digest of English law or culture, divided into a number of sections, or topics.<sup>11</sup> This is the 'dimensionality reduction' aspect of topic-modeling, producing an organized summary of a corpus that comprises an enormous amount of text that no human being could possibly hope to read.

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<sup>10</sup> The corpora were further processed following the steps suggested for STM estimation (Roberts et al., 2019). All words were converted to lower case and stemmed. We removed standard English stop words, numbers, words with fewer than three characters, words included in only one document, and punctuation.

<sup>11</sup> Before final estimation, the researcher must decide on the number of topics, that is, the number of sections of the digest. Using statistical criteria and a more subjective evaluation of the coherence and meaning of the produced topics, Grajzl and Murrell (2021a) chose 100 topics for the STM of the ER corpus and Grajzl and Murrell (2023c) chose 110 for the STM of the TCP corpus.



A topic is a distribution over the corpus vocabulary: the use of a topic by an author simply indicates a greater preference for some words than others. Each document is a mixture of topics: that is, the authoring of a document implies emphasizing some topics and playing down others.

Importantly, topic-modeling is an unsupervised form of ML: the researcher simply sets up the estimation framework, but does nothing to dictate the details of the summary produced. The topics themselves are entirely the product of estimation, not the result of an attempt to fit documents (reports or texts) into pre-existing categories. But the interpretation and naming of the estimated topics is the researcher's task. This process entails studying the words most associated with each topic and a close reading of documents that feature a given topic most prominently. The detailed work of legal and cultural historians over the centuries provides the background for analysis of this information, enabling the researcher to understand which areas of law or culture a particular topic reflects, thereby driving the crucial step of topic naming. Examples of the topic names for the STM of the ER corpus (Grajzl and Murrell, 2021a, 2021b) are Assumpsit, Claims from Financial Instruments, and Self-Help in Real-Property Disputes. For the STM of TCP (Grajzl and Murrell, 2023c), examples are Monarchs' Lives, Commercial Aids, and Baconian Theology. (We capitalize topic names throughout the paper. Online Appendixes A and B provide the key words and a brief description of all the topics whose names appear in this paper.)

Topic models are crude representations of the underlying text: the order of words in a document is discarded. But topic modeling does not rely merely on word counts: topic estimation is driven by correlations of word use across documents. Thus, semantics within documents can be reflected in the resultant estimates (Reich et al., 2015). Moreover, STM (Roberts et al., 2014, 2016) directly incorporates into the estimation process information about the texts that is not contained in the text themselves (e.g., the year and the court). In comparison with earlier topic-modeling approaches, such as LDA, STM therefore improves the identification of topics (Roberts et al., 2014: Online Appendix).

We characterized each corpus with a separate STM. Due to differences between the ER and the TCP with respect to time periods covered and substantive foci, merging the ER and TCP corpora into one grand corpus would not have been warranted.

### **3. Seeing quiet revolutions: the empirical approach**

In this section we first explain how we use our two sets of STM estimates to construct annual time series of relative attention to the different legal and cultural topics. We then outline our empirical strategy for identifying the onset of periods of fundamental change in the attention to topics. Periods of fundamental change in attention to multiple related topics are times when there are quiet revolutions in legal and cultural thought.

#### *3.1. Constructing the time series of relative attention to legal and cultural topics*

The central output of a topic model is a document-topic prevalence matrix. The columns provide information on the prevalence of a given topic in each document. The rows show the proportions of a document attributable to each of the topics. Together with the metadata about each

of the documents (for example, the year of publication and, for the ER, the adjudicating court), the resulting output provides a dataset that can drive many interesting quantitative analyses.<sup>12</sup>

Define  $\theta_{dt}^i$  as the proportion of document  $d$  from year  $t$  devoted to topic  $i$ . We also know document word lengths,  $w_{dt}$ . Then, for each corpus, the relative attention of the corpus to topic  $i$  in year  $t$  is:

$$y_t^i = \frac{\sum_{d \in D_t} w_{dt} \theta_{dt}^i}{\sum_{d \in D_t} w_{dt}}, \quad (1)$$

where  $D_t$  is the set of all documents published in year  $t$ . For the ER corpus,  $i = 1, \dots, 100$  and  $t = 1552, \dots, 1764$ . For the TCP corpus,  $i = 1, \dots, 110$  and  $t = 1530, \dots, 1700$ . The starting year of the series for each corpus (1552 for the ER and 1530 for the TCP) corresponds to the beginning of an era when the frequency of documents in the applicable corpus becomes large enough to facilitate quantitative analysis. Figures presenting timelines for all 210 time series of attention are included in Appendices C and D. From the resulting 210 series, we drop three series. These three reflect residual topics that are artefacts of the process of using less-than-perfect texts (Non-Translated Latin in ER and TCP, and Not English for TCP).<sup>13</sup>

Two comments about measure (1) are pertinent. First, because the number of documents included in both the ER and the TCP varies considerably over time (Grajzl and Murrell, 2021a, 2023c), we focus on relative attention to a given topic as opposed to total attention. In comparison with a measure of total attention, a measure of relative attention is less sensitive to variation due to the expansion of the printing press or the increasing standardization of case reports, for example. These are the types of changes that are irrelevant to current concerns. Focusing on relative attention, therefore, is effectively analogous to the use of yearly fixed effects in a standard panel regression framework.

Second, to compute relative attention, we weight document prevalences with the number of words in a document. This weighting addresses the fact that documents can be of greatly varying lengths. Longer documents naturally provide greater in-depth elaboration of ideas than shorter documents do. Thus, not weighting documents by their length would effectively underestimate the true (relative) attention of the corpus to the pertinent ideas.

### 3.2. Searching for unknown structural breaks

Our interest is in identifying episodes of dramatic change in the relative attention paid to different legal and cultural ideas. To identify the beginnings of such periods, we use econometric tools for estimating structural breaks (see, e.g., Perron, 2006). The sample consists of  $T$  annual

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<sup>12</sup> See, for example, Grajzl and Murrell (2022a, 2022b, 2023b, 2022d, 2023a, 2023c).

<sup>13</sup> The existence of residual topics is a consequence of the fact that topic models "often shunt noisy data into uninterpretable topics in ways that strengthen the coherence of topics that remain" DiMaggio et al. (2013, p. 582). Reassuringly, all three series exhibit as a primary break a down break in the latter half of the 17<sup>th</sup> century or early 18<sup>th</sup> century (see Appendix E). This is consistent with the notion that the era of printing and the increasing emphasis on the vernacular in both religion and law led to greater standardization of the language and less use of Latin.

observations. We use a linear regression model containing only a set of constants that allow for  $m$  breaks, giving rise to  $m + 1$  distinct regimes. Specifically, for observations in periods  $t = T_j, T_j + 1, \dots, T_{j+1} - 1$  that characterize a given regime  $j$ , we posit that

$$y_t^i = \mu_j^i + \varepsilon_t^i, \quad (2)$$

where  $y_t^i$  is defined in (1),  $\mu_j^i$  is mean relative attention to topic  $i$  during regime  $j$ , and  $\varepsilon_t^i$  is an error term. The break year  $T_{j+1}$  is the first year of the new regime.

Importantly, we do not make a priori assumptions on either the number or the years of break points for any of the series. Instead, we determine the number of breakpoints using the Bai-Perron sequential testing procedure (Bai, 1997; Bai and Perron, 1998, 2003a, 2003b).<sup>14</sup> That procedure begins with the full sample and performs a test of whether there is one unknown break. If the applicable F-test rejects the null hypothesis of no structural breaks, the algorithm determines the break year, divides the sample at the break point and repeats the same process for each of the two subsamples. The process is repeated until F-tests fail to reject the nulls of no structural breaks in all subsamples. We use a variant of the testing procedure that is robust to serial correlation and heteroscedasticity and also allows error distributions to differ across breaks.

This procedure can discover more than one break in any given series. In that case, the first identified break reflects the most important change in the series.<sup>15</sup> Therefore, in the analysis of our results, we use only the first break if a series features two or more breaks.

Finally, we note that the algorithm outlined above will not identify breaks that might occur very close to the start or the end of the time periods for which we have observations: the testing procedure requires a minimum segment length to identify breaks reliably. As a result, although our caselaw series extends from 1552 to 1764 and our culture series covers 1530-1700, our procedures will only uncover breaks during somewhat narrower time spans: we exclude (approximately) the first and last three decades for the ER-based series and the first and the last two-and-a-half decades for the TCP-based series.<sup>16</sup>

### 3.3. Summarizing, visualizing, and interpreting the estimates

The most basic information about our estimates of structural breaks appears in Tables E1 and E2 in Appendix E, the former for caselaw and the latter for culture. For each series, the tables show the year of each identified break (if any), with multiple breaks (if more than one) listed in the order produced by the procedure outlined in Section 3.2.

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<sup>14</sup> Relative to simultaneous estimation of multiple unknown breaks, the sequential approach has been shown to be comparatively more robust to misspecification (Bai, 1997).

<sup>15</sup> Bai and Perron (1998, p. 63), for example, characterize the first break point as "dominating in terms of the relative magnitudes of shifts and the regime spells".

<sup>16</sup> We use the standard value of 0.15 for the 'trimming' parameter, implying that in testing for unknown breaks we exclude the first and the last 15% of the observations.

Tables E1 and E2 also provide information on whether the break entailed an increase (up) or a decrease (down) in relative attention to the corresponding ideas. This is vital information because different directions of changes in relative attention reflect fundamentally different aspects of the development of the underlying legal or cultural ideas. As argued in Section 2, the ER and TCP corpora focus on works that stress new ideas. Grajzl and Murrell (2021a) show that the amount of attention paid to a set of ideas (a topic) in any given year is a function of the amount of change in adherence to the set of ideas in that year. Then, the annual time series of relative attention to a topic reflects the intensity of diffusion of the associated ideas in each year.

A significant positive change (up break) in the relative attention paid to a topic therefore signifies the beginning of an era when the associated ideas begin to diffuse more rapidly: these ideas are occupying a more prominent place in the cultural space. For example, ideas about precedent-based thought began to diffuse more rapidly only in the second half of the 17<sup>th</sup> century (see Section 4).

In contrast, a negative change (down break) marks the start of an epoch when the applicable ideas attract reduced attention.<sup>17</sup> This is an indication that the proponents of those ideas no longer needed to present them forcefully: it is a time when the ideas have become relatively accepted, or consolidated. For instance, our data show that relative attention to many ideas about real property decline in the first half of the 17<sup>th</sup> century, as feudalism waned (see Table E1 in Appendix E). Therefore, down breaks are not associated with the beginnings of revolutionary changes.

We thus focus exclusively on up breaks. In discussing our findings, we summarize the core information on the up breaks from Tables C1 and C2 using Figures 1 and 2. Time is measured on the vertical axis. The horizontal axis lists the series that feature an up break as the first estimated break, with the series listed from left to right based on the chronological order of those up breaks.

Figures 1 and 2 allow one to easily identify periods of profound legal-institutional and cultural change. Imagine a line tracing out the break markers. Then, a revolutionary episode would appear as a section with a gentle slope, showing a pattern of up breaks distributed over a narrow time interval. In contrast, a period of gradual change would have a comparatively steep slope, showing a set of up breaks scattered over a relatively extended time period.

#### **4. Quiet revolutions in caselaw**

Of the 99 caselaw series that we analyze, 41 (41%) evidence an up break, with the earliest one occurring in 1593 (Attorney- & Solicitor-General) and the latest one in 1734 (Multiparty Cases). As readily seen in Figure 1, we can periodize the patterns in (up) breaks into four distinct clusters. These are in the late Elizabethan and early Stuart period; the late Protectorate period; the period from the Restoration to the end of Stuarts; and the early Hanoverian era. In what follows, we focus

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<sup>17</sup> When a rise in attention is large enough to cause a break, it is due to contention about a particular subject, where there are proponents of some particular point, A, or its complement,  $\sim A$ . The down break occurs when a large proportion of society has accepted either A or  $\sim A$ . We usually name the topic according to the 'winner'.

on the first three of these clusters of breaks. The early Hanoverian period features only a few breaks in thematically unrelated series and therefore did not witness any quiet revolution in the law.

#### *4.1. The late Elizabethan and early Stuart era: gradual change*

The period between 1585 and 1645 features ten breaks. These can be traced with a relatively steep slope indicating a time when there is a succession of newer legal ideas appearing, but only sporadically. During the early part of this era, the waning years of Elizabeth I's reign, we see no particular focus in the changes. For example, there is an increase in attention to Nuisance (break 1586), a set of legal ideas about how to govern a broad range of disputes involving unlawful use of one's property (for example, when a person's construction on their own land blocks a neighbor's light).<sup>18</sup> Later, there is a break in Restraints on Trade (1599), a topic reflecting legal issues regarding the Crown's right to extend monopolies. While these signify the rising importance of two areas of law that are still immensely important today, the work of the courts during the later Elizabethan ideas can hardly count as contributing to a revolutionary episode.

----- [Figure 1 about here, displayed in landscape orientation to occupy a full page] -----

The early Stuart era (James I, 1603-1625, and Charles I, 1625-1649) exhibits seven breaks. This is again a time of gradual change, but in contrast to the previous time period the new areas of attention have a common theme. Several breaks involve topics pertaining to court procedure and jurisdiction, for example about jurisdictional boundaries of different courts (Prohibiting Jurisdiction, 1604), the domain of equity (Equity Jurisdiction, 1629), and judicial review of orders by local officials (Reviewing Local Orders, 1630). Later there is a break in Precedent (1642), the most prominent topic in the whole pre-1765 ER corpus (see Grajzl and Murrell, 2021a) and the defining feature of the English legal tradition. Contributions to traditional legal-historical research vary in their assessment of the timing of the emergence of widespread emphasis on precedent-based thought. Our empirical evidence indicates that the use of precedent began to take hold before the middle of the 17<sup>th</sup> century.<sup>19</sup>

The first half of the 17<sup>th</sup> century therefore witnessed a gradual process whereby the courts turned their attention to key aspects of their own organization, functioning, and mode of legal analysis. Given the acknowledged importance of the English legal system for comparative development, given the central role of precedent in that system, and given the crucial contribution of the separation of common law and equity (Grajzl and Murrell, 2022b), legal change might have been gradual (as opposed to revolutionary) at this time, but in terms of its consequences it was profound.

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<sup>18</sup> The rise in attention to this topic in the late 16th century can be attributed to the fact that around this time the main common-law courts, the Common Pleas and the King's (Queen's) Bench battled about the appropriate legal action for such disputes (Baker, 2019, pp. 454-455).

<sup>19</sup> This conclusion is entirely consistent with the evidence in Grajzl and Murrell (2021b) who use different methods to conclude that "[e]mphasis on precedent-based reasoning increases by 1650, but diffusion was gradual, with pertinent ideas solidifying only after 1700." That is, using the method for ascertaining unknown breaks, we have identified the start of the process of faster diffusion.

#### *4.2. The Civil War and the Protectorate: the land law revolution*

Our estimates identify a cluster of five breaks occurring during the late Protectorate, between 1656 and 1659. However it should be noted that the paucity of reported cases for that period makes the precise estimate of the year of breaks subject to some error: what is being captured is the difference between the 1650's in general and the Restoration afterwards. Several of these breaks may be interpreted as reflecting the after-effects of the turmoil of the earlier Civil War era and then the Commonwealth's attempt to enact a new institutional order.<sup>20</sup>

Real property issues were especially important.<sup>21</sup> Our estimates reveal breaks in Contingency in Wills (1659) and in Estate Tail (1657), two topics that are intimately related to real-property issues.

Especially notable is the break in Mortgages (1659). Earlier, courts had begun to move away from viewing mortgages as a way of conveying ownership rights over land to understanding mortgages as transactions that provided security to creditors (see, e.g., Plucknett, 1948, p. 652). During the Protectorate, the development of mortgage markets was spurred by an influx of landowners who needed funds in order to pay hefty fines imposed as a result of their support of the Crown. For lenders, extending mortgage-backed loans to these landowners was an attractive option as the government was viewed as an unreliable debtor and demand for loans from the merchant community was low (Habakkuk, 1965). The legal nuances of transactions, and the corresponding disputes that emerged, had to be ironed out in the courts. As we argue below, the break in Mortgages may also be interpreted as signifying the early beginnings of the financial revolution, which is clearly identifiable in our data.

While there is debate among legal historians about when the most fundamental changes in 17<sup>th</sup>-century English land law occurred, and whether they can be classified as "revolutionary" (Reid, 1995), our results suggest a quiet revolution begins in the last years of the Protectorate.

#### *4.3. From the Restoration to the end of the Stuarts: financial and family revolutions*

The precise timing of the financial revolution has long been a point of contention in the literature. According to the, still, most influential view, the Glorious Revolution provided the key impetus for the financial revolution (North and Weingast, 1989). Subsequent research has challenged this perspective.<sup>22</sup> But this research was not based on quantitative assessments of developments in caselaw. Grajzl and Murrell (2021b) provide the first quantitative evidence that many of the ideas relevant to caselaw on finance were accepted already by the mid-17<sup>th</sup> century.

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<sup>20</sup> There was no widespread attempt to reverse the caselaw rulings on property that had occurred during the Commonwealth.

<sup>21</sup> Even though the first Restoration Parliament annulled all legislation passed from 1646-1659 (with the exception of the provisions covered by the 1660 Declaration of Breda), the most important property legislation, which targeted the core of the existing land tenure system, was immediately reinstated by the same parliament (see, e.g., Jenks 1938, p. 242). Therefore, related caselaw developed before 1660 would have still been relevant.

<sup>22</sup> See Grajzl and Murrell (2021b: Sec. 3) and references therein.

By estimating structural breaks in time series constructed from the data generated by the Grajzl and Murrell (2021a) topic model, we add new precision to these assertions.

Four breaks in the caselaw directly related to finance follow closely on the one for Mortgages in 1659: Repaying Debt (1671), Executable Purchase Agreements (1672), Claims from Financial Instruments (1673), and Prioritizing Claims (1673). Then in 1686, there is a break in Negotiable Bills & Notes (1686), a topic on an area of caselaw whose development was vital to the increasing use of bills of exchange and promissory notes. Our analysis thus demonstrates that a financial revolution was stirring well before the last decade of the 17<sup>th</sup> century. This revolution in caselaw began well before the Glorious Revolution of 1688.

Our estimates also show that the latter part of the long 17<sup>th</sup> century featured another quiet revolution, one comprising successive breaks in topics pertaining to families. That the nature and dynamics of family life in England changed in the late preindustrial era is well understood. Erickson (1993, p. 6), for example, argues that sometime after 1700 England experienced a cultural shift toward affective families. However, the legal-institutional aspects and the timing of the family revolution have not been pinpointed using systematic data.

Our results reveal four breaks in 21 years in topics directly relevant to families, with three of those breaks occurring no more than three years apart. Marking the start of the family revolution is the break in Geographic Settlement of the Poor (1696). The rise in the attention to this topic, which often focused on children (see Grajzl and Murrell, 2021a), reflects the legal system's reaction to the administration of poor laws, which placed parishes at the heart of poverty relief. With legislative refinements in the rules of settlement that restricted a person to relief in a specific parish, parishes and the poor subsequently engaged in litigation that contested decisions on the awarding or denial of relief.

At the start of the 18<sup>th</sup> century, there is a cluster of breaks in Implementing Trusts (1705), Marriage Settlement (1705), Daughters' Legacies (1706), and Implementing Ambiguous Wills (1707). Marriage settlements were trusts of land and other assets established by the families of the bride and groom. These contractual arrangements specified, for example, how the marital property was to be used and what happened to this property upon the death of one of the betrothed. As such, marriage settlements allowed families to circumvent common-law constraints on inheritance and on the use of the wife's assets during marriages. Parents could ensure a better legacy for their daughters (hence the break in the corresponding topic). But the implementation of marriage settlements required advances in the law of trusts (and hence another break). The first decade of the 18<sup>th</sup> century thus saw a quiet revolution in law relevant to family property. The corresponding institutional developments would have had important repercussions for labor and capital markets and, consequently, would have stimulated the economy on the eve of industrialization (Grajzl and Murrell, 2023b).

Our analysis also casts light on the deep institutional origins of the financial and family revolutions. Historically, the English legal order evolved into a structure based on two complementary but distinct systems: common law, adjudicated primarily in King's/Queen's Bench

and Common Pleas, and equity, administered primarily by Chancery. Common law relied on an elaborate and rigid schema of writs, emphasized adversarial procedure, and used juries. Equity allowed for laxer pleading rules, used an inquisitorial procedure without juries, and provided relief in the form of alternative remedies such as decrees and injunctions (see, e.g., Baker, 2019).

Some scholars of English legal history have suggested that during the later preindustrial era, "the chief engine of law reform...was the judicial actions of the Courts, proceeding chiefly under the guise of Equity, and chiefly...in the court of Chancery" (Jenks, 1938, p. 211). But just how important was equity as a complement to common law in spearheading the financial and family revolutions? To answer this question, we focus on the twelve finance and family time series that feature a break between the late Protectorate and the end of the Stuart period. Using information on the court in which each case was heard, we then compute Chancery's contribution to attention to the twelve topics in the two decades prior to and after the breaks in their time series (see Appendix F for details).

The analysis reveals that, of the twelve finance and family topics exhibiting a break during the second part of the 17<sup>th</sup> century or in the early 18<sup>th</sup> century, Chancery contributed over one-half of the observed average yearly relative attention for nine (Mortgages, Executable Purchase Agreements, Claims from Financial Instruments, Prioritizing Claims, Implementing Trusts, Marriage Settlement, Daughters' Legacies, Implementing Ambiguous Wills, Bankruptcy). Hence, the financial and family-law revolutions were led by developments in equity, not common law.

Finally, our estimates reveal that the pattern of breaks observed from 1670 to 1688 continues smoothly into the last decade of the 17<sup>th</sup> century. There is no sign that the political and constitutional changes of 1688-1689 produced significant changes in the rate at which new areas of caselaw were coming to the attention of the courts.<sup>23</sup> The noisy Glorious Revolution did not produce a subsequent revolution in English caselaw. Our findings thus bolster the conclusions of recent studies that emphasize the non-revolutionary nature of the Glorious Revolution in terms of its impact on institutional change (Murrell, 2017; Hodgson, 2017, 2023; Ogilvie and Carus, 2014).

## 5. Quiet revolutions in culture

We examine breaks in 108 series derived from the topic-model of the TCP corpus. There are 65 series (60%) that have up breaks, 19 (18%) that have down breaks, and 24 (22%) with no breaks. Nothing intrinsic in the methods nor in historical processes inevitably leads to more up than down breaks.<sup>24</sup> The best interpretation of the imbalance between the types of breaks for culture is that

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<sup>23</sup> The four up breaks in the final years of the century are on areas of law that are substantively unrelated to each other (Municipal Charters, Evidence Gathering & Admissibility, Geographic Settlement of the Poor, Equity Appeals).

<sup>24</sup> An empirical argument would simply note that, for ER, ups and downs are nearly equal, with the latter slightly bigger. The theoretical argument is as follows. An up break occurs because a particular subject matter grabs attention. A down break occurs because a particular subject matter is losing the limelight. Suppose the data begin in a time when cultural patterns are stable, with no breaks occurring. Then this settled cultural progression is jogged out of its equilibrium by a sudden focus on a specific set of topics, which grab attention with all others experiencing slight, but not statistically significant declines (recall that our time series reflect relative attention). And then this new era remains stable until the data end. It is feasible in such a case, that there are many up breaks and no down breaks.



this is a period of cultural awakening, with the resultant cultural diffusion still ongoing as our data end. As before, we solely focus on up breaks, which are portrayed in Figure 2, whose structure and general interpretation is identical to that of Figure 1.

A quick glance at Figure 2 suggests a periodization in the ebb and flow of new cultural developments, with four easily identifiable eras: the reign of Elizabeth (1558-1603); the early Stuart era (1604-1635); the period immediately preceding the Civil War, (1636-1642); and the era of political vicissitude (1643-1676). We discuss each in turn.

### *5.1. The Elizabethan era: widespread cultural innovation*

During the reign of Elizabeth (1558-1603), there are 29 breaks, occurring at a more rapid pace than average. This is an era of widespread cultural innovation. Three broad areas dominate the topics that exhibit a break, that is, begin to gain significantly more attention. Numerically dominant are basic skills, or "counting, classifying, and cataloging" (the 3 C's) to use Mokyr's (2016, p. 275) euphonious phrasing.<sup>25</sup> Next in numerical importance are religious topics, innovations in which become especially more frequent in the later years of this era. Third, there is a smaller cluster of topics on politics and institutions. As we comment below, many of the topics straddle more than one of these areas.

----- [Figure 2 about here, displayed in landscape orientation to occupy a full page] -----

The 3 C's refers to practical knowledge that is below the level that would justify the label of science. The topic Using Numbers (break in 1587) is a typical example: one 1602 document that heavily uses that topic is entitled "A Caveat for the Borrower: or, a perfect table of usurie, shewing how much the principal sum, with the interest, and interest upon interest, from one pound to a thousand amounts unto yearly for twenty-one year, after the rate of ten in the hundred". A similar topic is Compilations of Laws (1588), heavily featured, for example, in a document that discusses what fines are and what their purpose and amount is. Catechismal Compilations (1570) is all about cataloging basic skills that are most applicable in the religious sphere. Among the many additional examples are Equine Learning (1566), Scholarly Learning Guides (1580), and Listing City Facts (1580). Note that in this period there are more innovations in non-religious, non-political culture than in all other time periods covered by our data.

The early break in Using Numbers is particularly interesting. McCloskey (2016, pp. 270-275) would associate this topic with the bourgeois virtue of prudence, placing its appearance in the late 17<sup>th</sup> century, particularly under Dutch influence. But we place the heightened interest in calculating in the late 16<sup>th</sup> century. For example, a 1589 document entitled "The Booke of Thrift, containing a perfite order, and right methode to profite lands, and other things belonging to Husbandry" begins by advising "First he that shal render account, ought to sweare that he shall render a true account... let him cast up all to the just value of money, to charge therewith his account." This is a notable

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<sup>25</sup> Mokyr (2016) focuses on later years than we do when emphasizing the cultural importance of the 3 C's. However, this probably reflects his interest in the spread of ideas and their use, while this paper concentrates on finding the time period when these ideas were innovative. Harkness (2007) does see the 3 C's as present in 16<sup>th</sup> century London.

contrast with McCloskey's (2016, Ch. 34) claim that reasoning by counting was disdained in Shakespeare's time.

The second cluster of topics featuring breaks encompasses Protestant themes, particularly Puritan ones.<sup>26</sup> Examples are Apocalyptic Theology (1570) and Sin Damnation and Repentance (1594). But most interestingly, many of these 'Puritan' topics are ones that border on the 3 C's and politics: Autonomous Church Governance (1572), Practicing Christianity (1580), Catechismal Compilations (1570), Political Uses of Religion (1573), and Lawfulness (1583).

In 1553, a large group of Protestant clergy fled England upon the accession of Mary I, a Catholic monarch who had reversed the reforms implemented in the aggressively Protestant reign of her brother. The fleeing clergy spent their exile in the major Protestant centers of Europe. A plurality spent time in Calvin's Geneva, where they fully absorbed the lessons of church self-government, the primacy of the Bible in understanding their role in the world and their relationship with God, the didactic importance of personalized sermons, and the necessity of practicing religion in every aspect of their lives, from the sphere of the family to the governance of the nation. The Marian exiles returned to England on the accession of the Protestant Elizabeth in 1558. They, and their disciples, continually struggled to change the tenor of the Protestantism that was practiced in England, both within and outside the church.

The Puritans intensively used rigorous, repetitive, and organized lessons, that is catechisms, for instruction in the scriptures. Catechisms are numbered lists, classifying and cataloging lessons. The complementarity with the 3 C's is transparent. Inside the church the Puritans favored decentralization of decisions to lower levels and the freedom of the clergy to spread personalized messages about how life should be conducted. Given that the English church was a wholly political structure, this had inevitable implications for political and legal behavior. Thus, there is a transparent complementarity with politics and institutions, the third of our cluster of related breaks during the Elizabethan era. Among this cluster are Autonomous Church Governance (1572), Political Uses of Religion (1573), Lawfulness (1583), Republicanism (1585), Compilations of Laws (1588), and Catholics under Protestant Rule (1592).

The birth of all of these inter-related areas of cultural attention surely amounts to a quiet revolution of some significance. Some authors (e.g., Acemoglu and Robinson 2012) have connected the Industrial Revolution directly to institutional development in the late 17<sup>th</sup> century; Mokyr (2016, p. 274) suggests that the Industrial Revolution was a result of the 18<sup>th</sup> century confluence of artisanal ingenuity and the scientific method and discovery; McCloskey (2016, p. xii) associates England's enrichment with a pro-bourgeois rhetoric forming around 1700. Our analysis has discovered embryonic elements of all these in the late Elizabethan period, all

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<sup>26</sup> The term Puritan loosely refers to those who wanted to purify English Protestantism from all vestiges of Catholicism, particularly emphasizing the basing of all religious practices on the Bible. Within Puritanism, there were many shades of theology and practice, the two most readily identifiable groups being Presbyterians and Congregationalists. On the origins of Puritan thought and action in Elizabethan England see, for example, Walzer (1982) and Marshall (2017).

reflecting to some extent signature ideas of Puritanism.<sup>27</sup> Of course, there were other factors contributing to this emerging zeitgeist. Perhaps existing English culture had prepared the way for the 3 C's (Harkness, 2007); perhaps the early English tradition of individualism played a big part (Macfarlane, 1978). Or perhaps it was a fateful interaction of all three. The uncertainty here about definitive conclusions echoes Mokyr's (2016, p. 231) emphasis on the contingency of cultural evolution.

### *5.2. The early Stuart era: seeds of the scientific revolution?*

The thirty-year Early Stuart era (1604 to 1635) can best be viewed as a desultory one during which few new cultural foci began to emerge. There are nine breaks, four of which are religious. But, in contrast to the Elizabethan era, these four cannot be associated with a common theme.

Intriguingly, two of the more interesting breaks relate to science. Deductive Reasoning (1628) develops insights using logical rules and methods (not empirical facts). In TCP, there are examples of its use in religion, science, and philosophy. Baconian Theology (1615) uses logical arguments and emphasizes learning from facts, biblical, historical, or personal. It harnesses deduction in pursuit of its inductive conclusions, developing broader theological insights from experience, or experiment. When its methods were later applied in the secular domain, they would be labeled as Puritan science (Mokyr, 2016, pp. 227-237).

Therefore, one possible interpretation of the increasing attention to Baconian Theology is that it was stimulated by the rise of Puritan religious thought in the Elizabethan era. This is consistent with our data since the spike in attention in the Early Stuart era marks the moment when gradual developments during the Elizabethan era began to spread widely (Grajzl and Murrell, 2023c). According to this interpretation, Bacon's philosophical works were merely sophisticated versions of ideas that were becoming widespread exactly when Bacon's works were being produced.<sup>28</sup> In support of this view, we do know that Bacon spent the early decades of his life in an environment suffused with Puritanism.<sup>29</sup> Moreover, there is little evidence that Bacon's works themselves were accorded much attention in England in the first few decades after their publication, suggesting that it was not Bacon himself who spurred the increasing attention to Baconian theology.

The alternative hypothesis, emphasized by Mokyr (2016: Ch. 7, 13), is that Bacon was the real innovator (providing a cultural mutation) and that the complementarity with Puritan ideas was later and fortuitous: "The lineage from Francis Bacon to the Industrial Revolution via Puritan science is easily discernible." Our evidence points in a different direction, that Bacon's works on scientific

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<sup>27</sup> For example, McCloskey (2016, p. 385) dates a post millennial eschatology at 1646, while our Apocalyptic Theology appears in 1570. Our Autonomous Church Governance appears in 1572; this is McCloskey's (2016, Ch. 39) democratic church governance.

<sup>28</sup> Mokyr (2016, p. 246) emphasizes "a trail blazed by Bacon and the Puritans who admired him", whereas our data suggests that Bacon built a road following a trail that clearly existed already.

<sup>29</sup> Bacon's maternal grandfather was a Marian exile (Garrett, 1938). His mother fostered Puritan causes as much as was possible given that she was a woman living in a polity with a Queen who was an ardent anti-Puritan. After Bacon's father died, his mother was willing to use her command over family resources to influence her profligate sons (Magnusson, 2001).

method might be better viewed as highly successful expositions of ideas that existed within his cultural milieu, and in this sense Mokyr's view of Bacon as a cultural entrepreneur, not an innovator, should be stressed more.<sup>30</sup> Choosing between these hypotheses will require delving much more deeply into the data, but it will certainly involve text methods.

### *5.3. The immediate pre-Civil War era: a quiet revolution of dissent*

This era (1636-1642) begins with the popular defiance of the Crown in the open refusal to pay taxes (Langelüddecke, 2007) and ends with the final rift that precipitated the Civil War. It is the most fecund of our four time periods in terms of emerging foci of cultural change (18% of breaks in just 6% of years). It is a time of political dissent, with the King dissenting from more widespread views on the limits of his own powers and Parliament distinguishing between its allegiance to constitutional structures and its loyalty to the particular person inhabiting the monarchy. Although the era ended with a cataclysmic revolution, the Civil War, there was no internal warfare during this era.

Nine of the topics with breaks fit into the category of politics and institutions.<sup>31</sup> Several of these have religious elements. Dissent, Schism, & Toleration (1636) captures the language of debates about Protestant dissenters from the Church of England. Fearing Catholicism (1641) reflects establishment views on the dangers of Catholicism, both theological and political. Allegiance & Resistance (1642) expresses ideas on the appropriate behavior of those whose views collide with the dominant ideology, whatever the disagreements were. This is not a religious topic but nevertheless its language would have appeared in the documents of those whose disagreements were primarily religious.

One aspect of allegiance or resistance is the use of rhetorical tools to make one's case before the highest political bodies. The language of Petitions, Protests & Proposals (1639) and of Economic Lobbying (1641) now receive more attention in print publications. The former focuses on broad political issues, for example, religious regulations, while the latter reflects more parochial concerns, such as the raising of the interest rate.

There is also concern with how to structure governance. Constitutional Rules (1641) reflects caselaw and statutes concerning the rights and duties of the highest-level actors in the nation, as well as the structure of the institutions within which these actors function. Parliamentary & Court Procedure (1641) captures discussions of procedural rules within the courts and Parliament. Scottish Political Acts (1638) and (English) Ordinances (1642) focus on the language that is typical of the rule-making in their respective spheres.

The rise in attention to this coherent set of topics in such a short period indicates that a sea change has begun in the way that the English write about their politics. There is increasing

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<sup>30</sup> There are many elements of Bacon that were enthusiastically endorsed by later generations. Here we focus only on his emphasis on the experimental and inductive; we have no comment to make on two other sets of ideas often associated with Bacon by later followers, the utilitarian promise of science and the centralized organization of the scientific quest. On these, see Grajzl and Murrell (2019).

<sup>31</sup> The remaining three include one on religion without any political overtones and two on the 3 C's.

emphasis on discussion of how to dissent from rulers, on demanding policies and reform from their leaders, and on how to structure the rules within which the rulers interact with the ruled. That is, the language of normal democratic processes receives more attention in English culture, a language that has been used ever since. This is a quiet revolution of words and ideas, one that preceded the noisy revolution of force and arms.

#### *5.4. Era of political vicissitude: ongoing cultural diffusion*

This time of great political changes (1643-1676)—the civil wars, the judicial beheading of a monarch, the Protectorate, and the Restoration of the monarchy—sees breaks occurring at approximately the average pace for the entire period covered by the culture data. At the same time, it is difficult to make the case that any specific type of subject matter is particularly prominent in these cultural developments; breaks in politics and institutions, in particular, are not important. Nevertheless, one can see elements of an evolving culture: there are more new areas of attention in science than in skills, and the religious topics that have breaks do not show any distinctive marks of Puritanism.

The first breaks in this era are in two religious topics, *Attacking False Doctrine* (1644) and *Reasonable Religious Discourse* (1645). These capture styles of discourse much more than new areas of theology. At the same time, new skills topics have breaks, *Student Practitioner Law* (1647) and *Bibliographical Practice* (1654). Intriguingly, under a political regime usually characterized as austere in its pursuit of a Godly Kingdom, *French Romance* (1652) begins to gain attention. Could this have been the first glimmer of the culture that in the lighter works of history has usually been viewed as characterizing the Restoration: an era concerned with entertaining itself, often in a ribald manner?<sup>32</sup> The new attention to *Lusty Entertainments* (1660) is consistent with that conjecture.

Separate fields of science begin to emerge: *Physics* (1661), *Chemistry* (1662), *Diseases & Cures* (1663), and *Anatomy* (1664). Given the founding of the Royal Society in 1660, the timing is particularly intriguing. Grajzl and Murrell (2023) find no evidence that the founding of the Royal Society had a causal effect on the total amount of scientific culture produced. (Natural Philosophy, which covered all areas of science, exhibits an up break almost a century before, in 1571, and is still important at this time.) Hence, the primary effect of the Royal Society seems to have been to stimulate the emergence of the different disciplines within society. It will surprise no-one to learn that organization led to compartmentalization.

Few patterns can be detected in the new areas of cultural attention that surface in those years of the Restoration covered by our data. Still, there are some intriguing developments. Two topics

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<sup>32</sup> Consider this introduction to an introductory English history course: "Culturally, the Restoration is best known as a backlash against the Puritan rule it followed. Specifically, society and culture around the king was characterized by loosened morals, more opulent displays of wealth and learning, and the celebration of the bawdy and the bodily. While much of that was limited to the court culture around London, Charles's court became the center of English culture, as he and his followers became the most important patrons of the arts." (<https://resources.saylor.org/wwwresources/archived/site/wp-content/uploads/2013/10/ENGL203-OC-1.1.1-Restoration18thcintro.pdf>, accessed February 18, 2023).

with breaks reflect theology from the Church of England. *Salvation Via Virtue* (1666) expresses a utilitarian view of what it means to live a good life, very much in contrast to the *Salvation via Faith* (1641), which is closer to Puritanism. In a similar vein, *Ecclesiastical History* (1675) captures views from supporters of the Church of England on those elements of the history of the Christian church that can be said to have led to the contemporaneous English ecclesiastical arrangements.

In sum, the most revolutionary era ever in England, at least in terms of open hostilities and dramatic constitutional changes, can hardly be characterized as one exhibiting major turning points in culture. No quiet cultural revolution began in the midst of the noisy political revolutions. If culture was changing during this time, as it undoubtedly was, then the change would have been a product of the major turning points that had occurred before the political revolutions began. Based on our estimates, this era of political vicissitude is best characterized, on the cultural front, as a time when there was continuing gradual diffusion of a heterogeneous set of ideas.

## **6. Concluding remarks**

Unlike violent overthrows of government and the ensuing changes in political order, quiet revolutions, such as the financial or scientific revolution, are not readily detected as they commence and unfold. Yet despite their non-cataclysmic character, quiet revolutions often involve or precede fundamental upheavals in the existing social order. Quiet revolutions are in this sense the embodiment of institutional and cultural change.

Our analysis revolutionizes the existing research on revolutions and English history along two key dimensions. Methodologically, we have offered a template for quantitatively identifying quiet revolutions by combining machine-learning techniques for analysis of text-as-data and time-series econometrics. The resultant approach could be fruitfully applied to study quiet revolutions, and more broadly the evolution of institutions and culture, beyond early-modern England. Moreover, the quantitative account of quiet revolutions that we have provided might offer some insights into the determinants of the much-discussed noisy revolutions in early-modern England. It has not escaped our attention that the quiet revolution of dissent that we have identified occurs in the immediate pre-Civil War era.

Substantively, our paper casts novel light on England's institutional and cultural change during the pivotal early-modern period. Our analysis of caselaw adds new quantitative precision to the timing and nature of the revolutions in caselaw on land law, finance, and the family. Many of the results emanating from this analysis suggest that proponents of institutional change as the cause of England's rise should look earlier than their usual late 17<sup>th</sup> century dating. Our investigation of print culture reveals evidence of widespread cultural innovation during the Elizabethan era, earlier than emphasized by McCloskey (2016) and Mokyr (2016). In the Elizabethan era, we have found many elements of the 3 C's, including increasing emphasis on calculation. At the same time, there is the rise of a millennialist theology, which imparted to adherents a focus on improving society: McCloskey (2016, p. 385) dates this cultural change as occurring in the 1640's. Contemporaneously, there appear ideas about decentralized church governance, encouraging notions that a hierarchical society can be challenged. Similarly, soon after the Elizabethan era, in

the early 17<sup>th</sup> century, we see a sharp increase in Baconian Theology, an ingredient in the "project of reading God's nature from creation [which] was the framework for British thought generally for a century and a half" (McCloskey, 2016, p. 385): McCloskey dates the beginnings of this framework to 1680. The timing here also indicates some element of doubt concerning Mokyr's (2016) suggestion that Bacon provided a cultural mutation.<sup>33</sup> Thus one central lesson from our paper is that, whether one thinks institutions or ideas were the ultimate determinant of England's rise, the verbal thermometers indicate much earlier change than has been asserted of late by economists.

Finally, it should be emphasized that our methodology is explorative and descriptive—it is not addressed at uncovering the causal determinants of these revolutions. Even so, for readers more interested in the causal, we have uncovered many fundamental changes in English law and culture that could stimulate further investigation. For example, what exactly provided the impetus for the sudden increase in the emphasis on skills (counting, classifying, cataloguing) in the Elizabethan period? Can the rise in the attention paid to skills during the Elizabethan era be causally linked to the surge in attention to Baconian Theology and Deductive Reasoning during the subsequent Stuart era? And did developments within caselaw and print culture proceed autonomously or, alternatively, can one find evidence of interrelated coevolutionary dynamics between institutions and culture? The study of the evolution and coevolution of institutions and culture in preindustrial England and beyond constitutes a fundamentally important but empirically under-researched area of inquiry.

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<sup>33</sup> See also Grajzl and Murrell (2019).

## References

- Acemoglu D, Robinson JA (2012) *Why nations fail: the origins of power, prosperity, and poverty*. New York, NY: Random House.
- Bai, J. (1997). Estimating multiple breaks one at a time. *Econometric Theory*, 13(3), 315-352.
- Bai, J. & Perron, P. (1998). Estimating and testing linear models with multiple structural changes. *Econometrica*, 66(1), 47-78.
- Bai, J., & Perron, P. (2003a). Computation and analysis of multiple structural change models. *Journal of Applied Econometrics*, 18(1), 1-22.
- Bai, J., & Perron, P. (2003b). Critical values for multiple structural change tests. *Econometrics Journal*, 6(1), 72-78.
- Baker, J. (2019). *An introduction to English legal history*. Fifth edition. Oxford, UK: Oxford University Press.
- Blei, D.M. (2012). Probabilistic topic models. *Communications of the ACM*, 55(4), 77-84.
- Brown, R.C. (1931). The law of England during the period of the Commonwealth. *Indiana Law Journal*, 6(6), 359-382.
- DiMaggio, P., Nag, M., & Blei, D. (2013). Exploiting affinities between topic modeling and the sociological perspective on culture: Application to newspaper coverage of U.S. government arts funding. *Poetics*, 41(6), 570-606.
- Erickson, A.L. (1993). *Women and property in early modern England*. London, UK: Routledge.
- Garrett, Christina Hallowell (1938). *The Marian exiles: A study in the origins of Elizabethan Puritanism*. Cambridge, UK: Cambridge University Press.
- Goldstone, J.A. (2009). Rethinking revolutions: Integrating origins, processes, and outcomes. *Comparative Studies of South Asia, Africa, and the Middle East*, 29(1), 18-32.
- Goldstone, J.A. (2014). *Revolutions: A very short introduction*. Oxford, UK: Oxford University Press.
- Grajzl, P., & Murrell, P. (2019). Toward understanding 17th century English culture: A structural topic model of Francis Bacon's ideas. *Journal of Comparative Economics*, 47(1): 111-135.
- Grajzl, P., & Murrell, P. (2021a). A machine-learning history of English caselaw and legal ideas prior to the Industrial Revolution I: Generating and interpreting the estimates." *Journal of Institutional Economics*, 17(1), 1-19.
- Grajzl, P., & Murrell, P. (2021b). A machine-learning history of English caselaw and legal ideas prior to the Industrial Revolution II: Applications." *Journal of Institutional Economics*, 17(2), 201-216.
- Grajzl, P., & Murrell, P. (2022a). Lasting legal legacies: early English legal ideas and later caselaw development during the Industrial Revolution. *Review of Law & Economics*, 18(1), 85-141.
- Grajzl, P., & Murrell, P. (2022b). Using topic-modeling in legal history, with an application to pre-industrial English caselaw on finance. *Law and History Review*, 40(2), 189-228.



- Grajzl, P., & Murrell, P. (2022d). Did caselaw foster England's economic development during the Industrial Revolution? Data and evidence. SSRN Working Paper 4269309.
- Grajzl, P., & Murrell, P. (2023a). A macrohistory of legal evolution and coevolution: Property, procedure, and contract in early-modern English caselaw. *International Review of Law and Economics*, 73, 106113.
- Grajzl, P., & Murrell, P. (2023b). Of families and inheritance: Law and development in England before the Industrial Revolution. *Cliometrica*, forthcoming. <https://doi.org/10.1007/s11698-022-00255-8>
- Grajzl, P., & Murrell, P. (2023c). A macroscope of English print culture, 1530-1700, applied to the coevolution of ideas on religion, science, and institutions. SSRN Working Paper 4336537.
- Grimmer, J., Roberts, M.E., Stewart, B.M. (2022) *Text as data. A new framework for machine learning and the social sciences*. Princeton, NJ: Princeton University Press.
- Habakkuk, H.J. (1965). Landowners and the Civil War. *Economic History Review*, 18(1), 130-151.
- Harkness, D.E. (2007). *The jewel house: Elizabethan London and the scientific revolution*. New Haven, CT: Yale University Press.
- Hodgson, G.M. (2017). 1688 and all that: Property rights, the Glorious Revolution and the rise of British capitalism. *Journal of Institutional Economics*, 13(1), 79-107.
- Hodgson, G.M. (2023). *The wealth of a nation: Institutional foundations of English capitalism*. Princeton, NJ: Princeton University Press.
- Jenks, E. (1938). *A short history of English law*. Fifth Edition. London, UK: Methuen & Co. Ltd.
- Langelüddecke, H. 'I finde all men & my officers all soe unwilling': The collection of ship money, 1635-1640. *Journal of British Studies*, 46(3), 509-542.
- Macfarlane, A. (1978). *The origins of English individualism: The family, property, and social transition*. New York, NY: Cambridge University Press.
- Magnusson, L. (2001). Widowhood and linguistic capital: The rhetoric and reception of Anne Bacon's epistolary advice. *English Literary Renaissance*, 31(1), 3-33.
- McCloskey, D.N. (2016). *Bourgeois equality: How ideas, not capital or institutions, enriched the world*. Chicago, IL: University of Chicago Press.
- Marshall, P. (2017). *Heretics and believers: A history of the English Reformation*. New Haven, CT: Yale University Press.
- McInnes, A. (1982). When was the English revolution? *History*, 67(221), 377-392.
- Mokyr, J. (2016). *A culture of growth: The origins of the modern economy*. Princeton, NJ: Princeton University Press.
- Murrell, P. (2017). Design and evolution in institutional development: The insignificance of the English Bill of Rights. *Journal of Comparative Economics*, 45(1), 36-55.
- North, D.C., & Weingast, B. (1989). Constitutions and commitment: the evolution of institutions governing public choice in seventeenth-century England. *Journal of Economic History*, 49(4), 803-832.

- Ogilvie, S., & Carus, A.W. (2014). Institutions and economic growth in historical perspective. In: Aghion, P. & Durlauf, S.N. (eds.), *Handbook of economic growth*. Vol. 2, Amsterdam: Elsevier, 403-513.
- Perron, P. (2006). Dealing with structural breaks. In: Mills, T.C. & Patterson, K. (eds.), *Palgrave handbook of econometrics*, Vol. 1: Econometric Theory. New York, NY: Palgrave Macmillan, 278-352.
- Plucknett, T.F.T. (1948). *A concise history of the common law*. Fourth edition. London, UK: Butterworth & Co.
- Reich, J., Tingley, D., Leder-Luis, J., Roberts, M.E., Stewart, B.M. (2015). Computer-assisted reading and discovery for student-generated text in massive open online courses. *Journal of Learning Analytics*, 2(1), 156-184.
- Reid, C.J. Jr. (1995). The seventeenth-century revolution in the English land law. *Cleveland State Law Review*, 43(2), 221-302.
- Renton, A.W. (1900-1932). *The English Reports*. Great Britain. Parliament. House of Lords. Edinburgh, UK: W. Green & Sons.
- Roberts, M. E., Stewart, B. M., Tingley, D., Lucas, C., Leder-Luis, J., Gadarian, S. K., Albertson, B., & Rand, D. G. (2014). Structural topic models for open-ended survey responses. *American Journal of Political Science*, 58(4), 1064-1082.
- Roberts, M.E., Stewart, B.M., & Tingley, D. (2019). stm: R package for structural topic models. *Journal of Statistical Software*, 91(2), 1-40.
- Roberts, M.E., Stewart, B.M., & Airoidi, E.M. (2016). A model of text for experimentation in the social sciences. *Journal of the American Statistical Association*, 111(515), 988-1003.
- Skocpol, T. (1979). *States and social revolutions: A comparative analysis of France, Russia and China*. Cambridge, UK: Cambridge University Press.
- Thagard, P. (1992). *Conceptual revolutions*. Princeton, NJ: Princeton University Press.
- The Text Creation Partnership (TCP). (2022). URL: <https://textcreationpartnership.org>
- Walzer, M. (1982). *The revolution of the saints: A study in the origins of radical politics*. Cambridge, MA: Harvard University Press.

Figure 1: Quiet revolutions in caselaw

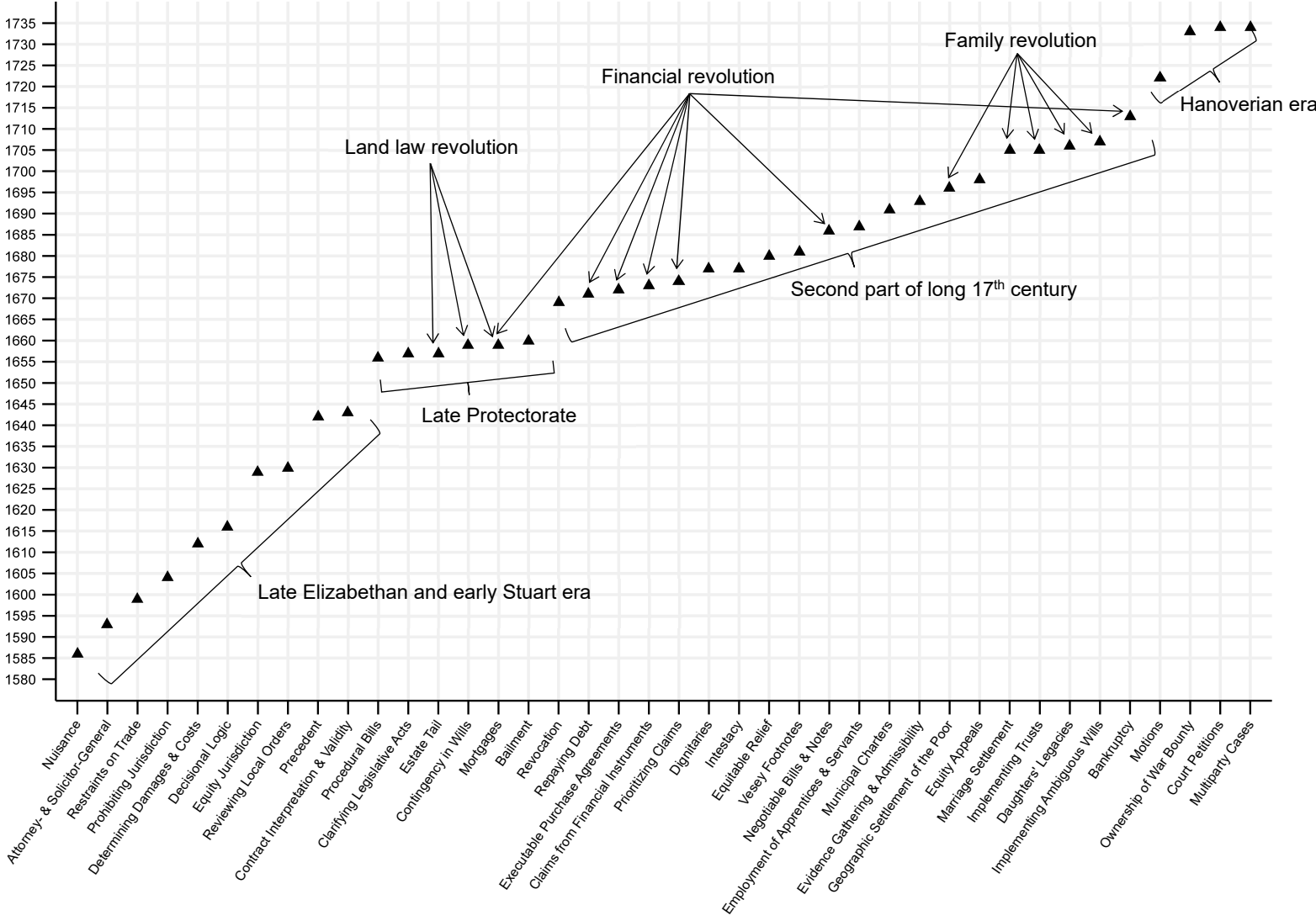
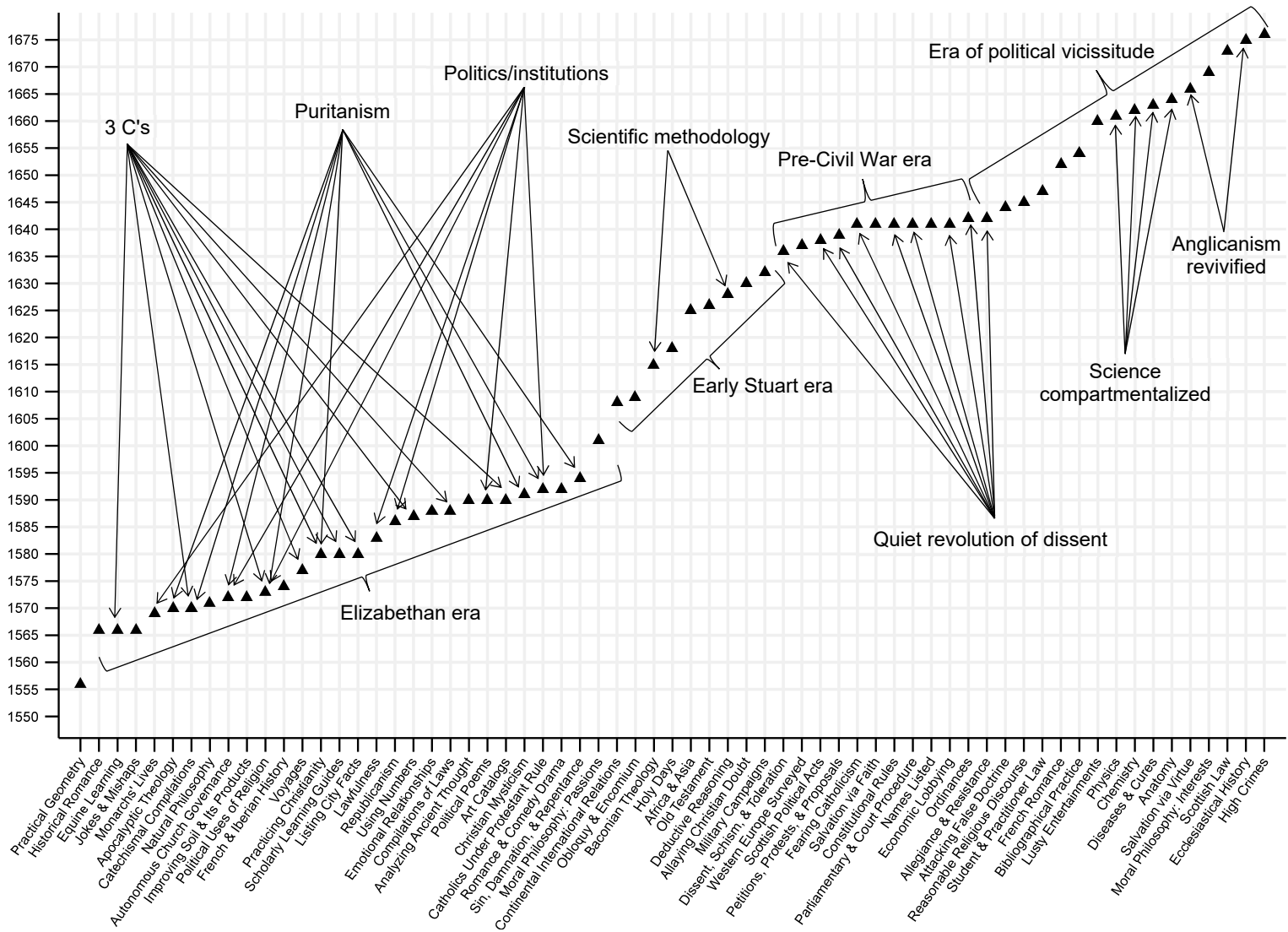


Figure 2: Quiet revolutions in culture



Online supplementary material for  
**Quiet Revolutions in Early-Modern England**

Peter Grajzl      Peter Murrell

July 17, 2023

## Appendix A: The estimated topics from the ER corpus

Topic	Keywords and brief description
Actionable Defamation	word, action, speak, say, lie, innuendo, slander, libel, false, knave, thief, witch, whore, rascal, pox. Which specific words in a statement involving alleged slander or libel are actionable.
Arbitration & Umpires	award, arbitr, umpir, submiss, umpirag, arbitra, attach, releas, perform. Use of arbitrators and umpires in dispute resolution.
Assumpsit	assumpsit, promis, indebitatus, consider, forbear, non, assum, indebt, pay, debt. When an assumpsit can be said to have taken place and whether an action of assumpsit is allowed.
Attorney- & Solicitor-General	sir, henri, edward, knt, general, esq, solicitor, attorneygener. Actions involving the participation of Attorney-General or the Solicitor-General.
Bailment	carrier, hors, innkeep, game, postmast, pawn, play, guest, guinea, steal, meat, drink. Scenarios where A gains physical possession of B's property, usually for temporary safekeeping.
Bankruptcy	bankrupt, creditor, assigne, debt, bankruptci, assign. Instances of bankruptcy and its resolution, including assignment of the bankrupt's estate.
Bonds	bind, condit, oblig, debt, releas, perform, void, discharg, obligor, oblige, sureti, thing, forfeit, payment. Bonds, those with penalties to ensure debt payment or to ensure some other commitment or to respect the decisions of arbitrators.
Claims from Financial Instruments	pound, annuiti, hundr, cent, annum, thousand, valu, per, southsea, ayear, secur, stock, rate, dividend. Resolving monetary claims concerning bonds, stocks, dividends, mortgages, annuities.
Clarifying Legislative Acts	act, word, parliament, enact, legislatur, preambl, power, extend, vest, proviso, claus, intent, construct, express, mean, make. On legislative acts, their wording, the legislator's intention, and the act's relevance in a given context.
Coke-Style Reporting	roll, abr, coke, case, elizabeth, com. Coke's distinctive style of reporting (or the style of subsequent editors), especially with regard to the use of historical sources.
Coke-Style Procedural Rulings	case, justic, good, fol, coke, law, jame. A wide spectrum of substantive areas of law when Coke was Chief Justice of King's Bench, focusing on the procedural rules for pursuing cases in these areas.
Common-Land Disputes	common, cattle, land, replevin, avowri, distrain, avow, pastur, distress, damagefeas. Property disputes pertaining to common land and whether specific actions (replevin, avowry, distress damage feasant) are justified or not.
Competing Land Claims	land, tenant, demand, writ, fitzherbert, law, assiz, seiz. A has some sort of claim to land and B challenges it in some way, or there are dueling writs.
Contingency in Wills	conting, remaind, devis, son, limit, survivor, death, vest, executori. Disputes involving a range of different contingencies that arise in wills.
Contract Interpretation & Validity	agreement, contract, bargain, mutual, write, agre,specif, sign, perform, execut, fraud. Interpretation of the meaning of a contract in a given setting.
Contrasting Cases & Statutes	brook, case, king, land, law, good, yet, statut. Many substantive issues, but all include mention of past cases and existing statutes and contrast their implications.
Conveyancing by Fine	fine, levi, bar, proclam, year, five, case, land, conuse, right. A fine of lands as a method of conveyance involving a fictitious lawsuit, which had the advantage of making the conveyance appear in court records.
Correct Pleas	plead, plea, demurr, show, bar, travers, matter, issu. Pithy statements of when aspects of pleading, including demurrer and traverse, are allowed.

Topic	Keywords and brief description
Court Petitions	petit, commission, order, chancellor, committee, lunat, partner, partnership. Court petitions, often concerning bankruptcy cases or cases involving lunacy.
Daughters' Legacies	marriag, daughter, portion, father, settlement, consent, condition. The conditions under which a daughter is entitled to a trust or legacy, usually created by the father.
Decisional Logic	plaintiff, defend, declar, appear, insist, billet, counsel. Outline of the facts, in-court interactions, and procedural steps surrounding and leading to a court decision.
Decisions After Conviction	indict, convict, offenc, pardon, feloni, treason, conspiraci, murder, peac. Issues that arise once a person has been convicted of a criminal offence (or when anticipating conviction), e.g. when the King can pardon.
Determining Damages & Costs	cost, damage, tripl, recover, tax, expans. How damages and various litigation-related costs (including attorney fees) should be determined when plaintiff wins, and how taxes should be applied in that context.
Dignitaries	lord, earl, peer, duke, ladi, countess, duchess, honour, sequestr. Legal issues involving nobility and the corresponding procedural specifics.
Disentangling Heirs	son, father, daughter, die, heir, old, young, issu, shall, death, mother, brother, male, grandfath, without, life. Issues pertaining familial matters related to heredity.
Ecclesiastical Appointments	church, bishop, patron, patronag, adwovson, vicarage, benefic, quar, hinder, induct, clerk, usurp, collate. Church appointments and associated benefits.
Elizabethan Land Cases	elizabeth, case, queen, land. Descriptions of cases referring to Queen Elizabeth I or her reign in some capacity and involving primarily land-related matters.
Employment of Apprentices & Servants	master, apprentic, servant, wage, employ, work, retain, discharg, salari. The rights and obligations of servants and apprentices, as well as of their masters.
Equitable Relief	chan, equiti, vern, abridg, decre, prec, rep, ibidem, abr, mich, vide, vin, trin, yellow, lord, talbot, case. Chancery Court decisions, often clarifying the scope of equity cases and the jurisdiction of equity courts.
Equitable Waste	wast, court, injunct, commit, tenant, restrain, impeach. Equity cases where the decision is an injunction or a restraint concerning waste on property, often involving tenants not subject to an action of waste.
Equity Appeals	appel, respond, say, order, decre, shall, caus, appeal, hear. Issues spanning the gamut of commercial activities of the time, all appeals to the House of Lords, from Equity Courts.
Equity Jurisdiction	court, chanceri, case, law, equiti, lord, keeper, reliev, chancellor. Focus on issues pertaining to whether the judges in Chancery will consider a case.
Estate Tail	male, heir, estatetail, estat, remaind, testat, bodi, tail, son. Legal issues pertaining to an estate tail, an estate limited to certain bodily heirs, and excluding others.
Evidence Gathering & Admissibility	wit, evid, examin, oath, swear, deposit, proof, interrogatori, testimoni, trial, crossexamin, fact, admit. Ways of collecting evidence and what constitutes admissible evidence in a given situation.
Excluding Beneficiaries of Wills	alien, heir, inherit, shall, disabl, law, land, blood, descent, forfeit, ancestor, papist. Situations where the law prohibits a designated legatee from inheriting.
Execution & Administration of Estates	executor, administr, testat, asset, executrix, administratrix, probat. Disputes and actions concerning the administrators or executors of estates.
Executable Purchase Agreements	purchas, sell, sale, buy, convey, notic, know, fraud, fraudul, obtain, deed, reliev, asid, conceal, affect. Purchases and sales, that is, contractual transfers of property rights.
Geographic Jurisdiction of Laws	england, ireland, scotland, wale, kingdom, hundr. The applicability of English laws in cases involving subjects from other jurisdictions or the applicability of local (e.g. county) rules in other localities.

Topic	Keywords and brief description
Geographic Settlement of the Poor	parish, settlement, child, bastard, pauper, inhabit, father, mother, settl, remov. Determining geographic settlement of persons, typically of children from poor families or born out of wedlock.
Governance of Private Organizations	colleg, visitor, power, bishop, univers, fellow, hospit, visit, shall, scholar, give, corpor. Governance matters in private organizations, such as the rights and duties of decision-makers.
Habeas Corpus	bail, prison, habea, corpus, escap, custodi, gaol, gaoler, discharg, capia, remand. When a person is detained or discharged from prison, often in the context of a bail, with habeas corpus providing the focus or the background.
Identifying Contractual Breach	breach, coven, perform, nonpay, evict, break. Ascertaining and clarifying whether breach of contract has occurred in a given situation.
Implementing Ambiguous Wills	legaci, testat, legate, codicil, devis, executor, residuari, testatrix, bequest, surplus, estat. Implementation of wills where it is not clear what was willed or exact implementation is impossible.
Implementing Trusts	truste, trust, estat, chariti, profit, decre, convey, charit, beneficiari. The implementation as opposed to design of trusts, and the rules to determine what is legal in implementation.
Indicting for Murder	inform, kill, murder, manslaughter, malic, prison, prepens, provoc, cudgel, stab, assault. Conditions that need to be fulfilled to indict for murder, often emphasizing the distinction between murder and manslaughter.
Inferior-Court Jurisdiction	jurisdict, certiorari, counti, record, plaint, inferior, leet, amerc, court, palatin, procedendo, amercia, remo. Clarifying court jurisdiction, especially for inferior courts.
Intestacy	child, share, sister, distribut, intest, estat, moiety, grandchild. Complications arising in the accounting for and the distribution of the intestates' estates.
Jury Procedures & Trials	verdict, trial, juri, venir, issu, tri, find, juror, challeng, prius, assiz, nisi, distringa, new, panel, mistrial, tale. Proper use of jury procedures and aspects of jury trials.
Keble-Style Reporting	kebl, per, case, curian, contra, car, agre. Emphases in reports produced by or reports that refer to reports by Joseph Keble, a prominent case reporter.
Length & Expiry of Leases	leas, lesse, demis, year, lessor, renew, occup, life, habendum, indentur, surrend, twentyon, revers. Determining the length and expiry of leases.
Local Administrative Appointments	office, constabl, clerk, appoint, deputi, custo, appoint, power, grant, clerk, peac, duti, oath, nomin. Local administrative appointments such as those of clerks for justices of the peace and of constables.
Manorial Tenures	manor, copyhold, surrend, lord, custom, tenant, land, hold, estat, parcel, freehold. Land ownership in manorial arrangements.
Marriage Settlement	settlement, marriag, jointur, articl, remaind, estat, portion, wife, trustee, life. Design and interpretation of arrangements whereby a trust of land or other assets was established jointly by the parents of a husband and wife.
Minors & Guardians	infant, age, guardian, minor, guardianship, infanc, prochein, wardship. Issues pertaining to minors and their guardians.
Mistakes in Court Records	amend, varianc, record, orig, mistak, misnom, erratum, misrecit, mispris, omiss, defect, materi, omiss. Mistakes in various court records and documents, and ways of correcting them
Modern-Style Reporting	modern, holt, mod, cro, salk, salkeld, keb, lev. Emphases in the cases from Modern Reports or in reports that refer to Modern Reports and have the same style.
Mortgages	mortgag, mortgage, mortgagor, redempt, redeem, foreclosur, equiti, encumbr, encumbranc, interest, foreclos. Rights and obligations of mortgagors, mortgagees, and impacted parties.
Motions	affidavit, court, rule, motion, move, proceed, venu. Motions, e.g., to change venue, enlarge a rule, set aside judgment, stay proceedings, attachment against a person.



Topic	Keywords and brief description
Multiparty Cases	john, mari, elizabeth, say, jame, saint, date, premis, june, wilson, ann, samuel, georg, joseph, philip. Issues in cases that involve many parties, and thus use many names.
Municipal Charters	elect, mandamus, corpor, mayor, charter, borough, alderman. Clarifying aspects of election, who can and cannot hold specific office given a municipal charter, and other aspects of workings of municipal governments.
Negotiable Bills & Notes	bill, note, accept, endorse, promissory, merchant, exchange, endors. Usage of bills of exchange and promissory notes, especially with regard to their transferability from one person to another with or without endorsement.
Non-Translated Latin	predict, pillag, quod, prd, johann, domini, svan, men, adtunc. Residual topic, absorbing Latin that has not been translated during text processing.
Nuisance	hous, repair, build, way, mill, erect, use, nuisanc. The duties and rights connected with structures that are either helping or interfering with the passage of people, water, and light.
Ownership of War Bounty	ship, insur, cargo, admiralti, voyag, fraught, port, polici, captur, sail. War-related issues of ship and cargo ownership, arising in Admiralty Court.
Pleadings on Debt	aforesaid, wit, counti, premis, verifi, attorney, plea, obligatori, behalf. The various pleadings to which creditor and debtor have access, especially focusing on the bill and the counter pleading.
Possession & Title	possess, titl, seiz, right, eject, enter, claim, entri, tenant, law. Issues concerning possession and title, including whether and when possession conveys title.
Precedent	case, reason, though, law, opinion, therefor, think, object, question, differ, court, cite. Justifying what the caselaw is while appealing to (some notion of) the authority of precedent.
Prioritizing Claims	estat, debt, person, shall, payment, creditor, asset, real, charg, liabl, sell. Who should be paid when claims exceed available funds.
Procedural Bills	decre, bill, discoveri, dismiss, injunct, review, chancellor, rehear. Bills (here, complaints to a court) that identify a problem with a procedural issue.
Procedural Rulings on Actions	action, bring, lie, debt, case, sue, recov, recoveri, remedi, debet. Whether various forms of legal action (e.g., action of debt or action on the case) have satisfied procedural requirements
Procedural Rulings on Writs	sheriff, writ, return, capia, facia, process, execut, testa, latitat, supersede, elegit, summon. The technicalities of whether writs are legal and have been processed legally.
Prohibiting Jurisdiction	prohibit, spiritu, jurisdict, ecclesiast, court, admiralti, probat. Prohibiting jurisdiction, often with reference to the ruling of the King's Bench.
Publishing & Copyright	print, printer, copyright, publish, book, right, copi, lord, kenyon, see, mansfield, author, blackston, also, principl, fact, may, mere, foster, clear. Publishing, printing, and copyright related issues.
Regulating Commerce	custom, london, citi, duti, prisag, wine, merchant, freeman, citizen, commonalti, communiti, measure, import. Violation of rules and customs related to the importing, producing, and selling of merchandise.
Rendering Judgment	judgement, attorney, banc, postea. The court's judgment itself or procedural circumstances pertinent to the rendering of the judgment.
Rental Payments	rend, reserv, land, year, arrear, pay, demand, tenant, due, render. Whether rental payments were paid in an amount and at a time as agreed.
Repaying Debt	payment, interest, due, repay, discharge, indebt, lend. The details of paying back a sum of money that is owed, often with a focus on interest and often via complex transactions.
Restraints on Trade	trade, compani, use, sell, bylaw, licenc, make, buy, may, penalti. Whether private entities can have a right to restrain trade in some way and then whether localities can pass by-laws to enforce such restraints.

Topic	Keywords and brief description
Reviewing Local Orders	quash, session, churchwarden, overs, certiorari, order, poor, rate, justic. Judicial review of local orders, especially of Justices of the Peace at the quarter sessions.
Revocation	deed, revoc, revok, will, codicil, power, attest, credibl. Ascertaining if revocation of a given legal instrument (e.g., a deed or a will) is possible and which aspects of the legal instrument hold.
Rights of Married Women	wife, husband, dower, marriage, feme, covert, covertur, surviv, die, death, divorc. The legal rights of married women, e.g., when the husband passes away, after divorce, upon adultery, or in re-marrying.
Rights of Public Office	parliament, privileg, member, baron, bench, lord, hous, judg, arrest. The rights of important office holders (such as members of parliament, serjeants who become judges, clerks as court officers).
Royal Patents & Tenures	patent, king, grant, crown, queen, prerog, patente, duchi, charter, letter, letterspat, land, attaind, inquisit. When patents (here, instances where the monarch gave a right or appointment) hold.
Rulings on the Calendar	term, day, time, year, first, last, within, six, continu, second, month, next. Rulings pertaining to timing issues, often on procedural grounds.
Self-Help in Real-Property Disputes	appurten, tenement, acr, manor, pastur, demesn, premis, seiz, damag, trespass. Scenarios where A has done something to B involving property and B takes revenge in some way, typically involving property.
Shared & Divided Property Rights	one, two, three, sever, whole, joint, common, tenanc, moiety, divid, undivid, survivor, residu, partit. Resolving situations where property rights are divided, or jointly held, by multiple parties.
Specifying Inherited Property Rights	devis, land, devisor, will, heir, estat, word, claus, inherit, pass, bequeath, give, chattel. Testamentary disposition of property rights, especially in land, but also other property.
Statute Applicability	statut, within, commonlaw, law, cap, case, extend, extent, limit, word, void, say. Ascertaining and clarifying whether a particular statute applies to a specific case, often clarifying how it interacts with the common law.
Temporal & Spiritual Jurisdiction	canon, marriag, prohibit, ecclesiast, convoc, levit, laiti, church, spiritu, licenc, offenc, clergi, divorc, punish. The limits of the jurisdiction of spiritual courts.
Timing of Property Rights	estat, remaind, tail, entail, estatetail, fee, tenant, life, revers, inherit, heir. Land and estate rights, clarifying which party has what rights when.
Tithes	tith, vicar, parish, titheabl, pay, modus. Determining tithes, clarifying exceptions from having to pay tithes, and specifying who is entitled to proceeds from tithes.
Transfer of Ownership Rights	feoff, grant, lesse, lessor, liveri, seisin, seiz, reenter, releas, revers, reentri, disseize, bargain. Ownership rights in situations where property rights are transferred from one party to another.
Tree Law	wood, cut, tree, outlawri, take, shall, say, gro except, tree, outlawri, cut, wood, outlaw, timber, wast, oak, lop, grow, underwood, timbertre, estov, coppic, morgan. Issues pertaining to trees, timber, wood, underwood.
Trespass to Goods	trespass, take, close, enter, enclos, assault, fish, arrest, guilti, damage, justif. Whether trespass occurred and if the plaintiff is entitled to damages as a result, where personal property was the item in question.
Uses	use, heir, feoff, seiz, land, shall, estat, fee, make, convey. Issues pertaining to uses (in real property law, duties of a person to carry out the purposes that are the conditions of property conveyance).
Validity of Wills	deceas, will, depon, lee, say, make, william, give, wit, believ, know, see, come, prove, tell, hear. Issues addressed in the probate court pertaining to validity of wills.
Vesey Footnotes	ves, atk, wms, reg, vernon, ambler, amb, bro, lib, versus, fol, vide, vern, vol, ibidem, case, sup, post, sch. References to points made by Vesey, a prominent case reporter, in his reports.
Vesey-Style Reporting	vesey, senior, ves, supplement, eden, sen, equiti, atk, estat, fund, mrs, interest, consid, repres, sincha, court. Emphases in reports produced by or reports that refer to Francis Vesey, Sr., a prominent case reporter.

Topic	Keywords and brief description
Writs of Error	judgement, error, writ, revers, erratum, erron, supersedeas. The procedures that must be followed for addressing various errors of fact or law, often with reference to other (e.g., inferior) courts.
Wrongful Possession	good, trover, propertis, sale, sell, take, convers, convert, deliv, detinu, chattel, owner, bailment, deliv. When ownership of goods, often obtained in possession via wrongful taking or purchasing of stolen goods, is ambiguous.

Notes: The table lists the names, a sampling of keywords (top or distinctive), and brief descriptions of the topics estimated in the ER corpus. For a detailed description and justification of topic names, including quotes from top documents featuring a given topic most prominently, see Grajzl and Murrell (2021a: Appendix E).

## Appendix B: The estimated topics from the TCP corpus

Topic	Keywords and brief description
Africa & Asia	king, citi, place, countri, peopl, river, provinc, kingdom, picarro, mandarin, cozco, china, portugues, aurengzeb, ispahan. Descriptions of the peoples, places, objects, terrain, customs, religions, languages of Africa and Asia.
Allaying Christian Doubt	christ, god, soul, heart, grace, sin, love, spirit, jesus, faith, comfort, spiritu, sinner, righteous. Giving hope to those who might feel they have sinned or are in doubt about their beliefs.
Allegiance & Resistance	king, god, power, law, oath, subject, princ, kingdom, govern, swear, magistr, peopl, allegi, obedi, coven, resist. Expressions of allegiance or of resistance to those in power.
Analyzing Ancient Thought	poet, plutarch, cap, plini, plato, hist, plut, greek, herodotus, aristotl, philosoph, jupit, laert, homer, diodorus. Many different cultures are reflected in the topic but all before 500CE, and analysis of the relevant texts is central.
Anatomy	muscl, membran, caviti, ventricl, arteri, tendon, vertebra, glandul, intercost, peritonaeum, nerv, cartileg, vertebr. Anatomical knowledge.
Apocalyptic Theology	antichrist, christ, rev, jew, propheci, messiah, prophet, kingdom, babylon, church, beast. Apocalyptic theology, with references to existing theology relevant to the apocalypse that will accompany the second coming.
Art Catalogs	loreto, landscap, paint, gold, pictur, medal, marbl, beauti, statu, figur, fruitpiec, seapiec, portico, hous, architecture. Listings of works of art, often in connection with auctions.
Asserting Parliamentary Powers	parliament, committe, armi, lilburn, cromwel, vote, kingdom, fairfax, hous, militia, strafford, commission, scotland, england. Claiming, using, exerting Parliamentary powers.
Astronomy & Astrology	moon, sun, star, sign, year, planet, mark, saturn, jupit, astrolog, mercuri, conjunct, ascend, eclips. Astronomy and astrology treated separately, but more often together.
Attacking False Doctrine	quaker, christ, god, spirit, scriptur, jesus, apostl, righteous, light, truth, doctrin, antichrist, prophet, persecut, conscience. Expression of dislike, even venom or hatred, for the beliefs of others.
Authority Relationships	say, shall, unto, answer, come, accord, manner, command, declar, demand. How individuals of different statuses in society do and should interact, including the issuing of commands by the person with a higher status.
Autonomous Church Governance	church, minist, offic, ordin, power, call, pastor, preach. How to organize churches that are seeking independence from the national system of church government.
Baconian Theology	upon, yet, though, will, thus, find, mean, inde, speak. Views from a wide variety of religious perspectives, involving logical arguments and emphasizing learning from facts, biblical, historical, or personal, using induction applied to experience, or 'experiment'.
Biblical History	israel, judah, lord, david, son, god, jerusalem, mose, saul, king, jew, peopl, egypt, philistin, priest, abraham, father. Bibles, extracts thereof, or summaries thereof treated as plain history without commentary.
Bibliographical Practice	book, write, learn, letter, print, year, author, read, publish, translat, latin, colleg, school. Bibliography together with the techniques of bibliography.
Botany	dioscorid, bauhinus, lobel, clusius, flower, footestalk, tabermontanus, stalk, matthiolus, latifolia, purplish, seed. Study of plants from a scientific perspective.
British Isles History	king, britain, earl, realm, saxon, scotland, pict, england, scot, archbishop, bishop, cnote, slay, normandi, Scotland. History of British Isles.
Catechismal Compilations	christ, god, jesus, apostl, cor, luk, eph, sin, john, isa, father, rev, psalm, salvat, faith, gospel. Works in the style of catechisms, in the sense of summaries, questions-and-answers, and lists.
Catholics Under Protestant Rule	page, answer, pag, book, word, ibidem, sect, author, jesuit, reader, affirm, opinion, prove, point, doctrine. Reactions of Protestants to the Catholics living under Protestant rule, and the corresponding views of Catholics.

Topic	Keywords and brief description
Chemistry	water, salt, spirit, fire, vitriol, acid, alkali, menstruum, antimoni, cucurbit, sulphur, volatile. The science of chemistry, not chemistry for application in practical activities.
Chivalric Literature	knight, king, sir, lord, good, lady, duke, arm, emperor, horse, castle, fair, sancho. Works of literature dedicated to telling the stories of heroic knights, often laced with romance.
Chorography	country, city, sea, river, island, mile, inhabit, mountain, province, town, africa, region. Descriptions of places, where subject matter is determined solely by location and the substance can be about anything in that location.
Christian Mental Exercises	good, life, self, soul, grace, heart, sin, heaven, perfect, true, faith, virtue. Instructions and examples of how to live a good Christian life and the temptations that might arise in such a life.
Christian Mysticism	god, devil, spirit, heaven, angel, adam, creature, soul, eternal, christ, satan, witch. Christian mysticism (i.e. the sense of contact or inner experience with God).
Comedy, Satire, Epigrams	quoth, epigram, pharisee, phylautus, euphu, philaleth, fool, play, tarlton, wench. Works of literature to provide entertainment, but often social commentary as well.
Commercial Aids	pound, money, merchant, shill, silver, penny, weight, coin, gold, exchange, pound, shill. Printed tables containing the results of calculations for commercial purposes.
Constitutional Rules	king, parliament, law, statute, england, act. The caselaw and statutes concerning the rights and duties of the highest-level actors in the nation, as well as the structure of the institutions within which these actors function.
Continental International Relations	duke, holland, elector, sweden, french, swede, prince, imperialist, spanish, treaty, swedish, netherlands, orange. Relationships among the major powers of Europe, excluding England.
Cookery	take, put, make, boil, water, little, let, lie, together, white, half, sugar, egg, beat, pound, butter, wine, salt, fire, fine. Preparing and cooking food.
Counter-Reformation Scholarship	church, faith, scripture, catholic, true, doctrine, apostle, pope, rome, heretic, believe, truth. Scholarly discussion of counter-reformation tracts, usually not the tracts themselves, but the reactions and counter-reactions to them.
Deductive Reasoning	reason, power, perfect, act, object, good, soul, must, self, knowledge, true, yet, understand, truth, cause. Reasoning about any substantial matter using logical (not empirical) techniques and the rules and methods of such techniques.
Deductive Theology	unto, also, thereof, thing, mean, therefore, even, cause, whereof, neither, whereby. The use of logical arguments, or at least the vocabulary of logic, to make theological arguments.
Defending Monarchs	great, time, matter, cause, country, common, prince, counsel. Statements supporting the monarch's position, sometimes by monarchs themselves, when facing rebellious situations.
Diet & Health	drink, good, meat, eat, wine, sick, health, disease, stomach, water, physician. The links between diet and health from a perspective that includes the science of the day.
Dignitary Law	king, earl, son, henri, edward, knight, daughter, heir, william, land, lord, wife, manor. Features of law relating to the highest ranks of England's subjects, except for the royal family itself.
Diseases & Cures	blood, disease, cause, spirit, fever, cure, medicine, humour, body, reason, salt, distemper. Manuals of the symptoms, causes, and cures of all types of illnesses.
Dissent, Schism, & Toleration	church, communion, liturgy, worship, schism, doctrine, prayer, nonconformist, ceremony, reform, catholic. How to treat people who are unwilling to conform to the establishment religion and its practices.
Early Literature, Secular	king, great, greek, troy, son, heart, right, trojan, slay, love, high, eke, hercules, achilles. Non-religious history, highlighting a use of language characteristic of the very earliest documents in the corpus.
Early Literature, Spiritual	shall, man, say, may, good, god, great, nat, love, right, manner, gyve, soon, full, mani, wise, deed. Spiritual matters, illuminating and a use of language characteristic of the very earliest documents in the corpus.
Ecclesiastical History	bishop, saint, church, council, emperor, christian, letter, eusebius, father, rome, ancient, greek, constantinople. The history of those elements of the Christian church that led to the current English ecclesiastical arrangements.

Topic	Keywords and brief description
Economic Lobbying	trade, money, pay, poor, good, make, nation, england, land, countri, peopl, interest. Petitions to Parliament or government or general proposals made by some economic interest in pursuit of their own gains.
Emotional Relationships	love, eye, heart, fair, sweet, beauti, die, must, joy, soul, heaven, life. Expressions of emotions about the relationships between small numbers of people, usually two.
Equine Learning	hors, cure, hand, leg, foot, turpentin, pastern, hogsgreas, farrier, farcin, leg. Techniques for riding and caring for horses.
Establishing Correct Doctrine	god, christ, man, word, faith, holi, paul, law, sin, true, good, gospel, teach. Stating the doctrine that the author considers as capturing religious truth, without much theological or historical justification.
Expressing Loving & Loathing	thou, shall, art, will, self, let, heart, know, unto, give, say, may, thing, take, see, word, come, lie, make, son, lord. Love or hate of people, countries, cities, historical figures, etc.
Family Matters	child, wife, woman, father, husband, marriag, son, marri, parent, mother, daughter, brother, famili, sister. Law and norms concerning how members of families should interact with each other.
Fearing Catholicism	protest, england, papist, church, popish, poperi, jesuit. The laying out of the theological and political dangers or other religions, particularly Catholicism.
French & Iberian History	monsieur, duke, king, castill, navarr, franc, sieur, cardin, huguenot, cathol, portug, princ, mazarin. French and Iberian History.
French Romance	love, self, tell, madam, princ, princess, great, time, yet, without, day, madam, aronc, sylvand, philoxyp. Romance literature written in the style of contemporary French romance novels, often simply translations of such novels.
Hierarchical Church Governance	bishop, church, pope, council, priest, rome, canon, power, ecclesiast, clergi, law, archbishop, jurisdict, tith, excommu. Discussions of varieties of topics all connected to the governance of integrated systems of churches.
High Crimes	lord, wit, gentleman, king, evid, swear, inform, prison, juri, guilti, trial, examin, ask, depon, cellier, dugdal. References to criminal acts that involve the highest-ranked people in the country.
Historical Romance	self, love, princ, desir, ladi, life, fortun, death, knight, king, polexand, olivair, zelman. Romance, to be interpreted as not only about love but also invoking a broader set of emotions, sparked by heroic and chivalrous adventures.
Holy Days	day, sabbath, law, worship, time, observ, rest, keep, ceremoni, week, fast, feast. The origins and justifications of the holy days, focusing on the sabbath and on which day of the week it should be celebrated.
Holy Lives	saint, holi, god, christ, father, virgin, jesus, mother, miracl, mari. The lives and deeds of religious people, particularly the saints, focusing on their works and miracles.
Improving Soil & Its Products	tree, fruit, plant, ground, grow, root, earth, sow, water, seed, corn, cut, land, garden. Agronomy, with arboreal, arable, and horticultural farming and gardening.
Industrial Arts	make, foot, piec, part, inch, water, side, end, half, length, work, mark, height, set, long, draw, weight. The manual and technical skills required to work with tools, designs, and simple calculations to make usable objects.
Jokes & Mishaps	friend, hous, night, money, poor, gentleman, wife, hear, master, siuqila, woman, devil, bed. Tall tales, jokes, real-life horror, unfortunate happenings, all in the service of entertaining the reader with light fare.
Compilations of Laws	king, per, quod, year, cum, pro, fol, england, royal, ibidem, non, speech, cap, domini, power, writ, pillag. General collections of statutes and caselaw, often in user-friendly forms and addressed to a highly specific legal issue.
Lawfulness	law, punish, justic, conscienc, judg, magistr, condemn, accus, case, command, judgement. Whether actions of governments or individuals are lawful, including with respect to higher principles of justice and conscience.
Legal Practice Aids	heir, assign, land, executor, grant, premis, law, administr, rend, pay, tenement, coven. Information for those who want to practice law at the lower levels of the profession, producing wills, contracts, conveyance documents, etc.
Listing City Facts	bishop, london, church, saint, archbishop, place, colleg, canterburi, citi, build, parish, oxford, archbishop, dean, sheriff, cathedr, westminst, saint, durham, lincoln, mayor, chancellor. Enumeration of facts about cities.

Topic	Keywords and brief description
Local Law	justic, peac, parish, offic, counti, statut, offenc, constabl, hous, prison, commit, feloni, session, sheriff. Statements of law relevant to the lowest levels of administration.
Lusty Entertainments	cuckold, prithe, damnd, mrs, devil, whig, fop, cheat, fool, rogu, whore, jilt, ladi, tom, nonsens, pimp, madam. Entertainment that is lusty in two senses of the word: lustful and rousing.
Mathematics	parallelogram, trianl, quotient, angl, line, divisor, rectanl, icosahedron, perpendicular, diamet, segment. Mathematical techniques and concepts.
Medical Science	cure, wound, caus, medicin, patient, pain, humour, diseas, blood, ulcer, bodi, bone, natur. Practice-oriented knowledge relevant to the treatment of all illnesses, injuries, etc.
Military Campaigns	hors, take, enemi, march, armi, forc, captain, colonel, command, general, soldier, garrison, regiment. Accounts of military campaigns with little or no discussion of the political context in which they are pursued.
Military Training	soldier, enemi, place, armi, leav, arm, battl, command, right, fight, captain, march, war, hand, order, rank, foot. The training pertinent to the acquisition of skills needed for lower-level troops, not of their leaders in strategy.
Monarchs' Lives	king, queen, england, franc, scotland, henri, edward, york, lancast, crown, spain, parliament, Elizabeth. Retellings of the lives of a variety of monarchs, principally, but not only, English ones.
Moral Philosophy: Interests	design, oblig, sentiment, engag, interest, person, intrigu, reflect, monsieur, believ, consider. Precepts on and about behavior, mainly in politics, and focusing on the importance of interests in understanding why behaviors occurred.
Moral Philosophy: Passions	affect, passion, action, rather, pride, vaniti, humour, natur, self, conceit, moral, fanci, ambit. Moral injunctions on the passions, how the passions affect behaviors, and how the passions can be controlled.
Moral Philosophy: Virtues	man, virtu, rich, good, wisdom, philosoph, wise, life, evil, mind, fortun, great, virtuous, vice, socrat, learn. What a virtuous life is, how to live it, and what are the opposites of virtuousness.
Names Listed	john, william, thoma, richard, robert, esquir, georg, edward, henri, jame, lord, knight, mayor, franci. The use of common names, often in the form of lists and often containing titles.
Natural Philosophy	natur, bodi, soul, heat, motion, thing, sensit, spirit, aristotl, generat, moistur, sens, air, element. All manner of scientific inquiries, using the language of very early science.
Non-Translated Latin	non, quod, cum, hoc, autem, etian, deus, ergo, ecclesia. Residual topic, absorbing Latin that has not been translated during text processing.
Not English	ing, con, eth, redg, livr, par, ion, sse, leur, vous, foe, cion, tout, pro, uva, aith. Residual topic, absorbing the elements of documents that have foreign, not-Latin words and English misspellings and badly OCR'ed words.
Obloquy & Encomium	great, honour, blood, princ, king, high, god, happi, glori, heaven, life, nobl, crown, divin, glorious, death, sacr, enemi. Public statements of praise and condemnation made in epitaphs, funeral elegies, speeches, etc.
Official Prayer	lord, god, prayer, pray, bless, father, holi, prais, hear, jesus, thank, servant, help, amen, Prayers issued by the authorities, to mark particular occasions, especially to give thanksgiving for particular events.
Old Testament	ver, word, chap, mose, hebrew, jew, king, peopl, sacrific, exodus, vers, translat, law, Israel. Commentaries on and excerpts from various parts of the Hebrew Bible or the Protestant, Catholic, or Orthodox Old Testaments.
Ordinances	commission, shall, aforesaid, person, pay, enact, offic, counti, act, assess, deputi, excis, citi, committe, admiralty. The topic captures the style in which ordinances are written, using a language of authority.
Papacy	pope, emperor, rome, cardin, franc, itali, empir, church, germani, john, bishop, charl. Information about popes and the papacy, and sometimes the history that surrounds popes and the papacy.
Parliamentary & Court Procedure	lord, hous, court, lordship, bill, order, read, parliament, common, answer, petit, proceed, committee. Procedural rules in the courts and parliament.
Petitions, Protests, & Proposals	peac, engag, desir, interest, secur, public, resolut, hope, expect, design, endeavour, propos, resolv, concern, parti. Entreaties by some to others and the answers in reply to those entreaties.

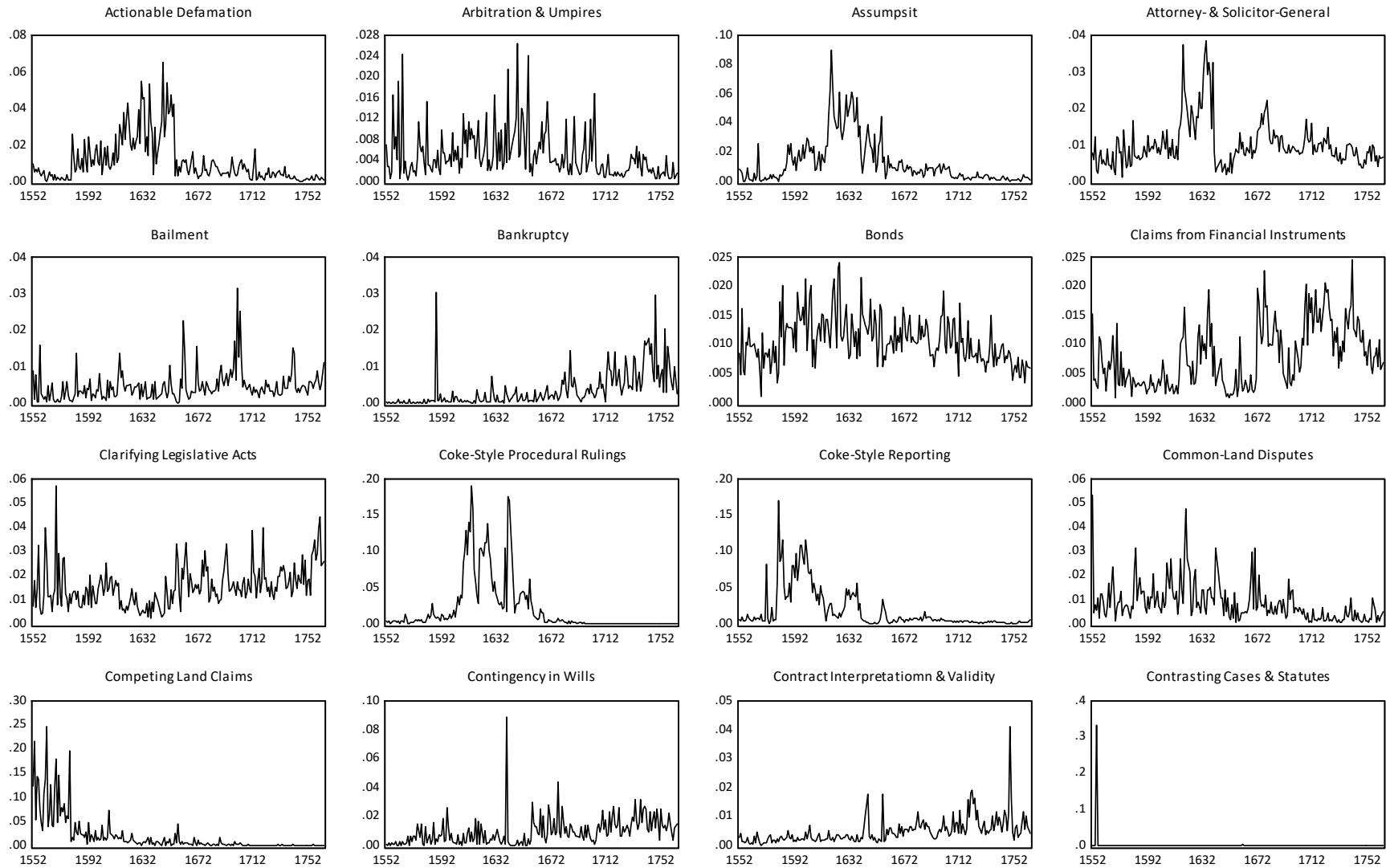
Topic	Keywords and brief description
Pharmacology	ounc, dram, decoct, syrup, bugloss, turpentin, betoni, mucilag, powder, oil, marshmallow, fennel. Chemical and physical remedies for the curing of diseases.
Physics	bodi, water, air, earth, motion, observ, experi, natur, appear, suppos, caus, section, atmospher, corpuscl, hypothesi, cylind, phenomenon, air, particl. Physics.
Poetic Laments	deer, heart, woe, foe, mind, grief, love, nought, deed, fear, grace, thrall, joy, hate, wretch. Poetic, passionate expressions of sorrow and grief.
Political Poems	now, heaven, thus, sea, shall, arm, lie, hand, bear, stand, see, like, fli, god, fall, make, fire. Poems reporting on contemporary or ancient events with great relevance for politics.
Political Uses of Religion	god, lord, peopl, psalm, wick, sin, judgement, fear, righteous, job, evil, enemi, afflict, israel. Highly judgmental views on politicians from a religious stance, using the Bible, particularly the Old Testament.
Practical Geometry	degre, sun, point, line, find, place, hour, meridian, latitud, circl, pole, distanc, declin, north, star, horizon, south. Geometrical principles used for practical purposes such as telling time, navigation, producing surveys, etc.
Practicing Christianity	god, man, sin, good, word, see, conscienc, duti, true, Christian. Instructions on how to be a good Christian, from the perspective of musings about the temptations that might arise and how to ward them off.
Reasonable Religious Discourse	say, word, may, author, scriptur, reason, believ, prove, answer, argument, true, suppos, think, express. Religious debate that is sensible, wise, fair, as well as rational (17 <sup>th</sup> -century meaning of reasonable).
Religious Love & Hope	heaven, lord, glori, soul, bless, joy, love, heart, saint, holi, light, psalm, prais. Expressions of optimism and of good feeling towards all peoples (presumably just English), especially using songs and poems, using a religious tone.
Republicanism	govern, peopl, commonwealth, princ, law, monarchi, nation, state, power, civil, kingdom, magistr, empir, elec. Republicanism, with the use of the corresponding ideas can either negative or positive.
Romance & Comedy Drama	enter, love, ladi, good, madam, lord, exit, self, gentleman, speak. Romance and comedy, usually in the form of plays, but not necessarily.
Roman History	roman, consul, caesar, pompey, war, armi, aetolian, senat, citi, athenian, hannib, rome, scipio, carthaginian, antigonus. History of Rome and Romans.
Royal Proclamations	majesti, kingdom, subject, proclam, ireland, royal, realm, religion, gracious, king, cathol, command. The style in which proclamations on any subject were made by the monarch, even if not actually made by the monarch.
Rural Recreations	bear, colour, hawk, head, black, bird, feather, fish, wing, gule, red. The types of leisure activities that a gentleman might undertake, especially one in the countryside.
Salvation via Faith	faith, coven, grace, believ, baptism, justifi, law, elect. Salvation will be attained by following appropriate religious rules and carrying out ordained religious practices.
Salvation via Virtue	religion, christian, duti, apostl, principl, improv, righteous, temptat, sincer, practice. Modes of behavior and living, not necessarily religious, that will make the reader prepared when the reader comes before God.
Scholarly Learning Guides	first, second, three, word, two, one, part, place, note, rule, chapter, everi, answer, vers, exampl, follow. Guides to the skills and knowledge needed to carry out activities that are more scholarly than practical in nature.
Scottish Law	annualr, infeft, decreet, teind, lifer, wodset, tailzi, poind, absolvitor, warrandic, laird, wodsett, appriz, appris, liferent, pannal, testat, creditor, donatar, legatari, section, spuilzi. Scottish law.
Scottish Political Acts	edinburgh, kirk, presbyteri, scotland, parliament, montros, wallac, commission, bothwel, laird, assembl, Glasgow. Measures passed at the highest levels of Scottish political institutions.
Self-Reflection	will, shall, must, think, know, see, speak, tell, self, good, believ, world, sure, enough. Dialogues with oneself about fundamental questions that define a person.
Sin, Damnation, & Repentance	sin, sinner, death, soul, hell, repent, heaven, merci, sorrow, die, etern, miseri, torment, devil, forgiv, wrath, damnat. Admonishments and warnings on the wages of sin, and the hopes that can be held if a good life is lived.

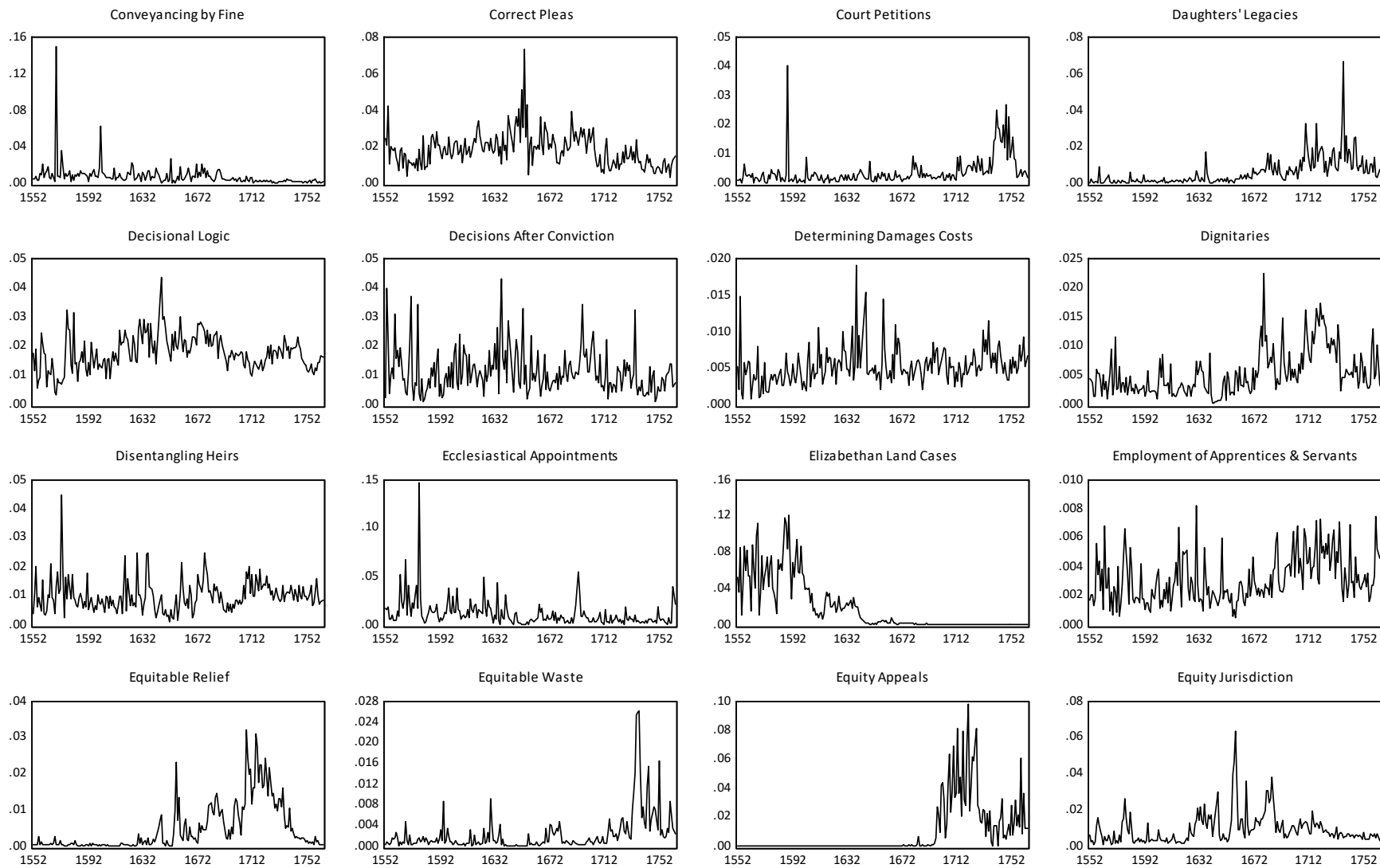


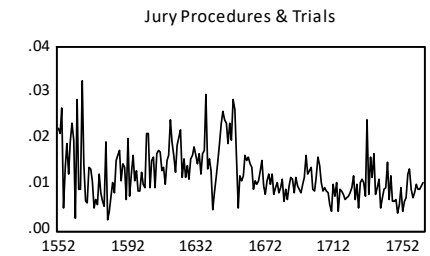
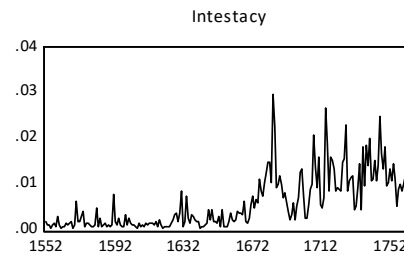
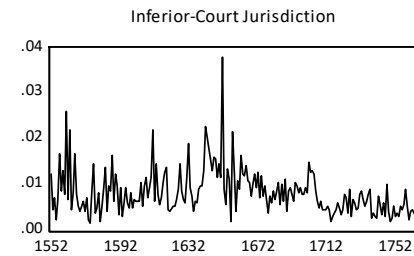
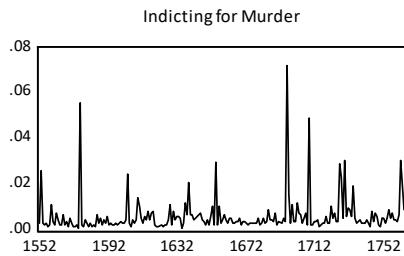
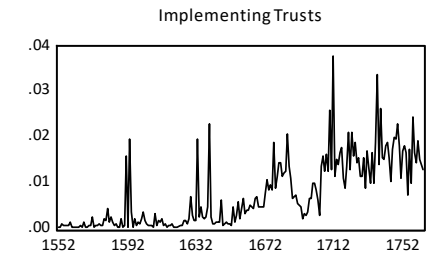
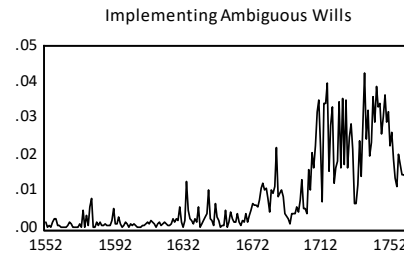
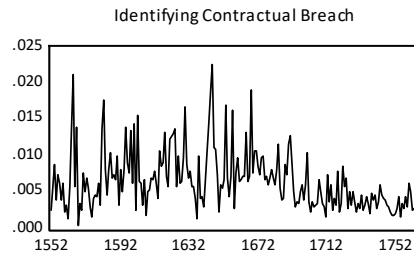
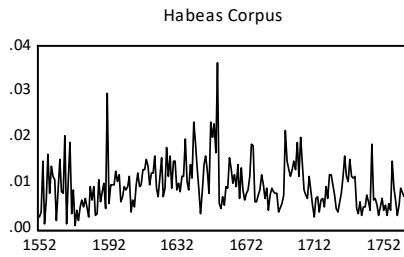
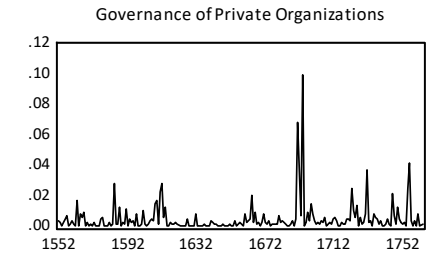
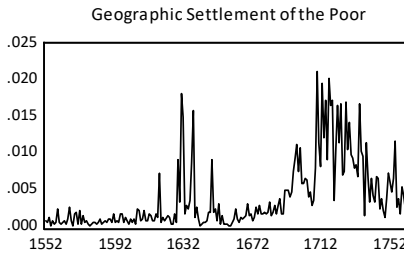
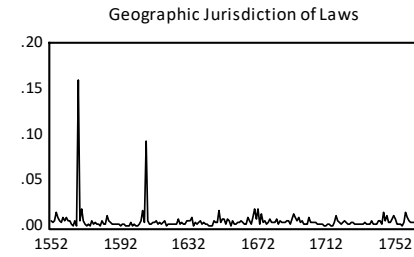
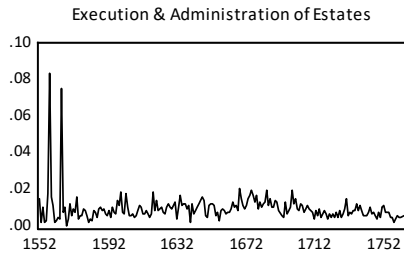
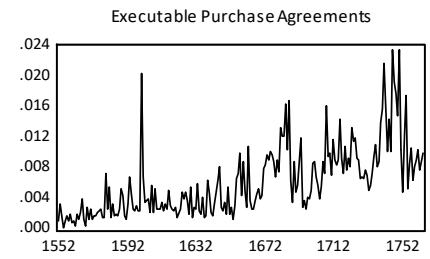
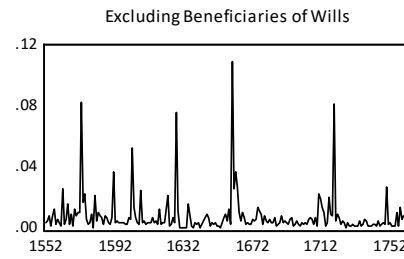
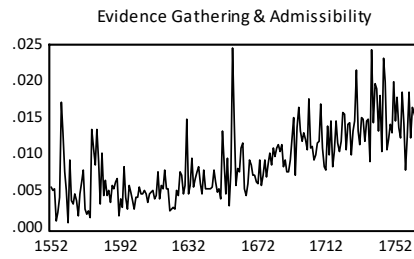
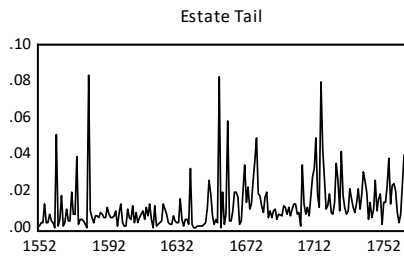
Topic	Keywords and brief description
Student & Practitioner Law	case, land, plaintiff, action, defend, court, writ, statut, tenant, judgement, law, seiz, heir, plead. Intermediate-level law, not intended for clerks or lawyers handling the simplest cases or those developing law at the highest level.
Transubstantiation	sacrament, christ, bread, eucharist, sacrific, blood, bodi, transubstanti, supper. Arguments for and against the doctrine of transubstantiation.
Turkish International Politics	vizier, turk, bassa, venetian, suleman, mustapha, sultan, bajazet, scanderbag. Histories and contemporary descriptions of the interaction of the Turks with other nations, including wars, peace, and diplomatic initiatives.
Using Numbers	year, hundr, thousand, three, four, twenti, six, five, two, month, eight, seven, ten, thirti, pound, forti, one, twelv. The use of numbers in varied substantive areas, often in the form of tables.
Voyages	ship, indian, island, leagu, sail, captain, spaniard, aboard, sea, panama, coast, southeast, fathom. Descriptions of voyages plus also information about how to make the voyages, that is, using navigation charts, etc.
Western Europe Surveyed	counti, river, town, fenground, mile, british, britain, saxon, furlong, south, shire, island, north, scray, west, east. Descriptions of places in England or near England, focusing especially on landscapes and geographical situation.
Zoology	beast, plini, serpent, dog, water, bird, wolf, fox, lion, tooth, hair, fab, fish, skin, worm, fli, crocodil, creatur. Creatures of the world often from a scientific perspective.

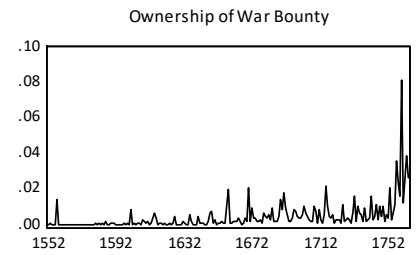
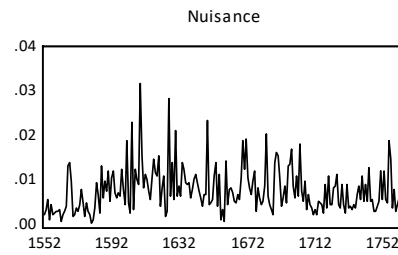
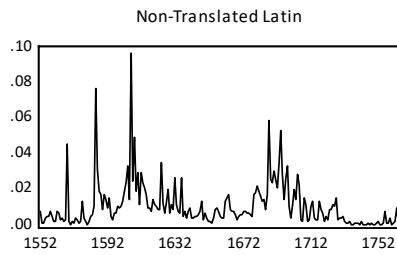
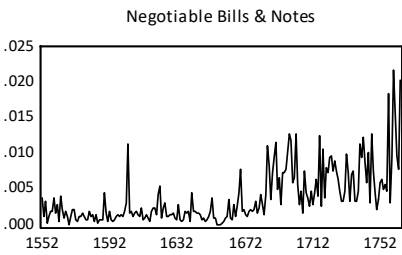
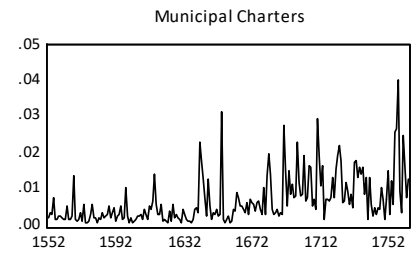
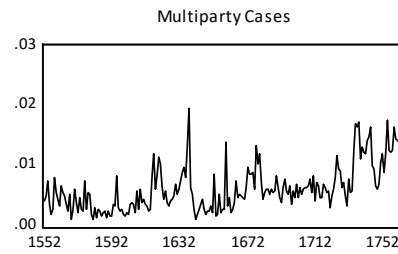
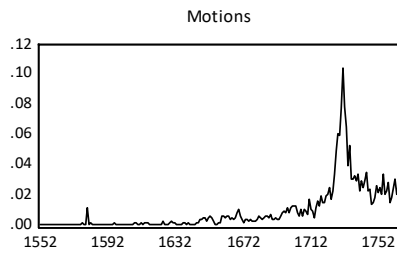
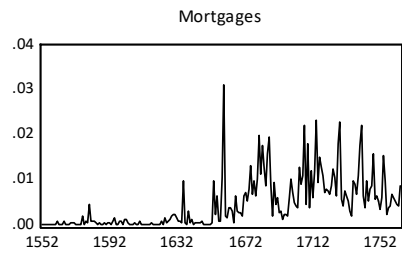
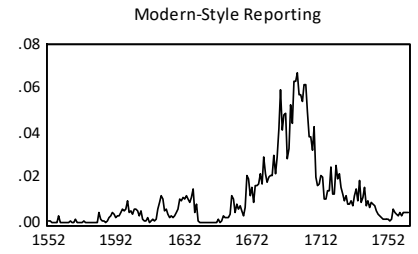
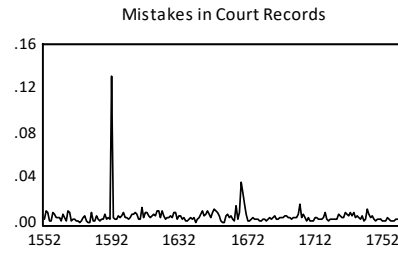
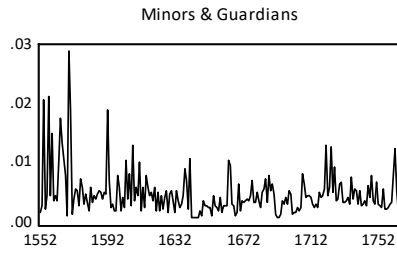
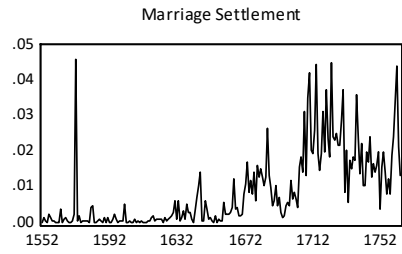
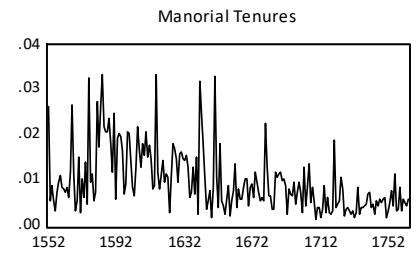
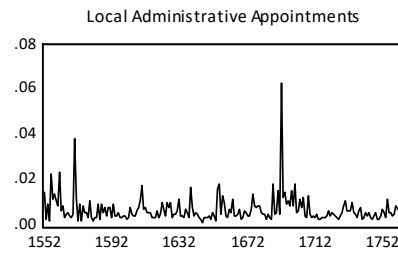
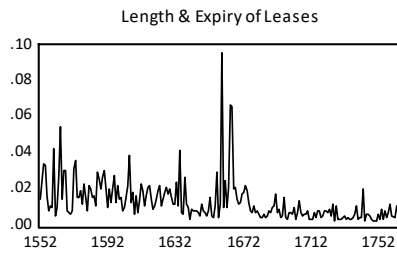
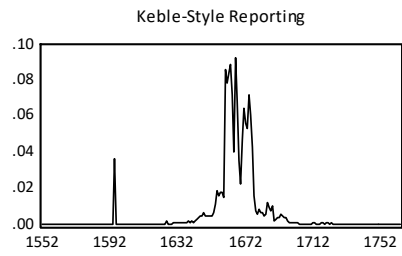
Notes: The table lists the names, a sampling of keywords (top or distinctive), and brief descriptions of the topics estimated in the TCP corpus. For a detailed description and justification of topic names, including quotes from top documents featuring a given topic most prominently, see Grajzl and Murrell (2023c: Appendix B).

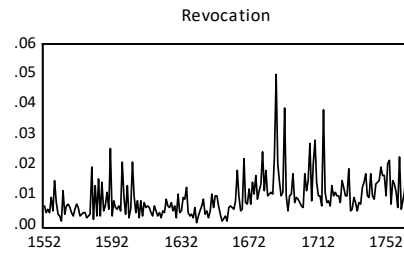
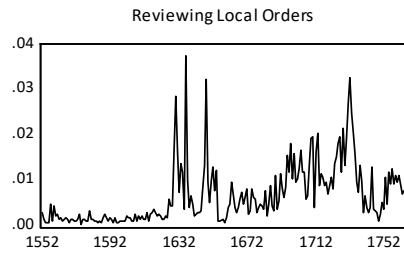
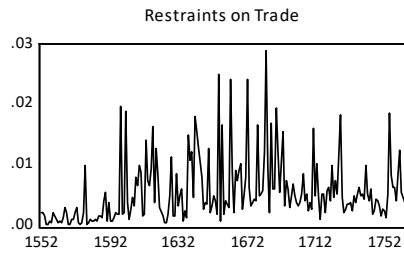
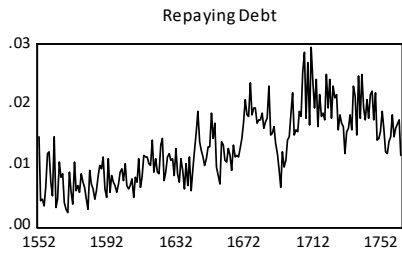
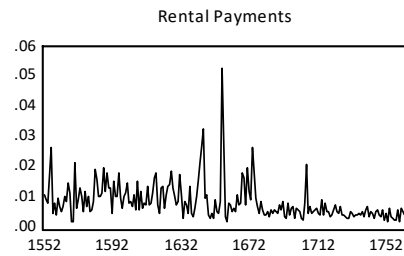
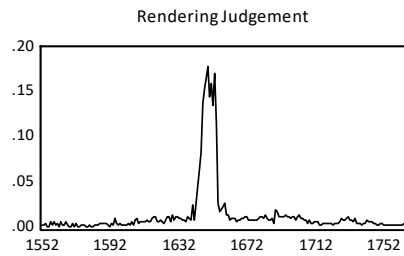
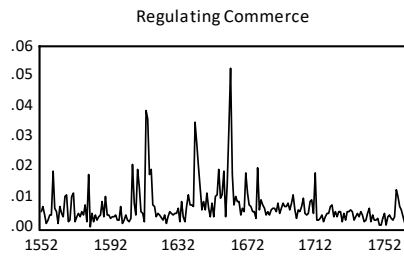
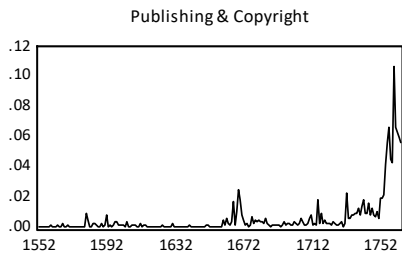
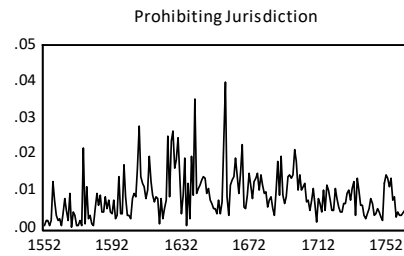
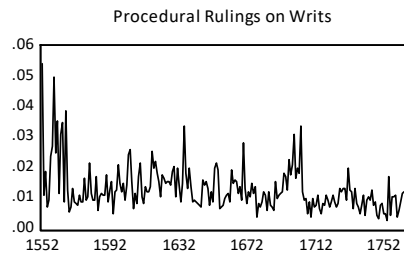
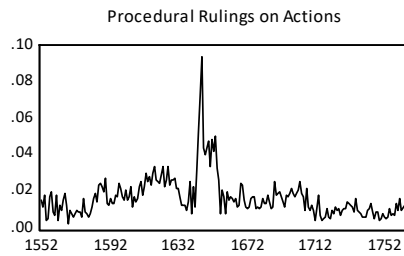
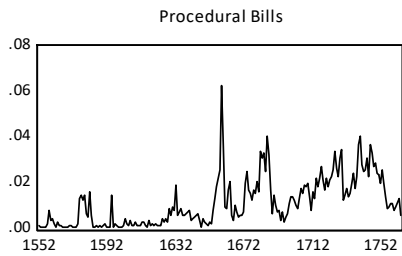
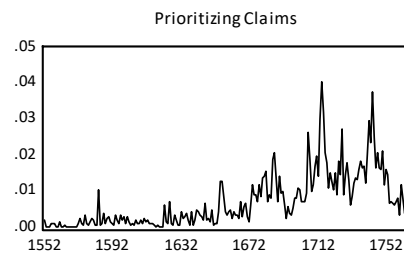
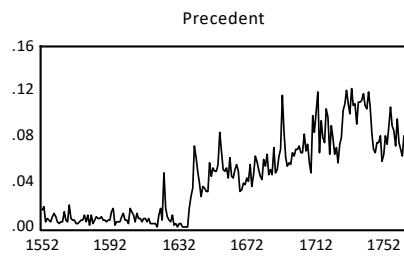
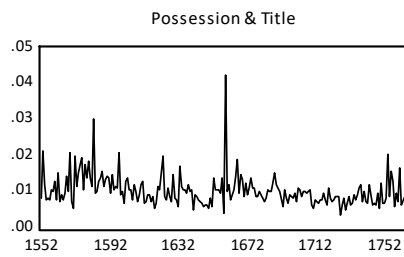
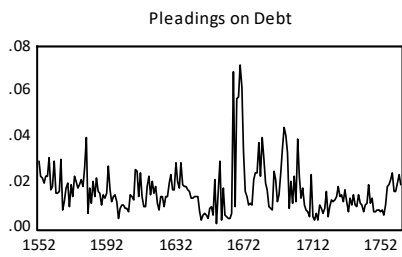
## Appendix C: The caselaw series, 1552-1764

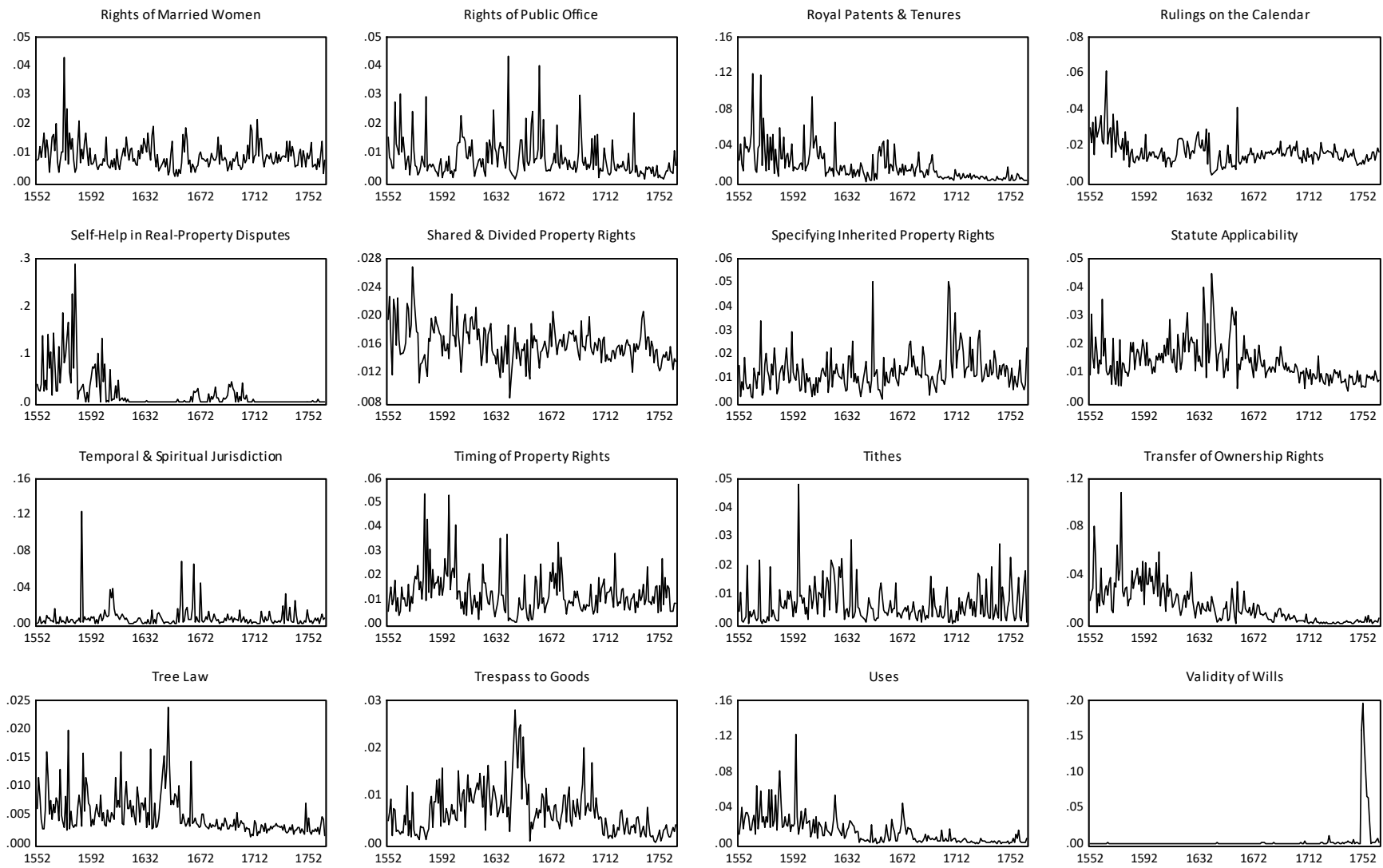


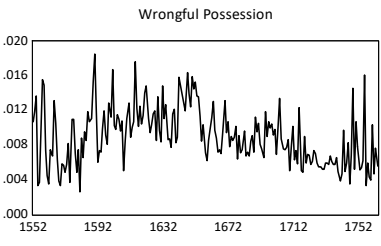
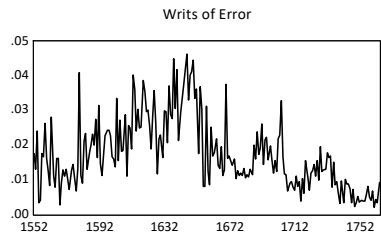
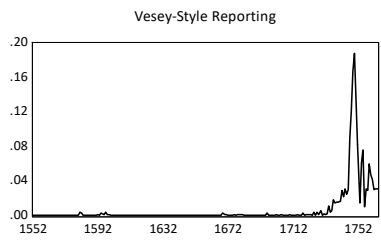
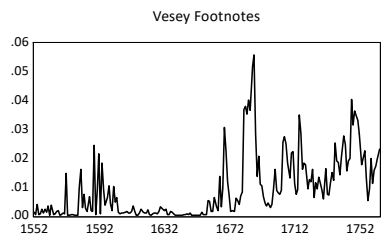






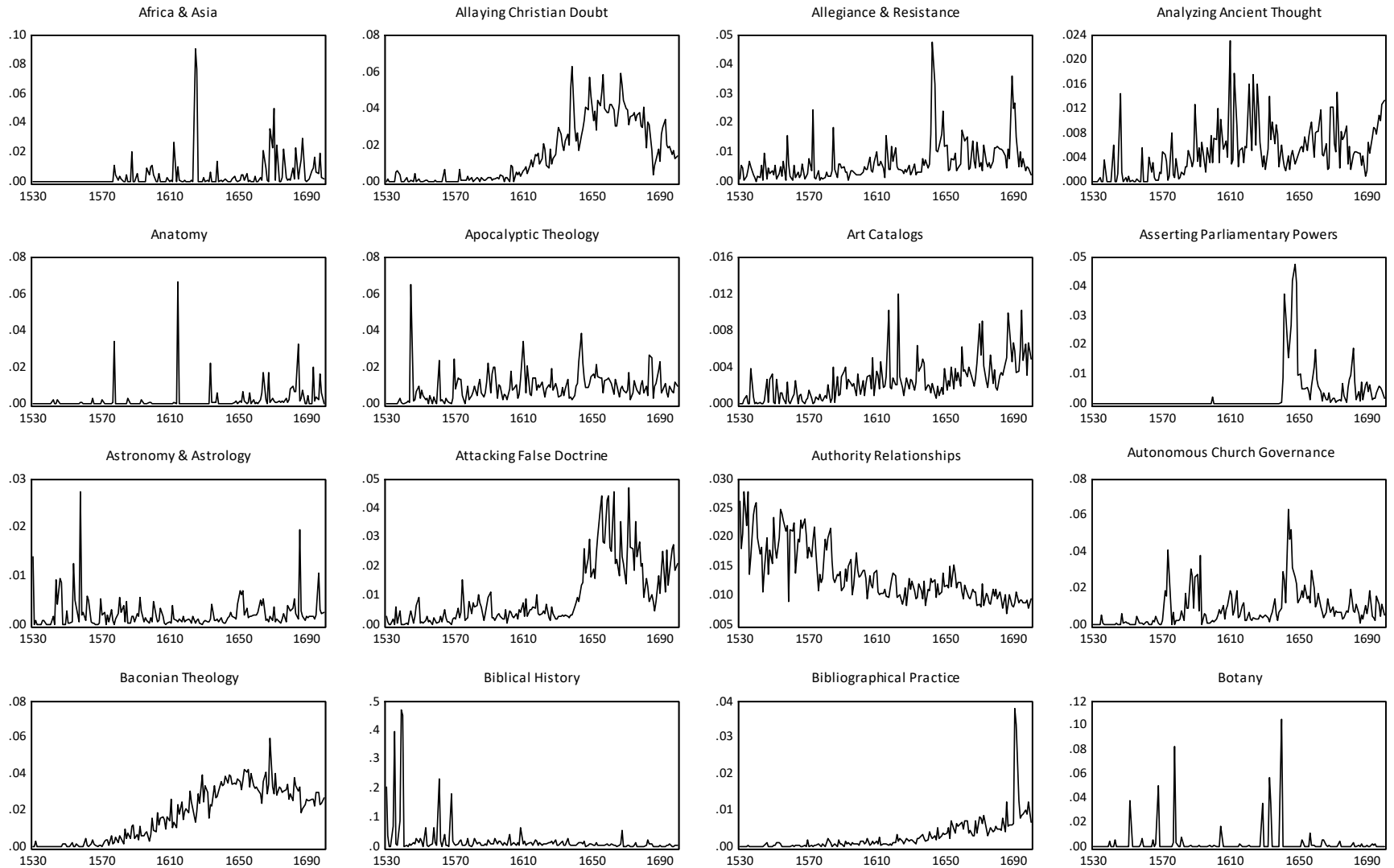


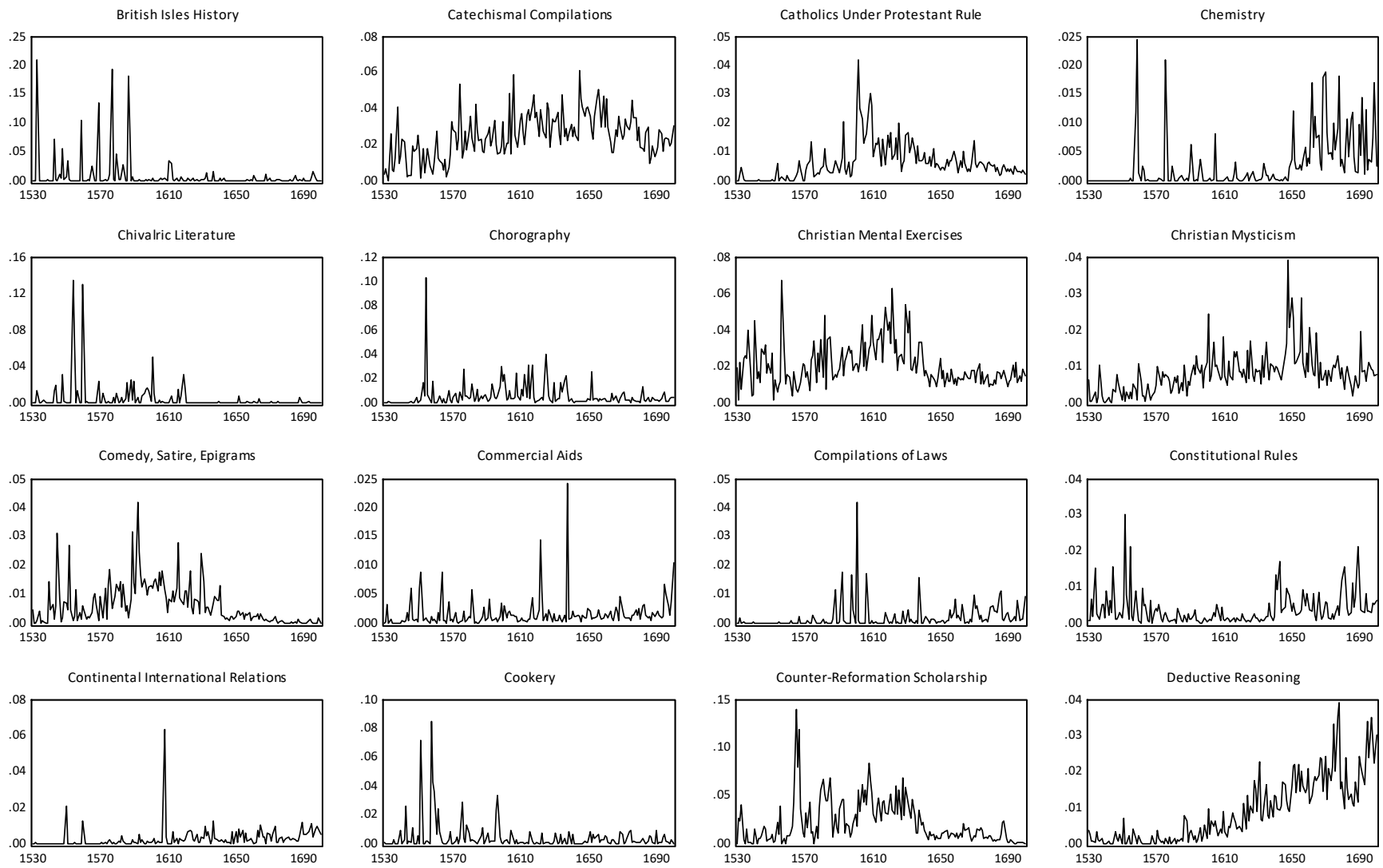


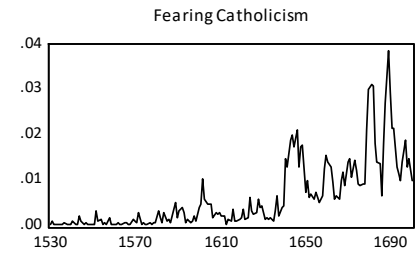
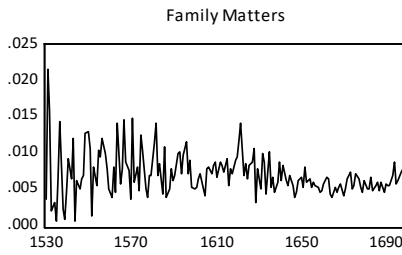
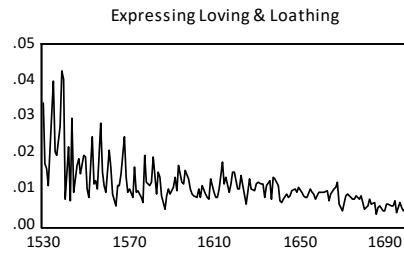
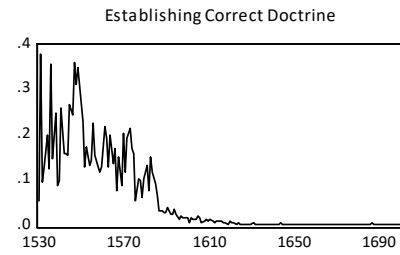
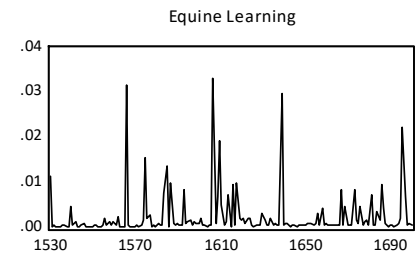
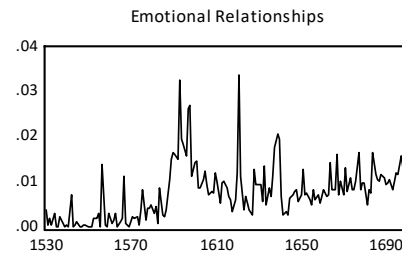
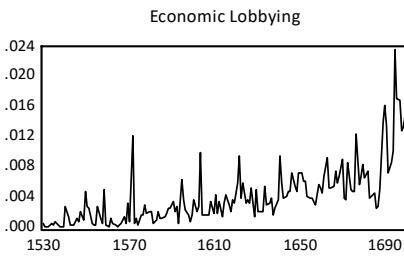
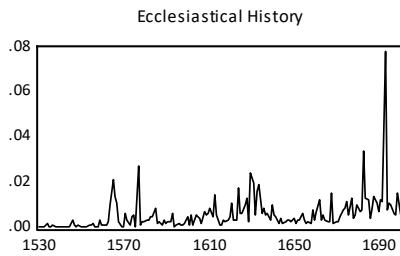
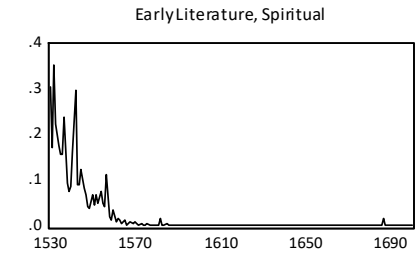
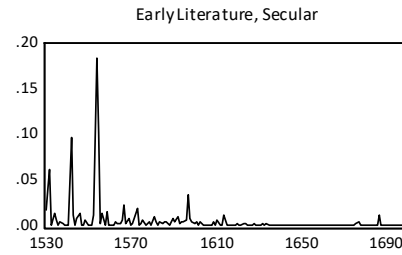
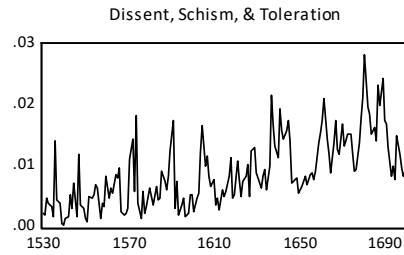
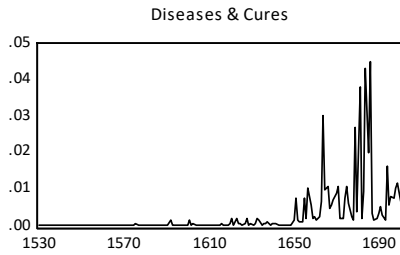
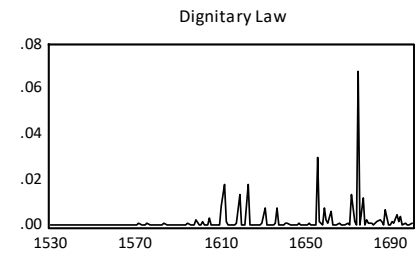
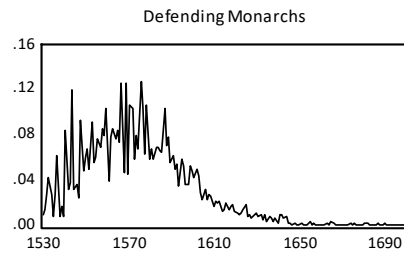
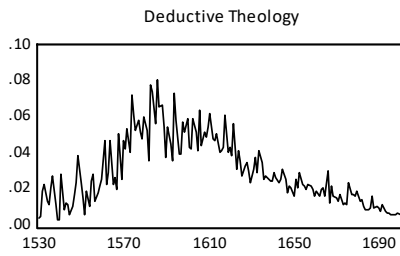


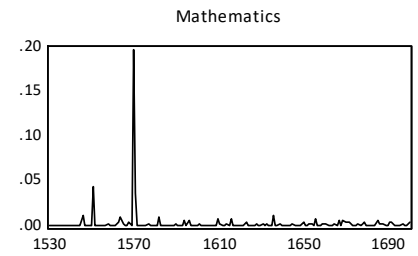
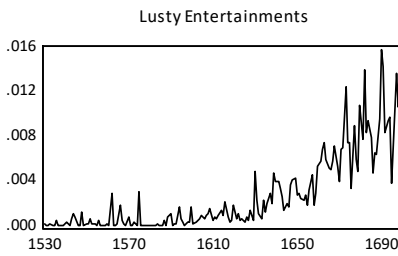
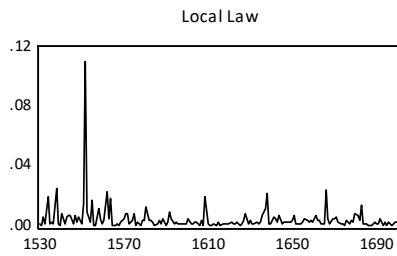
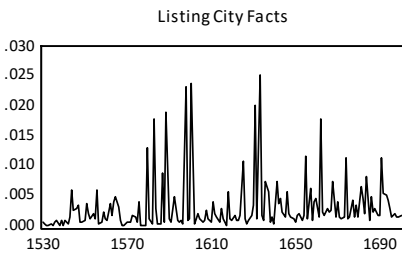
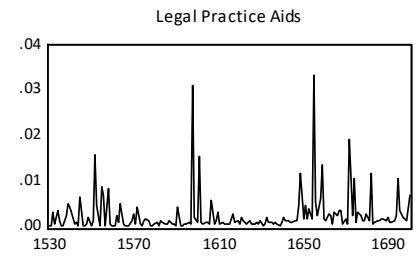
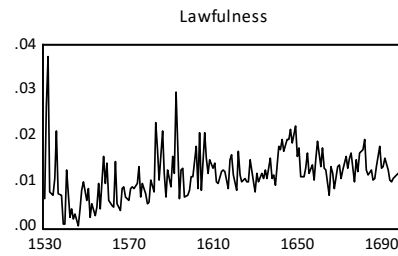
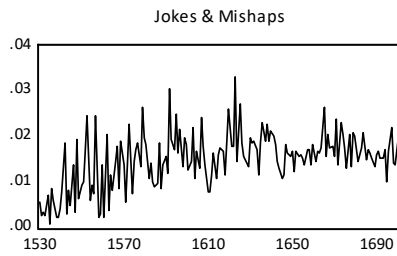
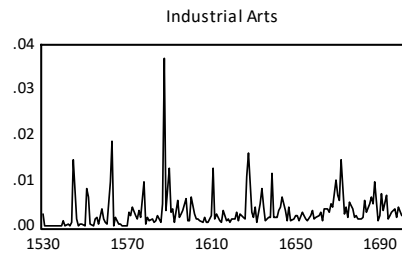
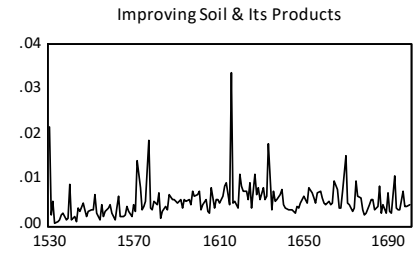
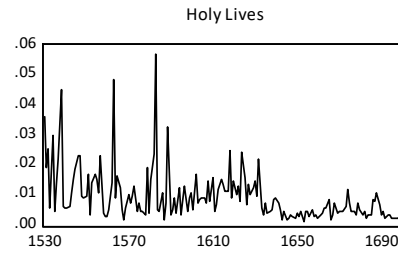
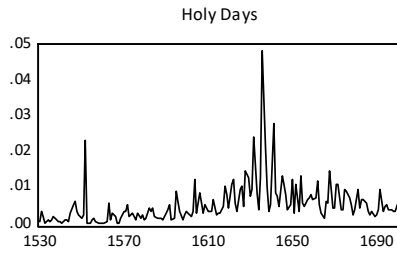
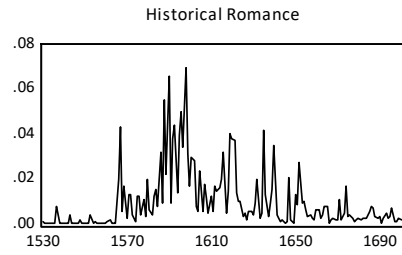
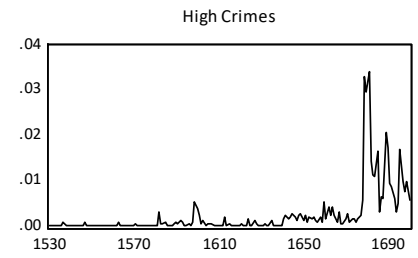
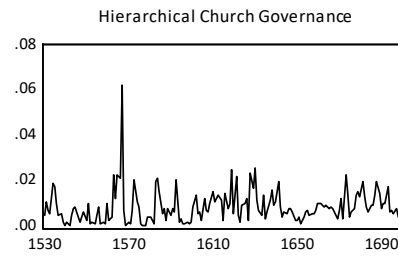
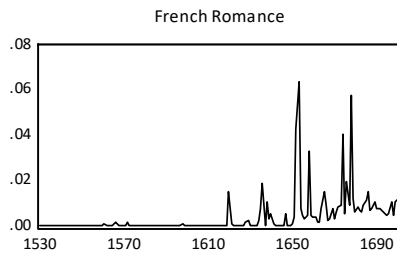
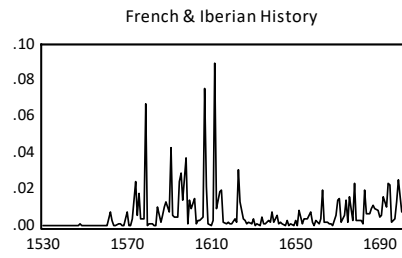


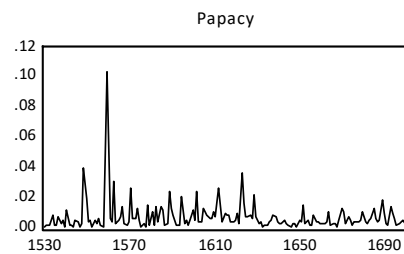
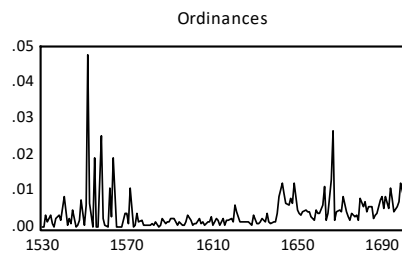
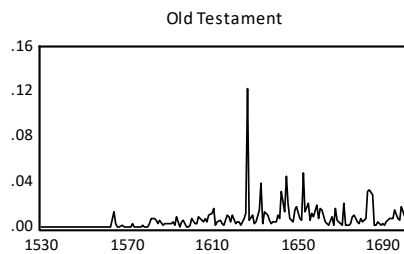
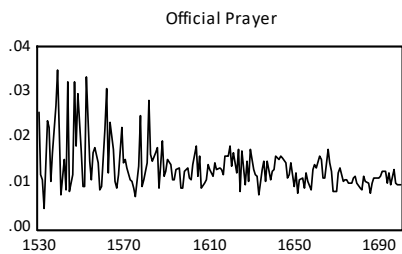
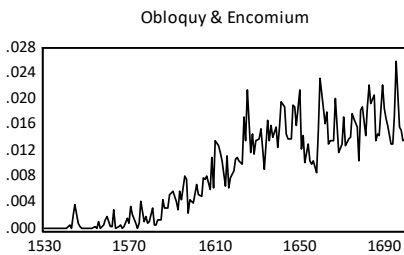
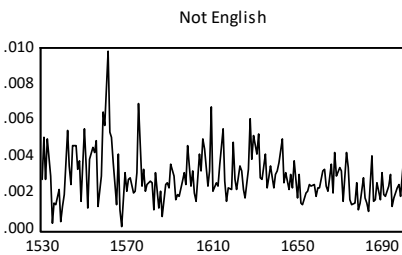
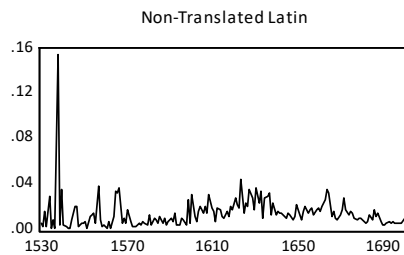
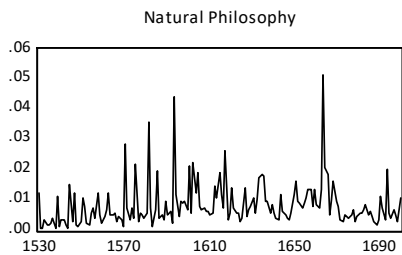
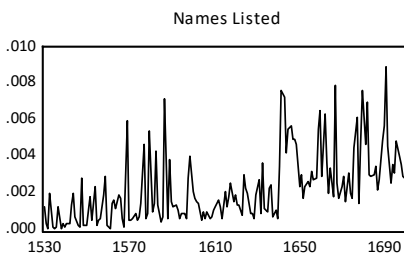
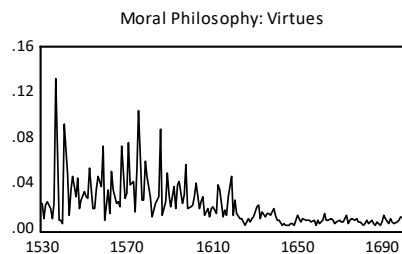
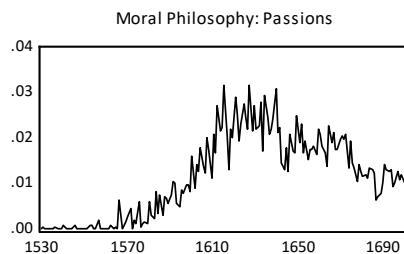
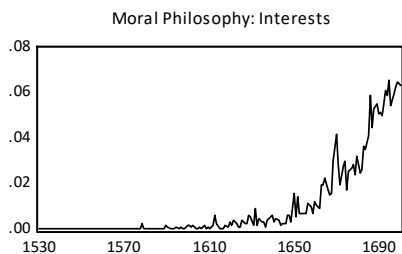
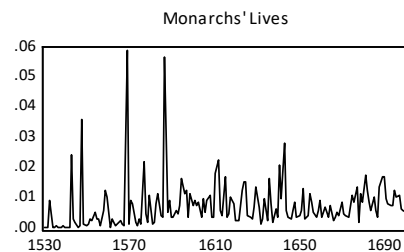
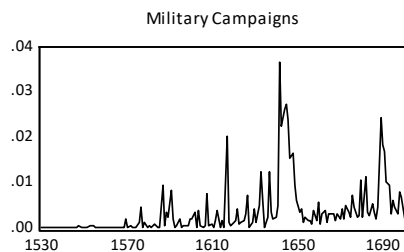
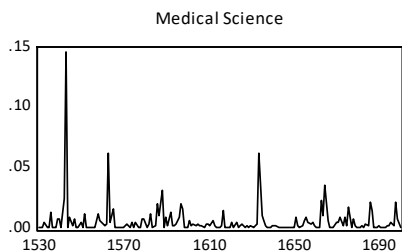
## Appendix D: The culture series, 1530-1700

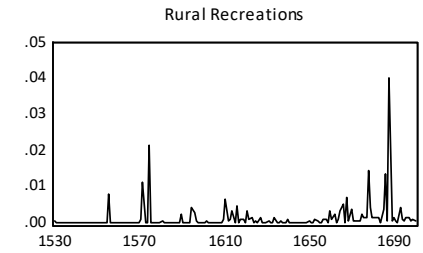
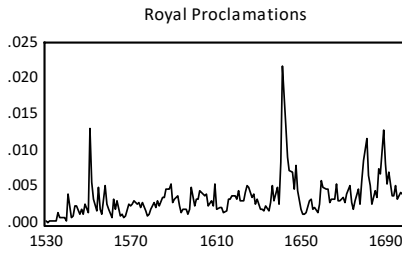
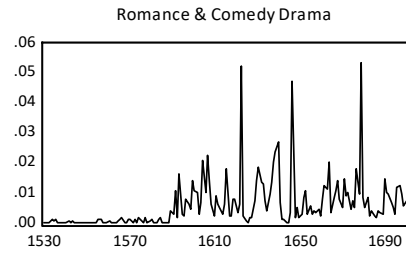
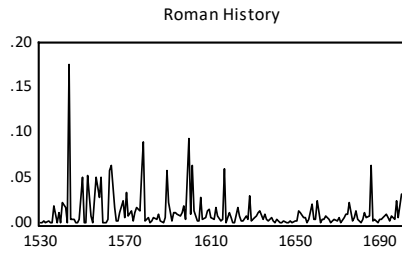
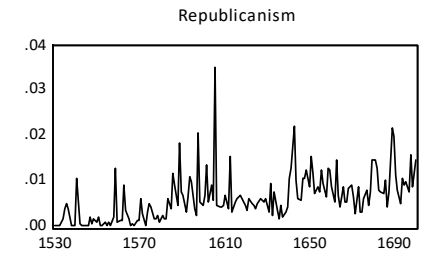
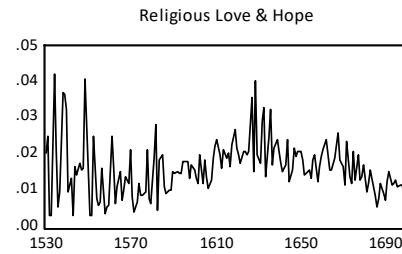
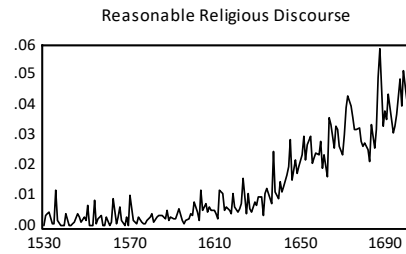
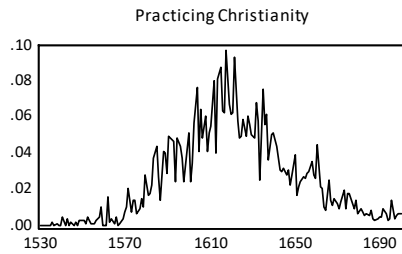
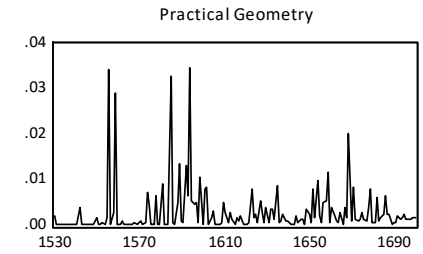
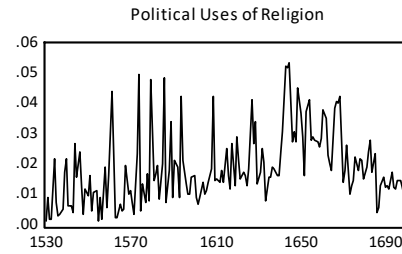
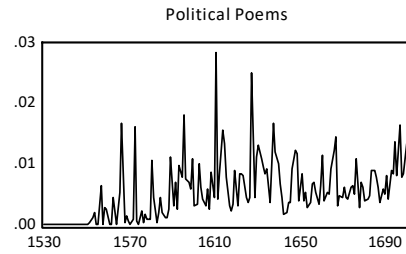
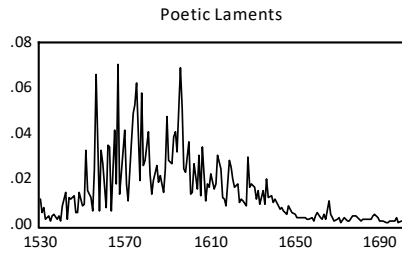
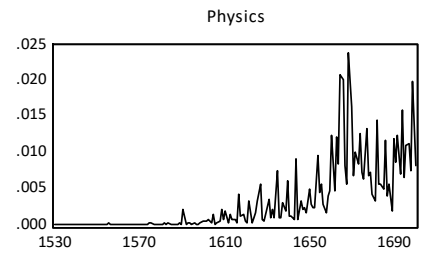
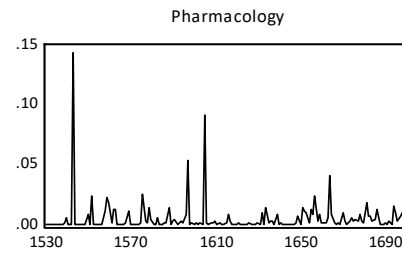
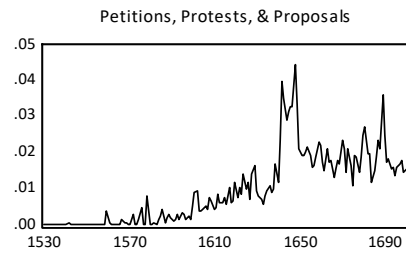
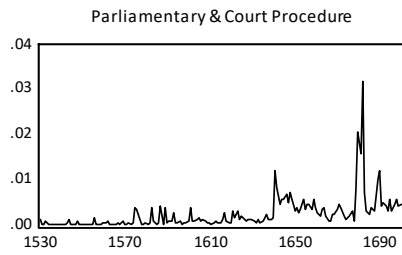


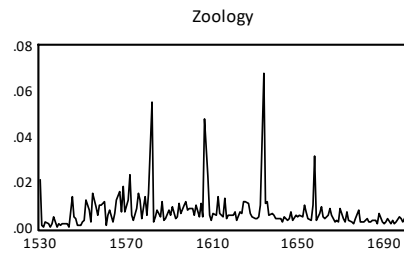
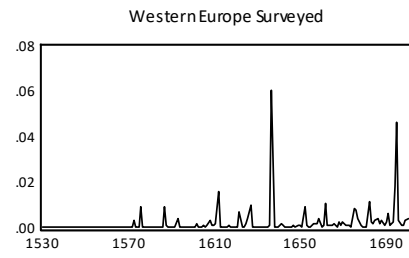
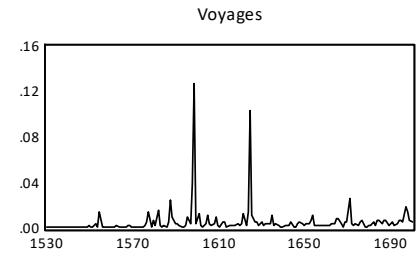
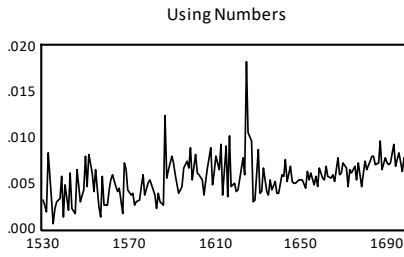
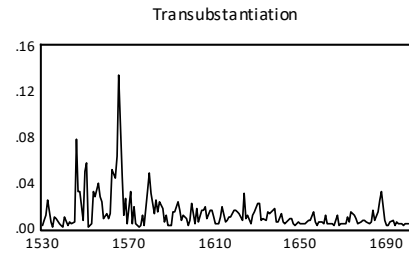
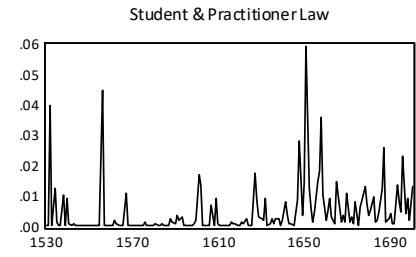
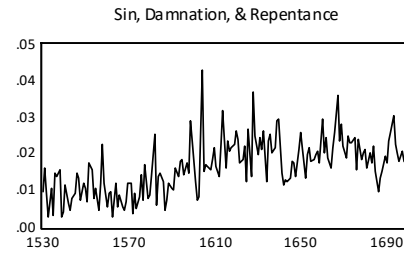
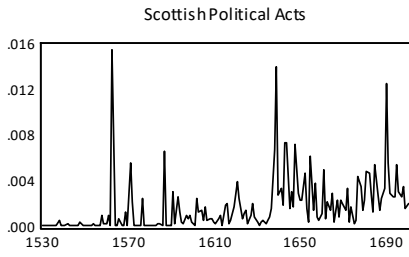
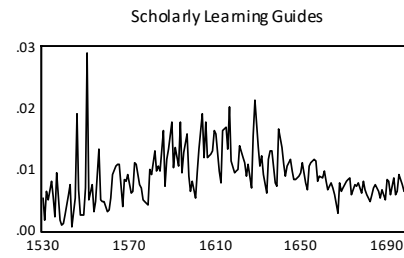
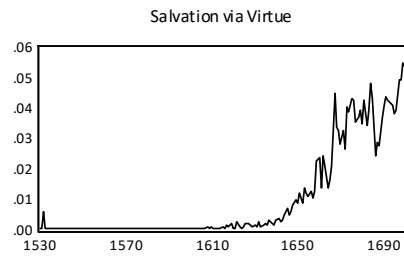
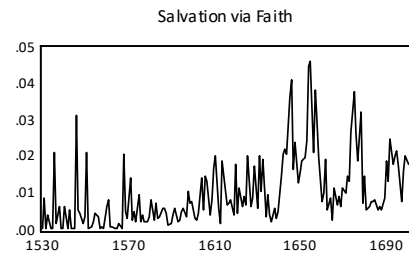












## Appendix E

Table E1: Breaks in caselaw series, 1552-1764

Series (topic)	Break 1		Break 2		Break 3		Break 4		Break 5
Actionable Defamation	1656	down	1616	up	1585	up	1715	down	
Arbitration & Umpires	1705	down							
Assumpsit									
Attorney- & Solicitor-General	1593	up							
Bailment	1660	up							
Bankruptcy	1713	up	1680	up	1589	up			
Bonds	1716	down	1583	up					
Claims from Financial Instruments	1673	up							
Clarifying Legislative Acts	1657	up	1616	down					
Coke-Style Reporting	1641	down							
Coke-Style Procedural Rulings									
Common-Land Disputes	1699	down							
Competing Land Claims	1583	down	1619	down	1676	down	1707	down	
Contingency in Wills	1659	up							
Contract Interpretation & Validity	1643	up							
Contrasting Cases & Statutes									
Conveyancing by Fine	1691	down	1722	down					
Correct Pleas	1706	down	1617	up					
Court Petitions	1734	up							
Daughters' Legacies	1706	up	1672	up					
Decisional Logic	1616	up	1692	down					
Decisions After Conviction	1710	down							
Determining Damages & Costs	1612	up							
Dignitaries	1677	up							
Disentangling Heirs									
Ecclesiastical Appointments	1635	down							
Elizabethan Land Cases	1606	down	1642	down	1682	down			
Employment of Apprentices & Servants	1687	up							
Equitable Relief	1680	up	1734	down					
Equitable Waste									
Equity Appeals	1698	up	1729	down					
Equity Jurisdiction	1629	up							
Estate Tail	1657	up							
Evidence Gathering & Admissibility	1693	up	1729	up	1652	up			
Excluding Beneficiaries of Wills	1724	down							



Series (topic)	Break 1		Break 2		Break 3		Break 4		Break 5	
Execution & Administration of Estates	1711	down								
Executable Purchase Agreements	1672	up	1589	up						
Geographic Jurisdiction of Laws										
Geographic Settlement of the Poor	1696	up	1732	down						
Governance of Private Organizations										
Habeas Corpus	1706	down	1610	up						
Identifying Contractual Breach	1693	down								
Implementing Ambiguous Wills	1707	up	1673	up	1626	up				
Implementing Trusts	1705	up	1673	up	1629	up				
Indicting for Murder										
Inferior-Court Jurisdiction	1707	down								
Intestacy	1677	up	1626	up						
Jury Procedures & Trials	1666	down								
Keble-Style Reporting										
Length & Expiry of Leases	1677	down								
Local Administrative Appointments	1710	down								
Manorial Tenures	1655	down	1709	down						
Marriage Settlement	1705	up	1672	up						
Minors & Guardians	1594	down								
Mistakes in Court Records										
Modern-Style Reporting										
Mortgages	1659	up								
Motions	1722	up	1686	up	1647	up				
Multiparty Cases	1734	up	1616	up						
Municipal Charters	1691	up	1642	up						
Negotiable Bills & Notes	1686	up								
Non-Translated Latin	1707	down	1584	up						
Nuisance	1586	up	1705	down						
Ownership of War Bounty	1733	up	1658	up						
Pleadings on Debt	1708	down								
Possession & Title	1599	down								
Precedent	1642	up	1711	up						
Prioritizing Claims	1674	up	1642	up	1584	up				
Procedural Bills	1656	up								
Procedural Rulings on Actions	1708	down	1583	up						
Procedural Rulings on Writs	1706	down								
Prohibiting Jurisdiction	1604	up	1706	down						
Publishing & Copyright										
Regulating Commerce	1713	down								

Series (topic)	Break 1		Break 2		Break 3		Break 4		Break 5	
Rendering Judgment										
Rental Payments	1677	down	1727	down						
Repaying Debt	1671	up	1614	up						
Restraints on Trade	1599	up								
Reviewing Local Orders	1630	up								
Revocation	1669	up								
Rights of Married Women	1590	down								
Rights of Public Office	1708	down								
Royal Patents & Tenures	1616	down	1699	down						
Rulings on the Calendar	1583	down								
Self-Help in Real-Property Disputes	1603	down	1708	down						
Shared & Divided Property Rights	1629	down								
Specifying Inherited Property Rights										
Statute Applicability	1681	down	1712	down						
Temporal & Spiritual Jurisdiction										
Timing of Property Rights	1603	down								
Tithes										
Transfer of Ownership Rights	1629	down	1682	down	1713	down				
Tree Law	1667	down	1706	down						
Trespass to Goods	1708	down	1583	up						
Uses	1626	down	1681	down	1713	down				
Validity of Wills										
Vesey Footnotes	1681	up								
Vesey-Style Reporting										
Writs of Error	1706	down	1583	up	1656	down	1614	up		
Wrongful Possession	1706	down								

Notes: The table reports the estimated breaks in each of the caselaw series constructed on the basis of the ER corpus (see Section 3). The series are defined over the time period 1552-1764. The breaks are listed in the order as identified by the Bai-Perron method for detecting unknown breaks, assuming a maximum of five breaks (see Section 3). 'Up' denotes a break that resulted in an increase in the expected value of the series. 'Down' denotes that a break that resulted in a decrease in the expected value of the series.

Table E2: Breaks in culture series, 1530-1700

Series (topic)	Break 1		Break 2		Break 3		Break 4		Break 5	
Africa & Asia	1625	up	1578	up						
Allaying Christian Doubt	1630	up	1603	up						
Allegiance & Resistance	1642	up								
Analyzing Ancient Thought	1590	up								
Anatomy	1664	up								
Apocalyptic Theology	1570	up								
Art Catalogs	1590	up	1669	up						
Asserting Parliamentary Powers										
Astronomy & Astrology										
Attacking False Doctrine	1644	up	1572	up						
Authority Relationships	1585	down	1660	down	1611	down				
Autonomous Church Governance	1572	up								
Baconian Theology	1615	up	1584	up	1559	up	1640	up	1673	down
Biblical History										
Bibliographical Practice	1654	up	1622	up	1581	up				
Botany										
British Isles History	1588	down								
Catechismal Compilations	1570	up								
Catholics Under Protestant Rule	1592	up	1566	up	1636	down	1676	down		
Chemistry	1662	up	1558	up						
Chivalric Literature										
Chorography										
Christian Mental Exercises	1641	down	1604	up						
Christian Mysticism	1591	up	1560	up						
Comedy, Satire, Epigrams	1642	down	1667	down	1575	up				
Commercial Aids										
Constitutional Rules	1641	up	1565	down						
Continental International Relations	1608	up								
Cookery										
Counter-Reformation Scholarship	1641	down	1564	up						
Deductive Reasoning	1628	up	1601	up	1664	up				
Deductive Theology	1636	down	1568	up	1667	down	1611	down		
Defending Monarchs	1604	down	1631	down	1656	down	1555	up		
Diet & Health										
Dignitary Law										
Diseases & Cures	1663	up								
Dissent, Schism, & Toleration	1636	up	1571	up						
Early Literature, Secular										
Early Literature, Spiritual	1558	down	1583	down						
Ecclesiastical History	1675	up	1564	up						

Series (topic)	Break 1		Break 2		Break 3		Break 4		Break 5	
Economic Lobbying	1641	up	1589	up						
Emotional Relationships	1588	up	1557	up						
Equine Learning	1566	up								
Establishing Correct Doctrine	1586	down	1612	down	1637	down				
Expressing Loving & Loathing	1558	down	1669	down	1641	down				
Family Matters	1636	down								
Fearing Catholicism	1641	up	1588	up						
French & Iberian History	1574	up								
French Romance	1652	up								
Hierarchical Church Governance										
High Crimes	1676	up	1641	up						
Historical Romance	1566	up	1623	down						
Holy Days	1618	up								
Holy Lives	1633	down								
Improving Soil & Its Products	1572	up								
Industrial Arts										
Jokes & Mishaps	1566	up								
Compilations of Laws	1588	up								
Lawfulness	1583	up								
Legal Practice Aids										
Listing City Facts	1580	up								
Local Law										
Lusty Entertainments	1660	up	1630	up	1600	up				
Mathematics										
Medical Science										
Military Campaigns	1632	up	1587	up						
Military Training										
Monarchs' Lives	1569	up								
Moral Philosophy: Interests	1669	up	1644	up	1613	up	1588	up		
Moral Philosophy: Passions	1601	up	1676	down	1576	up				
Moral Philosophy: Virtues	1620	down								
Names Listed	1641	up	1558	up						
Natural Philosophy	1571	up	1671	down						
Non-Translated Latin	1676	down								
Not English	1650	down								
Obloquy & Encomium	1609	up	1584	up	1635	up				
Official Prayer	1566	down	1669	down						
Old Testament	1626	up	1582	up						
Ordinances	1642	up								
Papacy										
Parliamentary & Court Procedure	1641	up	1575	up						

Series (topic)	Break 1		Break 2		Break 3		Break 4		Break 5
Petitions, Protests, & Proposals	1639	up	1600	up	1575	up			
Pharmacology									
Physics	1661	up	1625	up	1600	up			
Poetic Laments	1638	down	1556	up	1601	down	1668	down	
Political Poems	1590	up	1557	up					
Political Uses of Religion	1573	up	1673	down	1642	up			
Practical Geometry	1556	up							
Practicing Christianity	1580	up	1643	down	1668	down	1606	up	
Reasonable Religious Discourse	1645	up	1604	up	1672	up			
Religious Love & Hope	1676	down	1609	up	1641	down			
Republicanism	1586	up							
Romance & Comedy Drama	1592	up							
Roman History	1604	down							
Royal Proclamations									
Rural Recreations									
Salvation via Faith	1641	up	1604	up					
Salvation via Virtue	1666	up	1641	up	1616	up			
Scholarly Learning Guides	1580	up	1658	down					
Scottish Law	1673	up	1591	up					
Scottish Political Acts	1638	up	1563	up					
Self-Reflection	1605	down	1654	down					
Sin, Damnation, & Repentance	1594	up							
Student & Practitioner Law	1647	up							
Transubstantiation									
Turkish International Politics									
Using Numbers	1587	up	1675	up					
Voyages	1577	up							
Western Europe Surveyed	1637	up	1573	up					
Zoology	1662	down	1555	up					

Notes: The table reports the estimated breaks in each of the caselaw series constructed on the basis of the TCP corpus (see Section 3). The series are defined over the time period 1552-1764. The breaks are listed in the order as identified by the Bai-Perron method for detecting unknown breaks, assuming a maximum of five breaks (see Section 3). 'Up' denotes a break that resulted in an increase in the expected value of the series. 'Down' denotes that a break that resulted in a decrease in the expected value of the series.

## Appendix F

This appendix provides the methodological background for the claims, made in Section 5.3, on the relative contributions of common law and equity. In particular, we show how we calculate the contribution of equity to the financial and family revolutions.

Between the late Interregnum and the end of the Stuart era, our analysis identifies up breaks in twelve finance and family topics: Mortgages (1659), Repaying Debt (1671), Executable Purchase Agreements (1672), Claims from Financial Instruments (1673), Prioritizing Claims (1673), Negotiable Bills & Notes (1686), Bankruptcy (1713), Geographic Settlement of the Poor (1696), Implementing Trusts (1705), Marriage Settlement (1705), Daughters' Legacies (1706), and Implementing Ambiguous Wills (1707). We are interested in ascertaining the contribution of the Chancery, the key equity court, to these topics.

Recall expression (1), giving the relative attention of a corpus to topic  $i$  in year  $t$ :

$$y_t^i = \frac{\sum_{d \in D_t} w_{dt} \theta_{dt}^i}{\sum_{d \in D_t} w_{dt}}, \quad (\text{F1})$$

where  $\theta_{dt}^i$  is the STM-estimated proportion of document  $d$  from year  $t$  devoted to topic  $i$ ,  $w_{dt}$  is the length in words of document  $d$ , and  $D_t$  is the set of all documents (case reports) from the ER corpus published in year  $t$ . Using the Grajzl and Murrell (2021a) data, each document can be unambiguously classified as pertaining to either a case heard in the Chancery ( $C$ ) or a case heard in another court (non-Chancery,  $N$ ). Thus,  $D_t = D_t^C \cup D_t^N$ , where  $D_t^C$  and  $D_t^N$  are respectively the sets of all Chancery and non-Chancery reports published in year  $t$ , with  $D_t^C \cap D_t^N = \emptyset$ .

Expression (F1) can therefore be written as:

$$y_t^i = \frac{\sum_{d \in D_t^C} w_{dt} \theta_{dt}^i + \sum_{d \in D_t^N} w_{dt} \theta_{dt}^i}{\sum_{d \in D_t^C} w_{dt} + \sum_{d \in D_t^N} w_{dt}}. \quad (\text{F2})$$

Next, define:

$$\omega_t^{i,C} = \frac{\sum_{d \in D_t^C} w_{dt} \theta_{dt}^i}{\sum_{d \in D_t^C} w_{dt} + \sum_{d \in D_t^N} w_{dt}} \quad (\text{F3})$$

$$\omega_t^{i,N} = \frac{\sum_{d \in D_t^N} w_{dt} \theta_{dt}^i}{\sum_{d \in D_t^C} w_{dt} + \sum_{d \in D_t^N} w_{dt}}, \quad (\text{F4})$$

where  $\omega_t^{i,C} + \omega_t^{i,N} \equiv y_t^i$ . Then, we define Chancery's share of relative attention to topic  $i$  in year  $t$  as:

$$\Omega_t^{i,C} = \frac{\omega_t^{i,C}}{y_t^i}, \quad (\text{F5})$$

where  $\Omega_t^{i,C} \in [0,1]$ . To gauge the contribution of the Chancery to the development of caselaw and legal ideas captured by topic  $i$  over the relevant time period, we then calculate:

$$\overline{\Omega^{i,C}} = \frac{\sum_{t \in T_B^i} \Omega_t^{i,C}}{20}. \quad (\text{F6})$$

where  $T_B^i$  is the 20-year period that has the up break for topic  $i$  in the eleventh year. Measure (F6) therefore gives the average annual share contributed by Chancery to the pertinent relative topical attention, using the observations from a decade prior to and a decade after the identified up break in the applicable series.

Table F1 summarizes the results in the form of the value of measure (F6) for each of the twelve finance and family topics under consideration. As stated in Section 5.4, the value that measure exceeds one half for nine of these topics.

Table F1: Chancery contribution to relative attention

Topic (with year of up break)	Chancery contribution (share)
Mortgages (1659)	0.591
Repaying Debt (1671)	0.361
Executable Purchase Agreements (1672)	0.555
Claims from Financial Instruments (1673)	0.706
Prioritizing Claims (1674)	0.602
Negotiable Bills & Notes (1686)	0.245
Geographic Settlement of the Poor (1696)	0.039
Implementing Trusts (1705)	0.556
Marriage Settlement (1705)	0.579
Daughters' Legacies (1706)	0.688
Implementing Ambiguous Wills (1707)	0.671
Bankruptcy (1713)	0.591