2022

Financial Crises and Legislation

Peter Conti-Brown
University of Pennsylvania Wharton School of Business, and The Brookings Institute

Michael Ohlrogge
New York University School of Law

Financial Crises and Legislation

Financial Crises and Legislation[1]

Peter Conti-Brown[2] and Michael Ohlrogge[3]

Abstract

Scholars frequently assert that financial legislation in the United States is primarily crisis driven. This "crisis-legislation hypothesis" is often cited as an explanation for various supposed shortcomings of US financial legislation, including that it is poorly conceived and inadequate to the problems it aims to address. Other scholars embrace the hypothesis, but from the perspective that crises are the needed impetus to prompt constructive reforms. Despite the prevalence of this hypothesis, however, its threshold assumption—that Congress passes major financial legislation only when financial crises arise—has never been analyzed empirically. This article provides that analysis. We first devise a new system for assessing legislative importance based on the notion of citation indexing, the principle at the heart of algorithms employed by modern search engines such as Google. Using a suite of legislative importance metrics, we show that the crisis-legislation hypothesis strongly fits for securities laws but far less so for banking laws. We conclude, therefore, that reformers would be ill-advised to push for government interventions in the banking system only following crises and that those seeking to understand dysfunction in US bank regulation will need to pursue fuller explanations.

Keywords: Banking law, financial history, financial regulation, political economy, securities law

JEL Classification: D7, G28, K22, L5, P16

---

[2] Peter Conti-Brown is the Class of 1965 Associate Professor of Financial Regulation at the Wharton School and nonresident fellow in economics studies, the Brookings Institution, petercb@wharton.upenn.edu.

[3] Michael Ohlrogge is an assistant professor of law at New York University School of Law, ohlrogge@nyu.edu.

1.   Introduction

In the late fall of 2008, as markets imploded and storied firms on Wall Street stumbled toward (or beyond) collapse, policymakers affiliated with President-elect Barack Obama strategized about the appropriate legislative-policy course for the new administration to address the problems of the financial system that the 2008 crisis had, to their eyes, exposed. Rahm Emanuel, a Democratic congressman tapped by the new president, (in)famously summed up the legislative opportunity confronting the administration and its congressional coalition to a *Wall Street Journal* conference: "You never want a serious crisis to go to waste" (Seib 2008). The crisis had concentrated the minds of legislators, the thinking went, and to let the opportunity pass without reform would be to close that window of opportunity.

The idea that financial legislation in the United States originates in political responses to financial crises is promoted not only by those who seize the levers of reform. Over the past two decades, legal scholars have formed a hypothesis about the causal relationship between crises and financial legislation. Roberta Romano, for example, describes an "iron law" of financial regulation: that is, that major legislation is "invariably" driven by financial crises (Romano 2014). Paul Mahoney writes, similarly, that "nearly all significant financial reform legislation in England and America has been enacted in the aftermath of a collapse in equity values" (Mahoney 2015). This idea has become the common ground for warring scholarly camps that see crisis either as the prerequisite for organizing collective action (Gerding 2009; Coffee 2012) or as a toxic background counterproductive law (Romano 2005; Romano 2014; Bainbridge 2010; Mahoney 2015;).

Yet the predictions these accounts offer of when major financial reform will be passed differ from those of other political theories of legislation. For example, John Kingdon's influential book *Agendas, Alternatives, and Public Choices* deviates significantly from the "iron law" hypothesis, first by embracing a broad range of crises (not merely financial ones) that can prompt legislation,[4] and second by recognizing that while influential, crises are neither necessary nor sufficient for significant legislative action (Kingdon 2010). Sarah Binder and Mark Spindel (2017) similarly deviate from a crisis-legislation-centric view of financial regulation. They emphasize the role of institutional coalitions as much as crises in motivating Congress and argue that often it is the threat of legislation, rather than legislation itself, that is most influential in shaping regulatory outcomes in US central banking. Lastly, Conti-Brown and Feinstein (2021) stress the role of randomness and uncertainty, particularly in the manufacture of coalitions that promote successful financial legislation. None of these competing theories claim that financial crises play no role in influencing legislation, nor do they deny that specific pieces of legislation (the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, for instance) have been particularly shaped by financial

---

[4] Kingdom's work is focused broadly on legislative determinants, rather than specifically on financial legislation. Nevertheless, nothing in his writing suggests that he views only a single type of crisis as being capable of prompting legislation in any given area. As we discuss below, crises in terrorism, civil rights, housing supply, and other areas have prompted significant legislative action in US banking law over the past century.

crises. Nevertheless, they treat financial crises as merely one factor among many influencing legislation—and not necessarily the preeminent factor at that.

In this paper, we seek to measure empirically the extent to which Congress's interventions in financial markets are dominated by responses to financial crises. Part of our goal is to generate information with which to evaluate the accuracy of these competing political theories of financial legislation. The stakes of evaluating the crisis-legislation hypothesis are much higher than just this. If the crisis-legislation hypothesis is correct, then it can provide valuable guidance to supporters and critics of government intervention alike, indicating that efforts to improve our financial system should focus on the periods immediately following financial crises. If the hypothesis is erroneous, however, it may be misleading efforts by both groups to understand and improve our financial system astray.

History provides some obvious examples of "crisis legislation." Besides Dodd-Frank, the Great Depression ushered in both short- and long-lived reforms such as federal deposit insurance, the separation of commercial and investment banking, and what remains the primary framework for securities disclosures and exchange regulations (Rahman 2012).

On the other hand, there are numerous counterexamples to the crisis-legislation hypothesis in which prominent pieces of legislation were passed at a significant distance from financial crises, such as the Bank Holding Company Act of 1956, the Bank Secrecy Act of 1970, and the Federal Reserve Act of 1913 (Conti-Brown 2016). Other major pieces of banking regulation, such as the 1975 Home Mortgage Disclosure Act (HMDA) and the 1977 Community Reinvestment Act (CRA), were likewise passed with no financial crises in sight. And arguably one of the most extensive governmental interventions in financial markets in the past century, the creation (and concurrent regulation) of government-sponsored enterprises (GSEs) such as Fannie Mae, Freddie Mac, and Sallie Mae, was largely accomplished through a series of noncrisis laws, such as the Housing Act of 1948, the Housing Act of 1954, the Housing and Urban Development Act of 1968, the Emergency Home Finance Act of 1970, and the Education Amendments of 1972.

It is not enough, though, to list examples and counterexamples to assess the validity and applicability of the crisis-legislation hypothesis. While the sheer number of counterexamples makes it difficult to accept the strongest versions of the crisis-legislation hypothesis—that major legislation is "invariably" crisis-driven—we may still wonder whether these are the exceptions that prove the rule, or whether is there more exception than rule? Might the hypothesis be true for certain types of legislation, or for certain historical eras, but not others?

To make progress on these questions, we use a novel methodology for systematically measuring the importance of hundreds of pieces of US financial legislation passed between 1912 and 2011.[5] Our method is based on the principles of citation indexing. These principles have been used for more than half a century in assessing the impact of academic articles (Garfield 1955) and identifying which web sites to return in search results of modern search

---

[5] For reasons we describe below, our quantitative methods as currently formulated are less suited to measuring the importance of legislation before 1912 or after 2011.

engines such as Google (Vise and Malseed 2017). Using these new metrics, we examine what percentage of "important" legislation, defined variably, is attributable to periods immediately following financial crises.

We develop four separate metrics of legislative importance, based on citations of laws by sources such as the US Code, US judicial opinions, and the *New York Times* (NYT). To build these metrics, we devise new tools to mine unstructured textual databases, including more than 4,000 pages (2 million words) spanning a dozen editions of the US Code, more than 1 million judicial opinions, and millions of articles from the NYT. We show that our metrics generate credible lists of the most important pieces of securities and banking legislation in the United States. Our analyses demonstrate the robustness of our conclusions across these metrics and present some evidence that a combination metric created by averaging the four may produce still more accurate measures by enabling errors in individual metrics to at least partially cancel one another out. Our methods bear some similarities to those in Hail, Tahoun, and Wang (2018), though in that work the authors mine newspapers to gauge public sentiment, whereas in ours the goal is to measure legislative importance.[6] Our methods likewise build off of, and expand upon, many of the techniques pioneered by Mayhew (1991) in his investigation of whether congressional legislation is dominated by laws passed during periods of unified party control.

Having constructed our metrics, we divide the crisis-legislation hypothesis into two fields: securities legislation and banking legislation. These fields point to separate kinds of predicate crises. For banking legislation, we use the crises identified by Reinhart and Rogoff (2009) and Eichengreen and Bordo (2002). Ironically, given the focus the capital markets received in earlier work, the literature on crises and securities legislation does not define crises specifically. To make the crisis-legislation hypothesis testable for securities, therefore, we define crises based on large drops in US equity prices. For instance, in one of our baseline specifications, we consider a peak-to-trough decline of 35% or more in equity prices to constitute a crisis,[7] though we also consider a wide range of other specifications.[8]

---

[6] In particular, Hail, Tahoun, and Wang (2018) look at a cross section of 26 counties and the major newspapers in each. The authors examine whether the occurrence of words for "scandal" (with additional filtering to ensure these are accounting scandals) systematically precede the occurrence words for "regulator" and draw inferences based on this regarding the relationship between accounting scandals and political pressure for accounting reforms.

[7] This identification method is thus very similar to that used by Barro and Ursúa (2017). We discuss this in more detail below.

[8] At times, the crisis-legislation literature mentions the notion of scandal being connected with the causal channel for financial legislation (see, for example, Romano 2005). For several reasons, we choose not to attempt to measure scandals or include them in our tests. First, while scandals are at times mentioned, they do not feature nearly as frequently or as prominently in the majority of the academic literature on the crisis-legislation hypothesis. For instance, the primary work in this field—Romano (2014), Coffee (2012), and Bainbridge (2010)—rarely mention scandals and focus almost exclusively on crises. Second, to craft a definition of scandal, where none have previously been devised in the literature, and then to incorporate that into our empirical tasks, would add further complexity and length to this project. We therefore leave empirical investigations of the relationship between scandals and crises as a topic for further research (on this point more broadly, see Hail, Tahoun, and Wang 2018).

We find that, under a representative baseline specification, roughly 84% of all US securities legislation was passed in the immediate aftermath of equity crises, despite these periods encompassing just 27% of the time span we examine. The crisis-legislation hypothesis, therefore, strongly suggests congressional reaction to equity crises. By contrast, we find that only 36% of US banking legislation was passed in the aftermath of banking crises, with these periods encompassing roughly 28% of the time span we examine.

We examine whether this starkly different result for banking might be explained by a pattern in which Congress passes major deregulatory legislation in the periods between crises, but we find little evidence of that. Instead, Congress regularly passes new legislation aimed at increasing government intervention in banking markets, with only a modest elevation of activity following crises. Through qualitative analyses, we identify only a small number of laws that could even plausibly be construed as primarily deregulatory (a designation we view as a significant oversimplification), and we find that excluding these laws from our analyses has little impact on our results. This is in part because even some of this "deregulatory" legislation was passed in the wake of financial crises, meaning that excluding it reduces importance metrics in both postcrisis and noncrisis periods. These results are hard to square with the simple, bipolar political economy (pitting pro- and anti-regulation factions against each other) presumed by the crisis-legislation hypothesis, but they are unsurprising given the more complex array of factions and political economies presumed by other theories of financial legislation.

While our quantitative methods give numerical estimates for the importance of legislation in crisis and noncrisis periods, they do not, in and of themselves, tangibly convey what exactly the impact of congressional action during noncrisis periods was. Thus, as a complement to our numerical findings and to bolster confidence in their results, we conduct a qualitative survey of several key areas of banking legislation. We discuss nearly two dozen pieces of important noncrisis banking legislation and describe the ways this legislation shaped key facets of banking regulation.

Although we conclude that the crisis-legislation hypothesis fits well for securities legislation but much more poorly for banking legislation, we do not claim that financial crises are irrelevant for banking legislation. We find merely that the modest elevation in postcrisis banking legislation falls far short of what can plausibly be termed an "iron law"—and of justifying a dominant focus on postcrisis periods in seeking to understand or improve US banking legislation.

Furthermore, while we explicitly consider the question of whether legislation increases or decreases the extent of government intervention in financial markets, there are many other dimensions of legislation that we do not investigate in depth. The crisis-legislation hypothesis to date has largely taken the form of sweeping statements about all government intervention in financial markets, so we make these our focus. One could imagine refinements of the hypothesis that state that some particular type of governmental intervention is in fact dominated by postcrisis legislation—perhaps legislation targeting some subsector of the banking industry or with some particular regulatory goal, or legislation that is favored (or opposed) by some particular subset of the many political

constituencies involved in shaping financial legislation. Indeed, if a sufficiently large number of possibilities are considered, it would be odd not to find at least some dimension of legislation that is more prevalent postcrisis. We urge caution in evaluating such alternative formulations. Testing multiple hypotheses naturally raises concerns about false positive results. Furthermore, it seems hard to infer a strong causal link if, for instance, a particular subset of banking legislation encompasses four major pieces of legislation, three of which were passed postcrisis and one of which was not. Nevertheless, our results by no means rule out the possibility that there may be some dimension of banking legislation that is largely driven by reactions to crises.

Beyond evaluating the plausibility of competing political theories, our results have three key implications. First, understanding the ways that capital markets and banking differ is a defining question for economists (for example, Kroszner and Rajan 1994) and legal scholars (for example, Armour et al. 2016). Our findings suggest that these divisions are central not only to the US legal framework but also to its political framework.

Second, from the perspective of policy reforms, those who, like Rahm Emanuel, want to see major changes to the capital markets are better off focusing on legislative sessions that follow equity crises. But for those who would reform the banking system, Emanuel's statement is incomplete: While there may be some advantages to pushing for reform following crises, more than half of the important banking legislation in the past century was passed without a crisis to prompt it. To update Emanuel's advice to reformers, we therefore urge, "Never let a *lack* of serious crises go to waste either."

Third, for those who see many ills and inefficiencies in US banking legislation and their regulatory implementation, the pathologies of "crisis legislation" offer at best only a partial explanation. Legislative proposals in banking should rise and fall on their own (de)merits.

In constructing our metrics of importance and empirical tests, we must make a number of assumptions. To ensure the robustness of these assumptions, we discuss a range of specifications and demonstrate that our overall conclusions are generally stable across them. We have also created two interactive online platforms that allow users to choose for themselves how to resolve a large number of the different alternatives in formulating our analyses.[9] Even so, we do not claim that our metrics capture legislative importance perfectly. We assert instead that a sufficient condition for these metrics to advance academic understanding is that they (a) capture some meaningful amount of the signal of legislative importance, relative to the inevitable noise, and (b) do so in an unbiased way—meaning here that they are no more likely to under/overweight the importance of laws close to or far from crises.

The remainder of this article proceeds as follows. Section 2 surveys political theories of financial legislation. Section 3 works to define the crisis-legislation hypothesis with sufficient precision to render it testable. Section 4 discusses our motivations for using citation

---

[9] These tools can be accessed here:

http://ohlrogge.law.nyu.edu:3838/apps/Crisis_Legislation/Individual_Laws/.

http://ohlrogge.law.nyu.edu:3838/apps/Crisis_Legislation/Histograms/.

indexing. Section 5 presents details on constructing our metrics of legislative importance. Section 6 examines whether our metrics capture credible information on legislative importance. Section 7 presents the results of our empirical tests of the crisis-legislation hypothesis. Section 8 examines the robustness and interpretation of our findings, and Section 9 concludes.

2.   Theories of Congressional Action

2.1 The Crisis-Legislation Hypothesis

The idea that crises prompt political reaction extends far into the history of political science.[10] The modern strain in legal thought connecting financial crises and financial legislation began in earnest in the late 1990s. Stuart Banner, a legal historian, argued that new securities regulations and legislation are often introduced in the wake of declines in equity prices (Banner 1997; Banner 1998).[11]

These historical observations took on much greater policy salience in 2005 with the publication of Roberta Romano's article "The Sarbanes-Oxley Act and the Making of Quack Corporate Governance" (2005). Romano argued that Congress had failed to take account of the empirical literature on the provisions of the legislation it adopted in the aftermath of the Enron, WorldCom, and related accounting scandals. This led Romano to conclude that the effort was "quack corporate governance," rather than a product of "careful deliberation by Congress": "emergency legislation," as she summarized it, "enacted under conditions of limited legislative debate, during a media frenzy" (Romano 2005, 1528). Romano recommended that "emergency financial legislation" passed in the wake of future crises include sunset provisions that would automatically repeal it unless reapproved by Congress postcrisis.

That line of thinking expanded in the wake of the Global Financial Crisis of 2008. Looking to explain the "appalling legislative and regulatory state of affairs" created by the heavily bank-oriented legislation passed in the US (with Dodd-Frank) and many other jurisdictions (with Basel III) in the wake of the financial crisis, Romano (2014) articulated an "iron law of financial regulation" in which

> (1) Enactment is invariably crisis driven, adopted at a time when there is a paucity of information regarding what has transpired; (2) resulting in "off-the-rack" solutions often poorly fashioned to the problem at hand; (3) with inevitable flaws given the dynamic uncertainty of financial markets; (4) but arduous to revise or repeal given the stickiness of the status quo in the U.S. political framework of checks and balances. The ensuing one-way regulatory ratchet generated by repeated financial crises has produced

---

[10] See Reinhart and Rogoff (2009), Grossman (2010), and Goetzmann (2016) for broad treatments.

[11] To be clear, Banner explicitly does not seek to evaluate the merits of the legislation whose history he examines (Banner 1998, 7) and refers to the association between equity declines and legislation as a "general trend, not an absolute rule" (Banner 1997, 850).

not only costly policy mistakes accompanied by unintended consequences, but also a regulatory state whose cumulative regulatory impact produces, over time, an increasingly ineffective regulatory apparatus. (Romano 2014, 56)

Coffee (2012) objects to the policies that Romano proposes,[12] yet he still starts his analysis from the premise that "experience has shown . . . that only after a catastrophic market collapse can legislators and regulators overcome the resistance of the financial community and adopt comprehensive 'reform' legislation" (Coffee 2012, 1020). Much of Coffee's analysis, then, is focused on (a) the need to ensure that the unique legislative opportunity posed by crises is not wasted and (b) the challenges of protecting, postcrisis, the sensible aspects of the reforms that do get passed.[13] Paul Mahoney's 2015 book, *Wasting a Crisis*, similarly argues that "the timeline of financial reform almost always consists of a financial crisis, followed by reform legislation, followed by no financial crisis" (Mahoney 2015, 4–5).

2.2 Alternative Legislative Theories

Many other theories from the fields of political science, history, and law yield predictions about the relationship between financial crises and legislation that differ substantially from those that embrace versions of Romano's "iron law." For instance, in *Agendas, Alternatives, and Public Choices*, John Kingdon looks at how external events activate policy entrepreneurs in different "streams" who shape legislation. Crises can be factors in those activation points, but they are neither necessary nor sufficient to the ultimate enactment of legislation (Kingdon 2010). Furthermore, there is nothing in Kingdon's theory to support the notion of financial crises as a unique type of precipitating event for financial legislation. Consider, for instance, the USA Patriot Act, whose expansion of money-laundering controls on banks was sparked by the crisis of the 9/11 terrorist attacks, or the Community Reinvestment Act, which was sparked by the civil rights and civil unrest crises of the 1970s, or the Housing Act of 1948, which was sparked by the housing crisis for veterans returning from World War II. While these nonfinancial crises and their financial-legislative responses would fit squarely within Kingdon's theoretical framework, they stand as anomalies to the "iron law" hypothesis.

In literature more closely focused on financial legislation, Sarah Binder and Mark Spindel (2017) write about how Congress exerts authority over the Federal Reserve, suggesting that a mix of crises and institutional coalitions drives changes to Fed practices. Furthermore, in Binder and Spindel's account, changes occur largely in reaction to legislative threats rather than through legislative change (2017). Lastly, Conti-Brown and Feinstein (2021) argue that

---

[12] Coffee, writing in 2012, was responding in part to a working paper and subsequent book chapter by Romano that previewed much of the content in Romano 2014.

[13] Coffee's argument is similar to an earlier theory articulated by Gerding (2009) that articulates a "regulatory instability hypothesis" connecting crises, legislative reactions, and the political economy, which eventually erodes the new legislative protections when markets "appear" to be soaring. Gerding's analysis is focused on the acts of regulators and is therefore less sensitive to the "crisis-legislation hypothesis," although it depends on this hypothesis in part.

banking legislation follows a mostly historically contingent path, with little overall institutional logic, given the fragility of coalitions needed to enact it.

Because of the significant divergence in theoretical predictions among these different writers, we proceed in the following sections to develop empirical tools to shed more light on the relationship between financial crises and financial legislation.

3.   Defining the Crisis-Legislation Hypothesis

3.1 The Need for a Precise Definition of the Crisis-Legislation Hypothesis

As with any hypothesis, for the crisis-legislation hypothesis to be meaningful, it must make testable predictions. In this section, we articulate four questions that any version of the crisis-legislation hypothesis must address but that no scholar has yet either articulated or answered. We then discuss our answers to these questions.

3.2 How We Define the Crisis-Legislation Hypothesis

3.2.1 Question 1: How to Define a Financial Crisis?

Because the literature on financial crises and legislation began by focusing on equity crises, we seek first to formalize the definition of equity crises. For this, we look at peak-to-trough drops in in the S&P 500, an equity index, using data provided by the firm Global Financial Data.[14] Detecting peaks and troughs in a time series is a nontrivial task in signal processing, with no widely agreed upon method.[15] As a baseline, we consider a bandwidth of 12 months, identifying a date as a "peak" if the S&P 500 value is greater on that date than on any of the preceding or subsequent six months. We identify the "troughs" as the minimum points between peaks. We define a crisis as occurring when there is a peak-to-trough decline beyond a specified threshold. We consider alternative thresholds of 25%, 30%, 35%, 40%,

---

[14] Globalfinancialdata.com. This data seeks to reconstruct an equivalent to the S&P 500 during the period prior to 1926, when the S&P index was first created.

[15] For an overview of the issue and various responses to it, see generally Palshikar 2009.

45%, and 50%.[16] In our formulation, an equity crisis persists until prices rebound above this threshold of decline.[17]

When testing the hypothesis for banking legislation, we follow the definitions of banking crises established by Reinhart and Rogoff (2009) and Eichengreen and Bordo (2002). Reinhart and Rogoff define banking crises as follows:

> We mark a banking crisis by two types of events: (1) bank runs that lead to the closure, merging, or takeover by the public sector of one or more financial institutions; and (2) if there are no runs, the closure, merging, takeover, or large scale government assistance of an important financial institution (or group of institutions) that marks the start of a string of similar outcomes for other financial institutions.[18] (Reinhart and Rogoff 2009, 10)

Appendix B provides the specific sets of dates identified as crises under each of our definitions. In all of the analyses we discuss below, we consider the relationships between banking crises and banking legislation and between equity crises and securities legislation. Nevertheless, our suite of online data tools also allows readers to investigate the relationship between equity crises and banking legislation and between banking crises and securities legislation themselves.

3.2.2 Question 2: How to Define Periods Following Financial Crises?

Crisis legislation must also be specified by its proximity to the predicate crisis. Otherwise, every piece of legislation in US history that came after the Panic of 1792 could conceivably be crisis legislation responsive to that event. To this end, then, we use a schema for formalizing the temporal and causal connection between legislation and crises. Elections perform an important function in our analysis. We use presidential and congressional elections as the separation point between immediate crises and their legislative by-product

---

[16] Barro and Ursúa (2017) consider stock-market crashes, which they define as "cumulated multi-year real returns of -25 percent or less." This largely maps on to our definition of peak-to-trough declines, although Barro and Ursúa use a less granular source of stock return data (so as to make it comparable with multiple countries) and thus reach slightly different time designations for crises than we do. Barro and Urúsa also consider instances in which stock-market crashes are followed by major or minor depressions. They define a major depression as a 25% or more contraction of GDP and a minor one as a 10% or more such contraction. In our sample, the only period qualifying under either definition is the crash of 1929. This would thus exclude the Sarbanes–Oxley Act of 2002, Dodd-Frank, and the Investment Company Act of 1940: pieces of legislation central to the modern crisis-legislation hypothesis. As such, we do not explicitly consider analyses that use 1929 as the sole crisis period, but our online tools make it easy for readers to examine this on their own if they consider this to be the only relevant financial crisis of the past century.

[17] Suppose, for instance, that we are using a 35% threshold and that the S&P index had a starting value of 1,000. The S&P begins dropping in value. It hits 650 in March of some year and drops down to 550 by June. By November, it has risen back to 650. We would then consider the equity crisis to persist from March, when the index first dropped 35% from its high value of 1,000, until November, when it first rose back above the crisis threshold.

[18] The decision rule used by Eichengreen and Bordo (2002) is very similar, resulting in no different classifications of years during the period of our study.

and those legislative efforts that are merely responding to general trends in political economy.

To differentiate between these types of legislation, we define crisis legislation as either "first-order" or "second-order" and then consider these designations in the context of both presidential and congressional terms. First-order crisis legislation refers to any statute passed during the same electoral period as a financial crisis. Second-order crisis legislation refers to a statute passed in the electoral period after an intervening election. Anything passed after two successive elections have occurred cannot, in our schematic, be called crisis legislation. Because congressional elections are biannual and presidential elections quadrennial, this period of crisis legislation can extend for as many as eight years beyond a crisis. We recognize that such a window enlarges the period of crisis legislation in ways that may favor the hypothesis. In Section 7 and our online data tools, we consider variations of the crisis-legislation hypothesis using first- and second-order congressional postcrisis periods and first- and second-order presidential ones.[19]

Our schematic does not assert that crises in the more distant past are no longer relevant to financial reform. Ideas can percolate through a political system for decades and even have a profound influence on the shape of subsequent events. We assert instead that the robust causal link that the crisis-legislation hypothesis requires is broken if legislation passes two elections. By then, the short attention span of the electorate has moved on in the ways that the crisis-legislation hypothesis imagines.

The passage of the Federal Reserve Act of 1913 illustrates the importance of this schematic. The Act is often characterized informally as the quintessential example of crisis legislation because it followed the Panic of 1907 and the question of how to resolve such panics weighed heavily on the Congress as of the time. But the period between the legislation's passage and the Panic of 1907 makes that direct causal link untenable. Rather than a knee-jerk populist reaction to crisis, the Federal Reserve Act was passed only after three subsequent congressional elections and two subsequent presidential elections. Woodrow Wilson, who was elected some five years after the Panic of 1907, along with the new Democratic majorities in Congress, crafted the Federal Reserve Act based primarily not on the panics of the Gilded Age but on the "money trust" hearings led by Arsene Pujo and Samuel Untermyer in 1912. Treating the Federal Reserve Act uncritically as a piece of crisis legislation misunderstands the nature of this political economy and fails to explain why the bill differed so dramatically from the proposals that were made (and rejected) immediately in the aftermath of the crisis (Conti-Brown 2016).[20]

---

[19] In particular then, all laws that qualify as first-order also qualify as second order, while the converse does not hold.

[20] Debates about the differences between the Federal Reserve Act and its Republican-proposed predecessor legislation, the National Reserve Association, have been going on since at least the 1920s. See Glass (1927) and Warburg (1930). But there is no doubt that the Democrats made significant changes, not least in the structure and governance of the system. For example, the Federal Reserve Act created 12 Federal Reserve Banks, governed by a government-controlled Federal Reserve Board; the National Reserve Association would have given control to a clearinghouse-like board of private bankers with minimal governmental participation.

Our temporal specifications are consistent with those of the proponents of the crisis-legislation hypothesis. These proponents argue that the haste associated with financial reform necessarily promotes the interests of "policy entrepreneurs" who seek to exploit the focused attention of the electorate to accomplish their own goals rather than reflect on the causes and consequences of financial panic. When multiple elections have passed since a crisis, the time horizon is no longer consistent with the view of "rushed" legislation. While crises in those instances may thus inform the formulation of financial legislation, the populist enthusiasm for financial reform is distinct from the passage of legislation.

3.2.3 Question 3: How to Define "Major" Legislation?

In testing the crisis-legislation hypothesis, it is clearly important to distinguish between legislation that establishes lasting reforms and laws that represent merely technical amendments. To identify "major" legislation, we start by devising continuous metrics of legislative importance based on our text-mining methods. We then take two complementary approaches to discerning which legislation is sufficiently important to be covered by the crisis-legislation hypothesis.

From certain perspectives on practical policy outcomes, there should be little difference between whether a given set of actions is taken in a single law or spread over multiple pieces of legislation. It would be, for instance, an odd proposition to assert that the Securities Act of 1933 and the Securities Exchange Act of 1934 would have been more important or influential had they been passed as a single bill, rather than in subsequent years. Indeed, existing work in political science documents that large changes in policy are at times accomplished through a series of incremental legislative moves (see, for example, Graetz and Shapiro 2011). Thus, as a default, our analyses of the crisis-legislation hypothesis consider all legislation that impacts the US Code in Titles 15 (capital markets legislation) or 12 (banking legislation).

There are many smaller pieces of legislation that are, according to our metrics, 100 or even 1,000 times less important than the most important laws we identify. Because of their low importance ratings, such laws have relatively little impact on the conclusions of our analyses. This arguably obviates the need to draw an arbitrary distinction between "major" legislation and minor.

Nevertheless, to complement this approach, we also consider formulations of our analyses in which we only consider, for instance, the 10 most important pieces of banking or securities legislation according to our metrics. The online tools allow others to modify these specifications however they prefer.

4. Citation Indexing: Background and Motivation

Given the years and decades that many legal scholars spend developing expertise on a small suite of legislation, the notion that algorithms may offer insights into legislative importance

not available to experts may seem audacious.[21] Nevertheless, there are two reasons these techniques can offer new insights. First, there are roughly 600 pieces of legislation that have impacted securities and banking law in the United States between 1912 and 2011. The sheer quantity of legislation makes it extremely difficult to fathom what a purely qualitative analysis of it would look like.[22]

Second, citation indexing allows us to move beyond some of the limitations of qualitative analysis, which is reliant on subjective assessments. For instance, a qualitative analysis of banking law might note that some important pieces of legislation, such as Dodd-Frank and the Banking Act of 1933, were passed shortly after financial crises, whereas others, such as the Federal Reserve Act and the McFadden Act of 1927, were more temporally removed from crises. This approach poses important questions, though: What do these facts mean for evaluating the crisis-legislation hypothesis? Is it mostly true, with a few exceptions? Is it mostly untrue, with a few salient examples that fit it? Is the crisis-legislation hypothesis equally true for banking and securities, or does one area of the law clearly fit better? By their nature, qualitative analyses are not well suited to fully answer these kinds of questions, particularly in situations where scholars may disagree on how much importance to assign to different pieces of legislation.[23]

5.   Defining Metrics of Legislative Importance

5.1 Identifying the Universe of Relevant Laws

A necessary precursor to measuring the importance of financial laws in the United States is to identify the universe of laws that we will study. The US Congress has passed tens of thousands of laws in the past century. These laws are not inherently labeled by Congress as pertaining to "financial regulation" or not, much less as being "banking" or "securities" laws, nor could they be, especially in an age of omnibus legislation, in which many substantive areas are broached in a single large bill (see, for example, Sinclair 2019; Gluck, O'Connell, and Po 2015).

To identify the set of relevant laws, we therefore turn to the US Code, which codifies and compiles all legislation passed by Congress and organizes that legislation under different Titles based on subject area. We focus on Title 15, which contains securities legislation, and

---

[21] The practice does, however, have a long intellectual history and support in fields such as library science and computer science and has proved valuable for assessing the impact of academic articles (Garfield 1955; Garfield and Merton 1979) and for identifying important web pages, such as in Google's PageRank algorithm (Vise and Malseed 2017).

[22] The large number of laws at play also makes it difficult for even deeply versed experts to be meaningfully familiar with all of the relevant legislation. Indeed, a potential advantage of the systematic approach that we take is that it may serve to bring attention to legislation that while important might otherwise be overlooked.

[23] This is not to say that an approach using citation indexing eliminates subjectivity. For instance, we made subjective decisions regarding the sources used when counting citations. The advantage is that we can explicitly articulate the subjective assessments that we make, inviting critique of them, and in many cases, we can compare analytic results across a range of plausible decisions.

Title 12, which contains banking legislation. Each of these Titles contains a set of chapters, organized by subject matter, that further organize their content. Title 15, for instance, covers all "Commerce," not merely securities legislation. Therefore, we focus on the subset of chapters directly pertinent to securities.[24] Title 12 is more specifically focused on banking. We consider the majority of this Title but exclude certain chapters of trivial importance to banking[25] such as, for instance, those segments governing check truncation. Unless otherwise noted, whenever we refer to Title 15 or Title 12 in this article, we are referring only to the chapters that we have selected in this fashion.

The Office of Law Revision Council (OLRC), which produces the US Code, does not simply insert whole pieces of legislation into the respective Titles of the Code. Instead, the chapters of the Code are organized into sections and other divisions that articulate all of the active law on a given subject. As such, the text of each section will generally be the product of multiple laws. "Source credits" appear at the end of each of these sections, stating which laws influenced the section's contents through addition, modification, or repeal.[26] These source credits form the basis for identifying the set of laws relevant to securities and banking legislation. This undertaking is nontrivial. Both Titles 12 and 15 of the US Code are sprawling documents, together covering more than 4,000 print pages and 2 million words. Over the course of our study period, we identify roughly 600 separate pieces of legislation that have amended the chapters of these Titles we examine.

We identify these laws by writing computer programs, based on regular expression matching, to identify the Statutes at Large citations (unique to each law) contained in the source credits to the US Code. We then cross-reference these citations with the OLRC's "Popular Name Tool"[27] to identify the names by which the laws are commonly referred to and the dates on which they were passed.[28] Having generated these lists of laws to consider, we next proceed to constructing our four metrics of legislative importance, each based on a different type of citation to these laws.

---

[24] In particular, we look at Chapter 2A—Securities and Trust Indentures, Chapter 2B—Securities Exchanges, Chapter 2B-1—Securities Investor Protection, Chapter 2C—Public Utility Holding Companies, Chapter 2D—Investment Companies and Advisers, Chapter 98—Public Company Accounting Reform and Corporate Responsibility, and Chapter 109—Wall Street Transparency and Accountability.

[25] Specifically, we exclude Chapter 7—Farm Credit Administration, Chapter 7A—Agricultural Marketing, Chapter 7B—Regional Agricultural Credit Corporations, Chapter 8—Adjustment and Cancellation of Farm Loans, Chapter 9—National Agricultural Credit Corporations, Chapter 10—Local Agricultural-Credit Corporations, Livestock-loan Companies And Like Organizations; Loans To Individuals To Aid In Formation Or to Increase Capital Stock, Chapter 23—Farm Credit System, Chapter 25—National Commission on Electronic Fund Transfers, Chapter 26—Disposition of Abandoned Money Orders and Traveler's Checks, Chapter 27—Real Estate Settlement Procedures, Chapter 31—National Consumer Cooperative Bank, Chapter 37—Solar Energy and Energy Conservation Bank, and Chapter 50—Check Truncation.

[26] For more detail, see http://uscode.house.gov/detailed_guide.xhtml.

[27] See http://uscode.house.gov/popularnames/popularnames.htm.

[28] Certain pieces of very minor legislation are excluded from the OLRC's Popular Name Tool. We exclude these from our considerations as well.

5.2 Metric No. 1: US Code Citations

Our first metric is based on the number of different sections of the US Code that cite a given law in their source credits. New codifications of the US Code are released roughly every six years. Thus, we look to the codification in which a piece of legislation first appears in order to capture its contemporaneous importance.

This focus on contemporaneous importance runs through all our methods. A separate consideration could be one of importance over time: namely, which pieces of legislation have "stood the test of time" and shown themselves to be of lasting importance. We decline to pursue this for two reasons. First, practically speaking, a test of growing importance over time would exclude highly relevant pieces of recent legislation, such as the Dodd-Frank Act. Second, and more fundamentally, whether or not a given law grows in importance over time has much to do with subsequent actions of Congress, regulators, and others. For instance, a law that is passed and then repealed ten years later will generally not grow in importance. But what happens years or decades after a law's passage is a matter of the political economy of those subsequent periods. The crisis-legislation hypothesis, by contrast, is squarely and consistently articulated in terms of the political economy of the Congress that actually passes given laws.

One challenge with our first metric in its simplest form is that over time there is a strong trend towards laws becoming longer and more complex and thus influencing more sections in the US Code.[29] A more complex law, however, is not necessarily a more important one.[30] To address this secular trend, we develop a procedure to normalize the metric. Specifically, for each law, after generating an aggregate count of sections of Title 15 or Title 12 that it introduces, eliminates, or modifies, we divide that count by the total number of sections in in Title 15 or 12 in the next codification to be released following the law's passage. Thus, for example, if a law affected every single section of Title 15 or Title 12 in the codification following its passage, that law would have a normalized importance value of one.

We use a series of regression analyses to more precisely illustrate the presence of these secular trends and the effectiveness of our normalization procedures to control for them. For instance, if we consider all pieces of banking legislation passed in a given year and count the total number of sections of the US Code, Title 12 that cite those laws, and then regress the log of this count plus one on the year plus an intercept, we obtain a coefficient of 0.021 (t-value = 4.890, adjusted R^2 = 0.32). In other words, there is a steady trend by which each passing year increases, on average, the importance of banking legislation passed by roughly 2.1%, and this trend, by itself, explains nearly 1/3 of the variation in banking legislative importance. Performing this test on our normalized metric, however, yields a coefficient of essentially zero (–0.000052) and comparably zero adjusted R^2. When considering the

---

[29]Analyzing a time series with a clear trend, without taking steps such as those we do to address that trend, also creates serious problems for the validity of most forms of statistical analyses.

[30]The Federal Reserve Act of 1913 was a monumental legislative achievement in the 20th century but is 31 pages long; the Sherman Antitrust Act of 1890 reorganized the relationship between large enterprise and the US government but spans less than two pages.

securities legislation in Title 15, the unadjusted version of this regression yields a coefficient of 0.018, while the adjusted version yields a coefficient of –0.0003.[31]

5.3 Metrics Nos. 2– 4

We construct the next three metrics in a conceptually similar fashion and provide details in the appendix. In brief, Metric no. 2 is based on citations of laws in the *New York Times* (NYT)*.* Metric no. 3 is a variant of Metric no. 1, but instead of treating all citations of laws within the US Code the same, we give more weight to provisions of the Code that are more often cited by state and federal courts. The metric is thus in some ways analogous to the Google search algorithms that rank websites based on hyperlinks to them, giving more weight to hyperlinks from more prominent websites. Finally, Metric no. 4 is based purely on the frequency with which provisions of a given law are cited by state or federal courts.

5.4 Combining Importance Metrics

The notion of uncorrelated errors is fundamental to modern statistics and data analysis. This is the reason why, for instance, confidence in any given statistical estimate tends to increase with sample size. Any given observation may be prone to error, in the sense of not being representative of the true population. As long as the errors among observations are less than fully correlated with one another, an unbiased estimator will become more accurate as the sample size increases because observations that lead to an overestimation of a true population value will tend to cancel out with observations that lead to an underestimation of that true population value.

Similarly, a key to our effort to produce credible metrics of legislative importance is to combine the results of multiple metrics. It is easy, for instance, to envision ways that the particular metrics we create might over- or underestimate the importance of certain pieces of legislation. To the extent, however, that these shortcomings are specific to a particular metric, they will be offset as we combine multiple metrics together and the influence of any one type of shortcoming diminishes.

In general, therefore, in the sections of this article that follow, we focus on presenting results that are from combining two or more different importance metrics. In order to combine these metrics, we use the following procedure. First, for each individual metric, we take the sum of the importance ratings over all laws (either in Title 15 or Title 12) and then divide each individual law's importance rating by this sum.[32] This normalizes each metric so that the total importance of all laws under consideration will be one. The fact that the total importance of all laws adds up to one also lends a convenient and common interpretation to the metrics. For instance, a law with a normalized importance rating of 0.05 indicates that

---

[31] Adjusted R^2 on the non-normalized regression is 0.096 and for the normalized regression it is 0.046.

[32]In some of our analyses, we use variations in the sample period of years in which we consider legislation. In others of our analyses, we use variations that include only the top *n* most important laws for various values of *n*. In all of these scenarios, we normalize our metrics to 1. Thus, in a formulation that only considers the top 50 most important laws passed between 1984 and 2011, the sum of the importance scores of those 50 laws will still be 1.

the given piece of legislation represents 5% of total securities or banking importance over our sample period.

After normalizing each metric, we assign, for each law, a combined importance defined by an equally weighted combination of the two or more metrics that are being combined. There is a substantial amount of evidence from other fields of statistics that when combining multiple metrics, equally weighted combinations are optimal. One reason for this is that even if there were, in theory, some unequally weighted combination that would be superior, in practice, attempting to estimate the correct weights to use is extremely difficult and tends to introduce more error than it corrects for.[33]

6.   Assessing Metrics of Legislative Importance

6. 1 Listings of Important Financial Legislation

Figure 1 presents results for our rankings of securities legislation, based on an equally weighted combination of all four of our importance metrics. Figure 2 presents results of our rankings for banking legislation. As described in the appendix, the court-citation-based metrics (nos. 3 and 4) that we develop are defined specifically for 1930 onward and thus do not cover the entirety of our sample of banking legislation. Accordingly, Figure 2 presents results from an equally weighted combination of Metrics nos. 1 (US Code citations) and 2 (NYT citations). Tables of laws for banking legislation that consider a weighted combination over all four metrics, and that are thus restricted to the time periods those metrics are defined for, are available through our online data tools.[34]

---

[33] For an accessible discussion of these notions, see Silver (2012).

[34] In Section 7, we also discuss results of our empirical tests of the crisis-legislation hypothesis for banking legislation when using the first two metrics and the entire sample period, as well as when using all four metrics and a restricted sample period.

Figure 1: Title 15 (Securities Legislation): Equally Weighted Combination of All Four Importance Metrics

This table covers all securities legislation between 1932 and 2011. Importance ratings are normalized to sum to one over all laws considered. Thus, for instance, an importance rating of 0.05 means that a given law represents 5% of all legislative importance over the given sample period. Cumulative importance measures the total importance of all laws up to and including a given law in rank. Thus, if the tenth law reports a cumulative importance of 0.50, it means that the top ten laws have together 50% of all legislative importance. This table presents only the top 30 laws by importance. For a full list of laws and importance ratings, see our interactive online data tools.

Rank	Importance	Date	Law Name	Cumulative Importance
1	0.1485	1934-06-06	Securities Exchange Act of 1934	0.1485
2	0.1190	1933-05-27	Securities Act of 1933	0.2675
3	0.0892	1935-08-26	Public Utility Holding Company Act of 1935	0.3567
4	0.0739	2010-07-21	Dodd-Frank Wall Street Reform and Consumer Protection Act	0.4307
5	0.0591	1940-08-22	Investment Company Act of 1940	0.4897
6	0.0552	2002-07-30	Sarbanes-Oxley Act of 2002	0.5449
7	0.0510	1995-12-22	Private Securities Litigation Reform Act of 1995	0.5959
8	0.0287	1998-11-03	Securities Litigation Uniform Standards Act of 1998	0.6246
9	0.0221	1964-08-20	Securities Act Amendments of 1964	0.6467
10	0.0205	1975-06-04	Securities Acts Amendments of 1975	0.6673
11	0.0197	2000-12-21	Commodity Futures Modernization Act of 2000	0.6870
12	0.0143	1987-12-04	Securities and Exchange Commission Authorization Act of 1987	0.7013
13	0.0136	1970-12-14	Investment Company Amendments Act of 1970	0.7149
14	0.0126	1933-05-27	Trust Indenture Act of 1939	0.7274
15	0.0123	1991-12-19	Federal Deposit Insurance Corporation Improvement Act of 1991	0.7397
16	0.0119	1996-10-11	National Securities Markets Improvement Act of 1996	0.7516
17	0.0081	1990-11-15	Securities and Exchange Commission Authorization Act of 1990	0.7597
18	0.0080	1990-10-15	Securities Enforcement Remedies and Penny Stock Reform Act of 1990	0.7678
19	0.0080	1988-11-19	Insider Trading and Securities Fraud Enforcement Act of 1988	0.7757
20	0.0079	1980-10-21	Small Business Investment Incentive Act of 1980	0.7836
21	0.0074	1968-07-29	Williams Act	0.7910
22	0.0070	1978-05-21	Securities Investor Protection Act Amendments of 1978	0.7980
23	0.0070	1989-08-09	Financial Institutions Reform, Recovery, and Enforcement Act of 1989	0.8050
24	0.0069	1977-12-19	Foreign Corrupt Practices Act of 1977	0.8119
25	0.0068	1978-11-06	Bankruptcy Reform Act of 1978	0.8187
26	0.0062	1935-08-23	Banking Act of 1935	0.8249
27	0.0062	2005-08-08	Energy Policy Act of 2005	0.8311
28	0.0061	1999-11-12	Gramm-Leach-Bliley Act	0.8372
29	0.0058	1984-08-10	Insider Trading Sanctions Act of 1984	0.8430
30	0.0056	1936-05-27	Unlisted Securities Trading Act	0.8486

Source: Authors' analysis

Figure 2: Title 12 (Banking Legislation): Equally Weighted Combination of Metrics No. 1 (US Code Citations) and No. 2 (NYT Citations)

This table covers all banking legislation between 1912 and 2011. As such, it uses only the first two of our metrics, as Metrics nos. 3 and 4 are defined for only the post-1932 period. Importance ratings are normalized to sum to one over all laws considered. Thus, for instance, an importance rating of 0.05 means that a given law represents 5% of all legislative importance over the given sample period. Cumulative importance measures the total importance of all laws up to and including a given law in rank. Thus, if the 10th law reports a cumulative importance of 0.50, it means that the top ten laws have together 50% of all legislative importance. This table presents only the top 30 laws by importance. For a full list of laws and importance ratings, see our interactive online data tools.

Rank	Importance	Date	Law Name	Cumulative Importance
1	0.1468	1913-12-23	Federal Reserve Act	0.1468
2	0.0561	1938-02-03	National Housing Act Amendments of 1938	0.2029
3	0.0551	1933-06-16	Banking Act of 1933	0.2580
4	0.0518	2010-07-21	Dodd-Frank Wall Street Reform and Consumer Protection Act	0.3098
5	0.0454	1935-08-23	Banking Act of 1935	0.3552
6	0.0367	1934-06-27	National Housing Act	0.3920
7	0.0273	1954-08-02	Housing Act of 1954	0.4192
8	0.0265	1989-08-09	Financial Institutions Reform, Recovery, and Enforcement Act of 1989	0.4457
9	0.0235	1948-08-10	Housing Act of 1948	0.4692
10	0.0211	1950-04-20	Housing Act of 1950	0.4903
11	0.0200	1965-08-10	Housing and Urban Development Act of 1965	0.5103
12	0.0168	1927-02-25	McFadden Act	0.5270
13	0.0146	1968-08-01	Housing and Urban Development Act of 1968	0.5416
14	0.0134	1961-06-30	Housing Act of 1961	0.5550
15	0.0131	1957-07-12	Housing Act of 1957	0.5681
16	0.0122	1979-12-21	Housing and Community Development Amendments of 1979	0.5803
17	0.0117	1982-10-15	Garn-St Germain Depository Institutions Act of 1982	0.5919
18	0.0115	1987-08-10	Competitive Equality Banking Act of 1987	0.6034
19	0.0112	1999-11-12	Gramm-Leach-Bliley Act	0.6146
20	0.0110	1951-09-01	Defense Housing and Community Facilities and Services Act of 1951	0.6255
21	0.0105	1996-09-30	Deposit Insurance Funds Act of 1996	0.6360
22	0.0102	1992-10-28	Housing and Community Development Act of 1992	0.6462
23	0.0088	1978-11-10	Financial Institutions Regulatory and Interest Rate Control Act of 1978	0.6551
24	0.0088	2008-07-30	Housing and Economic Recovery Act of 2008	0.6639
25	0.0086	1991-12-19	Federal Deposit Insurance Corporation Improvement Act of 1991	0.6725
26	0.0083	1955-08-11	Housing Amendments of 1955	0.6809
27	0.0081	1994-09-23	Riegle Community Development and Regulatory Improvement Act of 1994	0.6889
28	0.0075	1980-03-31	Monetary Control Act of 1980	0.6964
29	0.0073	1956-08-07	Housing Act of 1956	0.7037
30	0.0071	1983-11-30	Supplemental Appropriations Act, 1984	0.7108

Source: Authors' analysis.

Because there is no observable, absolute "truth" of legislative importance, against which metrics can be judged, we cannot decisively establish that a certain formulation is superior to another. Nevertheless, we believe that in general, readers will find the law rankings produced by combined metrics to be more credible than those generated by single metrics, which we present in the appendix.

In Appendix B, we present two additional exercises to assess the importance metrics we develop. First, we compare our designations of important legislation to those developed by David Mayhew (1991). Mayhew's designations have a different legislative focus than ours and cover a different time period, making them unsuitable to directly use in analyzing the crisis-legislation hypothesis. Nevertheless, we show a strong similarity between our metrics and his for the places where there is overlap. Second, we consider correlation among our four metrics of importance and examine what that may mean for the information contained in each such metric.

7. Results: Testing the Crisis-Legislation Hypothesis

7. 1 Empirical Specification

In our empirical tests of the crisis-legislation hypothesis, we focus on three key statistics: the percentage of total legislative importance passed during crisis periods, the percentage of the total time in our sample that qualifies as crisis periods, and the ratio of these two. In Appendix C, we discuss why we prefer these simple statistics over regression analyses or other statistical tests.

We define a "crisis period" based on two specifications: first, a given crisis definition—say, a 35% or more drop in equity values—and second, the time following such crises during which legislation, if passed, qualifies as crisis legislation. For example, a first-order congressional legislative period contains legislation passed following a crisis but before a new Congress has been elected.[35]

Each of the three statistics we consider gives different insight into testing the crisis-legislation hypothesis. For instance, a finding that 70% of legislative importance was passed during crisis periods might at first appear a relatively strong confirmation of the crisis-legislation hypothesis. Yet this would be rather less remarkable if the given definition of crisis periods encompassed 55% of the total sample period (yielding a ratio of 70:55, or 1.27). Similarly, a ratio of 3:1, comparing importance in crisis periods to time in crisis periods, has substantially different implications for the crisis-legislation hypothesis depending on whether the ratio reflects a finding that 90% of importance is accounted for

---

[35] See Section 3 for details on our definitions.

by 30% of the sample period or a finding that 30% of importance is accounted for by 10% of the sample period.[36]

7.2.1 Defining Our "Baseline" Specification

In general, we eschew arguing for a "preferred" specification for our tests; hence the creation of online tools to permit others to specify at will. Out of necessity, we do select a "baseline" specification to begin our analysis. This baseline then becomes the starting point for examining variations. We choose our baseline based on two criteria: first, that it supports ready comparison between securities and banking legislation, and second, that it yields results reasonably representative of those under an array of specifications.

Specifically, for our baseline specification, we consider second-order congressional legislation. This gives, on average, roughly three years for legislation to be passed following the end of a crisis and still qualify as crisis legislation.[37] Crises themselves often last for one or more years. Thus, this formulation frequently results in a period of four to five years from the beginning of a crisis during which new laws qualify as "crisis legislation." This gives a reasonable amount of time for Congress to pass new laws without being excessive.[38] In general, as we will discuss, this formulation also tends to yield the results that are most strongly supportive of the crisis-legislation hypothesis.

Our baseline specification uses equity drops of 35% or more to designate equity crises. We consider the full sample of securities legislation, from 1932 to 2011, and the full sample of banking legislation, from 1912 to 2011. Because only our first two metrics of legislative importance are defined over the full sample period, we consider an equally weighted combination of these two in our baseline. Finally, our baseline specification considers all pieces of legislation, rather than imposing a cutoff that considers only a certain number of the most important laws.

7.2.2 Results under the "Baseline" Specification and Variations Thereof

Given these specifications, we find fairly strong support for the crisis-legislation hypothesis when considering securities legislation. For instance, we find that second-order congressional-legislation periods account for 84.1% of the weight of important legislation impacting Title 15, whereas only 26.6% of time in the sample fell into these periods, yielding

---

[36] In the latter case, the results would show a substantially elevated level of legislative activity following crises but would still suggest that these crisis periods can only account for a relatively small portion of total legislative importance.

[37] Congressional terms are two years. Thus, if a crisis is equally likely to end at any point during a two-year congressional term, on average it will end in the middle, in other words, one year from term's end. Extending the legislative period to the end of the following Congress thus yields three years.

[38] Second-order presidential periods, by contrast, last on average six years past the end of a crisis. While this certainly makes it much easier for important laws to qualify as crisis legislation, it also tends to encompass many years with minimal legislative activity within crisis periods and, likewise, to result in fairly high percentages of total US history qualifying as crisis periods. For instance, if one chooses a 30% drop in equity values as defining an equity crisis and a second-order presidential period as the threshold for crisis legislation, then 55% of US history between 1932 and 2011 qualifies as crisis periods.

a ratio of importance-in-crises to time-in-crises of 3.2. If we restrict consideration to the top 10 most important securities laws, crisis periods now account for 94.6% of the weight of important securities legislation. Adding in our two additional metrics of legislative importance, both based on court-opinion citations, reduces this but only modestly, yielding again 84.8% of the weight of important legislation accounted for by crisis periods.

This finding is in general robust over different time periods. For instance, even if we start our sample in 1940, after the passage of key New Deal–era securities laws, we still find that 79.1% of the weight of important legislation is accounted for by 19.6% of time spent in crisis periods, for a ratio of 4.0.[39] We also investigate the implications of modifying the crisis period— in other words, the amount of time following crises by which legislation still counts as crisis-driven. If we consider only first-order congressional legislation (starting from 1932), the ratio goes up significantly, to 5.2, although the percentage of total legislative importance explained by crisis periods drops to 66.4%.[40] Moving in the other direction, if we consider second-order presidential legislation, the ratio drops notably, to 2.3. In this formulation, 94.6% of importance is accounted for by crisis periods, but those periods cover 41% of the sample period.

We find less support for the crisis-legislation hypothesis when investigating banking legislation. On the one hand, across nearly all of our specifications, we find an elevated incidence of important banking legislation following banking crises—in other words, we find ratios of significance-in-crises to time-in-crises above one. But this degree of elevation is far less than that for securities legislation, and in general, crises immediately precede half or less of banking legislative importance.

Returning to our baseline specification[41] but now applied to banking legislation, we find 35.8% of total importance accounted for by 27.5% of total time in crisis periods, for a ratio of 1.3. If we restrict comparison to the top 10 most important laws, this ratio rises modestly to 1.6. If we maintain the restriction to the top 10 laws but now begin our sample period in 1940 and use an equally weighted combination of all four metrics, the ratio of importance-in-crises to time-in-crises rises to 2.3, but this is in the context of crises still accounting for only a bare majority (50.5%) of total legislative importance.

The most favorable results in support of the crisis-legislation hypothesis for banking legislation are generally found by starting the sample period in 1932. This excludes from the sample the 1913 Federal Reserve Act—one of the most important pieces of US banking legislation and one that was passed at some remove from prior financial crises—while

---

[39] These results are under the specification that considers an equally weighted combination of our first two importance metrics and only considers the ten most important pieces of securities legislation. If we use a combination of all four metrics, the ratio drops modestly to 3.2.

[40] This is under the formulation that considers the top 10 laws and the first two metrics. A weighted combination of all four metrics yields a ratio of 4.7. Using all four metrics and the top 20 laws, rather than the top 10, yields a ratio of 4.2.

[41] The baseline specification covers the full sample period, which, for banking laws, extends from 1912 to 2011. The baseline further uses an equally weighted combination of our first two importance metrics. Finally, the baseline uses second-order congressional legislative periods.

including key pieces of New Deal legislation, such as the Banking Act of 1933 and the National Housing Act of 1934. Starting in 1932 and using an equally weighted average of our first two metrics yields a ratio of 1.7, though even here, this represents only a minority, 44.7%, of legislative importance, accounted for by 26.3% of the sample in crisis. If we use an equally weighted combination of all four metrics, this result is largely unchanged, with 48.1% of importance now accounted for by crisis periods. Restricting results to the top 20 laws under this formulation increases the ratio to 2.1 (55.6% of importance accounted for by crises); and restricting to the top 10 laws yields a ratio of 2.5 (66.3% of importance attributed to crisis periods).[42]

It is possible that these findings therefore offer modestly strong support for the crisis-legislation hypothesis as applied to banking laws, though the hypothesis would still fit far less well than it does for securities legislation. Nevertheless, we deem it likelier that these findings are a result of the particulars of the sample selection. For instance, if we start the sample period in 1940, rather than in 1932, we get a result in which 36.9% of legislative importance is accounted for by 22.2% of time in crisis periods (a ratio of 1.7).[43]

In any event, even taking the most extreme of these results as given, we believe a finding that 66.3% of banking importance is attributable to crisis periods falls far short of justifying any of the policy implications derived from the crisis-legislation hypothesis. In particular, reformers would still be ill-advised to follow an advocacy strategy that leaves out more than one-third of the important banking reforms of the past century. Sixty-six percent of important legislation passed during crises would hardly qualify the hypothesis as an "iron law," according to which important legislation is "invariably" crisis driven, nor would such a finding support the contention that crisis legislation can explain why we have the bank regulatory system that we have and why it is so (allegedly) dysfunctional.

7.2.3 Distributions of Results over Wider Ranges of Specifications

The results we describe above give a representative overview of the literally thousands of different specifications one could consider within our analytic framework. One approach that we take to gain a broader perspective is to consider simultaneously multiple different specifications and to compute distributions of our three key statistics over those different specifications. For this, we consider the following possibilities: Equity crises can be defined as a 30%, 35%, or 40% drop in equity values; the crisis period can be first-order congressional, second-order congressional, or first-order presidential; the start year for banking legislation can be 1912, 1932, or 1940; the start year for securities legislation can be 1932 or 1940; the importance metric can be a weighted combination of all four metrics or just our first two; and the laws considered can be all laws, only the top 10, only the top 20

---

[42] Both of these figures use the equally weighted combination of all four metrics of importance. Using other variations yields similar results, though generally modestly lower ratios.

[43] This considers all laws and a weighted average of our first two metrics of importance. The ratio drops to 1.5 if only the first two metrics are used. It increases back to 1.7 if we then restrict to the top 20 laws and goes to 1.6 when we consider only the top 10.

or only the top 50. All of these analyses end the sample period in 2011.[44] These combinatorics yield 144 different specifications for securities legislation and 60 for banking legislation.[45]

Figure 3 plots the distributions of the percent of importance in crises and the ratio of percent importance to percent time in crises across these different specifications. For securities legislation, the median across these specifications is 62% of importance in crises, compared to 41% for banking legislation. In other words, in the majority of these specifications, crisis legislation accounts for less than half of total banking legislative importance. Similarly, the median ratio across the specifications is 3.1 for securities legislation, whereas for banking it is 1.8.[46] Figure 1 shows that while certain specifications provide moderately high ratios or percentages of time in crises for banking legislation, the center of the distributions for both of these statistics is much lower than for securities.

---

[44] In Appendix E, we consider variations that end the sample period in 1983 and that begin the sample period in 1984.

[45] The relatively smaller quantity of banking legislation options exists because we use only a single measure of banking crises, as defined by Reinhart and Rogoff (2009).

[46] For all of these statistics, the means are nearly identical. Full details can be calculated by replicating these specifications using our online data tools.

Figure 3: Distributions of Statistics over Ranges of Plausible Variations

(a)   (b)
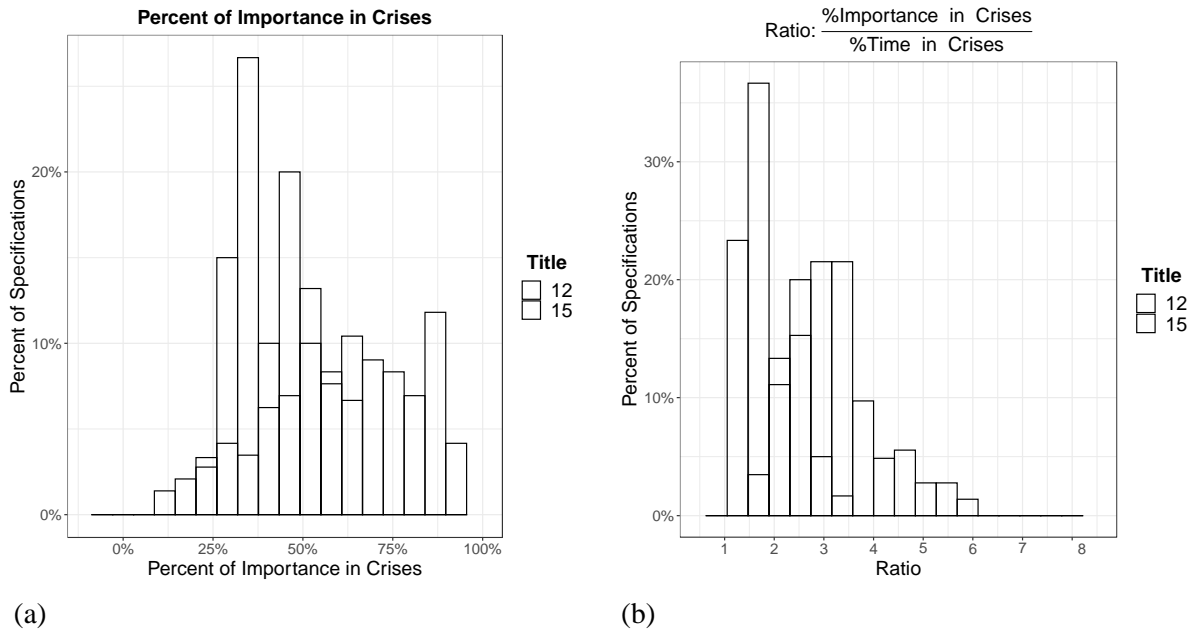
Areas shaded in the intermediate gray color indicate overlaps between the distributions of statistics for Titles 12 (banking) and 15 (securities). These two histograms calculate two of the three statistics that we define in Section 7.1 over a range of plausible specifications. We describe the precise set of these specifications in Section 7.2.3, also providing certain summary statistics of the distributions depicted in this figure. Each of the histograms presented here can be precisely replicated using our online data tools as described in Section 7.3.

Source: Authors' analysis.

Many of the articulations of the crisis-legislation hypothesis in prior literature assert that all or nearly all important legislation follows crises. We find it almost impossible to find support for that proposition in banking law as measured by our metrics of importance. A modestly weaker formulation of the hypothesis might say that crisis legislation "dominates" a field of law. Even this is hard to justify for banking legislation, given the results from our metrics. For instance, to support such a contention, we might expect to see, at the very least, 75% of legislative importance accounted for by crisis legislation, with crisis periods accounting for less than—and ideally substantially less than—50% of the sample period. None of the specifications we consider above fit that criteria for banking legislation.[47] By contrast, 42 of the specifications fit it for securities legislation.

At the same time, if one adopts a sufficiently weak version of the crisis-legislation hypothesis, namely, that there is some degree of elevation in legislative activity during periods following crises, then almost all the plausible specifications we consider support this for both banking and securities legislation.

7. 3 Online Data Tools

All the statistics and figures that we present in the preceding discussion are calculated directly using our online data tools. As such, any reader can reproduce them without possessing formal knowledge of computer coding or familiarity with the precise details of our data and algorithms. Our main goal, however, in providing these tools is to allow readers to explore our data flexibly. In this section, we briefly describe the tools and what they enable users to accomplish.

We have created two complementary data tools. We call the first the "individual law explorer," available at http://ohlrogge.law.nyu.edu:3838/apps/Crisis_Legislation/Individual_Laws/. We call the second the "distribution comparison tool," available at http://ohlrogge.law.nyu.edu:3838/apps/Crisis_Legislation/Histograms/. Both allow users to choose from the range of variations in specifications that we discuss in our earlier analyses. In particular, users may specify the definition of financial crises, the crisis period (say, second-order presidential crisis-legislation periods), the start and end years for the analyses, which metrics or combinations of metrics to consider, and whether to restrict the analyses to a certain top number of laws. Given these specifications, both tools present the three key statistics we have discussed: the percentage of legislative importance passed during crisis periods, the percentage of time in the sample period that qualifies as a crisis period, and the ratio of these two.

---

[47] This is not to say that there is no specification that can produce this result for banking legislation. Our online data tools allow readers a great amount of flexibility, and a very small number of specifications can be found to support almost any contention. The challenge, however, is to find hypotheses that are supported widely across reasonable specifications, or to build a convincing case that the small minority of specifications that fit a particular hypothesis are actually the most theoretically correct. We welcome further efforts by readers on either of these fronts.

The individual law explorer is designed to give a micro view of a particular specification. Given a set of choices over each of the variations we consider, the law explorer will display a table of the most important financial legislation, including the specific importance values assigned to each law. This allows users to gauge the extent to which the ranking and importance assigned to the laws under the particular specification seem credible. Given this particular specification, the individual law explorer will then calculate and present the three statistics we study for that specification. Finally, the individual law explorer allows users to exclude specific laws from the calculations of these statistics. Thus, if users wish to experiment with different versions of the crisis-legislation hypothesis that exclude certain types of statutes, this tool will enable them to do so.

The distribution comparison tool, by contrast, presents a macro view of the results of our methods. On the one hand, it can be used to reproduce any given set of statistics displayed on the individual law explorer.[48] But whereas the individual law explorer allows users to select only one specification at a time, the distribution tool is designed primarily to allow users to select multiple different specifications simultaneously. Just as in the analyses we present in Section 7.2.3, the distribution comparison tool will then consider the combinatorial possibilities among all of the options a user selects.

8.   Interpretation and Robustness of Results

To many readers, the most surprising aspect of our findings may be that only a modest elevation in banking legislation follows banking crises. In this section, we investigate possible explanations for this. In doing this, we add a dimension of qualitative and historical analysis to what have previously been largely quantitative investigations.

We first consider whether this result is driven by deregulatory legislation being passed during noncrisis periods. We next briefly discuss other variations on the crisis-legislation hypothesis, such as whether crises play a unique role in facilitating legislation opposed by certain segments of the financial industry, or legislation aimed at reducing systemic risk, or other such variations. We then examine the extent to which our results are driven by one law or a small group of laws. We conclude by presenting a narrative description of some of the ways that noncrisis legislation has shaped the US banking system. In so doing, we seek to add color and context to what otherwise may be abstract numerical results. In particular, since a major conclusion of this paper is that reformers should not limit advocacy efforts to

---

[48] One other small difference between the two tools is that as currently designed, the individual law explorer will only consider at most the top 100 most important laws according to any given specification. The distribution explorer, by contrast, has options to consider "All" laws, as well as specific numbers. The reason for this difference is simply in the user interface tools. For the individual law explorer, we employ a slider bar to allow users to select any number from 1 to 100 of the top laws to consider. This gives the user a large degree of flexibility. Because the statistics presented in the distribution explorer are precalculated, it would be less practicable to precalculate them for all 100 different possible options. However, a disadvantage of the slider bar is that if we extend it to 600 to encompass all laws, it would become much more difficult to differentiate between, say, the top five versus the top seven laws.

periods following crises, we seek to make more concrete the contributions of noncrisis legislation.

8.1 Are Banking Results Driven by Deregulatory Legislation?

As currently formulated, our metrics seek to quantify the importance of legislation, but they do not directly measure whether laws increase or decrease the extent of government intervention in financial markets. Therefore, if a hypothetical law were to repeal Title 12 in its entirety, it would rank very highly on our importance metrics (and rightly so). This raises the possibility, however, that the substantial amounts of noncrisis banking legislation that our metrics detect might be laws that reduce, rather than increase, government intervention in the banking system. If so, then our findings for banking legislation would be more consistent with the crisis-legislation hypothesis than the numerical results presented so far indicate.

One potential response to this would be to devise an additional set of quantitative metrics to assess not just how important those laws are, but the direction of their impact, perhaps along some regulatory-deregulatory axis. Given the limits of space and scope in this article, not to mention the question of whether such a measurement endeavor would even be tractable, we decline to pursue such an option here. Fortunately, however, our existing metrics still position us well to address this question of deregulatory legislation. This is because the metrics do generate a manageable set of important laws to consider, and from these, we can evaluate qualitatively which laws might conceivably be considered deregulatory and then consider how our results might change if we exclude those laws.

Interestingly, we identify only four major banking laws enacted in the past 100 years that could even plausibly be considered primarily deregulatory. These laws are the Gramm-Leach-Bliley Act of 1999, the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994, the Garn–St Germain Depository Institutions Act of 1982, and the Monetary Control Act of 1980. We ourselves consider designations of these laws as "de-regulatory" to be simplistic. For example, the Gramm-Leach-Bliley Act of 1999 (GLB) is often viewed as one of the most important pieces of pro-industry, de-regulatory legislation in history, abolishing key elements of the Depression-era Glass-Steagall Act. But GLB also introduced extraordinary compliance costs for privacy and other consumer protections, a concession to secure the legislative coalition required to push it through Congress.[49] Some estimates of these GLB compliance costs are as high as $2 billion and $5 billion a year (MacCarthy 2011, 435).[50] This complexity belies the Manichaean political economy of the crisis-legislation hypothesis but is less surprising under other political theories of financial legislation.

---

[49] Such trade-offs of provisions favorable to multiple different factions are common throughout banking legislative history. See also, for instance, the Competitive Equality Banking Act of 1987, which combined introduced new capital regulations for some institutions, loosed capital regulations (through forbearance programs) for other institutions, and loosened interstate branching restrictions, amongst many other provisions.

[50] For more on the rise of compliance costs following Gramm-Leach-Bliley, see Mearian (2001) and Miller (2014).

The other pieces of plausibly deregulatory legislation exhibit similar complexity. For instance, the Riegle-Neal Interstate Banking and Branching Efficiency Act can in some ways be seen as a counterpart to GLB, abolishing restrictions on banks operating in multiple states simultaneously that had operated for most of the past century. Yet this law was passed in the wake of the savings and loan (S&L) crisis, qualifying it as crisis legislation under most of our formulations.[51] Similarly, while Riegle-Neal expanded the abilities of banks to own interstate branches, it made doing so contingent on satisfactory ratings under the Community Reinvestment Act (CRA), thereby effectively strengthening the influence of CRA regulatory requirements. The Monetary Control Act of 1980, which abolished the "Regulation Q" cap on deposit account interest rates, might seem to better fit the narrative of deregulation during noncrisis periods. But although 1980 is not identified as a crisis period in our metrics, 1980 is generally understood to mark the beginning of the turmoil that resulted in the S&L crisis, and the Monetary Control Act of 1980 was passed in response to the increasing financial strain put on banks by soaring interest rates and the collapse of the Bretton Woods Agreement.

For these and other reasons, we resist what we consider oversimplifying designations of laws as pro-regulatory or deregulatory. Nevertheless, for the sake of argument, we consider variations on our analyses that exclude these laws. Doing so has almost no impact on our conclusions. For instance, in our baseline analyses, removing these moves us from showing that 35.8% of important banking legislation occurs during crisis periods to showing that 36.7% of important legislation follows crises.

Why should removing these laws have so little impact on our conclusions? One reason is that, as discussed above, at least one of these laws was in fact passed during a crisis period. Thus, removing all four of them reduces legislative importance in *both* crisis and noncrisis periods, leaving the percent of total importance in noncrisis periods less affected. Another, more subtle reason that removing these laws has relatively little impact on our results is that none of them had particularly high importance ratings in the first place. We hesitate to delve too deeply into the accuracy of any given law's importance rating; a key contention of our work is that the metrics are accurate assessments *on average*. Nevertheless, we note that both GLB's repeal of banking activity restrictions and Riegle-Neal's repeal of branching restrictions were preceded by several decades of gradual reductions in these restrictions. Thus, rather than momentous, these laws were in many ways incremental, as is widely recognized by scholars (see, for example, Wilmarth 2017). Indeed, much of the deregulation that GLB and Riegle-Neal finished was accomplished during the S&L crisis of the 1980s. This occurred through regulatory changes as well as through laws such as the Competitive Equality Banking Act of 1987, which loosened activity and branching restrictions while increasing capital requirements and supplementing fiscal assistance for failing banks. Indeed, were we to account more fully for all of the deregulatory aspects of legislation passed during the 1980s S&L crisis, our total "pro-regulatory" importance passed during banking-

---

[51]Reinhart and Rogoff designate the S&L crisis as spanning 1984 to 1992, meaning Riegle-Neal qualifies as second-order congressional legislation. Other accounts of the S&L crisis, such as that by the Federal Deposit Insurance Corporation, date it as extending through 1994, making Riegle-Neal even more clearly crisis legislation (FDIC 1997).

crisis periods would decline even further, making our results even less supportive of the crisis-legislation hypothesis.

In short, the large amount of important banking legislation that we find during noncrisis periods cannot be explained by noncrisis laws being primarily deregulatory.

8.2 Other Variations on the Crisis-Legislation Hypothesis

In Section 8.1, we show that even if we exclude from our importance metrics the set of laws that might plausibly be classified as deregulatory, the results for banking legislation remain at odds with the crisis-legislation hypothesis. Nevertheless, one can imagine alternative versions of the hypothesis that divide legislation according to criteria beyond simply whether the laws increase or decrease government intervention in financial markets. For instance, perhaps it is laws that are opposed by industry that are uniquely passed following crises, or laws that seek to reduce systemic risk, or laws that share some other common characteristic.

As we argue above, designating laws as pro- or deregulatory is a fraught affair. This applies likewise to nearly any other variation on the crisis-legislation hypothesis one might consider. And, while it is tractable to enumerate the list of even plausibly deregulatory laws, attempting to do that for each conceivable variation on the crisis-legislation hypothesis goes beyond the scope of this article. In large part, then, we state simply that our results do not rule out the possibility that there is some specific type of legislation that is entirely or almost entirely passed postcrisis.

Nevertheless, we can at the very least rule out absolutist forms of the crisis-legislation hypothesis, "iron laws," so to speak, that state that some type of legislation is "invariably," passed following crises. For instance, it cannot be that crises alone enable legislation opposed by the financial industry to be passed. While we do not attempt to evaluate such a hypothesis numerically, laws such as the Financial Institutions Supervisory Act of 1966 or the Community Reinvestment Act of 1977 belie the iron-law theory of such legislation. Similarly, neither can it be that financial crises are unique in enabling legislation aimed at reducing bubbles or systemic risk. Laws such as the Bank Holding Company Act of 1956 or the International Banking Act of 1978 were aimed at least in part at these problems and were passed during noncrisis periods.

Thus, while we cannot assert that crises play no role in driving this or that particular characteristic of legislation, we nevertheless feel confident in advising reformers that they should think twice before believing that it will be impossible or even impractical to advance such laws during noncrisis periods.

8.3 Dependence of Results on Specific Legislation

The next consideration we explore in this section is the extent to which our results are driven by specific pieces of legislation. We first consider the Federal Reserve Act, which stands prominently at or near the top of importance via most of our metrics and is consistently designated as a noncrisis law. Are our findings about the importance of noncrisis banking

legislation really just findings about the importance of this single law? Our quantitative metrics are particularly useful here because they allow a rapid evaluation of how much our conclusions depend on specific aspects such as this.

In our baseline that includes the Federal Reserve Act, crisis-legislation accounts for 35% of banking legislative importance. If we exclude the Federal Reserve Act, crisis legislation accounts for 41% of importance.[52] This is a noticeable increase, but hardly one that suggests our conclusions are driven by this single law.

Alternatively, we consider variations on our analyses that would classify the Federal Reserve Act as crisis legislation. As we describe in section 3.2.2, the Federal Reserve Act was not passed for three congressional elections and two presidential elections following the Panic of 1907. As such, it is hard to square it with the political economy presupposed by the crisis-legislation hypothesis, which envisions Congress making rash decisions to satisfy popular outrage in the immediate aftermath of a crisis. The significant time lag between the Panic of 1907 and the passage of the Federal Reserve Act means that it does not qualify as crisis-legislation under any of the definitions we use in this paper.

Nevertheless, for the sake of argument, we could consider "fourth order" congressional postcrisis periods and "third order" presidential postcrisis periods, which would be necessary for the Federal Reserve Act to qualify as crisis legislation. As we report in section 7.2.2, our baseline specification for banking crises (based on a second-order congressional postcrisis period) finds 35.8% of total importance accounted for by 27.5% of total time in crisis periods, for a ratio of 1.3. If, to include the Federal Reserve Act, we move instead to a fourth-order congressional postcrisis period, then 59.5% of total importance will now be accounted for by crisis periods. Nevertheless, 40.1% of all time periods will then qualify as crisis periods. The ratio of importance in crisis periods to time in crisis periods, under this fourth-order designation only increases to 1.5. For presidential postcrisis periods, moving from first-order periods, which would not include the Federal Reserve Act, to third-order periods that would include the Federal Reserve Act, actually results in a decrease of this ratio, from 1.3 (for first-order presidential periods) to 1.2 (for third-order presidential periods).[53]

Thus, while a sufficiently long postcrisis period can be constructed to label the Federal Reserve Act as crisis legislation, doing so only modestly increases support for the crisis-legislation hypothesis. The greater amount of total legislative importance captured by the longer postcrisis periods is largely balanced out by the fact that a much larger amount of total US history now qualifies as a crisis or post-crisis period. Accordingly, just as excluding the Federal Reserve Act does relatively little to change the overall conclusions of our analysis, stretching the definition of crisis periods to include the Federal Reserve Act also does relatively little to change our overall results.

---

[52] If we restrict consideration to the top 100 laws, as in the online individual law explorer, the figure from excluding the Federal Reserve Act is 42.8% of importance in crisis periods.

[53] The ratio of importance in crises to time in crises using second-order presidential postcrisis periods is 1.2.

In addition to the Federal Reserve Act, legislation relating to housing, much of which pertains to the creation and regulation of the government-sponsored enterprises (GSEs), stands out prominently near the top of our lists of important banking legislation. Another question, then, may be the extent to which our results are driven by these laws governing GSEs and housing finance. Given that a checking account and a home mortgage (usually GSE backed) are probably the two most salient ways that most Americans interact with the banking system, excluding these laws might seem quite strange. Furthermore, a key motivation for many scholars pursing the crisis-legislation hypothesis is to understand the root causes of the dysfunction in the American financial system. Romano (2014) describes the GSEs as "ground zero" for the 2008 financial crisis, devoting a sizable section to criticizing Dodd-Frank for not doing more to address problems with the GSEs. It would therefore seem quite odd that legislation concerning the GSEs would not fall within the ambit of the crisis-legislation hypothesis. Nevertheless, for the sake of argument, we consider a rough variation on our analyses that removes all laws with "housing" or "home" in their titles. This moves total importance attributed to crisis periods from 35% to 43%. Thus, even when we remove housing- and GSE-related legislation, it is hard to find strong support for the crisis-legislation hypothesis in banking law.

8.4 How Noncrisis Legislation Has Shaped US Banking

A central contention of this article is that noncrisis periods remain viable for reformers to pursue the changes to the financial system. In this section, we briefly survey the ways that noncrisis legislation has shaped US banking. Our goal is to make our results more concrete, and similarly to highlight how many important reforms over the past century would have gone unmade had advocates focused on passing laws only in the aftermath of crises. We examine three areas in which significant legislative innovations occurred outside of periods of crisis: holding company legislation, housing finance, and consumer financial-protection and civil-rights legislation. There is no unified theory behind the slow development of financial legislation in these areas, except that it was largely not passed within first-order periods of crisis. If statutory development requires a unified theory, it cannot be the crisis-legislation hypothesis.

8.4.1 Holding Company Legislation

Since the creation of "national banks" under the National Banking Acts of 1863 and 1864, the US banking system has existed on two levels of chartering, state and federal. This bifurcation created what is now called the "dual banking system," an unusual feature of the US financial system not followed in other countries. The result in the late 19th and early 20th centuries was that national banks and state banks followed different chartering requirements, such that national banks were restricted to a single bank per building, whereas states promulgated different rules for state banks. By the late 1920s, there was a wide divergence of standards for national and state banks, leaving uncertainties about how groups of banks would be regulated, if at all.[54]

---

[54] For more on the development of the dual banking system, see Scott (1977).

The McFadden Act of 1927 was the first attempt to resolve the differing regulation of these groups of banks. The Act accomplished several goals, including subjecting national banks to state law on branching rather than the federal standard put in place before then.[55] This was a compromise bill that was cheered by few, but it endured for almost 70 years, until its repeal in 1994. It also represented the beginning of serious regulation of bank-holding companies. The Act furthermore subjected all banks, regardless of their membership status within the Federal Reserve System, to many of the same rules on, for example, interactions with subsidiaries. Given that only a third of banks were members of the Federal Reserve System at the time, this aspect of the Act represented a substantial expansion of federal power over the banking system.

Although the Banking Acts of 1933 and 1935 made some minor changes to the status of holding companies, the next major piece of legislative reform did not come not until the Bank Holding Company Act (BHCA) of 1956.[56] The BHCA arose out of a multidecade effort by the Federal Reserve to regulate anticompetitive consequences of the McFadden Act, including a failed effort to use the Clayton Antitrust Act of 1914 to force the breakup of the largest of these holding companies, A.P. Giannini's Transamerica, the predecessor to Bank of America. It was an effort "to restrict geographic expansion of large banking groups and, more broadly, to prevent excessive concentration in the commercial banking industry" (Omarova and Tahyar 2011, 120). Legislation to that effect had been pending in Congress for more than two decades and, by the time of its enactment, elicited, in one Fed official's words, a collective "a sigh of relief—and exhaustion—almost without precedent in the annals of American banking."[57] The exhausted relief stemmed from the major federal intervention in what had been the mostly state-level regulation of bank holding companies. Although the initial legislation required frequent congressional revision, the 1956 BHCA set the stage for federal dominance of bank holding companies for the years and decades following. By the 1960s, the holding company had become "a popular means of expanding the size of the market area served by banks," and, in the decades since, it has emerged as the dominant form of organizing financial assets in the United States.[58] To keep pace with the changes initiated in 1956, Congress enacted major revisions to bank mergers (in 1960 and 1966), a substantial expansion of holding-company legislation (in 1970)[59] (see Avraham, Patricia, and James 2012).[60]

The Financial Services Modernization Act of 1999, better known as Gramm-Leach-Bliley (GLB), was another dramatic expansion of holding company legislation. Although perhaps

---

[55] The Act also terminated six years early the 20-year charters for the Federal Reserve Banks and attempted to resolve the different regulations that applied to members of the Federal Reserve System versus others, 44 Stat. 1224 (Feb. 25, 1927).

[56] Pub. L. No. 84-511, §§ 1-12, 70 Stat. 134, 135 (1956).

[57] Robertson (1956).

[58] McLeary (1968).

[59] See Bank Merger Act: Pub. L. 86–463, 74 Stat 129 (May 13, 1960); Bank Merger Act Amendments of 1966: Pub. L. 89–356, 80 Stat 7 (Sept 21, 1966); and Bank Holding Company Act Amendments of 1970: Pub. L. 91–607, 84 Stat. 1760 (1970).

[60] Avraham, Patricia, and James (2012).

best known for its repeal of important parts of the New Deal–era Glass-Steagall Act, GLB expanded federal authority over holding companies and all financial institutions that interacted with consumers. GLB created the "financial holding company," a term defined through compliance with the intricate framework set up by Congress but generally referring to a bank holding company that can engage in "an expanded range of financial activities, including investment banking and insurance activities," so long as they are "well capitalized and well managed" after an annual supervision by the Federal Reserve (Kress 2019, 33)[61] This structure enshrined the holding company as a primary legislative unit, a phenomenon that Congress expanded with the passage of both Dodd-Frank in 2010 and the Economic Growth, Regulatory Relief, and Consumer Protection Act of 2017. Importantly, this trajectory—with only Dodd-Frank as the exception—was not shaped by crisis, but an often slow, deliberate, compromise-driven process over many decades.

8.4.2 Housing Finance

One of the most profound ways congressional action has shaped the US banking system is through the creation of the GSEs. These entities purchase mortgages on a massive scale and thus support housing finance by banks and other lenders. The National Housing Act of 1934, passed in the wake of the Great Depression, laid the foundation for the GSEs. Yet the 1934 legislation only envisioned private mortgage associations purchasing loans backed by the Federal Housing Administration (FHA). It was not until 1938, at more significant remove from the Great Depression, that the Housing Act Amendments of 1938 created Fannie Mae, engineering a much more direct government intervention.

Furthermore, even under the 1938 authorization, the scope of the loans that Fannie could purchase was tiny. At its pre–World War II peak, Fannie had only $211 million in loan assets (Howard 2014), less than 1% of the more than $23 billion in outstanding debt on individual mortgages at the time (US Department of Commerce 1942). Later legislation, such as the Housing Act of 1948, authorized Fannie to buy Veteran Administration (VA)–backed loans. In 1950 alone, Fannie acquired more than 130,000 loans, close to double the total volume it had processed in its entire history up to that point (Howard 2014). Fannie's expansion continued with the Emergency Home Finance Act of 1970, which authorized it to buy conventional loans not backed by the FHA or VA. This further tripled the loans Fannie was authorized to purchase (US Department of Housing and Urban Development n.d.). Congress continued the expansion of the GSEs in 1968 with the Housing and Urban Development Act of 1968, which created Ginnie Mae.[62] The Emergency Home Finance Act of 1970 then created Freddie Mac, and the Education Amendments of 1972 created Sallie Mae. At nearly every step of the way, these key financial reforms that increased government financial intervention in housing finance occurred during times when no crises were in sight.

---

[61] Kress (2019, 178) argues persuasively that although GLB represents a major de jure expansion of legal authority, the Fed has mostly ignored that authority.

[62] Thus, Ginnie was created by the same Act that privatized Fannie. See, generally, Hagerty (2012, 38, *supra* note 6).

8.4.3 Consumer Financial Protection and Civil Rights

Through the 19th and much of the 20th centuries, there was no federal concept of consumer financial protection beyond common-law and state-law contractual and antifraud provisions (Fleming 2018). This changed with the passage of the Truth-in-Lending Act of 1968 (TILA),[63] the brainchild of Senator Paul Douglas, who was responding to a growing coalition of consumer groups that diverged from the structural reforms more closely associated with antitrust and banking regulation more generally. Douglas had sought to make uniform credit disclosure more readily available and enforceable since at least 1960, but the legislative moment was not right in large part because of strong industry opposition to these standards.[64] In 1966, Democrats swept the House of Representatives and the power of the consumer as a political class ascended in force. The final bill—a compromise that focused exclusively on disclosure—was a lopsided victory in the face of these changing political dynamics, with a 92–0 vote in the Senate for its passage.

Few if any pieces of banking legislation match the Truth-in-Lending Act for its impact on the workaday experience of credit intermediation in the United States. Every credit instrument—mortgages, credit cards, personal loans, student loans, and much more—is subject to its requirements. And those financial institutions that continue to seek to evade the clarity of its required disclosures are subject to enforcement from across the federal government.

The election of 1968 and the years following Richard Nixon's rise and fall as a major political force made the politics of consumer financial protection and financial civil rights an unpredictable needle to thread. Congress responded to this with a series of laws, most importantly the Equal Credit Opportunity Act of 1974 (ECOA)[65] and the Community Reinvestment Act of 1977 (CRA).[66] These statutes served different purposes and came about through fundamentally different processes, despite their proximity in passage. The ECOA prohibited discrimination originally "on the basis of sex or marital status" in "any aspect of a credit transaction"[67] (Gelb and Palley 1979). Despite broad consensus that sex discrimination should be prohibited in banking, the ECOA had to be passed as a rider to a statute that raised the limit of deposit insurance from $20,000 to $40,000. The House of Representatives only voted on the ECOA in the conference on the deposit insurance bill.[68] Broader categories of antidiscrimination—eventually to include race, religion, nation of origin, and age—were added a few years later.

Today, the ECOA is the primary mechanism to enforce antidiscrimination in lending relationships and dominates supervision and examination of financial institutions by the Consumer Financial Protection Agency. Its prominence within banking regulation has grown

---

[63] As codified in 15 USC § 1601 et seq.

[64] On the history of consumer politics in Congress, see Pertschuk (1982).

[65] As codified in 15 USC § 1691 et seq.

[66] As codified in 42 USC § 5301 et seq.

[67] 15 USC § 1691.

[68] See Reeves (1983).

in recent years as the CFPB filed its first disparate impact suit under the ECOA's authority and has expanded its reach to include protection for members of the LGBTQ community (CFPB 2021; Taylor 2018).

The Community Reinvestment Act (CRA), passed just three years later, was designed to correct the problem of redlining, the discriminatory practice of "deliberately avoiding making loans in black communities" (Baradaran 2019, 232). The architecture of the bill looked more like the ECOA than the Truth-in-Lending Act, in that the banks both had to disclose the level of lending in low-income—and largely minority—neighborhoods (a disclosure regime), data that was then used by federal supervisors to determine whether the banks were "Outstanding" or in "Substantial Noncompliance." Banks that received low scores on their CRA exams were then blocked from a variety of bank practices, including, notably, new mergers and applications for new business lines, raising the possibility of deal-making between community groups that sought better CRA compliance and banks that wanted to expand their reach (Calomiris and Haber 2014). The CRA continues to this day to be a very influential piece of legislation, with a significant amount of modern scholarship devoted to measuring the size and nature of its impacts on lending (Barr 2005; Agarwal et. al 2012; Ding and Nakamura 2021). The Home Mortgage Disclosure Act of 1975 (HMDA) was similarly designed to combat discriminatory lending practices, this time by adding requirements that banks publicly disclose a volume and detail of lending information that rivals or surpasses what is required under prominent disclosure legislation in other fields of law, such as the Sarbanes–Oxley Act of 2002.

8.4.4 Additional Pieces of Major Noncrisis Banking Legislation

The three areas of law that we've highlighted are merely examples of the many important ways in which noncrisis legislation has shaped modern banking. In the realm of capital regulation, for instance, the International Lending Supervision Act of 1983 was the first time legislation required federal banking agencies to set minimum capital adequacy standards for banks. Considering prudential supervision, the Financial Institutions Supervisory Act of 1966 gave regulators the authority for the first time to remove officers and directors for unsafe or unsound behavior. Money-laundering legislation has been significantly shaped by noncrisis laws, such as the Currency and Foreign Transactions Act of 1970 (more widely known as the Bank Secrecy Act) and the Patriot Act of 2001. Lastly, the Small Business Administration (SBA) was established by legislation in 1953. In the decades following its creation, the SBA processed hundreds of billions of dollars of federally subsidized bank loans and took on even further prominence in administering hundreds of billions of dollars of additional relief (via subsidized bank loans) as part of the congressional response to COVID-19.

9.   Conclusion

For some time, scholars have articulated a hypothesis with testable propositions: Financial reform in the United States is invariably driven by financial crisis. This narrative has been articulated both by those who see crises as providing the necessary impetus to enact

important (if imperfect) reforms and those who see crises as leading to misguided and counterproductive laws.

Although the hypothesis rests on testable assumptions, no one has tested them. This article takes up the challenge of formally and quantitatively evaluating part of this narrative, focusing separately on securities and banking legislation. To do so, we develop a suite of novel empirical methods to measure the importance of hundreds of pieces of financial legislation based on the methodological foundations of citation indexing.

For securities legislation, we find support for a robust version of the crisis-legislation hypothesis. Across a range of specifications, "crisis legislation" in securities accounts for large majorities of total legislative importance, even while the periods immediately following financial crises constitute a small amount of our sample period.

For banking legislation, the picture is different. On the one hand, we consistently find evidence of elevated legislative activity in banking laws in periods following crises. But the degree of elevation is far less than for securities laws. Very frequently in these specifications, crisis legislation can account for only half or less of total legislative importance in banking. We flesh out our quantitative assessments with a narrative account spanning nearly two dozen important pieces of noncrisis legislation that have helped to shaped modern banking.

This work has important methodological and substantive implications for the study of the legislative process, financial crises, and the political economy of finance. Methodologically, the approach we develop here is not specific to the evaluation of the crisis-legislation hypothesis: Citation indexing and legislative importance are important for virtually every field of study that relies on legislative outputs. Substantively, there are two key projects that our work can trigger. First, the crisis-legislation hypothesis requires an adjustment, in light of the divergence between capital markets and the banking system. Second—and related— there is no clear explanation in the literature for the divergence between Congress's greater relative attention to corrections in the capital markets and its more constant engagement with the banking system. Each of these questions will require further elaboration.

10.   References

Abadie, Alberto, Susan Athey, Guido W. Imbens, and Jeffrey M. Wooldridge. 2017. "Sampling-based vs. Design-based Uncertainty in Regression Analysis." Cornell University. arXiv preprint arXiv: 1706.01778. June 6, 2017.
https://arxiv.org/abs/1706.01778

Agarwal, Sumit, Efraim Benmelech, Nittai Bergman, and Amit Seru. 2012. "Did the Community Reinvestment Act (CRA) Lead to Risky Lending?" NBER Working Paper 18609. doi:10.3386/w18609. December 2012.
https://www.nber.org/papers/w18609

Avraham, Dafna, Patricia Selvaggi, and James Vickery. 2012. "A Structural View of U.S. Bank Holding Companies." *FRBNY Economic Policy Review 18, no. 2: 65–81.* July 2012.
https://www.newyorkfed.org/medialibrary/media/research/epr/2012/EPRvol18n2.pdf

Armour, John, Dan Awrey, Paul Davies, Luca Enriques, Jeffrey N. Gordon, Colin Mayer, Jennifer Payne. 2016*. Principles of Financial Regulation.* New York City, NY: Oxford University Press.

Bainbridge, Stephen M. 2010. "Dodd-Frank: Quack Federal Corporate Governance Round II." *Minnesota Law Review* 95: 1779–1821.
https://scholarship.law.umn.edu/mlr/464

Banner, Stuart. 1997. "What Causes New Securities Regulation? 300 Years of Evidence." Washington University Law Review 75, no. 2: 849–55.
https://openscholarship.wustl.edu/law_lawreview/vol75/iss2/6

———. 1998. *Anglo-American Securities Regulation: Cultural and Political Roots, 1690–1860*. Cambridge, UK: Cambridge University Press.

Baradaran, Mehrsa. 2017. *The Color of Money: Black Banks and the Racial Wealth Gap*. Cambridge, MA: Harvard University Press.

Barr, Michael S. 2005. "Credit Where It Counts: The Community Reinvestment Act and Its Critics." *New York University Law Review* 80, no. 2: 513–652.
https://repository.law.umich.edu/articles/60/

Barro, Robert J., and José F. Ursúa. 2017. "Stock Market Crashes and Depressions." *Research in Economics* 71, no. 3: 384–98.
https://doi.org/10.1016/j.rie.2017.04.001

Binder, Sarah, and Mark Spindel. 2017. *The Myth of Independence: How Congress Governs the Federal Reserve*. Princeton, NJ: Princeton University Press.

Calomiris, Charles W., and Stephen H. Haber. 2014. *Fragile by Design: The Political Origins of Banking Crises and Scarce Credit*. Princeton, NJ: Princeton University Press.

Consumer Financial Protection Bureau. 2021. "CFPB Clarifies That Discrimination by Lenders on the Basis of Sexual Orientation and Gender Identity Is Illegal." Consumer Financial Protection Bureau, news release, March 9, 2021. https://www.consumerfinance.gov/about-us/newsroom/cfpb-clarifies-discrimination-by-lenders-on-basis-of-sexual-orientation-and-gender-identity-is-illegal/

Coffee, John C., Jr. 2012. "The Political Economy of Dodd-Frank: Why Financial Reform Tends to be Frustrated and Systemic Risk Perpetuated." *Cornell Law Review* 97: 1019–82. https://scholarship.law.columbia.edu/faculty_scholarship/517/

Conti-Brown, Peter. 2016. *The Power and Independence of the Federal Reserve*. Princeton, NJ: Princeton University Press.

Conti-Brown, Peter, and Brian D. Feinstein. 2021. "The Contingent Origins of Financial Legislation." *Washington University Law Review* 99: 145–219. https://wustllawreview.org/2021/11/23/the-contingent-origins-of-financial-legislation/

Ding, Lei, and Leonard Nakamura. 2019. "'Don't Know What You Got till It's Gone': The Community Reinvestment Act in a Changing Financial Landscape." *Journal of Real Estate Research* 43. November 2019.

Eichengreen, Barry, and M. Bordo. 2002. "Crises Now and Then: What Lessons from the Last Era of Financial Globalization?" In *Monetary History, Exchange Rates and Financial Markets: Essays in Honour of Charles Goodhart*, edited by Paul Mizen. Cheltenham, UK: Edward Elgar, 52–91.

Federal Deposit Insurance Corporation (FDIC). 1997. *An Examination of the Banking Crises of the 1980s and Early 1990s*. Vol. I. https://www.fdic.gov/bank/historical/history/vol1.html

Fleming, Anne. 2018. *City of Debtors: A Century of Fringe Finance*. Cambridge, MA: Harvard University Press.

Garfield, Eugene. 1955. "Citation Indexes for Science." *Science* 122, no. 3159: 108–11.

———. 1979. "Citation Indexing: Its Theory and Application in Science, Technology, and Humanities." New York: John Wiley & Sons, Inc.

Gelb, Joyce, and Marian Lief Palley. "Women and Interest Group Politics: A Comparative Analysis of Federal Decision-Making." *The Journal of Politics* 41, no. 2: 362–92. May 1979.

Gerding, Erik F. 2013. *Law, Bubbles, and Financial Regulation*. London, U.K.: Routledge.

Glass, Carter. 1927. *An Adventure in Constructive Finance*. New York: Doubleday, Page & Company.

Gluck, Abbe R., Anne Joseph O'Connell, and Rosa Po. 2015. "Unorthodox Lawmaking, Unorthodox Rulemaking." *Columbia Law Rev*iew 115, no. 7: 1789–1865. https://openyls.law.yale.edu/bitstream/handle/20.500.13051/4719/Unorthodox_Lawmaking__Unorthodox_Rulemaking.pdf?sequence=2.

Goetzmann, William N. 2016. *Money Changes Everything: How Finance Made Civilization Possible.* Princeton, NJ: Princeton University Press.

Graetz, Michael J., and Ian Shapiro. 2011. *Death by a Thousand Cuts: The Fight Over Taxing Inherited Wealth*. Princeton, NJ: Princeton University Press.

Grossman, Richard S. 2010. *Unsettled Account: The Evolution of Banking in the Industrialized World since 1800*. Princeton, NJ: Princeton University Press.

Hagerty, James R. 2012. *The Fateful History of Fannie Mae: New Deal Birth to Mortgage Crisis Fall.* Chellenham, U.K.: The History Press.

Howard, Timothy. 2014. *The Mortgage Wars: Inside Fannie Mae, Big-Money Politics, and the Collapse of the American Dream*. New York: McGraw Hill Professional.

Hail, Luzi, Ahmed Tahoun, and Clare Wang. 2018. "Corporate Scandals and Regulation." *Journal of Accounting Research* 56: 617–71.

Kingdon, John. 2010. *Agendas, Alternatives, and Public Choices*. New York: Pearson. Second edition.

Kress, Jeremy C. 2019. "Solving Banking's 'Too Big to Manage' Problem." *Minnesota Law Review* 104, no. 33: 171–241.

Kroszner, Randall S., and Raghuram G. Rajan. 1994. "Is the Glass-Steagall Act Justified? A Study of the US Experience with Universal Banking Before 1933." *The American Economic Review* 84, no. 4: 810–32.

MacCarthy, Mark. 2011. "New Directions in Privacy: Disclosure, Unfairness, and Externalities." *Journal of Law and Policy Information* 6: 425–512.

Mahoney, Paul G. 2015. *Wasting a Crisis: Why Securities Regulation Fails*. Chicago: University of Chicago Press.

Mayhew, David R. 1991. *Divided We Govern*. New Haven, CT: Yale University.

McLeary, J. W. 1968. "Bank Holding Companies: Their Growth and Performance." *Economic Review (Federal Reserve Bank of Atlanta)* 53, no. 10. October 1968.

Mearian, Lucas. 2001. "Compliance with New Regulations Costs Millions." CNN.com, July 3, 2001. https://www.cnn.com/2001/TECH/industry/07/03/regs.cost.firms.idg/index.html.

Miller, Geoffrey P. 2014. *The Law of Governance, Risk Management, and Compliance*. Philadelphia, PA: Wolters-Kluwer.

Omarova, Saule T., and Margaret Tahyar. 2011. "That Which We Call a Bank: Revisiting the History of Bank Holding Company Regulation in the United State." *Review of Banking & Financial Law* 31: 113–98.

Palshikar, Girish. 2009. "Simple Algorithms for Peak Detection in Time-Series." *Proceedings of the 1st International Conference "Advanced Data Analysis, Business Analytics and Intelligence."* Ahmedabad, India, June 6–7, 2009.

Pertschuk, Michael. 1983. *Revolt Against Regulation: The Rise and Pause of the Consumer Movement*. Berkeley: University of California Press.

Rahman, K. Sabeel. 2012. "Democracy and Productivity: The Glass-Steagall Act and the Shifting Discourse of Financial Regulation." *Journal of Policy History* 24: 612–43.

Reeves, Ed. 1983. "The Federal Reserve and the Equal Credit Opportunity Act: A Marriage of Inconvenience." *Annual Review of Banking Law* 2: 301–23.

Reinhart, Carmen M., and Kenneth Rogoff. 2009. *This Time Is Different: Eight Centuries of Financial Folly*. Princeton, NJ: Princeton University Press.

Robertson, James L. 1956. "Long View of the Bank Holding Company Act: Address before the Independent Bankers Association, Twelfth Federal Reserve District at the American Bankers Association Convention". Los Angeles, CA, October 22, 1956. https://fraser.stlouisfed.org/title/statements-speeches-james-louis-robertson-929/a-long-view-bank-holding-company-act-36092

Romano, Roberta. 2005. "The Sarbanes-Oxley Act and the Making of Quack Corporate Governance." *Yale Law Journal* 114: 1521–1611.

———. 2014. "Regulating in the Dark and a Postscript Assessment of the Iron Law of Financial Regulation." *Hofstra Law Review* 25: 43–93.

Scott, Kenneth. 1977. "The Dual Banking System: A Model of Competition in Regulation." *Stanford Law Review* 30: 1–50.

Seib, Gerald F. 2008. "In Crisis, Opportunity for Obama." *Wall Street Journal*, November 21, 2008. https://www.wsj.com/articles/SB122721278056345271

Silver, Nathaniel. 2012. *The Signal and the Noise: Why So Many Predictions Fail—But Some Don't*. New York: Penguin.

Sinclair, Barbara. 2019. *Unorthodox Lawmaking: New Legislative Processes in the US Congress.* Washington, DC: CQ Press.

US Department of Commerce, Bureau of Foreign and Domestic Commerce. 1942. "Indebtedness in the United States 1929–41." 21 Economic Series, May 1942.

US Department of Housing and Urban Development, Office of Policy Development and Research. n.d. "US Housing Market Conditions—Historical Data—Table 16. Mortgage Originations, 1–4 Family Units by Loan Type: 1970–Present." Accessed January 12, 2018. https://www.huduser.gov/periodicals/ushmc/spring97/histdat2.html)

Taylor, Winnie. "The ECOA and Disparate Impact Theory: A Historical Perspective." *Journal of Law and Policy* 26: 575–635.

Vise, David, and Mark Malseed. 2017. *The Google Story*. New York: Macmillan.

Warburg, Paul. 1930. *The Federal Reserve System: Its Origin and Growth*. New York: The Macmillan Company.

Wessel, David. 2012. "Decoding New Rules for Banks." *Wall Street Journal*, October 17, 2012. https://www.wsj.com/articles/SB10000872396390444592704578062251222752268

Wilmarth, Arthur. 2017. "The Road to Repeal of the Glass-Steagall Act." *Wake Forest Journal of Business and IP Law* 17: 441–548. https://scholarship.law.gwu.edu/cgi/viewcontent.cgi?article=2556&context=faculty_publications

11.   Appendixes

# Appendix A: Illustrations of Online Data Tools

Figure 4: Online Data Tools—Individual Law Explorer
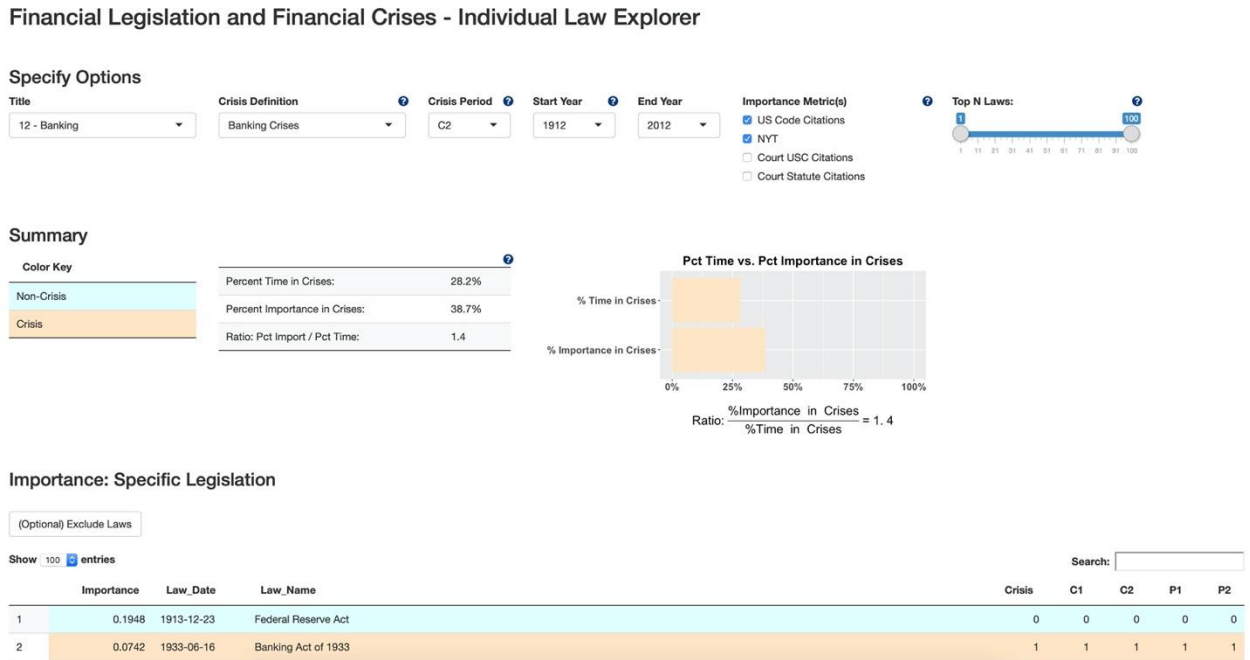
Source: Individual Law Explorer and authors' analysis.

Figure 5: Online Data Tools—Comparing Results Across Specifications

Title 12 vs. Title 15: Comparing Results Under Ranges of Specifications

Display App Overview

Specify Options

Equity Crisis Definition ❓	Crisis Period	Start Year Title 12	Start Year ❓ Title 15	End Year	Importance Metric(s) ❓	Top N Laws:
☐ Equity 25% Drop	☐ C1	☑ 1912	☑ 1932	☑ 2011	☐ US Code Citations	☑ All
☐ Equity 30% Drop	☑ C2	☐ 1932	☐ 1940	☐ 1983	☐ NYT	☐ 2
☑ Equity 35% Drop	☐ P1	☐ 1940	☐ 1984		☑ US Code + NYT	☐ 3
☐ Equity 40% Drop	☐ P2	☐ 1984			☐ Court USC Citations	☐ 5
☐ Equity 45% Drop					☐ Court Statute Citations	☐ 10
☐ Equity 50% Drop					☐ All Metrics Combined	☑ 20
						☐ 50
						☐ 100

Histograms

Summaries of Histograms

Title	Mean	Median	Max	Std Dev	N Specifications	Title	Mean	Median	Max	Std Dev	N Specifications	Title	Mean	Median	Max	Std Dev	N Specifications
12	27.5%	27.5%	27.5%	0%	2	12	39.7%	39.7%	41.7%	2.9%	2	12	1.4	1.4	1.5	0.1	2
15	26.6%	26.6%	26.6%	0%	2	15	88.2%	88.2%	91.2%	4.3%	2	15	3.3	3.3	3.4	0.2	2

Source: Distribution Comparison Tool and authors' analysis.

Appendix B: Additional Details on Legislative Metrics

A. Metrics Nos. 2–4: Construction

Metric no. 2: Law Citations by the New York Times

Our second metric draws upon a completely different type of citation: references to laws made in the *New York Times* (NYT). We chose the *Times* because it was a prominent national newspaper of record for the duration of our sample period. To make the computation of this metric practicable, we focus on the one-month (31 calendar day) period following the passage of each law.[69] During that period, for each of the laws identified in our prior metric, we search the historical archives of the NYT to identify all articles that reference that law.

The NYT metric is the exception to our effort to standardize the metrics and computations used in this article. As we discovered when initially attempting to craft this metric, there is no simple or standardized way that a given piece of legislation is referenced in the NYT. For instance, some NYT articles directly reference the "Federal Reserve Act." Other articles, by contrast, refer to it by names such as the "Glass-Owen Act," the "Currency Bill," the "Money Bill," or many other variations. Thus, while it would be far simpler and easier to search only for the most common title by which a bill is referred, this has the potential to yield badly skewed results based on the arbitrary condition of how standardized a bill's name was at the time of its passage.

To confront this challenge, we adopt a more manual process for uncovering the pertinent articles in the NYT. Our procedure begins by searching the NYT for the most common name or names associated with a law, as, for instance, given in the Office of Law Revision Council (OLRC)'s Popular Name Table. The articles returned in this fashion frequently use multiple different methods for referring to the law, methods we in turn adopt to generate new search terms.

From here, we expand the searches further, investigating the content of the law, based on both our reviews of secondary sources regarding the law and information in the articles we have found regarding the law. For instance, many articles about the Dodd-Frank Act focus on the Consumer Financial Protection Bureau (which the Act created) and Elizabeth Warren, who was appointed as the first head of the bureau. We use information from these investigations to generate further search terms. Finally, we use a set of general search terms that we have found through experience are often useful for picking up references to legislation not otherwise captured. For instance, articles on legislation frequently mention the name of the US president who signed the bill, with this name occurring in the article near the word "sign" or some variation thereof. Similarly, we use searches for terms such as "bank," "stock," and "finance" near other terms such as "reform," "legislation," "mandate," and so forth.

---

[69] See our discussion in Section 5.2 regarding our focus on the contemporaneous importance of legislation.

Through all of these search procedures, we use ProQuest's search code syntax, which enables us to avoid the same article's being returned by multiple searches.[70] This greatly reduces the amount of material that needs to be reviewed, thereby enhancing the efficiency and accuracy of the process.

We initially developed these search procedures ourselves. We then worked to train a team of research assistants to implement them. We provided the research assistants with detailed instructions and feedback on their work. To ensure accuracy, we required that each research assistant be able to complete at least three consecutive laws with results that matched what we had obtained doing our own searches before we would begin using that research assistant's work in generating our metrics. We also reviewed the set of search terms used by every research assistant (RA) on every law and made suggestions for any they might have missed. Finally, we manually reviewed every newspaper article returned by the research assistants to validate that they indeed did pertain to the laws in question.[71] A full set of articles identified for each law is available upon request.

Given these specifications, then, we simply measure the importance of each piece of legislation based on the number of NYT articles that cite it in the 31 days following its passage.[72] We investigate whether these importance metrics based on NYT citations exhibit the same secular trend that the US Code metrics do, thus potentially requiring a similar normalization procedure. In fact, although we find that laws get longer and more complex with time (producing a secular trend in our first metric), NYT articles about laws do not, nor do they become systematically more or less numerous. In particular, when we regress the natural logarithm of importance on year (using the same specifications described above), we find a coefficient of only –0.0002 (in other words, a 0.02% decline in importance per year) for Title 12, and of –0.00035 for Title 15, with adjusted R^2 values of 0.01 and 0.028 respectively. Thus, we do not employ any normalization for our NYT-based metric.

Our next two metrics draw in citation information from another new source, this time federal and state court opinions obtained from the Free Law Project's database.[73] This database covers more than 1 million cases up to the end of 2018, which is when we last accessed the data for this project. Coverage of US court cases in this database is very close to

---

[70] In particular, we utilize the "not" statement to exclude from each new search any articles that met the criteria of prior searches.

[71] In general, we eliminated only a small number of articles in this way. The eliminations were usually situations in which the article referenced activity by federal regulators that occurred near the time of a law's passage but that was in response to prior legislation enacted by Congress. Our training of the RAs stressed the value of returning overinclusive, rather than underinclusive, results, as we much preferred to leave these more difficult judgments to ourselves. In a small number of cases, laws contain a mixture of content, some of which does not pertain to financial reform. For instance, the Crime Control Act of 1990 contained an important component of the legislative response to the savings and loan crisis, creating, for instance, new mechanisms by which bank employees could bring whistleblower claims against their employers based on violations of federal law. Yet, this Act also contained many other provisions, dealing, for instance, with gun-free school zones, that clearly are not pertinent to financial legislation. In these cases, we consider only those articles that directly relate to financial reform.

[72] We do not, therefore, attempt to rate articles based on their length, depth of treatment, or other factors.

[73] See https://free.law/.

comprehensive for later periods but sparser in earlier periods. For instance, the very first court case to cite provisions of Title 12 of the US Code does not appear until 1927, and the citations in next several years after that are relatively sparse. For what we describe as modern securities legislation, which began with the Congress elected in 1932 and its passage of the Securities Act of 1933, this is not a major problem. By the 1930s, there were a substantial number of cases citing both Title 15 and Title 12.

Thus, we are able to use metrics that draw on court opinions for the full time period we analyze for securities legislation. For banking legislation, by contrast, these metrics are not meaningfully defined for laws such as the 1913 Federal Reserve Act. For consistency across banking and securities legislation, we choose 1932 as the start date for applying court-opinion-based metrics to Title 12 as well.[74]

The first of our importance metrics that draw on judicial citations is inspired by the component of Google's search algorithms that weights links more heavily if they are made by a more popular website. We adapt this principle to create, as our third metric, a modified version of our first metric (as described in Section 5.2). In Metric no. 1, we simply count the total number of sections of the US Code that cite to a given law in their source credits, thus weighting each section equally. A potential concern with this approach is that some sections of the US Code are more important than others, and thus a law that modifies an obscure and unimportant section is probably less significant than a law that modifies a prominent one. Thus, for Metric no. 3, we seek to use court-case citations of sections of the US Code to determine which are the most important sections.

Specifically, for each law, we count the number of judicial opinions that cite a section in Title 12 or 15 that the law amended, introduced, or repealed. Thus, if a law impacts only sections of the US Code that are effectively irrelevant for the purposes of writing judicial opinions, then it would receive no importance under this metric. Conversely, laws that impact frequently cited provisions of the US Code receive greater importance under this metric. With more than 1 million cases in the Free Law Project to search, we managed these computations using custom-written software, again based on regular expressions, to comprehensively mine the court cases for citations of the US Code. Because of the diversity of citation formats employed by different courts over different time periods, the development and honing of this software required considerable time.[75]

Just as legislative length and complexity have increased over time, requiring normalization of our first metric, so too the number of judicial opinions citing Titles 12 and 15 has risen over time, requiring normalization of this metric. For each law, we consider the 10 years following its passage.[76] For each of these years, we measure the total number of judicial opinions that cite Title 12 or 15 and calculate the fraction of those opinions that cite sections introduced or amended by the given piece of legislation. We then take the average of these

---

[74] In Section 7, we discuss further details on how the time periods these metrics are defined for relate to the results of our analyses.

[75] Details, including the complete code that we used, are available upon request.

[76] If less than 10 years is available, we use the amount of time we have and scale all calculations accordingly.

fractions over all 10 years. As with our first metric, then, this ranges from a value of 1, which would indicate that every single court case dealing with Title 12 or 15 cites provisions impacted by a given law, and 0, which would indicate complete irrelevance of a law as far as court citations are concerned.

Metric No. 4: Direct Judicial Citations

Our third metric uses judicial citations but draws upon citations of legislation in the US Code as well. Our fourth and final metric, by contrast, makes no use of citations from the US Code and employs judicial opinions in a way distinct from Metric no. 3. When a court opinion references statutory law, it may do so in different ways. In almost all cases, a court will reference the version of that law codified in the US Code. It is these citations that Metric no. 3 uses. In some instances, however, a court will also directly cite the original law. Our fourth metric makes use of the direct citations to laws that appear in judicial opinions, as given by references to the statute-at-large citation or the public-law number of a law. As with Metric no. 3, we write custom software to mine the million cases in the Free Law Project

database, covering the many different formats in which these citations may appear.

Under this metric, a law's importance is defined by the number of unique court cases that cite it directly within 10 years of the law's passage. In calculating this, we consider only cases that also cite some provision of either Title 12 or Title 15 (depending on which type of legislation we are evaluating). The purposes of this is to address legislation that may impact, for instance, both banking and tax. We want only to ascribe banking significance based on cases that interpret banking law. This parallels the approach we take with US Code citations: considering only the impact of a law on Title 12 or 15, rather than the total number of citations to it that appear anywhere in the US Code.

After we count the number of cases within 10 years of a law's passage that directly cite that law and Title 12 or 15 of the US Code, we normalize, dividing by the total number of cases that cite any provision of Title 15 or 12, respectively, within that 10-year period.[77] Thus, for instance, if every single case that cites Title 12 directly references a given piece of legislation, then that law would receive the highest possible importance rating under this metric, which is 1.

Metrics nos. 3 and 4 complement each other in some respects, with each containing desirable features that help to address the other's potential weaknesses. A scenario of potential concern with Metric no. 3 is a law that makes many trivial modifications to various sections of the US Code. The US Code source credits, upon which Metric no. 3 draws, cite all laws that make any modification to a given section of the Code, thus not directly discriminating between fundamental and superficial changes. A trivial law such as this would be far less

---

[77] To fully clarify, we compute these metrics separately for securities and banking legislation. Thus, for securities legislation, we consider all cases that cite the securities chapters in Title 15. For banking legislation, we consider all cases that cite the banking provisions of Title 12.

likely to be cited directly within a court opinion and thus score relatively low on Metric no. 4.

Metric no. 4, however, also has its limitations. A scenario of concern here would be a piece of legislation that modifies many components of the US Code apart from those titles pertaining to banking or securities legislation.[78] In this situation, when a court opinion cites that legislation directly, it may be ambiguous whether it really reflects the importance of the law vis-à-vis financial legislation or some other area of law. By only considering court cases that also cite some component of Title 15 or Title 12, we take significant steps to alleviate this concern. Nevertheless, these may not fully resolve it. Under Metric no. 3, by contrast, any provisions of a law that influence the US Code outside of Titles 15 or 12 will be ignored in creating the metric, thus eliminating this concern.

A final potential advantage of Metric no. 3 over Metric no. 4 is that there is more total data available to generate the former. The reason for this is that nearly all cases that deal with federal legislation will cite the US Code, whereas only a subset of these will directly reference a given law.[79] With a larger pool of cases to draw on, therefore, Metric no. 3 may offer reduced variance. At the same time, direct citations of a law, rather than just its codification, may indicate that the law is particularly important for the resolution of a case, thereby potentially favoring Metric no. 3. Therefore, rather than attempting to make a judgment that one of these judicial-citation-based metrics is clearly superior, we present both as complements to each other and give readers through our online data tools great flexibility in examining how results vary depending on the metric used.

B. Assessing Legislative Importance Metrics

Comparing Our Metrics to an External Source on Legislative Importance

We provide additional validation that our metrics capture meaningful information on legislative importance by examining how closely our metrics relate both to each other and to an external source of information on legislative importance. For a source of external information, we turn to the lists of significant legislation developed by Mayhew (1991) and since updated through 2016.[80] Mayhew investigates whether Congress passes more significant legislation in periods of unified party control of government. He therefore develops lists of what he deems "important" laws passed by each Congress from 1948 to

---

[78] The Crime Control Act of 1990, discussed in Section 5.3

[79] To some extent, conventions for whether a court opinion will cite to the US Code, to a piece of legislation directly, or to both, are set by individual judges and courts. Frequently, however, this is left to a judge's case by case discretion. We do therefore observe some variation from year to year in the total number of citations directly to laws, as used in Metric no. 4. But we do not observe a consistent secular trend in this variation. We also do not observe substantive differences among, for instance, state vs. federal courts, in how frequently they cite laws directly. Furthermore, the normalization that we use in creating this metric will address at least some remaining potential concerns regarding variation among courts in their citation practices.

[80] See http://campuspress.yale.edu/davidmayhew/datasets-divided-we-govern/. We are grateful to Roberta Romano for suggesting that we incorporate Mayhew's analysis into our findings.

2016. Mayhew draws these distinctions based, for instance, on contemporary press accounts of legislation and ex-post evaluation by scholars.

Mayhew's task does not perfectly mirror our own for several reasons. First, he is interested in the overall importance of legislation, rather than the importance of financial regulation. There are some pieces of legislation that are important for other areas of law (such as tax) that only impact financial regulation in minor ways.

Furthermore, Mayhew does not assign a numerical significance to laws; laws are either important or not in his analysis. This has two implications. First, even with regard to laws that we and Mayhew agree are important, our metrics contain substantially more variation. In our metrics, but not in Mayhew's, laws A and B can both be important, but B can be 50% more important than A. Conversely, since our techniques are applicable to all pieces of legislation, our metrics, unlike Mayhew's designations, contain variation even among laws of more modest (but still nonzero) significance.

In total, then, we view Mayhew as a useful complement to, but not a substitute for, our methods. Likewise, even if there were, for instance, perfect agreement between our metrics and Mayhew's regarding which pieces of legislation are "important," one would still anticipate substantial variation between our metrics and his because our metrics are continuous and his are binary. Despite these limitations, we find Mayhew's designations useful as a source of external comparison for our metrics.

When comparing our metrics to Mayhew's, we start with a simple question. Of the laws that our metrics find most important, how many does Mayhew also consider important? For this and all other comparisons to Mayhew, we consider our metrics only over laws passed after 1947, the start date of Mayhew's metrics. For both securities and banking legislation, four of the top five most important laws that we identify are also identified by Mayhew as important. Seven of the top 10 banking laws we identify as important are also considered important by Mayhew, and four of the top ten securities laws we identify as important are also considered as such by Mayhew.

We next consider regressions that seek to predict the importance we assign to laws based on Mayhew's designations and vice versa. In total, Mayhew considers as important 29 pieces of banking legislation that appear within our set of laws and nine pieces of securities legislation. Given these, we examine a series of linear regressions of the form

$$Importance_i = \alpha + \beta * Mayhew_i + \varepsilon_i$$

Here i indexes individual laws. *Importance* represents a law's importance under one of our metrics, α is a constant, and *Mayhew* represents a binary indicator for whether a given piece of legislation was identified as important by Mayhew. To aid interpretability of results, we normalize each of our importance metrics by first subtracting their mean and then dividing by their standard deviation. Thus, for example, a coefficient of 2.0 means that a law being designated by Mayhew as important correlates with a two-standard-deviation increase in one of our importance metrics.

Figure 6 presents the results of these analyses for both securities and banking legislation. One interesting finding is that for both securities and banking legislation, Mayhew's ratings have the highest R^2 when predicting importance according to our combined metric. We do not consider this a precise or dispositive test. Nevertheless, it lends some credence to the notion that taking equally weighted averages over multiple metrics makes for more accurate methods overall.

Figure 6: The relationship between our importance metrics and Mayhew's

Each of the rows in these tables presents the results of a linear regression of the form

$$Importance \ = \ \alpha + \beta Mayhew + \varepsilon$$

where *Importance* represents one of our metrics of legislative importance, α is a constant, and *Mayhew* represents a binary indicator for whether a given piece of legislation was identified as important by Mayhew. Since Mayhew's work spans 1947 to the present, all of these analyses cover our metrics for that period as well. "Coef" in these tables represents the coefficient estimate on the "Mayhew" variable, and "t-stat" represents the HW robust t-stat on that coefficient. We normalize each of our importance metrics by first subtracting their mean and then dividing by their standard deviation. Thus, for example, a coefficient of 2.0 means that a law being designated by Mayhew as important correlates with a two-standard-deviation increase in one of our importance metrics.

Metric	R^2	Coef	t-stat
#1: US Code	0.16	1.44	1.97
#2: NYT	0.24	1.75	1.84
#3: Court US Code	0.13	1.28	2.21
#4: Court Statute	0.28	1.88	2.35
Combined	0.30	1.93	2.43

(a) Title 15

Metric	R^2	Coef	t-stat
#1: US Code	0.17	1.71	4.08
#2: NYT	0.13	1.52	2.66
#3: Court US Code	0.09	1.25	3.69
#4: Court Statute	0.13	1.50	2.32
Combined	0.19	1.80	3.28

(b) Title 12

Source: Authors' analysis.

The specific adjusted R^2 values in these tests, 0.30 for securities legislation and 0.19 for banking legislation, indicate that Mayhew's designations are able to explain roughly 30% and 19%, respectively, of the variation in our combined importance metrics. We consider these to be meaningfully large figures that lend further credibility to our metrics, particularly given the many differences between our approach and Mayhew's, which tend to attenuate the relationship between our results and his.[81]

The coefficient estimates in Figure 6 range in general from around 1.5 to 2.0, indicating that laws Mayhew designates as important are on average 1.5 to 2 standard deviations above average in our importance metrics. The t-statistics in the table, based on HW robust standard

---

[81] Also, these estimates are likely conservative. Some of the laws that Mayhew considers important, such as the Social Security Amendments of 1983, had an impact, but only a very small one, on fields of banking or securities. As such, these designations by Mayhew result in laws that he considers important but which our metrics consider, we think rightly, to be quite unimportant when it comes to financial regulation. If we were to remove these instances from our consideration of Mayhew, the relationship between his metrics and ours would certainly increase. But for the sake of presenting conservative estimates, and given the subjective challenges in deciding which precisely among Mayhew's law designations to exclude, we choose instead to consider the full set of laws Mayhew designates as important, even if some are of only very marginal significance to finance.

errors, generally exceed the 2.33 threshold for significance at the < 0.01 confidence level. We also consider logistic regressions in which we regress a binary indicator for whether Mayhew designates a law as important on a constant plus our continuous metrics of importance. In these, the robust t-statistics on our combined metrics are 4.05 for securities legislation and 6.54 for banking legislation.[82]

Correlation Between our Metrics

For a final source of insight into the information captured by our metrics, we consider the correlations between each of our four importance metrics. One reason this may be insightful is that moderately high degrees of correlation between metrics may suggest that the metrics are indeed picking up on some meaningful underlying signal, rather than, for instance, each representing simply random noise. At the same time, correlations between metrics that are substantially less than 1 may indicate some extent to which errors across the metrics are less than fully correlated. This, in turn, could lend credence to our approach of combining metrics. We acknowledge, however, that neither of these interpretations is precise nor dispositive.[83]

Figure 7 presents results of these analyses. Over all of the specifications it considers, the average correlation is 0.59, with a minimum of 0.38 and a maximum of 0.84. Based on the considerations described above, we consider these results relatively encouraging. Nevertheless, there is no clear theoretical prediction regarding what the "optimal" degree of correlation between our metrics would be. Thus, there is substantial room for readers to interpret these results as they deem appropriate.

---

[82] Both of these figures are for our combined metrics. As in the linear regressions, when considering these logistic regressions, the t-statistics for the individual metrics are in general somewhat lower than for the combined metrics. Full details are available upon request. We choose the linear regression to present in Table 3 because of the more readily interpretable model fit statistic of adjusted R2, something that is not directly defined for the nonlinear logistic formulation. The higher t-statistics for the logistic regressions likely indicate that the nonlinear model is a better descriptor for relationship between our metrics and Mayhew's.

[83] For instance, a high correlation could simply indicate that the metrics pick up on correlated noise, with no meaningful signal. Likewise, a low correlation could simply mean that there is little to no underlying signal, and so the notion of errors in observing that signal canceling each other out would not be meaningful.

Figure 7: Correlations between Importance Metrics

Each of these sub-tables represents the correlation matrix between our importance metrics. Table (a) considers Title 15 (securities legislation) and all four importance metrics over the full sample period, 1932–2011, in which we consider securities legislation. For Title 12 (banking legislation), the first two of our metrics are defined starting in 1912, whereas the second two are defined starting only in 1932. Thus Table (b) considers, for Title 12, the correlation between metrics nos. 1 and 2 over the whole sample period, from 1912–2011, whereas Table (c) considers, for Title 12, the correlation between all four metrics from 1932–2011.

	US Code	NYT	Court US Code	Court Statute
US Code	1.00			
NYT	0.84	1.00		
Court US Code	0.42	0.47	1.00	
Court Statute	0.73	0.79	0.61	1.00

(a) Title 15: 1932-2011 (All Metrics).

	US Code	NYT
US Code	1.00	
NYT	0.77	1.00

(b) Title 12: 1912-2011 (Metrics 1,2).

	US Code	NYT	Court US Code	Court Statute
US Code	1.00			
NYT	0.59	1.00		
Court US Code	0.59	0.38	1.00	
Court Statute	0.52	0.42	0.53	1.00

(c) Title 12: 1932-2011 (All Metrics).

Source: Authors' analysis.

53

Appendix C: Dates of Financial Crises

In this appendix, we list the date ranges for the financial crises identified under our various specifications. For banking crises, Reinhart and Rogoff (2009) simply designate years as banking crises, rather than specifying particular months. For our peak-to-trough equity crisis definition, by contrast, we identify specific months for start and end dates.

Banking Crises
1907
1914
1929-1934
1984-1992
2007-2011
Equity Crises, 50% Peak-to-Trough Threshold
1930-12-01 to 1934-01-01
1938-03-01 to 1938-04-01
2009-02-01 to 2009-03-01
Equity Crises, 45% Peak-to-Trough Threshold
1930-10-01 to 1934-01-01
1938-03-01 to 1938-06-01
1974-09-01 to 1974-10-01
2002-09-01 to 2002-10-01
2009-01-01 to 2009-04-01
Equity Crises, 40% Peak-to-Trough Threshold
1930-09-01 to 1934-01-01
1937-12-01 to 1938-06-01
1942-04-01 to 1942-05-01
1974-09-01 to 1974-10-01
2002-09-01 to 2002-11-01
2008-11-01 to 2009-07-01
Equity Crises, 35% Peak-to-Trough Threshold
1907-11-01 to 1907-12-01
1930-06-01 to 1934-01-01
1937-11-01 to 1938-07-01
1942-02-01 to 1942-08-01
1974-08-01 to 1975-01-01
2002-07-01 to 2003-07-01
2008-10-01 to 2009-08-01
Equity Crises, 30% Peak-to-Trough Threshold
1907-10-01 to 1908-04-01
1914-10-01 to 1914-12-01
1917-11-01 to 1918-01-01
1921-06-01 to 1921-10-01
1929-11-01 to 1934-01-01
1937-10-01 to 1938-10-01
1941-11-01 to 1942-10-01

1970-06-01 to 1970-07-01
1974-07-01 to 1975-03-01
1987-11-01 to 1987-12-01
2001-09-01 to 2003-12-01
2008-10-01 to 2009-11-01
Equity Crises, 25% Peak-to-Trough Threshold
1907-09-01 to 1908-05-01
1914-08-01 to 1915-01-01
1917-11-01 to 1918-08-01
1920-12-01 to 1921-12-01
1929-11-01 to 1934-01-01
1937-10-01 to 1938-12-01
1940-05-01 to 1943-01-01
1948-02-01 to 1948-03-01
1970-05-01 to 1970-08-01
1974-05-01 to 1975-05-01
1987-11-01 to 1988-01-01
2001-08-01 to 2004-02-01
2008-10-01 to 2010-03-01

Appendix D: Additional Details on Empirical Specifications

We choose not to pursue any kind of regression analysis or employ other more complicated statistical methods. In short, we do not believe these capture any useful information not covered in the summary statistics we have already described. Likewise, many of the premises behind these techniques do not fit our analytic situation. In regression analyses, the underlying assumption is that one is drawing limited samples from an infinite population and using information from the samples to make inferences about the population. The uncertainty in the analyses, as represented, for instance, by the confidence intervals on parameter estimates, is premised on the question of whether the limited sample is representative of the infinite population or whether, by random chance, the sample happens to be substantially atypical of the whole population.

This premise does not fit our analytic situation. We observe the entire population of financial laws passed over the prior century in the United States. Consider a concrete example that contrasts our situation with more typical econometric formulations. In a typical econometric analysis, one might seek to estimate the impact of a job-training program on, say, 100 workers who participate in it. These one hundred workers are simply a subset of the larger population of workers who did, or at least in theory could, receive the training program.

Suppose the econometrician calculates a coefficient estimate of close to zero for a variable associated with the job training program. This near-zero coefficient estimate might indicate that the training program has no impact on participants. But it is also possible that the workers selected were, simply by random chance, unusually unresponsive to the program and that a different sample would respond differently. The confidence intervals calculated on the given parameter estimate would reflect, conditional on a set of statistical assumptions, how likely it is that the workers in the sample were substantially less responsive than the population of potential workers as a whole.

Our analytic situation is quite different.[84] If one observes no discernible impact of a training program on 100 participants, one might still very reasonably contend that it is quite possible an effect would be seen on another or a larger sample of workers. By contrast, if the best that could be said for the crisis-legislation hypothesis is that it is not supported by the actual history of US financial legislation over the past 100 years, but that it might be supported over the next 100 years or more, then the theory becomes stripped of essentially all meaning.

This discussion is not to say that there is no element of uncertainty in our calculations. Quite the opposite is true. But the source of uncertainty in our analytic situation is not based on questions of whether our sample is representative of a larger population. Instead, it is based primarily on uncertainty as to whether we are accurately measuring legislative importance and appropriately defining financial crises. This type of uncertainty cannot be captured by traditional statistical tools such as confidence intervals and markers of statistical significance. Instead, the uncertainty in our calculations is best captured by viewing how our analytic results vary based on different definitions of legislative importance, financial crises,

---

[84] For a discussion of these topics by a team of preeminent modern empiricists, see Abadie et al. (2017).

crisis periods, and so forth. Thus, in the ensuing discussion of results, and in particular through our suite of online data tools, we emphasize investigations that consider how the key statistics that we calculate vary across a range of plausible specifications.

Appendix E: Analysis Results and Modern Periods

E. 1 Analyses Considering Only Modern Periods

How do the results that we present in Section 7.2 vary if we only consider modern legislation, starting in 1984? (We choose this because it is the start date of the eight-year-long banking-crisis period identified by Reinhart and Rogoff [2009]).

For banking legislation, when we run our baseline specification[85] starting in 1984 instead of 1912, the ratio of percentage of importance in crises to percentage of time in crises is actually unchanged: The result is 1.4 under both specifications. But for the full sample, from 1912 to 2011, this ratio comes from 39% of importance being accounted for by 28% of time in crises. By contrast, for the period from 1984 to 2011, this ratio comes from 82% of importance being accounted for by 57% of time in crises. Adjusting our importance measure to use an equally weighted combination of all four metrics leaves this statistic unchanged.

For securities legislation, we see, over the 1984 to 2011 period, 60.6% of legislative importance accounted for by 28% of time in crises, for a ratio of 2.2. This is a reduction in the ratio of 3.2 found by running the securities specifications over the full period from 1932 to 2011.

How should one interpret these results? On the one hand, the ratio of 1.4 for banking legislation over this period may be seen as indicating that the same conclusions we draw for our main analyses of banking law also apply to this period. But the picture may be muddier than that. The 82% of banking importance accounted for by crisis periods may seem, in some respects, to be fairly strong confirmation of the crisis-legislation hypothesis for banking during this period. Yet the fact that 57% of this span qualifies as a second-order congressional crisis-legislation period, according to our specifications, means that it is less remarkable to find a moderately large majority of legislation accounted for by crisis periods.

We express no opinions regarding the interpretation of the results for securities legislation over the 1984 to 2011 period. There is much that could be investigated or discussed here, but we leave it as a topic for future research.

E.2 Analyses Excluding Modern Periods

Another way to consider time variation in ways that go beyond what we treat in the main text is to consider analyses that stop the sample period in 1983—that is, to exclude the modern period that was the focus of the prior discussion. This is potentially more fruitful because it still leaves a relatively large sample period.

For banking, our baseline ratio of 1.4 increases modestly to 1.7 when restricting to the 1912 to 1983 period, although the total amount of legislation attributable to crises declines from 39% to 27%. For securities legislation, our baseline ratio of 3.3 also increases modestly to

---

[85] This is an equally weighted average of the first two metrics, which we choose as the baseline because these metrics are defined for our full sample period. See Section 7 for more details on the selection of this baseline.

3.7 when restricting to the 1912 to 1983 period, with now 92.6% percent of total importance accounted for by 26% of time in crises. Overall, we interpret these results as broadly similar to our results that extend to 2011. That is, we do not see evidence that the 1984 to 2011 has an outsize role in driving our conclusions for either securities or banking legislation.