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Essays on Welfare State Retrenchment

By

Christopher Michael Kroglund

A dissertation submitted in partial satisfaction of the

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University of California, Berkeley

Committee in charge:

Professor Paul Pierson, Chair
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Abstract

Essays on Welfare State Retrenchment

by

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Doctor of Philosophy in Political Science

University of California, Berkeley

Professor Paul Pierson, Chair

This dissertation is comprised of several essays on welfare state retrenchment in advanced industrial democracies since 1990. The intent is to provide a strong empirical grounding for the theories of welfare state retrenchment using original data sets and state-of-the-art machine learning methods. It also goes beyond the causes of retrenchment to provide suggestive evidence for several effects of retrenchment on the economic behavior of individuals.

Overall, the dissertation finds that retrenchment events are most likely to occur when highly-indebted, labor-docile countries experience public fiscal crises, exemplified by rising sovereign debt yields, which are preceded by a weakening of the governing power held by incumbent politicians. Political weakness creates electoral uncertainty which, in combination with economic frailty, sets off a rise in the premium states must pay to issue further debt. This creates significant fiscal pressure for retrenchment. Once retrenchment is carried out, evidence suggests that its effects impact the behavior and mindset of individual consumers, potentially decreasing their expenditures and optimism over their short-term economic future.

To Mom and Dad

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Chapter 1

Introduction

In one its most basic theoretical conceptions, politics is any set of actions taken, or beliefs held, with intent to influence a given distribution of resources ([Lasswell, 1936](#)). These resources are entirely mutable and generic, ranging from money and property to fame or even power. While resource accumulation is motivated by individual desires to maximize individual utility, politics – through its apportioning of resources – determines the final distribution of utilities ([Mill, 1863](#)).

It should come as no surprise, then, that greater political attention will be paid by any society to those issue areas most directly determining the allocation of important resources, notably income and wealth. To be sure, few aspects of modern democratic governance have power to impact these resources greater than that held collectively by the policies and programs of the welfare state. In providing social insurance against various life-course developments that might hamper the ability of individuals to labor sufficiently for personal maintenance, welfare policies directly expropriate an amount of individual income or wealth for public disbursement.

As a consequence, though often in differing guises, the welfare state has proven to be a perennial issue in electoral contests and governance alike. Equal, if not greater, attention to the welfare state has been a hallmark of social science over the last 50 years ([Castles, 2010](#)). Across its major disciplines, including economics, political science, and sociology, scholars have worked doggedly to conceptualize the welfare state and to systematically analyze its dynamics. Likewise, it has been the subject of interest across many countries and continents. While long a favorite topic of European and North American researchers, the welfare state has also recently taken center stage in the scholarship of Asia, South America, and the Middle East ([Gough and Wood, 2004](#); [Rudra, 2002](#); [Segura-Ubiergo, 2007](#); [Holliday, 2000](#)).

Though scholastic attention to the welfare state has been relatively persistent, certain themes and processes have been of greater or lesser interest over time. Without question, a plurality of post-war research worked to understand the causes of welfare state expansion – a phenomenon especially prevalent during the period from 1945 to 1975 ([Quadagno, 1987](#)). Correspondingly, this work sought to understand why certain states developed welfare policies that were notably generous in their allowances and open to the vast majority of citizens, while other states afforded only meager protections to a relatively small group of individuals.

Since the mid-1970s, however, as the developed economies of the Western world have struggled with demographic changes, industrial restructuring, and various domestic and international political developments, substantially greater attention has been paid to new limits being placed on state-provided social insurance (Pierson, 2001). Though competing conceptualizations and operationalizations abound, *Welfare State Retrenchment*, as the phenomenon is known, broadly refers to the reduction of individual access to, or receipt of, the monetary, programmatic, or legal benefits conferred by state-provided social insurance programs. Its empirical forms are various. Retrenchment can include, for instance, lowering the duration of unemployment benefit payouts from 26 weeks to 12 weeks. It may take the form of a reduced annual cost-of-living adjustment made to a pensioner's monthly allowance, or raising the retirement age from 65 to 67 years old.

As is detailed below and in subsequent chapters, the past 30 years of scholarship on welfare state retrenchment has put forward a number of coherent explanations for the rising penuriousness of state-provided social insurance programs (Schwartz, 2001). For largely empirical reasons, however, many of these theories remain contested. Moreover, scant work has been put forward to try and understand whether, or to what extent, these various explanatory factors jointly or dynamically contribute to welfare state retrenchment.

The purpose of this dissertation is three-fold and targeted towards the aforementioned shortcomings of the literature. First, it looks to take a step toward establishing a stronger empirical grounding for the theories of welfare state retrenchment. Second, it attempts to elucidate how the many factors driving retrenchment connect over time to produce the final outcome. Lastly, it opens up an avenue of research that has remained largely unexplored by providing suggestive evidence for several different causal effects held by retrenchment on the behavior of individuals.

Overall, the dissertation identifies a fairly reliable causal path leading to retrenchment. Specifically, it finds that **retrenchment events are most likely to occur when highly-indebted, labor-docile countries experience a public fiscal crisis – exemplified by rising sovereign debt yields – which is preceded by a weakening of the perceived power held by incumbent politicians.** Political weakness creates electoral uncertainty which, in combination with economic frailty, sets off a rise in the premium states must pay to issue further debt. This creates significant fiscal pressure for retrenchment. Once retrenchment is carried out evidence suggests that **its effects impact the behavior and mindset of individual consumers, potentially decreasing their expenditures and optimism over their short-term economic future.**

The remainder of this chapter is intended to introduce to reader to the literature of welfare state development, with particular emphasis on those theories developed to explain retrenchment. Thereafter, brief summaries of the remaining chapters are presented, including details of their overall focus, the aspect of retrenchment they seek to explain, and the theories, data, and methods utilized to draw their conclusions.

1.1 The Literature on Welfare State Retrenchment

1.1.1 Logic of Industrialism/Neo-functionalism

One can identify three broad approaches to understanding welfare state development, each with a specific retrenchment component. The first is often termed as the *Logic of Industrialism/Neo-functionalism* (LoI/NF) approach – a tradition firmly embedded in the structural functionalist perspective (Parsons, 2013) that saw the welfare state as a direct reaction to industrial change. The LoI/NF approach argues that states will respond almost automatically to any change in the nature of industry or production that results in labor market failures through the introduction of compensatory policies such as unemployment insurance, skills training, sickness/disability insurance, family allowances, and old age pensions. Any such response will be tempered, according to this perspective, by the relative wealth of a state. Greater wealth is accompanied by greater tax revenue, providing a larger pool of financial resources from which the government can promulgate redistributive programs (Wilensky, 1974; Wilensky and Lebeaux, 1966).¹

The post-Bretton Woods welfare experience has shown that pressures for welfare retrenchment are not exclusively derived from changes in the nature of industry or production, but are rather mediated by demographic and social changes, as well as broader developments in global capitalism. A conventional account is typified by Iversen and Wren (1998), who argue that the gradual post-war transformation from economies based upon heavy industry and manufactures to economies increasingly reliant on services for employment jeopardizes a state's ability to finance social programs. Under the theory that the service sector experiences a necessarily lower level of annual productivity gains than the manufacturing sector (Baumol, 1967),² wage increases must decline to insure competitive pricing, which in turn sets a limit on state revenue potential for a given level of taxation. Retrenchment becomes actuarially necessary, however, if state welfare commitments begin to outstrip state fiscal resources – as has been the case since the mid-1970s in the West, thanks to a combination of benefit indexation under high inflation, population aging (Castles, 2004), increased female labor force participation (Daly, 2000), and long-term unemployment derived from increased trade-openness (Cameron, 1978; Rodrik, 1997) and capital mobility (Garrett et al., 1998).³

¹ The LoI/NF approach developed in the mid-20th century and applied mainly to the phenomenon of welfare expansion also emphasized the importance of changing family structures and the bureaucratic capacity of states. On the former, certain social benefits such as old age pensions were necessitated not only by the inability of older workers to take physically demanding industrial positions, but also their inability to rely on extended families for basic welfare maintenance. This decline of extended family living arrangements has often been attributed to the progress of industrial capitalism (see Flora and Heidenheimer (1981)). On the latter, LoI/NF argues that states will only develop social programs that they can successfully administer, bureaucratic capacity being the primary limiting factor. Neither of these auxiliary elements of the LoI/NF approach have obvious implications for welfare state retrenchment in the industrialized democracies post-Bretton Woods.

² The validity of this assumption continues to be hotly debated (see Triplett and Bosworth (2003))

³ Problematic for the theory of retrenchment is, of course, the potential for these problem pressures to breed further expansions of welfare programs precisely as a mechanism to insure against their detrimental effects (Rodrik, 1998; Iversen and Cusack, 2000). For this reason, all theoretical predictions of

1.1.2 Power Resources

A second approach to explaining the development of the welfare state is the *Power Resources* school, which argues that welfare outcomes are determined by the nature of class conflict. Specifically, the balance of each class's power resources – that is, the various organizational tools and capabilities brought to bear in the political arena on their behalf – is what dictates both the scope and scale of the welfare state (Stephens, 1979; Korpi, 1983; Esping-Andersen and Korpi, 1986). The vast majority of scholars adopting this approach specifically consider the power resources of the left, though others have argued for the overarching importance of powerful Christian-Democratic or right parties in shaping welfare outcomes (Castles and McKinlay, 1979; Esping-Andersen, 1990).

Among the various aspects of left power resources, two have taken a prominent place in the literature. The first is, not surprisingly, the extent of labor, social democratic, and generally leftist representation in national parliaments. The story here is a standard one of delegated political agency – left politicians have working class interests as their natural constituency, and failing to push the policies they desire (assumed to be mainly greater redistribution) can result in the failure to be re-elected. It follows that left politicians will seek to prevent welfare state retrenchment, and that success in holding off retrenchment attempts is directly proportional to the left-balance of parliament.

The second major font of left power resources cited in the literature is the nature of trade unions, mainly of the blue-collar variety. Powerful trade unions can more effectively communicate the demands (for social protection) of the working classes to policy makers, and do so on the basis of a more credible threat to carry out a highly costly strike. A trade union movement that has a relatively high density, a low number of total unions, and a high degree of centralization (i.e. peak unions are empowered) should mount a more muscular defense against welfare retrenchment. Such union movements possess a high degree of internal coordination and overall economic power, making them powerful forces in negotiations with business and government, and therefore more able to wrestle favorable policy concessions.

Some work on welfare retrenchment explicitly rejects the power resources viewpoint. Perhaps the most controversial aspect of Pierson (1995, 1996) was to forcefully argue against left governments, trade unions, and class in general as being consequential factors for retrenchment. By the mid-1990s, trends in conventional measures of the welfare state (usually social expenditures) showed no cross-national variation consistent with the predictions of the power resources school. Pierson pointed out that it had great difficulty in explaining, for instance, how Britain's Prime Minister Margaret Thatcher could preside over a decade of unchallenged conservative rule, eviscerate her nation's trade unions, and still see only minor adjustments to welfare spending. Despite such counterexamples to the power resources thesis, more recent work has found a significant, negative correlation between the strength of left party resources and the overall degree of retrenchment (Korpi and Palme, 2003).

Shifting the debate, some scholars have argued that left power resources impact retrenchment via means that are more complex and idiosyncratic than simple delegation

retrenchment derived from new "problem pressures" must be taken somewhat lightly.

models might predict. [Ross \(2000\)](#) has forwarded the idea that left parties might be relatively better placed to undertake retrenchment, given their “ownership” of the issue. Following a Nixon- goes-to-China strategy, the left may actually be more successful than the right in rolling back social policy commitments because any such efforts from the left would be seen as more legitimate in the eyes of the public (indicative of a true need for cutbacks). Similarly, [Levy \(1999, 2001\)](#) shows that parties of the left can combine strategies that simultaneously trim prodigal welfare commitments and redirect these savings towards the expansion of more deserving welfare programs. In any case, these theories eschew generalizations in favor of case-by-case analyses.

1.1.3 Institutions

A final area of welfare state retrenchment concerns the impact of institutions. The institutional perspective argues that the effects on retrenchment of demographic, economic, political and social developments are all filtered through a series of behavioral constraints, or “rules of the game” ([North, 1990](#)). Rational choice theorists have argued mathematically that systems of proportional representation and electoral systems with relatively larger district magnitudes force governing parties and coalition leaders to distribute policy concessions towards a relatively larger number of political actors, thereby generating a relatively more generous set of social policies ([Persson and Tabellini, 2005](#)). A separate view holds that a greater overall number of veto points (specifically, opportunities for political actors to prevent policy changes) will lower the overall level of policy change ([Tsebelis, 2002](#)). For welfare state retrenchment, this means that fragmented political systems will see relatively fewer rollbacks.

Another strand of institutional thought argues that the degree to which political institutions are fragmented or veto-prone plays directly into a central political logic of retrenchment, specifically blame avoidance on the part of politicians ([Pal and Weaver, 2003](#)). Highly centralized political institutions with a minimal number of veto points make it easier for voters to affix blame for cutbacks on specific individuals, parties, or coalitions. This contrasts with more fragmented systems containing a large number of veto points, presenting a host of foxholes in which elected officials can duck political fire. It follows from this logic that fragmented political systems will see relatively more rollbacks. Taken together, the institutional perspective yields an indeterminate hypothesis:

Of course, all such theories must confront the problem of institutional endogeneity. A highly developed source of institutional arguments for both welfare state expansion and retrenchment concerns the existence of distinct welfare regimes that create regime-specific, path dependent development trajectories. This historical institutionalist approach is most readily associated with the work of [Esping-Andersen \(1990\)](#), who roots his three “worlds” of welfare capitalism back as far as early industrialization. More recently, [Cusack et al. \(2010\)](#) and [Iversen and Soskice \(2009\)](#) have connected Esping-Andersen’s 19th century starting point to even earlier forms of production and industrial organization. The end point of the various historical welfare state development trajectories has therefore been argued by some to be a direct result of historical contingencies that created different systems of production ([Hall and Soskice, 2001](#)), skill profiles and insurance needs ([Estevez-Abe et al., 2001](#)), systems of representation ([Cusack et al., 2007](#)), patterns of in-

dustrial conflict (Mares, 2003), and kinds of governing coalitions (Powell, 2000; Iversen and Soskice, 2006).

1.2 Overview of Subsequent Chapters

Each of the remaining chapters in this dissertation follows a similar format. They begin by identifying one or more shortcomings of the literature on retrenchment, either theoretical or empirical. The remaining text brings to bear new data and analytical methods to take steps towards addressing each issue.

Chapter 2 takes aim at persistent measurement and methodological issues in the literature. With regard to the former, it describes the shortcomings of common measurements used in studies of retrenchment. These typically include reductions in state spending or income replacement rates aggregated to the country-year level. A new dataset is then introduced that uses various legislative databases to pinpoint legally-mandated retrenchment down to the country-day level. This allows for more precise correlations to be made between changes in suspect explanatory factors and actual retrenchment events. A sophisticated machine learning algorithm is then utilized to tease out which of the many explanatory factors put forth in the literature actually show strong associations with retrenchment events. The main finding is that retrenchment occurs overwhelmingly when states accumulate a great deal of sovereign debt and experience sharp increases in their costs for issue new debt.

Having identified the most reliable and causally-proximate predictors of welfare retrenchment, Chapter 3 attempts to venture further up the causal chain by identifying developments that lead to sharp increases in the cost of issuing sovereign debt. Using a newly-compiled dataset of debt yields and methods similar to those utilized in Chapter 2, it finds that yield spikes are most commonly precipitated by increasing uncertainty over the ability of incumbent politicians to govern effectively and implement their preferred policies. Illustrative scenarios of this sort include failures to achieve stated goals during negotiations between international and national-level political actors, declining electoral prospects for near-term elections, and the rise of new national political parties or protest movements. Several case studies illustrate these processes, specifically economic bailout negotiations between European Union Economic Affairs Commissioner Ollie Rehn and Spanish prime minister Mariano Rajoy over austerity measures in 2012, the dramatic fall of Italian prime minister Silvio Berlusconi in 2011, and the rising electoral success of far-right parties in France and the United Kingdom since 2009.

Finally, Chapter 4 pivots away from asking what might cause welfare state retrenchment and toward identifying some of its follow-on effects. Taking advantage of a natural experiment built into the 2011 Italian pension reforms and a nationally-representative survey of pensioners, this chapter finds several individual-level behavioral effects of being exposed to welfare state retrenchment. In the case where pensioners see reductions in their benefits, one can identify a resultant decrease in personal expenditures and increase in pessimism over the immediate future of the stock market and household incomes. These results suggest that even relatively minor retrenchments are noticed by those on the receiving end, and that the economic consequences of retrenchment may go beyond

the simple balance sheet effects of reduced government spending.

Chapter 2

Revisiting the Causes of Welfare State Retrenchment, 1990-2014

2.1 Introduction

In February 1976, Margaret Thatcher was just one year into her tenure as leader of the conservative opposition in the United Kingdom, yet firmly in place as high priestess for the country's anti-welfare ideology.¹ In a television interview that month, Thatcher tersely summarized her primary criticism of comprehensive welfare states. The problem with socialism, she argued, is simple: eventually, you run out of other people's money.²

Such comments put Thatcher at the forefront of a movement spanning much of Western Europe and North America that called for reform of the post-war, cradle-to-grave welfare state as a solution to several of the decade's afflictions. These included declining employment, stubborn inflation, oversized marginal tax rates, and chronic budget deficits. In hindsight, the "Iron Lady" was standing at a turning point in the history of the modern welfare state, wherein a 30-year drive for more generous and encompassing social policies was replaced by a combination of willful neglect and occasional bouts of outright retrenchment.

Thatcher's diagnosis notwithstanding, great academic effort has been put forward over the last several decades to understand the causes behind this development. While the logic of the initial transition in the 1970s and 1980s is fairly well understood, the continued disassembly of the western welfare state in the 1990s and beyond remains obscure. To be sure, the puzzle has a surplus of candidate explanations, but neither a consensus standout nor hierarchy among them. Several factors have contributed to this outcome, including poor theoretical conceptualization, a concomitant lack of appropriate measurements and data, as well as widespread erroneous application of inferential methods.

¹ Available at <http://www.margaretthatcher.org/speeches/displaydocument.asp?docid=102452>. Last accessed 2015-08-05.

² The actual quote is less pithy: "... Socialist governments traditionally do make a financial mess. They always run out of other people's money." Available at <http://www.margaretthatcher.org/speeches/displaydocument.asp?docid=102953>. Last accessed 2015-08-05.

In the main, it is the objective of this chapter to bring some clarity to our understanding of post-Thatcher welfare state retrenchment. The means by which this will be accomplished are two-fold. First, the paper presents a new dataset of individual retrenchment episodes culled from national legislation, rather than aggregated time-series measurements of social spending or wage replacement rates. Second, the new dataset is analyzed using flexible methods for practical machine learning that help produce a more complex portrait of the factors associated with retrenchment episodes than traditional regression-based approaches.

Two main findings emerge from the analysis. First, though crude, the Thatcherian conceit is largely correct: the terminal cause of retrenchment is almost always public fiscal distress. Retrenchment is generally shown to occur when highly indebted governments are confronted with moderate-to-severe economic downturns that make financing additional sovereign debt prohibitively expensive. Second, while it would be unwise to say that most non-economic factors play no role in causing retrenchment events – including demographics, labor organization, and the structure and organization of domestic politics – their effects remain quantitatively obscure. The results presented here suggest that the major causal contributions of these factors likely operate either over the long-term, falling at a relatively upstream position in the causal process, or over the extreme short-term, in the days and weeks preceding retrenchment.

The remainder of this chapter is organized as follows. Section 2.2 details the conceptualization of welfare state retrenchment used in this paper and how it relates to many common conceptualizations present in the literature. Section 2.3 provides a review of this literature, highlighting the major suspects in the causal process, as well as pointing out several empirical issues in this work that limits the validity of its results. Section 2.4 contains the bulk of the investigation, laying out the collection and assembly of the new retrenchment dataset, the new analytical methods applied, as well as the main quantitative results.

2.2 Definitions and Scope

Given the many definitions and conceptualizations of the welfare state present throughout the literature, a crucial first step in any analysis is to clearly define the outcome under consideration. As noted by Green-Pedersen (2004), lack of clarity and precision in this area is “a major obstacle for cumulative knowledge about welfare state retrenchment.” For the mainly empirical purposes of this paper, the welfare state is defined herein as a set of policies originating and financed at the national level whose intent is to either provide monetary resources or promote a successful return to the labor market for those individuals who, by reason of age, health, or opportunity, are temporarily unable to acquire a minimum gross income through market sources alone.

A byproduct of adopting such a narrow conceptualization of the welfare state for empirical reasons is that it departs from other equally valid conceptualizations present in the literature in several respects. First, it considers only policies originating at the national level of government. Welfare policies developed and funded primarily by regions, states, districts, municipalities, or other subnational administrative units are disregarded, as are

elements of the “private” welfare state (Hacker, 2002), such as employer-provided health or retirement benefits.

Second, it includes only those policies designed to *respond* to a loss of individual income, rather than to *avoid* such a loss. Thus it stands apart from the definition put forward in Schwartz (2001) – specifically, as the set of policies intended to blunt any and all market pressures on incomes – by omitting policies designed to explicitly avoid job losses in the first place, such as wage subsidies, barriers to trade, and other elements of industrial policy. Note that job re-training, being a direct response to job loss, is included in the definition.

Finally, it disregards those policies that provide mainly subsidies for the purchase of specific goods and services that do not clearly contribute to either higher gross income or increased participation in the labor market, such as state-provided medical benefits or foodstuffs. As such, it does not cover tax expenditures or other aspects of the “hidden” welfare state (Greve, 1994; Howard, 1999). Stated less precisely, the welfare state is considered here to be those policies that either replace gross income lost due to unsuccessful labor market participation, or promote successful return to labor market participation by improving individual employability.

What this definition of the welfare state lacks in comprehensiveness, it makes up for in the ease with which one can define welfare state retrenchment. For the purposes of this dissertation, retrenchment is defined as any reduction in the nominal monetary benefit accruing to eligible individuals for the standard payment interval (e.g. per day, per week, etc.), any shortening of the standard payment period (e.g. 12 weeks, 52 weeks, etc.), or any further eligibility requirements, restrictions, or conditions that are intended to shrink the pool of eligible individuals without the corresponding provision of skills or other resources to promote successful labor market reentry. More informally, welfare state retrenchment is taken here to be any intentional action on the part of government that decreases the generosity of the welfare state or forces individuals back into the labor market without retraining.

Though this definition corresponds closely to perhaps the most common understanding of the phenomenon present in the literature, it does diverge from a prominent school of thought that considers retrenchment to be a socioeconomic outcome or effect, rather than simply a set of policies. Clayton and Pontusson (1998) argue that, “the existing literature tends to focus on the efforts by politicians to enact entitlement changes... [but] welfare reforms must be situated in the context of rising social inequality and insecurity.” Changes in the structure of the economy “affect the way welfare states work, irrespective of whether governments cut or reform social programs.” Hacker (2004) terms this process “policy drift”. In this view, retrenchment is thus political neglect of the welfare state that renders its policies unable or ill suited to achieve their intended outcome.

To be sure, this effect-based perspective on retrenchment is a valuable complement to the traditional perspective focusing on policy prescriptions. There is, however, a trade-off in subscribing to one viewpoint or the other with respect to operationalization of the concept. Whereas identifying and measuring welfare policy changes is a relatively straightforward and reliable process that facilitates comparisons between countries over time, the operationalizing of retrenchment as the deviation between some set of observed socioeconomic outcomes from their intended outcomes is problematic. Reminiscent of the

ecological fallacy, precisely inferring the intended effects of legislation on large populations is several orders of magnitude more difficult than precisely inferring the intended effects for individuals. Legislative or administrative documents, for instance, can reveal with certainty the desire to raise certain individual benefits by a given amount. Assessing the desire to decrease income inequality via the same action can rarely be communicated beyond a simple “yes” or “no”, let alone by how much or via which measures. For reasons of conceptual and operational precision, therefore, this chapter eschews the outcomes perspective of retrenchment in favor of the policy perspective.

2.3 Review of the Literature

2.3.1 Theories of Retrenchment

The most fundamental explanations for welfare state retrenchment find their origins, not surprisingly, in the many studies looking to account for the so-called *trente glorieuses* – the period between roughly 1945 and 1975 that saw an unprecedented expansion of social insurance for old-age, unemployment, sickness and disability across the Western world. The findings in this literature are manifold, but generally point to either deep economic transformations or the nature of political competition.

In the first camp, the introduction of a more generous welfare state is viewed as a direct response to developments in the foundational structure of the economy that leave individuals unable to meet their most basic needs and simultaneously augment the capacity of government to address such hardship (Wilensky, 1974; Cameron, 1978; Rodrik, 1997; Iversen and Wren, 1998; Garrett et al., 1998). The most obvious development of this kind was the period of industrialization in the late 19th and early 20th centuries that transformed still largely agrarian economies into rationalized, largely manufacturing-based economies. In the process, many previously successful participants in the mainly agricultural labor market – notably women, the young, and the old – were no longer able to do so. This opened up a gap between household incomes and expenditure requirements. At the same time, this industrial transformation created great new wealth that could be taxed by governments for social purposes, as well as administrative and bureaucratic management techniques that enhanced the extractive efficiency of government. This evolution thus permitted the introduction of new programs for social protection.

The second camp, while certainly not denying the impact of economic transformation on welfare state outcomes, views the structure and content of politics as a set of more compelling causal factors. They argue that generous welfare states are first-and-foremost the result of political ideology, notably those associated with “leftist” movements supporting policies for state support of families or individuals via redistribution (Stephens, 1979; Korpi, 1983; Esping-Andersen, 1990). The ability of these movements to wield political power is therefore paramount in welfare state expansion. Of course, many factors bridle the political power of any political faction in democratic government. These include the ability of left parties to mobilize voters during elections and to participate in governing coalitions or otherwise influence legislative and executive actions.

A major complication for the analysis of political contributions to welfare state devel-

opment is the growing theoretical and empirical consensus that these moderators of political power are not mutually independent (Iversen and Soskice, 2006, 2009). For instance, nations with strong and centralized labor unions generally have greater left political representation in their legislatures. Likewise, parliamentary governments with proportional representation also have greater representation of the political left than presidential governments or even parliamentary governments with plurality voting. Crucially, however, robust labor movements are very highly correlated with proportionally-represented parliamentary government. Despite this, the overall finding that political competition has important consequences for welfare state outcomes is undisputed.

Explanations for retrenchment diverge from their expansionary forebears in two main respects. First, retrenchment is thought to appear when the nature of any structural economic transformation actually *impairs* the ability of government to act as social insurer. This effect is ordinarily promulgated by way of the purse. When government can no longer extract sufficient fiscal resources to cover the entirety of its welfare expenditure commitments, necessity dictates that the welfare state will be reduced in scope or generosity. While the nature of the transition from agricultural to industrial production pushed welfare state expansion, several aspects of the the post-war transition from manufacturing to service provision have pulled in the opposite direction. Declining rates of wage and overall economic growth left government revenues short of expectations, forcing a scramble for alternative sources of funding. Likewise, some economic theorists suggested that the productivity gains from service provision were more limited than those of manufacturing, all but ensuring growth in tax revenue would decline to zero without further rate adjustments. And with most Western nations facing more severe bouts of unemployment and an impending bubble of retirees in potentially poor health, a lack of revenue growth or access to other means of finance would necessitate rolling back existing welfare commitments.

The second aspect in which retrenchment theories depart from expansionary theories concerns the role of politics. While the process of expansion typifies a standard principal-agent relationship – wherein the politician (agent) performs certain tasks on the behalf of, according to the preferences of, voters (principals) – retrenchment *per se* is rarely the preferred outcome or ideology of constituents. Under the assumption that politicians desire re-election and, therefore, the favor of their constituents, retrenchment becomes less about traditional principal-agent exchanges and more about attempts by agents to avoid being sanctioned by their principals. The literature has documented a number of these evasatory tactics, including passing the buck, tying of hands, obfuscation, implementation delays, and compensation, just to name a few. Some tactics even involve attempts to manipulate the beliefs of voters or the information available to them (see, for instance, the “Nixon-goes-to-China” strategy, or the righteous politician.) In any case, the success of any retrenchment attempt, according to these theories, depends crucially on the ability of politicians to somehow diminish its electoral costs.

2.3.2 Empirical Analysis of Retrenchment

Aside from describing the theoretical landscape of welfare state retrenchment, it is important to understand where the literature stands with respect to the quality of its inferences.

Even disregarding the fact that work in this area is overwhelmingly observational in nature (and reasonably so), there are three traits common to most empirical analyses of retrenchment that severely limit the strength of their conclusions and thus clarity of the general causal process described in the literature.

In the first place, as may be evident from the theoretical review above, few studies explicitly weigh the relative importance of the causal pathways they investigate. It is exceedingly rare for work in this area to claim that certain factors are of greater causal – or even predictive – importance than others in driving the retrenchment process. This is partly due to the fact that, even among studies using methods that retrieve standardized effect estimates, the results are rarely stable enough to conclude anything beyond simply whether or not, in a binary sense, certain factors are likely associated with the outcome. Further, these studies generally fail to report or even speculate as to the way in which significant causal factors may be ordered in time preceding a retrenchment event, or how different factors may act conjuncturally to produce retrenchment. This lack of work attempting to create structured causal processes is responsible for the superabundance of causal factors present in the literature that collectively bring little clarity to the phenomenon of retrenchment.

Secondly, despite widespread acknowledgment among scholars, the famous “dependent variable problem” is unresolved ([Green-Pedersen, 2004](#)). This issue refers to the continuing reliance of empirical researchers on government social spending measures as proxies for welfare state generosity, with changes in these accounts taken to indicate either welfare state expansion or retrenchment. As was famously pointed out by Esping-Andersen, these measures mostly fail to match the most common theoretical conceptualizations of the welfare state. Politicians provide voters with policies – including monetary benefits, but also services and rights – rather than gross expenditures. Moreover, these measures are often affected by automatic stabilizers that respond only to economic developments, thereby impacting the observed effects of politics.

More recently, the literature has moved to use income replacement rate measures as proxies for changes in the welfare state ([Allan and Scruggs, 2004](#); [Scruggs and Allan, 2006](#)). While these measures are certainly more accurate and reliable in tracking changes in welfare state generosity than expenditures, they are still second-best approximations. In particular, replacement rates measures are affected not only by policy actions changing the nature of welfare programs, but also economy-wide developments that affect wages and are not necessarily reflective of deliberate political action. What is more, replacement rates are calculated almost exclusively for just a single position in the national income distribution, namely that of the average wage³. Thus adjustments to welfare policy that apply exclusively to constituents who are far-removed from the average income are unlikely to be reflected in these measures. Given that most researchers seek to explain the purposive and active dismantling of the welfare state, which services primarily those with lower incomes, measures of this sort leave much to be desired.

Finally, as an additional consequence of these dependent variable issues, large swaths of the literature likely suffer from post-treatment bias derived from improper time lag specification. Due to the fact that many retrenching policies are implemented with sig-

³ See, for instance, [Van Vliet and Caminada \(2012\)](#).

nificant time delays – a popular tool used by politicians to try and avoid the deleterious electoral consequences of retrenchment – expenditure measures for a given period often reflect the implementation of policy decisions taken in previous, potentially far-removed periods (Tepe and Vanhuysse, 2010). The result is that candidate causal factors analyzed via conventional panel regression methods may actually be picking up the effects of previous retrenchments. As is well known, such post-treatment bias can greatly contaminate a variety of results. This casts a long shadow over many of the findings in the literature.

2.4 An Empirical Re-examination of Retrenchment

To reiterate, then, the literature on welfare state retrenchment suffers from the widespread use of data that poorly operationalizes essential concepts and methods that point towards likely invalid conclusions. In what follows, two major steps are taken to help improve this state of affairs. First, I describe the construction and content of a new dataset of retrenchment outcomes that avoids expenditure and income replacement rate measures in favor of discretized acts of retrenchment drawn directly from domestic legislation. This dataset more closely approximates the conceptualization of retrenchment detailed previously, and helps overcome the post-treatment biases flowing from thorny time lag issues associated with other measures. Second, I present a roadmap for a quantitative analysis of retrenchment brings to bear several novel methods from machine learning. These techniques are highly flexible tools that allow for the recovery and comparison of complex associational patterns between different factors and a given outcome, making them well-suited for the analysis of retrenchment.

2.4.1 A New Dataset of Retrenchment Events

Unlike most retrenchment data, the dataset presented here is a panel dataset containing discrete retrenchment events drawn from legislative records. While the most basic unit of analysis is technically a single piece of legislation, the relative infrequency of these events yields a unit of analysis that is effectively the country-day. The dataset is built upon the NATLEX database maintained by the International Labor Organization⁴. NATLEX tracks and archives legislation around the world relating to issues of labor, social security, and human rights. As of 2015, its records cover roughly 100,000 acts, bills, agreements, and regulations spread across 196 countries, usually beginning in the early 20th century. Each entry contains a variety of information on the measure it documents, including the general subject area, the type of legislation (parliamentary act, executive regulation, international agreement, etc.), the dates of adoption and entry-into-force, as well as bibliographic information pointing to the regulation's publication in official government journals or gazettes.

The first step in constructing the dataset of retrenchment outcomes was to select only pieces of legislation whose subject area were most relevant to the prevailing theoretical conceptualization of the welfare state in the literature. According to Green-Pedersen

⁴ Available at <http://www.ilo.org/dyn/natlex/natlex4.home>. Last accessed 2016-03-25.

(2004), the least contested definition is the “policy definition where the welfare state means the benefits provided by the state in case of sickness, old-age, unemployment, etc., and services in the area of health, child care etc.” NATLEX contains subject tags that cover many of the policy realms referenced by this definition. All legislation whose NATLEX subject was coded as one of “Medical Care and Sickness Benefit”, “Old-age, Invalidity, and Survivors Benefit”, “Unemployment Benefit”, “Maternity Protection”, or “Social Security (General Standards)” were selected for coding and inclusion in the dataset.

The second step involved the creation of a country-period sample that covered those units most commonly utilized for empirical and theoretical inquiry in the literature. Without a doubt, Western Europe stands at the heart of such research, with additional contributions coming from several Commonwealth nations. The sample was therefore limited to Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom. This grouping covers several important welfare state typologies, notably those by [Esping-Andersen \(1990\)](#); [Castles and Mitchell \(1993\)](#); [Ferrera \(1996\)](#); [Bonoli \(1997\)](#), and [Korpi and Palme \(1998\)](#). Several commonly-scrutinized states were not included in the dataset due to a lack of sufficient archival materials required to properly code retrenchment events. Included amongst this lot are Japan, the Netherlands, and New Zealand. Additionally, the United States was barred from the country sample due to its exceptional economic and political standing relative to other nations, as well as its thoroughly unique cluster of tax-based, federalized welfare institutions ([Howard, 1999](#); [Mettler, 2011](#)). All included legislation was promulgated between January 1st, 1990 and December 31st, 2014.

Finally, the legislation included in the database was limited to certain kinds of motions. NATLEX catalogues several different types of acts, including laws that are approved by legislative bodies, regulations that are adopted by cabinets or other executives, collective bargaining agreements concluded amongst social partners, as well as certain international agreements. Given that much of the welfare state literature points to the impact of voting and representation in national legislatures, only entries that required full legislative approval were included in the dataset. This means that executive regulations, collective agreements, and international agreements not requiring an explicit expression of legislative intent are omitted.

Once the legislation database was assembled, the following procedures were followed for categorizing and coding each entry. First, a clustered random sample was drawn that contained five pieces of legislation from each of the 17 represented countries. The resulting sample of 85 entries amounted to just over six percent of the 1,282 total entries in the dataset. Using the sampled pieces of legislation as guidance, I developed a topical coding scheme that was more fine grained than the general coding provided by NATLEX. In this case, almost all legislation fell into one or more of seven categories:

- *Unemployment*: the provision of monetary benefits following loss of employment, as well as re-training or skill enhancement programs designed to promote re-entry into the labor market
- *Pensions*: the provision of monetary benefits for old-age retirees, including regulations over retirement ages, supplementary pensions, employee contributions, and

cost-of-living adjustments

- *Sickness/Disability*: the provision of monetary benefits and related services for individuals of working age who are either temporarily or permanently unable to participate in the labor market due to physical, cognitive, or psychological ailments
- *Medical*: the provision of medical services and products – including dentistry, optometry, and pharmacy services – or regulations over individual contributions or reimbursements for such items
- *Survivors*: regulations concerning the transfer of certain benefits to next-of-kin in the event of benefit-holder death
- *Maternity*: regulations concerning the provision of job leave for new parents
- *Family/Child*: the provision of monetary benefits for families intended to cover the costs of child care or to subsidize overall costs

Additionally, the sample was used to develop outcome codings for each piece of legislation, as well as a list of criteria associated with each coding. Legislation was sorted into one of five categories.

Laws representing welfare state *expansion* were clearly and conclusively intended either to provide monetary resources or to promote a successful return to the labor market for individuals who, for reasons of age, health, or opportunity, were currently unable to acquire a certain gross income through market sources alone. Conversely, legislation promoting welfare state *retrenchment* generally sought to reduce the monetary resources accruing to such individuals, or to hasten their return to the labor market without the provision of new skills or other resources. If a law contained both expansionary and retrenching elements that were roughly equal in scope, it was given the distinct coding of *mixed*. Legislation that had no direct and discernible implications for the relative level of state support or resources provided to these disadvantaged individuals – ordinarily texts covering administration and other legal or technical elements – were coded as *none*. Finally, a small proportion of legislation contains provisions whose scope or net impact could not be clearly identified. These laws were given a residual coding of *unclear*.

Various criteria drawn from several different sources were used to assign each coding. Legislation text often contains explicit references to the change in benefit amounts, durations, or receipt criteria. In these cases, determining the appropriate coding is relatively straightforward. Lacking such explicit references in the legislation text, two primary sources were used to determine the correct coding. First, legislative archives frequently retain explanatory memoranda used by legislators to outline the basic elements of a bill, how it relates to previous legislation, and professional commentary concerning the bill's projected fiscal and economic impact. These documents usually provide ample information regarding legislative intent sufficient to apply a coding. Second, where no explanatory memoranda are retained, such documents and their content are frequently referenced by legislators during parliamentary debate. The combination of these references and the party affiliation of each orator can also be helpful in triangulating an appropriate coding.

Coding	Count	Percent
Expansion	367	28.6
Mixed	130	10.1
Retrenchment	99	7.7
None	622	48.5
Unclear	64	5.0
Total	1282	100.0

Table 2.1: Counts of Welfare State Legislation by Type, 1990-2014

The breakdown of codings in the dataset is shown in Table 2.1. As can be clearly seen, the modal piece of legislation concerns administrative or other policies that do not obviously and directly impact the generosity of the welfare state. Roughly half of all legislation falls into this category. Amongst legislation that does have clear consequences for the welfare state, however, expansion is still much more commonly observed than retrenchment. Roughly 35 percent of legislation carries with it at least some sort of expansionary policies, while about 18 percent engages in some form of retrenchment. 8 percent of legislation expands and retrenches the welfare state in equal measure. Definitive codings could not be applied in roughly five percent of cases.

Importantly, the proportion of legislation engaging in expansion, retrenchment, or both actions fluctuates over time. Figure 2.1 shows that the overall pattern was most prevalent for the sampled countries in the early- to mid-1990s, as well as the mid-2000s. By contrast, the period from 1997 to 2001 shows a marked increase the overall proportion of expansionary legislation, while retrenchment has been the order of the day since 2010. While retrenchment is something of a rare event, it has become relatively common in recent years.

The data also show that the promulgation of different kinds of welfare state legislation varies considerably across countries, as seen in Figure 2.2. Countries such as Germany, Greece, Italy, Sweden, Switzerland, and the United Kingdom engage in some form of retrenchment in more than 50 percent of their relevant legislation. By contrast, states like Finland and Portugal retrench far less frequently, with rollbacks appearing in less than a third of legislation relevant to the welfare state. Of course, a comparison of proportions belies the fact that some countries more actively tinker with their welfare policies. Amongst the frequently retrenching states listed previously, Figure 2.2 shows that Sweden outpaces the others with respect to the amount of legislation passed—reaching upwards of 65 pieces since 1990. While Germany appears moderately prolific in its welfare legislating, Greece, Italy, Switzerland, and the United Kingdom pass relevant legislation at less than one third the rate of Sweden. Likewise, amongst states that are much more likely to expand the welfare state than to roll it back, Finland produces such legislation at more than double the rate of Portugal.

Importantly, these country-level patterns also display certain trends when disaggregated over time. Figure 2.2 shows that Denmark, Ireland, and Portugal retrenched sparingly until the late 2000s. Certain countries experienced concentrated bouts of reform and retrenchment, such as Finland in the mid-2000s, Italy or Sweden in the early 1990s,

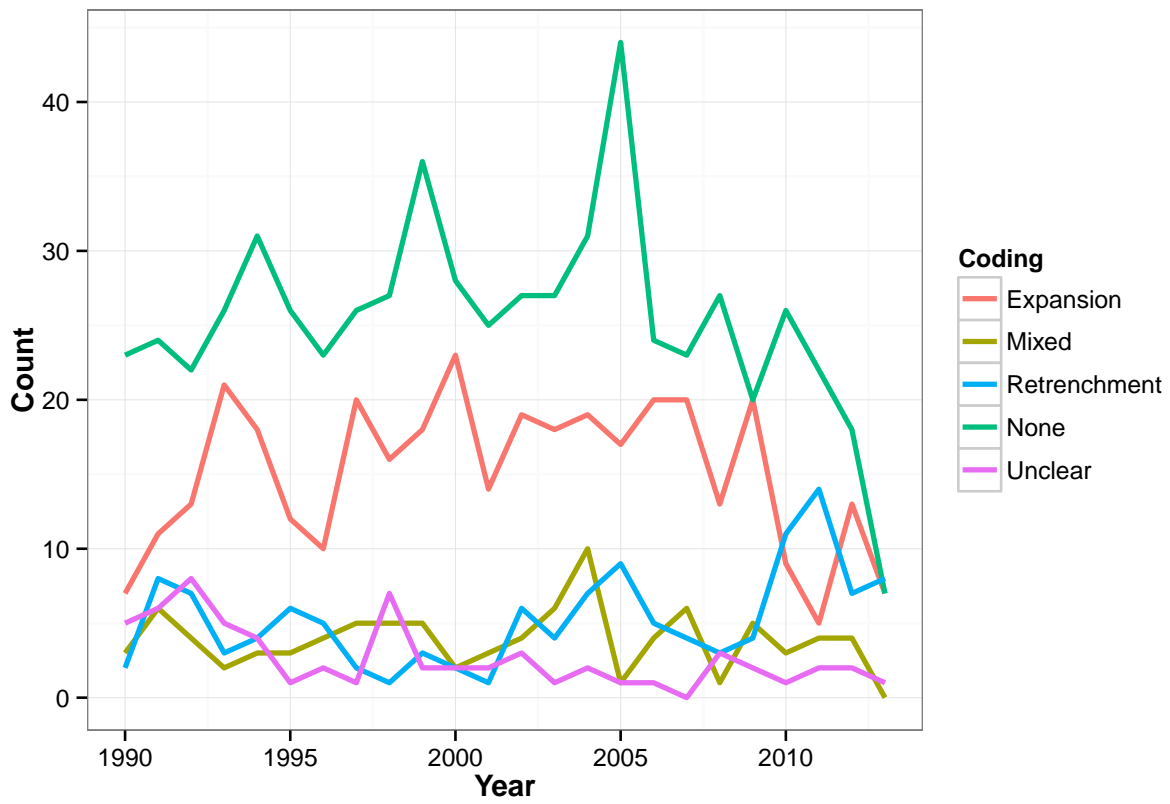


Figure 2.1: Annual Counts of Welfare State Legislation by Type, 1990-2014

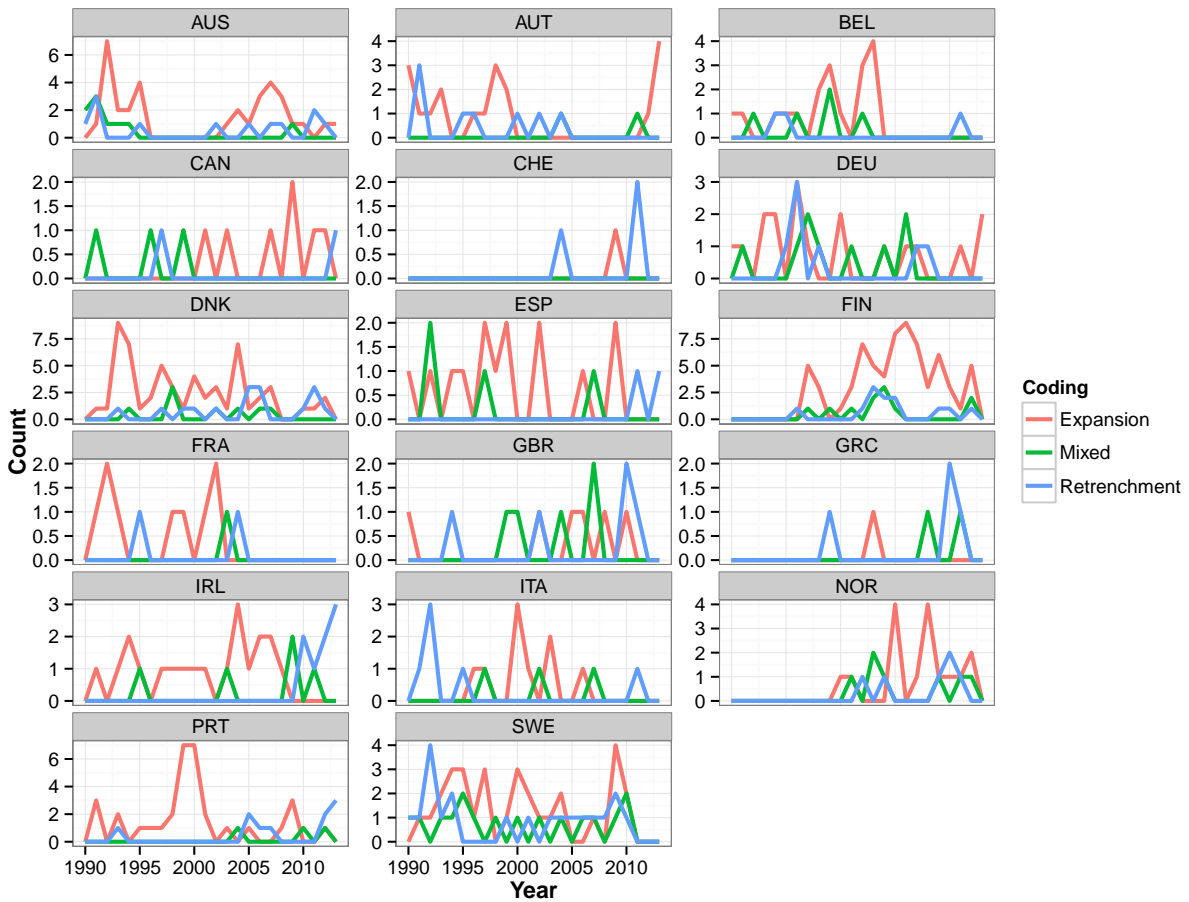


Figure 2.2: Annual Counts of Welfare State Legislation by Type and Country, 1990-2014

Coding	Count	Percent
Pensions	40	33.3
Unemployment	28	23.3
2 or more areas	18	15.0
Sickness/Disability	17	14.2
Medical	7	5.8
Family/Child	6	5.0
Maternity	2	1.7
Survivors	2	1.7
Total	120	100.0

Table 2.2: Counts of Welfare State Legislation by Subject Area, 1990-2014

or Germany in the late 1990s and 2000s. The remainder tend to pass a relatively consistent mix of expansionary and retrenching legislation.

Among legislation that involves some form of retrenchment, Table 2.2 shows that not all areas of the welfare state are equal targets of reform. Pensions are by far the most popular area for retrenchment, representing a third of all such legislation in the dataset. Retrenchment with respect to unemployment represents just under one quarter of all retrenchment actions, followed by sickness/disability at approximately one seventh. Fifteen percent of legislation included in the database induces broad-based retrenchment in two or more areas.

Beyond retrenchment, the dataset contains information on many different covariates that have been suggested as impacting the likelihood of welfare state retrenchment. As was noted above, the primary intent of this analysis is not necessarily to add a new causal explanation for retrenchment, but rather to adjudicate amongst the mass of existing explanations. Therefore, the goal in selecting which covariates to include was primarily to create a complete and exhaustive representation of the causal factors already present in the literature. In the end, over 150 factors were used to train the models detailed below. This includes many basic factors, along with several of their transformations, such as period-to-period percentage changes, multi-period rolling averages, and percentage deviation from group averages and trends. All models were also trained using country and time indicators. Detailed measurement and source information can be found in Appendix 2.6.1, though the major covariate areas covered include:

- National output and growth
- Trade and capital flows
- Prices, interest rates, and exchange rate regimes
- Government spending, taxation, and debt
- Labor, employment, and unionization
- Political parties, voting, and representative institutions

- Political composition of leadership, cabinets, coalitions, and legislatures
- Political crises and caretaker governments
- Population demographics (size, age, and immigration)

2.4.2 New Methods for Analyzing Retrenchment

With this new dataset in hand, we can begin to search for suggestive relationships between different combinations of potentially causal factors and retrenchment events. In order to select an optimal strategy for analysis, it is important to point out several aspects of the retrenchment process that may require special handling.

First, the data show that retrenchment is a considerably rare binary event. Retrenchment legislation is promulgated in less than 0.1 percent of all country-days. This means that any method used for statistical analysis must be able to accommodate severe class imbalance in the outcome (Japkowicz, 2000). Second, the multitude of hypothesized causal factors present in the literature suggest that any causal process leading to retrenchment is likely to be complex and nonlinear, being comprised of many higher-order transformations and combinations of different factors that operate in both the long and short run. Moreover, the possibility that multiple distinct causal pathways precede retrenchment cannot be ruled out a priori. Thus we require a method that is adaptable to, and proficient in handling, a large number of highly variegated variable transformations and combinations.

An ideal source for methods that satisfy these very demanding requirements can be found in an area of machine learning known as “deep learning”, whose algorithms employ models that connect the feature space of a given input to some output by constructing an elaborate network of feature combinations and nonlinear transformations thereof.⁵ These techniques are applied to a wide range of complex learning tasks – including pattern recognition and signal processing – and are well-known for their ability to reliably navigate complex associational patterns (LeCun et al., 2015; Schmidhuber, 2015). Additionally, recent research has shown that deep learning techniques may outperform many other workhorse binary classifiers when dealing with rare events or otherwise imbalanced outcome classes (Japkowicz, 2000; Japkowicz and Stephen, 2002; Sun et al., 2009; Galar et al., 2012).

The basic technique employed below is a deep artificial neural network.⁶ Figure 2.3 illustrates how these models proceed. At initialization, the relationship between a given set of inputs and an output is represented as a fully connected directed graph with several layers. Each node in the graph’s input layer represents a covariate, while each node in the output layer represents one of the possible outcome values. Nodes contained in the

⁵ While the desire to confront this classification problem using a generalized linear model with logit or probit link is understandable, such an approach was avoided due to concern over the potential for biased coefficient values. Logistic regressions produce biased results when applied to data with severe class imbalance in the outcome variable, as is present in the current data (King and Zeng, 2001). While the model could certainly be estimated, it would be unwise to put much confidence in its results.

⁶ The following overview borrows from explanations put forth in Candel et al. (2015).

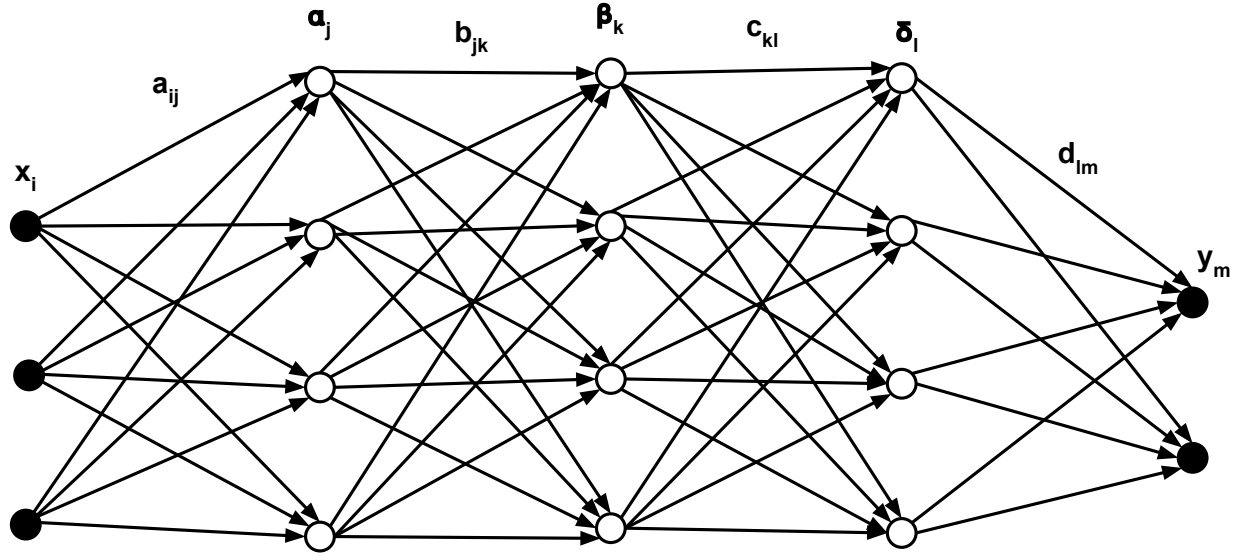


Figure 2.3: Hypothetical Deep Neural Network with Three Hidden Layers

internal layers are considered to be “hidden”, but are in practice weighted sums of the nodes contained in the antecedent layer, along with a bias term. The network functions by repeatedly propagating values from the input layer through the hidden layers, before a special function is used to transform the values in the final hidden layer into predicted probabilities and, thereafter, outcomes. The contribution of each hidden node to the overall error in the model is then used to adjust the node’s weights after each iteration, with the goal of minimizing overall prediction error.

Consider again Figure 2.3. In this case, the network is initiated with three input vectors denoted as x_i . These observed covariates flow into three hidden layers – identifiable by their transparent coloring – each containing four nodes. The value of the hidden nodes are weighted sums of the preceding notes, and can be expressed as

$$\alpha_j = f\left(\sum^i a_{ij}x_i + \theta_j\right) \quad (2.1)$$

$$\beta_k = f\left(\sum^i b_{jk}\alpha_j + \sigma_k\right) \quad (2.2)$$

$$\delta_l = f\left(\sum^i c_{kl}\beta_k + \omega_l\right) \quad (2.3)$$

where f is an activation function and θ , σ , and ω are bias values. The final hidden layer produces probability values or predictions y_m for each of the outcome classes similarly,

though usually with some function g that produces scaled values

$$y_m = f\left(\sum^l d_{lm}\delta_l + \pi_m\right) \quad (2.4)$$

$$(2.5)$$

The algorithm works to identify the weight values a , b , c , and d such that the overall classification error is minimized.

Once the model has been trained and validated, several methods are available for assessing the relative importance of each input factor. In general, these methods work by perturbing either the input values fed into the network, or the weights and values of the hidden nodes. The significance of each input or node is thus determined by the degree to which these perturbations decrease the predictive accuracy of the network. For instance, suppose we have a predictive model M trained on some dataset D containing N observations of K covariates. ζ_D is the overall classification error rate of the model for the data contained in D . To measure the importance of some factor k to the accuracy of the model, the values of k in the dataset are permuted to create a new dataset D_k , which results in a new error rate ζ_{Dk} . The importance score given to variable k is a function of the absolute difference between the two error rates, with

$$I = f(|\zeta_{Dk} - \zeta_D|) \quad (2.6)$$

$$\frac{\partial I}{\partial f} > 0 \quad (2.7)$$

Determining which variables are significant – in the statistical sense of the term – is a somewhat informal process when using importance measures. In this case, I follow the “elbow rule”, which is commonly deployed in cluster analysis to determine the optimum number of groups in a dataset. The rule suggests that, after ordering the variables in terms of their relative importance scores, the line between significant and insignificant variables should be drawn roughly where the marginal difference between importance scores begins to plateau. Mathematically, this point is often found by identifying the point on the curve that is furthest from the line segment connecting the most and least variable importance scores. Formally, suppose we have one vector of positive integers V_x and another vector of variable importance scores V_y containing the ranked scores of all K covariates in the model, such that

$$V_x = [1, 2, 3, \dots, K] \quad (2.8)$$

$$V_y = [v_1, v_2, v_3, \dots, v_K] \quad (2.9)$$

$$v_1 > v_2 > \dots > v_K \quad (2.10)$$

Together, V_x and V_y provide the horizontal and vertical components of a curve P . Suppose further that F is a line segment connecting the first and last points of P , specifically $(1, \max V_y)$ and $(K, \min V_y)$. The cutoff rank between significant and insignificant variables is calculated by the elbow method to be the horizontal value p_x of point p satisfying the equation

$$\overline{pF} = \max(\overline{PF}) \quad \forall \quad p \in P \quad (2.11)$$

The resulting point p represents the closest approximation to the elbow of the variable importance rank curve.

While these variable importance measures detail how critical each factor is in making correct predictions for the outcome, they contain no information on the nature of the conditional or even unconditional relationship between each important factor and the outcome, as might be provided by a correlation or other model coefficient. For this information, one must turn to the raw data to understand how – if at all – the levels and trends present in these critical variables might contribute to the onset of a retrenchment event. To facilitate this, for each significant covariate in every retrenchment event in the dataset, I calculate the percentage difference in covariate values between the retrenching country and the average of all other countries at the same point in time for each day in the six month period preceding the retrenchment event. The average daily percentage differences across this period in all such events is then plotted. This approach is useful in that it provides information on standing or slowly-changing differences between retrenching and non-retrenching countries, while also illustrating potentially important short-term deviations. Put formally, given a set of N retrenchments, for covariate k in the retrenching country containing the i th retrenchment at time t , the period group percentage difference d_{kit} is calculated as

$$d_{kit} = \frac{k_{it} - \left(\frac{1}{N-1}\right) \sum k_{-it}}{\left(\frac{1}{N-1}\right) \sum k_{-it}} \quad (2.12)$$

The plots presented below estimate generalized additive models to smooth the variation in d_{kit} values across all $t \in [-180, 0)$, where t represents the number of days prior to the event.

The network results presented below were produced using the H2O facility for deep artificial neural networks (Candel et al., 2015). This toolkit uses a popular adaptive learning rate method for stochastic gradient descent optimization. A grid search was used to identify optimal hyperparameter values. As such, neural networks with three hidden layers containing 100 nodes each were constructed. Rectifier (with dropout) was used for the activation function of the nodes, as was a non-zero weight penalization ($L1$) of 1×10^{-5} and an input dropout ratio of 0.2. Each model was trained over 500 epochs.

2.4.3 Results

In this model, the outcome is retrenchment in *any* policy area, inclusive of pensions and unemployment/sickness. Despite having several recorded retrenchment incidents in the areas of medical, family/child, survivors, and maternity policies, their numbers are too few to produce stable model results. For this reason, the dependent variable is taken to be a combination of the two most common retrenchment areas observed.

The overall confusion of the model is low, as the overall predictive error rate is just 13 percent. Moreover, the error rates for predicting retrenchment versus lack of retrenchment are well balanced, at 11 and 15 percent, respectively.

Figure 2.4 shows the ordering of variable importance scores produced by the model. Elbow calculations suggest that the line between significant and insignificant variables

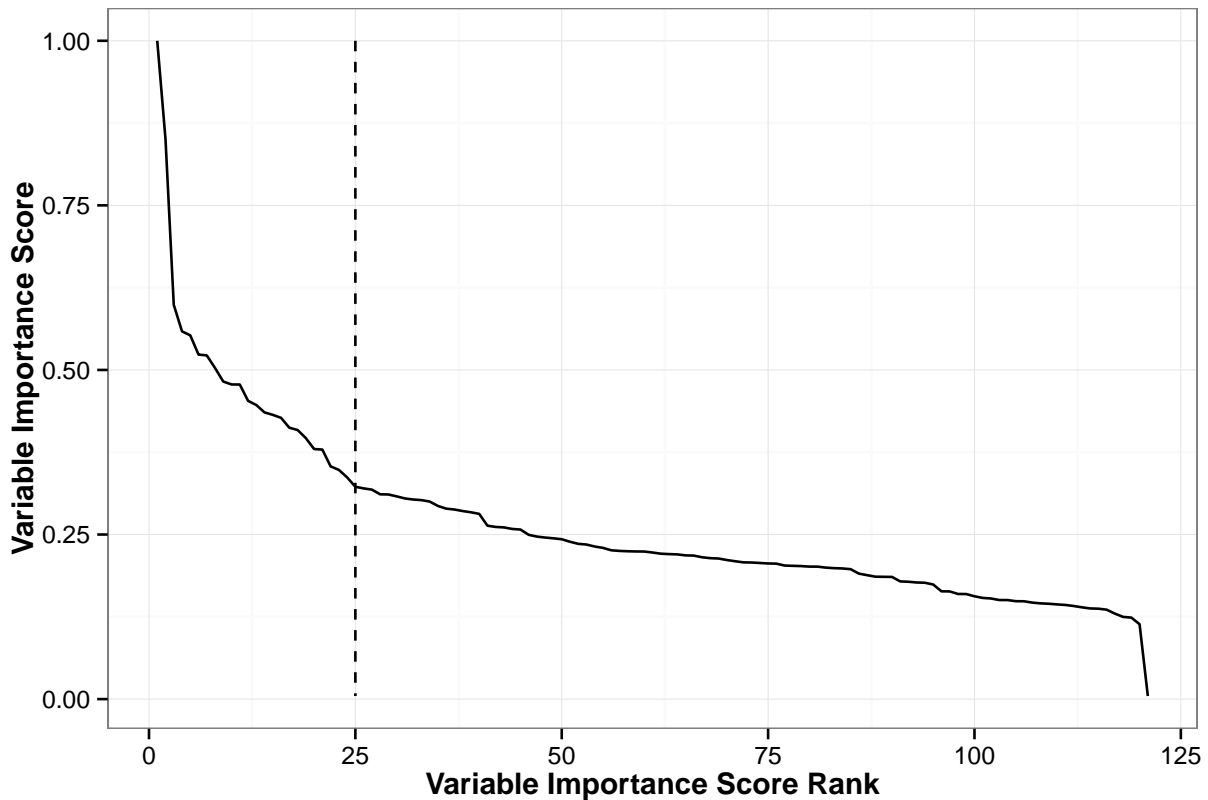


Figure 2.4: Ranking of Variable Importance Scores with Elbow Method Cutoff Indicator

should be drawn after the twenty-fifth factor. Figure 2.5 reveals these variables. While the results include many transformations of certain variables, the most important factors generally fall into one of five categories. These include a) government spending and debt, b) growth in consumption and trade, c) stock market volume, d) prices and interest rates, and e) labor and demographics. Several factors present in the theoretical literature do not find strong support in the model. These include a) capital openness, exchange rates and regimes, b) trade union density and centralization, c) voter turnout and vote share received by various party types, as well as d) the distribution of political affiliations within legislatures or cabinets. Each of these factors appear to play a relatively small role in driving retrenchment when compared with the economic and demographic fundamentals noted previously.

With regard to exactly how these important factors impact retrenchment, Figures 2.6-2.10 provides some insight into the differences between retrenching and non-retrenching countries in the months leading up to a retrenchment event.

First, one can observe several differences between these two types of countries with regard to background conditions, defined as differences that do not appear to change significantly in months preceding retrenchment. Of note, countries that experience re-

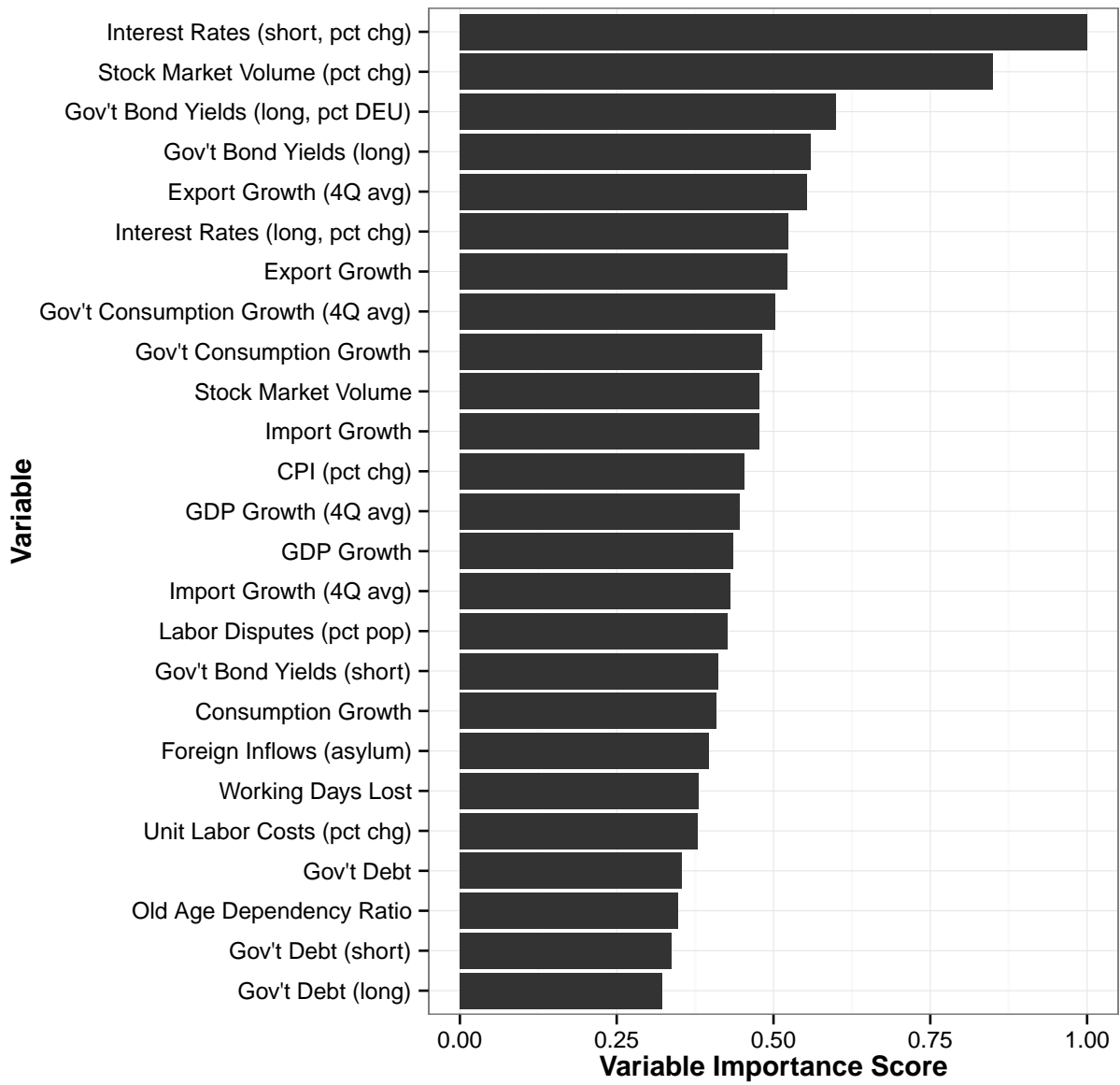


Figure 2.5: Variables with Importance Scores Indicating Statistical Significance

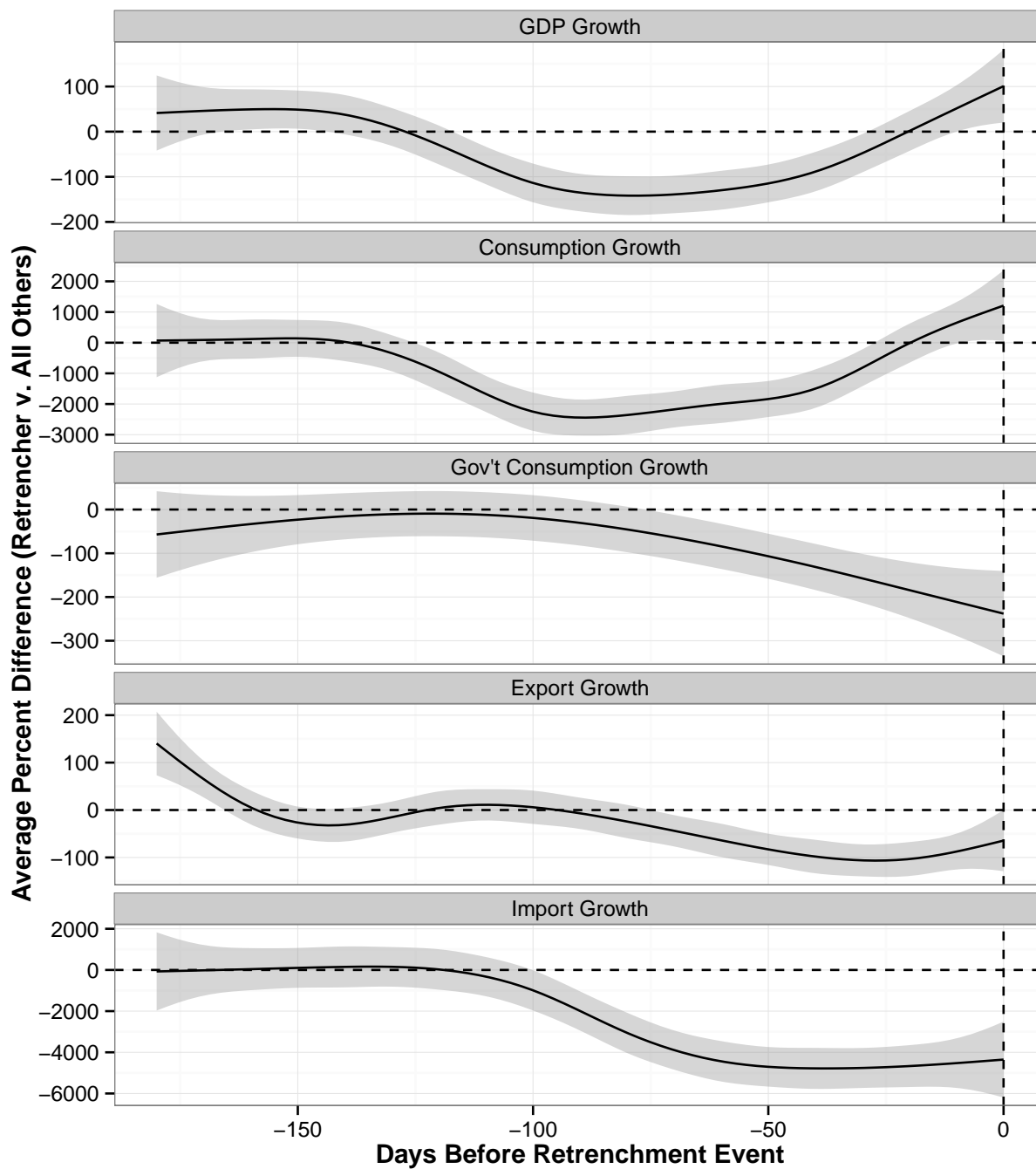


Figure 2.6: Average Differences Between Retrenchment and Non-Retrenchment Events in GDP and Other Components in 180-day Window Prior to Event

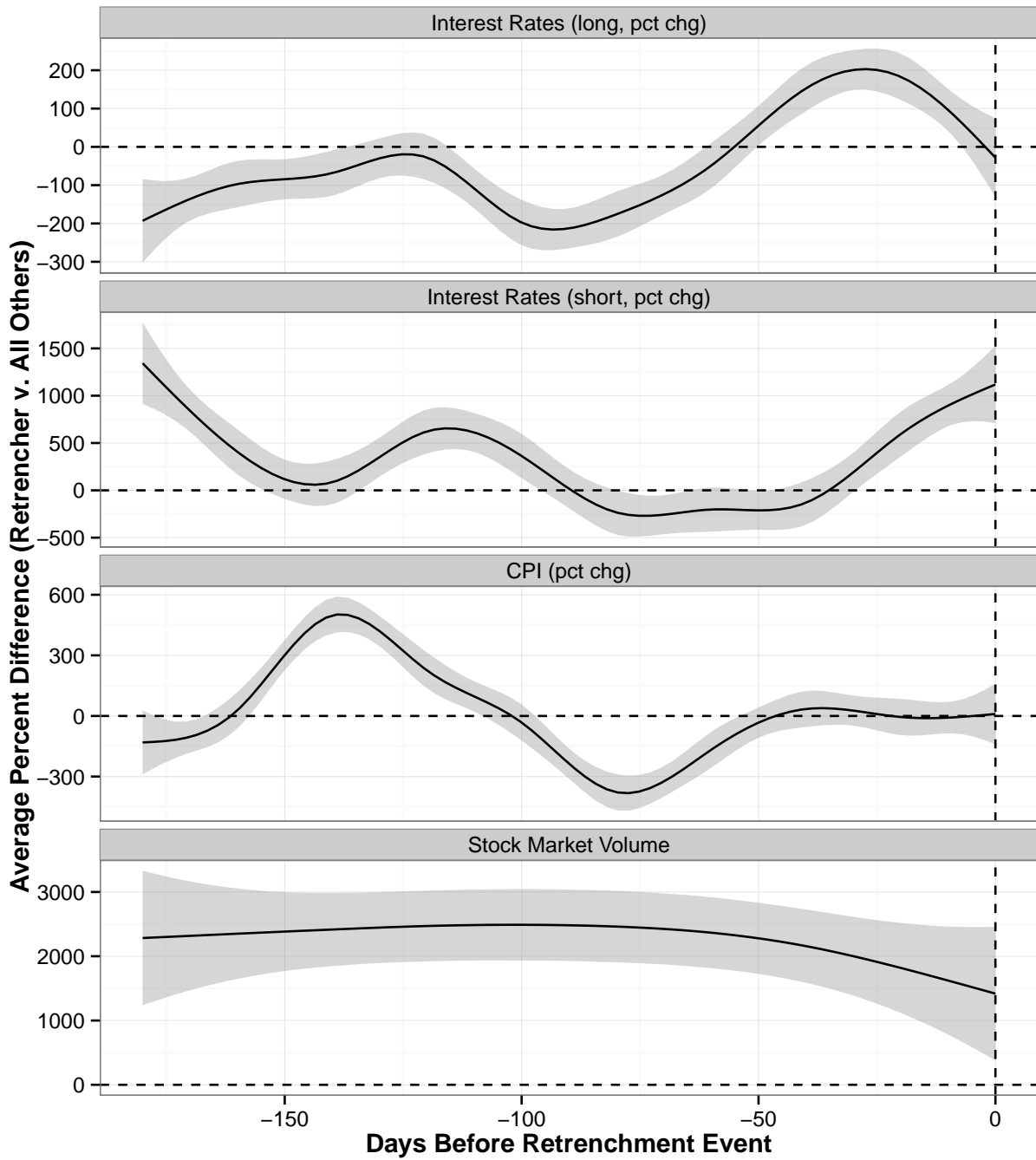


Figure 2.7: Average Differences Between Retrenchment and Non-Retrenchment Events in Interest Rates, Prices, and Trading Volume in 180-day Window Prior to Event

trenchment have higher stocks of government debt than non-retrenching countries. In particular, the retrenching countries have a much higher load of short-term government debt than do non-retrenching countries – on the order of 15 to 20 percent. With regard to labor, retrenching countries appear to generally experience faster increases in unit labor costs, although fewer working days are lost to strike activity. Though the size of the labor force relative to the size of the old-age dependent population is seen as an important predictor of retrenchment, there appears to be no difference in this covariate between retrenching and non-retrenching countries in advance of a retrenchment event. Retrenching countries do, however, have issues with their potentially dependent populations, specifically in the form of greater immigration by individuals seeking asylum. Taken together, those countries most susceptible to retrenchment are saddled with relatively high debt, along with increasing costs from a non-militant labor force and new humanitarian (and possibly welfare) commitments tied to immigration.

Second, the figures point to a series of short-term developments taking place in the period immediately preceding retrenchment. Roughly four to five months before each event, retrenching countries experience a sharp decline in economic growth relative to non-retrenching countries. This drop is driven mainly by a decline in private consumption and coincides with declines in prices, interest rates, and labor disputes. At approximately three months before each event, the price paid by retrenching countries to finance their short-term debt begins to increase relative to the prices paid by non-retrenching countries. Short-term bond yields continue to increase, moreover, all the way up to the actual retrenchment event.

The general pattern, then, is clear. Welfare state retrenchment appears to occur most commonly when states that carry relatively high debt loads experience a broad economic downturn. This decline in growth causes bond markets to mandate higher interest rates for additional lending. Governments continue to make these interest rate concessions until such borrowing becomes prohibitively expensive, at which point welfare spending commitments are retrenched.

2.5 Conclusion and Discussion

After extensive data collection and pre-processing, along with analysis via sophisticated modeling techniques, a relatively simple picture emerges of the events immediately preceding retrenchment events. In general, as a background condition, countries experiencing retrenchment have relatively higher levels of sovereign debt, generally non-militant labor forces, and potentially increasing welfare commitments due to immigration. The first in a series of short-term events that appear to precipitate retrenchment is economic recession. Thereafter, sovereign bond yields increase right until the moment of retrenchment, suggesting a causal pressure that welfare cutbacks are quick to relieve.

Several questions arise from these results. First, while the temporal ordering of recession followed by increasing bond yields is clear, it remains to be seen whether other factors (including the noted background conditions) residing further up the causal chain impact either the movement toward recession or rising yields, or even both. Chapter 3 confronts this question head on by using text analysis to identify other developments that

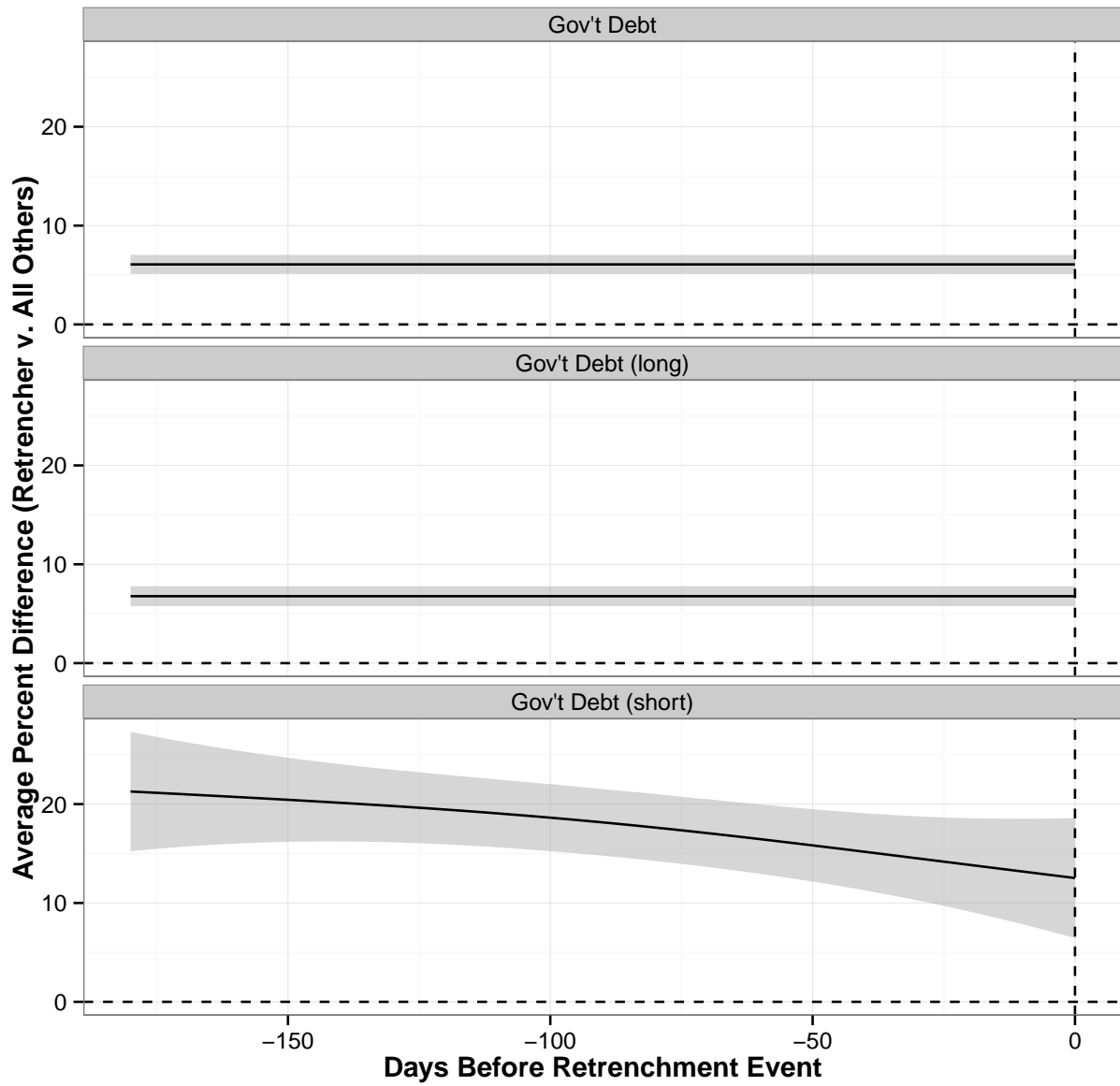


Figure 2.8: Average Differences Between Retrenchment and Non-Retrenchment Events in Government Debt in 180-day Window Prior to Event

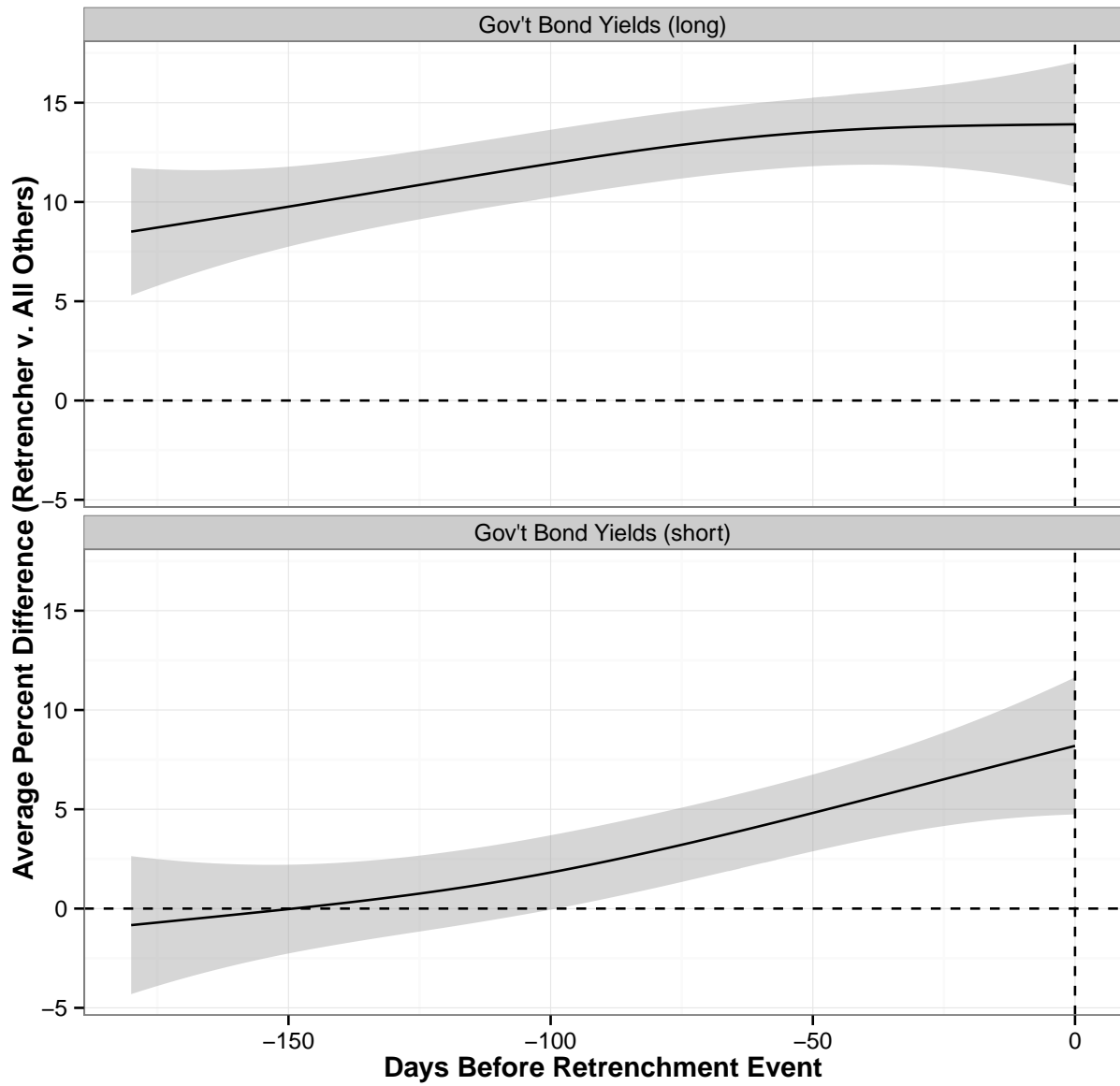


Figure 2.9: Average Differences Between Retrenchment and Non-Retrenchment Events in Government Bond Yields in 180-day Window Prior to Event

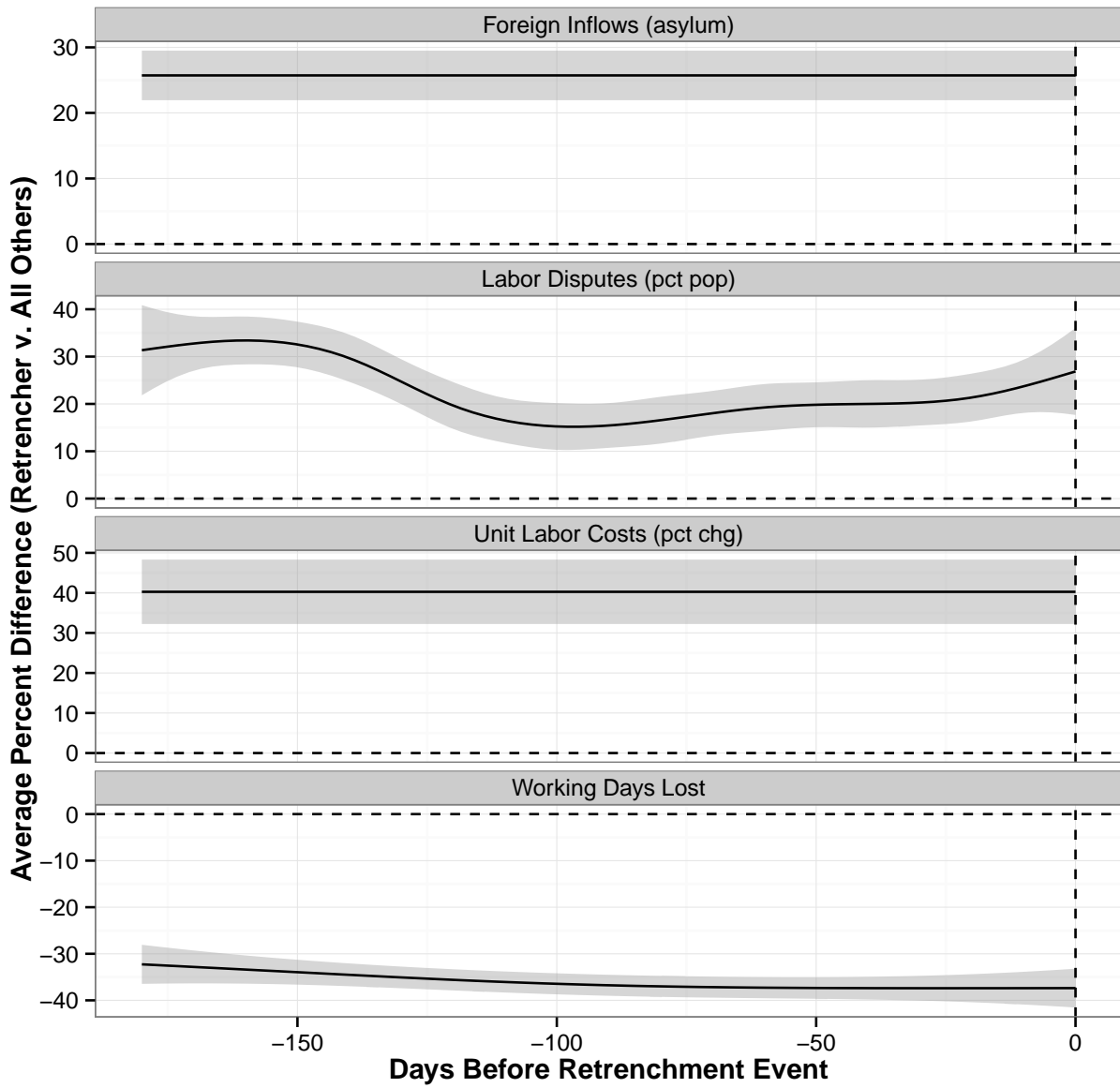


Figure 2.10: Average Differences Between Retrenchment and Non-Retrenchment Events in Labor and Population Demographics in 180-day Window Prior to Event

may cause investors to demand a higher premium for financing additional debt.

Second, and as was referenced in the introduction, little explicit causal role was identified for politics in driving progress toward retrenchment during this event window. It still remains to be determined whether (or, more likely, how) politics reliably impacts retrenchment events over the long-term and the extreme short term. Both fall largely outside the primary window of examination presented above, occurring, respectively, earlier than three months or later than one week prior to the event. The first challenge lies with extreme short-term effects and is primarily one of measurement. Short-term political actions, such as meetings between ministers, protest actions, and aspects of media coverage, need to be conceptualized, operationalized, and then collected upon with respect to retrenchment. These tasks are perhaps easier than carrying out the same actions for politics over the long term. While many of the measurements may be the same – such as meetings, protests, and media – meaningfully aggregating them and identifying important trends would seem to be a formidable task.

Finally, several up-front methodological choices made in this analysis may require further examination to fully understand their impact on the results. Specifically, the conceptualization and measurement of the welfare state as being a constellation of national-level policies that essentially provides income replacement, and of retrenchment as deliberate political efforts to make downward adjustments to these policies, may preordain certain empirical conclusions. Subsequent efforts should look to include state- and local-level policies that might interact with, or otherwise alter, the forces empirically associated with retrenchment. Likewise, separate investigations should largely repeat the above analysis for instances where welfare state retrenchment occurs not by deliberate action, but by drift or legislative neglect.

2.6 Appendix

2.6.1 Covariate Definitions and Sources

Covariate	Description	Unit	Base Source
Cabinet Parties Seat Share	Seats in legislature held by parties in the cabinet	Percent	ParlGov
Cabinet Parties, Number	Number of parties in cabinet	Count	ParlGov
Cabinet, Agrarian Parties	Cabinet majority held by Agrarian party	Binary	ParlGov
Cabinet, Christian Democracy	Cabinet majority held by Christian Democratic party	Binary	ParlGov
Cabinet, Communist/Socialist	Cabinet majority held by Communist/Socialist party	Binary	ParlGov
Cabinet, Conservative	Cabinet majority held by Conservative party	Binary	ParlGov
Cabinet, Green/Ecologist	Cabinet majority held by Green/Ecologist party	Binary	ParlGov
Cabinet, Liberal	Cabinet majority held by Liberal party	Binary	ParlGov
Cabinet, Right-Wing	Cabinet majority held by Right-Wing party	Binary	ParlGov
Cabinet, Social Democracy	Cabinet majority held by Social Democratic party	Binary	ParlGov
Capital Openness	National openness to cross-border financial flows	Index	Chinn-Ito Index
Caretaker	Caretaker government	Binary	ParlGov
Consumption	Consumption	Constant US\$	IFS, IMF
Consumption Growth	Consumption growth	Percent	IFS, IMF, author's calculations
Consumption Growth, 4Q Rolling Avg	Four quarter rolling average of consumption growth	Percent	IFS, IMF, author's calculations
Consumption Growth, pct GDP	Consumption growth	Percent	IFS, IMF, author's calculations
Consumption Growth, pct GDP, 4Q Rolling Avg	Four quarter rolling average of consumption growth	Percent	IFS, IMF, author's calculations
Consumption, 4Q Rolling Avg	Four quarter rolling average of consumption	Constant US\$	IFS, IMF, author's calculations
Consumption, pct GDP	Consumption	Percent	IFS, IMF, author's calculations
Consumption, pct GDP, 4Q Rolling Avg	Four quarter rolling average of consumption	Percent	IFS, IMF, author's calculations
CPI	Consumer price index	Index	IFS, IMF
CPI, YoY Chg	Year-Over-Year Change in Consumer price index	Percent	IFS, IMF, author's calculations
Exchange Rate Regime	Exchange rate regime (fully fixed to fully floating)	15 Ordered Categories	Iizetzki et al.
Exchange Rate Regime Directional Change	If change in exchange rate regime, towards floating or fixed	3 Ordered Categories	Iizetzki et al., author's calculations
Exchange Rate Regime Duration	Years since changing exchange rate regime	Years	Iizetzki et al., author's calculations
Export Growth	Export Growth	Percent	IFS, IMF, author's calculations
Export Growth, 4Q Rolling Avg	Four quarter rolling average of exports growth	Percent	IFS, IMF, author's calculations
Export Growth, pct GDP	Export Growth	Percent	IFS, IMF, author's calculations
Export Growth, pct GDP, 4Q Rolling Avg	Four quarter rolling average of exports growth	Percent	IFS, IMF, author's calculations
Exports	Exports	Constant US\$	IFS, IMF
Exports, 4Q Rolling Avg	Four quarter rolling average of exports	Constant US\$	IFS, IMF, author's calculations
Exports, pct GDP	Exports	Percent	IFS, IMF, author's calculations
Exports, pct GDP, 4Q Rolling Avg	Four quarter rolling average of exports	Percent	IFS, IMF, author's calculations
Foreign Inflow, Labor	Ratio of foreign inflows for labor to population	Ratio	WDJ, World Bank
Foreign Inflows, Asylum	Ratio of foreign inflows seeking asylum to population	Ratio	WDJ, World Bank
Foreign Inflows, Total	Ratio of foreign inflows to population	Ratio	WDJ, World Bank
Foreign Stock Asylum	Ratio of foreign residents seeking asylum to population	Ratio	WDJ, World Bank
Foreign Stock Labor	Ratio of foreign residents laboring to population	Ratio	WDJ, World Bank
Foreign Stock, Total	Ratio of foreign residents to population	Ratio	WDJ, World Bank
Fractionalization, Electoral	Rae's Index of Electoral Fractionalization	Index	ParlGov
Fractionalization, Legislative	Rae's Index of Legislative Fractionalization	Index	ParlGov
GDP	Gross Domestic Product	Constant US\$	IFS, IMF
GDP Growth	Gross Domestic Product Growth	Percent	IFS, IMF, author's calculations
GDP Growth, 4Q Rolling Avg	Four quarter rolling average of GDP Growth	Percent	IFS, IMF, author's calculations
GDP, 4Q Rolling Avg	Four quarter rolling average of GDP	Constant US\$	IFS, IMF, author's calculations
Government Bonds, Long-Term	Average yield of national-level government bonds with maturities between 11 and 30 years (inclusive)	Percent	Global Financial Data, author's calculations
Government Bonds, Long-Term, German	Ratio of average yield of national-level government bonds with maturities between 11 and 30 years (inclusive) to German benchmark	Ratio	Global Financial Data, author's calculations
Government Bonds, Medium-Term	Average yield of national-level government bonds with maturities between 6 and 10 years (inclusive)	Percent	Global Financial Data, author's calculations
Government Bonds, Medium-Term, German	Ratio of average yield of national-level government bonds with maturities between 6 and 10 years (inclusive) to German benchmark	Ratio	Global Financial Data, author's calculations

Government Bonds, Short-Term	Average yield of national-level government bonds with maturities between 1 and 5 years (inclusive)	Percent	Global Financial Data, author's calculations
Government Bonds, Short-term, German	Ratio of average yield of national-level government bonds with maturities between 1 and 5 years (inclusive) to German benchmark	Ratio	Global Financial Data , author's calculations
Government Debt	National government debt	Constant US\$	OECD Stat
Government Debt, Arrears	National government debt deemed in arrears	Percent	OECD Stat
Government Debt, Domestic Currency	National government debt held in domestic currency	Percent	OECD Stat
Government Debt, Foreign Currency	National government debt held in foreign currencies	Percent	OECD Stat
Government Debt, Long-term	National government debt with maturities greater than 10 years	Percent	OECD Stat
Government Debt, Short-Term	National government debt with maturities 10 years or less	Percent	OECD Stat
Government Debt/GDP	National government debt vice annual GDP	Ratio	OECD Stat, author's calculations
Government Spending	Government spending	Ratio	OECD Stat, author's calculations
Government Spending Growth	Government spending growth	Percent	IFS, IMF
Government Spending Growth, 4Q Rolling Avg	Four quarter rolling average of government spending growth	Percent	IFS, IMF, author's calculations
Government Spending Growth, pct GDP	Government spending growth	Percent	IFS, IMF, author's calculations
Government Spending Growth, pct GDP, 4Q Rolling Avg	Four quarter rolling average of government spending growth	Percent	IFS, IMF, author's calculations
Government Spending, 4Q Rolling Avg	Four quarter rolling average of government spending	Percent	IFS, IMF, author's calculations
Government Spending, pct GDP	Government spending	Percent	IFS, IMF, author's calculations
Government Spending, pct GDP, 4Q Rolling Avg	Four quarter rolling average of government spending	Percent	IFS, IMF, author's calculations
Import Growth	Import growth	Percent	IFS, IMF, author's calculations
Import Growth, 4Q Rolling Avg	Four quarter rolling average of import growth	Percent	IFS, IMF, author's calculations
Import Growth, pct GDP	Import growth	Percent	IFS, IMF, author's calculations
Import Growth, pct GDP, 4Q Rolling Avg	Four quarter rolling average of import growth	Percent	IFS, IMF, author's calculations
Imports	Imports	Constant US\$	IFS, IMF
Imports, 4Q Rolling Avg	Four quarter rolling average of imports	Constant US\$	IFS, IMF, author's calculations
Imports, pct GDP	Imports	Percent	IFS, IMF, author's calculations
Imports, pct GDP, 4Q Rolling Avg	Four quarter rolling average of imports	Percent	IFS, IMF, author's calculations
Interest Rates, Long-term	Benchmark long-term interest rates	Percent	WDJ, World Bank
Interest Rates, Long-term, YoY Chg	Benchmark long-term interest rates, year-over-year change	Percent	WDJ, World Bank
Interest Rates, Short-term	Benchmark short-term interest rates	Percent	WDJ, World Bank
Interest Rates, Short-term, YoY Chg	Benchmark short-term interest rates, year-over-year change	Percent	WDJ, World Bank
Labor Disputes	Percent of population involved in labor disputes	Percent	WDJ, World Bank
Minimum Coalition Size	Minimum number of parties required to form majority coalition	Count	ParlGov , author's calculations
Net Export Growth	Net export growth	Percent	IFS, IMF, author's calculations
Net Export Growth, 4Q Rolling Avg	Four quarter rolling average of net export growth	Percent	IFS, IMF, author's calculations
Net Export Growth, pct GDP	Net export growth	Percent	IFS, IMF, author's calculations
Net Export Growth, pct GDP, 4Q Rolling Avg	Four quarter rolling average of net export growth	Percent	IFS, IMF, author's calculations
Net Exports	Net exports	Constant US\$	IFS, IMF, author's calculations
Net Exports, 4Q Rolling Avg	Four quarter rolling average of net exports	Constant US\$	IFS, IMF, author's calculations
Net Exports, pct GDP	Net exports	Percent	IFS, IMF, author's calculations
Net Exports, pct GDP, 4Q Rolling Avg	Four quarter rolling average of net exports	Percent	IFS, IMF, author's calculations
Old-Age Dependency	Ratio of population older than 65 to total population older than 15	Ratio	WDJ, World Bank
Outright Party Majority	Single party has greater than 50 percent of seats in legislature	Binary	ParlGov , author's calculations
Parties excluded from government	Percent of parties in legislature not in government	Percent	ParlGov
Parties, Number	Number of parties in running candidates for legislature	Count	ParlGov , author's calculations
Parties, Number with Seats	Number of parties in running candidates for legislature, gaining seats	Count	ParlGov , author's calculations
Party Majority, Agrarian Parties	Legislative majority held by Agrarian parties	Binary	ParlGov
Party Majority, Christian Democracy	Legislative majority held by Christian Democratic parties	Binary	ParlGov
Party Majority, Communist/Socialist	Legislative majority held by Communist/Socialist parties	Binary	ParlGov
Party Majority, Conservative	Legislative majority held by Conservative parties	Binary	ParlGov
Party Majority, Green/Ecologist	Legislative majority held by Green/Ecologist parties	Binary	ParlGov
Party Majority, Liberal	Legislative majority held by Liberal parties	Binary	ParlGov
Party Majority, Right-Wing	Legislative majority held by Right-Wing parties	Binary	ParlGov
Party Majority, Social Democracy	Legislative majority held by Social Democratic parties	Binary	ParlGov
Population	Population size	Count	WDJ, World Bank
Population Growth	Year-Over-Year Change in Population	Percent	WDJ, World Bank, author's calculations
Prime Minister, Agrarian Parties	Prime ministership held by Agrarian party	Binary	ParlGov
Prime Minister, Christian Democracy	Prime ministership held by Christian Democratic party	Binary	ParlGov
Prime Minister, Communist/Socialist	Prime ministership held by Communist/Socialist party	Binary	ParlGov
Prime Minister, Conservative	Prime ministership held by Conservative party	Binary	ParlGov

Prime Minister, Green/Ecologist	Prime ministership held by Green/Ecologist party		ParlGov
Prime Minister, Liberal	Prime ministership held by Liberal party	Binary	ParlGov
Prime Minister, Right-Wing	Prime ministership held by Right-Wing party	Binary	ParlGov
Prime Minister, Social Democracy	Prime ministership held by Social Democratic party	Binary	ParlGov
Private Consumption	Private consumption	Constant US\$	IFS, IMF, author's calculations
Private Consumption Growth	Private consumption growth	Percent	IFS, IMF, author's calculations
Private Consumption Growth, 4Q Rolling Avg	Four quarter rolling average of private consumption growth	Percent	IFS, IMF, author's calculations
Private Consumption Growth, pct GDP	Private consumption growth	Percent	IFS, IMF, author's calculations
Private Consumption Growth, pct GDP, 4Q Rolling Avg	Four quarter rolling average of private consumption growth	Percent	IFS, IMF, author's calculations
Private Consumption Growth, 4Q Rolling Avg	Four quarter rolling average of private consumption	Constant US\$	IFS, IMF, author's calculations
Private Consumption, pct GDP	Private consumption	Percent	IFS, IMF, author's calculations
Private Consumption, pct GDP, 4Q Rolling Avg	Four quarter rolling average of private consumption	Percent	IFS, IMF, author's calculations
Seat Inequality	Gini coefficient for seat distribution amongst parties in legislature	Index	ParlGov, author's calculations
Seat Share, Agrarian Parties	Cabinet majority held by Agrarian party	Percent	ParlGov
Seat Share, Christian Democracy	Cabinet majority held by Christian Democratic party	Percent	ParlGov
Seat Share, Communist/Socialist	Cabinet majority held by Communist/Socialist party	Percent	ParlGov
Seat Share, Conservative	Cabinet majority held by Conservative party	Percent	ParlGov
Seat Share, Green/Ecologist	Cabinet majority held by Green/Ecologist party	Percent	ParlGov
Seat Share, Liberal	Cabinet majority held by Liberal party	Percent	ParlGov
Seat Share, Right-Wing	Cabinet majority held by Right-Wing party	Percent	ParlGov
Seat Share, Social Democracy	Cabinet majority held by Social Democratic party	Percent	ParlGov
Social Spending	Social spending as a percentage of GDP	Percent	OECD Stat
Stock Market Value	Index of stock market value	Index	Global Financial Data
Stock Market Value, Pct Chg	Day-to-day change in stock market value	Percent	Global Financial Data, author's calculations
Stock Market Volume	Index of stock market trading volume	Index	Global Financial Data
Stock Market Volume, Pct Chg	Day-to-day change in stock market trading volume	Percent	Global Financial Data, author's calculations
Trade Openness	Ratio of exports and imports to GDP	Ratio	IFS, IMF, author's calculations
Unemployment Rate	Percent of labor force currently unemployed	Percent	IFS, IMF
Union Centralization	Index of trade union centralization	Index	OECD Stat
Union Density	Percent of employed individuals with union memberships	Percent	OECD Stat
Unit Labor Cost	Benchmark cost of labor	Index	OECD Stat
Unit Labor Cost, Pct Chg	Year-Over-Year Change in benchmark cost of labor	Percent	OECD Stat, author's calculations
Vote Inequality	Gini coefficient for vote distribution amongst parties running for legislature	Index	ParlGov, author's calculations
Vote Share, Agrarian Parties	Vote share taken by Agrarian parties	Percent	ParlGov
Vote Share, Christian Democracy	Vote share taken by Christian Democratic parties	Percent	ParlGov
Vote Share, Communist/Socialist	Vote share taken by Communist/Socialist parties	Percent	ParlGov
Vote Share, Conservative	Vote share taken by Conservative parties	Percent	ParlGov
Vote Share, Green/Ecologist	Vote share taken by Green/Ecologist parties	Percent	ParlGov
Vote Share, Liberal	Vote share taken by Liberal parties	Percent	ParlGov
Vote Share, Right-Wing	Vote share taken by Right-Wing parties	Percent	ParlGov
Vote Share, Social Democracy	Vote share taken by Social Democratic parties	Percent	ParlGov
Voter Turnout	Percentage of registered voters actually voting	Percent	ParlGov
Women in Legislature	Percentage of seats in legislature held by women	Percent	OECD Stat
Working Days Lost	Working days lost to labor conflicts	Count	ILO Stat

Chapter 3

Political Uncertainty and Welfare State Retrenchment

3.1 Introduction

Welfare state retrenchment is a fundamentally rare event. Since 1990, as was reported in Chapter 2, somewhere less than ten percent of all welfare-related legislation in advanced industrial democracies has rolled back the aid provided by states to its citizens who are unable to participate in the labor market. On average, that equates to just a single reform every three months across the entire western world. And yet, as was previously demonstrated, these events generally occur under predictable circumstances. Highly indebted states face economic recessions, which are then followed by increases in the price they must pay for further borrowing. The experience of acute public fiscal distress – defined here as the inability to affordably finance new sovereign debt to cover expenditure requirements – then forces a reduction of state-provided social protection. Indeed, from an empirical standpoint, retrenchment events act like a safety valve that releases the pressure of rising debt finance costs.

Of course, much remains unknown about why certain economic downturns turn into larger crises of public finance. This leads one to wonder whether certain phenomena reliably occupy positions causally prior to debt crisis, and, if so, what they might be. Previous work on retrenchment has strongly suggested, for instance, that various political developments may induce retrenchment events (Levy, 1999; Ross, 2000; Korpi and Palme, 2003). Overall, however, robust empirical evidence has yet to validate many of these claims.

A few of the major impediments to identifying these elements of the causal process behind retrenchment are methodological in nature. In the first place, *operationalizing* many non-economic determinants of retrenchment presents a considerable challenge. For instance, while the party-seat structure of political coalitions can be easily represented in numerical terms, enumerating the perceived strength of a prime minister or the level of discord amongst a cabinet is less straightforward (Simon, 1953; Brams, 1968). Likewise, traditional quantification strategies make it difficult to usefully code unique, non-recurring events that may have singular causal importance for an outcome (Taleb, 2007).

This chapter attempts to overcome these methodological challenges and to elucidate some of the more upstream causes of welfare state retrenchment. Specifically, it looks to identify the developments that propel highly indebted countries experiencing economic recessions into the periods of public fiscal distress that so often precede retrenchment episodes. To do this, the paper relies upon a new dataset containing several hundred thousand news articles produced during the European debt crisis from 2010 to 2014. Topic modeling and deep learning techniques are used to detect events and occurrences that lead to instances of acute public fiscal distress, as proxied by major off-trend increases or “jumps” in the amount states must pay to issue further debt.

The results show that states are more likely to encounter rising fiscal constraints when the landscape of political power becomes more uncertain or, equally, when incumbents are perceived to have diminishing political power. This is exemplified by either a lack of resolve or inability to achieve certain ends on the part of sitting politicians and bureaucrats, or more frequent and destabilizing challenges to their leadership. Three particular examples are explored in greater detail, including the negotiations over a Spanish banking bailout between European Commissioner Olli Rehn and Prime Minister Mariano Rajoy in 2012, the domestic political fallout of Italian Prime Minister Silvio Berlusconi’s 2011 resignation, and the rise of two far-right political parties both domestically and in the European Parliament between 2011 and 2013.

3.2 Methods

3.2.1 Dependent Variable Identification

Operationalizing the outcome of interest – namely, the onset of public fiscal distress – requires several steps. For the purposes of this investigation, the primary numeric indicator of fiscal distress will be the yield on sovereign bond offerings. Using the *Global Financial Database* (2015), two broad indicators are constructed. The first represents short-term debt offerings and is equal to the average yield on sovereign debt with maturities less than or equal to five years, while the second focuses on medium-term debt with maturities of between six and ten years. In each case, yields were standardized relative to those on German sovereign debt with comparable maturities.

To demarcate the onset of new periods of heightened fiscal distress as indicated by bond yields, I consider only upward movements in yields that represent clear departures from local trends. In an effort to consistently and automatically identify these trend breaks, I use the Pruned Exact Linear Time (PELT) method proposed by [Killick et al. \(2012\)](#) to detect changes in the rolling mean of each time series. In general, PELT and other multiple change point algorithms iterate through different combinations of potential cut points in a time series and calculate whether a given test statistic is significantly changed by splitting the series at each cutpoint. Under minimal assumptions, these algorithms will identify all instances of significant departures from the local mean. I add an additional qualification by searching only for upward deviations to capture increasing, rather than decreasing, public fiscal distress.

Examination of the identified change points reveals that these breaks tend to be rela-

tively left-aligned with respect to yield increases, meaning that they mark the final day between the past period of lower yields and the new, higher yield period. Because yields often appear to take several days to stabilize at the higher average levels, each identified change point was taken to be the beginning of a three-day change period covering the overall transition time. This proves to be especially useful in the analysis detailed below, where news coverage in these transition periods will be mined for developments that are potential suspects behind these jumps.

Figures 3.1 and 3.2 show the short- and medium-term yields on the sovereign debt of Greece, Ireland, Portugal, Spain and Italy from 2010 through to 2015. These countries were selected because each is widely known to have experienced crises relating to the management of their sovereign debt in this period. Each vertical red line represents a mean trend break taken to indicate the onset of increased public fiscal distress. These are, in other words, turning points in which state debt is seen to be of notably greater default risk. For Ireland, Portugal, Spain, and Italy, there are anywhere between four and nine notable trend breaks between 2010 and 2014. This holds for both short-term and medium-term bond offerings. By contrast, Greece experienced roughly 20 similar trend breaks over the same period, in addition to experiencing an extended period in which short-term bonds were essentially untradeable. As a result, yields for this period were incalculable.

3.2.2 Article Collection

The initial step in identifying the sorts of events and occurrences that precipitate public fiscal crises is to create a textual approximation of the environment in which these happenings take place. Perhaps the most reliable way to recreate this environment is through the collection of primary source materials. Two guidelines should govern this process.

First, selected materials should contain only factual and impartial bits of information. Textual representations of human events are, in and of themselves, simply crude renderings of actual events, as experienced or understood by the author of a given text. That is to say, these documents are subject to biases, omissions, and emphases that may affect the quality of their representations. Minimizing these distortions is critical to constructing an accurate textual approximation.

Second, it is highly desirable that these materials be produced at regular intervals by professional and reputable providers. In the main, consistent production over time provides information as to the timing and development of different events and occurrences, and allows for their situation relative to background conditions. Furthermore, repeated professional output works to make the inaccuracies of representation in the sample minimal and consistent throughout the entire time period covered. This allows for greater ease in dealing with authorship and other publication biases, should the researcher be required to do so.

All these requirements point to the LexisNexis Academic newspaper collection as an ideal database for article sourcing. The collection contains full article texts for roughly 2,500 newspapers and other news-bearing publications that were published throughout

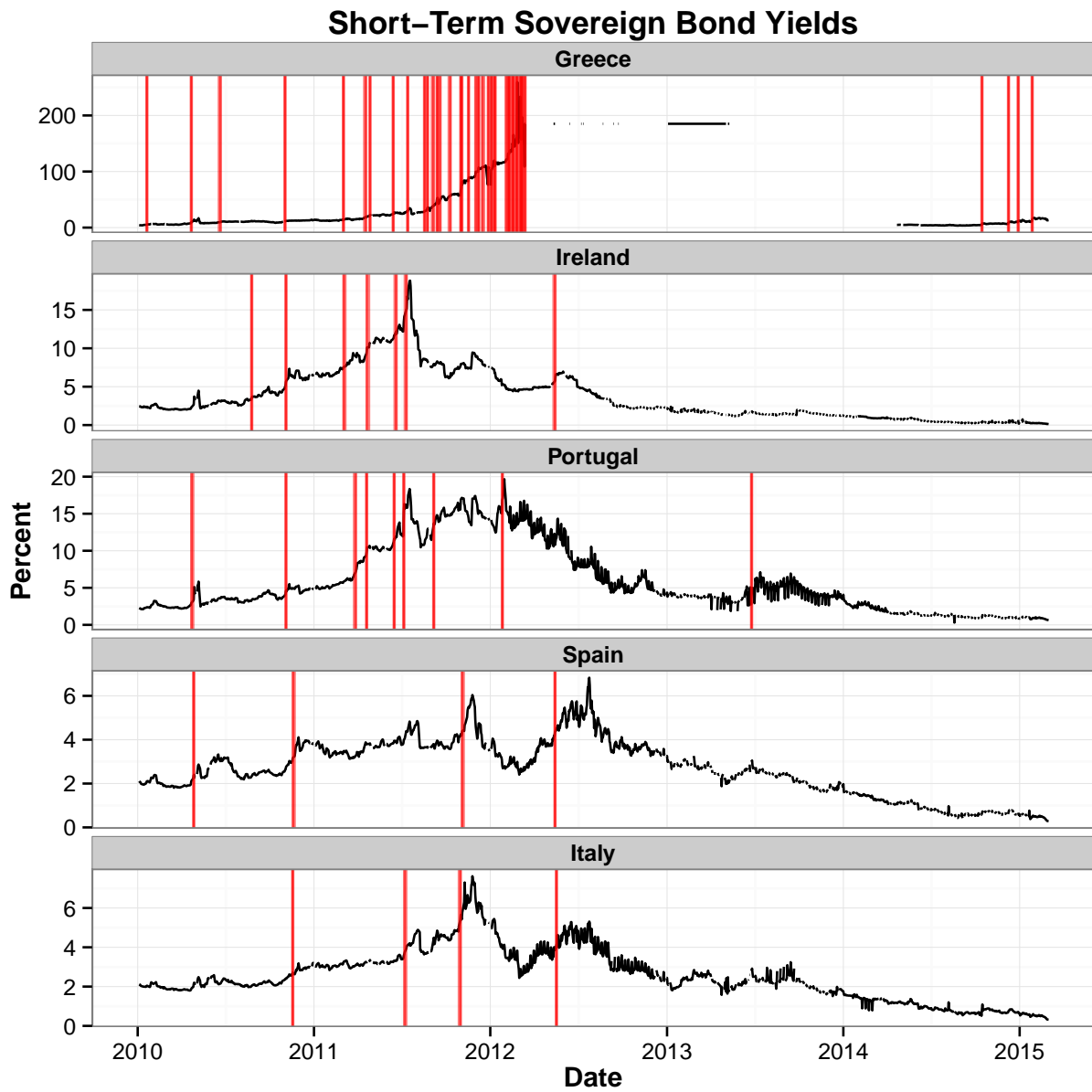


Figure 3.1: Yields on Short-Term Sovereign Debt with Indicated Upward Trend Breaks

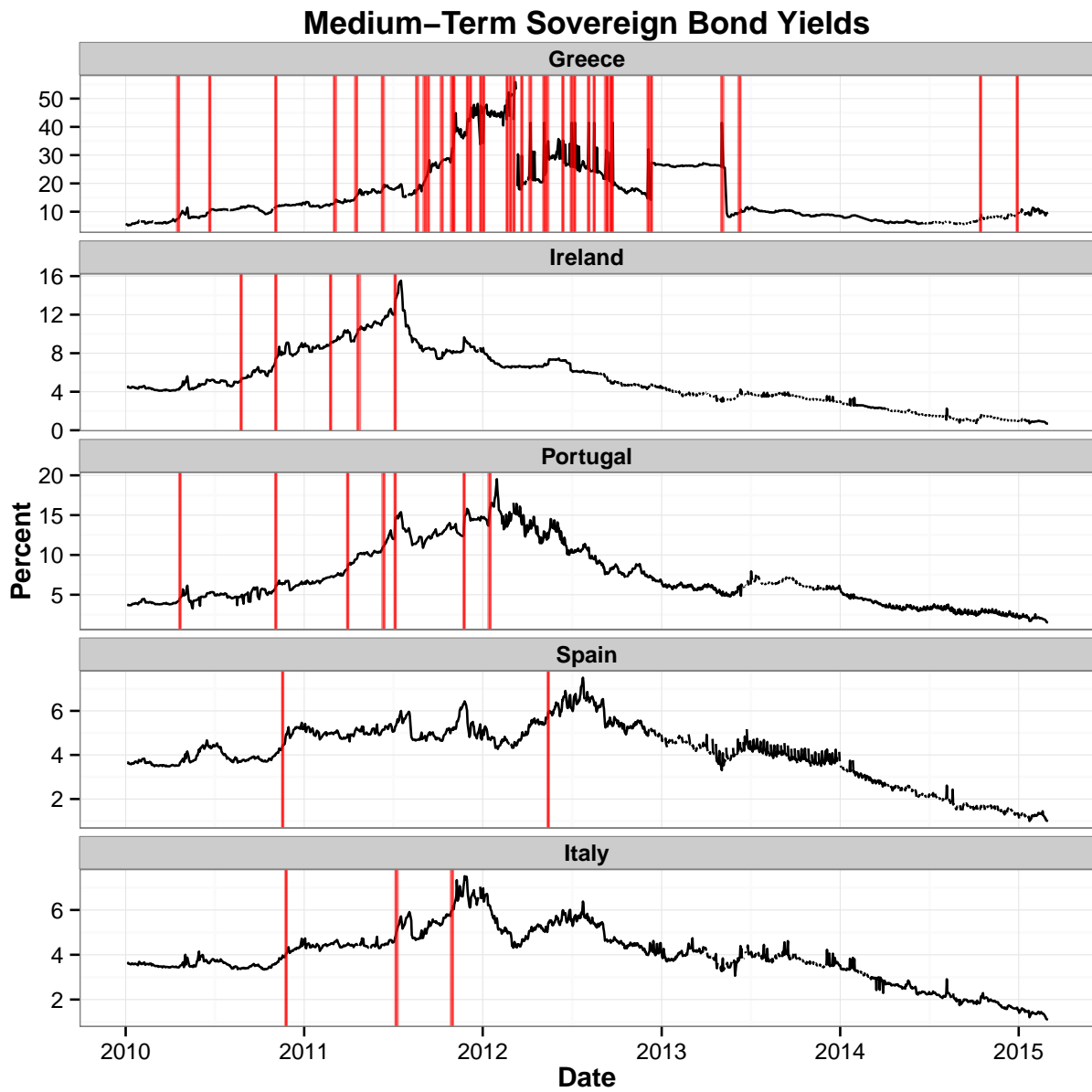


Figure 3.2: Yields on Long-Term Sovereign Debt with Indicated Upward Trend Breaks

the entire period of study.¹ Of these, approximately 2,000 sources published articles in English, with the remainder publishing generally in French, Spanish, or German. To facilitate consistent and robust text pre-processing for the topic modelling detailed below, only English language sources were utilized.

Critically, the database also contains a great deal of metadata than can be used to curate a sample of articles that most closely hews to the requirements noted above. Several filters were applied in this regard. In the first place, the sample was limited to articles contained in what the database refers to as “Major World Publications”. The publications are considered to be exceptionally reliable news sources that have a global reach in their reporting and are widely acknowledged for their journalistic integrity. Put another way, these outlets are considered to be newspapers of record.² Additionally, any articles tagged as being from either the editorial or opinion sections of these publications were omitted from the sample. The result is a sample space that contains only the most reputable and unbiased accounts of current events possible.

Download rate limiting and other database access restrictions prevent the researcher from easily viewing the entire article sample space and applying custom filtering algorithms to the full text of each article. As a result, several additional steps were executed to filter the database in a more circuitous fashion.

The first step involved using the database’s own article subject tags to identify those articles that were most relevant to the general topic of sovereign debt from the period spanning 2010 to 2014. The following procedures conform to those outlined by King et al. (2014) for extracting relevant subject keywords for use with access-limited databases. An initial sample of 1,000 articles was taken based solely on the geographic tags for each country of interest. These articles were returned based on LexisNexis’s own “relevancy” algorithm, the exact nature of which is proprietary and unknown. One can reasonably assume, however, that this algorithm seeks to maximize the purity of the article content with respect to the search terms or tags. In other words, an article with three quarters of its content judged to be relevant to the search criteria has a much higher likelihood of being returned in the most relevant results than an article with just one quarter of its content concerning the same criteria.

With this initial sample in hand, the article metadata with respect to country and subject matter were tabulated and filtered to represent the broadest set of tags germane to the movement of sovereign bond yields during the period of interest. Appendix 3.5.1 shows the top one hundred subject tags ordered by frequency of appearance, while Appendix 3.5.2 gives the full list of subject tags observed in alphabetical order. The number of articles in the initial sample containing each tag is given in parentheses. In order to reduce the overall number of subject tags included in the searches, a boolean search pattern³ was

¹ LexisNexis Content Reports and author’s calculations. Available at <https://www.dropbox.com/sh/yr2ujfdd08jtame/AABBdm7UYudM4DUw-xLzGUUOa?dl=0>. Last accessed 2015-09-21.

² A partial list of these sources is available at <https://www.dropbox.com/sh/yr2ujfdd08jtame/AABBdm7UYudM4DUw-xLzGUUOa?dl=0>. Last accessed 2015-09-21.

³ Formally, following the LexisNexis boolean search codings, the subject operator was specified as “SUBJECT(euro! or bank! or policy or union! or monetar! or devalu! or unemploy! or rat! or credit! or

constructed that sought to cover the most popular topics and their lexical derivatives, as well as those less frequent tags that were most conceptually relevant during the European crisis. The search pattern yielded a final set of 153 subject tags, which are shown in Table 3.5.3.

The second filtering step was to select only those articles that were the most substantial, or those that likely contained the greatest news content relevant to the subject matter. One potential proxy for this aspect of article content is its word count. Figure 3.3 shows the distribution of article lengths among the initial sample. As is clear from the figure, the vast majority of articles contain less than 2,000 words. Individual inspection of the full text for longer articles reveals them to be broadly composed of long-form journalistic accounts and other analytical pieces, rather than simple factual reports. Furthermore, individual inspection shows that articles with less than 250 words generally have minimal information content and are limited to briefs on minor news stories. For these reasons, the article sample space was further constrained to include only those articles containing between 250 and 2,000 words.

Finally, to get full article coverage across the entire period under consideration without exceeding download limits, a strategy must be developed to identify an optimal time chunk for each search. The goal here is to find the largest window of time than can be spanned in a given search while ensuring, for a limited total number of articles, that the major events for each day are not overwhelmed by coverage of momentous or fantastic events occurring within the same time period that might be deemed especially relevant by LexisNexis's search algorithm.

To identify this optimal window size, I selected several major events in the European debt crisis that might dominate news coverage for a multiday period. Specifically, I examined the days surrounding the first Troika bailout announcements for Greece, Ireland, and Portugal.⁴ I then analyzed the distribution of coverage generated for the top 1,000 most relevant articles produced by LexisNexis that fell within several different windows around each event. Overall, a window of 12 days appeared to be the largest search window that reliably included good coverage of even relatively minor happenings on all days in the examined interval. As a result, and in addition to the subject and word count filters, up to the top 1,000 most relevant articles were extracted from the LexisNexis database in batches of 12 day intervals from January 1st, 2010 through December 31st, 2014.

3.2.3 Text Pre-Processing

Once the texts were assembled, the entire corpus was processed into a format suitable for use with topic modeling and other text analysis routines. First, informal observation revealed that several duplicate or near-duplicate articles existed in the corpus. These were most commonly syndicated reports that were published with slight alterations to titles, bylines, and, less frequently, content across different news sources. To remove these duplicates, the corpus was transformed into a series of log-scaled term frequency/inverse

budget! or bail! or currenc! or gover! debt! or bond! or econ! or crisis or finan! or politi!) AND NOT SUBJECT(cruise! or soccer! or sport! or rugby! or tour! or tobacco or decor!)"

⁴ These events occurred on May 1st, 2010, November 29th, 2010, and May 16th, 2011, respectively.

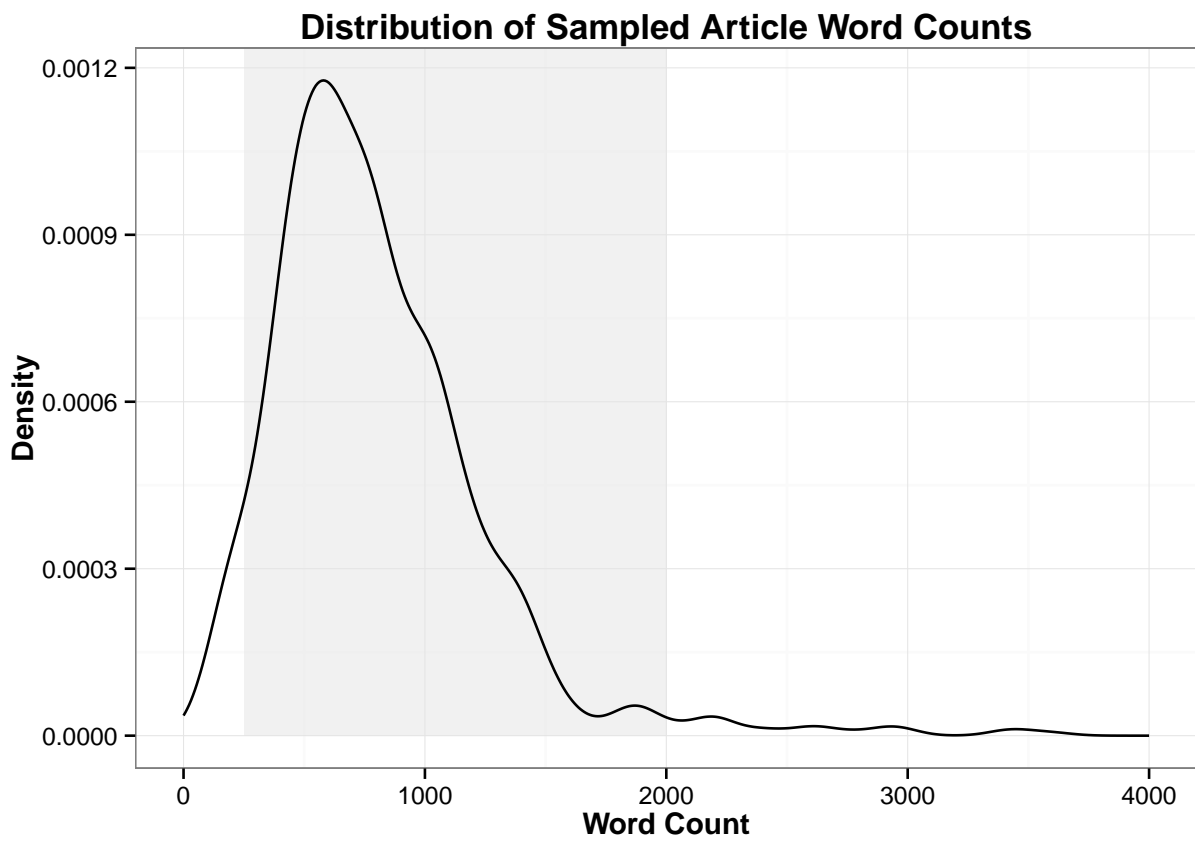


Figure 3.3: Distribution of Sampled Article Word Counts

term frequency (tf-idf) vectors, such that the scaled frequency F of raw frequency f for a given term t in document d is given by:

$$F(t, d) = 1 + \log f(t, d) \quad (3.1)$$

In the case that term t does not appear in document d , the value of $F(t, d)$ is set to zero. The tf-idf vectors are then used to calculate cosine similarity scores⁵ for each of the articles in the corpus, such that the similarity $S_{i,j}$ between vectors i and j is:

$$S_{i,j} = \frac{i \cdot j}{\|i\| \|j\|} \quad (3.2)$$

Documents with similarity scores greater than or equal to 0.9 were considered to be effective duplicates. Those redundant entries were removed from the corpus.

Once the corpus was thinned to contain only unique articles, its content was transformed into the simplifying “bag-of-words” format ubiquitous in computational linguistics. This representation converts the natural language content of each article into a tf-idf vector containing appearance frequencies of different tokens in the text. Each token is a different subunit of the text, usually demarcated in a manner consistent with common grammatical structures such as the word, phrase, or sentence. Considerable uncertainty may surround the demarcation of higher order tokens when using automatic detection on large corpora. For this reason, the most common tokenization scheme focuses on the quantification of n -grams, or the frequency with which orderings of a set of n words occur in the text. To balance the ability to detect occurrences of significant multi-word phrases in the articles with computational limitations in processing ability, each article was converted into tf-idf vectors containing all possible unigrams, bigrams, and trigrams.⁶

After tokenization, certain terms were removed from the tf-idf matrix that carried little or no information with respect to the subject matter and served largely grammatical functions. Following common practice, frequencies for a set of English language stop words were removed from the matrix. These words are composed primarily of parts of speech other than nouns, including articles, pronouns, prepositions, select verbs and adjectives, standalone letters, cardinal and ordinal numbers, days of the week, and months of the year. A full list of stopwords is available in Appendix 3.5.4. Bigrams and trigrams containing any of the stopwords were also removed, though trigrams containing certain stopwords at the second position were retained. This allowed for the capture of basic noun phrases, such as “Minister of Finance”, or common verbal phrases like “manage the deficit”.

⁵ Cosine similarity was selected over euclidean distance in keeping with common practice in text processing and information retrieval, as well as its superior performance in cluster recovery simulations (Huang, 2008).

⁶ For instance, consider the sentence, “The austerity policies were imposed on Greece by its international creditors.” The resulting tf-idf vector would contain non-zero entries for the unigrams {austerity; policies; were; imposed; on; greece; by; its; international; creditors}, bigrams {austerity policies; policies were; were imposed; imposed on; on greece; greece by; by its; its international; international creditors}, and trigrams {austerity policies were; policies were imposed; were imposed on; imposed on greece; on greece by; greece by its; by its international; its international creditors}.

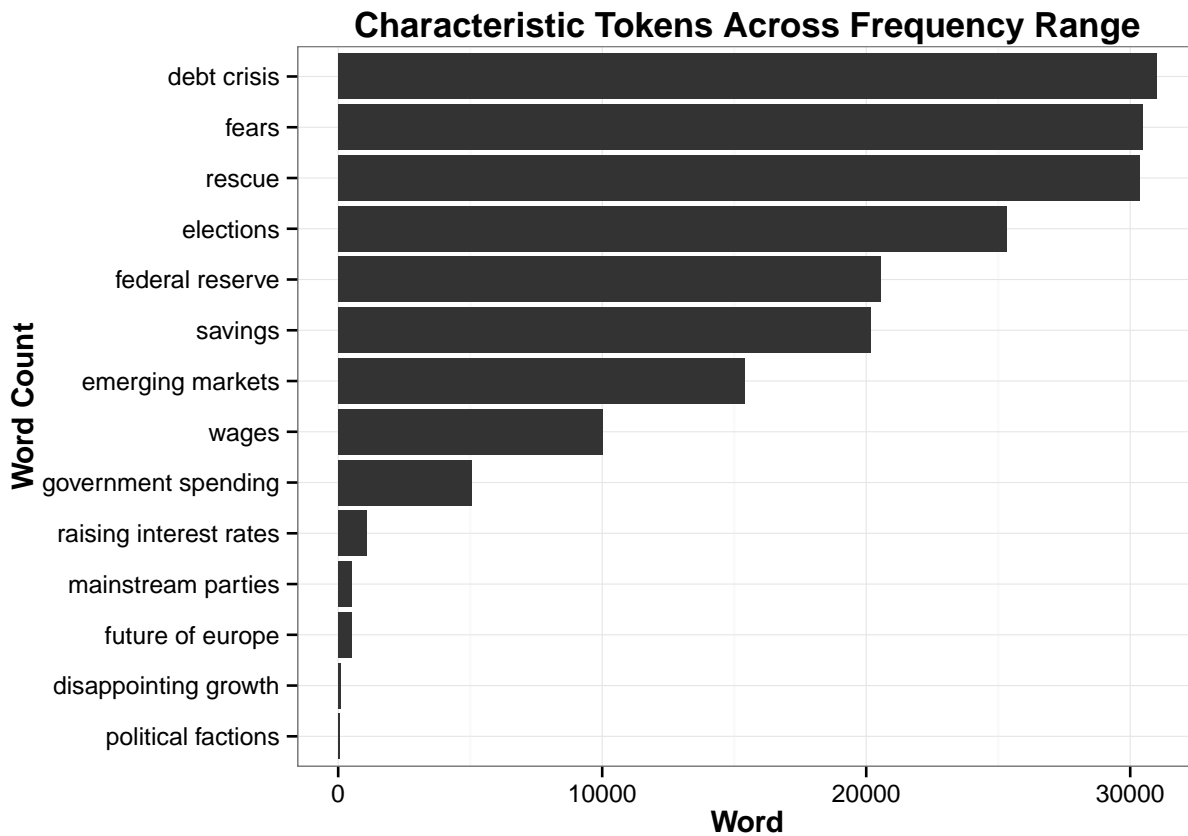


Figure 3.4: Counts of Characteristic Tokens Sampled From Across the Frequency Range

To once again balance statistical precision with computational limitations, the tf-idf matrix was rid of extremely rare tokens. More than 99 percent of all tokens appear less than 50 times across the entire corpus. Most of these are multi-word phrases, with more than 97 percent being either bigrams or trigrams. To get an idea of what kinds of tokens appear most often, Figure 3.4 displays the counts of several characteristic tokens at different points along the frequency density curve. Whereas “political factions” occurs exactly 50 times in the corpus, the term “elections” appears more than twenty-five thousand times. Multi-word phrases are inherently less frequent, appearing at a mere fraction of the rate for individual words.

The final pre-processing step was to reduce the size of the tf-idf matrix even further by stemming each word in the tokens. Stemming involves the use of algorithms to systematically remove morphological and other grammatical inflections from words to reveal the stem or root of the term. For instance, the token “rescued” might be reduced to “rescue” by the removing the preterit indicative ending. More complex routines for lexicalization will try to further normalize tokens by equalizing the stems of tokens that have very similar common definitions. For example, the terms “quickly” and “speedily” might both be lexicalized to “fast”. All terms in this analysis were stemmed using the Porter stemming

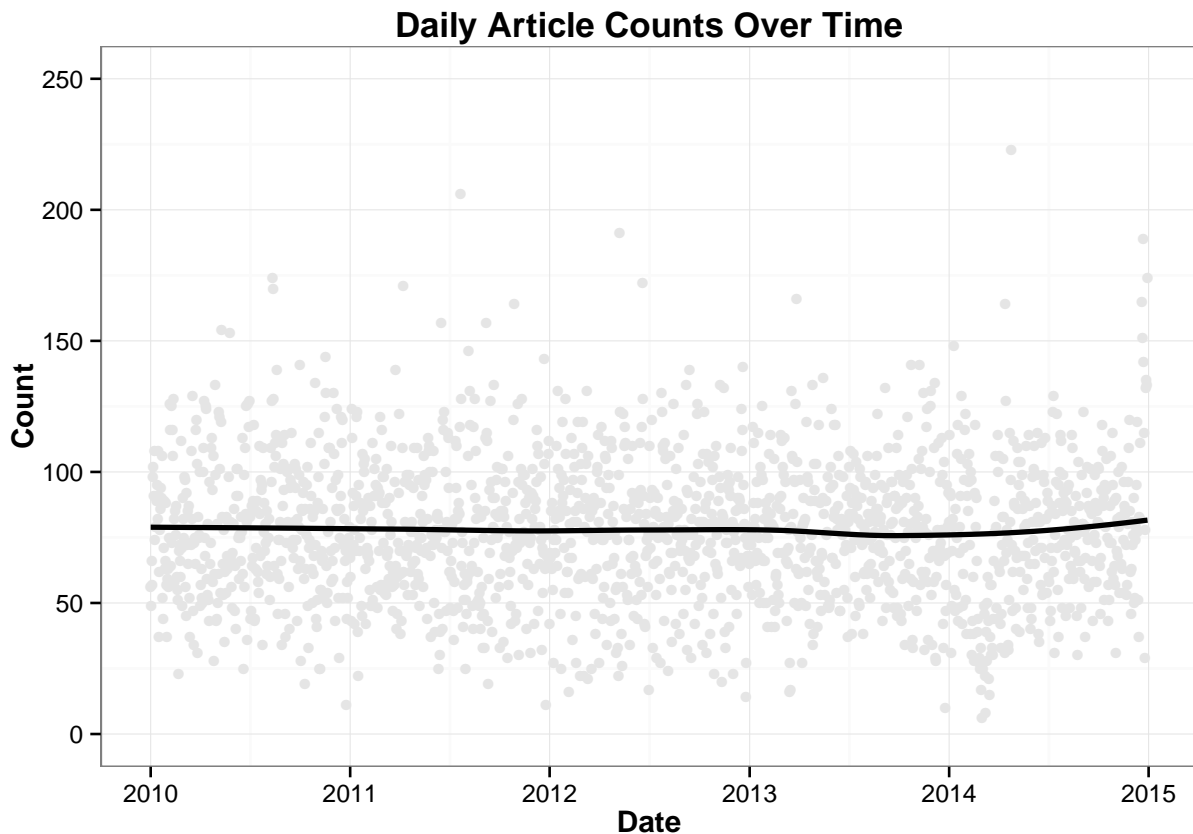


Figure 3.5: Daily Article Counts Over Time with One-Week Rolling Average

routine, which is widely used in text analysis and information retrieval.

All told, the final corpus contained 143,009 articles, with an average of 78 articles for each day between January 1st, 2010 and December 31st, 2014. As Figure 3.5 shows, moreover, the distribution of articles is fairly stable over time, obviating the need for weighting schemes to balance coverage for use with statistical models. Articles were drawn from 179 unique news sources and over 22,000 unique reporter combinations. Those news outlets contributing more than 0.1 percent of all articles are shown in Figure 3.6.

3.2.4 Topic Modeling

Once the tf-idf matrix was fully processed, the content of each article was retrieved using probabilistic topic modeling. This approach begins with the assumption that a given document contains information representing a blend of different topics. A typical news article in the current corpus might be, for instance, primarily concerned with upcoming national elections, somewhat concerned with recent economic growth numbers, and hardly at all concerned with immigration. Furthermore, the approach assumes that each of these topics is defined by a probability distribution over a set of tokens. For exam-

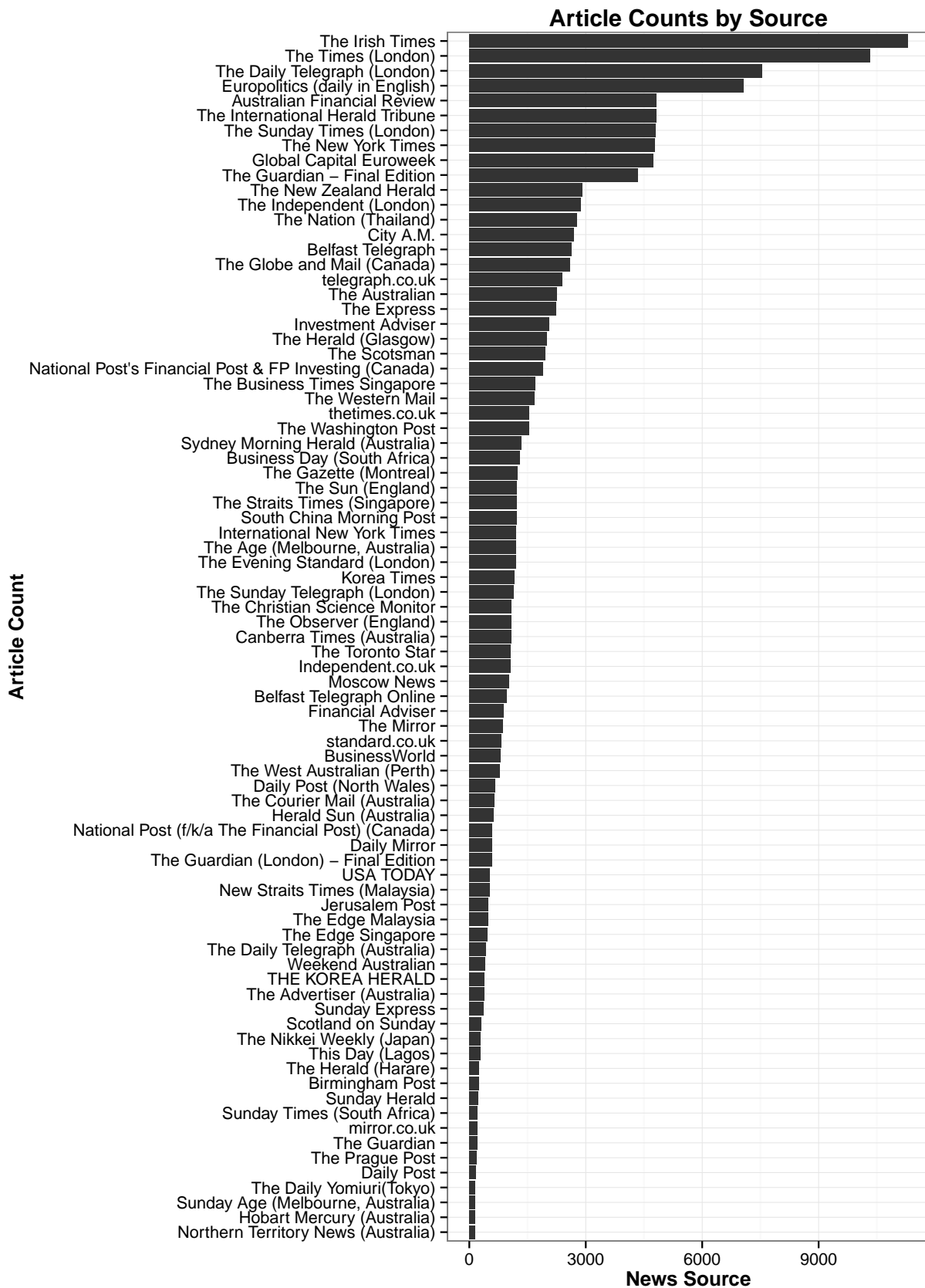


Figure 3.6: Counts of Included Article Across News Sources

ple, the probability of observing the terms “election”, “future”, “party platform”, and “promises” might be high if the topic at hand is upcoming national elections, while the probability of observing the terms “coffee”, “vehicle”, “state of mind”, and “table” would be no more likely than random chance. The goal of probabilistic topic modeling is to use the observed features of each document in a corpus (namely their token distributions) to recover the unobserved probability distributions of tokens for each topic and to then use these distributions to determine the proportions of each topic present in the various documents.

To recover the topics present in the corpus, I estimated a Latent Dirichlet Allocation (LDA) model.⁷ LDA assumes that the generative process responsible for the observed distribution of words in a given topic is given by

$$p(\beta_{1:K}, \theta_{1:D}, z_{1:D}, w_{1:D}) = \prod_{k=1}^K p(\beta_k) \prod_{d=1}^D p(\theta_d) \left(\prod_{n=1}^N p(z_{d,n} | \theta_d) p(w_{d,n} | \beta_{1:K}, z_{d,n}) \right) \quad (3.3)$$

where β_k is the distribution of tokens in topic k , $\theta_{d,k}$ is the proportion of document d devoted to topic k , $z_{d,n}$ is the topic assignment for the n th word in document d , and w_d is the distribution of words observed in document d . To compute the topic proportions in each document, one must recover the posterior distribution of the process, or the distribution of the unobserved components of the model conditional upon the observed components. This is represented as

$$p(\beta_{1:K}, \theta_{1:D}, z_{1:D} | w_{1:D}) = \frac{p(\beta_{1:K}, \theta_{1:D}, z_{1:D}, w_{1:D})}{p(w_{1:D})} \quad (3.4)$$

The posterior distribution was estimated using a collapsed Gibbs sampler, as implemented in [Chang \(2012\)](#).

Estimating LDA models also requires the parallel specification of several parameters to limit the topical universe scoured, as well as for general use in the optimization procedures. The first of these is the number of topics k present in the corpus. LDA ordinarily cannot automatically discover the number of topics present; this must be specified by the researcher. The second and third parameters are the α and η parameters of the dirichlet distribution. The former governs the assumed sparsity of topics in each document, while the latter governs the assumed sparsity of words in each topic. To find the optimal set $\{k, \alpha, \eta\}$, a grid search was conducted over the possible values $k = \{150, 200, 250, 300, 350, 400\}$, with $\alpha = 50/k$ and $\eta = 200/W$.⁸ Optimization of the model log-likelihood via the elbow method suggests 200 as the appropriate number of topics in the corpus, with corresponding α and η values of 0.25 and 0.002. The final model was estimated with 100 passes over the dataset and 1,000 burn-in iterations.

3.2.5 Predictive Analysis

The final step in the analysis involves mining the topics present in the corpus to identify factors that consistently predict the onset of episodes of public fiscal distress. For analyz-

⁷ This overview is adapted from [Blei \(2011\)](#).

⁸ These are the values suggested by [Griffiths and Steyvers \(2004\)](#).

ing relatively rare events whose generating functions are little known, yet assumed to be quite complex, machine learning techniques are an ideal choice. To this end, I estimate a deep artificial neural network to predict the onset of heightened public fiscal distress, using the elbow method to select significant predictors based on their relative variable importance scores. More information on these methods is available in Section 2.4.2.

The network results presented below were produced using the H2O facility for deep artificial neural networks. This toolkit uses a popular adaptive learning rate method for stochastic gradient descent optimization. A grid search was used to identify optimal hyperparameter values. As such, a neural networks with four hidden layers containing 100 nodes each were constructed. Rectifier (with dropout) was used for the activation function of the nodes, as was a non-zero weight penalization ($L1$) of 1×10^{-5} and an input dropout ratio of 0.2. Each model was trained over 200 epochs.

Additionally to help ensure that the topical content associated with each event is properly aligned in time with respect to its reporting, each day's news topics were moved forward by one day relative to bond yields for the same date. This maneuver works under the assumption that print reporting is generally delayed by one calendar day relative to the events it covers. For instance, news content published on April 10th will be matched up with closing yields for April 9th.

3.3 Results

In total, three different topics are found to be consistent predictors for the onset of heightened public fiscal distress. These three topics fall broadly under the same theme, namely events that highlight rising uncertainty over the landscape of political power, or when incumbents are perceived to have diminishing political power. Table 3.1 shows the top words associated with each of these topics, while Figure 3.7 illustrates how the prevalence of these topics and germane events fluctuates in the days preceding jumps in sovereign debt yields. Overall, notable increases in media focus on each of these topics is observed in the roughly two weeks preceding episodes of heightened public fiscal distress. Below, each of the topics is explored in further detail.

3.3.1 Rehn and Rajoy

The first of three topics comprising political uncertainty concerns the relationship between Spanish prime minister Mariano Rajoy and then-EU Economic Affairs Commissioner Olli Rehn. The first column of Table 3.1 shows the top ten tokens associated with the topic, notably the names of each actor as well as several terms concerning Spain's potential request of a bailout for its troubled banks.

An examination of the relationship between Rajoy and Rehn during the period in question reveals an ongoing power struggle, centered around the application of austerity measures. As Economic and Monetary Affairs Commissioner, Rehn's primary charge was to ensure that the eurozone nations undertook the necessary reforms to ensure their strict adherence to deficit reduction targets and other conditions placed on those states receiving bailouts. In theory, Rajoy ascended to the head of Spanish government with compli-

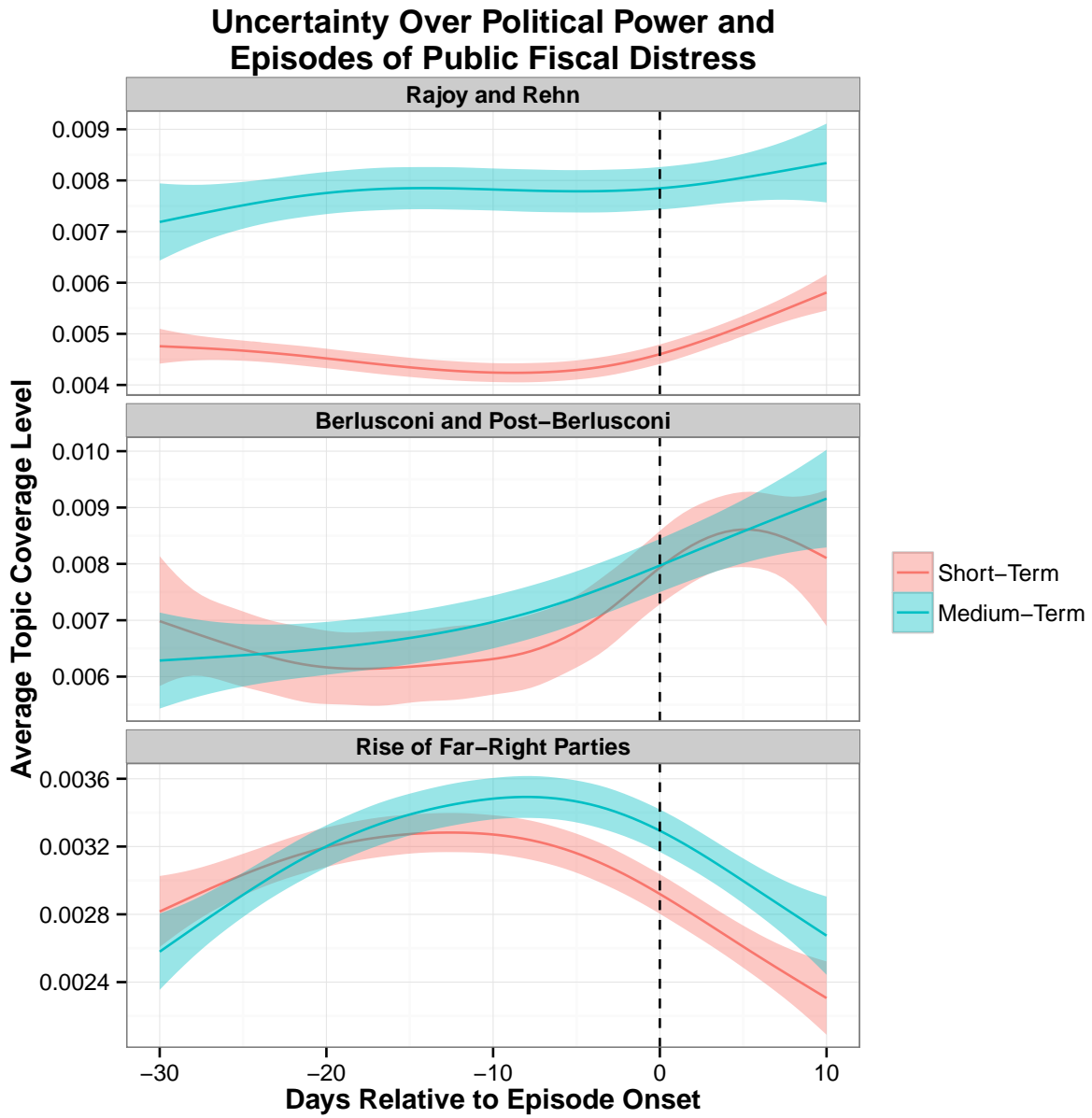


Figure 3.7: Uncertainty Over Political Power and Episodes of Public Fiscal Distress

Topic 1: Rehn & Rajoy	Topic 2: Berlusconi	Topic 3: Far-Right Parties
spain	italy	party
madrid	silvio berlusconi	european parliament
mariano rajoy	mario monti	ukip
govern	prime minister	election
olli rehn	govern	leader
bailout	reform	nigel Farage
spanish banks	leader	seat
request	austerity	vote
rescue	beppe grillo	national front
borrowing costs	technocrat	marine le pen

Table 3.1: Key Terms in Topics with Consistent Predictive Power

mentary goals. As head of the conservative *Partido Popular*, Rajoy had been elected on a platform that focused on cleaning up public finances and providing better management of the economy than had been common under the final years of the outgoing socialist government. Continued deficit reduction was widely seen within the new government as the only way to bring about a return to economic growth and a decline the country's skyrocketing unemployment rate.

From the start, however, Rajoy and Rehn sparred over the details of these budget reductions. In March 2012, just a few months after taking office, Rajoy announced a new round of budget cuts worth billions of Euros that would drastically reduce the country's budget deficit. At the same time, however, Rajoy stopped well short of cutting enough to meet the 3.0 percent of GDP deficit target contained in the Stability and Growth Pact. The cuts would even fall short of the previously-agreed upon target of 4.4 percent, likely settling closer to 5.8 percent. This announcement provoked consternation from Rehn, who noted that "[t]he worst of the crisis may now be behind us, but this is not an invitation to be complacent..."⁹ He added later that, "[t]o return to sustainable growth, it is a necessary condition to ensure sustainability of public finances."¹⁰

Whatever victory could be claimed by Rajoy was short-lived. The prime minister had sought to avoid requesting international assistance for fear of the conditions that might be imposed on the country.¹¹ By June, however, it became clear than Spanish banks were in need of recapitalization and that EU assistance was required. Pointedly, Rehn stated that amount and type of assistance required would be determined by the European commission and not the Spanish government. Moreover, the assistance package would unequivocally "not be condition-free."¹² Rehn stated grimly that the Commission would act "to ensure that the banks that emerge at the end of the process will be viable entities

⁹ Minder (2014)

¹⁰ Tremlett (2014)

¹¹ Kanter (2012)

¹² Mallet and Spiegel (2012)

that will not need further public support.”¹³

Whereas Rajoy had initially appeared to command relative power over the commissioner with respect to the ability to pare back austerity requirements, subsequent events proved that Rehn was still in a dominant position. Despite having a popular mandate and exceptionally strong domestic support, a cash-strapped Rajoy government eventually proved beholden to the technocrat with the power of the purse. This back-and-forth power struggle stands at the heart of events occurring during major upticks in Spanish borrowing costs.

3.3.2 Berlusconi and Post-Berlusconi

The second column of Table 3.1 gives the top tokens for the second topic concerning uncertainty in the landscape of political power. In this case, the tokens point directly to the fate of Silvio Berlusconi, who as prime minister in 2011 was involved in two major sets of events that raised doubts as to where power truly stood in Italian politics.

The first event concerned an intra-cabinet dispute over economic reforms. By mid-July 2011, cracks had begun to emerge in the Italian governing coalition. Giulio Tremonti, the reform-minded Minister of Economy and Finance, saw clear risks for his country, should markets turn sour on its sovereign debt. With outstanding debt valued at more than 120 percent of GDP and facing the imminent need to roll over some debts, a credit crunch could easily force the government to seek international assistance simply to pay its bills. At the same time, Prime Minister Silvio Berlusconi began to drop hints of his displeasure with Tremonti’s drive for reforms, fearing their electoral consequences.

Such discord between these two political players was unusual, in that they were long-time allies, with Tremonti serving in several Berlusconi governments since the mid-1990s. The tone with which Berlusconi discussed his cabinet minister was acutely negative and suggested to many observers that a personnel shakeup was in the offing. In an interview with *La Repubblica*, he quipped that “[Tremonti] thinks he’s a genius and that everyone else is stupid. ...[H]e’s the only one who is not a team player.”¹⁴ The prospect of Berlusconi replacing Tremonti and, thereby, delaying a new round of reforms was sufficient to spook investors who quickly drove up yields on Italy’s sovereign bonds. Market participants were reacting directly to growing uncertainty as to who wielded the greatest political power with respect to ushering in reform, or at least the most will to do so. As one investor described it, the potential loss of Tremonti from the cabinet represented a disruption of a sensitive equilibrium. Tremonti was the steadying hand of the “unpredictable and capricious” prime minister. His absence from government would tip the scales in favor of Berlusconi, who favored more electorally palatable, yet overall weaker reforms that would do less to sure up the state’s debt position.

The second set of events that gave rise to political uncertainty revolved around Berlusconi’s eventual resignation in November of that same year. Since the beginning of his first stint as prime minister in 1994, Berlusconi towered over Italian politics. Having consolidated control over large swaths of the national media market, a prominent soccer team,

¹³ Kanter and Minder (2012)

¹⁴ Rowley (2011)

and assorted other enterprises, it was difficult for many Italians to avoid hearing of his various exploits. And with a certain personality type that tended towards overwhelming charm – frequently at the expense of scandal – he was able to remain successful in, and central to, national politics despite numerous outsized challenges. As one observer noted at the time, his reign “possesses traits that classical political philosophers described as characteristic of tyranny. But rather than tyranny in the sense of a power imposed and maintained through violence, Berlusconi’s regime is more of a veiled tyranny... a political regime that has not established itself illegally, nor... resort[ed] to the use of massive coercion to remain in power.”¹⁵

Such was Berlusconi’s political dominance that, upon his resignation, many feared for the sheer chaos that would ensue. One lawyer observed that he “dislike[d] Berlusconi as much as anyone, but ... would far rather have him in power than have a return to the bloodshed of the ‘years of lead’ in the 1970s.”¹⁶ While the political tumult that did arrive was far less serious than the persistent left- and right-wing terrorism that defined the era, it was still considerable. The technocratic government headed by Mario Monti was struggling mightily to pass reforms in pensions and taxation. Despite their political non-alignment, the government found it initially difficult to secure support for any reforms, let alone those being pushed by EU and IMF officials.

At the same time, the Five Star Movement led by Beppe Grillo began to rise in popularity. Having successfully entered politics at the regional level in 2010, the movement quickly took up the mantle of anti-austerity and anti-government bulwark. In an open letter to Monti, Grillo scolded the technocrat appointed “by the spread, not by the Italians” to do no harm in his reforms by avoiding tax increases.¹⁷ With Monti at the helm, moreover, he argued that Italy was “put under house arrest. The economic policy is no longer our responsibility, but the IMF and the ECB. We receive letters from the EU that are the equivalent of orders, ultimatums.”¹⁸ With their rising popularity and the prospect of actually entering national government, the locus of power within Italian politics was shrouded in uncertainty. This incipient clash between Monti and the technocrats, on the one hand, and Grillo and the Five Star Movement, on the other, was sufficient to push up yields on Italian sovereign debt to new levels. Without certain knowledge of who would call the shots in regards to implementing or avoiding economic reforms, market participants saw substantially increased risk in holding Italian bonds.

3.3.3 The Rise of Far-Right Parties

The final compliment of tokens that represent generalized uncertainty in the landscape of political power is given in the last column of Table 3.1. Plainly, the terms point to the widely acknowledged rise of right-wing, anti-European Union parties during the European debt crisis. This, along with their leaders who failed to hesitate in using strong rhetoric that openly denounced the very institutional structure in which they often served.

¹⁵ Viroli (2011)

¹⁶ Jones (2010)

¹⁷ Grillo (2011)

¹⁸ Il Fatto Quotidiano (2011)

In particular, the token set points to the UK Independence Party (UKIP) led by Nigel Farage and Marine Le Pen's National Front (FN). Farage was especially known for his bombastic speeches on the floor of the European parliament. While he spoke on various issues in such a venue, his most popular statements focused on two issues. The first concerned the character and moral reprehension of European Union leaders. Farage was keen to point out on several occasions, in keeping with UKIP's strong advocacy of direct democracy or, equivalently in his mind, less European administration, that EU officials wielded their bailouts as swords of dictatorship. In chastening their actions, he asked:

What is european economic governance? ... I'll tell you what it is. It's a plane landing at Athens airport, out of which get an official from the [European] Commission, an official from the European Central Bank, and an official from the appalling IMF. And those three people – the troika, you call them – go in, they meet the Greek government, and they tell the Greek government what they may or may not do. You have killed democracy in Greece. You have three part-time, overseas dictators that now tell the Greek people what they can and cannot do. It is totally unacceptable. Is it any wonder the Greek people are now burning EU flags and drawing swastikas across them?¹⁹

These cries of illegitimate international governance were frequently coupled with Farage's second standard talking point, namely the need for Greece and their fellow bailout recipients to throw off the yoke of European dictatorship and exit the Eurozone. Speaking directly to European Commission President José Manuel Barroso and Commissioner Olli Rehn, Farage pleaded that they undertake only the actions that could truly benefit the citizens of debt-laden states. Speaking in reference to Greece, these included "help[ing] her to get her currency back" and "help[ing] her to reschedule her debts." And for good measure, he added "help[ing] her out of the mess that you have put her into."

These personalistic attacks and pleas to allow exits from the Euro were almost omnipresent in Farage's remarks starting from late 2011. What made this rhetoric unsettling for markets and holders of southern European debt was the increasing popularity of Farage and his UKIP party. In UK local elections in early 2013, UKIP made stunning gains, increasing the number of council seats held from 4 to nearly 150.²⁰ Just a year later, UKIP made similarly dramatic power gains in the European parliament. The party nearly doubled its 2009 vote count in the 2014 elections, as with its seats. In a remarkable development, UKIP received more European parliament seats from the United Kingdom than both the Conservative and Labour parties. While neither development was enough to fully control government, the gains were sufficient to introduce major legislative headaches for more pro-EU governing coalitions.

At the same time, Le Pen and the FN were also making unprecedented gains in both domestic local and European parliamentary elections. While their rhetoric towards the institutions of the European Union may have been slightly more subtle, their policy prescriptions were effectively the same. Speaking on the Euro in phrases eerily similar to those used by Farage, she noted that great fault for the current predicament fell on the shoulders of EU bureaucrats.

¹⁹ Farage (2011)

²⁰ Hope (2013)

*They promised us this currency would bring growth and welfare, and what happened? People were destroyed, we are talking about a real tragedy. Look what happened to Greece. ... Greek society is going backwards by whole decades. And although Greek people are showing patience, which has impressed me a lot, how long can this last? We must liberate our peoples and return to our own currencies. ... A revolutionary wind is blowing and I see it. It does not surprise me because people want more democracy and social justice.*²¹

The electoral payoff for the FN, moreover, was similar to that for UKIP. In the 2012 presidential election, Le Pen received nearly 18 percent of the first round vote – the highest ever gained by a FN candidate and nearly doubling their support from the previous election. Likewise, the FN made extremely impressive gains in the 2014 elections for European parliament. Relative to the previous election in 2009, support for the FN rose from 6.3 percent to 24.9 percent. This translated into taking a total of 24 seats over the 3 seats previously held. And as in the UK, the FN managed to gain more seats than either the conservative *Union for a Popular Movement* or the center-left Socialist party.

With ideas that could potentially undermine European unity and continued support for the debt-laden nations of Southern Europe, along with increasingly likely ascents to power, these far-right parties significantly disrupted the landscape of political power. Traditional governing parties and coalitions were no longer electorally successful. And though their clout was certainly diminished, they were not exactly ejected from power. With heightened uncertainty as to whose preferred policies would come to fruition or, more likely, what amalgamation of policies would emerge, holders of Southern European debt saw increasing risk in their holdings. As such, bond yields were prone to upward, off-trend jumps that indicated a potential onset of public fiscal distress.

3.4 Conclusion and Discussion

Given the finding in Chapter 2 that retrenchment events were consistently preceding by episodes of public fiscal distress, wherein states were forced to pay higher premiums for issuing debt, the task of this chapter was to determine what events transformed the presumably ordinary economic recessions of highly-indebted countries into full-fledged fiscal crises. Using a text mining approach on a large news corpus, an increase in uncertainty over the landscape of political power was identified as a consistent predictor for the onset of such crises. Put more directly, this refers mainly to incidents where incumbent politicians were observed to be of declining political power – either through an inability to achieve the outcomes they desired, or as indicated by an observed increase in the strength of their political adversaries.

Putting the puzzle pieces together, the findings reported in Chapters 2 and 3 suggest that welfare state retrenchment is most likely to occur in highly indebted, labor-docile countries that experience economic recession, followed by an increase in uncertainty over which political elements hold decisive power. The combination of these two factors is

²¹ Georgiopoulos (2011)

often sufficient to push bond markets to make it costlier for states to increase their debt loads, which, in turn, creates pressure for cuts to entitlement spending.

To be sure, a great number of methodological choices were made in collecting, processing, and analyzing the texts from which the above conclusions were drawn. While all such choices could potentially bias or otherwise negatively impact these results, subsequent research should focus on a few specific areas for confirmation and/or further methodological development.

Regarding the collection of data, each of the articles entered into the corpus was written in English and published (in most cases) in daily newspapers. Given that bond markets are global, and that some of the best and most influential reporting may be issued by non-English publications and other less frequently published periodicals, one would do well to specifically add these sources to the data and re-estimate the presented models. It is entirely possible that these sources, despite being few in number, could be outsized in influence. Determining whether such sources convey any information regarding people or events that consistently predict public fiscal crises is critical to the confirmation of this chapter's findings.

Additionally, while these results were able to clarify a role for politics in driving welfare state retrenchment that operates over the extreme short-term – specifically, a matter of days – the methodology was entirely unsuccessful in identifying long-term political factors that would seem to be of causal importance. Further research is undoubtedly necessary to quantify these long-term effects. Moreover, the methods put forward above may not be appropriate or otherwise adaptable for their identification, and will therefore likely necessitate the development new methodological approaches to studying the long-term effects of politics.

3.5 Appendix

3.5.1 Top 100 Subject Keywords by Frequency

monetary unions (680), euro zone (672), euro (585), bailouts (579), banking & finance (551), economic news (491), european union (491), public debt (452), bonds (444), economic crisis (422), euro crisis (414), public finance (389), central banks (375), greek debt crisis (365), european union institutions (332), debt crisis (329), international economic organizations (296), external debt (287), government bonds (285), bond markets (280), public finance agencies & treasuries (268), banking & finance agencies (266), currencies (236), prime ministers (234), heads of state & government (223), bank failures (190), budgets (171), economic policy (167), financial ratings (167), interest rates (157), recession (152), economic conditions (147), national debt (144), gross domestic product (142), government budgets (135), talks & meetings (132), credit bureaus (118), emerging markets (117), external debt reduction (114), public policy (110), budget deficits (107), politics (103), financial rating downgrades (102), credit crisis (78), elections (72), stock indexes (72), corporate debt (67), insolvency & bankruptcy (65), campaigns & elections (64), treasury securities (64), banking & finance sector performance (63), legislative bodies (63), unemployment rates (63), economic growth (58), international assistance (52), political parties (52), budget cuts (51), real estate (50), sovereign risk (50), international relations (47), securities trading (47), foreign lending (46), bond issues (45), stock exchanges (45), economic development (44), editorials & opinions (44), taxes & taxation (44), inflation (43), approvals (40), housing market (40), high yield bonds (38), executives (37), devaluation (36), risk management (36), business forecasts (35), industry analysts (35), interviews (35), real estate bubble (35), monetary policy (34), auctions (33), economic recovery (33), globalization (32), liberalism (31), mortgage banking & finance (31), wages & salaries (31), german chancellors (30), managers & supervisors (30), treasury departments (30), international trade (29), unemployed persons (29), export trade (27), swap transactions (27), conference calls (26), market open close (26), state departments & foreign services (26), us presidents (26), labor unions (25), agreements (24), annual financial results (24), debtor nations (24)

3.5.2 All Subject Keywords

accounting (2), agency rulemaking (8), agreements (24), agricultural exports & imports (1), agricultural trade (1), agriculture departments (1), air fares (2), aircraft pilots (1), airlines (8), airport operation (1), airports (2), alcoholic beverages (2), anniversaries (8), annual financial results (24), antitrust & trade law (1), appointments (9), approvals (40), archaeology (1), artists & performers (1), associations & organizations (13), astronomy & space (2), athletes (4), auctions (33), audits (3), automakers (2), automated teller machines (12), automobile mfg (2), automotive mfg (2), average earnings (2), aviation administration (1), awards & prizes (6)

bacteria (2), bail (8), bailouts (579), balance of payments (1), bank deposit insurance (6), bank failures (190), bank robbery (2), banking & finance (551), banking & finance agencies (266), banking & finance associations (12), banking & finance regulation (23), banking & finance sector performance (63), banking in china (2), banking law (10), beaches (2), beef (2), beer & ale (2), benchmarking (5), births & birth rates (2), blogs & message boards (1), bond funds (2), bond issues (45), bond markets (280), bonds (444), book reviews (1), bribery (3), bridges & tunnels (2), british nobility & gentry (2), british parliament (1), british pound (4), british prime ministers (7), budget (12), budget cuts (51), budget deficits (107), budget forecasts (2), budget planning & management (2), budget proposals (2), budgets (171), business (2), business & professional associations (4), business climate & conditions (2), business closings (11), business confidence (5), business education (9), business financial trouble (12), business forecasts (35), business insolvency & bankruptcy (1), business operations (4)

campaigns & elections (64), cancer (2), capital expenditures (2), capital movements (9), cardiovascular disease (2), cartels (3), cash flow (2), catholics & catholicism (2), central banks (375), chambers of commerce (2), charities (2), checking & savings accounts (3), child poverty (2), children (3), christmas (7), chronic diseases (5), cities (2), citizenship (1), city government (1), city life (2), civil services (17), classics (1), clothing & accessories stores (1), coins & coinage (3), college & university professors (4), colleges & universities (2), colorectal cancer (2), commerce departments (6), commercial & residential property (2), commercial banking (18), commercial credit insurance (3), commercial lending (16), commercial mortgages (5), commercial property (5), commodities markets (3), commodities prices (2), company earnings (3), company losses (4), company profits (8), computer games (1), conference calls (26), conferences & conventions (8), conservatism (9), constitutional law (1), construction (16), construction materials & components (2), construction sector performance (2), consulting services (3), consumer confidence (10), consumer electronics mfg (1), consumer price index (1), consumer spending (1), consumer spending & credit (1), consumer watchdogs (2), contracts & bids (2), cornea & retina disorders & injuries (4), corporate bonds (6), corporate debt (67), corporate debt financing (4), corporate tax (1), corruption (13), counterfeiting (5), credit bureaus (118), credit cards (1), credit crisis (78), credit default swaps (23), credit insurance (3), creditworthiness (7), crisis management consulting (2), crude oil markets (6), crude oil prices (5), culture departments (3), currencies (236), current account balance (16)

dance (2), deaths & death rates (2), debt ceiling (4), debt crisis (329), debt financing (3), debt notes (14), debtor nations (24), decisions & rulings (4), deflation (12), delays & postponements (19), delistings (2), demergers & spinoffs (1), depository services (2), derivative instruments (6), destinations & attractions (1), devaluation (36), developing countries (6), diplomatic services (2), diseases & disorders (6), distilled liquors (2), divestitures (3), dividends (5), dogs (1), drinking places (6)

easter season (7), economic bubble (15), economic conditions (147), economic crisis (422), economic decline (19), economic depression (2), economic development (44), economic growth (58), economic indicators (6), economic migration (1), economic news (491), economic policy (167), economic recovery (33), economic stimulus (12), economic surveys (12), editorials & opinions (44), education systems & institutions (4), elections (72), electric power plants (1), electronic banking (3), embassies & consulates (3), emergency rooms (11), emerging markets (117), employee termination (6), employment (11), employment growth (12), employment search (3), employment visas (2), endoscopy (2), energy markets (2), entrepreneurship (5), environmental testing (1), epidemics (4), ethnic groups (3), ethnicity (3), eu presidency (14), euro (585), euro crisis (414), euro zone (672), eurobonds (17), european union (491), european union accession (9), european union courts (1), european union institutions (332), european union law (10), european union regulation & policy (8), exchange rates (23), excise & customs (1), excise tax (3), executives (37), export controls (2), export prices (6), export promotion (2), export trade (27), external debt (287), external debt reduction (114), eye disorders & injuries (6)

factory orders (2), factory workers (1), failed & fragile states (2), family (2), ferries (1), fifa world cup (2), financial guaranty insurance (5), financial rating downgrades (102), financial ratings (167), financial results (1), financial risk management (8), fines & penalties (2), fires (2), fixed income research (19), folk & world music (2), food & beverage consumption (2), food banks & soup kitchens (2), food charities (2), food industry (2), foreign investment (19), foreign language education (1), foreign lending (46), foreign policy (6), foreign relations (1), fraud & financial crime (2), french presidents (7), friendly & provident societies (3), fuel tax (2), fundraising (4), furniture & home furnishings stores (2), furniture stores (2), futures (11)

gasoline (2), gasoline prices (2), gays & lesbians (1), geography (1), german chancellors (30), german mark (9), globalization (32), gold markets (5), goods & services trade balance (11), government bonds (285), government budgets (135), government grants & subsidies (2), governors (4), graduate & professional schools (1), grandparents (2), great depression (3), greek debt crisis (365), gross domestic product (142), gross national product (2), heads of government elections (12)

heads of state & government (223), hedge funds (15), helicopters (2), high yield bonds (38), hiking (2), history (5), holding companies (1), holidays & observances (5), home prices (19), homelessness (1), homeowners (10), horse meat (2), hospitals (2), hotel chains (2), hotels & motels (4), housing assistance (2), housing bubble (19), housing market (40),

housing starts (3)

immigration (7), immigration law (2), import trade (3), income assistance (1), income tax (2), index funds (2), industry analysts (35), industry sector performance (2), infant mortality (2), infants & toddlers (2), inflation (43), influenza (4), insolvency & bankruptcy (65), insurance (14), insurance company ratings (5), insurance premiums (5), insurance regulatory bodies (1), intensive care units (2), interbank lending (4), interest rates (157), inter-governmental talks (2), interim financial results (2), interior decorating (1), international assistance (52), international courts & tribunals (1), international economic development (3), international economic organizations (296), international law (1), international relations (47), international tourism (6), international trade (29), internet & www (1), internet social networking (3), interviews (35), investigations (13), investment banking (20), investment grade bonds (18), investment management (7), investment underwriters (4), islands & reefs (2)

jewelry & silverware mfg (2), job creation (11), jobless claims (4), joint ventures mergers & acquisitions law (1), journalism (2)

labor & employment law (6), labor departments (3), labor force (7), labor sector performance (18), labor unions (25), language & languages (1), language acquisition (1), law courts & tribunals (2), law enforcement (2), lawyers (2), layoffs (23), league tables (3), legislation (9), legislative bodies (63), legislators (3), leisure travel (1), letters & comments (3), liberalism (31), lines of credit (17), linguistics (1), litigation (1), living standards (8), loan defaults (7), lobbying (5), low income persons (2)

managers & supervisors (30), manufacturing facilities (1), manufacturing output (10), manufacturing sector performance (1), market open close (26), market research (3), market research & analysis (4), market research firms (2), marriage (2), meats (2), media syndication (1), medical treatments & procedures (2), mergers (9), military operations (1), minimum wage (6), mixed use developments (1), mobile & cellular telephones (1), monetary policy (34), monetary unions (680), money laundering (2), money market accounts (6), money supply (3), mortgage backed securities (4), mortgage banking (4), mortgage banking & finance (31), mortgage investments (2), mortgage loans (6), mortgage rates (4), motor vehicles (2), multilingualism (1), multinational corporations (1), museums & galleries (3), music (2), music composition (7), music groups & artists (2), musical instruments (2), muslims & islam (7), mutual funds (16)

national debt (144), nationalization (17), natural gas (2), natural gas products (2), new issues (17), news briefs (16), nobel prizes (6), non farm payrolls (2), nongovernmental organizations (2), novels & short stories (2)

obesity (2), obesity related diseases (2), oil & gas exploration (2), oil & gas industry (4), oil & gas prices (11), oil exploration (2), olympics (5), oncology (2), ophthalmology (9), orthopedics (1)

painting (1), paper & packaging (1), passports & visas (2), pension & retirement plans (5), pension funds (4), pension reform (5), pensions & benefits law (4), personal debt (6), personal finance (4), petitions (4), petroleum products (1), philosophy (1), photo & video sharing (1), photography (1), photography services (1), physicians & surgeons (1), poker (1), police forces (8), police misconduct (1), political candidates (1), political corruption (4), political debates (6), political organizations (6), political parties (52), political protests (3), political risk insurance (2), political science (2), politics (103), polls & surveys (11), poor population (3), population & demographics (2), population decline (2), port strikes (3), postwar reconstruction (4), poverty & homelessness (6), poverty rates (2), preferred stock (2), pregnancy & childbirth (2), presidential elections (1), press conferences (23), price changes (8), price cutting (4), price increases (18), primary & secondary education (1), primary schools (1), prime ministers (234), privatization (10), producer prices (1), product labeling (1), productivity (8), property tax (1), protests & demonstrations (21), public debt (452), public employee retirement systems (1), public finance (389), public finance agencies & treasuries (268), public policy (110), public schools (2), public television (7), publishing (2), purchasing & procurement (1)

racism & xenophobia (2), rankings (6), real estate (50), real estate bubble (35), real estate investing (4), real estate market (7), real estate valuations (16), rebellions & insurgencies (1), recession (152), recruitment & hiring (4), referees & umpires (1), referendums (21), refugees (5), regional & local governments (14), relief organizations (2), religion (10), relocations (1), rental property (3), repossession (5), research institutes (10), research reports (6), residential construction (2), residential property (21), residential rental property (1), resignations (9), restaurants (9), resumes & curricula vitae (2), retail banking (4), retail sales (3), retail sector performance (1), retailers (7), retirement & retirees (4), retirement age (2), return on investment (1), riots (16), risk management (36), rural development (1)

sales & selling (2), sales figures (1), sales tax (2), savings & loans (9), scandals (6), secondary market financing (13), secondary schools (1), securities brokers (2), securities law (5), securities trading (47), self employment (2), settlement & compromise (2), settlements & decisions (4), sex scandals (4), shareholder meetings (1), shareholders (9), singers & musicians (2), skiing (1), small business (4), small business assistance (4), small business lending (2), smoking (1), smoking bans (1), soccer (10), soccer tournaments (11), social justice (2), social security (2), sovereign risk (50), sovereign wealth funds (6), special olympics & paralympics (2), sport utility vehicles (2), sports (2), sports & recreation (6), sports & recreation events (10), sports awards (6), sports fans (2), stadiums & arenas (6), state departments & foreign services (26), state owned businesses (4), statistics (18), stock exchanges (45), stock indexes (72), stock market crashes (5), stock offerings (1), strategic fuel reserves (2), streaming media (1), strikes (9), students & student life (4), subprime lending (13), subprime mortgages (9), suicide (2), summer olympics (1), supreme courts (1), surgery & transplantation (7), swap transactions (27)

takeovers (1), talks & meetings (132), tax authorities (1), tax enforcement (1), tax fraud (6), tax increases (14), tax law (20), tax relief (2), taxes & taxation (44), telecommunications (4), telecommunications sector performance (2), telecommunications services (4), tempo-

rare employment (2), territorial & national borders (8), text messaging (2), this day in history (8), tobacco farming (1), tobacco industry (1), tobacco mfg (1), tobacco products (1), tobacco regulation & policy (1), tour operators (1), tour packages (2), tournaments (9), toxic assets (11), trade disputes (2), trade treaties & agreements (3), transgender persons (1), transportation infrastructure (1), travel agents (1), treasury departments (30), treasury securities (64), treaties & agreements (10), treaty of lisbon (6), trends (23), tsunamis (1), tuition fees (3)

unemployed persons (29), unemployment insurance (1), unemployment rates (63), unexploded ordnance (1), us 2013 fiscal cliff (3), us 401k plans (2), us democratic party (3), us dollar (24), us economic stimulus plan 2008-2009 (2), us federal government (9), us presidential candidates 2008 (2), us presidential elections (1), us presidents (26), us republican party (2), utility privatization (2)

value added tax (1), vandalism (2), verdicts (1), veto (12), visual & performing arts (1), visual artists (1), volunteers (2), voters & voting (23)

wages & salaries (31), war & conflict (3), wealthy people (13), wholesalers (2), wind instruments (2), wireless industry (2), wireless telecommunications carriers (2), working capital (2), workplace stress (1), world war i (9), world war ii (13), wounds & injuries (7), writers (12)

yield curve (2)

zero coupon securities (2)

3.5.3 Subject Keywords Included in Boolean Search

airport operation (1), annual financial results (24), aviation administration (1)

bail (8), bailouts (579), bank deposit insurance (6), bank failures (190), bank robbery (2), banking & finance (551), banking & finance agencies (266), banking & finance associations (12), banking & finance regulation (23), banking & finance sector performance (63), banking in china (2), banking law (10), births & birth rates (2), bond funds (2), bond issues (45), bond markets (280), bonds (444), budget (12), budget cuts (51), budget deficits (107), budget forecasts (2), budget planning & management (2), budget proposals (2), budgets (171), business financial trouble (12), business insolvency & bankruptcy (1), business operations (4)

central banks (375), city government (1), commercial banking (18), commercial credit insurance (3), consumer spending & credit (1), corporate bonds (6), corporate debt (67), corporate debt financing (4), corporate tax (1), credit bureaus (118), credit cards (1), credit crisis (78), credit default swaps (23), credit insurance (3), creditworthiness (7), crisis management consulting (2), currencies (236)

deaths & death rates (2), debt ceiling (4), debt crisis (329), debt financing (3), debt notes (14), debtor nations (24), devaluation (36)

economic bubble (15), economic conditions (147), economic crisis (422), economic decline (19), economic depression (2), economic development (44), economic growth (58), economic indicators (6), economic migration (1), economic news (491), economic policy (167), economic recovery (33), economic stimulus (12), economic surveys (12), electronic banking (3), euro (585), euro crisis (414), euro zone (672), eurobonds (17), european union (491), european union accession (9), european union courts (1), european union institutions (332), european union law (10), european union regulation & policy (8), exchange rates (23), external debt (287), external debt reduction (114)

financial guaranty insurance (5), financial rating downgrades (102), financial ratings (167), financial results (1), financial risk management (8), food banks & soup kitchens (2), foreign policy (6), fraud & financial crime (2)

government bonds (285), government budgets (135), government grants & subsidies (2), governors (4), greek debt crisis (365)

heads of government elections (12), heads of state & government (223), high yield bonds (38)

immigration (7), immigration law (2), insolvency & bankruptcy (65), insurance company ratings (5), interbank lending (4), interest rates (157), intergovernmental talks (2), interim financial results (2), international economic development (3), international economic organizations (296), investment banking (20), investment grade bonds (18)

labor unions (25), lines of credit (17)

military operations (1), monetary policy (34), monetary unions (680), mortgage banking (4), mortgage banking & finance (31), mortgage rates (4), multinational corporations (1)

national debt (144), nongovernmental organizations (2)

oil & gas exploration (2), oil exploration (2)

personal debt (6), personal finance (4), political candidates (1), political corruption (4), political debates (6), political organizations (6), political parties (52), political protests (3), political risk insurance (2), political science (2), politics (103), postwar reconstruction (4), poverty rates (2), primary & secondary education (1), protests & demonstrations (21), public debt (452), public finance (389), public finance agencies & treasuries (268), public policy (110)

regional & local governments (14), retail banking (4)

secondary market financing (13), secondary schools (1), strategic fuel reserves (2)

unemployed persons (29), unemployment insurance (1), unemployment rates (63), us democratic party (3), us economic stimulus plan 2008-2009 (2), us federal government (9)

3.5.4 English Stopwords Removed from Text

a, able, about, above, abst, accordance, according, accordingly, across, act, actually, added, adj, affected, affecting, affects, after, afterwards, again, against, ah, all, almost, alone, along, already, also, although, always, am, among, amongst, an, and, announce, another, any, anybody, anyhow, anymore, anyone, anything, anyway, anyways, anywhere, apparently, approximately, are, aren, arent, arise, around, as, aside, ask, asking, at, auth, available, away, awfully, b, back, be, became, because, become, becomes, becoming, been, before, beforehand, begin, beginning, beginnings, begins, behind, being, believe, below, beside, besides, between, beyond, biol, both, brief, briefly, but, by, c, ca, came, can, cannot, can't, cause, causes, certain, certainly, co, com, come, comes, contain, containing, contains, could, couldnt, d, date, did, didn't, different, do, does, doesn't, doing, done, don't, down, downwards, due, during, e, each, ed, edu, effect, eg, eight, eighty, either, else, elsewhere, end, ending, enough, especially, et, et-al, etc, even, ever, every, everybody, everyone, everything, everywhere, ex, except, f, far, few, ff, fifth, first, five, fix, followed, following, follows, for, former, formerly, forth, found, four, from, further, furthermore, g, gave, get, gets, getting, give, given, gives, giving, go, goes, gone, got, gotten, h, had, happens, hardly, has, hasn't, have, haven't, having, he, hed, hence, her, here, hereafter, hereby, herein, heres, hereupon, hers, herself, hes, hi, hid, him, himself, his, hither, home, how, howbeit, however, hundred, i, id, ie, if, i'll, im, immediate, immediately, importance, important, in, inc, indeed, index, information, instead, into, invention, inward, is, isn't, it, itd, it'll, its, itself, i've, j, just, k, keep keeps, kept, kg, km, know, known, knows, l, largely, last, lately, later, latter, latterly, least, less, lest, let, lets, like, liked, likely, line, little, look, looking, looks, ltd, m, made, mainly, make, makes, many, may, maybe, me, mean, means, meantime, meanwhile, merely, mg, might, million, miss, ml, more, moreover, most, mostly, mr, mrs, much, mug, must, my, myself, n, na, name, namely, nay, nd, near, nearly, necessarily, necessary, need, needs, neither, never, nevertheless, new, next, nine, ninety, no, nobody, non, none, nonetheless, noone, nor, normally, nos, not, noted, nothing, now, nowhere, o, obtain, obtained, obviously, of, off, often, oh, ok, okay, old, omitted, on, once, one, ones, only, onto, or, ord, other, others, otherwise, ought, our, ours, ourselves, out, outside, over, overall, owing, own, p, page, pages, part, particular, particularly, past, per, perhaps, placed, please, plus, poorly, possible, possibly, potentially, pp, predominantly, present, previously, primarily, probably, promptly, proud, provides, put, q, que, quickly, quite, qv, r, ran, rather, rd, re, readily, really, recent, recently, ref, refs, regarding, regardless, regards, related, relatively, research, respectively, resulted, resulting, results, right, run, s, said, same, saw, say, saying, says, sec, section, see, seeing, seem, seemed, seeming, seems, seen, self, selves, sent, seven, several, shall, she, shed, she'll, shes, should, shouldn't, show, showed, shown, shows, shows, significant, significantly, similar, similarly, since, six, slightly, so, some, somebody, somehow, someone, somethan, something, sometime, sometimes, somewhat, somewhere, soon, sorry, specifically, specified, specify, specifying, still, stop, strongly, sub, substantially, successfully, such, sufficiently, suggest, sup, sure t, take, taken, taking, tell, tends, th, than, thank, thanks, thanx, that, that'll, thats, that've, the, their, theirs, them, themselves, then, thence, there, thereafter, thereby, thered, therefore, therein, there'll, thereof, therere, theres, thereto, thereupon, there've, these, they, theyd, they'll, theyre, they've, think, this, those, thou, though,

thoughh, thousand, throug, through, throughout, thru, thus, til, tip, to, together, too, took, toward, towards, tried, tries, truly, try, trying, ts, twice, two, u, un, under, unfortunately, unless, unlike, unlikely, until, unto, up, upon, ups, us, use, used, useful, usefully, usefulness, uses, using, usually, v, value, various, very, via, viz, vol, vols, vs, w, want, wants, was, wasnt, way, we, wed, welcome, we'll, went, were, werent, we've, what, whatever, what'll, whats, when, whence, whenever, where, whereafter, whereas, whereby, wherein, wheres, whereupon, wherever, whether, which, while, whim, whither, who, whod, whoever, whole, who'll, whom, whomever, whos, whose, why, widely, willing, wish, with, within, without, wont, words, world, would, wouldnt, www, x, y, yes, yet, you, youd, you'll, your, youre, yours, yourself, yourselves, you've, z, zero

Chapter 4

Quasi-Experimental Evidence on the Effects of Welfare State Retrenchment

4.1 Introduction

On the afternoon of Sunday, December 4, 2011, Italy's newly appointed technocratic cabinet convened in an emergency session to confront the nation's rapidly escalating fiscal crisis. With 10-year sovereign bond yields having rocketed more than 200 basis points in just the previous three months, and with more than €110 billion of debt set to be re-financed in the first quarter of 2012 alone, state finances were in desperate need of swift and sweeping reform. The legislative program announced that evening from the Palazzo Chigi in Rome was notable for its severity, cutting in excess of €30 billion from pensions and government administration. Minister of Labor Elsa Fornero—herself an academic expert on pension reform—was indeed brought to tears when describing the sacrifices being asked of the nation.

Concessions of this sort (though rarely of this magnitude) have become commonplace in advanced industrialized economies, where for the past 30 years the welfare state has been buffeted by a number of unfavorable economic, political, and social developments (Clayton and Pontusson, 1998; Korpi and Palme, 2003; Allan and Scraggs, 2004). And while much attention has been paid to both the nature and causes of such policy changes, comparatively little work has examined the effects of these reforms.

To be sure, the paucity of such studies is not for lack of scholarly interest. Instead, a formidable combination of theoretical and methodological challenges has ordinarily made studying the effects of welfare state retrenchment prohibitively difficult. Office-seeking politicians have strong incentives to preemptively neutralize the most onerous effects of these reforms through obfuscation, delay, or amortization, rendering them effectively unobserved by constituents (Pierson, 1995; Lindbom, 2007; Weaver, 1986; Hood, 2002; Pal and Weaver, 2003; Hering, 2008). As a consequence, many short-term effects of these policy changes are assumed to be either null or undetectably small. Even when large enough to be theoretically detectable, moreover, the empirical challenges of precisely and unbiasedly estimating the effects of such convoluted reforms are usually considerable.

Fortunately, one aspect of the 2011 Italian pension reforms provides a natural exper-

iment through which some of the effects of welfare state retrenchment can be precisely described. Specifically, in an effort to curb rapidly growing pension commitments, a two-year moratorium was placed on the annual cost-of-living adjustments made to national pensions for individuals whose monthly pension income exceeded a certain threshold. Using a regression discontinuity approach and data taken from a nationally representative panel survey of Italian households, this chapter provides evidence for a number of the behavioral effects of welfare state retrenchment.

Two main sets of findings are reported. First, the results demonstrate that even small retrenchments in the area of pensions can upset what many retirees consider to be a delicate balance between income, savings, and expenditures. Individuals that were denied a cost-of-living adjustment were much more likely to report that their income was insufficient to match or cover their spending needs. As a result, these individuals tend to reduce their average monthly expenditures, primarily by forgoing insurance payments, major expenses on their residences, and the purchase of valuables. While they express a theoretical desire to reduce spending on durables, no such reduction is observed in practice. No impact is observed on the probability of re-entering the labor market.

Second, retrenchment appears to have effects on the expectations of individuals over certain future economic outcomes. Specifically, the loss of a cost-of-living adjustment makes individuals less optimistic about the probability of moderate-to-strong growth in the domestic stock market. Some evidence also suggests that these individuals anticipate either no change or a slight drop in nominal household incomes, though they are less sure regarding real incomes. Affected individuals also anticipate that government bond yields will not show any large increases.

The remainder of this chapter is organized as follows. Section 4.2 presents a brief overview of the relevant literature covering the effects, rather than causes or process, of welfare state retrenchment. Section 4.3 contains the methodological details of the study, including a primer on Italian pensions and the 2011 reforms, as well as specifics on the treatment, dataset, and empirical methods employed. The main body of results are given in Section 4.4.

4.2 Literature Review

As was noted above, the literature on welfare state retrenchment focuses overwhelmingly on understanding its causes rather than its effects. Consequently, identifying a set of pre-existing inquiries into the latter topic is less-than-straightforward, requiring the researcher to borrow from other literatures that are not necessarily concerned with retrenchment as such.

The most relevant literatures can be pinpointed by noting first that, though it is a complex and multi-faceted event, most retrenchments are characterized by either a loss of income or a loss of insurance. The difference between the two is largely individual-specific, depending upon whether he/she is currently receiving the social benefit being curtailed. As is detailed further below, the specific treatment of interest in this inquiry — namely changes made to the cost-of-living adjustments for current pensioners — was applied to individuals already receiving state retirement benefits. As a result, the most

relevant literatures for this retrenchment episode concern the effects of income loss, rather than insurance loss.

The set of relevant literatures can be winnowed further by limiting the topical range of the income loss effects considered. Again, as is explained further below, the data brought to bear on this treatment cover mainly economic phenomena occurring at the individual and household levels, including income, expenditures, savings, and short-term expectations for various macroeconomic outcomes. Given the nature of the treatment being studied and the limitations of the data, the literature reviewed below concerns the individual economic effects of income loss.

Most studies in this area trace their intellectual roots back to the pioneering work of [Ando and Modigliani \(1963\)](#), [Modigliani \(1988\)](#), and [Friedman \(1957\)](#) on the *Life-cycle / Permanent Income* hypothesis. This work assumes that individuals wish to smooth their consumption over a lifetime and, therefore, consumption in any period should be constant and calibrated such that no wealth nor debt exists after the final consumption period.¹ A loss of income in some intermediate period results in a change in consumption only insofar as it affects the lifetime income. Minor or temporary/short-term income losses should result in small consumption declines, while major or permanent/long-term losses will yield more substantial consumption reductions. Aside from the size or duration of the income loss, much work has focused on the effects of anticipated versus unanticipated shocks. If income losses are anticipated, there should be very little effect on consumption, as this income drop will already have been factored into the lifetime income estimate. On the other hand, unanticipated income shocks permanently reduce the lifetime income estimate and should, therefore, lead to lower consumption.²

Aside from the overall level of consumption, several studies have examined the effects of income loss on the consumption of specific kinds of goods and services. Work by [Hamermesh \(1982\)](#), [Parker \(1999\)](#), and [Browning and Crossley \(2000, 2009\)](#) suggests that luxuries and, under certain conditions, durables, should be primary targets for consumption reductions when faced with unanticipated income losses. Reducing overall expenditures should have a greater proportional effect on luxuries, simply by their greater average unit costs. But consumers may also have a utility-based incentive to reduce luxury purchases before those of other goods and services, as these items have high intertemporal substitutability, resulting in lower utility loss if these purchases are temporarily forgone. Relatedly, the short-term expenditure value of durable goods is flexibly re-deemed over a relatively long time horizon. Consumers facing temporary income loss may thus be able to forgo durables purchases while incurring minimal utility loss. The degree to which these losses are minimized is, of course, dependent upon the time horizon of the utility stream provided by the durables in question.

While the effect of income loss on consumption is thought to be dependent upon how it affects the expected value of future income, little theoretical or empirical work has been produced that pins down how income loss affects a broader class of expectations over

¹ This may not necessarily be the case depending upon assumptions over the intergenerational transferability of wealth or debts.

² The size of this reduction may be impacted by a variety of other factors, including uncertainty in the estimates of permanent income, buffer-stock savings, liquidity constraints, and access to credit.

various economic outcomes, such as national output, inflation, or stock market valuations. A large body of research has demonstrated that income loss can have deleterious social consequences, such as lowering the level of self-reported happiness or overall life satisfaction. What is more, some studies suggest that income loss and other traumatic economic experiences — such as unemployment — are imbued with scarring effects that convert temporary declines in happiness or outlook into permanent losses. One might reasonably surmise, therefore, that income loss could cause individuals to have generally more negative expectations surrounding future economic outcomes.

4.3 Treatment, Data, and Methodology

4.3.1 Historical Background

The story of how Italy came to implement its 2011 pension reform begins in July of that year and is driven by several key factors, including deteriorating economic performance, volatile coalition politics, and destabilizing external political and economic developments. The year began with a fairly rosy outlook for the domestic economy. In particular, the European Commission predicted that growth would continue to be non-trivially positive and that the government would run a primary surplus of slightly less than one percent of GDP. Compared with developments in Greece, Portugal, and Ireland—whose continued membership in the European Monetary Union was questionable—Italy appeared to have weathered the worst of the crisis. Though burdened with substantial debts that demanded almost five percent of GDP in annual payments, these were largely seen as mistakes of the past that could be managed through a modest package of reforms, such as that being shepherded by Giulio Tremonti, the Minister of Finance.

Market confidence in Tremonti's guiding hand was short-lived, however. A series of off-hand comments made by Prime Minister Silvio Berlusconi suggested a deteriorating relationship between the two. The root of the discord stemmed from Tremonti's opposition to watering down the reform package through additional tax relief—a policy strongly supported by the Prime Minister. The conflict between the two leaders was severe enough to concern markets that reform would not be easily forthcoming.

By August, the combination of poor manufacturing numbers, continuing domestic political drama, and the increasingly realistic prospect of a Greek debt default left the Italian economy in distress. Stock markets in Milan had dropped by 20 percent in the previous month, and the yield on Italian debt jumped perilously close to 6 percent. Adding insult to injury, it was unclear whether Italy might actually receive emergency assistance from international lenders, should it become the next domino to fall in the European crisis. Any political will for continued Greek-style bailouts had all but evaporated. A group of European Central Bank governors voted against the continued purchase of distressed Italian sovereign debt, and the new European Financial and Stability Facility for sovereign bond purchases was not set to be ratified for several weeks. The outlook was bleak enough for some analysts to suggest that, Italy would be unable to cover day-to-day operating expenses as early as September.

In exchange for continued debt purchases, the ECB managed to extract a promise

from the Berlusconi government to immediately pursue comprehensive reforms, including cuts to state pensions and regional government funding, a public-sector wage freeze, further taxes on high-income earners and capital gains, the elimination of several state holidays, and the implementation of new policies meant to crack down on tax evasion.

Unsurprisingly, however, announcing reform proved to be just the first step in a messy political process. By October, the package became something of a moving target, with little clarity as to which policies remained and which had been scrapped. New income taxes and cuts to regional governments were rolled back. Labor market reform was quietly dropped. A constitutional amendment proscribing budget deficits was introduced and lingered (albeit tenuously) under consideration. Tensions emerged in the governing coalition, as losses in local elections left the parties eager to avoid passing such unpopular measures. The center-left believed that a scheduled VAT increase would disproportionately impact the middle-class. Certain regional parties opposed raising the retirement age for women, as it would exacerbate a shortage of daycare facilities that was primarily filled by grandmothers. The main business lobby complained that the reforms relied too heavily on tax increases and not enough on spending cuts and privatizations, while the social partners forced a number of nation-wide strike actions.

By mid-month, the government's failure to implement any major reforms led to a crisis of confidence — acknowledged by a series of rolling downgrades for Italian national, regional, and corporate bonds. Markets perceived the governing coalition to be weak, hobbled by infighting, and unable to quell the increasingly riotous behavior of protesters in several major cities. Talk of an imminent government shakeup spread widely, and the coalition appeared to be on its last legs. Benchmark yields clawed back above six percent, despite ECB intervention. The political crisis came to a head in early November when, under immense pressure to resign, Berlusconi agreed to step down in exchange for the passage of an austerity budget.

In the days following Berlusconi's departure, President Giorgio Napolitano moved quickly to invite the former European Commissioner and American-trained economist Mario Monti to form a new government. Monti appointed a technocratic cabinet composed primarily of bankers, professors, and regulators. Uncertainty over Monti's ability to overcome the chamber's partisan quarrels kept benchmark yields on sovereign debt above seven percent. Sensing that a traditional legislative approach would likely yield only neutered reforms, the government took the somewhat unusual step of issuing a *decreto legge* — effectively a decree that comes into force immediately, but that must be approved by parliament within 60 days to continue as law.

Following an emergency cabinet meeting on Sunday December 4th, the Monti government detailed a sweeping reform package that was estimated to save €20 billion over the next two years. With regard to revenue, a new tax on property was introduced, while existing taxation of inheritances, capital repatriations, and luxury goods were all increased. A VAT increase of two percent was also anticipated, along with new measures to combat tax evasion. Expenditures were reduced primarily via cuts to regional administration and pension costs. Specifically, the value of all state pensions being paid out after the new year would be calculated on the basis of lifetime contributions, rather than earnings. The retirement age would be raised to 62 years for women and 66 years for men. Finally, representing the treatment of interest to this investigation, state pensions valued above

Monthly Pension (p)	COLA	COLA Range
$p \leq \text{€}1,382.91$	1.60%	€7.48 to €22.13
$\text{€}1,382.91 < p \leq \text{€}2,304.85$	1.44%	€19.91 to €33.19
$\text{€}2,304.85 < p$	1.20%	€27.66 +

Table 4.1: INPS Cost-of-Living Adjustments for 2011

certain thresholds would see either a reduction or an outright elimination of their annual cost-of-living adjustments.

4.3.2 Treatment

The vast majority of Italian public and private pensions are administered by the *Istituto Nazionale della Previdenza Sociale* (INPS). It covers more than 80 percent of the employed workforce and makes monthly payments of roughly €3 billion to over 16 million retirees. Following a round of pension reforms undertaken in 1992, all INPS pensions were to receive an annual cost-of-living adjustment to help maintain the purchasing power of these benefits. The value of this *perequazione automatica* would be determined by official inflation statistics and applied to monthly pension payments.

Around the time of the treatment, pensions were divided into three separate tiers for the purpose of annual inflation adjustments, as shown in Table 4.1. Pensions whose monthly benefit levels were up to three-times the minimum benefit level were awarded the full percentage value of the adjustment. For those pensions falling between three and five times the minimum benefit, only 90 percent of the full adjustment would be applied. Pensions in the final tier—those exceeding five times the minimum monthly benefit—would receive around 75 percent of the full adjustment. For 2011, monthly pensions between €467.43 and €1,382.91 were increased by 1.6 percent, or between €7.48 and €22.13. Pensions in the second tier, up to €2,304.85, received a 1.44 percent boost, topping out at €33.19. All other benefits were increased by 1.2 percent.

Table 4.2 shows that reforms put in place by the Monti government retained a three-tiered approach to cost-of-living adjustments, but significantly deviated from the procedures used in previous years. As before, pensions whose monthly benefit did not exceed three times the minimum benefit were to be granted the full inflation adjustment. In practice, this meant that all monthly pensions valued at less than €1,405.05 would see a 2.6 percent increase for 2012. The second pension tier, however, was greatly reduced in size. Rather than spanning between three and five times the minimum pension, it would extend only up to about 3.1 times the minimum. For beneficiaries in this range, no set percentage increase in the monthly pension would be received. Instead, all benefit amounts would simply be increased to the maximum benefit level for the tier. As a result, beneficiaries whose monthly payments were between €1,405.06 and €1,441.58—a difference of

Monthly Pension (p)	COLA	COLA Range
$p \leq \text{€}1,405.05$	2.60%	€12.18 to €36.53
$\text{€}1,405.05 < p \leq \text{€}1,441.85$	2.59% to 0.00%	€36.52 to €0.00
$\text{€}1,441.85 < p$	0.00%	€0.00

Table 4.2: INPS Cost-of-Living Adjustments for 2012

just €36.53—received adjustments anywhere between 0 and 2.6 percent. All pensioners in the final tier above this threshold would receive no cost-of-living adjustment.

As Figure 4.1 illustrates, the changes made to the three-tier system represent a relatively complex treatment, whose effect is likely determined by the interpretations of individuals assigned to both treatment and control. There are at least three major characteristics of the treatment that vary with the pension threshold. The first is whether the treatment represents a departure from the previous year’s overall adjustment policy. For example, all pensions below three times the monthly minimum are not effectively subject to any policy change, as they still receive the full value of the cost-of-living adjustment. By contrast, all other pensions are subject to new revaluation rules.

Another treatment characteristic concerns the change in adjustment rate for each pension. Because the 2012 adjustment rate for pensions near the intersection of the first and second tiers (€1,405.05) was increased relative to the 2011 rate, the sliding-scale reductions newly present in the second tier will not result in an actual decrease in the effective adjustment rate until monthly pension benefits move above €1,421.11. Only at this threshold will pensioners begin to differ as to whether their inflation adjustment rate was actually reduced after the reforms were put in place.

A final treatment characteristic regards whether the actual cash value of the inflation adjustment is lower than in the previous year, or whether pensioners received a smaller bonus in 2012 than they did in 2011. Again due to the sliding scale reductions present in the second pension tier, the point at which the year-over-year bonus difference becomes negative is somewhat removed from either of the intersections between the tiers. In this case, only pensions with a monthly benefit above €1,421.40 actually experience this drop in the adjustment’s cash value.

Taken together, the three treatment conditions combine to form four different treatment groups and one control group within Italian pensioners. As shown in Table 4.3, members in each of the treatment groups received a slightly different overall treatment, varying on whether their treatment involved a policy change, a rate change, or a cash change.

Due to sample size limitations in the data, regression discontinuity estimates for most of these treatments are not possible. This limitation notwithstanding, the relatively small distance between these various cut points still allows for a meaningful comparison between those individuals who experienced no change in the policy, rate, or cash value of

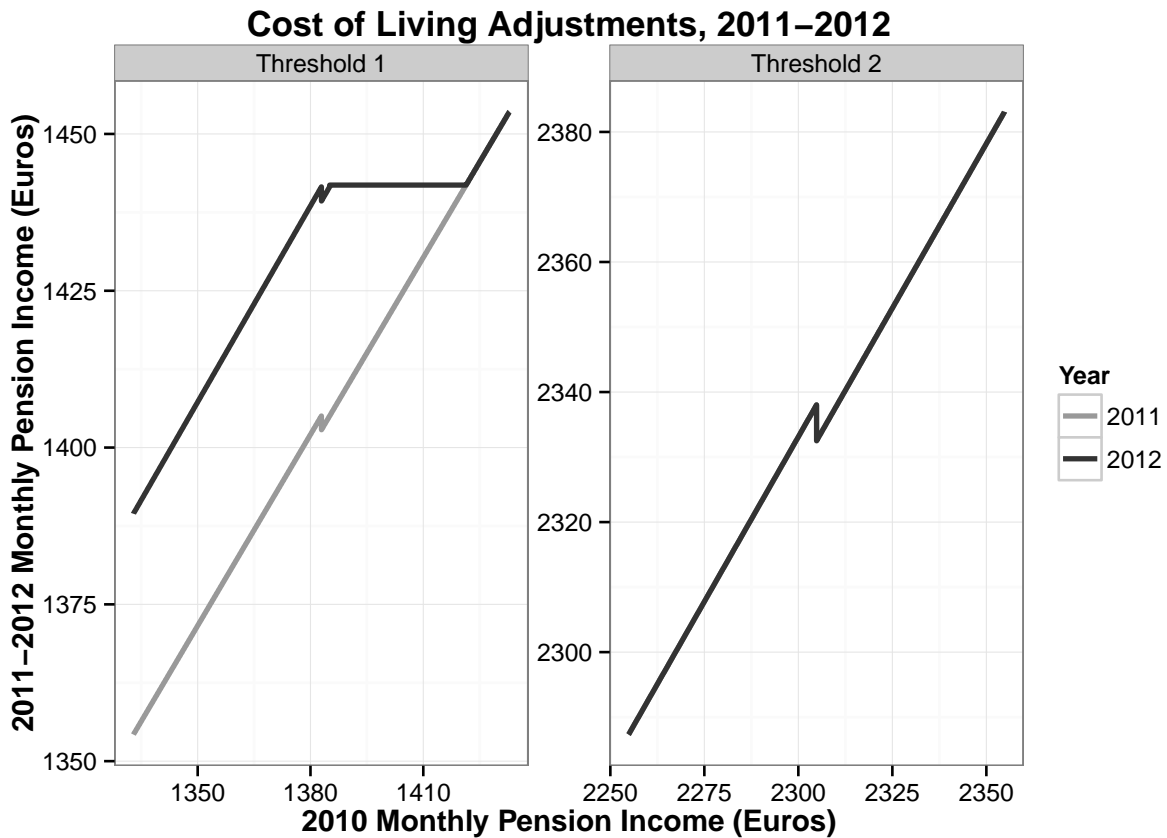


Figure 4.1: Changes in Cost-of-Living Adjustments for 2011 and 2012

Threshold (p)	Group	Policy Chg?	COLA Rate (r)	COLA Cash (c)
$p \leq \text{€}1,405.05$	C	No	$r > 0, \uparrow$	$r > 0, \uparrow$
$\text{€}1,405.05 < p \leq \text{€}1,421.11$	T-1	Yes	$r > 0, \uparrow$	$r > 0, \uparrow$
$\text{€}1,421.11 < p \leq \text{€}1,421.40$	T-2	Yes	$r > 0, \downarrow$	$r > 0, \uparrow$
$\text{€}1,421.40 < p \leq \text{€}1,441.58$	T-3	Yes	$r > 0, \downarrow$	$r > 0, \downarrow$
$\text{€}1,441.58 < p$	T-4	Yes	$r = 0, \downarrow$	$r = 0, \downarrow$

Table 4.3: Treatment Attributes at Various Thresholds

their cost-of-living adjustment, and those who experienced changes on all three of these dimensions. In effect, the setup can be reduced to a comparison between individuals who received a full cost-of-living adjustment and those who were denied a 2.6 percent increase, or roughly €430 over the year. While this separation between treatment and control groups with respect to the forcing variable introduces the potential for bias in any treatment effects estimated via a regression discontinuity approach, a series of robustness checks detailed below show no evidence of confounding on observables.

4.3.3 Data

To investigate the effects of this treatment, we turn to the *Survey on Household Income and Wealth* (SHIW)—a biennial survey of Italian households conducted by the Bank of Italy. Each iteration of the survey has a sample of roughly 8,000 households, comprising approximately 20,000 individuals. A built-in panel component ensures that slightly over half of surveyed households in a given year were also present in the previous wave. The battery of questions covers a variety of mainly economic topics, with respect to both individuals and the household. The primary topics include employment, wealth, income, expenditures, and savings. Each wave also contains a series of rotating topics covering diverse non-economic subjects, such as social capital or happiness. A full slate of demographic information and survey weights are also available for each respondent. Most importantly, the SHIW contains detailed information on the forcing variable—specifically, the monthly income received from pensions paid by INPS.

Identifying those individuals in the data who would have been subjected to the treatment requires a small bit of inference. While data on the forcing variable is available for 2010, the biennial nature of the survey means that we cannot directly observe the 2011 values of the forcing variable that were used to assign treatment status. Fortunately, INPS publishes detailed information about its annual cost-of-living adjustments, which allows for the easy imputation of 2011 monthly pension payments. Assuming that no adjustments beyond those made for inflation by INPS are applied to these pensions, the imputed 2011 pension values will exactly match the actual, unobserved values used for treatment assignment.

The 2010 wave contained 19,836 individuals distributed amongst 7,951 households. Of these respondents, 6,681 individuals in 4,389 households responded to the pensioner's questionnaire. As is shown in Table 4.4, just over two-thirds of these individuals received payments from a retirement pension. Of these pensions, more than four out of five were paid by INPS (Table 4.5).

To enhance the quality of inferences made, the sample was pruned via several criteria. First, for obvious reasons, respondents who did not report the amount of their monthly pension payments were excluded from the sample. Second, pensioners who received one of the “intermediate” treatments shown in Table 4.3 by virtue of receiving payments that fell between the two major thresholds utilized in the 2012 cost-of-living adjustment were dropped. Third, the sample was limited to individuals who received only a single retirement pension. Finally, given that many questions in the survey focused on household-level outcomes rather than individual-level outcomes, only small households composed

Pension Type	Sample N	Sample %	Population %
Retirement	4,567	68.34	68.46
Survivor's	1,186	17.75	18.03
Disability	381	5.70	5.56
Civil Disability	259	3.88	3.62
Social Assistance	230	3.44	3.50
Supplementary	41	0.61	0.63
War	14	0.21	0.14
Other	3	0.04	0.06

Table 4.4: Pensions Received by Type

Pension Payer	Sample N	Sample %	Population %
INPS	5,512	82.50	83.08
INPDAP	788	11.79	11.33
Government	115	1.72	1.50
INAIL	113	1.69	1.58
Private	84	1.26	1.45
Foreign	63	0.94	0.98
Other	6	0.09	0.10

Table 4.5: Retirement Pensions by Payer

of two or fewer individuals were included.³

All told, the sample contains 1,603 individuals drawn from 1,298 households. This equates to 1.23 treated pensions per household. Figure 4.2 shows the distribution of monthly pension payments in the sample. In 2011, the median payment was €940.77, while the average payment stood at €1016.60. The distribution is significantly right-skewed, as is typical of such measures. The average respondent is 74 years of age, having retired at 59 years of age. At the time of reform, the average pensioner had been receiving retirement payments from the state for 15 years.

Three out of five respondents are male and in self-reported good health. 65 percent are married, and another 24 percent widowed. 73 percent of respondents live in two-person households, while 27 percent live alone. Within two-person households, only 20 percent have just a single income earner. The vast majority of respondents completed only primary or lower secondary school. Only about 20 percent of respondents had completed high school. More than half of all individuals were employed as production workers in manufacturing or agricultural enterprises before retiring.

4.3.4 Empirical Strategy

While the nature of the treatment clearly lends itself to analysis via a regression discontinuity approach, at least three sets of choices must be made before actually implementing any such analysis.

In the first place, one must decide which of the two major techniques for regression discontinuity estimation will be used. Each technique fits regressions or other smoothers to the data on either side of the cut point, with the difference in predicted values at the cut point taken to represent a local average treatment effect. The approaches differ, however, over which observations are included in the model fitting procedure. Specifically, one technique estimates global linear or higher-order regressions, where the full sample of observations are used to estimate the treatment effect. The other technique fits local smoothers to only those observations that fall within a certain window around the cut point.

While both approaches have their advantages and disadvantages, this analysis exclusively utilizes the local smoother approach for estimating treatment effects. As detailed by Gelman and Imbens (2014), the global approach suffers from several afflictions that can jeopardize the quality of its inferences. These include unstable weighting schemes that assign extreme values to certain observations far from the cut point, estimates of the treatment effect that are highly sensitive to the order of the regression used for smoothing, and standard errors that impart a somewhat elevated probability of false discovery. By contrast, local smoothers assign more reasonable weights to observations as a function of their distance from the cut point, produce more stable treatment effect estimates across the polynomial degrees, and have well-calibrated standard errors.

A second set of choices to be made by the researcher concerns the setting of various parameters used in the local smoother regression discontinuity approach. In particular,

³ Restricting the sample to contain only individuals living alone yields an unacceptably small sample size.

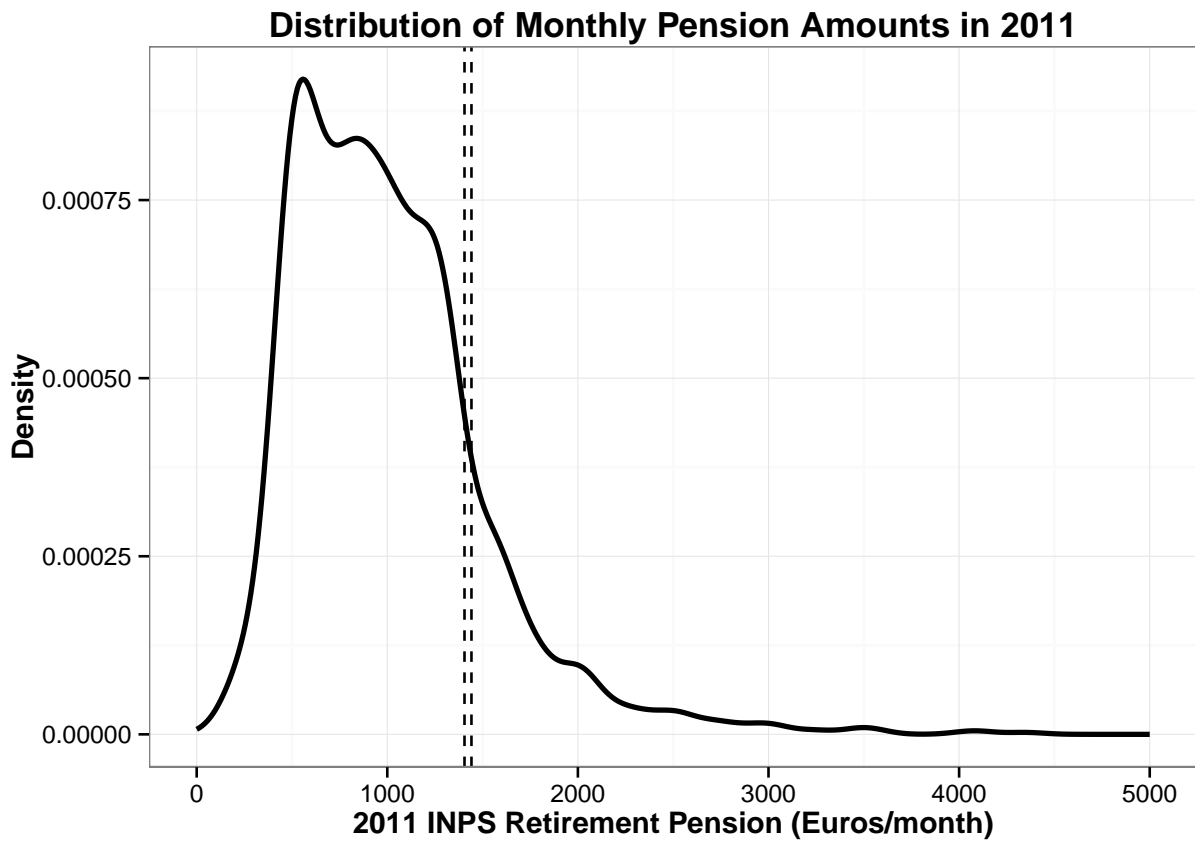


Figure 4.2: Distribution of Monthly INPS Retirement Pension Payments. The dotted lines represents the main treatment thresholds of € 1,405.05 and € 1,441.58.

one must select the order of the polynomial and the kernel function used for estimating the treatment effect. With local smoothers, the order is usually taken to be either linear or quadratic, while the kernel function is most commonly one of uniform, triangular, or Epanechnikov. Additionally, an algorithm must be selected for determining the optimal bandwidth used in the analysis. [Imbens and Kalyanaraman \(2011\)](#) and [Calonico et al. \(2014\)](#) provide two popular “direct plug-in” rules based upon the mean squared error, while [Ludwig and Miller \(2007\)](#) detail a cross-validation approach. Depending upon the bandwidth selection method chosen, the researcher must also specify the order of the polynomial used to estimate the bias of the estimator.

Finally, several decisions must be made with respect to ensuring that all findings are robust. For each outcome analyzed, a number of stock procedures are used to check for possible violations of the regression discontinuity assumptions. These include searching for any discontinuities in covariate values observed at the cut point that may confound the estimated treatment effects, as well as irregularities in the density of covariates around the cut point that may indicate strategic manipulation of individual treatment status. Results of these checks are detailed in [Section 4.4.3](#). To ensure that any findings are robust to parameter specification, only those results that are consistently significant across different functional forms, kernel functions, and bandwidth selectors are reported.

4.4 Results

4.4.1 Savings, Expenditure, and Income

In the first place, the results show that pensioners exist on a delicate balance of income and expenditures that is quite easily upset by unexpected shocks. [Figure 4.3](#) shows that, following the loss of any cost-of-living adjustment, treated individuals were significantly less likely to report that their household’s income was sufficient to see them through the end of the month. [Figure 4.4](#) shows the income and expenditure imbalances in slightly greater detail. The middle panel shows that treated households were less likely than untreated households to exactly match their expenditures to their income. Further, a comparison of the top and bottom panels makes it clear that the imbalance comes not from earning more than is spent, but rather from spending more than is earned. Though the coefficient estimates for the latter scenario are nearly statistically significant, though not quite, [Figure 4.5](#) shows clearly that treated households do draw down their savings, having relatively lower account balances than those of untreated households.

To bridge the gap between income and expenditures, households do not appear to rely exclusively on savings. Perhaps unsurprisingly, treated households also appear to take steps towards lowering the overall spending. [Figure 4.6](#) shows that treated households cut down their average monthly expenditures relative to untreated households. This spending excludes payments towards valuables purchases, rent, mortgages, property maintenance, and contributions to life or other social insurance policies.

One can also say something about the types of goods and services treated households tended to abandon. [Figure 4.7](#) shows the probability difference between treated and untreated individuals for purchasing various types of goods post-treatment. No treatment

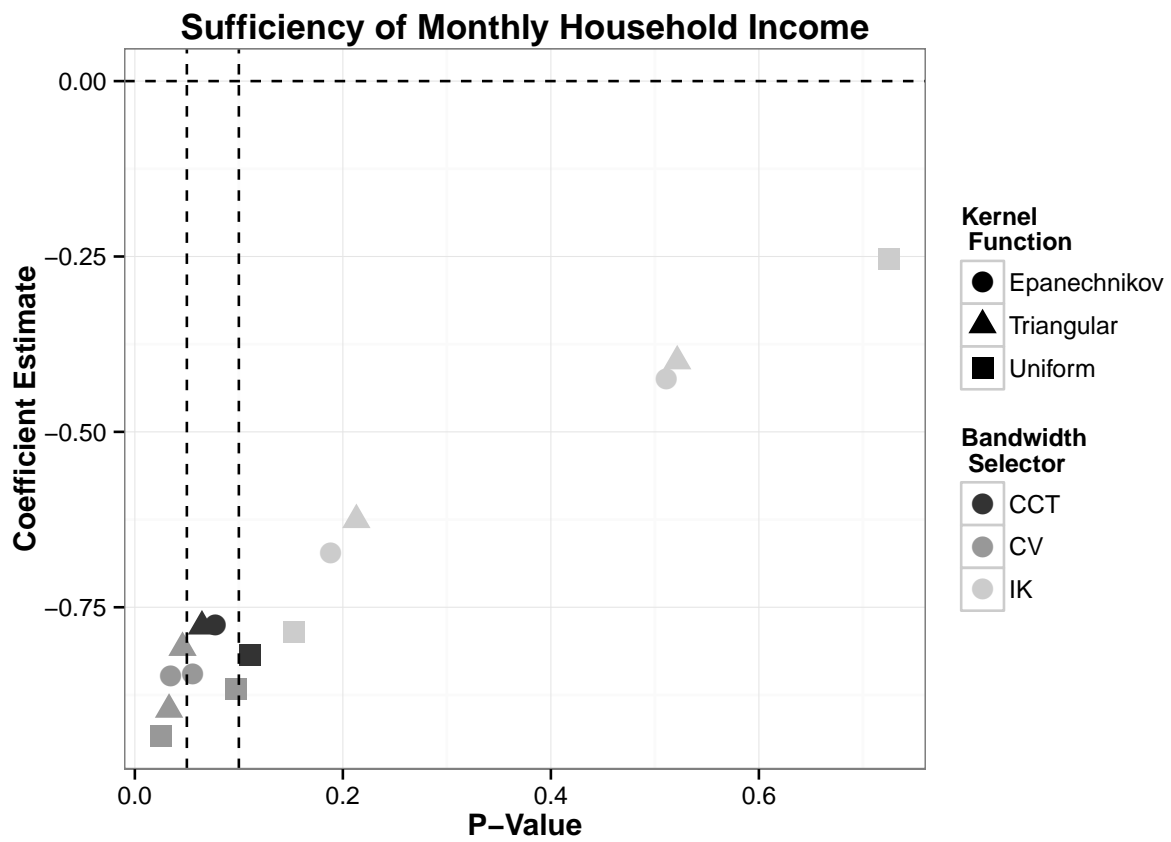


Figure 4.3: Prompt: "Is your household's income sufficient to see you through to the end of the month?"; rated on a scale of 1 ("with great difficulty") to 6 ("very easily")

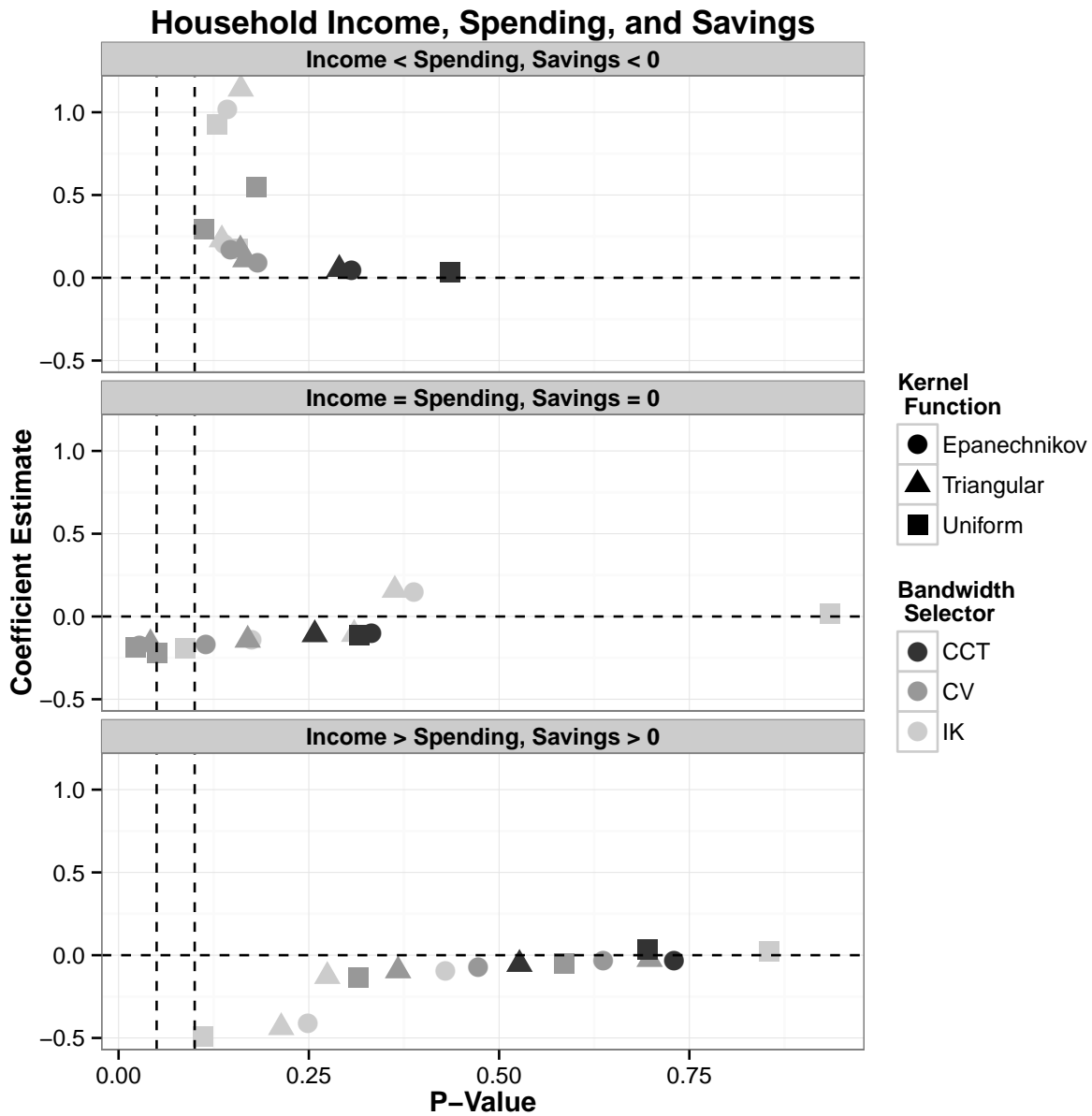


Figure 4.4: Prompt: “Please consider all of the sources of income for your household that you have told me about during this interview (employment income, rent, income from capital, etc.). Could you tell me if in 2012 your household a) spent its entire yearly income and didn’t manage to save anything, b) spent less than its entire yearly income and succeeded in saving, or c) spent more than its entire yearly income, drawing on savings or borrowing?”

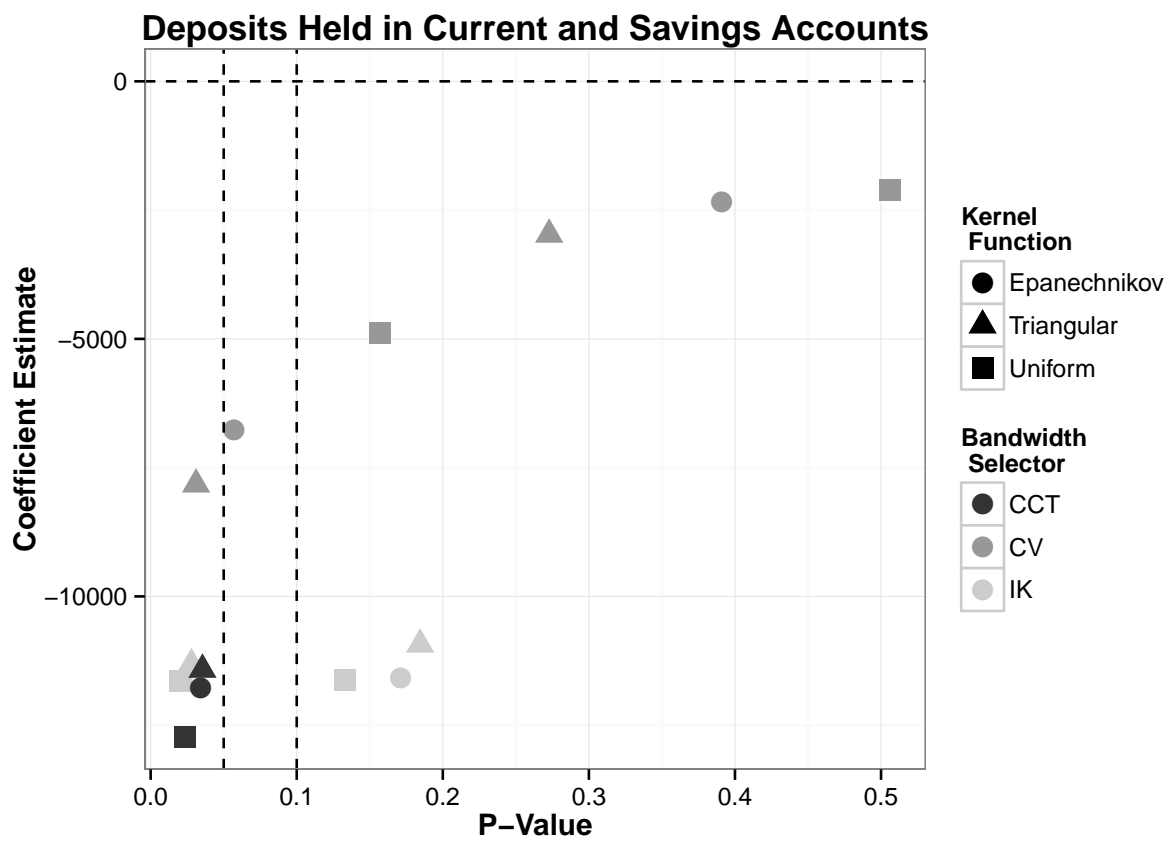


Figure 4.5: Balance held in current or savings accounts at banks and/or post offices at the end of 2012.

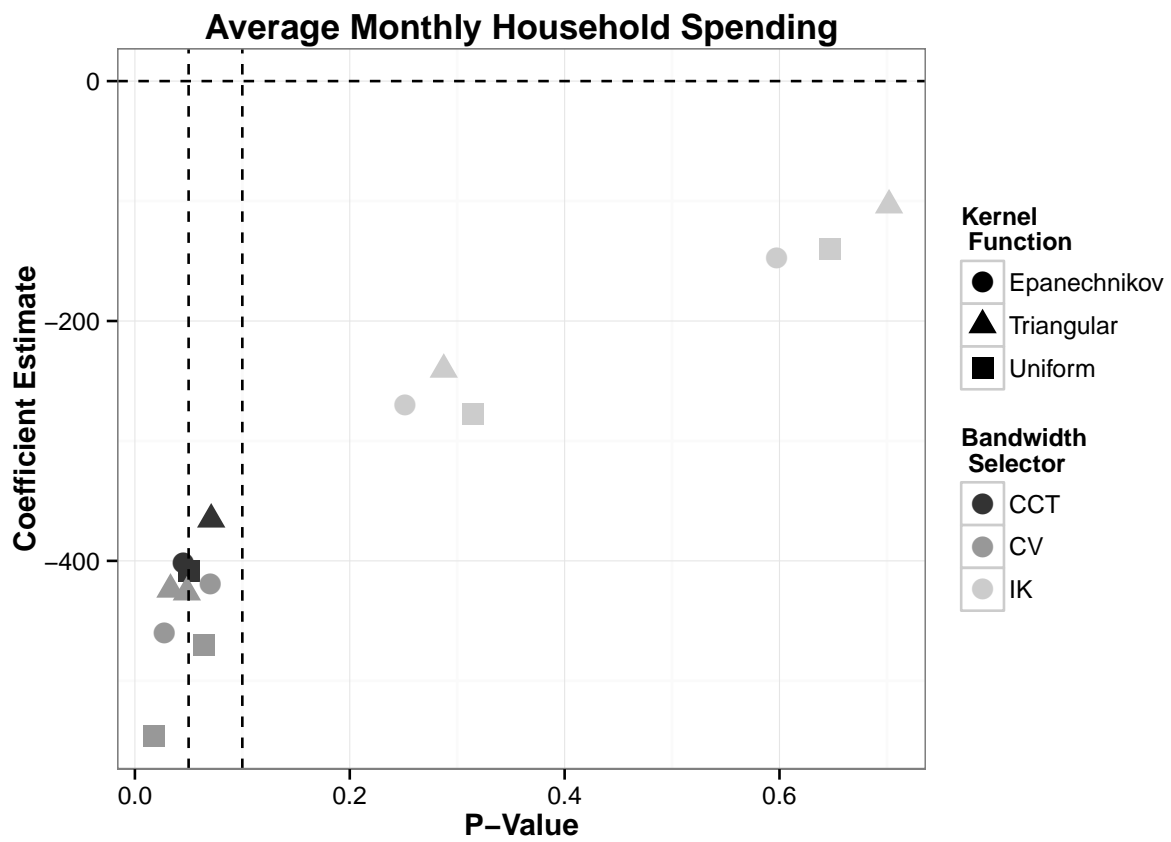


Figure 4.6: Average monthly household spending, excluding valuables, rent, mortgages, property maintenance, and insurance contributions.

effect is observed for purchases of cars and other means of transportation — individuals receiving a cost-of-living adjustment were just as likely to buy vehicles as those who did not. By contrast, almost every specification finds that treated households had a lower probability of purchasing valuables, including jewelry, collectible coins, works of art, and antiques. Several specific items are also avoided. In particular, Figure 4.8 shows that treated households strongly avoided major extraordinary purchases related to the maintenance or upgrading of their primary residences. Additionally, Figure 4.9 finds that failing to receive a cost-of-living adjustment pushed individuals to decrease the number of insurance policies held with coverage for life, motor vehicles, and real estate. No effect was found for health insurance coverage.

With a few exceptions, no treatment effect is observed for the purchase of durable goods and other big-ticket items. However, the data show that, in theory, treated households are much less inclined to purchase durables than are untreated households. Figure 4.10 shows the results of an inheritance game, where respondents were asked to consider a scenario in which they received an unexpected windfall equaling an entire year's income. While treated and untreated households do not diverge in the portions they dedicate towards savings, paying down debts, or purchasing non-durable goods such as food, clothing, or travel, a significant difference emerges regarding durables. Specifically, those who fail to receive a cost-of-living adjustment put a notably smaller portion of the windfall towards big-ticket purchases. These items include not only the sorts of valuables whose consumption is observed to decline, but also those vehicle and household appliance and furniture purchases that are not.

Finally, while treated individuals generally sought to compensate for the loss of income by drawing down savings and reducing expenditures, it does not appear that these individuals attempted to earn additional income by re-entering the labor market. Figure 4.11 and Figure 4.12 both fail to show any treatment effects. Treated individuals are no more likely than untreated individuals to pursue gainful employment post-treatment, either as an employee or via self-employment. Similarly, treated individuals do not appear to consider their employment status changed from being a pensioner to a blue-collar worker or an owner/operator. Nor does the treatment appear to incentivize work by other members of the household. Figure 4.13 shows that the average number of income earners in the household does not differ across households receiving a cost-of-living adjustment and those receiving no such remuneration.

4.4.2 Economic Expectations

A second set of effects observed in the data concern individual expectations over certain economic events and their probability of occurrence in the short-term, defined as the subsequent 12 months. One set of questions probed expectations about the financial economy, specifically the value of the Italian stock exchange index. In general, respondents had a slightly negative outlook. No large year-over-year change (plus or minus five percent) was expected with an average probability of 55 percent. With regard to the break-even point, however, respondents assigned just a 25 percent probability of observing positive growth.

Figure 4.14 shows that some treated individuals expected the stock market to perform

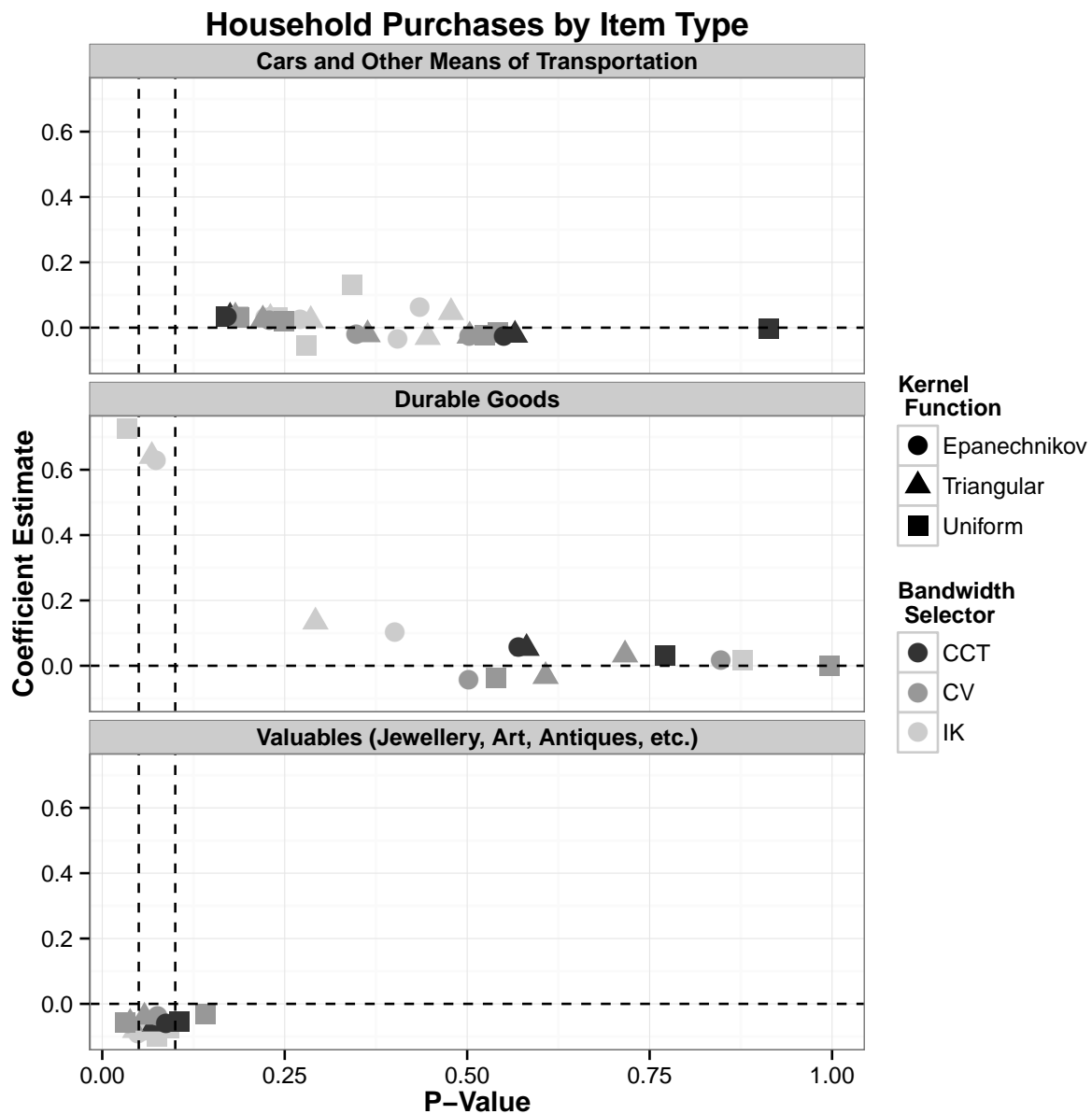


Figure 4.7: Purchase of various objects by members the household in 2012. “Durable Goods” includes furniture, furnishings, rugs and carpets, lamps, small household appliances, washing machine, dishwasher, vacuum cleaner, floor polisher, TV, PC, fridge, cooker, heater, air conditioner, radio, video-recorder, CD player, HI-FI equipment, mobile phone, fax machine, camera, and camcorders.

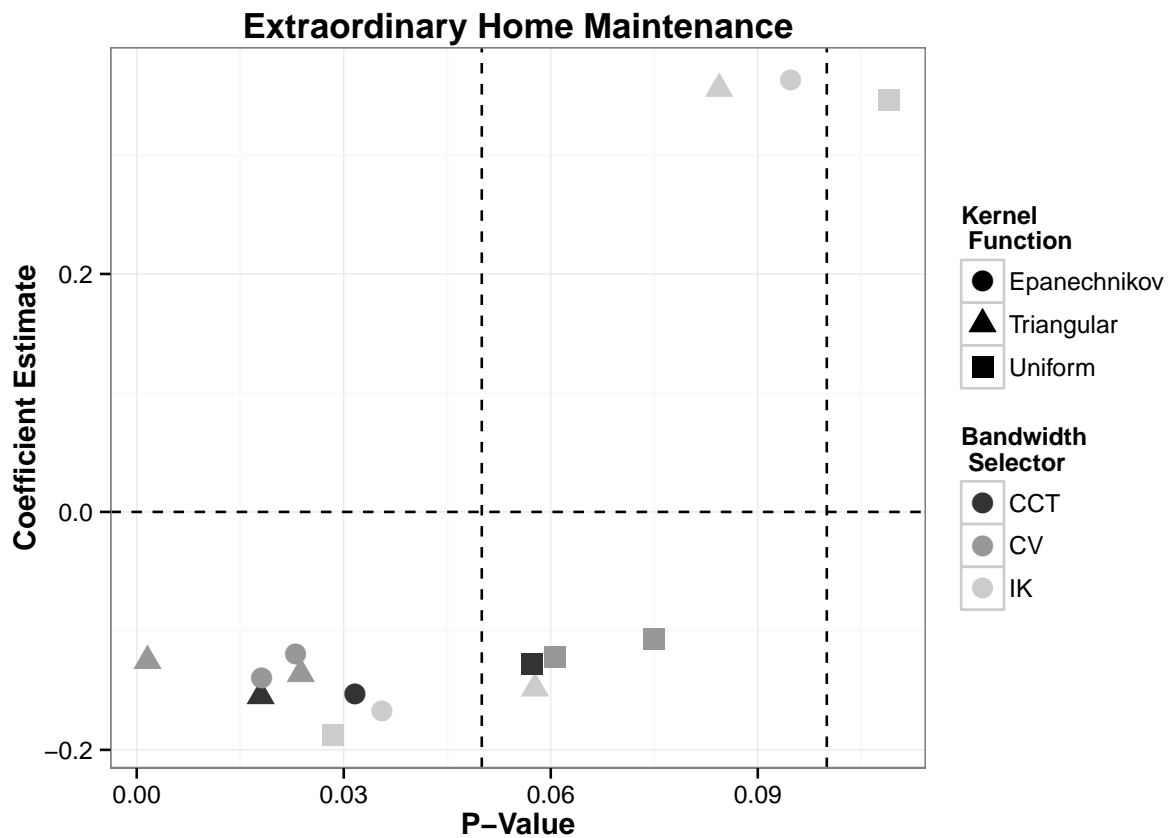


Figure 4.8: Probability of incurring expenses related to extraordinary maintenance of the primary residence, including extensions, improvements, renovations, repairs, and refurbishments.

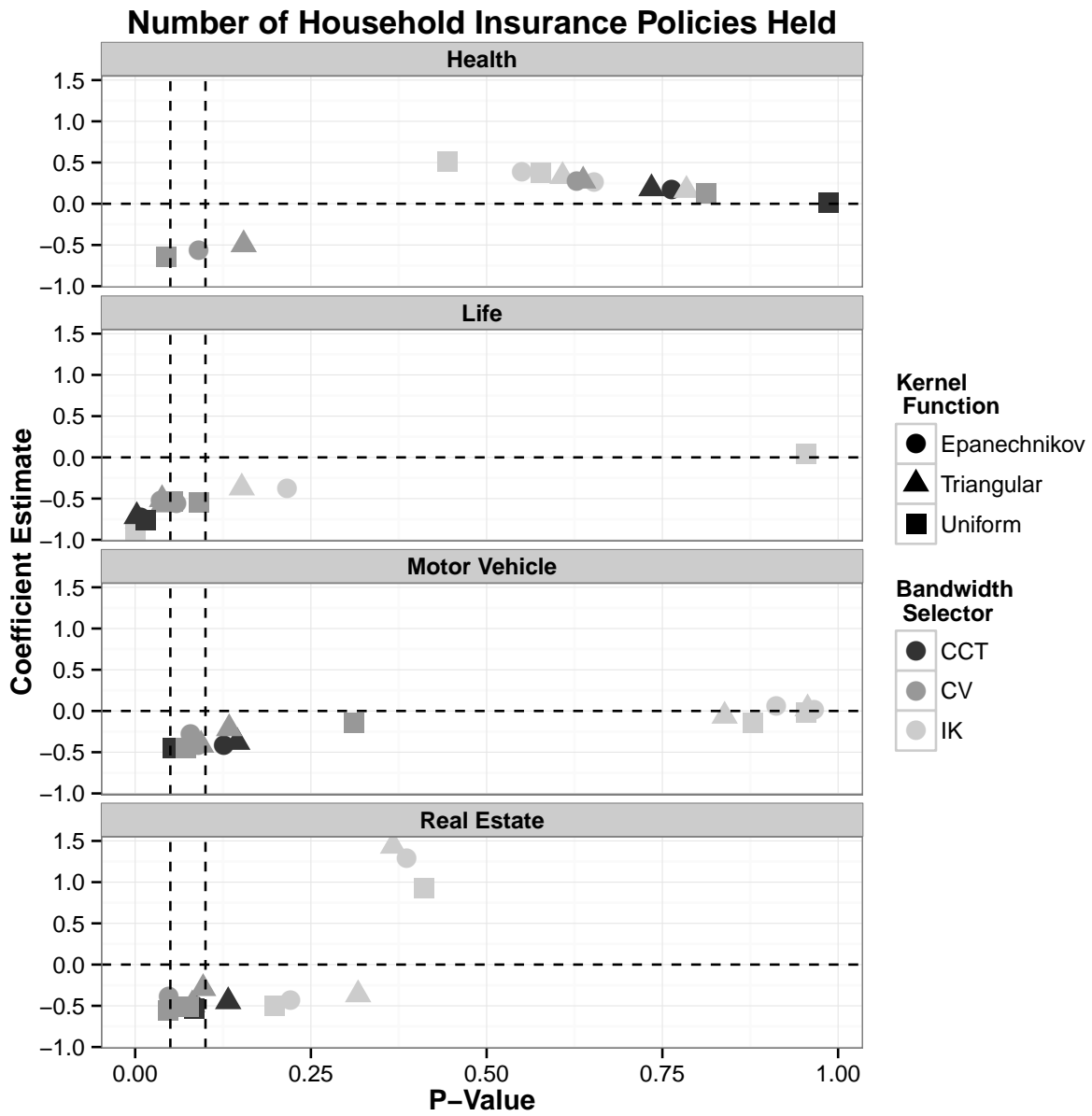


Figure 4.9: Number of insurance policies held by the household over various coverage areas.

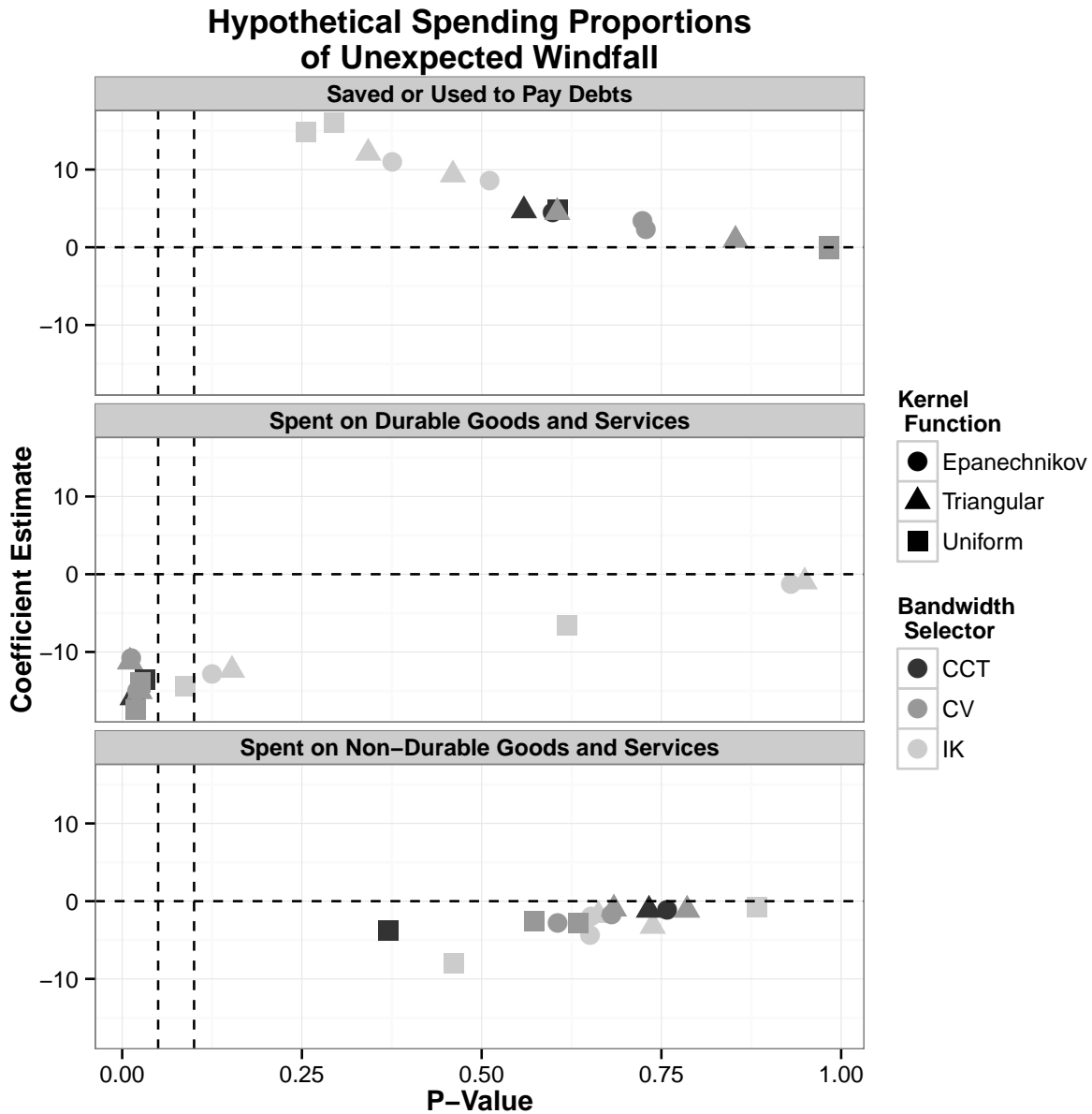


Figure 4.10: Prompt: “Imagine you receive an unexpected inheritance equal to your household’s income for a year. Over the next 12 months, how would you use this windfall? Setting the total equal to 100, divide it into parts for three possible uses [including the portions] saved for future expenditure or to repay debt, spent within the year on goods and services that last in time (jewelry and valuables, motor vehicles, home renovation, furnishing, dental work, etc.) that otherwise you would not have bought or that you were waiting to buy, [and] spent during the year on goods and services that do not last in time (food, clothing, travel, holidays, etc.) that ordinarily you would not have bought.”

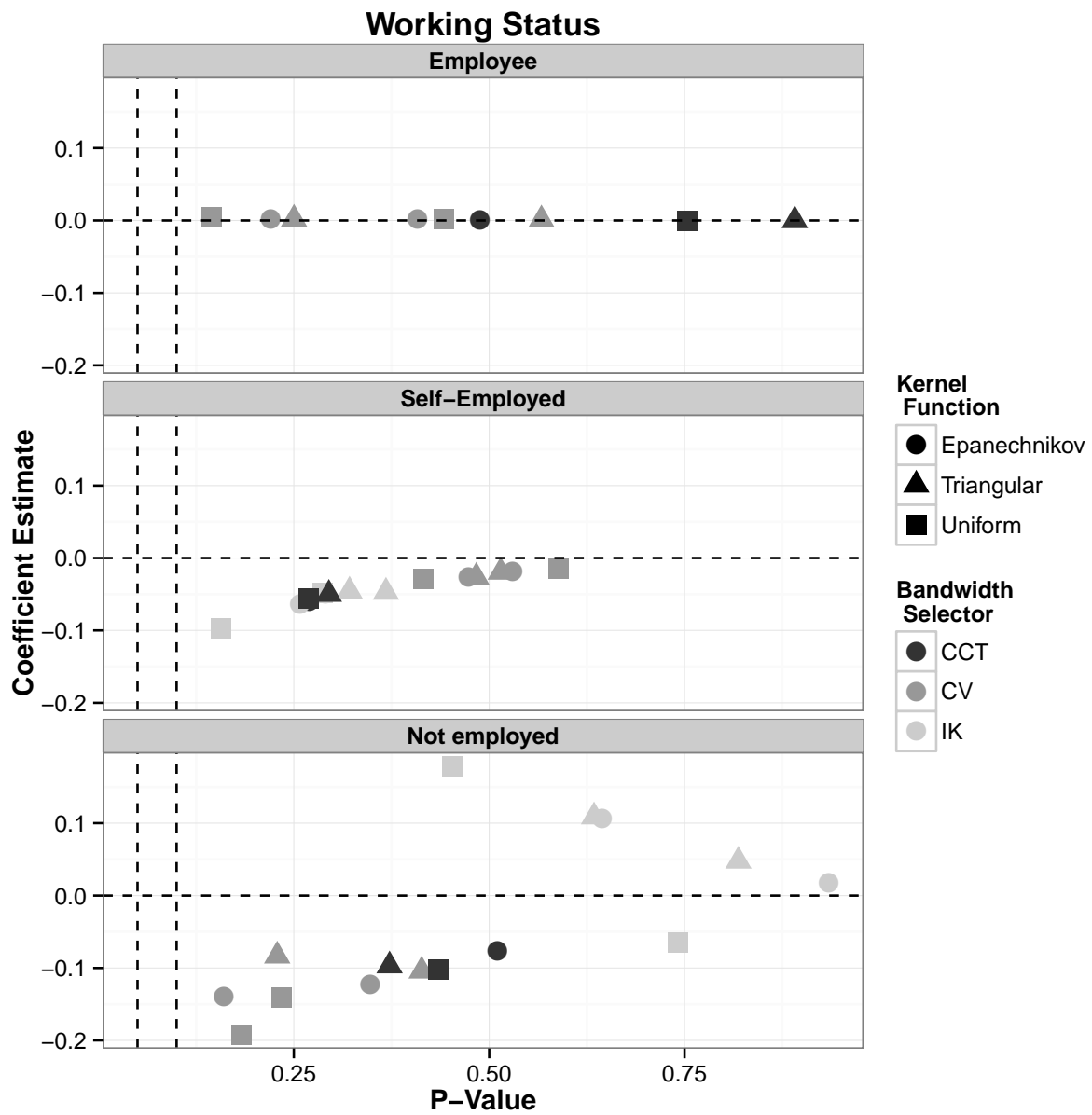


Figure 4.11: Self-reported working status in 2012.

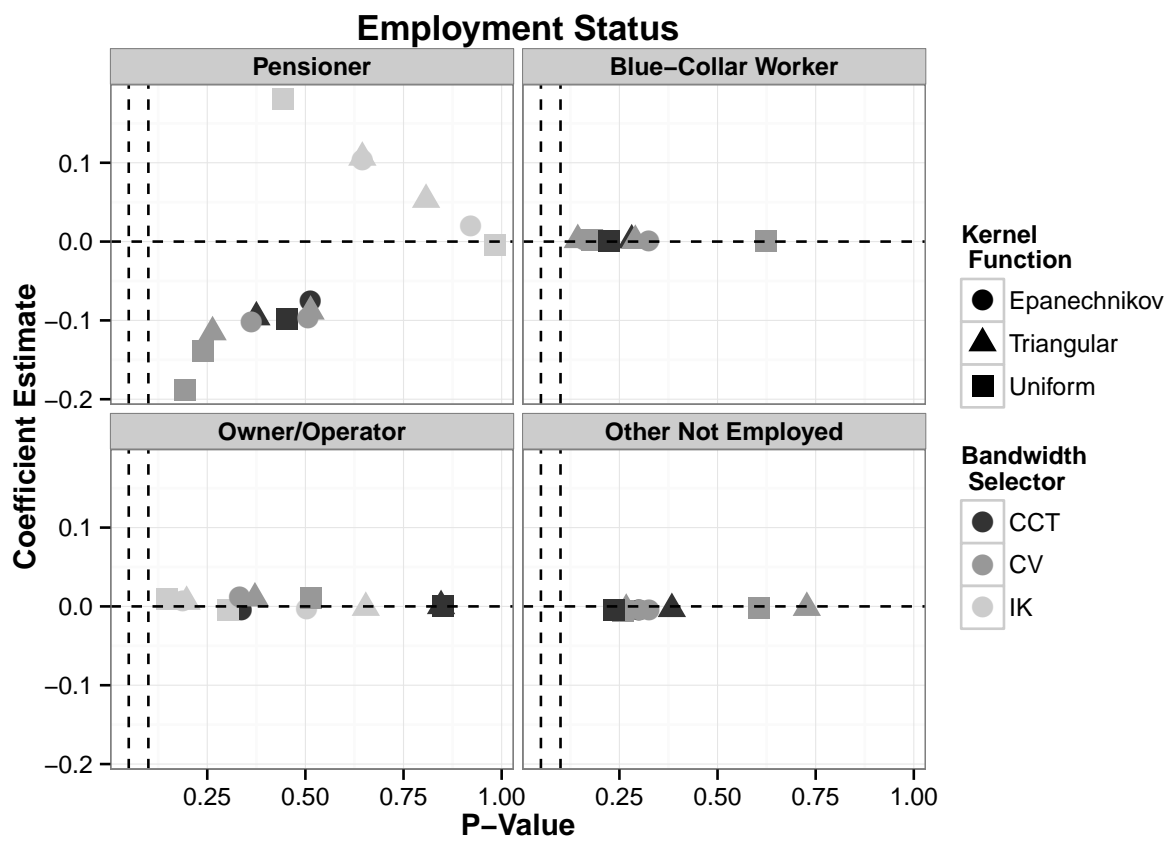


Figure 4.12: Self-reported employment status in 2012.

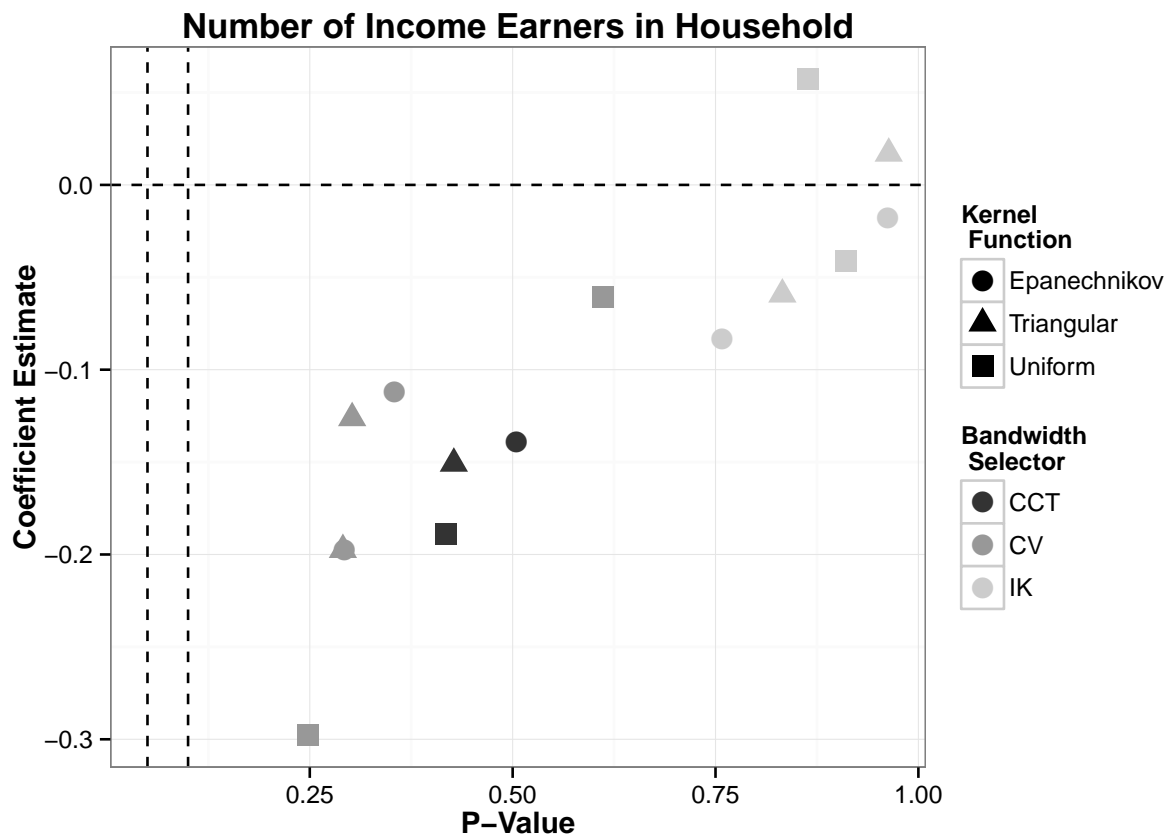


Figure 4.13: Total number of income earners in the household for 2012.

worse in the short-term, relative to untreated individuals. The major difference between these two groups is in the probability assigned to a moderate-to-strong year of growth. Individuals that did not receive a cost-of-living adjustment had a more bearish outlook, assigning a lower probability to such an outcome than those who did receive an adjustment. In general, however, this pessimism does not seem to translate into expectations for overall positive or negative growth. Figure 4.15 shows that treated individuals were no more or less likely than others to expect an overall increase in the value of Italian stock market investments.

Respondents were also queried as to how they believed the real economy might perform over the same period, and how their household income would be impacted in turn. In the full sample, the average individual believe that there was a two-thirds chance that his or her income would neither increase nor decrease by more than two percent. As with domestic stocks, however, the overall expectation was for negative growth. Respondents believed there was less than a one-in-five change that their household incomes would increase over the year.

Figure 4.16 shows that, again, individuals that did not receive a cost-of-living adjustment had different and — perhaps — lower expectations for their household’s income in the next year. Specifically, treated individuals were much less likely to expect little change in their household income, relative to untreated individuals. There is also some evidence that they assigned a higher probability to seeing between a two and ten percent income decrease, though this finding is not robust across different specifications. Concerning the more general question of whether their incomes would simply rise or fall, Figure 4.17 shows no difference between treated and untreated individuals. Figure 4.18 shows that this finding holds for real income increases, as well, with no significant differences being observed in the movement of household incomes relative to prices.

A final battery of questions concerned how markets would view the safety Italian sovereign debt over the next year. As a whole, the sample again expected only minor changes in the value of these bonds, assigning an average probability of 54 percent to their value neither increasing nor decrease by more than five percent. And as before, the average expectation that yields would decline was just 25 percent.

The effects of not receiving a cost-of-living adjustment on expectations for the value of sovereign bonds are shown in Figure 4.19 and Figure 4.20. The main finding is that treated individuals more likely believe that the worst is over Italian government bonds. The probability assigned by these individuals to an additional 20 percent or greater loss in value is decidedly lower that the probability assigned by untreated individuals. Some specifications also suggest that treated individuals are less likely to expect relatively no change (plus or minus five percent) in the value of these bonds, though this finding does not appear robust across many different specifications. Overall, there appears to be no treatment effect on break-even expectations.

4.4.3 Robustness Checks

To assess the validity of these findings, several robustness checks were performed. First, a number of pre-treatment covariates were examined for discontinuities in the area of the cut point in the forcing variable. These results are shown in Figure 4.21, where the

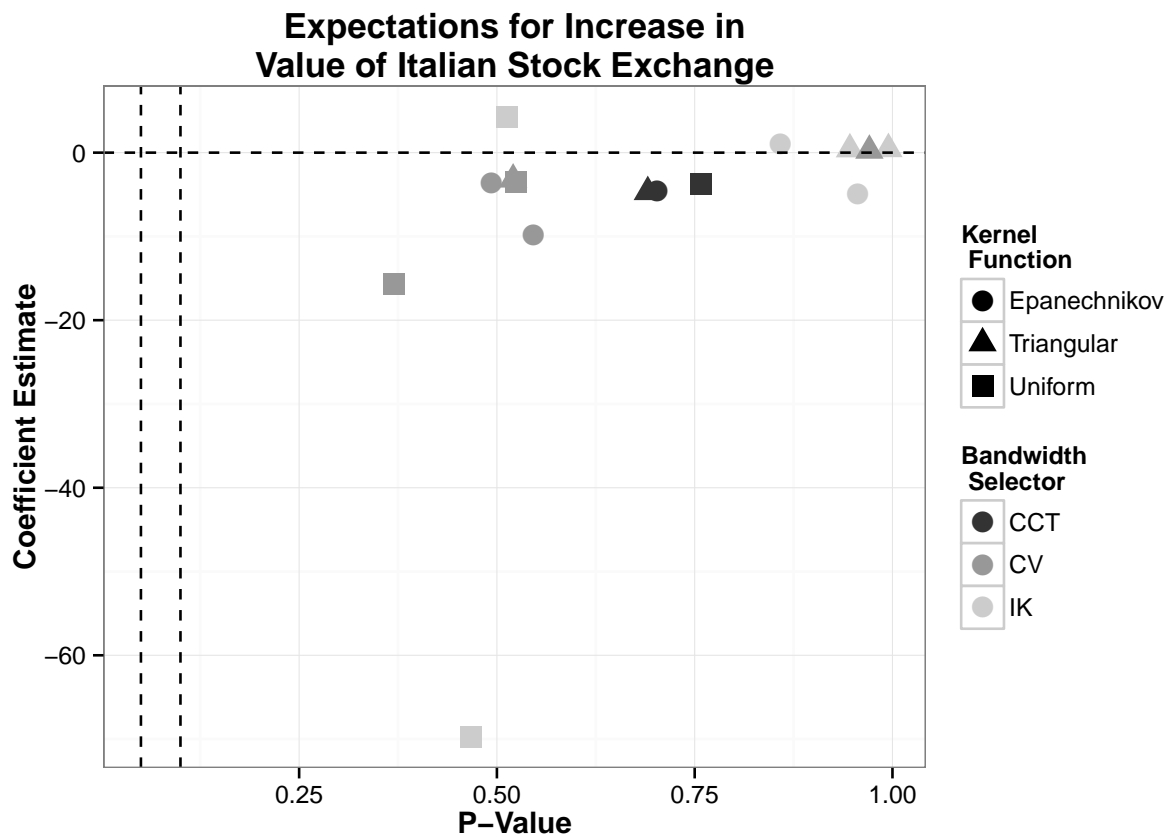


Figure 4.15: Prompt: “Twelve months from now, the value of an investment on the Italian stock exchange index will be higher than today, even by just one euro (on a scale of 0 to 100)”

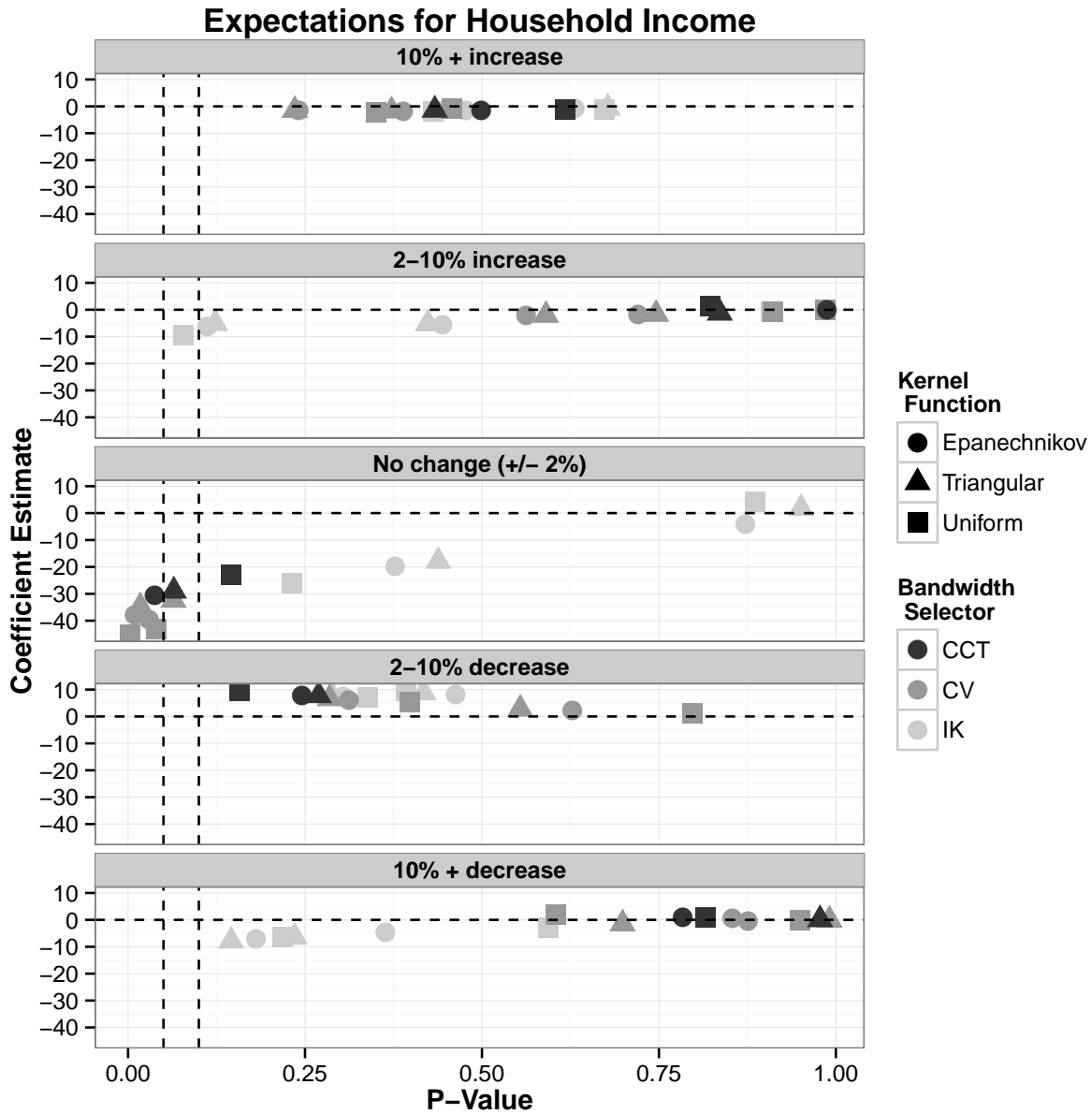


Figure 4.16: Prompt: "Twelve months from now, your household's income will be: a) much higher than today (by 10 per cent or more), b) somewhat higher (2 to 10 per cent), c) basically the same (no more than a 2 per cent increase or decrease), d) somewhat lower (2 to 10 per cent), or e) much lower than today (by 10 per cent or more)."

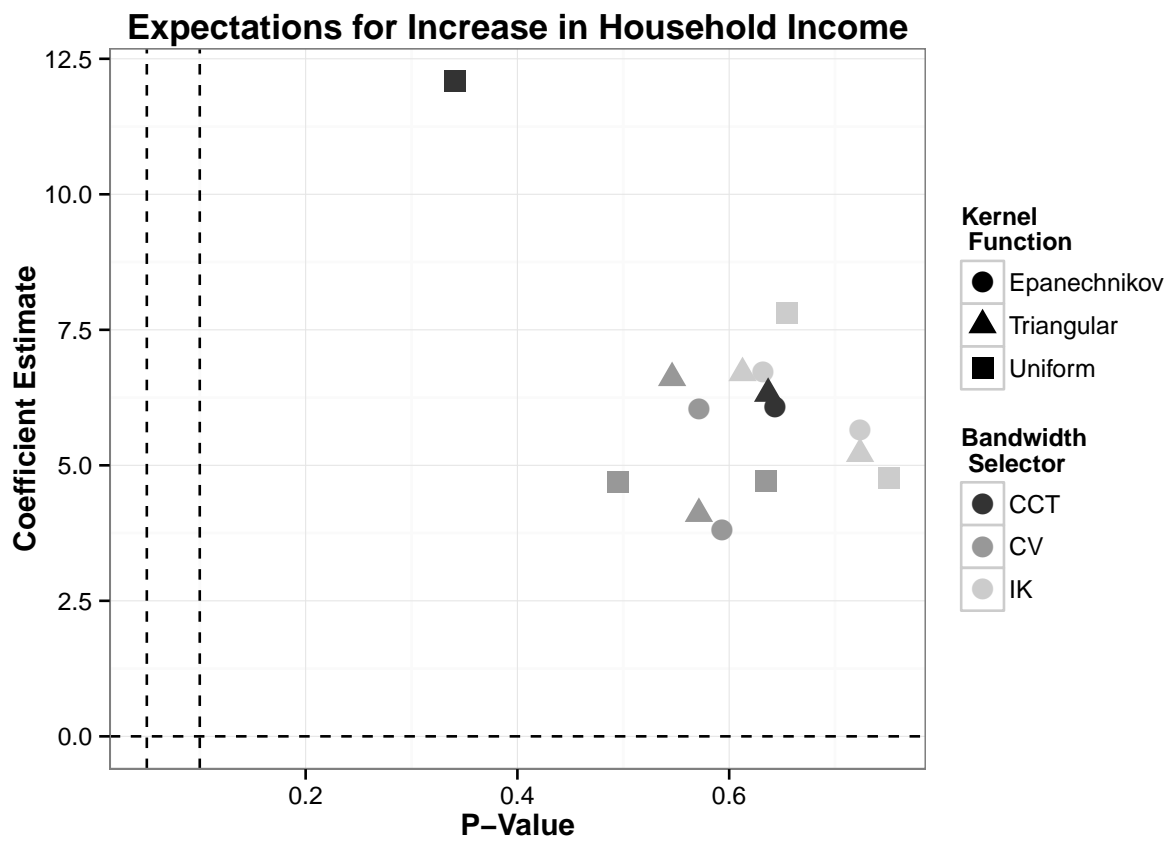


Figure 4.17: Prompt: "Twelve months from now, your household's income will be higher than today, even by just one euro (on a scale of 0 to 100)"

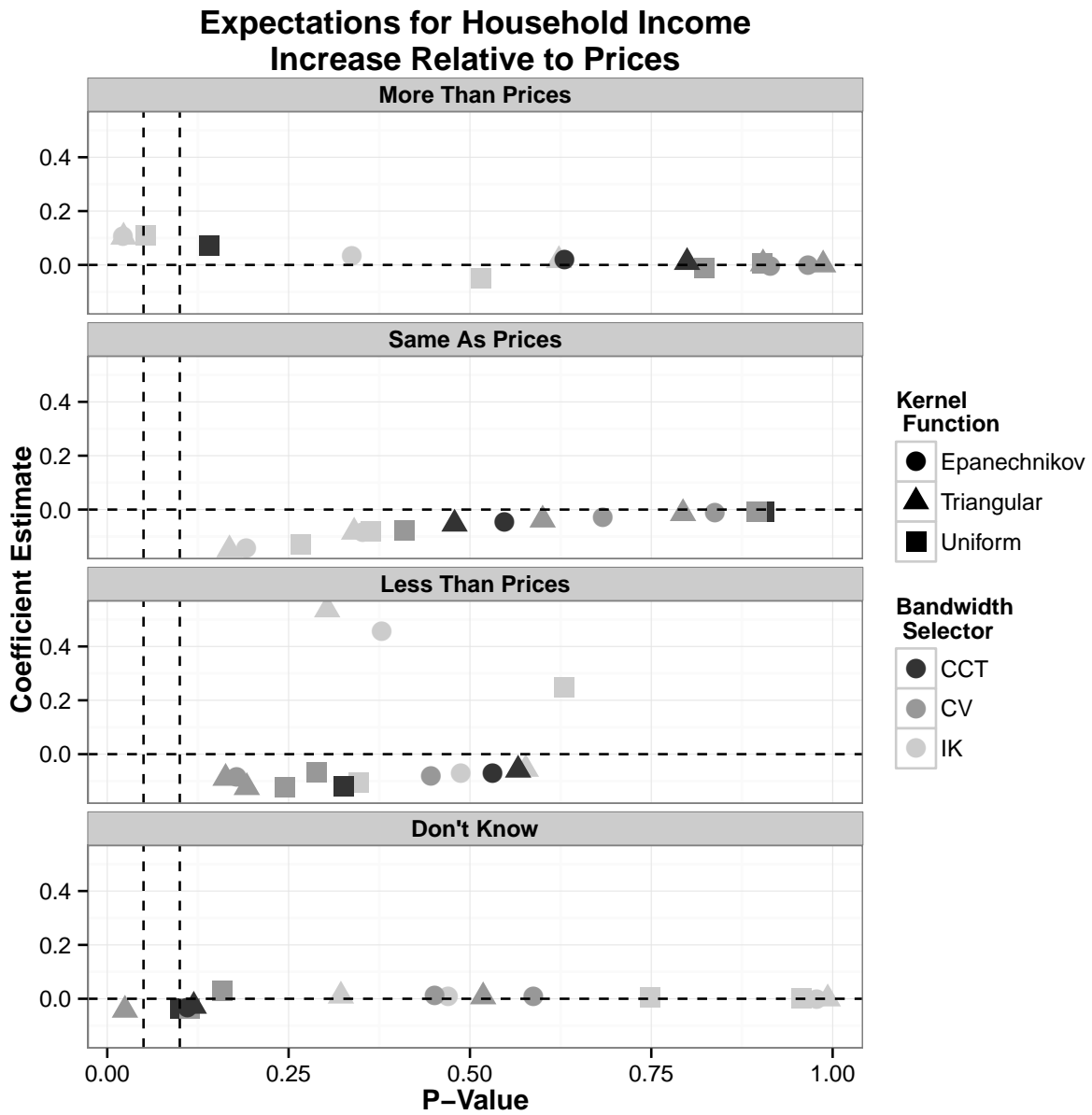


Figure 4.18: Prompt: "This year, in 2013, do you expect your household's total income to rise more than prices, less than prices, or about the same as prices?"

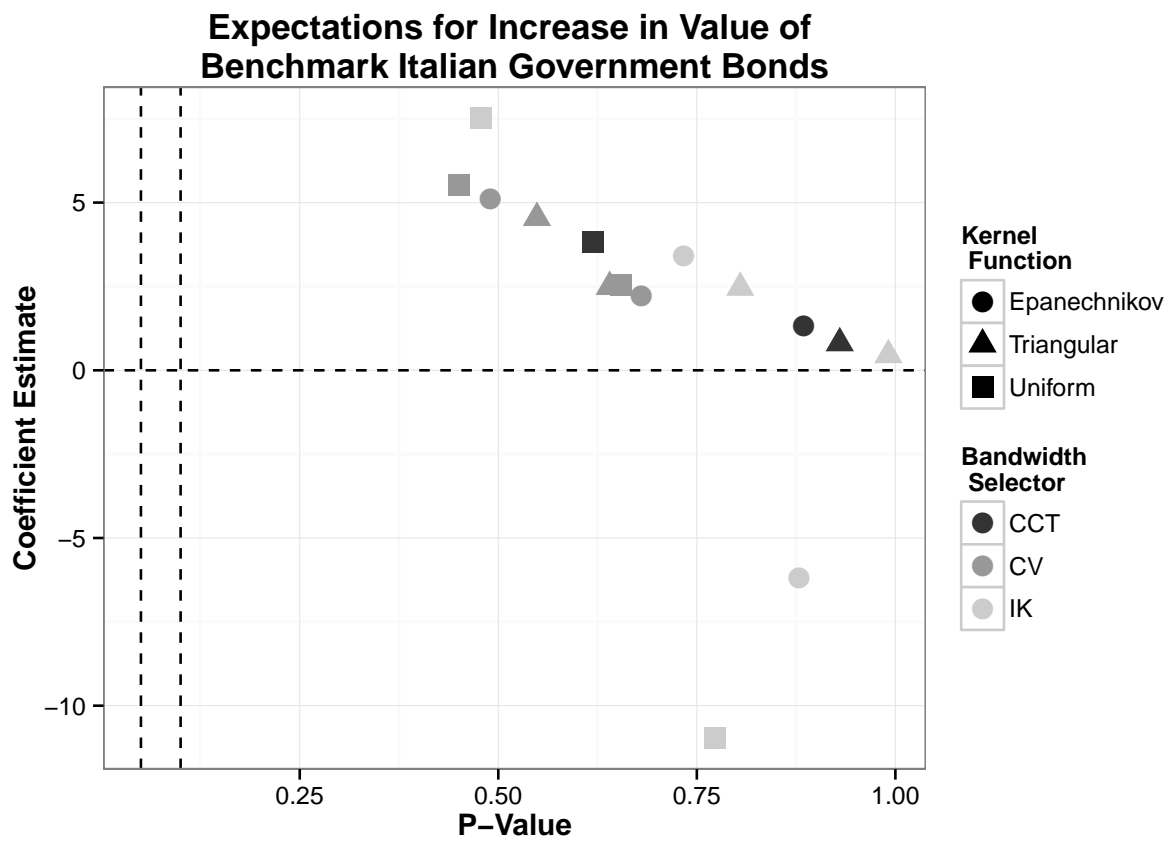


Figure 4.20: Prompt: “Twelve months from now, the value of a 10-year government bond (BTP) bought now will be higher than today, even by just one euro (on a scale of 0 to 100)”

mean and median p-values across various regression discontinuity specifications are presented. On almost all major pre-treatment covariates, no observable differences exist between treated and controlled units near the cut point. These covariates include information on age, gender, place of birth, education, marital status, employment status, and health status, among others. One possible imbalance between treated and controlled units concerns residence. Specifically, treated individuals are slightly less likely to reside in the center of the country than controlled individuals. To check for possible bias in the results following this imbalance, the coefficients were re-estimated separately for center-residing individuals and non-center-residing individuals. None of the original findings appears to systematically differ between these two populations.

Second, as proposed by [McCrary \(2008\)](#), a density test is used to assess whether strategic manipulation of treatment status is observed in the data. The test identifies sorting patterns by comparing the density of individuals on either side of the cut point. Should individuals appear to overwhelmingly clump on one side of the cut point, any regression discontinuity results could be biased due to effectively non-random treatment assignment. In this case, the density test was repeated for each of the unique optimal bandwidths used in the results presented above. The distribution of p-values for these tests is shown in [Figure 4.22](#).

It appears clear from these tests that the density of the forcing variable on one side of the treatment cut point differs from that on the other. But while strategic manipulation of treatment status appears possible, the density discontinuity is much more likely to be the result of rounding and approximation in the monthly pension income reported by survey respondents. [Figure 4.23](#) shows that respondents overwhelmingly round their reported pension income to the nearest €10 or €100.

Furthermore, as should be clear from the description of the events surrounding the pension reform, strategic manipulation of the forcing variable seems highly unlikely. The sample analyzed is limited to treated individuals who were already drawing a state pension at the time the treatment went into effect, making it unlikely that they could strategically increase or decrease their monthly state pension payments. Even if these individuals were, in fact, able to change their monthly state pension benefit, the speed with which the policy was implemented all but nullifies the possibility of significant manipulation. As opposed to the majority of pension reforms, which are ordinarily implemented with a lag of several years, the Italian reform was proposed, passed, and implemented all within the span of less than two months. Given such a short timeline, the sorting observed in the forcing variable seems unlikely to be the result of strategic manipulation of treatment assignment.

Finally, to check for differential attrition in the sample, the distribution of treatment statuses was compared between potentially treated individuals who left the panel and those who stayed. In total, 71 individuals, or roughly 2.6 percent of the sample was lost between panel waves. Of these individuals 13 were assigned to control and 13 were assigned to treatment, or 81.7 and 18.3 percent of departing individuals. Among those individuals who remained in survey, 86.7 percent were assigned to treatment and 13.3 percent were assigned to control. While sample drops were slightly more likely to be assigned to treatment, the difference in proportions is not statistically significant.

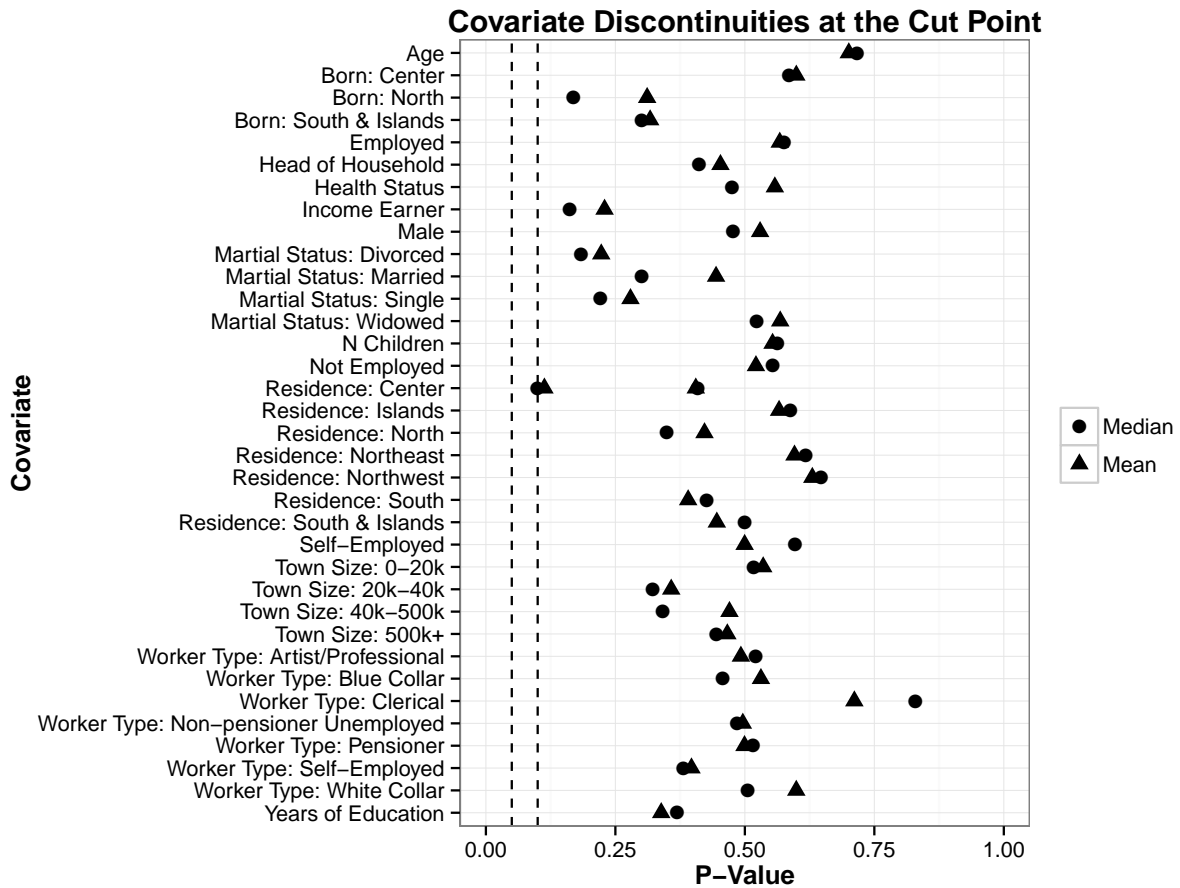


Figure 4.21: Tests for Discontinuities Near the Treatment Cut Point in Pre-Treatment Covariates

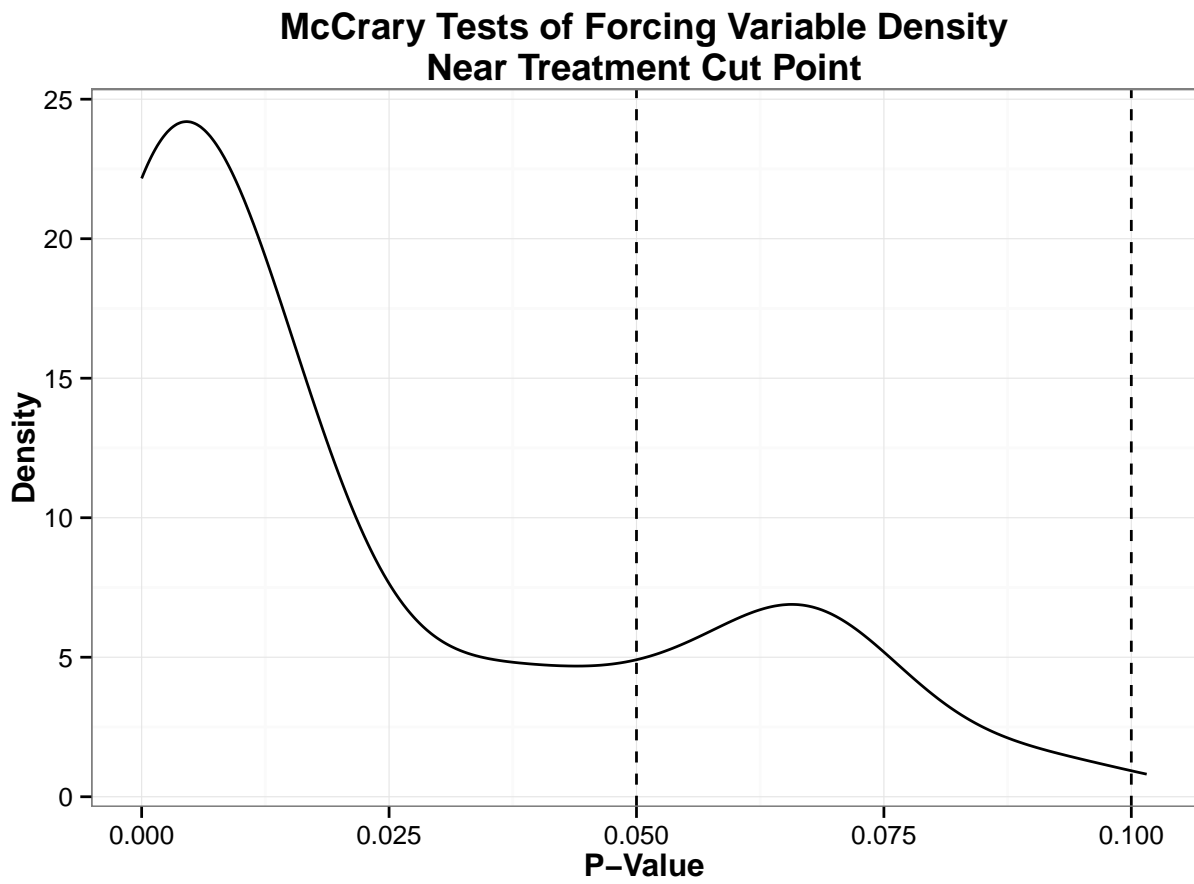


Figure 4.22: McCrary Tests for Density of Forcing Variable Near Treatment Cut Point

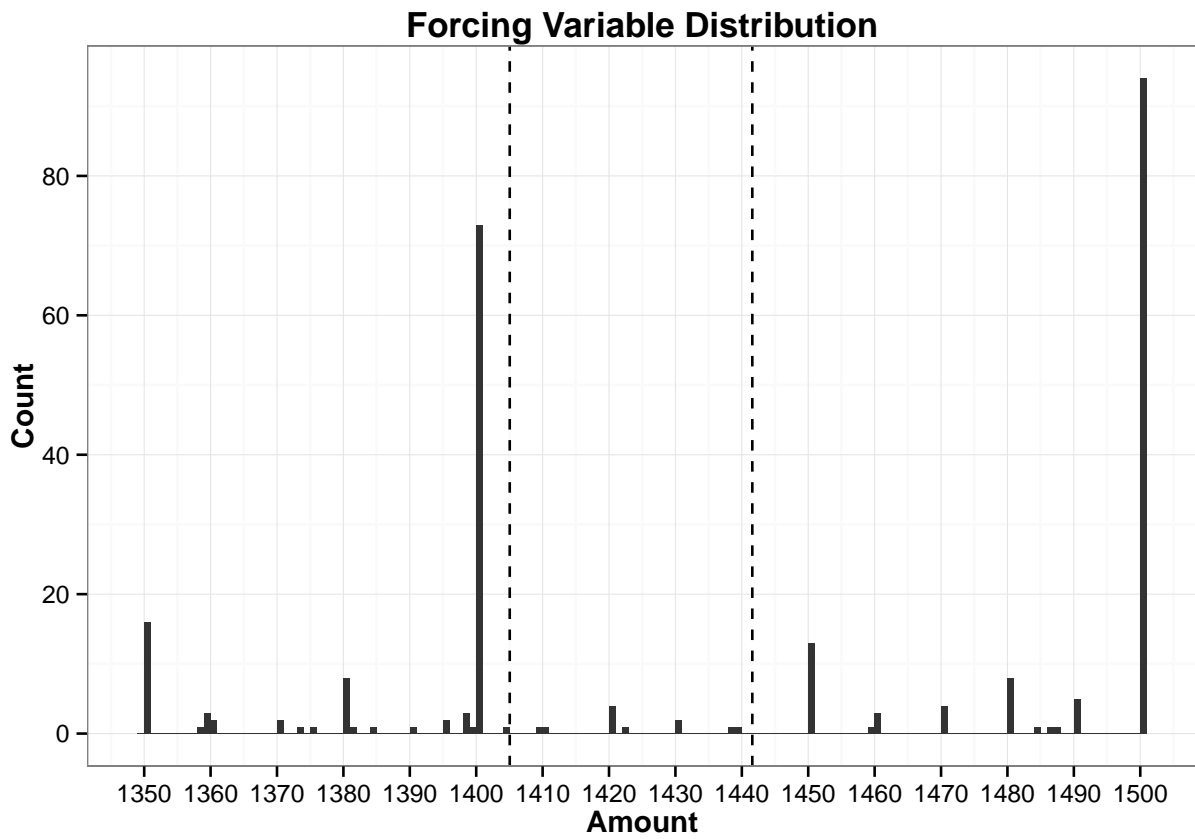


Figure 4.23: Distribution of forcing variable between €1,350 and €1,500, with bin width = €1

4.5 Conclusion and Discussion

Whereas Chapters 2 and 3 looked to understand the *causes* of welfare state retrenchment, this chapter concerned itself more with the *effects* of retrenchment. In regard to main findings, the data examined herein suggest two main effects of retrenchment when delivered in the form of lowered cost-of-living adjustments. First, of mainly theoretical interest, it is clear that even relatively minor and potentially obscure retrenchments do have observable effects on individual behaviors. Second, while the actual economic behaviors of individuals are minimally impacted, retrenchment does appear to carry significant expectation-based effects. Overall, the loss of a cost-of-living adjustment makes individuals less optimistic about future economic growth and income.

These results give rise to at least three potential avenues for future research. In the first place, similar changes to cost-of-living adjustments have been made across several European countries just since 2008. To undergird the findings noted above, it is critical that researchers attempt to confirm whether these effects have any external validity outside of the Italian case. Doing so requires finding the relevant data to make such measurements. Despite being an admittedly herculean task, researchers should scour survey data sets to find approximate replications of this treatment set in other national environments.

Relatedly, research should be carried out to understand how these effects decay over time. Fortunately, the data source for these results is an ongoing panel survey. Though the sample size may be even more limited, it would be certainly interesting to see whether the retrenchment effects identified above can endure beyond the short term. More directly, researchers studying the effects of retrenchment should strive to understand whether individuals can largely recover from benefit cuts, or whether these events permanently alter their behaviors and economic standing.

Finally, despite presenting compelling results on economic behavior, this data has done little to inform on perhaps the biggest intellectual prize – namely identifying any effects held by retrenchment on individual *political* behavior. Such information would not only be academically fascinating, but could also have its own political implications. If it became clear, for instance, that retrenching parties semi-permanently alienated important parts of their voting constituencies, perhaps the future course of retrenchment would be altered. As with the previous suggestion, this requires primarily careful attention to the methodological implications of various policy actions and a constant search for relevant data.

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