

The Local Memory of Repression and Who Fights*

Soeren J. Henn
Newcastle University Business School

Connor Huff
Department of Political Science
Rice University

June 19, 2023

Abstract

How does the local memory of past repression affect whether individuals fight for, or rebel against, the government perpetrator? We theorize how information about past repression is transmitted across generations over time to shape long-run patterns of loyalty and rebellion toward the state. We assess this argument by studying how the legacies of the 1845–1849 Irish Famine affected the decisions of subsequent generations of Irishmen to fight for or against Britain. Leveraging data on over 150,000 Irish combatants, we show that individuals in places more severely affected by the Famine fought in the pro-British Irish Militia and the WW1 British military at *lower* rates. By contrast, they rebelled against Britain at *higher* rates. Additional quantitative analysis provides evidence consistent with the theoretical argument: constituencies more severely affected by the Famine voted for the pro-Irish and anti-British Sinn Féin party at higher rates. Our paper demonstrates how the local memory of past repression can play a crucial role in shaping long-run patterns of conflict participation behavior.

*Soeren J. Henn (sjhenn@chicago.edu, <http://soerenhenn.com>) is a Lecturer in Economics at the Newcastle University Business School. Connor Huff (connor.huff@rice.edu, <http://connordhuff.com>) is an Assistant Professor of Political Science at Rice University. We are grateful to Kristin Bryant, Dara Cohen, Nick Coulombe, Jeffrey Frieden, Gladys Zubiria Fuentes, Allegra Hernandez, Jonathan Homola, Ashley Leeds, Jason Lyall, Matti Mitrunen, Carl Müller-Crepon, Yui Nishimura, Nathan Nunn, Jared Oestman, Alex Pugh, Rob Schub, Livia Schubiger, Andrew Shaver, Gary Uzonyi, Ariel White, Thomas Zeitoff, Yuri Zhukov, participants at EPSA 2021, APSA 2021, and CAGE 2023 for helpful comments. Kristin Bryant, Sedat Cankaya, Delaine Mansfield, and Yui Nishimura provided excellent research assistance. We thank James Feigenbaum and Shom Mazumder for helpful conversations in the early stages of the project, and Cécile Chemin, John Grenham, and Shane Wilson for helpful conversations navigating the historical records of nineteenth and twentieth century Ireland.

1 Introduction

History is replete with examples of governments engaging in repressive behavior against the populations over whom they rule. During Stalin’s “Terror by Hunger,” the deliberate starvation of the Ukrainian people resulted in the death of over three million individuals (Rozenas and Zhukov 2019: 570). During the Algerian War of Independence, the French engaged in the systematic use of torture and forced disappearances, and in 1919 British soldiers killed hundreds of unarmed protesters during the Amritsar Massacre in India. At the same time that governments engage in repressive behavior against the populations over whom they rule, they also commonly rely on these same communities to defend against both internal and external threats. To combat the Mau Mau rebels in Kenya, the British depended on the Kikuyu Home Guard—a government paramilitary force drawn from the same community as the Mau Mau (Anderson 2017).¹ During WW1, the British relied on approximately 1.5 million Indian soldiers to bolster their military forces (Morton-Jack 2018: 3)² while the French similarly recruited almost 500,000 troops from their colonies in West Africa, Madagascar, Indochina, Algeria, Tunisia, and Morocco (Das 2011: 4).³ The success of militaries commonly depends upon the willingness of domestic populations—the same individuals against whom they may have engaged in repressive behavior—to fight in the government’s defense. How does the local memories of past repression affect the likelihood individuals fight in defense of, or opposition to, the government deemed responsible?

We argue that the local memory of past repression shapes long-run patterns of loyalty and rebellion toward the perpetrating state. Consistent with a burgeoning body of research theorizing and empirically documenting the non-violent legacies of repression, we argue that localized narratives about the unjust nature of past government behavior are transmitted across generations by families and communities (Dell and Querubin 2018; Gilligan, Pasquale, and Samii 2014; Rozenas, Schutte, and Zhukov 2017). Local memories of past repression shape long-term grievances toward the government perpetrator (Lupu and Peisakhin 2017; Rozenas, Schutte, and Zhukov 2017; Wang

¹In both Ireland and India the British relied upon local combatants to fight against internal uprisings, such as during the Irish Rebellion of 1798 (McAnally 1949: ch. 8) and Indian Rebellion of 1857 (Spilsbury 2008: 78–79).

²Contemporaneously, the Defence of India Act 1915 allowed the arrest and imprisonment of Indian subjects without trial and the colonial government engaged in economic repression such as land seizures and debt bondage (Hardiman 1992).

³Prior to WW1, the French violently suppressed several rebellions such as the Kabyle Revolt in Algeria in 1871 and the Madagascar Revolt in 1895–1896, while also imposing trade restriction and instituting forced labor regimes.

2019). We argue that these local grievances increase the likelihood individuals rise up in rebellion against the perpetrating state, and decrease the likelihood they fight in its defense. Consistent with recent research on the legacies of repression (Rozenas and Zhukov 2019; Wang 2019), we further consider how contemporary forces—such as local economic incentives—can moderate the relationship between the local memories of repression and individual conflict participation behavior. Whether these moderating forces attenuate or exacerbate the consequences of local memory depends on whether and how much they change the costs and benefits associated with fighting.

We apply the theoretical argument to the case of 1840s–1920s Ireland. We assess whether and how the local memory of past repression shapes conflict behavior by studying how differences in the severity of the Irish Potato Famine affected the likelihood subsequent generations of Irishmen joined the British Empire’s military forces, or rebelled against them. Contemporary and historical accounts demonstrate the Famine was commonly remembered by local communities as a repressive and genocidal event. As John Mitchel, a leader of the revolutionary Young Ireland movement asserted, “The Almighty, indeed, sent the potato blight, but the English created the famine” (Mitchel 1861: 219). Historical research and archival evidence further shows how local memories of the death and destruction of the Famine were transmitted across generations over time (Donnelly Jr 1996). We argue that local grievances in places where the Famine was more severe should make individuals more likely to rebel against the British, and less likely to fight in their defense. We also consider how long-term shifts in the costs and benefits associated with conflict participation can moderate the relationship between local grievances and the choice to fight. Building on past research focusing on the economic consequences of famines around the world (Chen and Zhou 2007; Meriläinen, Mitrunen, and Virkola 2020; Ó Gráda 2006), we argue that long-run changes in local economic incentives have the potential to shape the opportunity costs associated with conflict participation. In the case of Ireland, we expect these incentives made individuals from places more severely affected by the Famine less likely to fight both for and against the British.

We assess the argument by compiling a new dataset to compare how differences in the severity of the Famine affected the rates of participation in the British military and Irish rebel forces. We treat the barony as the unit of analysis.⁴ This approach follows past research in political science that

⁴Baronies were geographically defined historical units used for cadastral purposes until 1898, comprising 330 subdivisions within Ireland.

conceptualizes the legacies of violence as being transmitted through local communities (Dell and Querubin 2018; Gilligan, Pasquale, and Samii 2014; Rozenas, Schutte, and Zhukov 2017), while also mirroring empirical research in economics seeking to better understand the long-run consequences of the Famine (Goodspeed 2016; Ó Gráda 1999). We collected detailed individual-level information on over 150,000 Irish combatants—including combatants’ birthplaces and residences—who fought either for or against the British Empire between 1880 and 1922. We geolocated the birthplace and residence of combatants using a *GoogleMaps* API algorithm and combined this individual-level data with population counts from the 1901 and 1911 censuses of Ireland. We use these data to calculate barony-level rates of participation in the (1) pro-British Militia in Ireland, (2) British Military in WW1, and (3) Irish rebel forces. We next proxy for the severity of the Famine within each barony by leveraging the local change in population between 1841 and 1851. The measure is intended to capture at a local level the widespread death and destruction we expect to shape local memories of past British repression, and thus the choice to fight.

Using the newly compiled data, we first demonstrate that places more severely affected by the Famine were less likely to have soldiers fight for the pro-British Irish Militia in 1880–1900s Ireland. We then show that they were also less likely to have soldiers fight, and die, in British forces in WW1. These results are substantively large. Baronies that lost a quarter of their population during the Famine having 25–50% less men fight for the pro-British Irish Militia and in British forces in WW1 than baronies with no population loss. Consistent with research in economics (Narciso and Severgnini 2023), we next show that the Famine also led to higher rates of fighting *against* the British.⁵ Baronies that lost a quarter of their population during the Famine had 50% more men fight in the Irish rebel forces. Sensitivity analyses discussed in Section E and the Appendix show that a high degree of confounding would need to exist to explain these findings. We show that a confounder explaining fifteen times the residual variance as is explained by going from a fully Protestant to a fully Catholic barony (in terms of population loss and conflict participation in the Irish rebel forces) would still not reduce the implied effect size to zero. Taken together, the findings suggest that individuals in places more severely affected by the Famine were both less likely to fight to defend the British Empire and more likely to mobilize against it.

⁵In contrast to Narciso and Severgnini (2023), we present a novel theoretical argument about how the legacies of the Famine shaped conflict participation generally. We also use a different empirical approach and sample for our analyses.

We next leverage a range of additional evidence to better understand the mechanisms underpinning these empirical findings. We start by considering whether there is additional evidence in favor of our argument for how local memory transmitted over time shaped the choice to fight. To do so, we leverage constituency-level data from the 1918 parliamentary election and show that constituencies more severely affected by the Famine voted at higher rates for the pro-Irish and anti-British Sinn Féin party. We also see that these higher rates of Sinn Féin vote share are positively correlated with fighting for the rebels, and negatively correlated with fighting for the British. Famine-induced grievances thus shaped individual attitudes toward the British, rather than solely making individuals more “violence-prone” as past research might suggest (Humphreys and Weinstein 2008). We next consider whether and how the mapping from local grievances to conflict participation is moderated by individuals’ local economic conditions. To do so, we first leverage proxies for economic well-being from the 1911 Irish census to assess how differences in the severity of the Famine shaped the opportunity costs of conflict participation. The evidence suggests that places more severely affected by the Famine were economically better off in the long-run. However, we next show that differences in these economic measures are only correlated with fighting for the British; economic indicators are largely uncorrelated with participation in the Irish rebel forces. Ultimately, the additional evidence is consistent with the argument that the local memory of past repression plays a central role in shaping long-run patterns of loyalty and rebellion toward the state.

The paper makes at least three main contributions to research in political science. The first contribution is studying a distinct outcome variable—the choice to fight—as part of a growing body of research considering how the legacies of the past shape behavior in the present (Charnysh and Finkel 2017; Homola, Pereira, and Tavits 2020; Homola et al. 2022; Lupu and Peisakhin 2017; Rozenas and Zhukov 2019; Wang 2019). We extend this prior work on the non-violent legacies of the past, by focusing on political behavior in one of its most extreme forms: the choice to engage in violence both for and against the state. In doing so, we demonstrate how the local memory of the past can play a crucial role in shaping long-run patterns of loyalty and rebellion. The manuscript also contributes to an important body of research exploring the legacies of famines. We expand the analytic purvey of recent research—which has largely focused on the long-run economic consequences of famines—to include the choice to fight in defense of the state deemed responsible. As such, we are part of a growing body of research considering how famines can shape

both violent (Meriläinen, Mitrunen, and Virkola 2020; Narciso and Severgnini 2023) and non-violent behavior (Rozenas and Zhukov 2019) across a range of contexts. The third contribution is empirical. By collecting individual-level information on over 150,000 combatants, we build directly on past empirical research exploring why individuals fight (Humphreys and Weinstein 2008). Doing so allows us to provide new insights into how the local memory of the past can play a crucial role in shaping conflict participation behavior.

2 How The Legacies of Repression Shape Conflict Participation

We argue that the local memory of past repression shapes long-run patterns of loyalty and rebellion toward the state, and in turn, the choice to fight. Throughout, our conceptual framework focuses on individuals' *locations* as the main channel for how past events shape local memory. The memory of past repression is kept alive and transmitted locally through families and communities (Lupu and Peisakhin 2017; Wang 2019). In the remainder of this section we first discuss how the local memory of past repression shapes long-run patterns of conflict participation behavior, after which we consider how contemporary incentives can moderate this expectation.

2.1 How the Local Memory of Past Repression Shapes Conflict Participation

A large body of research throughout political science considers both the causes and consequences of state repression. States faced with potentially hostile populations engage in a variety of actions as they seek to quell political unrest. These include engaging in censorship (Roberts 2018), coercive state violence (Greitens 2016), and mass starvation and terror (Rozenas and Zhukov 2019). Prior research demonstrates how the short-run consequences of repression depend in part on the extremity of the repressive tactics chosen (Gurr 1970; Lichbach 1987; Zhukov 2023). Moderate to low levels of repression have the potential to stimulate further political opposition by generating anger among the repressed population. However, when repression becomes sufficiently extreme, it instead reduces political opposition. This occurs because repression causes the public's fear of future punishment to overwhelm their anger, making it such that they are reluctant to rise up against the state.

A recent wave of research seeks to better understand the long-run consequences of this repressive behavior. Scholars of the historical legacies of political violence and repression document

how information about past government behavior is transmitted through local memory by families and communities. This information transmission shapes long-run local attitudes. For example, Lupu and Peisakhin (2017) demonstrate how individuals whose families were exposed to violence during the deportation of Crimean Tatars in 1944 have lower levels of outgroup trust. Similarly, Rozenas, Schutte, and Zhukov (2017) demonstrate how state violence perpetrated by the Soviet Union in Ukraine affects contemporary voting behavior; individuals in places where Soviet violence was worse are less supportive of parties associated with Russia. Wang (2019) explores the long-run consequences of state terror during China’s Cultural Revolution, documenting how individuals who were raised in localities that experienced more state-violence are less trusting of China’s contemporary political leaders and government system. Collectively, this work shows that past repression perpetrated by the state shapes local grievances and nonviolent political behavior. Interestingly, this work further argues that the fear that commonly accompanies past repression appears to dissipate over-time. For instance, Rozenas, Schutte, and Zhukov argue that “only the alienating effects exceed a conflict’s duration and solidify into community-level narratives of past victimization” (2017: 1148). This suggests that in the long-run, local communities remember the grievousness of the repressive actions, while at times forgetting the fear that accompanied them.⁶

Of particular importance to our paper, local communities similarly pass on memories of the death and destruction of famines. As we discuss more fully in Section 3.1, this dynamic was pervasive in historical Ireland; local communities memorialized the Great Famine through oral history, songs, and literature (Donnelly Jr 1996; Poirteir 1995). Similarly, local communities within Ukraine—whose ancestors suffered extensively during Stalin’s Terror by Hunger—played a direct role in constructing memorials commemorating their community’s victims (Wylegała and Głowacka-Grajper 2020: 55). Local memories of the Terror by Hunger also shaped long-run political attitudes (Rozenas and Zhukov 2019). In the case of Finland, recent research demonstrates how the 1866-68 Finnish Famine is considered to be “a collective traumatic incident, the memory of which has been recollected and repeated from one generation to another” (Kraatari 2016: 168). These memories are transmitted through books, memorials, and local commemorations (Newby and Kraatari 2018). Analyses of the Bengal Famine further buttresses the idea that the death and destruction of famines

⁶Importantly, as we discuss more fully in the conclusion, what instead seems to matter is the contemporary coercive capacity of the state (Rozenas and Zhukov 2019; Wang 2019).

can shape attitudes toward the government. For instance, Siegel (2018) argues that in India, hunger “had long been central to Indian understandings of imperial injustice, but after 1943, the elimination of hunger emerged as a nationalist imperative” (Siegel 2018: 23). Taken together, this research provides evidence for how the memories of famines are transmitted over time to shape anti-government attitudes.

Further, research on the determinants of conflict participation demonstrates how both the historical and contemporary actions of the state can generate grievances, which affect the choice to participate in violence and rebellion (Cederman, Gleditsch, and Buhaug 2013; Post 2005; Schubiger 2021; Wood 2003). Grievance-inducing events—such as discriminatory policies or coercive state violence—shape conflict behavior by increasing anger (Balcells 2017), hatred (Petersen 2002; Post 2005), or rage (Petersen 2002). Anger, hatred, and rage motivate individuals to fight. For example, focusing on the case of El Salvador, Wood (2003) demonstrates how moral outrage at past government violence caused individuals to derive personal benefits from participating in opposition to the state. In a similar spirit, Schubiger (2021) argues that state violence generates grievances, which increase the number of potential recruits for rebel organizations. Prior research also documents how information about past government atrocities transmitted through families and local communities can cause grievances. For example, Post (2005) argues that information about past atrocities causes hatred to be “bred in the bone,” and this shapes the choice to join militant groups such as Fatah.

Building on the logic of this work, we argue that individuals in places where the memory of past repression is stronger should be more likely to rise up against the state, and less likely to mobilize in its defense. This occurs because information about the death and destruction accompanying past repression is transmitted over time through local memory. The memory of past repression perpetuates local grievances against the perpetrator. Thus, individuals in places where past repression was relatively more severe should have stronger grievances against the government deemed responsible. These stronger grievances make individuals more likely on average to rebel against the perpetrator and less likely to mobilize in their defense. Of course, the long-run implications of past repression for conflict behavior also depend on the existence and strength of other mechanisms that affect the choice to fight. For this reason, we next turn to considering how contemporary incentives might potentially moderate the influence of local memory on individuals’ conflict participation behavior.

2.2 How Contemporary Incentives Can Moderate the Long-Run Consequences of Past Repression

Prior research on the legacies of repression demonstrates how the long-run consequences of repressive behavior can be moderated by *contemporary* incentives. For instance, while studying the political legacy of Stalin’s repression in Ukraine, Rozenas and Zhukov (2019) demonstrate how the long-run consequences of Stalin’s “Terror by Hunger” depended upon whether the regime could threaten retribution in response to opposition.⁷ In this paper we build upon this intuition to consider how economic considerations—which are commonly considered to be first-order consequences of famines and also core determinants in shaping the choice to fight in both conventional armies and rebel organizations—can moderate the behavioral consequences of local grievances.

State repression commonly affects both macro and micro economic conditions. At the state-level, repression can lead to the implementation of sanctions by the international community (Lebovic and Voeten 2009), which typically inhibit economic growth (Neuenkirch and Neumeier 2015). The death and destruction accompanying repression can also directly affect local economic conditions in the place where the repression occurred (Walden and Zhukov 2020). This is particularly true for famines, which commonly result from either repressive intent or malign neglect. In a number of cases, famines generated long-run negative economic consequences. For example, the 1866–68 Wheat Famine in Finland worsened local economic conditions and increased inequality; this eventually shaped local conflict participation behavior (Meriläinen, Mitrunen, and Virkola 2020). In China, the 1959–1961 Famine led to less healthy adults, a lower labor supply, and lower earnings (Chen and Zhou 2007). In other cases, famines can improve local economic conditions in the long-run. This can occur through improvements in the bargaining position of labor,⁸ increases in international aid (Keen et al. 2008), or new political and economic reforms (Karadja and Prawitz 2019; Pahontu, Hooijer, and Rueda 2021). Indeed, economic historians argue that the Great Famine in Ireland increased living standards in the long-run by increasing the bargaining power of labor (Ó Gráda 2006: 21).

⁷In places where retribution was credible, repression led individuals to behave more loyally to the regime; this pattern flipped when retribution was no longer credible.

⁸These dynamics are similar to what has been documented after the black death in Western Europe (Brenner 1976).

Further, prior research highlights how the choice to fight in both conventional militaries and rebel organizations is shaped by changing economic incentives. In conventional volunteer militaries, enlistment behavior is shaped by both shifts in the incentives provided by militaries, and potential enlistees civilian-sector economic prospects. For instance, in the United States recent estimates suggest that improving military pay increased the rates of high-quality enlistment; by contrast, a ten percent decrease in the civilian unemployment rate is estimated to have reduced the rate of high-quality enlistment by roughly two to four percent.⁹ These empirical findings accord with a parallel body of research arguing that individuals commonly weigh the material costs and benefits associated with conflict participation (Olson 1965; Popkin 1979; Lichbach 1998). As the expected benefits from fighting increase relative to individuals' outside options, we should expect individuals to be more likely on average to fight. Taken together, the logic of this prior research suggests that shifts in local economic conditions can serve as a moderating force shaping the choice to fight.

This means that understanding the consequences of repression for long-run patterns of loyalty and rebellion necessitates understanding whether and how repressive behavior shaped individuals' economic incentives. As demonstrated above, in many instances past repression worsens local economic conditions. If the case, then this can both increase the attractiveness of fighting for organizations that pay their combatants, and also reduce the opportunity cost associated with leaving a lower-paying civilian job. Overall, this should increase the attractiveness of fighting in both conventional militaries and rebel forces. On the other hand, prior research on the long-run consequences of famines suggests that they can at times improve local economic conditions by strengthening the bargaining power of labor. This can reduce the financial benefits of fighting in both conventional militaries and rebel organizations. Ultimately, the precise nature of the empirical predictions depend upon the direction of the long-run economic consequences for a given case. In Section 3.2, we turn to discussing these economic consequences for the case of historical Ireland.

⁹https://militarypay.defense.gov/Portals/3/Documents/Reports/SR05_Chapter_2.pdf

3 The Legacies of the Great Famine and Conflict Participation Behavior

We assess our theoretical argument in the context of the Great Famine in Ireland. In 1845, Ireland was struck by the fungus *Phytophthora infestans*, more commonly known as the potato blight. The blight led to widespread failure of the potato crop. This failure was a monumental disaster given that a large majority of Ireland's poor relied upon the potato for their daily subsistence (Bourke 1993: 97–100). From 1845–1849 the crop failure led to the death of approximately one million people, and the emigration of another million.

Both contemporary and historical accounts document how the starvation, disease, and death resulting from the Famine were largely perceived to be attributable to British rule. As the Famine ravaged Ireland between 1845 and 1849, the British generally took what was perceived to be a “hands-off” approach. This approach emphasized parsimony and making the Irish pay for “their crisis” (Ó Gráda 2006: 15). For some in the British government, this policy was justified by “Malthusian providentialism—the conviction that the potato blight was a divinely ordained remedy for Irish overpopulation” (Ó Gráda 2006: 15). Statements from British Prime Minister John Russell, whose government oversaw the response to the Famine, provide helpful context summarizing the sentiment of the British political class at the time; lamenting the policy constraints he faced within Britain, Russell noted how many thought that “we have granted, lent, subscribed, worked, visited, clothed the Irish; millions of pounds worth of money, years of debate etc. – the only return is calumny and rebellion – let us not grant, clothe etc. etc. any more and see what they will do . . .”¹⁰

Whether the Great Famine was the result of repressive and genocidal intentions, or simple neglect, has been debated throughout history (Bradshaw 1989; Donnelly Jr 1996; Kinealy 1997; Ó Gráda 1999). On the one hand, are those who argue that the British under-provision of aid was done purposefully with malign intent. This malign intent made it such that the Famine was a repressive action that some considered to be genocide.¹¹ As we discuss more fully in the next section, these arguments were made broadly during and after the Famine by members of the Irish nationalist community. On the other hand, are those who argue that the perception of genocidal intent

¹⁰Quoted in Kinealy (1997: 71).

¹¹For a discussion of the development of this narrative, see Donnelly Jr (1996).

is misplaced. Many modern scholars of Irish history, for example, argue that the severity of the Famine is more readily attributable to British neglect, rather than active murderous intent (Ó Gráda 1995: 4). Further, the scale of the Famine made it such that successfully implementing relief was an enormous and difficult challenge (Ó Gráda 1999: 10). While the overwhelming bulk of academic research aligns with the latter camp (Ó Gráda 1995: 4), what matters most for our purposes is how the local communities themselves memorialized the Great Famine. As we demonstrate in the next section, local communities commonly remembered the unjust evictions, fever, and death; these were largely perceived to be attributable to Britain's malign and repressive intent.

3.1 How the Great Famine Shaped Local Memory and Conflict Participation Behavior

Local communities' perceptions that the Famine results from Britain's malign and repressive intent developed through at least two channels. The first channel included individuals' direct experiences throughout the Famine period. Authorities evicted indebted tenants, and workhouses that were supposed to provide relief were left underfunded and overcrowded. Since landowners bore an increased tax liability under the Poor Law Amendment Act of June 1847, landowners engaged in a massive campaign of evictions to reduce this liability. The mass evictions were thus perceived to be the fault of both the British government that created the incentives for the evictions, and the landowners in Ireland who carried them out. The MP T.P. O'Connor noted how Irishmen evicted during the Famine will speak "... with a bitterness as fresh as if the wrong were but of yesterday. It was these clearances and the sight of wholesale starvation and plague, far more than racial feelings, that produced the hatred of English" (O'Connor 1891: 32). In a similar spirit, while summarizing the consequences of these evictions for attitudes in Ireland, Donnelly Jr (1996) wrote how "the mass evictions or clearances provided nationalists with what they considered the best and most compelling evidence of the malevolent intentions of the British government and parliament."¹²

The second channel includes the writings and narratives that were perpetuated by nationalist organizations. These narratives argued that the evictions, death, and destruction were the result of Britain's repressive policies. Perhaps most prominently, a member of the Revolutionary Young Irelander Movement, John Mitchel, wrote the widely circulated piece titled *The Last Conquest of*

¹²Donnelly Jr (1996) notes that this evidence was second in importance next to the exportation of grain.

Ireland (Perhaps). In the piece, Mitchel argued that Ireland had been plagued by an “artificial famine”¹³ since Britain exported grain from Ireland throughout the duration of the Famine, while Ireland starved. The actions of the British throughout the Famine period were thus considered tantamount to genocide. Anecdotal and historical evidence demonstrates how beliefs about Britain’s repressive intent became embedded in local memory. For example, Peter O’Leary, an individual who grew up in an area in Cork that had been particularly severely affected by the Famine, argued that “It was not at all for the protection of the people that the English made laws [at] that time. To crush the people down and to plunder them, to put them to death by famine and by every other kind of injustice—that’s why the English made laws in those days.”¹⁴ More recent analyses directly links local communities’ experiences observing the exportation of grain to the development of local memories of genocide and injustice. For example, Donnelly Jr (1996) argues that “It is beyond question that the notions connecting huge food exports with mass starvation and British genocide became deeply rooted in the folk memory of the nationalist Irish at home and abroad during the first half-century after the famine” (Donnelly Jr 1996: 28).

This idea that the British were responsible for the Famine carried into the early 20th century. Indeed, a range of qualitative accounts suggest that the Famine played an important role in shaping revolutionary attitudes against British rule. Edward “Ned” Neville describes his choice to join the Irish rebel forces, stating that “it was often I listened to stories of the Famine... The stories of the treatment meted out by the British to our ancestors made a deep impression on me, and my greatest ambition was that, some day, I could do some little thing to avenge their sufferings” (Neville 1954: 1). Phil Fitzgerald, the Adjutant of the 3rd Battalion of the 3rd Tipperary Brigade, similarly recounts how the Famine shaped his decision to rebel. Fitzgerald describes how his grandfather:

...and his large family fought the hunger and poverty and degradation that followed the artificial famine of 1847. Exorbitant rents, and all the economic ills that accompany occupation by enemy forces, drove two of my aunts and four uncles to Australia. That was my background as I grew to manhood, and, in a dim sort of way, my heart rebelled against the system that drove my kith and kin beyond the seas (Fitzgerald 1955: 1).

¹³Mitchel went on to state that “it was a famine which desolated a rich and fertile island that produced every year abundance and superabundance to sustain all her people and many more... The British account of the matter, then, is first, a fraud; second, a blasphemy.”

¹⁴Quoted in Donnelly Jr (1996: 29).

Similarly, in a biography of Irish rebel brothers Sean and Tom Hales, Liz Gillis shows how grievances about the Famine were transmitted locally and shaped the choice to fight. Gillis notes how “the young men and women there had grown up hearing stories of the Famine of the 1840s, which had a devastating effect on that area of the country, most notably in Skibbereen. . .” Gillis argues that these “stories helped instill in them a belief that only Irish people, and not a foreign government, should determine Ireland’s future, and that future could be achieved only by severing the link with Britain completely” (Gillis 2016: 24). Examples from Irish music and culture shows how this occurred in practice. Consider, for example, the Irish folk song “Dear Old Skibbereen.” The song is comprised of a dialogue in which a father tells his son about how the potato blight and Famine led to his family’s eviction and the death of his wife. This information radicalized the son, with the final stanza reading: “O father dear, the day will come when vengeance loud will call, And we will rise with Erin’s boys to rally one and all. I’ll be the man to lead the van beneath our flag of green, And loud and high will raise the cry ‘Revenge for Skibbereen.’”

Historical accounts also highlight how grievances reduced the likelihood Irishmen fought in British forces. In a speech at an Anti-Conscription rally in 1918 in Ireland, Friar O’Flanagan argued that Irishmen should refuse to fight since “The quarrel between Germany and England began four years ago. The fight to the death between Ireland and England began 700 years ago” (O’Flanagan 1918: 1). Sean McDermott, a leading member of the Irish rebel forces who would eventually be executed in the aftermath of the Easter Rising, similarly expressed his opposition to Irishmen fighting in British forces, stating “The Volunteers were not brought into existence to fight for England. To hell with England! Let her fight her own battles” (MacAtasney 2004: 74). Building on these historical accounts, we argue that grievance-based accounts suggest that individuals in places more severely affected by the Famine should be more likely to rebel against the British Empire, and less likely to fight in its defense.

3.2 How the Great Famine Shaped Long-Run Economic Incentives

Perhaps counterintuitively, research from economics and history—which compares either between countries or within a single county over-time—suggests that in the long-run the Famine *increased* the living standards of those in places that were more adversely affected. First, the costs of the Famine were borne unequally among local populations. Those who suffered most—and thus were

more likely on average to either die or emigrate—were generally the relatively poorer individuals in a given location (Ó Gráda 2006: 17). This mechanically shaped the local demography in places harder hit by the Famine. Second, this reduction in the overall number of individuals who lived in places more adversely affected by the Famine improved the economic prospects of those who remained. A lower supply of labour increased the relative bargaining power of workers, and their wages in turn (Boyer, Halton, and O’Rourke 1994; O’Rourke 1994). Taken together, these forces suggest that places more adversely affected by the Famine were economically better-off in the long-run.

Historical research also suggests that financial incentives shaped the choice to join the British military forces. As Mark Cronin notes in his study of enlistment in County Cork, “One fairly steady source of employment for Blackpool men, and central to this study, was, of course, the British army and navy” (Cronin 2014: 19). Similarly, in his seminal work studying Irish participation in WW1, Jeffery documents how Jim Donaghy in Derry was fired from his job and thus decided to enlist, while another individual named James English “found that, with separation allowances, he and his family were 154 percent better off once he was soldiering” (Jeffery 2000: 19). These examples show how when the financial benefits from “soldiering” outweigh those from remaining a civilian, we should expect individuals to be on average more likely to fight. Reflecting on the choice to participate in the British military, James Connolly, one of the leaders of the rebel Irish Citizen Army argued that “there are many thousands whose soul revolts against what they are doing, but who must nevertheless continue fighting and murdering because they were deprived of a living at home” (Jeffery 2000: 19). Taken together, an economic-based argument suggests that individuals in places more severely affected by the Famine should be less likely to fight in British forces. This should push in parallel to the demobilizing influence of local memory, making individuals even less likely to fight for the British.

Economic-based explanations similarly suggest that we should expect individuals in places more severely affected by the Famine to be less likely to fight in the Irish rebel forces. As local economic conditions improve, the amount potential rebels must forego through their participation also increases. This could take the form of lost-wages and time if rebels are fighting and also the longer-term risk of losing one’s job as a result of conflict participation. Indeed, a range of archival evidence

suggests that the loss of a job was a common reason rebels decided to stop fighting.¹⁵ If the costs associated with losing one’s job were steeper for individuals in places more severely affected by the Famine because economic conditions were better, then we should expect individuals in these places to be less likely on average to fight in the Irish rebel forces.¹⁶ This should push against the mobilizing influence of local memory, potentially attenuating its influence in shaping the choice to rebel. Whether and how much this occurs is an open empirical question, which we address directly in the remainder of the manuscript.

4 Historical Data on the Famine and Irish Combatants

The empirical task at hand is to assess how differences in exposure to the Famine affected differences in conflict behavior. Following our theoretical focus on how individuals’ *locations* shape local memory and contemporary economic incentives, we use the barony as the unit of analysis.¹⁷ Empirically, this approach mirrors recent research in economic history seeking to better understand the consequences of the Irish Famine (Goodspeed 2016; Ó Gráda 1999).

4.1 Explanatory Variable: Population Loss from 1841 to 1851

We start by constructing an empirical measure of the severity of the Famine. The Famine was above all a demographic tragedy. Not only did many die of starvation and diseases (Mokyr and Ó Gráda 2002), it also caused a large increase in migration to the other British Isles and the New World (Fitzpatrick 1989). The total population of Ireland shrank from 8.2 million in 1841 to 6.5 million in 1851 (Ó Gráda 1979: 283). Following research in economic history, we use these changes in population as a measure for assessing differences in the severity of the Famine (Ó Gráda 1999; Meriläinen, Mitrunen, and Virkola 2020). We calculate this by comparing the population of a

¹⁵For example, qualitative evidence for the Irish rebel Edward John Moore notes how losing his job made him stop fighting; his application for a military pension notes that “On his return to Dublin he rejoined, but he dropped out in October 1917, when he was obliged to leave Dublin to seek employment elsewhere” (Moore 1940: 51).

¹⁶An important difference between the Irish rebels and British military is the extent to which they sought to encourage conflict participation with financial incentives. Since fighting for the British necessitated full-time service that was commonly abroad, enlistees had to quit their jobs in order to enlist. In contrast to the Irish rebel forces, the British military also paid their combatants. This suggests that we might expect the importance of opportunity costs to be attenuated for the case of participation in the Irish rebels when compared with participation in the British military forces.

¹⁷This rests on the assumption of population stability, that is, there there was minimal in-migration and those living in baronies during WWI are the descendants of the original victims. We discuss these in Appendix Section C.1.

barony in 1841, four years before the Famine, to the population in 1851, two years after the Famine. Population data by barony come from the 1841 and 1851 Irish censuses which have been compiled by the Irish Historical Data Base (Crawford et al. 1997). This leads to the following equation for our main explanatory variable, *Population Loss from 1841–1851* in barony i :

$$PopulationLoss_i^{1841-1851} = \frac{Population_i^{1841} - Population_i^{1851}}{Population_i^{1841}} \quad (1)$$

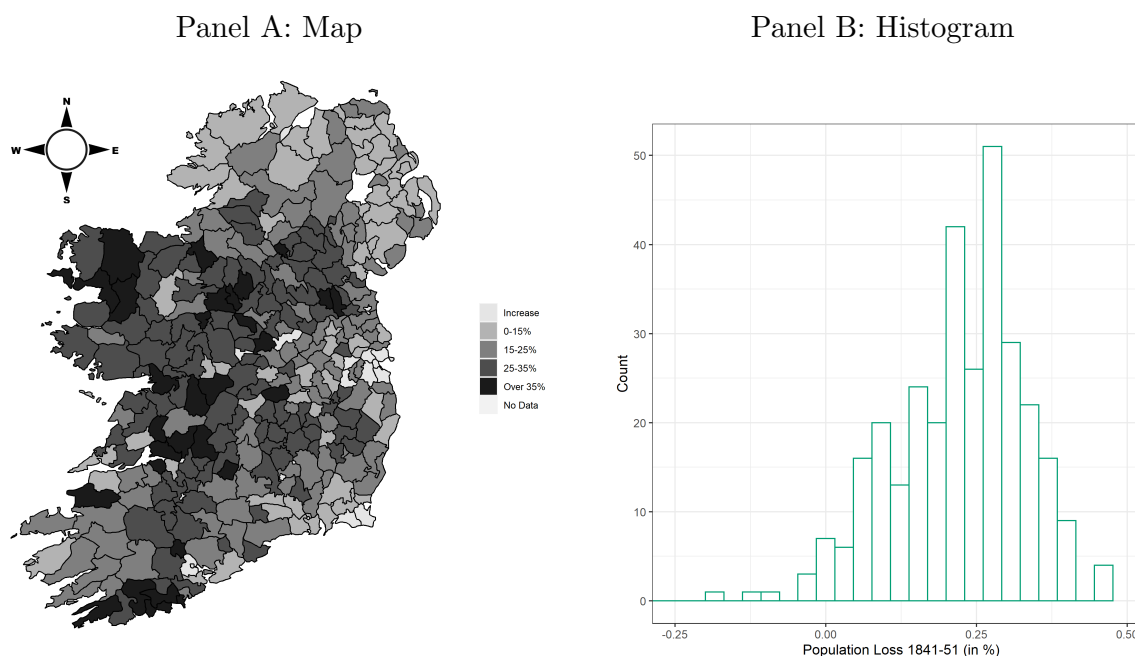
Panel A of Figure 1 maps the population loss from 1841 to 1851 by barony. The map shows that the population loss is most heavily concentrated toward the western half of Ireland. This geographic distribution of our main treatment variable accords with other work exploring the spatial variation in the consequences of the Famine (Kennedy, Ell, and Clarkson 1999: 26–29), providing face validity to our empirical measure.¹⁸ Panel B of Figure 1 plots the distribution of the variable. While most baronies had a population loss, others had a population gain. This population gain was most heavily concentrated in more urban areas such as Dublin and Belfast. Panel B demonstrates how relatively few baronies saw a population gain, with most places experiencing a population loss of some kind up to an extreme of almost 50%. Given the vast differences in experiences with the Famine between urban and rural localities, throughout our main analysis we restrict our sample to baronies with a 1841 population density of below 250 inhabitants per square kilometer (dropping 14 out of 323) and exclude those that experienced a population gain from 1841 to 1851 (dropping a further 13). However, in the Appendix we demonstrate that our results are robust to a broader sampling frame.

4.2 Dependent Variables: Participation in the Irish Militia, World War I, and Irish Rebel Forces

We focus on participation in three combat forces where participation was voluntary: the pro-British Irish Militia, the British Army during WW1, and the Irish rebel forces from 1916–1922. To construct our dependent variable of barony-level fighting rates, we require information for both the

¹⁸When aggregating to the county level, the population loss measure also correlates with county-level excess death data, with a correlation of 0.5.

Figure 1 – Population Loss from 1841 to 1851



Notes: The distribution of population loss during the Famine. Population loss is calculated by $\frac{Population_i^{1841} - Population_i^{1851}}{Population_i^{1841}}$. For legibility an outlier of -1.035 (Drogheda) has been removed from the histogram.

number of combatants for each of the respective combatant forces—our numerator—and the the number of potential combatants—our denominator.

We relied on four different sources to collect individual-level information on Irish combatants. First, we collected information on participation in the Irish Militia from the Militia Attestation Papers compiled and digitized by the National Archives.¹⁹ The full sample includes information on over 156,845 members of the Scottish, Welsh, and Irish Militias from 1800 to 1915. We restrict our sample to post 1881, when militia service became full time and comprises the vast majority of our data. We use individuals’ listed birthplaces to identify 62,782 Irish individuals serving in the Irish Militia.

Second, we collected information on Irishmen who fought in the British Military in WW1. This information is drawn from digitized British Service records, which contains information on non-commissioned officers and other ranks that served in the WW1 British military.²⁰ The dataset

¹⁹The National Archives. “War Office: Militia Attestation Papers.” available at <https://discovery.nationalarchives.gov.uk/details/r/C14304>.

²⁰The National Archives. “War Office: Soldiers’ Documents, First World War ‘Burnt Documents’.” available at <https://discovery.nationalarchives.gov.uk/details/r/C14567>

contains information about each service member’s year and place of birth, enlistment year, residence place, regiment, and family information. Using birthplace, residence, and membership in Irish regiments we identify 56,952 Irish service members. It is estimated that about 200,000 Irishmen served in WW1 out of which we thus have data on almost a third.²¹ Given that a large share of the WWI records were destroyed in a fire, we supplement this data with separate information on individuals who died in WWI, as a robustness check for WW1 participation. Our third source of data uses combatants’ place of birth in a dataset of 703,810 British service members who died in WW1,²² to identify 29,905 Irish casualties. It is estimated that about 35,000 Irishmen died during WW1. We are thus able to identify roughly 80% of the casualties (Myers 2011). While each of these three datasets vary in their completeness and depth of information, combined they provide unique information on over 100,000 combatants across different time periods and combatant bodies. The fact that we observe substantively similar results across each of them should help assuage concerns that our findings are unique to any given source of data.

Finally, we collected information on participation in the Irish rebel forces from digitized information from the Military Archives of the Defense Forces of Ireland. As part of an application process to obtain military pensions, individuals from several Irish rebel forces—the Irish Volunteers, Irish Citizen Army, or Cumman na mBan—provided their backgrounds and combat experience (Huff N.d.). Consistent with the Militia and WW1 data we focus our analyses on rebel men, resulting in a dataset containing 8,916 pension applicants.²³

After collecting the individual-level information on conflict participation, we next need to place individuals within baronies. We do so using a *GoogleMaps* API algorithm to find the locations for all addresses using *GoogleMaps*.²⁴ The algorithm takes the birthplace and residences of all combatants for whom we have this information, searches for the addresses on *GoogleMaps*, and outputs the coordinates of successful searches.²⁵ Such *GoogleMaps* API algorithms are frequently

²¹5 million men served in the British Army in WW1. However, a fire in 1940 destroyed about 60% of the records of which the records of 1.9 million individuals survived.

²²Naval, and Military Press. “British and Irish Military Databases.” available at <http://www.nmarchive.com/>.

²³Section D.11 in the Appendix discusses the pension data in more detail and provides robustness checks to assess the measure’s validity.

²⁴An alternative option would be to merge combatant information with the 1901 and 1911 censuses and thus obtain their place of residence. However, past studies using this approach have only been able to identify roughly 24% of combatants (Narciso and Severgnini 2023: 15), meaning they are discarding over three-quarters of the data.

²⁵In case of a non-perfect match, the algorithm either suggests coordinates for a closely related address or no coordinates at all. We test the accuracy of the algorithm by handcoding all addresses in the Irish rebel data for

used when geo-coding a large number of addresses (Larsen et al. 2019; Selb and Munzert 2018). After completing the geo-coding process, we count all combatants in a given barony to obtain our numerator for each of the respective organizations.

The final step in constructing our data entailed gathering information on the pool of individuals who could have in principle fought, which serves as our denominator. We collect information on the number of men within each barony from the 1901 and 1911 censuses of Ireland available at the National Archives of Ireland.²⁶ Given the temporal differences across combatant organizations, we use counts from the 1901 census when the Irish Militia is our numerator, and the 1911 census for the remainder of the calculations.

Table 1 – Conflict Participation Data

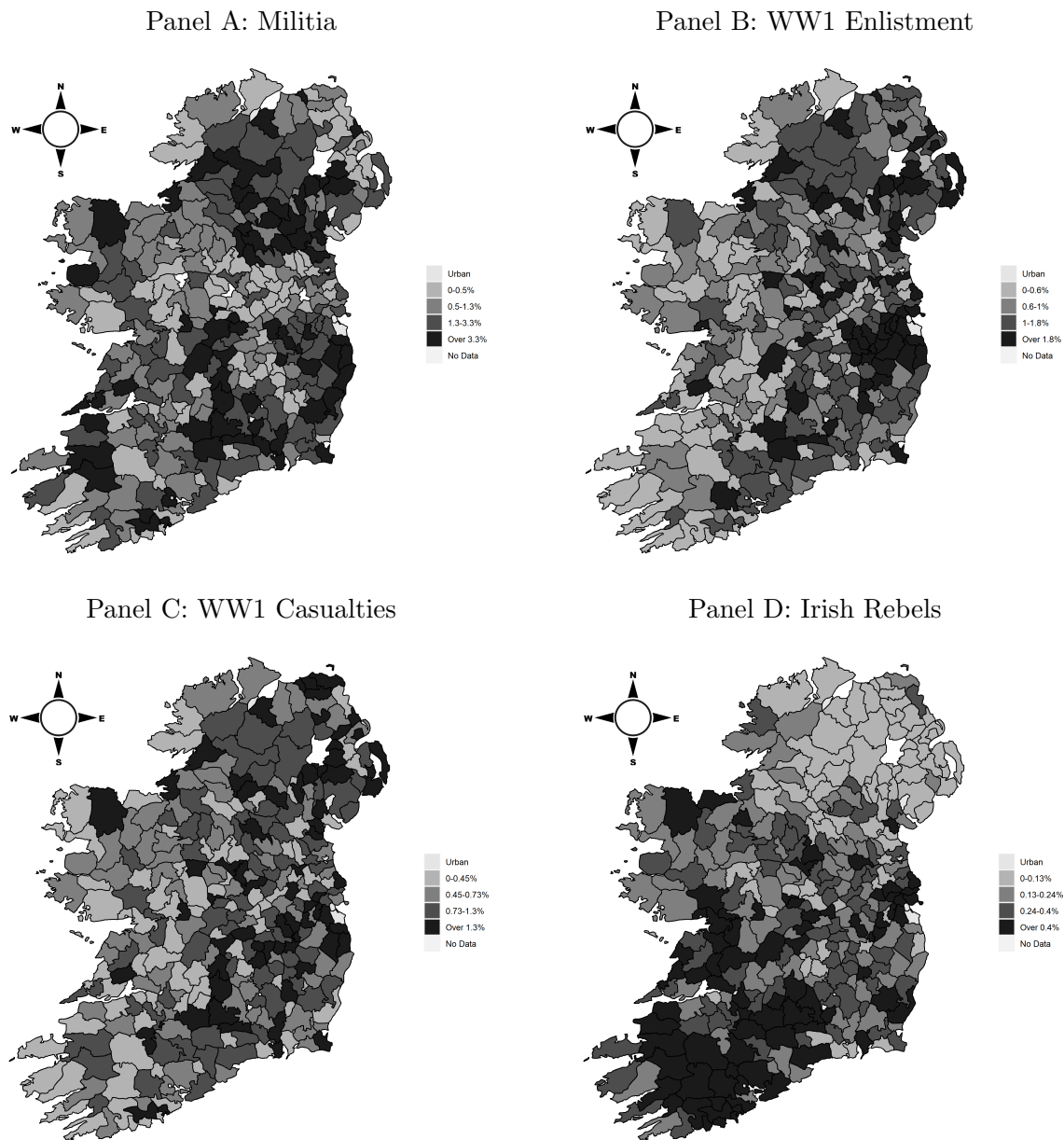
Dataset	Time Frame	Total # of individuals	# of Irish individuals	Individuals with addresses	Denominator Source
Militia members	1881-1915	156,845	62,782	60,473	1901 census
WW1 Service members	1914-1919	1,900,000	56,952	45,213	1911 census
WW1 Casualties	1914-1919	703,810	29,905	28,836	1911 census
Irish rebel forces	1916-1923	8,916	8,916	7,989	1911 census

The data construction process for our dependent variables is summarized in Table 1. After combining these sources of data, we now have four different dependent variables for each barony: the proportion of men within a given barony who fought in the pro-British Irish militia, the proportion who served in the WWI British military, the proportion who died in WW1, and the proportion of men who fought in the Irish rebel forces. The first three allow us to assess how differences in the severity of the Famine affected the likelihood that individuals fought for the British. The approach of leveraging distinct military bodies over different time periods provides important evidence for the external validity of the findings, while also allowing us to alleviate concerns that any given source of data is driving the results. The final dependent variable on rates of participation in the Irish rebel forces allows us to assess how the severity of the Famine affects the willingness of individuals to rebel. Figure 2 shows the distribution of the conflict participation variables. Encouragingly, the distribution of rebel participation and its concentration in the South-West is also in line with historical evidence (Fitzpatrick 1978; Hart 1997).

one county and find that the algorithm identifies the same barony as handcoding in 91% of cases. See Appendix Section B.

²⁶National Archives of Ireland. “1901 and 1911 Censuses.” <http://www.census.nationalarchives.ie/>

Figure 2 – Conflict Participation Rates by Barony



Notes: The distribution of conflict participation as a percentage of the male population fighting in the Irish Militia, WW1, and Irish rebel forces.

4.3 Pre-Famine Characteristics

There are at least two classes of empirical concerns for assessing the empirical consequences of the Famine. The first and perhaps most important type relates to the strategic behavior of the British. For example, we might be concerned that differences in population loss would be measuring Britain's

ex-ante beliefs about how likely a given barony was to rebel, rather than the consequences of the population loss. We tackle this concern in a number of ways. Perhaps most importantly given the long-standing religious divisions within Ireland between Catholics and Protestants, we digitized new data on the religious composition of baronies.²⁷ This digitization relied on a special 1834 enumeration of the religious denominations by parish, the administrative unit below barony.²⁸ We then merged the new data with shapefiles of 1841 parishes and baronies. This allows us to calculate the percentage of Catholics by barony in 1834. While creating a new measure of a barony’s religious composition provides a good starting point, it might still be the case that the British were able to discriminate their aid based upon additional information about a region’s latent rebelliousness. To address this concern we leverage information on the location of the 1798 rebellion as a measure of pre-Famine hostility toward the British. The 1798 rebellion was the largest Irish uprising against British rule before the Famine and resulted in 34 battles or skirmishes between British and rebel forces. We calculate each barony’s distance to the closest battle.

The second class of empirical concerns relates to whether there are other confounding variables driving both the levels of population loss from the Famine and conflict participation. For example, as we show in the Appendix, the Famine was more severe in poorer places (Mokyr 1983), and we have strong theoretical reasons to expect that individuals’ economic incentives affected the choice to fight. To address this potential concern, we control for a number of pre-Famine measures of poverty drawn from the 1841 census. These include barony-level literacy rates and the percentage of households living in fourth class housing (houses made from mud and containing only one room). Similarly, we might imagine that both the severity of the Famine and the ease with which individuals can enlist in the respective military forces was shaped by the rurality of the baronies. For this reason, we control for log population using information from the 1841 census. We also use information from a shapefile of all baronies available at the Irish Historical Database (Crawford et al. 1997), which allows us to calculate each barony’s area in log square kilometers and its population density. Relatedly, we might be concerned that other geographic factors lead to spatial clustering in both Famine severity and conflict participation. We therefore also include a range of geographical controls such as each

²⁷Previous studies have either used the larger diocese level (Gregory and Cunningham 2016) or used post-Famine measures from 1861 (Goodspeed 2016) or 1911 (Fernihough and Ó Gráda 2022).

²⁸“State of religious and other instruction now existing in Ireland: first report and appendix” (1835) available at <http://www.dippam.ac.uk/eppi/documents/10933>

barony ruggedness, its distance to the main population centers (and seats of power) Belfast and Dublin, as well as its distance to the coast.

Following recent research on the economic consequences of the Famine, we also control for factors which potentially affected the severity of the Famine itself (Fernihough and Ó Gráda 2022). Since the Famine was caused by a failure in the potato harvest we use FAO data²⁹ to calculate each barony’s potato suitability. From Met Éireann, the Irish meteorological services, we obtain the average temperature in July and July rainfall,³⁰ two factors that have been linked to the severity of the potato blight. Summary statistics of the explanatory variable, conflict participation, and covariates can be found in Table 2.

Table 2 – Summary Statistics of Treatment and Outcome Variables

Statistic	N	Mean	St. Dev.	Min	Max
Population Loss from 1841–1851 p/c	296	0.23	0.10	0.01	0.47
Conflict participation:					
Militia Participation p/c	296	0.02	0.03	0.00	0.20
Enlistment WW1 p/c	296	0.01	0.01	0.00	0.13
Casualties WW1 p/c	296	0.01	0.01	0.00	0.07
Irish Rebels Participation p/c	296	0.003	0.004	0	0.06
Covariates:					
Population 1841 (log)	296	9.91	0.69	7.91	11.75
Area 1841 (log km ²)	296	10.92	0.66	8.96	12.65
Population Density 1841 (per km ²)	296	95.46	34.74	24.43	243.97
Read and Write 1841 p/c	296	0.23	0.07	0.05	0.47
Fourth Class Housing 1841 p/c	296	0.37	0.14	0.12	0.85
Catholic 1841 p/c	296	0.83	0.23	0.05	1.00
Agriculture 1841 p/c	296	0.71	0.11	0.35	0.87
Potato Suitability	296	48.29	15.35	4.24	77.71
Mean July Temperature (°C)	296	15.21	0.44	13.60	16.11
Mean July Rainfall (mm)	296	77.38	14.40	53.39	134.83
Ruggedness	296	0.08	0.10	0.00	0.68
Distance to Coast (log km)	296	3.01	1.09	-0.93	4.50
Distance to Belfast (log km)	296	5.06	0.71	1.72	6.03
Distance to Dublin (log km)	296	4.76	0.60	2.66	5.72
Distance to 1798 Battle (log km)	296	3.41	0.89	-0.70	4.80

Notes: This table shows summary statistics of the explanatory variable, all outcome variables, and all covariates. The sample is restricted to rural baronies with a 1841 population density below 250 inhabitants per square kilometer and excludes baronies which had a population gain from 1841 to 1851.

²⁹FAO. “GAEZ v3.0.” available at <http://www.gaez.iiasa.ac.at/>

³⁰Met Éireann. “Long-term climate averages for Ireland 1981–2010.” available at <http://edepositireland.ie/handle/2262/74915>

4.4 Empirical Design

As discussed in Section 4.1, we use local changes in population as our main means of empirically testing the consequences of the Famine. We implement this using the following specification:

$$Y_i = \beta PopulationLoss_i^{1841-1851} + \chi_i + \eta_j + \epsilon \quad (2)$$

where Y_i is the rate of conflict participation in barony i ; $PopulationLoss_i^{1841-1851}$ is the percentage loss in population from 1841 to 1851; χ_i is a vector of geographical and pre-Famine covariates listed in Section 4.3; η_j are county fixed effects; we include robust standard errors ϵ . β is the coefficient of interest and denotes the effect of 1841–1851 population loss. For a broader discussion of the potential strengths and weaknesses of the empirical design, see Appendix Section A.

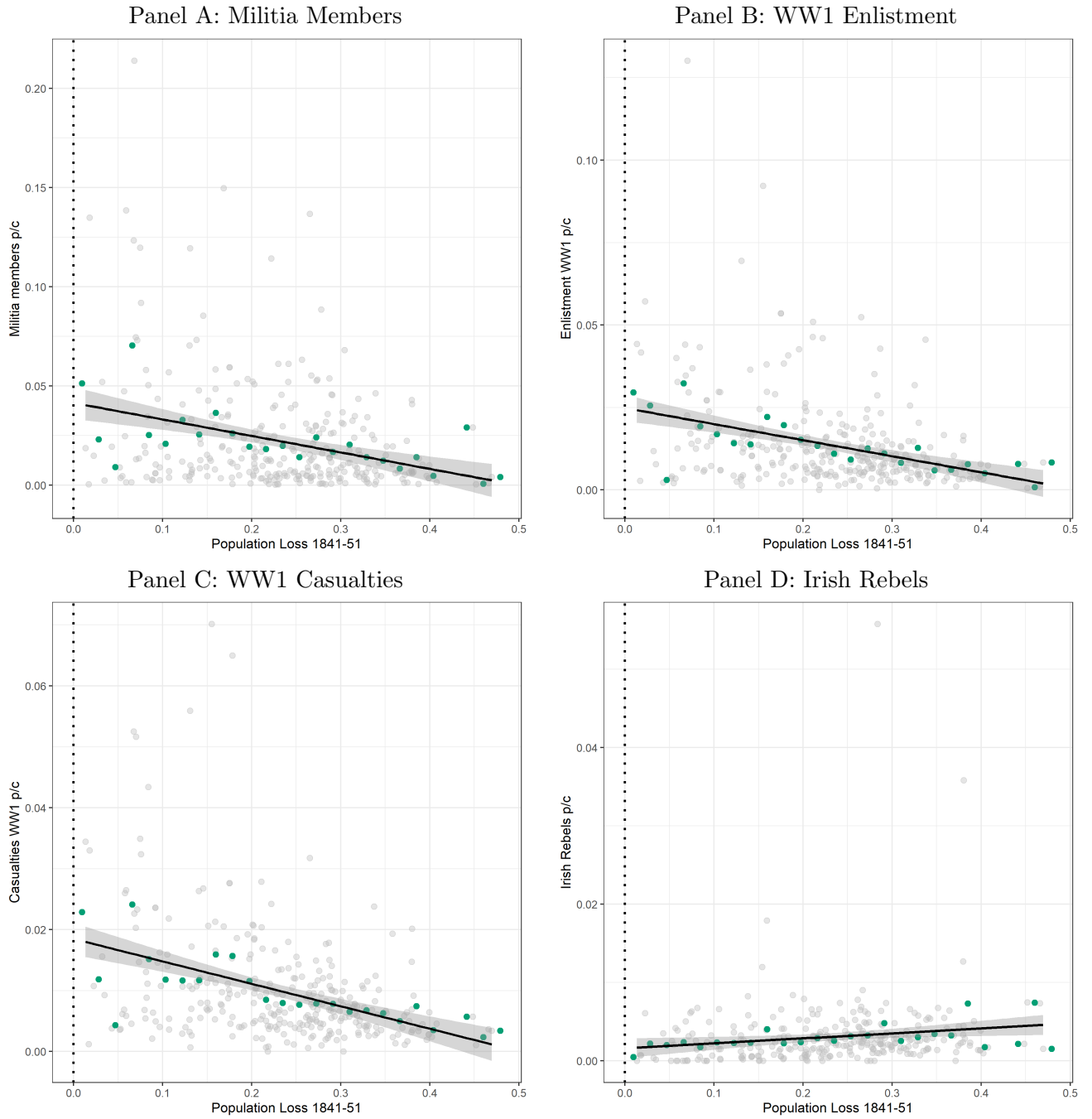
5 Results

In order to gain a descriptive sense of the relationship between differences in Famine severity and fighting behavior, Figure 3 shows the correlation between 1841–1851 population loss and the four participation measures in the raw data. There is a clear negative correlation for enlistment in the Irish Militia, the British WW1 Military, and WW1 casualties (Panels A-C). The descriptive plots provide preliminary evidence consistent with the theoretical argument that both grievances and opportunity costs had a demobilizing influence on the likelihood individuals fought in the British forces. By contrast, Panel D demonstrates that the correlation between population loss and participation in the Irish rebel forces is positive.

Table 3 shows our main effects. All models use OLS with robust standard errors. Following Specification 2, it regresses conflict participation on barony-level 1841–1851 population loss. Column (1) has per capita barony 1880–1910 enlistment in Irish militias as the outcome measure, Column (2) barony WW1 enlistment, Column (3) barony WW1 casualties, and Column (4) barony participation in the Irish rebel forces.

Columns 1–3 show a clear negative effect of 1841–1851 population loss on the probability of the barony population fighting for the British. Furthermore the estimated effects of the Famine on fighting for the British are large. On average, baronies in our sample lost 23% of their 1841

Figure 3 – Raw Data



Notes: This figure shows the relationship between 1841–1851 population loss and the four conflict participation measures in the raw data. Bold green dots show the binned average using 25 bins. The linear relationship between population loss and participation is added.

Table 3 – Effect of 1841–1851 Population Loss on Conflict Participation

	<i>Dependent variable:</i>			
	Militia p/c (1)	Enlistment WW1 p/c (2)	Casualties WW1 p/c (3)	Irish Rebels p/c (4)
Population Loss 1841–1851	−0.079*** (0.024)	−0.025*** (0.009)	−0.018** (0.008)	0.006* (0.003)
Fixed effects	County	County	County	County
Unit of observation	Barony	Barony	Barony	Barony
Controls	Yes	Yes	Yes	Yes
Observations	296	296	296	296
Adjusted R ²	0.425	0.317	0.323	0.091

Notes: This table shows the results of regressing conflict participation on barony-level 1841–1851 population loss following specification 2. Robust standard errors are shown in parentheses. *p<0.1; **p<0.05; ***p<0.01

population during the Famine. Baronies that lost a quarter of their population during the Famine, have 1.9 percentage point fewer men fight for the pro-British Irish Militia, which equals the variable mean of militia participation (Column 1). The effects on WW1 participation are of similar magnitude. Baronies that lost a quarter of their population during the Famine, have 0.6 percentage point fewer men enlist and 0.45 percentage point fewer men die for the British in WW1, a decrease of 50% with respect to the variable means (Column 2-3). Importantly, the similarity in findings across the three different outcome variables show that this effect persisted temporally, though the magnitude of the effect somewhat dissipated over time.

Column (4) shows that individuals in places more severely affected by the Famine fought in the Irish rebel forces at *higher* rates. Baronies that lost a quarter of their population during the Famine, have 0.15 percentage point more men fight in the Irish rebel forces, an increase of 50%. These results mirror Narciso and Severgnini (2023), who use an individual-level matching approach with a county-level measure of Famine excess mortality.

6 Further Considering Evidence for Local Memory and Contemporary Incentives

We now turn to further assessing the mechanisms underpinning these findings. We start by assessing the influence of local memory on conflict participation behavior. After doing so, we turn to exploring the influence of individuals' incentives when deciding whether to fight.

6.1 How the Famine Shaped Anti-British Attitudes and Conflict Participation Behavior

In order to assess how grievances transmitted through local memory shaped conflict participation behavior, we sought out observable measures of non-violent political attitudes toward the British to better understand how differences in the severity of the Famine affected how individuals thought about the actor deemed responsible. We found such a measure for early 20th-century grievances in the 1918 parliamentary election. The 1918 election brought about a seismic shift in Irish politics, with the emergence of the previously little-known pro-Republican and anti-British Sinn Féin party (de Bromhead, Fernihough, and Hargaden 2020). If grievances are higher in places more severely affected by the Famine, then we would expect these places to vote for Sinn Féin at higher rates. Based on vote totals published by Walker (1978), we calculate the vote share Sinn Féin received at the constituency level. Importantly, the constituency comprises a higher level of aggregation than the barony.

Table 4 shows the effect of 1841–1851 population loss on Sinn Féin vote share in the 1918 election. We aggregate the barony population data to calculate the population loss during the Famine in 90 non-urban 1918 constituencies. Across all specifications, we see that constituencies which lost a greater share of their population between 1841 and 1851 voted for Sinn Féin at higher rates. This provides further evidence that grievances were stronger in places more severely affected by the Famine; individuals in these places were willing to support a political party whose platform was directly opposed to British rule over Ireland. Additionally, it is worth emphasizing that the fact that we observe additional evidence consistent with the theoretical argument and previous findings should help assuage concerns that the results presented in the previous section are being driven by

either the sources of data or the way in which it is constructed. The data for these election results come from a different source, require no geo-coding, and rely upon a different unit of analysis.

Table 4 – Effect of 1841–1851 Population Loss on 1918 Election

	<i>Dependent variable:</i>			
	Vote Share Sinn Féin			
	(1)	(2)	(3)	(4)
Population Loss 1841–1851	1.239*** (0.300)	0.749*** (0.231)	0.793*** (0.234)	0.780** (0.297)
Fixed effects	No	No	Province	Province
Unit of observation	Constituency	Constituency	Constituency	Constituency
Controls	No	Yes	Yes	Yes
Observations	81	81	81	77
Adjusted R ²	0.228	0.789	0.786	0.786

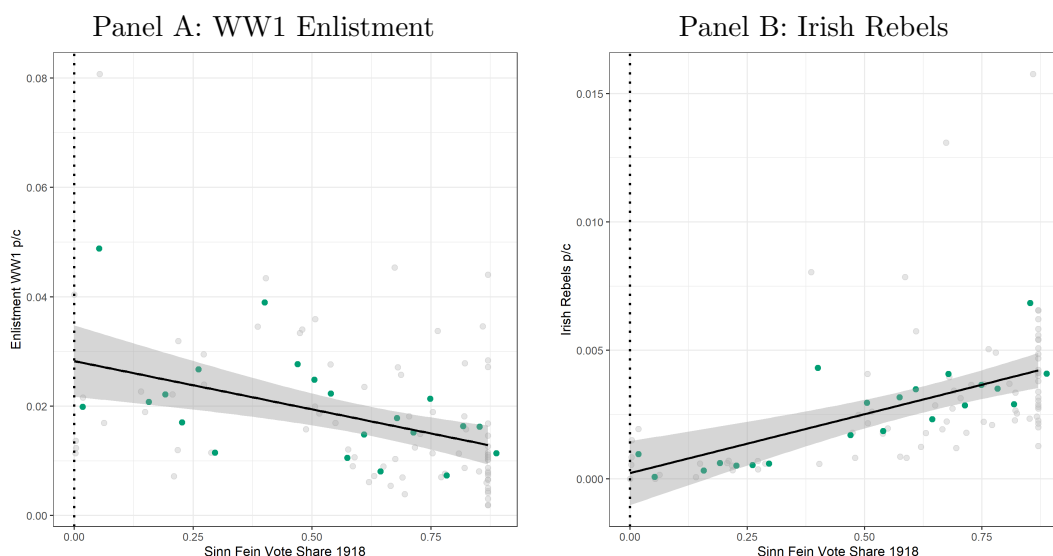
Notes: This table shows the results of regressing constituency Sinn Féin vote share in the 1918 parliamentary election on 1841–1851 population loss. Column 4 removes constituencies with 1841–1851 population gains. Robust standard errors are shown in parentheses. *p<0.1; **p<0.05; ***p<0.01

We now turn to assessing the correlations between Sinn Féin vote share and participation in the respective conflict bodies. This relationship is depicted in Figure 4. Panel A shows a clear negative correlation between Sinn Féin vote share and participation in the WW1 British military forces. By contrast, Panel B shows a positive relationship for participation in the Irish rebel forces. The evidence is consistent with the argument that grievances acted as a demobilizing force for participation in the British forces, and a mobilizing force for rebelling against them.

6.2 How the Famine Shaped Contemporary Economic Incentives and Conflict Participation Behavior

We next collected economic indicators to better understand how the Famine shaped the opportunity costs of conflict participation. We do so by leveraging information from the 1911 census. This approach builds directly on an important body of work in economic history similarly assessing the long-run consequences of the Famine (Boyer, Halton, and O’Rourke 1994; Ó Gráda 1999), generally treating the country as the unit of analysis. We focus on two variables. The first measure includes the percentage of individuals who can read and write in a given barony, which prior research uses as a proxy for economic well-being (Ó Gráda 1999: 27). Second, we consider the percentage of

Figure 4 – Correlation Between Sinn Féin Vote Share and Conflict Participation



Notes: This figure shows the relationship between Sinn Féin vote share in the 1918 parliamentary election and conflict participation in WW1 and the Irish rebel forces. Bold green dots show the binned averages. The linear relationship between vote share and conflict participation is added.

the population classified as “Labourers.” Prior research shows that labourers were the poorest and most vulnerable population in 19th century and early 20th century Ireland (Fitzpatrick 1980; Lane 2005) and demonstrates how these low-skilled workers were a common pool of recruits for the British military (Jeffery 2000; Cronin 2014: 18–20). These two measures thus provide a helpful means of proxying for the relative poverty across baronies.

Table 5 provides evidence on the positive economic long run effects of the Irish Famine by showing the effect of 1841–1851 population loss on literacy rates and the percentage of the population whose occupation in the 1911 census indicates that they were labourers. 1841–1851 population loss leads to an increase in the percentage of the population that can read and write (Column 1). A 25% loss in population during the Famine translate into a 3 percentage point increase in literacy by 1911. Column (2) reveals that baronies harder hit by the Famine have a lower proportion of the population engaged as labourers. The results are consistent with the claims of economic historians that the Famine improved individuals’ economic well-being in the long run.

We next turn to considering the relationship between differences in local economic incentives and conflict participation. Figure 5 plots the correlation between the two proxies for local economic

Table 5 – Effect of 1841–1851 Population Loss on Occupations in 1911

	<i>Dependent variable:</i>	
	Perc. Read and Write 1911	Perc. Labourer
	(1)	(2)
Population Loss 1841–1851	0.101*** (0.022)	−0.031** (0.014)
Fixed effects	County	County
Unit of observation	Barony	Barony
Controls	Yes	Yes
Observations	296	296
Adjusted R ²	0.718	0.511

Notes: This table shows the results of regressing the percentage of the population that can read or write (Column 1) or list “labourer” as their occupation (Column 2) in the 1911 census on barony 1841–1851 population loss. Robust standard errors are shown in parentheses. *p<0.1; **p<0.05; ***p<0.01

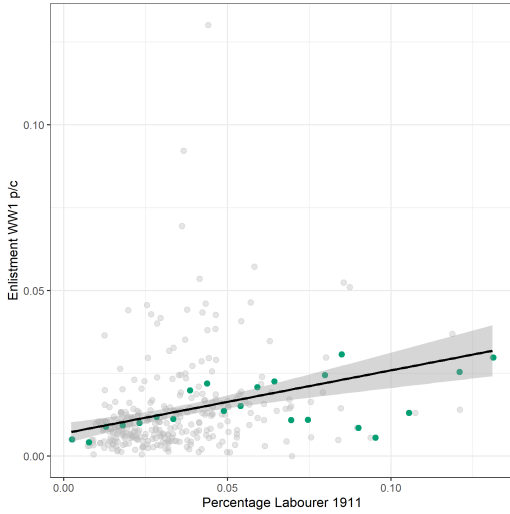
conditions and fighting for or against the British. The first column focuses on participation in the WW1 British military, while the second focuses on participation in the Irish rebel forces.

There are two main takeaways from the figure. First, Panel A provides descriptive evidence which accords with qualitative accounts for how opportunity costs shaped the choice to fight for the WW1 British military. We see higher rates of enlistment as the share of labourers increased. Panel C provides evidence which at first view appears inconsistent with this account; there is a positive relationship between literacy and WW1 British military participation. However, this is likely due to the fact that literacy is highly correlated with Protestantism and loyalty to the Crown in the context of pre-WW1 Ireland. In the 1911 full census we observe that the literacy rates for Catholics was 68.2% and 80.1% for non-Catholics. Indeed, when we plot the correlation between literacy and WW1 enlistment in Appendix Figure A1 separately for Catholics and non-Catholics, a negative correlation between literacy and WW1 enlistment becomes apparent.

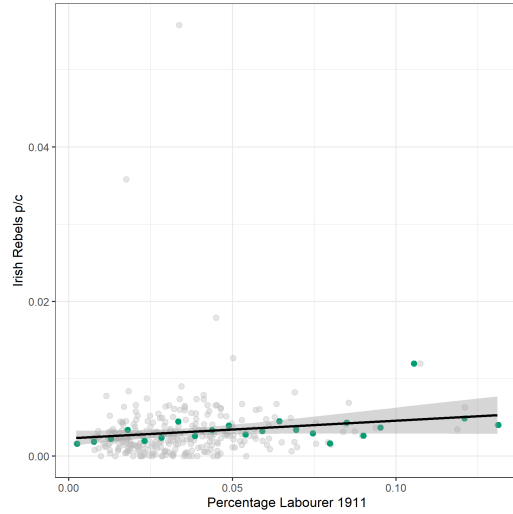
The second takeaway—depicted in Panels B, and D—is that proxies for opportunity costs are largely uncorrelated with the choice to fight in the Irish rebel forces. We see little to no correlation across each of the two measures. This contrasts markedly with the relationship between local economic conditions and participation in the British military.

Figure 5 – Correlation Between 1911 Economic Indicators and Conflict Participation

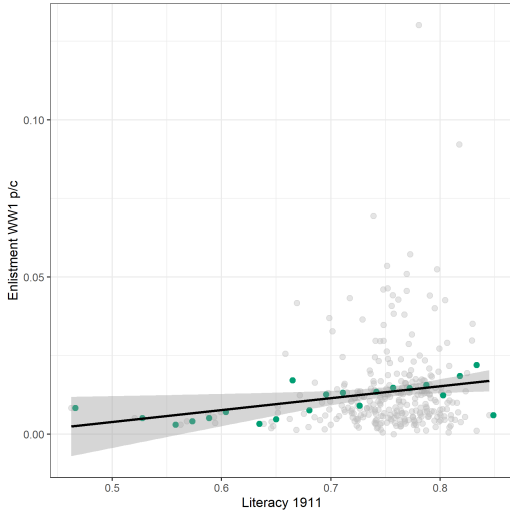
Panel A: WW1 Enlistment & Labourer



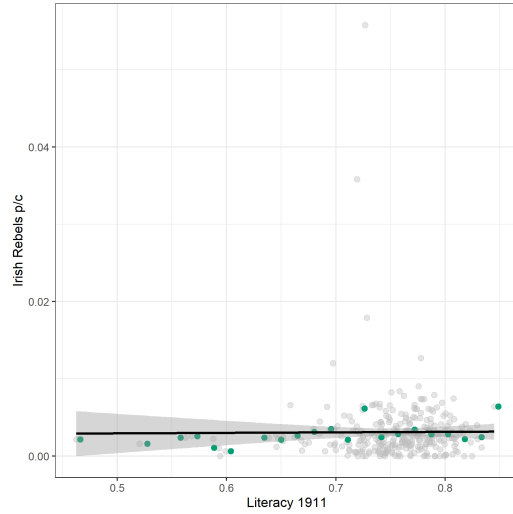
Panel B: Irish Rebels & Labourer



Panel C: WW1 Enlistment & Literacy



Panel D: Irish Rebels & Literacy



Notes: This figure shows the relationship between 1911 Economic indicators (percentage labourer and literacy) and conflict participation in WW1 and the Irish rebel forces. Bold green dots show the binned averages. The linear relationship between vote share and conflict participation is added.

7 Sensitivity and Robustness of the Findings

The findings of this paper rest on the assumption that places where the Famine was relatively more severe are comparable to places where it was less severe conditional on the control variables we include in our analyses. If, for example, the Famine was more severe in places that had a higher latent rebelliousness, then we might be concerned that the estimates we presented are measuring these underlying differences rather than the consequences of the Famine itself. Importantly, in order for these underlying differences to explain the results we observe, it must be the case that we are not capturing them through our theoretically and historically motivated control variables—such as religious composition, poverty, 1798 battle locations or distances to Belfast and Dublin, among others. Moreover, given the fact that we use county fixed effects throughout our analysis it must also be the case that this latent rebelliousness varies across baronies but within counties. It is not sufficient to say that one region of Ireland, such as the west, was simply more rebellious than another; our design addresses such a concern directly. Nevertheless, we conduct a range of additional tests to better understand whether and how unmeasured confounding might substantively affect our results.

Perhaps most importantly, we conduct sensitivity analyses to better understand how a confounding variable might affect our conclusions (Blackwell 2014; Cinelli and Hazlett 2018). Following recent applications in political science and conflict (Hazlett 2020), we first assess how much confounding must exist to explain away our results and then benchmark this relative to another variable which we theoretically expect to affect the choice to fight. Given the longstanding divisions within Ireland between Catholics and Protestants and the potential that the Famine might have been purposely allowed to affect Catholic areas more severely, we benchmark the sensitivity analyses relative to our newly compiled measure of 1841 barony-level religious composition. The results demonstrate that a confounder explaining fifteen times the residual variance as is explained by going from a fully Protestant to a fully Catholic barony (in terms of population loss and conflict participation in the Irish rebel forces) would still not reduce the implied effect size to zero. Given the strength of the theorized relationship between religion and conflict participation in Ireland, this implies that whether we have fully eliminated confounding or not, an extremely high degree

of confounding would be required to change our estimate substantially. In Appendix Section E we present the full sensitivity analyses for all four findings.

Additionally, in Section D of the Appendix we describe a myriad of other robustness checks. Specifically, we run our specifications with additional covariates and without any controls. We check robustness to different data generating decisions for the explanatory variable, the 1918 election data, and the Irish rebel data. We also replicate our results for fighting for the British, as well the economic impacts of the Famine using a lower level administrative division, the parish level. We also run a specification where we adjust the standard errors to account for potential spatial clustering. We also show that the Famine led to a persistent decline in population up until 1911 and find no evidence for out-migration. Lastly, we run our main specification with total conflict participation instead of rates. Throughout our robustness checks the results remain qualitatively the same: places harder hit by the Famine fight for the British at lower rates, and against the British at higher rates.

8 Conclusion

In this paper we considered how the local memory of past repression affected the likelihood individuals fought in defense of, or opposition to, the government deemed responsible. We presented a theoretical argument for how the memories of the past shape long-run patterns of loyalty and rebellion toward the state. We further considered how contemporary incentives can moderate this relationship. We then applied the argument to the case of the Great Famine in Ireland, and collected a range of new data to better understand the choice to fight for or against the British Empire. Using the newly compiled data, we first demonstrated that individuals in places more severely affected by the Famine were less likely to fight in the pro-British Irish Militia, and British Military in WW1. By contrast, they participated in the Irish rebel forces at higher rates. We next leveraged data from the 1918 election and 1911 census to better understand the mechanisms underpinning these relationships. We showed that places more severely affected by the Famine voted for Sinn Féin at higher rates, and that Sinn Féin vote share was positively correlated with fighting for the Irish rebels, and negatively correlated with fighting for the British. Ultimately, the findings of the

paper demonstrated how the local memory of past repression can play a crucial role in shaping the choice to fight.

There are at least two factors shaping the external validity of our findings. First, the local memory of past repression must be allowed to develop over time. Indeed, a comparative look at other famines—such as China after the Great Leap Forward (Ó Gráda 2015) and the Soviet Union after the Kazakh Famine (Kindler 2018)—demonstrates how states at times engage in further censorship and repression in an effort to prevent this from occurring. For example, during the Kazakh Famine of 1930–1933 the media was not allowed to report on the death and devastation of the famine. Further, mentioning the famine was strictly prohibited in the Soviet Union until the 1980s (Cameron 2018; Kindler 2018). In China, news of the 1959–1961 famine was suppressed and remained unknown even within China. As Ó Gráda (2015) notes, this suppression meant that “. . . for two decades or more a massive three-year famine remained virtually hidden both inside and outside China.” (Ó Gráda 2015: 132). In cases where the local memory of past repression is not allowed to develop, we suspect that the devastation of the past is unrelated to long-run patterns of loyalty and rebellion toward the state. We thus view further exploration of the actions states undertake as they work to shape the long-run development of local memory as an important area of future research.

Second, the coercive capacity of the state must be sufficiently weak such that the fear of future repression does not overwhelm the local memory of the past. The theory of this paper builds on recent research arguing that local communities commonly remember the grievousness of past repression, while forgetting the fear that might have accompanied it (Rozenas, Schutte, and Zhukov 2017). However, a recent wave of research argues that when the coercive capacity of the state is sufficiently strong, this fear remains. This can lead individuals to engage in preference falsification, whereby they engage in behavior that is inconsistent with their true preferences (Rozenas and Zhukov 2019). In the case of historical Ireland, it appears that the coercive capacity of the British state was insufficiently strong to continue to stoke fear among places more severely affected by the Famine. Moving forward, future research should explore the levels of coercive capacity necessary for fear to overwhelm anger in shaping long-run patterns of loyalty and rebellion. Further, theoretically and empirically considering whether these levels are the same for shaping both violent and non-violent behavior is also a fruitful area of future inquiry. Ultimately, some of the most heinous

actions governments and rebel groups take include the perpetration of famines, massacres, and torture in an effort to repressive local populations. Preventing these types of repression in the future depends both on better understanding the conditions under which they are most likely to occur, and how they fuel further violence and rebellion.

References

- Anderson, David. 2017. "Making the Loyalist Bargain: Surrender, Amnesty and Impunity in Kenya's Decolonization, 1952–63." *The International History Review* 39(1): 48–70.
- Balcells, Laia. 2017. *Rivalry and Revenge: The Politics of Violence during Civil War*. Cambridge University Press.
- Barrett, Alan. 2005. "Irish migration: characteristics, causes, and consequences." *European migration: what do we know* pp. 89–112.
- Blackwell, Matthew. 2014. "A Selection Bias Approach to Sensitivity Analysis for Causal Effects." *Political Analysis* 22(2): 169–182.
- Bourke, Austin. 1993. *'The Visitation of God?' The Potato and the Great Irish Famine*. Lilliput Press Ltd.
- Boyer, George R, Timothy J Halton, and Kevin O'Rourke. 1994. "The Impact of Emigration on Real Wages in Ireland, 1850–1914." In *Migration and the International Labor Market 1850–1939*, ed. Timothy J Halton, and Jeffrey G Williamson. New York: Routledge pp. 221–239.
- Bradshaw, Brendan. 1989. "Nationalism and Historical Scholarship in Modern Ireland." *Irish Historical Studies* 26(104): 329–351.
- Brenner, Robert. 1976. "Agrarian Class-Structure and Economic-Development in Pre-Industrial Europe." *Past and Present* 70: 30–75.
- Cameron, Sarah. 2018. *The Hungry Steppe: Famine, Violence, and the making of Soviet Kazakhstan*. Cornell University Press.
- Cederman, Lars-Erik, Kristian Skrede Gleditsch, and Halvard Buhaug. 2013. *Inequality, Grievances, and Civil War*. Cambridge University Press.
- Charnysh, Volha, and Evgeny Finkel. 2017. "The Death Camp Eldorado: Political and Economic Effects of Mass Violence." *American Political Science Review* 111(4): 801–818.
- Chen, Yuyu, and Li-An Zhou. 2007. "The Long-Term Health and Economic Consequences of the 1959–1961 Famine in China." *Journal of Health Economics* 26(4): 659–681.
- Cinelli, Carlos, and Chad Hazlett. 2018. "Making Sense of Sensitivity: Extending Omitted Variable Bias." *Journal of the Royal Statistical Society: Series B (Statistical Methodology)* 82(1): 39–67.
- Connor, Dylan Shane. 2019. "The Cream of the Crop? Geography, Networks, and Irish Migrant Selection in the Age of Mass Migration." *The Journal of Economic History* 79(1): 139175.
- Crawford, E. Margaret, L. Kennedy, M. W. Dowling, and L. A. Clarkson. 1997. "Database of Irish Historical Statistics. UK Data Service." available at <https://beta.ukdataservice.ac.uk/>.
- Cronin, Mark. 2014. *Blackpool To The Front*. Gill & Macmillan.
- Das, Santanu. 2011. *Race, Empire and First World War Writing*. Cambridge University Press.
- de Bromhead, Alan, Alan Fernihough, and Enda Hargaden. 2020. "Representation of the People: Franchise Extension and the Sinn Féin Election in Ireland, 1918." *Journal of Economic History* 80(3): 886–925.

- Dell, Melissa, and Pablo Querubin. 2018. "Nation Building Through Foreign Intervention: Evidence from Discontinuities in Military Strategies." *The Quarterly Journal of Economics* 133(2): 701–764.
- Donnelly Jr, James S. 1996. "The Construction of the Memory of the Famine in Ireland and the Irish Diaspora, 1850–1900." *Éire-Ireland* 31(1): 26–61.
- Fernihough, Alan, and Cormac Ó Gráda. 2022. "Population and Poverty in Ireland on the Eve of the Great Famine." *Demography* 59(10): 1607–1630.
- Fitzgerald, Phil. 1955. "Statement by Witness: Document No. W.S. 1262." *Bureau of Military History, 1913–1921*.
- Fitzpatrick, David. 1978. "The geography of Irish nationalism 1910–1921." *Past & Present* (78): 113–144.
- Fitzpatrick, David. 1980. "The disappearance of the Irish agricultural labourer, 1841–1912." *Irish Economic and Social History* 7(1): 66–92.
- Fitzpatrick, David. 1989. "Emigration, 1801–1870." In *A New History of Ireland, Volume V: Ireland under the Union 1801–1870*, ed. W. Vaughan. Clarendon Press pp. 562–607.
- Fitzpatrick, David. 1995. "The logic of collective sacrifice: Ireland and the British army, 1914–1918." *The Historical Journal* 38(4): 1017–1030.
- Gilligan, Michael J, Benjamin J Pasquale, and Cyrus Samii. 2014. "Civil War and Social Cohesion: Lab-in-the-Field Evidence from Nepal." *American Journal of Political Science* 58(3): 604–619.
- Gillis, Liz. 2016. *The Hales Brothers and the Irish Revolution*. Mercier Press.
- Goodspeed, Tyler Beck. 2016. "Microcredit and Adjustment to Environmental Shock: Evidence from the Great Famine in Ireland." *Journal of Development Economics* 121: 258–277.
- Gregory, Ian N., and Niall A. Cunningham. 2016. "'The Judgement of God on an Indolent and Unself-Reliant People': The Impact of the Great Irish Famine on Ireland's Religious Demography." *Journal of Historical Geography* 51: 76–87.
- Greitens, Sheena Chestnut. 2016. *Dictators and their Secret Police: Coercive Institutions and State Violence*. Cambridge University Press.
- Gurr, Ted Robert. 1970. *Why Men Rebel*. Princeton University Press.
- Hall, Andrew B, Connor Huff, and Shiro Kuriwaki. 2019. "Wealth, Slaveownership, and Fighting for the Confederacy: An Empirical Study of the American Civil War." *American Political Science Review* 113: 658–673.
- Hardiman, David. 1992. *Peasant Resistance in India, 1858–1914*. Oxford University Press.
- Hart, Peter. 1997. "The Geography of Revolution in Ireland 1917–1923." *Past & Present* (155): 142–176.
- Hazlett, Chad. 2020. "Angry or Weary? How Violence Impacts Attitudes toward Peace among Darfuriian Refugees." *Journal of Conflict Resolution* 64(5): 844–870.

- Homola, Jonathan, Connor Huff, Yui Nishimura, and Amoraë Times. 2022. “The Gendered Legacies of the Frontier and Military Enlistment Behavior.” *Journal of Historical Political Economy* 2(2): 635–653.
- Homola, Jonathan, Miguel M Pereira, and Margit Tavits. 2020. “Legacies of the Third Reich: Concentration Camps and Out-Group Intolerance.” *American Political Science Review* 114(2): 573–590.
- Huff, Connor. N.d. “Counterinsurgency Tactics, Rebel Grievances, and Who Keeps Fighting.” *American Political Science Review*. Forthcoming.
- Humphreys, Macartan, and Jeremy M. Weinstein. 2008. “Who Fights? The Determinants of Participation in Civil War.” *American Journal of Political Science* 52(2): 436–455.
- Jeffery, Keith. 2000. *Ireland and the Great War*. Cambridge University Press.
- Karadja, Mounir, and Erik Prawitz. 2019. “Exit, voice, and political change: Evidence from Swedish mass migration to the United States.” *Journal of Political Economy* 127(4): 1864–1925.
- Keen, David et al. 2008. *The benefits of famine: a political economy of famine and relief in Southwestern Sudan 1983-89*. James Currey Ltd.
- Kennedy, Liam, Crawford P Ell, and Leslie A Clarkson. 1999. *Mapping the Great Irish Famine*. Four Courts Press.
- Kindler, Robert. 2018. *Stalin’s nomads: power and famine in Kazakhstan*.
- Kinealy, Christine. 1997. *A Death-Dealing Famine: The Great Hunger in Ireland*. Pluto Press.
- Kraatari, Eliza. 2016. *Domestic dexterity and cultural policy: The idea of cottage industry and historical experience in Finland from the great famine to the reconstruction period*. Number 544 University of Jyväskylä.
- Lane, Fintan. 2005. *Rural labourers, social change and politics in late nineteenth-century Ireland*. Springer.
- Larsen, Martin V, Frederik G Hjorth, Peter T Dinesen, and Kim M Sønderkov. 2019. “When Do Citizens Respond Politically to the Local Economy? Evidence from Registry Data on Local Housing Markets.” *American Political Science Review* 113(2): 499–516.
- Lebovic, James H, and Erik Voeten. 2009. “The Cost of Shame: International Organizations and Foreign Aid in the Punishing of Human Rights Violators.” *Journal of Peace Research* 46(1): 79–97.
- Lichbach, Mark. 1987. “Deterrence or Escalation? The Puzzle of Aggregate Studies of Repression and Dissent.” *Journal of Conflict Resolution* 31(2): 266–297.
- Lichbach, Mark Irving. 1998. *The Rebel’s Dilemma*. University of Michigan Press.
- Lupu, Noam, and Leonid Peisakhin. 2017. “The Legacy of Political Violence Across Generations.” *American Journal of Political Science* 61(4): 836–851.
- MacAtasney, Gerard. 2004. *Seán MacDiarmada: The Mind of the Revolution*. Drumlin.

- McAnally, Henry. 1949. *The Irish Militia, 1793-1816: A Social and Military Study*. Taylor & Francis.
- Meriläinen, Jaakko, Matti Mitrunen, and Tuomo Virkola. 2020. “The Violent Origins of Finnish Equality.” Working Paper.
- Mitchel, John. 1861. *The Last Conquest of Ireland (Perhaps)*. Cameron & Ferguson.
- Mokyr, Joel. 1983. *Why Ireland Starved: A Quantitative and Analytical History of the Irish Economy, 1800-1850*. George Allen & Unwin.
- Mokyr, Joel, and Cormac Ó Gráda. 2002. “What Do People Die of During Famines: The Great Irish Famine in Comparative Perspective.” *European Review of Economic History* 6(3): 339–363.
- Moore, Edward. 1940. “File Reference MSP34REF59230.” *Bureau of Military History, 1913–1921*.
- Morton-Jack, George. 2018. *The Indian Empire at War*. Hachette UK.
- Myers, Jason. 2011. *The Great War and Memory in Irish Culture, 1918–2010*. Academica Press.
- Narciso, Gaia, and Battista Severgnini. 2023. “The Deep Roots of Rebellion.” *Journal of Development Economics* 160: 102952.
- Neuenkirch, Matthias, and Florian Neumeier. 2015. “The impact of UN and US economic sanctions on GDP growth.” *European Journal of Political Economy* 40: 110–125.
- Neville, Edward. 1954. “Statement by Witness: Document No. W.S. 1665.” *Bureau of Military History, 1913–1921*.
- Newby, Andrew G, and Eliza Kraatari. 2018. “Memory of the Great Hunger Years Revisited: Finland’s 1860s Famine Memorials, Mass Graves and a Commemorative Craft Initiative.” *Thanatos* 7(2): 90–126.
- Ó Gráda, Cormac. 1979. The Population of Ireland 1700–1900: A Survey. In *Annales de Démographie Historique*. pp. 281–299.
- Ó Gráda, Cormac. 1995. *The Great Irish Famine*. Cambridge University Press.
- Ó Gráda, Cormac. 1999. *Black ’47 and Beyond: The Great Irish Famine in History, Economy, and Memory*. Princeton University Press.
- Ó Gráda, Cormac. 2006. *Ireland’s Great Famine*. UCD Press.
- Ó Gráda, Cormac. 2015. *Eating People is Wrong, and Other Essays on Famine, Its Past, and Its Future*. Princeton University Press.
- O’Connor, Thomas Power. 1891. *The Home Rule Movement: With a Sketch of Irish Parties from 1843, and an Addition Containing a Full Account of the Great Trial Instigated by the London Times*. Benziger Bros.
- O’Flanagan, Michael. 1918. *Father O’Flanagan’s Suppressed Speech*. Sinn Féin.
- Olson, Mancur. 1965. *The Logic of Collective Action*. Harvard University Press.

- O'Rourke, Kevin. 1994. "The Economic Impact of the Famine in the Short and Long Run." *American Economic Review: Papers & Proceedings* 84(2): 309–313.
- Pahontu, Raluca L, Gerda Hooijer, and David Rueda. 2021. "Insuring Against Hunger? Long-Term Political Consequences of Exposure to the Dutch Famine." Working Paper.
- Petersen, Roger D. 2002. *Understanding Ethnic Violence: Fear, Hatred, and Resentment in Twentieth-Century Eastern Europe*. Cambridge University Press.
- Poirteir, Cathal. 1995. *Famine Echoes: Folk Memories of the Great Irish Famine*. Gill & Macmillan Ltd.
- Popkin, Samuel L. 1979. *The Rational Peasant: The Political Economy of Rural Society in Vietnam*. University of California Press.
- Post, Jerrold M. 2005. "When Hatred is Bred in the Bone: Psycho-Cultural Foundations of Contemporary Terrorism." *Political Psychology* 26(4): 615–636.
- Roberts, Margaret E. 2018. *Censored*. Princeton University Press.
- Rozenas, Arturas, and Yuri Zhukov. 2019. "Mass Repression and Political Loyalty: Evidence from Stalin's 'Terror by Hunger'." *American Political Science Review* 113.
- Rozenas, Arturas, Sebastian Schutte, and Yuri Zhukov. 2017. "The Political Legacy of Violence: The Long-Term Impact of Stalins Repression in Ukraine." *The Journal of Politics* 79(4): 1147–1161.
- Schubiger, Livia. 2021. "One for All? State Violence and Insurgent Cohesion." *International Organization* Forthcoming.
- Selb, Peter, and Simon Munzert. 2018. "Examining a Most Likely Case for Strong Campaign Effects: Hitler's Speeches and the Rise of the Nazi Party, 1927–1933." *American Political Science Review* 112(4): 1050–1066.
- Siegel, Benjamin Robert. 2018. *Hungry Nation: Food, Famine, and the Making of Modern India*. Cambridge University Press.
- Spilsbury, Julian. 2008. *The Indian Mutiny*. Hachette UK.
- Turner, Michael. 2002. *After the Famine: Irish Agriculture, 1850–1914*. Cambridge University Press.
- Walden, Jacob, and Yuri Zhukov. 2020. "Historical Legacies of Political Violence." In *Oxford Research Encyclopedia of Politics*.
- Walker, Brian. 1978. *Parliamentary Election Results in Ireland 1801–1922*. Royal Irish Academy.
- Wang, Yuhua. 2019. "The Political Legacy of Violence During China's Cultural Revolution." *British Journal of Political Science* 51: 463–487.
- Wood, Elisabeth. 2003. *Insurgent Collective Action and Civil War in El Salvador*. Cambridge University Press.
- Wylegała, Anna, and Małgorzata Głowacka-Grajper. 2020. *The Burden of the Past: History, Memory, and Identity in Contemporary Ukraine*. Indiana University Press.

Zhukov, Yuri M. 2023. "Repression Works (Just Not in Moderation)." *Comparative Political Studies*
Forthcoming.

Appendix

A	Additional Information on Population Loss as an Explanatory Variable	42
A.1	The Strengths and Weaknesses of Using Population Loss	42
A.2	The Correlation Between Covariates and Population Loss	43
B	Verifying the GoogleMaps Algorithm Via Handcoding	43
C	Additional Results	43
C.1	Population Stability	43
C.2	How the Famine Affected the Percentage of Farmers, Catholics, and Irish Language Speakers	44
C.3	How the Famine Affected Literacy Rates Over Time And By Religion	44
C.4	Further Considering Literacy	44
D	Robustness	45
D.1	Including Baronies with Population Gain	45
D.2	No Controls	45
D.3	Accounting for Possible Collinearity	45
D.4	Controlling for Value of Agricultural Land	45
D.5	Alternative Approach for Measuring 1798 Battle Locations	46
D.6	Controlling for Longitude and Latitude	46
D.7	Removing Climatic Controls	46
D.8	Alternative Specification with Number of Combatants as Dependent Variable	46
D.9	Alternative Approach Using the Parish as the Unit of Analysis	46
D.10	Replicating Results with Conley Standard Errors	47
D.11	Alternative Specifications and Approaches for Measuring Irish Rebel Participation	47
D.12	Robustness of 1918 Election Results	48
D.13	Correlates of the 1841 and 1911 Censuses with Conflict Participation	48
D.14	Correlation Between Sinn Féin Vote Share and Conflict Participation	48
E	Sensitivity Analysis	48
F	Tables and Figures	50
G	Appendix References	66

A Additional Information on Population Loss as an Explanatory Variable

A.1 The Strengths and Weaknesses of Using Population Loss

Our main specification uses population loss as the main measure of differences in the severity of the Famine. This specification differs from other approaches used by economic historians that use crop failure, suitability or other environmental characteristics (Hornbeck 2012, 2020; Saleh 2020). There are a number of strengths associated with using population loss as our main measure of differences in the severity of the Famine. Perhaps most importantly, it provides a direct measure of the widespread death and destruction resulting from the Famine. The loss of human life due to both death and emigration are the types of factors that prior research has argued should be most likely to lead to increasing grievances and changes in the local economic conditions. From a measurement perspective, the fact that we are able to observe population counts at the barony level both pre and post-Famine means that the measure is relatively fine-grained. This is useful for helping us understand the true depth of destruction wrought by the Famine.

That said, there are also a number of possible weaknesses associated with the measure. Perhaps most obviously, population loss captures both death and migration. Migration might be particularly concerning if individuals are extensively moving internally within Ireland; we would then have no idea whether the differences we observe in fighting behavior are a result of the Famine or migration, which may or may not be the result of the Famine. Three facts help assuage this concern. First, migration *within* Ireland was fairly limited during this period; the overwhelming majority of individuals leaving their barony of birth went to the other British Isles and the New World (Fitzpatrick 1989; Guinnane 1997). Second, the vast majority of people moving within Ireland went to cities. We thus remove cities from our main analyses to address this possible concern with internal migration. Finally, if individuals from places more severely affected areas migrated to those from places which were less severely affected, then this would downward bias our results.

A second potential concern with using population loss as our main measure is that baronies which were more severely affected by the Famine were somehow different than those which were less severely affected. Indeed, the fact that the Famine was perceived to be in part the fault of the British makes this particularly concerning. In the next section we directly assess how places where the population loss was more severe were different.

A.2 The Correlation Between Covariates and Population Loss

In order to better understand the determinants of which places suffered the most, we regresses 1841 to 1851 population loss on pre-Famine barony characteristics. These results are presented in Table A1. In line with previous research (Ó Gráda 1999), Table A1 shows that baronies with larger population loss due to the Famine were poorer as measured by lower levels of literacy and a higher percentage of the population living in fourth class housing. Baronies more reliant on agriculture and those further away from the coast and from Dublin were also worse affected by the Famine. This suggests that the places which suffered the most during the Famine years were those with a relatively poorer population which was more reliant on the potato. We control for all the covariates in Table A1 in our analysis.

B Verifying the GoogleMaps Algorithm Via Handcoding

A potential concern with our data generating process is that the *GoogleMaps* algorithm consistently misassigns certain addresses. This would be particularly concerning if this were to be correlated with Irish or Catholic place names which could be correlated with treatment intensity. To check this possibility we handcode all addresses in the Irish rebel dataset for one county, Cavan. The *GoogleMaps* algorithm identifies 67 locations, for which our handcoding assigns the same barony for 61 of them (91%). Out of the 6 misassigned addresses, three were assigned to neighboring barony and three to a different county. There was no bias against Irish or Catholic place names. This exercise increases our confidence in the accuracy of the *GoogleMaps* algorithm.

C Additional Results

C.1 Population Stability

In our main analysis we use the barony as the unit of analysis. This rests on the assumption of population stability, that is, that there was minimal in-migration and those living in baronies during WWI are the descendants of the original victims.

To address the first issue of in-migration, in our main analysis we remove baronies that saw a population gain from 1841 to 1851 as well as urban areas in 1841 which are likely to have seen migration in the years following the Famine. Encouragingly our results hold when including these in our sample (Table A6). In addition, there researchers studying migration in Ireland following the Famine have established that there was little evidence of considerable rural-to-rural migration within the island of Ireland (that is, individuals moving from relatively rural places less hard-hit by the Famine to places that were relatively more severely affected) (Barrett 2005; Connor 2019). If significant in-migration occurred, then we might expect population levels to converge in the long-run, that is we would observe similar population levels in places that are more or less severely affected by the Famine in the long-run. The empirical evidence is inconsistent with this possibility. Specifically, Table A2 assesses the barony-level changes in population for the years 1861, 1871, 1881, 1891, 1901, and 1911. In every year baronies harder hit by the Famine report lower population. Indeed, the coefficient for 1901 is actually 25% larger than that of 1861 and 1871, suggesting that, if anything, the out-migration only become more severe as time passed. Baronies that lost 25% of their population during the Famine have 5,000 fewer inhabitants in 1911, which represents 50% of the variable mean. These results support the argument made by economic historians that the Famine led to a persistent decline in available labor, which in turn increased the bargaining power of the remaining workers.

C.2 How the Famine Affected the Percentage of Farmers, Catholics, and Irish Language Speakers

In addition to literacy and the percentage of labourers in the 1911 census we can also look at whether the Famine increased the amount of farmers in a barony. Prior research documents how the nature of farming and agriculture changed in the aftermath of the Famine (Turner 2002), and that farm wages increased leading up to WW1 (Boyer, Halton, and O'Rourke 1994: 228). Moreover, prior research within political science documents the relatively high opportunity costs associated with abandoning one's farm to fight (Hall, Huff, and Kuriwaki 2019). In Ireland specifically "Official and contemporary reports throughout the war testify to the extreme reluctance of Irish farmers and agricultural workers to join the forces, probably reflecting the constraints on individual choice imposed by membership of a family acting as an economic unit" (Fitzpatrick 1995: p.1095) Column (1) in Table A3 supports this view indicating that baronies with a higher 1841–1851 population loss have a larger percentage of farmers in 1911. Farmers faced particularly high opportunity costs to fighting in WW1 further buttressing our argument that the Famine shaped economic conditions in a way that increased the opportunity costs to fighting.

Next, opposition to British rule was often correlated with Irish nationalism and Catholicism. The 1911 census includes a question of whether the individual can speak or write in the Irish language. It also gives each respondent's religious denomination.

Column (2) in Table A3 shows the effect of 1841–1851 population loss on the percentage of the population that can speak the Irish language in 1911. 1841–1851 population loss leads to a decrease in the proportion of Irish speakers among the population. Baronies that lost 25% of their population during the Famine have about 5 percentage point fewer Irish language speakers in 1911, which represents 37% of the variable mean. Column (3) shows no effect on the percentage of Catholics living in the barony in 1911.

C.3 How the Famine Affected Literacy Rates Over Time And By Religion

Table A4 shows the effect of 1841–1851 population loss on literacy over time. 1841–1851 population loss leads to an increase in the proportion of the population that can read and write from 1851 until 1911. The lasting effect on literacy is sizable. Baronies that lost 25% of their population during the Famine have 2.5 percentage points higher literacy rates. These results suggest that the population remaining in baronies harder hit by the Famine were better off afterwards.

Table A5 shows the effect of 1841–1851 population loss on 1911 literacy separately for Catholics and non-Catholics. Places harder hit by the Famine show higher literacy rates for both groups, yet the effect on Catholic literacy is almost double the size and more precisely estimated.

C.4 Further Considering Literacy

We now turn back to better understanding the relationship in Panel E in Table 6 presented in the body of the manuscript. To better understand what might be driving this positive relationship between literacy and WW1 conflict participation we plot the same relationship broken down by Catholic and non-Catholics. This is depicted visually in Figure A1. Panels A and C show that for both Catholics and non-Catholics, we actually see either a flat or slightly negative relationship between literacy and WW1 conflict participation. This suggests that the positive slope in the previous figure is driven by the correlations between religion, literacy, and baseline conflict participation rates. Considering Figures 5 and A1 together, the evidence suggests that a variety of factors shaped the choice to fight. In some places opportunity costs seem to clearly have mattered. However, the opposite relationship we observe when considering literacy suggests that other factors,

such as religion or loyalty to the crown which we think is correlated with literacy might have also shaped the choice to fight.

D Robustness

D.1 Including Baronies with Population Gain

We assess the robustness of several decisions made when constructing the data. In our main specification we have removed baronies that experienced population gain from 1841 to 1851. In Figure A2 we show the raw data of conflict participation and 1841–1851 population change including such baronies. Next, in Table A6 we include baronies with a population gain in our specification. The results on fighting for the British remain consistent. The coefficient on the Irish rebel forces loses significance which is not surprising since rebel activity was concentrated in urban areas which were also less affected by the Famine.

D.2 No Controls

One concern is that our results are driven by our choice of controls. Controlling for observables within County is a key part of our empirical strategy. We undertake three steps to assess the robustness of this strategy. First, to benchmark the impact of our control variables on our results, we run the specification without any controls (Table A7). While we see some loss in precision, the results remain generally the same. Second, in the following subsections we rerun our main specifications while including new or slightly modified control variables. Third, Appendix Section E investigates how large the effect of an unobserved confounder would need to be to threaten our results.

D.3 Accounting for Possible Collinearity

Our main specification includes controls for a barony’s log population in 1841, its area in log square kilometers, and its population density in population per square kilometer. A potential concern is collinearity between the three measures. The correlation between log population and density is 0.33 and the correlation between log area and population density is -0.20. Running a collinearity diagnostic gives a VIF of over 10 for the three variables raising concerns of collinearity. Therefore, in Table A8 we rerun our main specification without controlling for population density. The results are slightly larger and with no change in significance.

D.4 Controlling for Value of Agricultural Land

The Famine was predominantly an agricultural catastrophe. It could be that the Famine predominantly affected baronies with lower quality agricultural land that we might be unable to pick up with our existing controls. This is unlikely given that we find baronies more severely affected by the Famine to be better off economically in the long-run. Still, to test whether our results are driven by the value of agricultural land, we include 1845 baronial valuations of agricultural land to additionally control for pre-Famine agricultural significance (Table A9). We do not include this variable in our main specification since it is only available for a subset of baronies and thus reduces the sample size by a third.

D.5 Alternative Approach for Measuring 1798 Battle Locations

The severity of the Famine is often attributed to British policies or inaction. One concern might be that our findings are not the results of grievances or economic changes but instead the British simply let the Famine be worse in locations that they perceived as more hostile for them which then later correlates with lower fighting for and higher fighting against the British. Two pieces of evidence speak against this concern. First, our analysis of the mechanisms provides evidence of increased grievances and changed economic conditions in areas with higher population loss. Second, we leverage the 1798 rebellion to control for pre-Famine “hostility toward the British.” The 1798 rebellion was the largest Irish uprising against British rule before WW1 and resulted in 34 battles or skirmishes between British and rebel forces. We calculate each barony’s distance to the closest battle which we include our main specification. We also create a dummy for whether a battle took place in the barony. Including this dummy as a control instead of the distance variable does not change the results (Table A10).

D.6 Controlling for Longitude and Latitude

Table A11 shows the result while also controlling for each barony’s centroid’s longitude and latitude.

D.7 Removing Climatic Controls

Our main specification includes potato suitability, mean July rainfall, and mean July temperature as controls. One might be concerned that including these controls removes valuable variation induced by local climate and geography. To see how the results are affected by the inclusion of these variables, Table A12 does not include them as controls. The results are almost identical to our main specification.

D.8 Alternative Specification with Number of Combatants as Dependent Variable

Next, we also run our main specification with total conflict participation instead of rates of participation (Table A13). The results for fighting for the British are consistently negative and significant. Fighting against the British is not significantly affected. Yet, given that the Famine had large and persistent effects on the population size by barony (Table A2) the results suggests that baronies more severely impacted by the Famine fielded a similar amount of Irish rebels even though they drew from fewer potential recruits.

D.9 Alternative Approach Using the Parish as the Unit of Analysis

Our main explanatory variable, 1841–1851 population loss, is also available at the parish level, the administrative unit below baronies, via the Irish Famine Project (Fernighough 2020). We use this more fine-grained data in two ways. First, we repeat our analysis of the economic consequences of the Famine in Table A14. Parishes more severely impacted by the Famine have higher literacy, more farmers and less general labourers in 1911, mirroring the results when using baronies as the unit of observation. Second, we leverage fine-grained data on Irish Militia and WW1 enlistment to replicate our findings of lower rates of fighting for the British (Table A15).³¹

³¹The addresses given in the WW1 casualty data are not detailed enough to geolocate combatants below the barony level. The Irish rebel data in turn is too sparse to be used at the parish level.

D.10 Replicating Results with Conley Standard Errors

Since our unit of analysis is a geographical unit and the severity of the Famine might be correlated with geographical factors a potential concern is spatial clustering. In our main specification we include a range of geographical variables to control for factors that could plausibly create spatial clustering. Still some spatial clustering might remain. We address this concern by implementing Conley spatially clustered standard errors in Table A16. Across all specifications the standard errors are in fact smaller when correcting for spatial clustering.

D.11 Alternative Specifications and Approaches for Measuring Irish Rebel Participation

The geographic patterns we observe in Irish rebel participation (Figure 2) accord with prior research (Fitzpatrick 1978; Hart 1997). Scholars and Irish rebels themselves have proposed at least four explanations for why Irish rebellion was concentrated in the South and West (see Hart 1997 for a discussion): first, the South and West had a higher percentage of Catholics which were the part of the population the rebels recruited from (Hart 1997); second, rebellion was concentrated in rural Ireland and the South and West was the least urbanized region (Fitzpatrick 1978; Garvin 2005); third, the rugged and mountainous terrain of that part of the island provided a better base to stage rebellious activity from (Townshend 1979); fourth, the South and West, which is the region furthest from the centers of power Dublin and Belfast, had ineffective police and courts which were unable to reign in rebel activity and recruitment (Fitzpatrick 1978). For these reasons we include 1834 percentage Catholics, 1841 percentage agriculture, ruggedness and elevation, as well as distance to Belfast and Dublin in our specification to account for these factors and isolate the effect famine severity had on Irish rebel participation.

We also consider different specifications for our result on fighting against the British in the rebel forces in Table A17. Specifically, we consider three different samples that vary in terms of their completeness. To construct our initial sample, we collected information on all men whose files had been processed and publicly posted by the Military Archives. This resulted in information on 8,890 rebels in total, 6,878 of whose files had been approved by the pension board. This means that we have information on roughly 12% of applicants for pensions, and 48% of individuals who had pensions approved. Further, since the Military Archives started processing the materials of individuals who fought in the Easter Rising first, we have a nearly comprehensive list of all individuals who decided to rebel at conflict onset. As Pat Brennan a senior military archivist stated, “we’re pretty sure this is the definitive figure.”³² To probe the robustness of our results, we re-ran our main specification using each of these three different samples, each of which vary in terms of the number of combatants they include, and their relative completeness.

As can be seen in Table 1, results are directionally consistent across each of the three samples. When using the full sample of pension applicants (Column 1), we see that the results are statistically significant. When using more restrictive samples, results are similar in magnitude, though fall just above the conventional levels of statistical significance. Column 2 shows that the results are qualitatively the same (p-value 0.102) when restricting to individuals who were awarded a pension following either the 1924 or 1934 pension application act (as opposed to applying as in our initial sample). Column 3 restricts our sample to only individuals who were approved for service for participating in the Easter Rising (we know this sample is complete). Encouragingly the results

³²Brennan is quoted in the newspaper the *The Irish Times* in an article discussing how many individuals were “out” during the Easter Rising. For more, see <https://www.irishtimes.com/culture/heritage/how-many-were-really-out-for-easter-rising-1916-1.2261362>.

are qualitatively similar in this sample (p-value is 0.12). Importantly, it is worth emphasizing that as we increase the sample to include more combatants, the results become slightly larger in magnitude, and statistically significant. This in part helps assuage concerns that the existing missingness across the datasets is systematically missing in a way that leads us to overestimating our main effects, since adding more data produces the opposite effect. Further, given that our empirical setup including county fixed effects, a very particular type of missingness would need to occur in order to substantively change our conclusions. Specifically, the inclusion of county fixed effects means that the missingness would need to be systematically occurring between baronies within the same county; it is not sufficient for there to simply be geographic differences in either the processing or release of the pension applications, since these will be getting picked up in our county fixed effects. Taken together, the fact that we observe results that are substantively similar in magnitude across all three samples, paired with the fact that the geographic distribution of rebel combatants accords with well-known patterns from the conflict in Ireland, helps assuage concerns that our results are being driven solely by geographic irregularities in the pension processes.

D.12 Robustness of 1918 Election Results

Next, we show robustness of our result on the 1918 elections. In the 1918 election, Sinn Féin candidates won 25 constituencies unopposed. In the paper we put the Sinn Féin vote share for these cases at the sample max (87%). Table A18 shows the results when setting the Sinn Féin vote share in uncontested constituencies to 100% (Column 2), dropping these observations (Column 3), or including county fixed effects (Column 4).

D.13 Correlates of the 1841 and 1911 Censuses with Conflict Participation

Lastly, we show the correlation of all 1841 barony characteristics and our four conflict participation variables in Table A19 and the correlation with 1911 characteristics in Table A20.

D.14 Correlation Between Sinn Féin Vote Share and Conflict Participation

Figure A4 shows the correlation of 1918 Sinn Féin Vote Share and our four conflict participation variables at the constituency level.

E Sensitivity Analysis

The findings of this paper rest on the assumption that places where the Famine was relatively more severe are comparable to places where it was less severe conditional on the control variables we include in our analyses. If, for example, the Famine was more severe in places which had a higher latent rebelliousness, then we might be concerned that the estimates we presented are measuring these underlying differences rather than the consequences of the Famine itself. Importantly, in order for these underlying differences to explain the results we observe, it must be the case that we are not capturing them through our theoretically and historically motivated control variables—such as religious composition, poverty, 1798 battle locations or distances to Belfast and Dublin, among others. Moreover, given the fact that we use county fixed effects throughout our analysis it must also be the case that this latent rebelliousness varies across baronies but within counties. It is not sufficient to say that one region of Ireland, such as the west, was simply more rebellious than another; our design addresses such a concern directly. Nevertheless, we conduct a range of additional

tests to better understand whether and how unmeasured confounding might substantively affect our results.

We conduct sensitivity analyses to better understand how a confounding variable might affect our conclusions (Blackwell 2014; Cinelli and Hazlett 2018). Following recent applications in political science and conflict (Hazlett 2020; Huff 2021), we first assess how much confounding must exist to explain away our results and then benchmark this relative to another variable which we theoretically expect to affect the choice to fight. Table A21 shows the Robustness Value, that is “the minimum strength of association unobserved confounding would need to have, both with the treatment and with the outcome, to change the research conclusions” (Cinelli and Hazlett 2018: 1). We see that unobserved confounders would need to explain more than 10–25% of the residual variance of both the treatment and outcome to reduce the absolute value of the effect size by 100%. Second, given the longstanding divisions within Ireland between Catholics and Protestants and the potential that the Famine might have been purposely allowed to affect Catholic areas more severely, we benchmark the sensitivity analyses relative to our newly compiled measure of 1841 barony-level religious composition. Figure A5 visualizes this benchmarking exercise. The results demonstrate that a confounder explaining fifteen times the residual variance as is explained by going from a fully Protestant to a fully Catholic barony (in terms of population loss and conflict participation in the Irish rebel forces) would still not reduce the implied effect size to zero. Given the strength of the theorized relationship between religion and conflict participation in Ireland, this implies that whether we have fully eliminated confounding or not, an extremely high degree of confounding would be required to change our estimate substantially.

F Tables and Figures

Table A1 – 1841–1851 Population Loss and 1841 Characteristics

Variables	Obs	Coefficient
Area (log km ²)	296	0.027 (0.500)
Population (log)	296	0.079 (0.501)
Population Density (per km ²)	299	−19.105 (23.497)
Perc. Literacy	296	−0.085** (0.034)
Perc. Fourth Class Housing	296	0.303*** (0.086)
Perc. Catholic	296	0.083 (0.051)
Perc. Agriculture	296	0.409*** (0.074)
Potato Suitability	296	4.195 (8.628)
Mean July Temperature	296	−0.213 (0.251)
Mean July Rainfall	296	−2.515 (7.885)
Ruggedness	296	0.028 (0.075)
Distance to Coast	296	1.504** (0.725)
Distance to Belfast	296	0.136 (0.151)
Distance to Dublin	296	0.283* (0.165)
Distance to 1798 Battles	296	−0.005 (0.403)

Notes: This table shows the coefficients on regressing 1841–1851 population loss on 1841 barony characteristics. Each row is a separate specification which includes County fixed effects. Robust standard errors are shown in parentheses. *p<0.1; **p<0.05; ***p<0.01

Table A2 – Effect of 1841–1851 Population Loss on Population

	<i>Dependent variable:</i>					
	1861	1871	Barony Population		1901	1911
	(1)	(2)	1881	1891	(5)	(6)
Population Loss 1841–1851	–1.504*** (0.212)	–1.448*** (0.209)	–1.589*** (0.222)	–1.694*** (0.227)	–1.627*** (0.332)	–1.893*** (0.298)
Fixed effects	County	County	County	County	County	County
Unit of observation	Barony	Barony	Barony	Barony	Barony	Barony
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	286	283	282	282	296	296
Adjusted R ²	0.894	0.891	0.887	0.879	0.796	0.824

Notes: This table shows the results of regressing barony population according to the 1861 to 1911 censuses on barony 1841–1851 population loss. Robust standard errors are shown in parentheses. *p<0.1; **p<0.05; ***p<0.01

Table A3 – Effect of 1841–1851 Population Loss on Farmers, Irish language, and Catholicism 1911

	<i>Dependent variable:</i>		
	Perc. Farmer 1911	Perc. Irish Language 1911	Perc. Catholic 1911
	(1)	(2)	(3)
Population Loss 1841–1851	0.174*** (0.033)	–0.146* (0.087)	0.004 (0.029)
Fixed effects	County	County	County
Unit of observation	Barony	Barony	Barony
Controls	Yes	Yes	Yes
Observations	296	296	296
Adjusted R ²	0.754	0.830	0.969

Notes: This table shows the results of regressing the percentage of the population list “farmer” as their occupation (Column 1), that speak the Irish language (Column 2), and identify as Catholic (Column 3) in the 1911 census on barony 1841–1851 population loss. Robust standard errors are shown in parentheses. *p<0.1; **p<0.05; ***p<0.01

Table A4 – Effect of 1841–1851 Population Loss on Literacy

	<i>Dependent variable:</i>			
	Perc. Read and Write			
	1851	1861	1901	1911
	(1)	(2)	(3)	(4)
Population Loss 1841–1851	0.099*** (0.015)	0.093*** (0.023)	0.052** (0.024)	0.101*** (0.022)
Fixed effects	County	County	County	County
Unit of observation	Barony	Barony	Barony	Barony
Controls	Yes	Yes	Yes	Yes
Observations	286	286	296	296
Adjusted R ²	0.959	0.921	0.805	0.718

Notes: This table shows the results of regressing the percentage of the population that can read and write according to the 1851, 1861, 1901, and 1911 census on barony 1841–1851 population loss. Robust standard errors are shown in parentheses. *p<0.1; **p<0.05; ***p<0.01

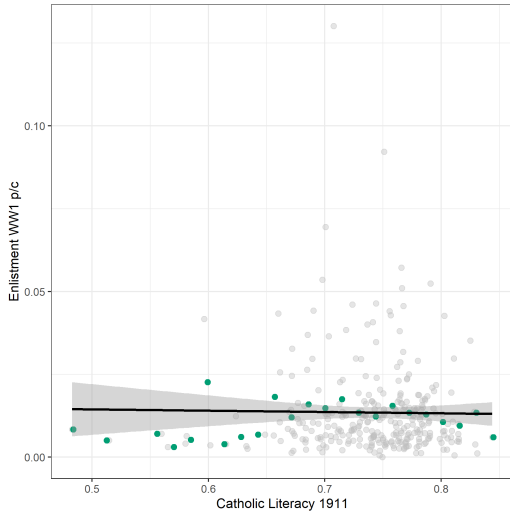
Table A5 – Effect of 1841–1851 Population Loss on Literacy by Religion

	<i>Dependent variable:</i>	
	Percentage Read and Write 1911	
	Catholic	Non-Catholic
	(1)	(2)
Population Loss 1841–1851	0.079*** (0.022)	0.052* (0.030)
Fixed effects	County	County
Unit of observation	Barony	Barony
Controls	Yes	Yes
Observations	296	296
Adjusted R ²	0.710	0.520

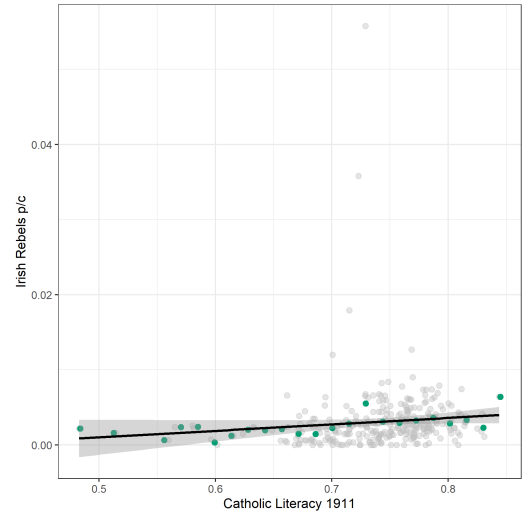
Notes: This table shows the results of regressing the percentage of the population that can read and write according to the 1911 census on barony 1841–1851 population loss. Column (1) shows the effect on Catholic literacy while Column (2) shows the effect on non-Catholic literacy. Robust standard errors are shown in parentheses. *p<0.1; **p<0.05; ***p<0.01

Figure A1 – Correlation Between 1911 Literacy and Conflict Participation by Religion

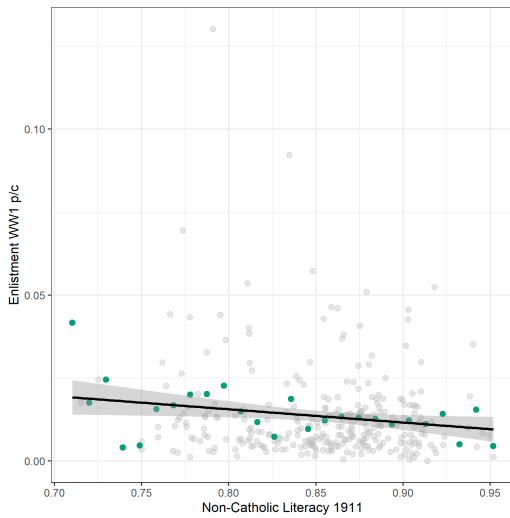
Panel A: WW1 Enlistment & Catholic Literacy



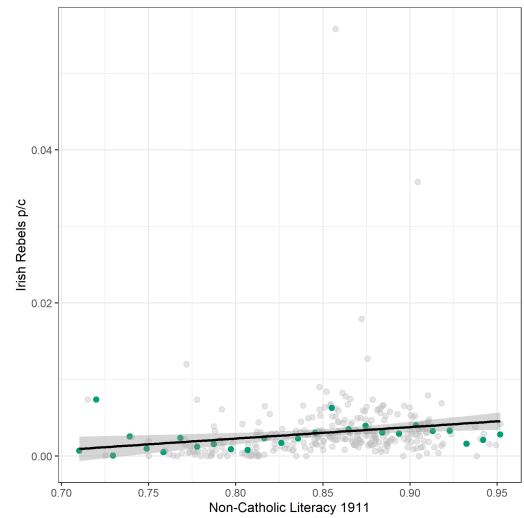
Panel B: Irish Rebels & Catholic Literacy



Panel C: WW1 Enlistment & Non-Catholic Literacy



Panel D: Irish Rebels & Non-Catholic Literacy



Notes: This figure shows the relationship between 1911 Catholic or Non-Catholic literacy and conflict participation in WW1 and the Irish rebel forces. Bold green dots show the binned averages. The linear relationship between vote share and conflict participation is added.

Table A6 – Effect of 1841–1851 Population Loss on Conflict Participation Including Baronies with Population Gain

	<i>Dependent variable:</i>			
	Militia p/c (1)	Enlistment WW1 p/c (2)	Casualties WW1 p/c (3)	Irish Rebels p/c (4)
Population Loss 1841–1851	–0.064*** (0.023)	–0.020** (0.009)	–0.014* (0.008)	0.002 (0.004)
Fixed effects	County	County	County	County
Unit of observation	Barony	Barony	Barony	Barony
Controls	Yes	Yes	Yes	Yes
Observations	299	306	306	306
Adjusted R ²	0.373	0.351	0.304	0.141

Notes: This table replicates Table 3 but includes baronies with a 1841–1851 population gain. Robust standard errors are shown in parentheses. *p<0.1; **p<0.05; ***p<0.01

Figure A2 – Raw Data with Population Gain

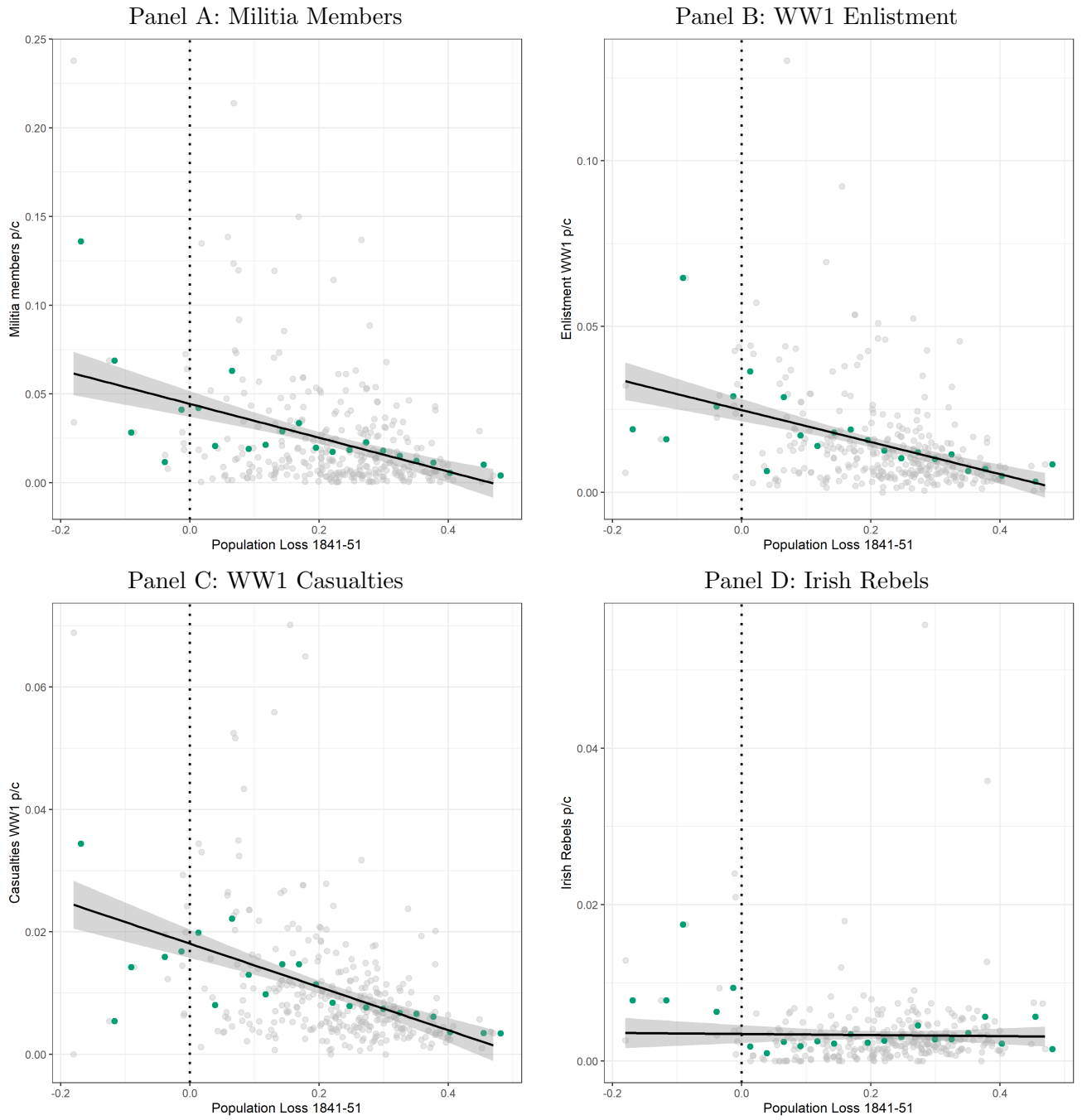


Table A7 – Effect of 1841–1851 Population Loss on Conflict Participation Without Controls

	<i>Dependent variable:</i>			
	Militia p/c (1)	Enlistment WW1 p/c (2)	Casualties WW1 p/c (3)	Irish Rebels p/c (4)
Population Loss 1841–1851	–0.096*** (0.025)	–0.038*** (0.009)	–0.028*** (0.007)	0.003 (0.003)
Fixed effects	County	County	County	County
Unit of observation	Barony	Barony	Barony	Barony
Controls	No	No	No	No
Observations	296	296	296	296
Adjusted R ²	0.301	0.147	0.163	0.092

Robust s.e. in parentheses *p<0.1; **p<0.05; ***p<0.01

Table A8 – Effect of 1841–1851 Population Loss on Conflict Participation

	<i>Dependent variable:</i>			
	Militia p/c (1)	Enlistment WW1 p/c (2)	Casualties WW1 p/c (3)	Irish Rebels p/c (4)
Population Loss 1841–1851	–0.080*** (0.024)	–0.026*** (0.009)	–0.019** (0.008)	0.006* (0.003)
Fixed effects	County	County	County	County
Cluster	Barony	Barony	Barony	Barony
Controls	Yes	Yes	Yes	Yes
Observations	296	296	296	296
Adjusted R ²	0.427	0.316	0.323	0.090

Robust s.e. in parentheses *p<0.1; **p<0.05; ***p<0.01

Table A9 – Effect of 1841–1851 Population Loss on Conflict Participation including Valuation as Control

	<i>Dependent variable:</i>			
	Militia p/c (1)	Enlistment WW1 p/c (2)	Casualties WW1 p/c (3)	Irish Rebels p/c (4)
Population Loss 1841–1851	–0.075** (0.030)	–0.027* (0.015)	–0.017 (0.012)	0.003 (0.002)
Fixed effects	County	County	County	County
Unit of observation	Barony	Barony	Barony	Barony
Controls	Yes	Yes	Yes	Yes
Observations	195	195	195	195
Adjusted R ²	0.421	0.251	0.275	0.314

Robust s.e. in parentheses *p<0.1; **p<0.05; ***p<0.01

Table A10 – Effect of 1841–1851 Population Loss on Conflict Participation Controlling for 1798 Battle Indicator

	<i>Dependent variable:</i>			
	Militia p/c	Enlistment WW1 p/c	Casualties WW1 p/c	Irish Rebels p/c
	(1)	(2)	(3)	(4)
Population Loss 1841–1851	−0.078*** (0.024)	−0.026*** (0.010)	−0.018** (0.008)	0.005* (0.003)
Fixed effects	County	County	County	County
Unit of observation	Barony	Barony	Barony	Barony
Controls	Yes	Yes	Yes	Yes
Observations	296	296	296	296
Adjusted R ²	0.415	0.328	0.322	0.093

Robust s.e. in parentheses

*p<0.1; **p<0.05; ***p<0.01

Table A11 – Effect of 1841–1851 Population Loss on Conflict Participation Controlling for Longitude and Latitude

	<i>Dependent variable:</i>			
	Militia p/c	Enlistment WW1 p/c	Casualties WW1 p/c	Irish Rebels p/c
	(1)	(2)	(3)	(4)
Population Loss 1841–1851	−0.079*** (0.024)	−0.024*** (0.009)	−0.018** (0.008)	0.006* (0.003)
Fixed effects	County	County	County	County
Unit of observation	Barony	Barony	Barony	Barony
Controls	Yes	Yes	Yes	Yes
Observations	296	296	296	296
Adjusted R ²	0.421	0.313	0.319	0.085

Robust s.e. in parentheses

*p<0.1; **p<0.05; ***p<0.01

Table A12 – Effect of 1841–1851 Population Loss on Conflict Participation Without Climate Controls

	<i>Dependent variable:</i>			
	Militia p/c	Enlistment WW1 p/c	Casualties WW1 p/c	Irish Rebels p/c
	(1)	(2)	(3)	(4)
Population Loss 1841–1851	−0.080*** (0.024)	−0.025** (0.010)	−0.018** (0.008)	0.005 (0.003)
Fixed effects	County	County	County	County
Unit of observation	Barony	Barony	Barony	Barony
Controls	Yes	Yes	Yes	Yes
Observations	296	296	296	296
Adjusted R ²	0.420	0.315	0.331	0.084

Robust s.e. in parentheses

*p<0.1; **p<0.05; ***p<0.01

Table A13 – Effect of 1841–1851 Population Loss on Total Conflict Participation

	<i>Dependent variable:</i>			
	Militia count	Enlistment WW1 count	Casualties WW1 count	Irish Rebels count
	(1)	(2)	(3)	(4)
Population Loss 1841–1851	–617.686*** (176.732)	–288.574*** (73.978)	–180.217*** (62.130)	–2.709 (16.779)
Fixed effects	County	County	County	County
Unit of observation	Barony	Barony	Barony	Barony
Controls	Yes	Yes	Yes	Yes
Observations	296	296	296	296
Adjusted R ²	0.447	0.402	0.450	0.321
Robust s.e. in parentheses	*p<0.1; **p<0.05; ***p<0.01			

Table A14 – Effect of 1841–1851 Population Loss on Parish Level Economic Outcomes

	<i>Dependent variable:</i>				
	Population 1911	Literacy 1911	Irish Language 1911	Perc. Farmer 1911	Perc. Labourer 1911
	(1)	(2)	(3)	(4)	(5)
Population Loss 1841–1851	–1.169*** (0.157)	0.017 (0.014)	–0.039** (0.019)	0.048*** (0.015)	–0.016** (0.007)
Fixed effects	Barony	Barony	Barony	Barony	Barony
Unit of observation	Parish	Parish	Parish	Parish	Parish
Controls	Yes	Yes	Yes	Yes	Yes
Observations	2,258	2,258	2,258	2,258	2,258
Adjusted R ²	0.878	0.426	0.850	0.577	0.224
Robust s.e. in parentheses	*p<0.1; **p<0.05; ***p<0.01				

Table A15 – Effect of 1841–1851 Population Loss on Parish Level Conflict Outcomes

	<i>Dependent variable:</i>	
	Militia p/c	Enlistment WW1 p/c
	(1)	(2)
Population Loss 1841–1851	–0.029** (0.012)	–0.012 (0.008)
Fixed effects	Barony	Barony
Unit of observation	Parish	Parish
Controls	Yes	Yes
Observations	1,701	2,258
Adjusted R ²	0.574	0.072
Robust s.e. in parentheses	*p<0.1; **p<0.05; ***p<0.01	

Table A16 – Effect of 1841-1851 Population Loss on Conflict Participation with Conley Standard Errors

	<i>Dependent variable:</i>			
	Militia p/c (1)	Enlistment WW1 p/c (2)	Casualties WW1 p/c (3)	Irish Rebels p/c (4)
Population Loss 1841–1851	–0.079***	–0.025*** (0.009)	–0.018** (0.007)	0.006** (0.002)
Fixed effects	County	County	County	County
Unit of observation	Barony	Barony	Barony	Barony
Controls	Yes	Yes	Yes	Yes
Observations	296	296	296	296
Adjusted R ²	0.425	0.317	0.323	0.091

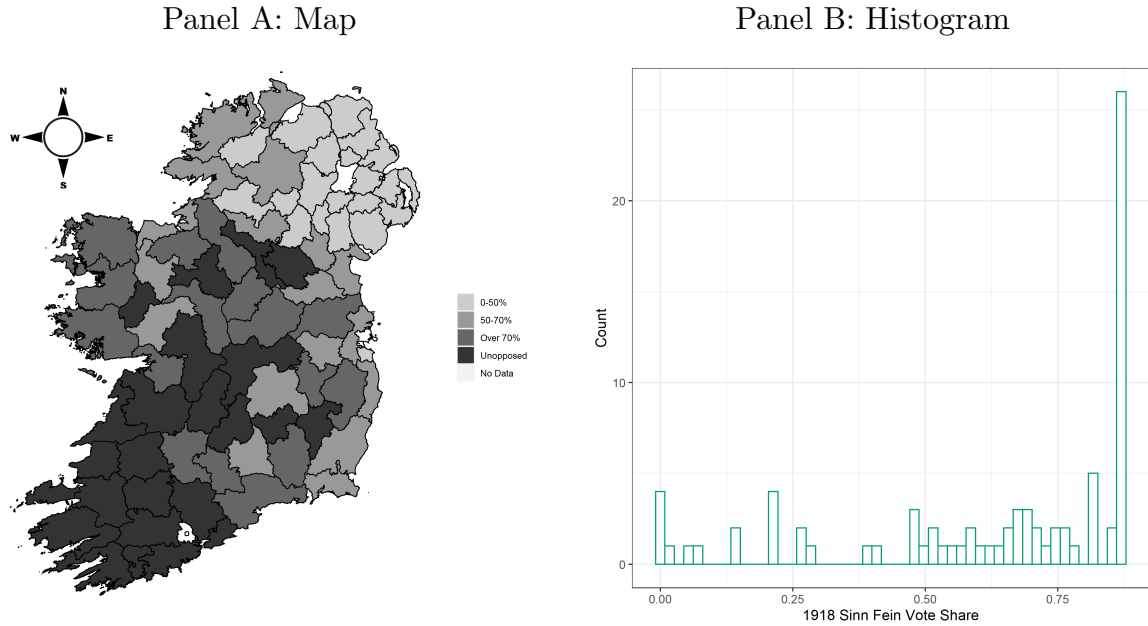
Robust s.e. in parentheses *p<0.1; **p<0.05; ***p<0.01

Table A17 – Effect of 1841-1851 Population Loss on Conflict Participation in Irish Rebel Forces

	<i>Dependent variable:</i>		
	Irish Rebels p/c		
	Pensions p/c (1)	Awarded 24/34 (2)	Easter Rising p/c (3)
Population Loss 1841-1851	0.006* (0.003)	0.005 (0.003)	0.004 (0.003)
Fixed effects	County	County	County
Cluster	Barony	Barony	Barony
Controls	Yes	Yes	Yes
Observations	296	296	296
Adjusted R ²	0.091	0.042	0.030

Notes: This table shows the effect of 1841–1851 population loss on participation in the Irish rebels as seen in Column 4 of Table 3 but using different samples. Column (1) is the same as the main specification. Column (2) restricts to individuals who were awarded a pension following either the 1924 or 1934 pension application act (p-value = 0.102). Column (3) restricts to individuals awarded a pension for participating in the Easter Rising (p-value = 0.127). Robust standard errors are shown in parentheses. *p<0.1; **p<0.05; ***p<0.01

Figure A3 – Sinn Féin Vote Share 1918



Notes: Geographic distribution and histogram of Sinn Féin Vote share in 1918.

Table A18 – Effect of 1841–1851 Population Loss on 1918 Election Robustness

	<i>Dependent variable:</i>		
	<i>Vote Share Sinn Fein</i>		
	(1) Main Specification	(2) Uncontested Removed	(3) Uncontested=100%
Population Loss 1841–1851	0.793*** (0.234)	0.589* (0.311)	0.940*** (0.277)
Fixed effects	Province	Province	Province
Unit of observation	Constituency	Constituency	Constituency
Controls	Yes	Yes	Yes
Observations	81	56	81
Adjusted R ²	0.786	0.752	0.764

Robust s.e. in parentheses

*p<0.1; **p<0.05; ***p<0.01

Table A19 – 1841 Correlates of Conflict Participation

	<i>Dependent variable:</i>			
	Militia p/c (1)	Enlistment WW1 p/c (2)	Casualties WW1 p/c (3)	Irish Rebels p/c (4)
Perc. Catholic	0.027 (0.029)	0.016 (0.013)	0.011 (0.015)	0.007* (0.004)
Perc. Farmer	-0.064** (0.027)	-0.032*** (0.009)	-0.024*** (0.008)	-0.001 (0.003)
Area	0.0001 (0.0003)	0.0001 (0.0001)	0.0001 (0.0001)	-0.00004 (0.00004)
Pop Density	0.173*** (0.059)	0.145*** (0.028)	0.093*** (0.023)	0.014* (0.009)
Literacy	0.008 (0.017)	0.022** (0.010)	0.007 (0.005)	0.0004 (0.003)
Population	-0.0004** (0.0002)	0.00003 (0.0001)	0.00002 (0.0001)	0.0001 (0.00004)
Fourth Housing	0.009 (0.009)	-0.001 (0.005)	-0.001 (0.004)	0.001 (0.002)
Potato Suitability	0.0002 (0.0002)	0.0002 (0.0002)	0.00003 (0.0001)	0.0001 (0.0001)
July Temp	0.023 (0.022)	0.006 (0.014)	0.010 (0.009)	-0.002 (0.002)
July Rain	0.003 (0.003)	-0.0004 (0.001)	-0.00001 (0.001)	-0.001 (0.001)
Ruggedness	0.016** (0.007)	0.007 (0.006)	0.009** (0.004)	0.001 (0.001)
Dist Coast	-0.006 (0.012)	-0.001 (0.004)	-0.0001 (0.003)	-0.001 (0.001)
Dist Belfast	-0.004 (0.004)	-0.003 (0.002)	-0.001 (0.001)	-0.0003 (0.0005)
Fixed effects	County	County	County	County
Unit of observation	Barony	Barony	Barony	Barony
Observations	290	296	296	296
Adjusted R ²	0.372	0.304	0.307	0.086

Robust s.e. in parentheses

*p<0.1; **p<0.05; ***p<0.01

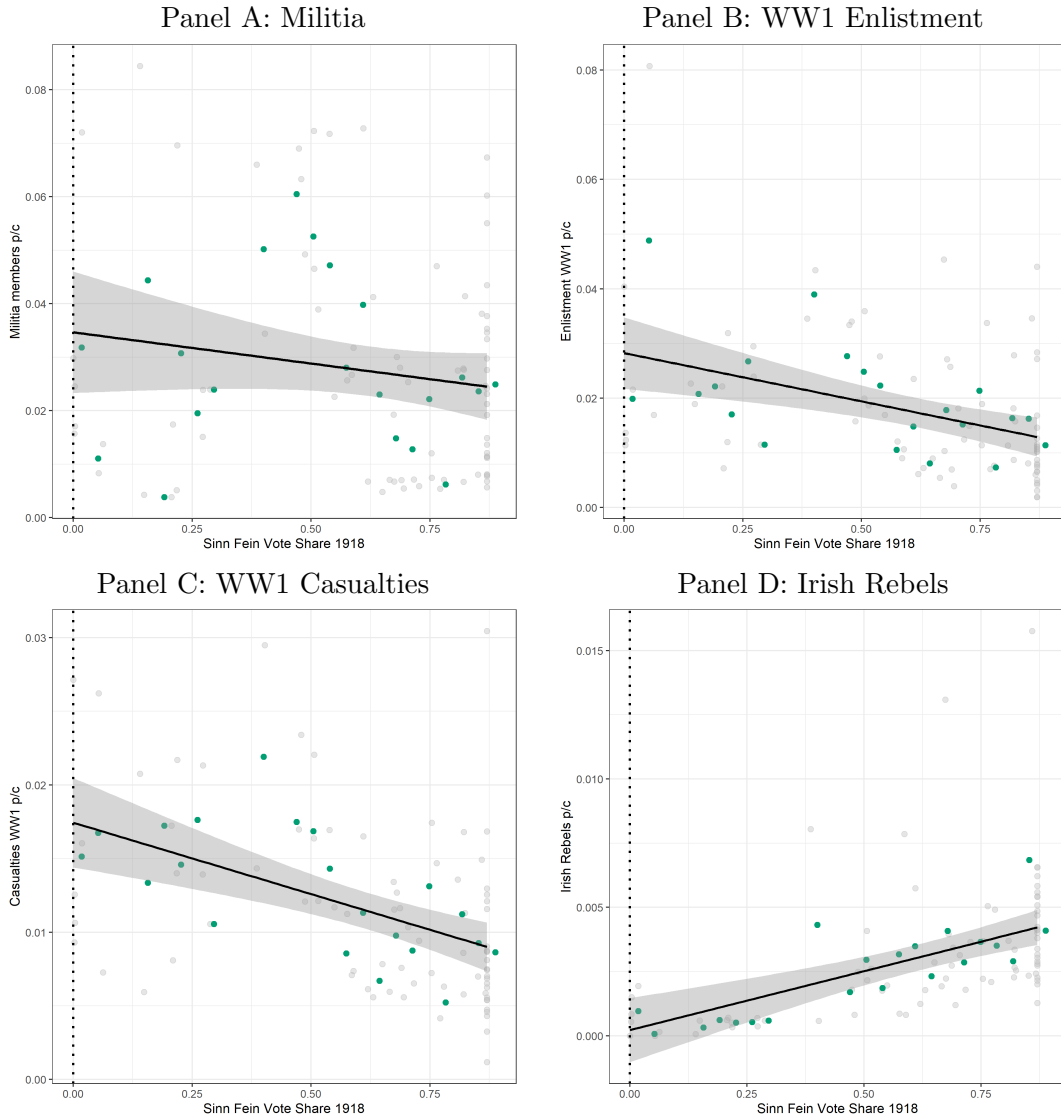
Table A20 – 1911 Correlates of Conflict Participation

	<i>Dependent variable:</i>			
	Militia p/c (1)	Enlistment WW1 p/c (2)	Casualties WW1 p/c (3)	Irish Rebels p/c (4)
Perc. Catholic	−0.014 (0.028)	−0.003 (0.013)	−0.007 (0.014)	0.008* (0.004)
Perc. Irish Speak	−0.008 (0.013)	0.006 (0.006)	0.002 (0.005)	0.002 (0.003)
Perc. Farmer	−0.110* (0.061)	−0.095*** (0.029)	−0.043** (0.020)	−0.005 (0.014)
Perc. Labourer	0.471*** (0.177)	0.113* (0.064)	0.151*** (0.053)	0.022 (0.017)
Literacy	0.029 (0.044)	0.050** (0.025)	0.026 (0.016)	0.023** (0.011)
Perc. Male	−0.353*** (0.108)	−0.061 (0.043)	−0.055 (0.035)	0.005 (0.013)
Population	0.002 (0.003)	0.001 (0.002)	−0.0004 (0.001)	0.0001 (0.001)
Potato Suitability	−0.0001 (0.0002)	0.0002 (0.0001)	0.0001 (0.0001)	0.0001 (0.00004)
July Temp	0.002 (0.008)	−0.004 (0.005)	−0.003 (0.004)	0.001 (0.002)
July Rain	−0.0001 (0.0002)	0.00003 (0.0002)	−0.0001 (0.0001)	0.0001 (0.0001)
Ruggedness	0.034* (0.020)	0.010 (0.014)	0.012 (0.009)	−0.002 (0.002)
Dist Coast	0.003 (0.002)	0.0003 (0.001)	0.0002 (0.001)	−0.001 (0.001)
Dist Belfast	0.021*** (0.007)	0.007 (0.007)	0.009** (0.004)	0.001 (0.001)
Dist Dublin	0.002 (0.010)	0.004 (0.003)	0.002 (0.002)	−0.001 (0.001)
Dist 1798 Battle	−0.005 (0.004)	−0.003* (0.002)	−0.001 (0.001)	−0.0003 (0.0004)
Fixed effects	County	County	County	County
Unit of observation	Barony	Barony	Barony	Barony
Observations	290	296	296	296
Adjusted R ²	0.437	0.246	0.271	0.098

Robust s.e. in parentheses

*p<0.1; **p<0.05; ***p<0.01

Figure A4 – Correlation Between Sinn Féin Vote Share and Conflict Participation

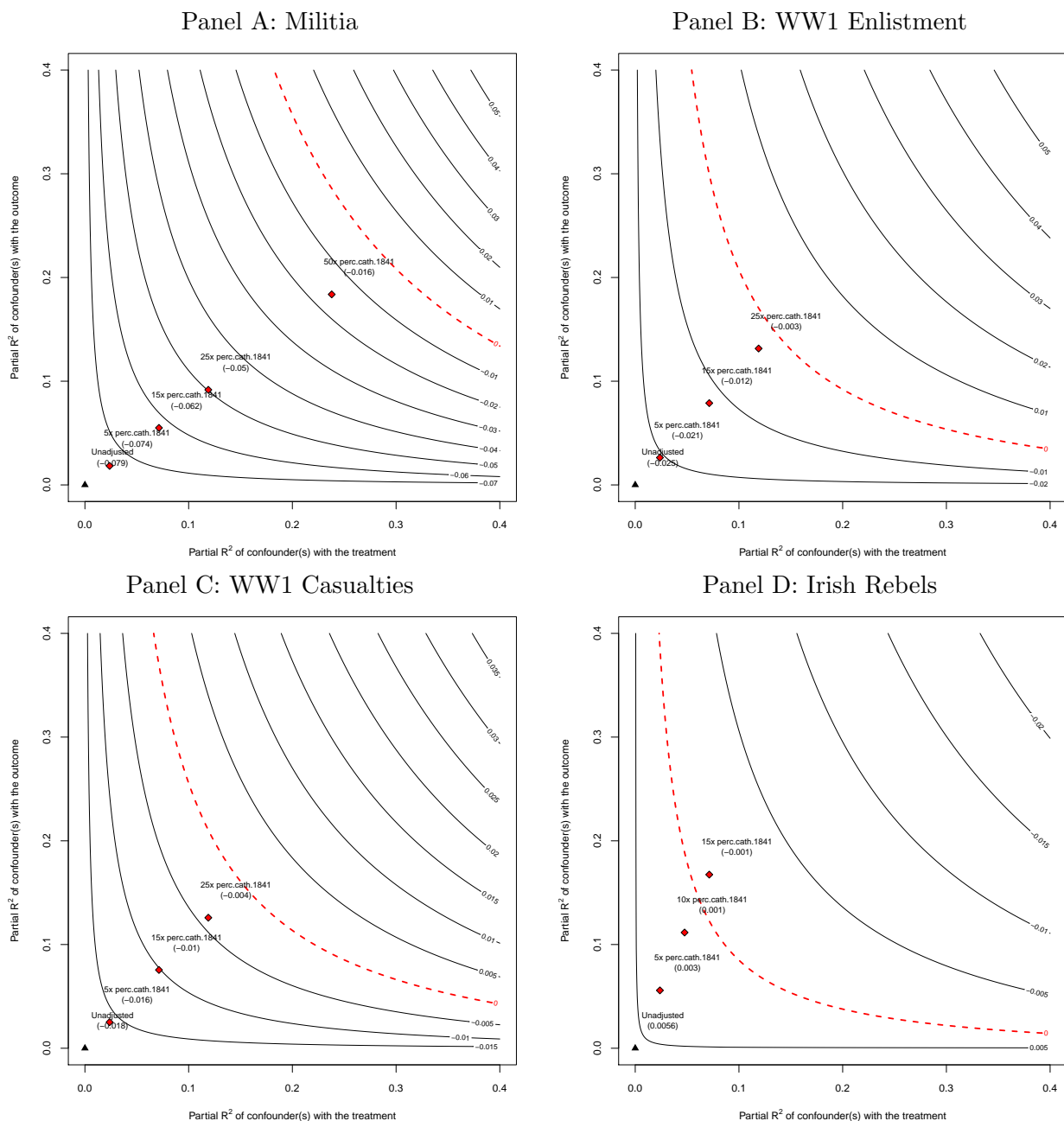


Notes: This figure shows the relationship between Sinn Féin vote share in the 1918 parliamentary election and conflict participation in WW1 and the Irish rebel forces. Bold green dots show the binned averages. The linear relationship between vote share and conflict participation is added.

Table A21 – How grievances and opportunity costs combine to shape the choice to fight.

<i>Panel A: British Militia</i>					
Treatment	Est.	SE	t-value	$R^2_{Y D X}$	RV
Population Loss 1841-1851	-0.0794	0.0169	-4.7049	8.19%	25.74 %
<i>Panel B: WW1 Enlistment</i>					
Treatment	Est.	SE	t-value	$R^2_{Y D X}$	RV
Population Loss 1841-1851	-0.0246	0.0103	-2.3895	2.25%	14.07%
<i>Panel C: WW1 Casualties</i>					
Treatment	Est.	SE	t-value	$R^2_{Y D X}$	RV
Population Loss 1841-1851	-0.0184	0.007	-2.6539	2.76%	15.49%
<i>Panel D: Irish Rebels</i>					
Treatment	Est.	SE	t-value	$R^2_{Y D X}$	RV
Population Loss 1841-1851	0.0056	0.0036	1.5295	0.93%	9.25%

Figure A5 – Sensitivity Analysis



Notes: The horizontal axis specifies a hypothesized strength of association between confounding and the treatment (Population Loss 141–1851), in terms of the partial variance in population loss after accounting for covariates. The vertical axis shows hypothetical values of confounding related to the outcome (conflict participation) in terms of the partial variance explained. The contours demonstrate the adjusted effect implied by each hypothesized level of confounding. The “Unadjusted” conventional estimate is depicted in the bottom left corner, and assumes that there is no confounding. Let us assume that confounding can explain up to 10 times as much residual variance (in both the treatment and outcome) as is explained by the percent of Catholics in a barony. Even if such a strong confounder exists, it would imply that our adjusted effect size is the one marked by 10x perc.catholic1841 on the plot.

G Appendix References

- Blackwell, Matthew. 2014. “A Selection Bias Approach to Sensitivity Analysis for Causal Effects.” *Political Analysis* 22(2): 169–182.
- Cinelli, Carlos, and Chad Hazlett. 2018. “Making Sense of Sensitivity: Extending Omitted Variable Bias.” *Journal of the Royal Statistical Society: Series B (Statistical Methodology)* 82(1): 39–67.
- Coleman, Marie. 2016. “The Military Service (1916–1923) Pension Collection: The Medal Series.” Óglaigh na hÉireann chapter Service Medals and Special Allowances.
- Townshend, Charles. 1979. “The Irish Republican Army and the development of guerrilla warfare, 1916–1921.” *The English Historical Review* 94(371): 318–345.
- Fitzpatrick, David. 1978. “The geography of Irish nationalism 1910–1921.” *Past & Present* (78): 113–144.
- Fitzpatrick, David. 1989. “Emigration, 1801–1870.” In *A New History of Ireland, Volume V: Ireland under the Union 1801–1870*, ed. W. Vaughan. Clarendon Press pp. 562–607.
- Garvin, Tom. 2005. *The evolution of Irish nationalist politics: Irish parties and Irish politics from the 18th century to modern times*. Gill & Macmillan Ltd.
- Guinnane, Timothy W. 1997. *The Vanishing Irish: Households, Migration, and the Rural Economy in Ireland, 1850–1914*. Princeton University Press.
- Hart, Peter. 1997. “The Geography of Revolution in Ireland 1917–1923.” *Past & Present* (155): 142–176.
- Hazlett, Chad. 2020. “Angry or Weary? How Violence Impacts Attitudes toward Peace among Darfurian Refugees.” *Journal of Conflict Resolution* 64(5): 844–870.
- Hornbeck, Richard. 2012. “The Enduring Impact of the American Dust Bowl: Short- and Long-Run Adjustments to Environmental Catastrophe.” *American Economic Review* 102(4): 1477–1507.
- Hornbeck, Richard. 2020. “Dust Bowl Migrants: Environmental Refugees and Economic Adaptation.” *Working Paper*.
- Huff, Connor. 2021. “Counterinsurgency Tactics, Rebel Grievances, and Who Keeps Fighting.” *Working Paper*.
- Ó Gráda, Cormac. 1999. *Black ’47 and Beyond: The Great Irish Famine in History, Economy, and Memory*. Princeton University Press.
- Saleh, Mohamed. 2020. “Export Booms and Labor Coercion: Evidence from the Lancashire Cotton Famine.” *Working Paper*.