TAKING CREDIT
Redistribution and Borrowing in an Age of Economic Polarization

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PRETAX income inequality has risen dramatically across the advanced industrial world since the early 1980s.[1] The causes of this shift in relative earnings are much debated, but the consequences of it are what concern us here. In widely read works, several leading academics and journalists have argued that growing disparities in income and wealth were at the root of the 2008–9 financial crisis.[2] These authors all suggest a similar core relationship: widening gaps in access to economic resources produce turmoil among voters as many see themselves falling further behind while others reap spectacular fortunes. Policies stimulating immediate consumption by extending credit at easy terms were more politically feasible than direct fiscal redistribution from the rich. Raghuram Rajan states this succinctly in reference to the United States:

> [S]triving to rectify the inequality [through fiscal redistribution] may precipitate the very conflict the citizenry wants to avoid. Politicians have therefore looked for other ways to improve the lives of voters. Since the early 1980s the seductive answer has been easier credit . . . Easy credit has large, positive, immediate, and widely distributed benefits whereas all the costs lie in the future.[3]

*Versions of this paper were presented at IPES, MPSA, and ISNIE meetings, as well as at colloquia at Duke University; the Higher School of Economics; University of Konstanz; the London School of Economics and Political Science; Nuffield College, University of Oxford; Princeton University; Purdue University; Stanford University; UCSD; UIUC; UNC; and the University of Wisconsin. We thank Pablo Beramendi, William Bernhard, Carles Boix, Barry Burden, Gary Cox, Tim Frye, Scott Gehlbach, Guy Grossman, Robert Gulotty, Gordon Hanson, Florian Hollenbach, Karen Jusko, Mark Kayser, Bill Keech, Desmond King, Edmund Malesky, Yotam Margalit, Layna Mosely, Philipp Rehm, Graeme Robertson, Jonathan Rodden, Bryn Rosenfeld, David Rueda, Kenneth Scheve, David Soskice, Milan Svolik, Jack van Thomme, and Dwayne Woods for helpful conversations. Sarah Bouchat and Ryan Powers provided research assistance.

Replication code for this article is available at Ahlquist and Ansell 2017a.

[1] Alvaredo et al. 2014.

[2] Chinn and Frieden 2011; Hacker and Pierson 2010; Lewis 2010; McCarty, Poole, and Rosenthal 2013; Piketty 2014; Rajan 2010.

[3] Rajan 2010, 31.

World Politics 69, no. 4 (October 2017), 640–75
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doi: 10.1017/S0043887117000089.

https://doi.org/10.1017/S0043887117000089 Published online by Cambridge University Press

More provocatively, Thomas Piketty claims:

> In my view there is no doubt that the increase of inequality in the United States contributed to the nation's financial instability. The reason is simple: one consequence of increasing inequality was virtual stagnation of the purchasing power of the lower and middle classes in the United States, which inevitably made it more likely that modest households would take on debt, especially since unscrupulous banks and financial intermediaries, freed from regulation and eager to earn good yields on the enormous savings injected into the system by the well-to-do, offered credit on increasingly generous terms.[4]

The claims that widening income inequality leads to greater levels of household borrowing and increased financial fragility have four embedded premises. First, rising inequality affects the demands for access to economic resources. Second, the demands for more resources can be satisfied either by redistributing income from richer to poorer citizens or by providing access to credit. That is, resources can either be transferred across income groups or across time periods. Third, politicians in the United States find direct, redistributive policies politically unattractive. Accordingly, they promoted credit policies that made household borrowing easier.[5] Hence, widening pretax income gaps in the US induced households to save less current income to maintain relative consumption, thereby driving demand for credit. Fourth, this level of borrowing is unsustainable, and in this case led to the financial crisis.

In this article, we do not interrogate each step in the argument, but turn to an implication of the first three: in the face of rising inequality more aggressively redistributed pretax income would have resulted in less borrowing. We move beyond existing claims in two ways. First, the theoretical mechanisms presented by Rajan and Piketty connecting inequality, redistribution, and credit are underspecified. Our theoretical approach provides a clear mechanism related to positional goods that demonstrates how prevailing levels of redistribution shape the connection between inequality and credit. Second, although Rajan focuses on the United States, properly examining this implication necessarily entails a cross-national, comparative approach that takes seriously variation in how rising inequality might translate into demands for credit that differ depending on the institutional and policy context.

[4] Piketty 2014, 297.

[5] Note that Rajan, Piketty, and others are equivocal about whether policymakers choose credit-promoting policies specifically to address widening income disparities or whether these policies emerged for other reasons, but had a catalytic effect on borrowing.

https://doi.org/10.1017/S0043887117000089 Published online by Cambridge University Press

We emphasize a demand-side mechanism connecting inequality, redistribution, and credit that combines models of "expenditure cascades" and fiscal redistribution.[6] We argue that rising income inequality produces positional externalities in consumer spending.[7] These externalities, especially in housing and education, induce households to reduce savings or to borrow to maintain relative consumption. Fiscal redistribution can blunt this effect of inequality on credit demand by reducing the gap in disposable incomes between rich and poor. The extent of fiscal redistribution, in turn, is conditional on the historical patterns of government partisanship. Countries in which left-wing parties are frequently represented in governing coalitions have substantially higher levels of redistribution than those in which the center and right dominate.[8] In sum, we argue that in countries with traditions of left-wing government, the connection between inequality and credit will be substantially weaker.

We rely on variation in the relationship between long-run partisan control of government and the prevailing level of redistribution to gain empirical leverage on the connection between income inequality and household borrowing. Our empirical strategy for better identifying the relationship between inequality and borrowing takes advantage of the long-run nature of partisan control, related at least in part to rarely changing electoral systems established several decades in the past.[9] This strategy provides us with a way of circumventing endogeneity and measurement problems with fiscal redistribution. We build a Bayesian hierarchical model and establish that among eighteen OECD democracies, increased pretax inequality is linked to more rapid growth in credit, but only in countries where left parties rarely participate in government.[10] Our findings have implications for financial-system risk; in an era of rising inequality, countries with less redistributive governing coalitions could be particularly prone to household-driven credit booms.

The article is composed of four sections. The first section reviews current thinking around inequality, redistribution, credit, and financial crises. In section two, we build on existing models to describe the link between inequality, household consumption decisions, and the politics

[6] Respectively, Frank, Levine, and Dijk 2005; Meltzer and Richard 1981.
[7] Hirsch 1978.
[8] Iversen and Soskice 2006.
[9] Ticchi and Vindigni 2009
[10] The countries are Australia, Canada, Denmark, Finland, France, Germany, Italy, Ireland, Japan, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and the United States. We focus on the 1980–2010 period, but include data as far back as 1963 in some analysis and figures.

https://doi.org/10.1017/S0043887117000089 Published online by Cambridge University Press

of redistribution. The third section presents our empirical models, and the fourth section concludes.

Existing Work

Inequality and the Demand for Credit

The connection between inequality and redistribution is well-tilled soil in the study of political economy, with a wide range of theoretical expositions and empirical estimations. By contrast, scholarship connecting inequality and the demand for credit is newer terrain. In the former case, Allan Meltzer and Scott Richard provide the canonical model linking inequality and fiscal redistribution, and develop a mechanism by which rising inequality in pretax incomes produces incentives for the median voter to demand higher taxes to redistribute further down the income ladder.[11] Despite the clarity and intuitiveness of this Robin Hood model, empirical support for the claim is at best mixed. Cross-nationally, among developed countries the reverse pattern appears to hold, with countries that are more unequal redistributing less. Lane Kenworthy and Jonas Pontusson find some evidence that within-country increases in inequality lead to more redistribution, although Torben Iversen and David Soskice note that this result appears to be due to built-in features of existing policy rather than to any shift in citizen preferences or a change in policy.[12] Vladimir Gimpelson and Daniel Treisman find that people are generally poorly informed about their place in the income distribution, but those who perceive themselves as relatively disadvantaged prefer greater redistribution.[13] Regardless of the empirical relationship, it remains the case that redistribution *could* provide one policy solution to median voter demands for a share of the spoils of rising inequality.

Studies connecting inequality to borrowing and credit are scant and worth considering at greater length. Existing research typically takes one of two approaches to link inequality to credit. The first emphasizes the ways in which inequality affects *credit supply*. Michael Kumhof, Romain Rancière, and Pablo Winant construct a model in which increased inequality leads to increased savings by the rich, and hence to greater credit availability, and ultimately to credit booms and crashes.[14] The supply of capital from the enriched elite explains one part of the

[11] Meltzer and Richard 1981.
[12] Kenworthy and Pontusson 2005; Iversen and Soskice 2015.
[13] Gimpelson and Treisman 2016.
[14] Kumhof, Rancière, and Winant 2015.

https://doi.org/10.1017/S0043887117000089 Published online by Cambridge University Press

connection between inequality and credit. Individuals farther down the income distribution borrow more to maintain consumption following a loss of relative income.[15] The view that inequality alters the ability of individuals with different incomes to save dates back to John Maynard Keynes.

A very different strand of work—and one we draw on heavily—emphasizes how inequality might affect the *demand for credit*, building on Fred Hirsch and Robert Frank's notion of "positional goods."[16] Positional goods are those from which individuals derive benefit, at least in part, from the good's social scarcity, that is, the fact that not everyone can have it, regardless of how rich they are. Like a purely private good, the consumption of a positional good *G* by person *i* prevents person *j* from enjoying *G*. But unlike a private good, *i*'s consumption of *G* also imposes a cost on *j* for not having acquired *G*. Typical examples of positional goods include desirable housing and access to elite educational institutions; many expend resources competing for them, but few win positions.[17] If you get a spot at the elite college and I do not, then not only do I not get the elite college experience, but I also pay the cost of having not gone to the elite college while you have. Indeed, this notion is baked in to the very word *elite*.

Competition over positional goods is thus reminiscent of an auction in which relative income determines who gets to enjoy the good. Positional externalities emerge when too many people bid in the auction because the final price of the good does not factor in the costs imposed on the losers. Importantly, positional externalities can emerge without invoking emotional motivations like aspirational consumption or envy, although such motivations can clearly play a role as well.

How does inequality connect to positional consumption? Frank, Seth Levine, and Oege Dijk argue for the existence of "expenditure cascades."[18] As the dispersion of incomes increases, those at the top spend relatively more competing over positional goods. This spending in turn affects relative prices of important positional goods for the next income group, driving up spending through the income distribution. A classic example is housing. Janna Matlack and Jacob Vigdor show that rising inequality increases average rents in tight housing markets.[19]

[15] Other than cross-national variation in inequality, what explains variation in credit supply in this model is not obvious. Furthermore, presuming internationalized credit markets, we would expect credit supply to be determined by trends in global, rather than domestic, inequality.

[16] Hirsch 1978 and Frank 1985.

[17] Frank 1985; Bogaerts and Pandelaere 2013; Solnick and Hemenway 2005.

[18] Frank, Levine, and Dijk 2005.

[19] Matlack and Vigdor 2008.

https://doi.org/10.1017/S0043887117000089 Published online by Cambridge University Press

Concern for relative position affects immediate consumption choices and also, once intertemporal decision making is examined, savings and borrowing.[20] The intuition here is twofold. First, agents are making choices in an early period that affect their likely position in the consumption distribution in later periods, inducing a willingness to gamble on future position. Second, certain positional goods may need to be purchased "early" to have value in terms of relative consumption. For example, sending children to private school cannot be done when they are beyond school age.[21] Notably, housing and education, particularly higher education, are important positional goods and ones for which people readily go into debt.[22] Even in the case of public education, housing prices reflect perceived school quality and drive increased mortgage debt.[23] In sum, the positional consumption literature suggests that rising income inequality should translate into higher borrowing for spending on positional goods. Importantly, this literature implicitly focuses on disposable income, ignoring the redistributive wedge between pre- and postfisc incomes.[24]

Empirical studies at the micro- and macrolevel confirm a link between inequality and individual consumption and borrowing choices. Moritz Drechsel-Graua and Kai Schmid use German panel data to show that increasing consumption by richer households leads to substantially increased consumption by those lower down the income ladder.[25] Dimitris Georgarakos, Michael Haliassos, and Giacomo Pasini use Dutch survey data to show that those with incomes below the average of their social peers are more likely to take out both collateralized and unsecured loans.[26] Marianne Bertrand and Adair Morse look at variation in inequality across US states and find evidence that greater expenditures by the rich (those above a state's 80th income percentile) are associated with greater consumption by everyone else and greater reported financial duress and higher rates of personal bankruptcy.[27] In addition, laboratory experiments show that positional externalities reduce savings and increase consumption by lower-ranked individuals.[28]

[20] Ray and Robson 2012.
[21] Frank 1985, 196.
[22] Sullivan, Warren, and Westbrook 2006.
[23] Gingrich and Ansell 2014.
[24] Prefisc refers to market income prior to the payment of any taxes of the recipients of any benefits. Postfisc income is market income less taxes and plus benefits.
[25] Drechsel-Graua and Schmid 2014.
[26] Georgarakos, Haliassos, and Pasini 2014.
[27] Bertrand and Morse 2016.
[28] Feltovich and Ejebu 2014.

https://doi.org/10.1017/S0043887117000089 Published online by Cambridge University Press

In terms of cross-national data, Michael Bordo and Christopher Meissner use a panel data set and find no evidence of greater inequality leading to more credit in the economy.[29] Using a different data set, Tuomas Malinen finds the opposite: rising inequality is linked to greater private sector borrowing.[30] Both studies use pretax inequality, but neither accounts for cross-national heterogeneity in how inequality might affect credit demand. In particular, neither study accounts for the potential importance of redistributive interventions by the state that might moderate the impact of inequality on credit—the focus of our theoretical and empirical account.

Politicians and the Supply of Credit

Following the credit boom and bust of the first decade of the twenty-first century, scholars began to examine the political economy of the supply of credit. Implicit in much of this analysis are the assumptions that rising inequality has produced greater demand for resources from the citizenry in the wake of stagnating median wages and that easier access to credit has been a politically convenient way to satisfy these demands. Political economists have examined a wide range of credit-access policies in the United States and beyond. And although these studies provide engrossing accounts of the pressures from citizens and interest groups on politicians to provide cheap credit, particularly in the absence of redistributive programs, they often lack explicit, generalizable theoretical mechanisms. Following the discussion of the contemporary literature on the politics of credit below, we provide a clear account connecting inequality, credit, and redistribution.

The lion's share of work on the politics of credit in recent years focuses on the American case, not least because of its identification as patient zero in the global financial crisis. Nolan McCarty, Keith Poole, and Howard Rosenthal, for example, argue that US politicians tried to stimulate private borrowing in lieu of more aggressive fiscal redistribution. But the focus of their argument about the trade-off between redistribution and credit is largely limited to policies promoting homeownership rather than the broader redistributive terrain. For example, they argue that aversion to redistribution meant housing policy avoided fiscal transfers for down payments in favor of a "loosely-regulated mortgage market."[31]

[29] Bordo and Meissner 2012.
[30] Malinen 2013.
[31] McCarty, Poole, and Rosenthal 2013, 129.

https://doi.org/10.1017/S0043887117000089 Published online by Cambridge University Press

A series of important book-length treatments also argue that American politics has a particular bias toward providing credit rather than redistribution. For Monica Prasad, access to housing credit in the United States—what she calls "American mortgage Keynesianism"—substitutes for the welfare state, an argument that draws on seminal work by Jim Kemeny.[32] Prasad argues that US citizens are willing to forego social insurance provided they can privately insure against risk through housing, but that access to housing requires cheap and readily available credit.[33] In contrast, for Greta Krippner the expansion of consumer credit in America is a response to the inflation of the 1970s and the "fiscal crisis of the state" in the 1980s that forced a reliance on open capital flows and the financialization of the economy.[34] Similarly Menzie Chinn and Jeffry Frieden argue that endemic US fiscal deficits from the 1980s onward led to an ever-growing dependence on borrowing from abroad. This borrowing had "attractive political features . . . for thirty years, working-class and middle-class Americans had seen their incomes stagnate … access to easy credit and easily financed consumption helped take the edge of this resentment."[35]

In addition, Atif Mian, Amir Sufi, and Francesco Trebbi focus on the incentives of US politicians to increase homeownership among low-income Americans, arguing that the lowered lending standards set the stage for the financial crisis.[36] By contrast, Manuel Adelino, Antoinette Schoar, and Felipe Severino argue that middle-income and poor Americans borrowed unsustainably, implying that policies supplying cheap credit and inequality-induced demand for cheap credit played roles in the credit bubble.[37] Thus, cheap credit emerges as a solution to weak provision of social insurance, the need to finance deficits, and well-meaning measures to aid poorer citizens. Although each argument casts the American experience quite distinctly, the commonality is that higher taxation and redistribution ought to have reduced incentives for US politicians to support policies leading to high levels of debt. Our argument below makes this claim explicit.

Although the US has been a crucial case for the literature on the politics of credit, a number of scholars have examined cross-national patterns in credit provision. Frances Rosenbluth and Ross Schaap argue

[32] Prasad 2012; Kemeny 1981.
[33] See also Ansell 2014.
[34] Krippner 2012.
[35] Chinn and Frieden 2011, 15.
[36] Mian, Sufi, and Trebbi 2010. See also Mian and Sufi 2015.
[37] Adelino, Schoar, and Severino 2016.

https://doi.org/10.1017/S0043887117000089 Published online by Cambridge University Press

that the cost of borrowing is higher for consumers in countries with proportional representation or mixed electoral systems, such as Germany and Japan (pre-1995), than in countries with majoritarian electoral systems, such as the UK and the United States.[38] Herman Schwartz provides a more extensive account of comparative differences in consumer financing, particularly for housing, arguing for structural differences between net borrowers (the "Americanized rich") and net lenders (the "repressed rich") across the OECD.[39] But Waltraud Schelkle notes that the United States in fact had a smaller housing bubble and longer-term mortgage contracts than did Britain and France, although the American response to the crisis was indeed more hands-off than the response in Continental Europe.[40] Gunnar Trumball argues that the French and American consumer finance regimes are in fact substantially more similar than Schwartz's dichotomy suggests.[41] This similarity implies that relationships between inequality and credit may well hold cross-nationally, albeit moderated by the effects of national institutions.

Although these works on the politics of credit are timely and insightful, they lack a systematic account of how rising inequality feeds growth in credit and of how the redistributive policy landscape shapes this relationship. The mechanisms offered tend to be country or period specific. Exactly how a larger welfare state or more redistribution might reduce credit remains largely unspecified. To understand cross-national variation in the connection between inequality and credit, we need a clearer account of exactly *how* differences in the redistributive environment matter. We next turn to developing our argument linking inequality, redistribution, and credit.

Theory: Inequality, Redistribution, and Credit

In this section we build a simple formal model of positional goods, redistribution, and borrowing decisions. The model shows that rich-to-poor redistribution reduces positional externalities in consumption and accordingly, that greater levels of redistribution limit the effects of rising pretax inequality on borrowing. In the supplementary material we provide a fully developed model of expenditure cascades that incorporates a redistributive tax.[42] Here we provide the basic framework of our

[38] Rosenbluth and Schaap 2003.
[39] Schwartz 2009.
[40] Schelkle 2012.
[41] Trumball 2012.
[42] Ahlquist and Ansell 2017b.

https://doi.org/10.1017/S0043887117000089 Published online by Cambridge University Press

theory, which enables us to develop the hypotheses about cross-national variation in the inequality-credit connection that we examine empirically in the subsequent section.

We begin by setting out the argument informally. We draw on the positional goods argument made by Frank, and argue that rising inequality increases individuals' desire to engage in greater consumption in the present, which drives up borrowing.[43] Put simply, where average citizens see the rich spending more, they adjust their own consumption upward, drawing on future resources by borrowing. The mechanism behind this could be a pure keeping-up-with-the-Joneses effect drawn from the psychological need to engage in conspicuous consumption for status reasons.[44] Alternatively, it could emerge as the rich driving up the costs of positional goods, such as housing and education, even as median incomes stagnate.[45] Redistributive taxation weakens this connection in two ways. First, on the tax side it reduces the net incomes of the rich, thereby curtailing their consumption and its effect on positional goods. Second, it increases the net incomes of poorer and middle-income citizens thereby reducing their demand for credit to maintain or increase consumption. Hence, in countries with higher levels of redistribution, all else equal, the connection between pretax inequality and credit should be weaker.

We now turn to a formal development of this claim. Our model draws together the effects of inequality and redistribution on positional consumption.[46] We follow Iversen and Soskice and Torsten Persson and Guido Tabellini, and examine a two-period economy with three equally sized groups, $J \in \{H, M, L\}$, each with group-specific exogenous first-period incomes, y_J, where $y_H > y_M > y_L$.[47] Following Frank, Levine, and Dijk, individuals have Cobb-Douglas preferences over first- (current) and second- (future) period consumption.[48] Each individual decides what proportion of their income, net of taxes, to consume during the first period, denoted c_J, receiving the remainder in the second period. We assume that a flat income-tax rate, t, on first-period income is used to fund a lump sum transfer, g, received by all citizens in the first period. We also assume that individuals have exogenous second-period income, f_J, which permits them to borrow today (allowing $c_J > 1$).[49]

[43] Frank 1985; Frank 2013.
[44] Veblen 2009.
[45] Frank 2013.
[46] See Frank, Levine, and Dijk 2005 on inequality, and Bilancinia and Boncinelli 2012 on redistribution.
[47] Iversen and Soskice 2006; Persson and Tabellini 1999.
[48] Frank, Levine, and Dijk 2005.
[49] By restricting taxation and redistribution to the first period, we thus focus our attention on how

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To capture positional consumption, we allow agents to care about consumption relative to their peers. We assume that in the first period, lower- and middle-income citizens compare their consumption, $c_J y_J$, to the expected consumption of the rich, $\hat{c}_H y_H$.[50] We use the parameter π to capture the importance of positional consumption. Putting all this together, we have the following group-specific utility function:

$$u_J = [(1-t)c_J y_J + g - \pi(1-t)(\hat{c}_H y_H - c_J y_J)]^{(1-\alpha)}[(1-t)(1-c_J)y_J + f_J]^{\alpha}. \quad (1)$$

A full derivation of each agent's preferred level of consumption, denoted c_J^* is presented in the supplementary material.[51] We next examine the effects of an increase in inequality (produced by a rising y_H, holding the other two groups' incomes constant) on the preferred consumption of the poorer two groups, *L* and *M*. This produces the following result:

$$\frac{\partial c_J^*}{\partial y_H} = \alpha\left[\pi(1-t)\hat{c}_H - \frac{t}{1-t}\frac{1}{y_J}\right] \text{ for } J \in \{L, M\}. \quad (2)$$

Rising inequality has two consequences for the consumption and borrowing decisions of lower- and middle-income citizens. First, there is a positive effect, $\pi(1-t)\hat{c}_H$, which represents the impetus for both groups to consume more and save less as the consumption of the rich rises—the positional goods effect. Second, there is a negative effect, $-\frac{t}{(1-t)y_J}$, which occurs because higher inequality produces a greater absolute amount of redistribution to lower- and middle-income groups in the first period. This higher net income reduces their desire to borrow more to engage in current consumption.

Higher taxation thus negatively affects the desire to borrow galvanized by rising inequality in two ways: it reduces the size of the first effect noted above and increases the size of the second one (put formally, $\frac{\partial^2 c_J^*}{\partial y_H \partial t} < 0$). First, higher taxes reduce the net income of the rich

changes to net current income affect private saving and borrowing decisions. We discuss this assumption at greater length in the supplementary material. Ahlquist and Ansell 2017b.

[50] This comparison could be purely aspirational, capturing keeping-up-with-the-Joneses motivations, or it could reflect the increased cost—relative to a group's fixed income—of positional goods as the incomes of the richest group rise. These goods typically need to be bought "earlier" to be valued (schooling is the most obvious example). Accordingly, the comparison to the consumption of the rich is made during only the first period.

[51] Ahlquist and Ansell 2017b.

https://doi.org/10.1017/S0043887117000089 Published online by Cambridge University Press

and therefore their level of consumption. Accordingly, higher taxes compress the difference in consumption between the rich and the rest, and thereby reduce the positional consumption effect. Second, higher taxes lead to larger redistributive transfers that increase the non-rich's income in the first period, reducing the incentive to consume private income in that period. Where redistribution is higher, we should be less likely to see demand for higher consumption and hence, less demand for credit in response to growing inequality.

To recap the basic intuition of the model, imagine there is a median-preserving rise in income inequality such that the rich become relatively richer. If positional consumption motivations are important, this increase results in greater consumption and reduced savings (or increased borrowing) among the middle-income and poorer groups as the relative price of positional goods rises. Assuming that many positional goods must be bought earlier rather than later, this preference for higher consumption also produces a greater demand for credit as agents borrow against future earnings. All else equal, a widening gap in incomes increases credit demand. Higher levels of redistribution weaken this effect because they reduce the gap in disposable income that can be used to buy positional goods. The rich are postfisc poorer and the poor are postfisc richer. Thus the positive effect of pretax inequality on credit demand is reduced as redistribution rises.

Although the model most clearly builds on relative consumption comparisons among citizens, it also fits the case where rising inequality produces credit demand due to stagnating median wages. Positional consumption motivations tend to emerge when citizens compete over goods for which the supply is fixed in the short or medium term, such as housing and quality education. Rising inequality allows the rich to bid up the prices of these goods. If poorer citizens have inelastic demand for these goods and cannot reduce their consumption, then they find more and more of their income devoted to expenditure on them. When rising inequality is produced by stagnant median wages and rising incomes at the top, the prices of positional goods rise and middle-income citizens find themselves saving less or borrowing more to purchase the same goods, just as in our simple model. Credit demand can emerge from the base motivation of keeping up with the Joneses *and* from the squeeze on middle-class incomes produced by the rising cost of goods, such as housing and education. Both mechanisms are essentially positional.

Credit demand provides a mechanism connecting redistribution to an attenuated relationship between pretax inequality and credit, but

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examining contemporary levels of redistribution alone is problematic from both a theoretical and empirical standpoint. If inequality and redistribution are connected as the Meltzer-Richard model implies, then we need to be able to separate out the effects of redistribution that occur in response to rising inequality (and hence, are endogenous) from those that reflect the long-run historical patterns of fiscal development that predate subsequent rises in inequality. Indeed, our model takes the redistributive environment as fixed and examines borrowing choices. More specifically, private consumption decisions are substantially more flexible than prevailing national levels of redistribution. Accordingly, if we wish to explain cross-national differences in the connection between rising inequality and growing credit, we must turn to theories explaining long-run, cross-national differences in redistribution.

Although tax and spending levels are political decisions, they display marked stability due to the policy design of welfare-state institutions and tax codes. Many scholars have argued that major public policy programs, especially the welfare state, exhibit path dependence for both economic and political reasons.[52] The level, structure, and fiscal progressivity of redistribution are produced by the slow accretion of policy decisions over decades that once in place are difficult to alter rapidly. Cross-national differences in redistribution are, we argue, largely a product of the partisan composition of government over the long run. We follow the tradition of scholars from both the power resources and comparative political economy traditions in arguing that cumulative left-wing control of government produces higher rates of spending and taxation.[53] Since governments can rarely reverse all the policy accomplishments of their predecessors, what matters is the frequency with which left and right parties have governed in the postwar era, as opposed to the partisanship of the prevailing government in any particular period.

In the empirical analysis below, we use cumulative left-government as our proxy for long-run levels of redistribution that shape the expectations of citizens when they make borrowing and consumption choices. Frequent left-wing participation in government has been more common in countries operating under proportional electoral systems[54]—institutions that are themselves exogenous to credit demand. Empirically, we find that the cumulation of left-wing rule itself, rather than other aspects of electoral proportionality, appears to drive this relationship. This

[52] Pierson 2000; Gingrich 2015.
[53] Boix 1998; Bradley et al. 2003.
[54] Iversen and Soskice 2006.

https://doi.org/10.1017/S0043887117000089 Published online by Cambridge University Press

finding bolsters our confidence that redistributive policy drives cross-national variation in the inequality credit-demand relationship.

What about cross-national differences in credit supply—another potential connection between inequality and borrowing. We do not deny that there are systematic cross-national patterns in the price and supply of credit that are related to the governance and regulation of the financial sector.[55] But the arguments relating credit supply to inequality, for example that of Kumhof, Rancière, and Winant, are less likely to be affected by cross-national differences.[56] These arguments assume that inequality pushes up the credit supply due to the rich becoming richer but having lower propensity to consume. This new glut of savings is not nationally constrained; it increases the supply of global savings available to borrow across *all* countries. Hence, there is likely to be a weaker connection between national inequality and national credit supply in contrast to the national inequality and credit demand story where domestic rates of taxation are crucial to the mechanism.

Empirics

Our empirical strategy is to estimate reduced-form models and to compare the empirical results with the expectations derived from our theoretical framework. Our theory implies that higher levels of fiscal redistribution will attenuate any relationship between rising pretax inequality and household savings and credit use. But rigorous examination of this claim poses a number of challenges. To begin, measuring fiscal redistribution requires comparable data on both the pre- and posttax income distributions, and the availability of such data, especially on a consistent longitudinal basis, is extremely limited. Even if the data were available, simply regressing credit on redistribution runs into serious endogeneity problems since both redistribution and credit may be endogenous to pretax inequality.

The path diagram in Figure 1 outlines the rationale of our approach. The long-run history of partisanship and its effect on the development of redistributive policy shaped over many years prior to the period we analyze is credibly exogenous to existing levels of inequality and credit, thereby providing a way around the data limitations and the endogenous inequality-redistribution relationship.

Figure 1 also clarifies why we focus on pretax incomes in the empirical analysis. The positional consumption argument holds that rising disposable income inequality will lead to reduced saving and more

[55] See Chang et al. 2010; Rosenbluth and Schaap 2003.
[56] Kumhof, Rancière, and Winant 2015.

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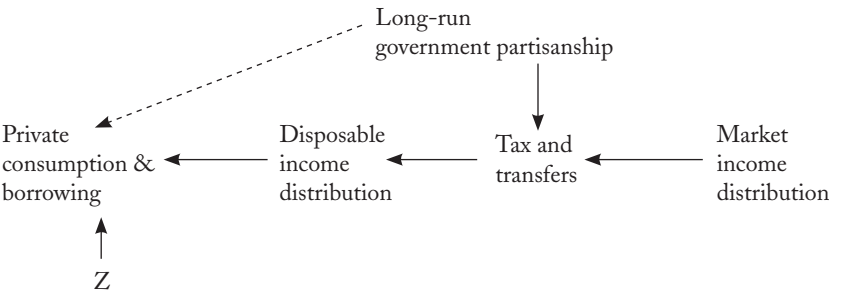


FIGURE 1
STATIC PATH DIAGRAM UNDERLYING THE EMPIRICAL MODEL[a]

[a] *Z* is other exogenous covariates.

borrowing. All else equal, the relationship between credit and postfisc inequality should be the same regardless of the level of redistribution, which tells us nothing about whether fiscal redistribution and consumer credit are substitutes. Moreover, the dashed line represents the fact that all else may not be equal. Long run–government partisanship may affect credit levels in ways beyond the partisan/redistributive channel. As a result, postfisc inequality is uninformative about the mechanisms in our argument.

Long run–government partisanship cannot be used as a formal instrument for redistribution because we do not have sufficient data on redistribution and we find the exclusion restriction unsustainable here. But we can discern whether long-run partisanship conditions the relationship between credit and pretax inequality, giving us the ability to empirically examine parts of our argument and move the literature forward.

DATA AND MEASUREMENT

Our core analysis uses a panel data set covering eighteen OECD countries from 1980–2010.[57] The main constraint that generates this restricted time period is the availability of several covariates. Simpler models excluding these covariates are reported in the supplementary material.[58] Findings with the longer time frame are actually stronger than those reported here, but given the observational nature of the study, we discuss the full model in the main text since we believe it important to condition on as many potential confounders as possible.

To measure the extent of private sector credit, we follow the current

[57] In the supplementary material we report results from iteratively removing each country. Substantive conclusions do not change. Ahlquist and Ansell 2017b.

[58] Ahlquist and Ansell 2017b.

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standard and use real credit as percent of GDP, taken from the 2012 update of the well-known, cross-national data set on financial sectors by Thorsten Beck, Asli Demirgüç-Kunt, and Ross Levine.[59] This measure includes credit provided by banks and nonbank financial institutions, and displays substantial variation both across countries and over time. Although scholars focusing on the financial crisis in the United States have zeroed in on housing credit and mortgage securitization as the relevant policy areas, we have no reason to believe real estate finance is the only policy area relevant to household credit conditions. We therefore look at the outcome of interest—aggregate private borrowing—rather than specific credit types or policy variables. Note that this variable is an economy-wide aggregate; it cannot speak to who is borrowing or where they are doing so. Although this lack of more fine-grained data is unfortunate, we view it as a necessary initial price to pay to take advantage of cross-national differences in redistributive context. Future work is needed to both better identify what parts of the income distribution react to changing inequality most readily and the geographic context in which these people are embedded.

We include three covariate terms to model the relationship of theoretical interest: pretax income inequality, a measure of long-term partisanship, and an interaction between the two. We use the Piketty-Saez top-income shares data, specifically the top 1 percent income share (including capital gains, when available), as our indicator of inequality, updated to 2010.[60] In addition to being a pretax measure of market income inequality, the top-income shares data have the virtue of better cross country availability and comparability and better longitudinal coverage than any alternative. The top 1 percent measure also resonates with the claims made by Rajan, Chinn and Frieden, Piketty, and others.[61] We interpolate missing values for intermittently reported series and lag this variable by one year.

We construct a series of statistical models using long-run cabinet composition as the core mechanism connecting electoral system to redistribution.[62] Our preferred indicator is cumulative left government, defined for country i in year t as the proportion of cabinet seats held by parties of the left, as defined in Klaus Armingeon and colleagues, averaged over 1960 to t.[63] This measure changes slowly for the years we analyze (1980–2010), yet incorporates contemporary government con-

[59] Beck, Demirgüç-Kunt, and Levine 2000.

[60] Piketty and Saez 2006. Results are qualitatively similar if we use inequality excluding capital gains. See the supplementary material. Ahlquist and Ansell 2017b.

[61] Rajan 2010; Chinn and Frieden 2011; Piketty 2014.

[62] Iversen and Soskice 2006.

[63] Armingeon et al. 2012. Within each year cabinet seat representation is weighted by days for

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ditions.[64] Below, we discuss the links between our cumulative left-government variable and three measures of electoral institutions.

Figure 2 suggests that there is a visible, positive connection between lagged top income shares and credit in the domestic economy in the 1961–2010 period.[65] The figure also highlights that the strongest part of this relationship is driven by country-years that have high levels of inequality and a limited history of left government.

Observed credit in the economy is an equilibrium quantity, so we include a slate of additional covariates meant to conform to other studies and to account for other plausible drivers of private sector credit demand and supply. We include GDP (logged) and GDP growth to capture business cycle effects and the fact that our response variable is standardized by GDP. To capture the business cycle experienced by consumers, we include the harmonized unemployment rate taken from the OECD. We also include log population and population growth. The GDP and population variables are taken from the updated Penn World Tables.[66] We include the proportion of the population sixty-five years old and over to account for possible life cycle/demographic trends.[67]

There may be concerns that our use of total credit combines credit to households and credit to firms. To capture firms' investment activities we follow Bordo and Meissner and Malinen, and condition on gross fixed capital formation (GFCF) as a percent of GDP, taken from the OECD.[68] Note that in the supplementary material we report models using the average household savings rate as our dependent variable and produce results with a similar interpretation to those shown below.[69] Because government borrowing may affect credit availability indirectly by crowding out private borrowing, we include the lag of the government budget balance (negative numbers imply deficits).

International economic flows can also affect credit availability.[70] As such, we include the lag current account balance to directly account for capital inflows. Several commenters on the global financial crisis, including Rajan, have also expressed concern with savings imbalances and

which each party was in the cabinet. We also note that empirical results replacing cumulative left participation with the cumulative average partisanship of the government, also taken from Armingeon et al. 2012, are nearly identical. See the supplementary material. Ahlquist and Ansell 2017b.

[64] We also fit models using *lagged government partisanship* rather than *cumulative left government* as the key variable. Simple partisanship variables did not appear as meaningful predictors of credit, giving us further confidence that our cumulative partisanship variable is capturing the enduring impact of political institutions rather than a simple contemporary partisanship effect.

[65] We have data for ten countries in 1961, thirteen by 1963, and eighteen by 1982.

[66] Heston, Summers, and Aten 2002.

[67] OECD 2014.

[68] Bordo and Meissner 2012; Malinen 2013; OECD 2014.

[69] Ahlquist and Ansell 2017b.

[70] Caballero 2016.

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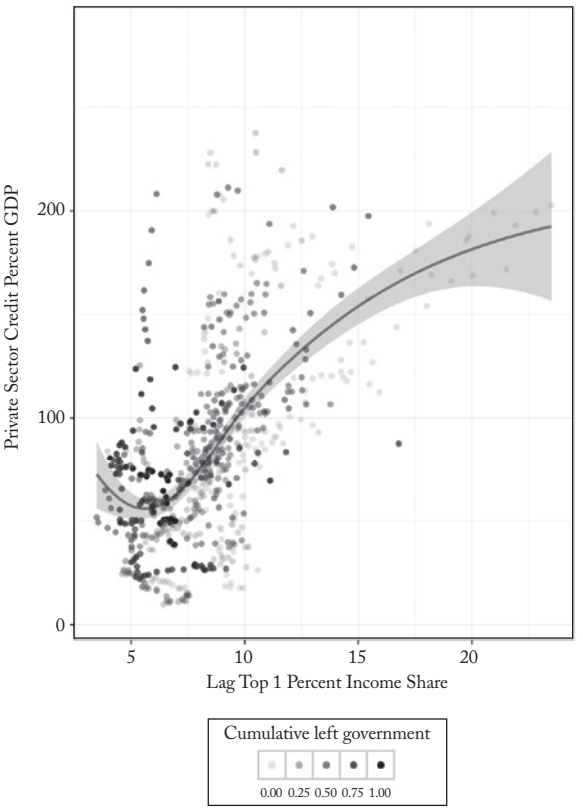


FIGURE 2
CREDIT TO THE PRIVATE SECTOR AND INEQUALITY BY THE LONG-TERM LEFT GOVERNMENT, WITH NONPARAMETRIC LOESS CURVE SUPERIMPOSED[a]

[a]Points represent all available country-years from 1961–2010, shaded based on the cumulative years of left-party government since 1960 as proportion of years since 1960.

a global savings glut. To address broader international savings conditions, we follow Bracke and associates and sum for each year the absolute value of current account balances for all reporting countries in the world and divide by world GDP.[71] We refer to this variable as *world savings*. Note that this variable is constant across countries within a year, so we omit year effects in the model for the mean. We expect both a local current account deficit and more money in the global system to be associated with greater credit availability, all else equal.

A word on monetary policy and central bank independence is in order. We might imagine that less independent central banks would pro-

[71] Bracke et al. 2008.

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vide an additional policy lever for elected governments to pull: they can directly stimulate borrowing by keeping interest rates low and inflate away debt, both public and private. From a purely practical angle, existing measures of de jure bank independence are almost entirely time invariant within the countries considered here, substantially complicating any attempt to tease out the relationships between credit, inequality, and long run–government partisanship, with the latter two changing very slowly. Furthermore, as shown by Christopher Adolph, de jure measures of bank independence fail to capture the incentives facing central bankers.[72]

We therefore turn to a behavioral measure of monetary conditions: broad money (M3) growth. We construct our measure from three different sources. We start with the broad money growth (annual percent) indicator from the World Bank's World Development Indicators (WDI).[73] The WDI defines broad money growth as "the sum of currency outside banks; demand deposits other than those of the central government; the time, savings, and foreign currency deposits of resident sectors other than the central government; bank and traveler's checks; and other securities such as certificates of deposit and commercial paper." It is by far the single most complete source for these data. Still, historical data for several countries, including France, Germany, Portugal, and Spain, are not included in it. For these countries, we calculate percentage growth rates from annual M3 stocks as reported in the International Monetary Fund's International Financial Statistics Database.[74] After 1999, we use the monetary aggregate M3 indicator from the European Central Bank's Statistical Data Warehouse for all country-years in the Eurozone.[75] We take the mean of these monthly annual growth rates as the percentage growth rate for the Eurozone in a given year.

Hierarchical Error Correction Model

We are interested in the dynamic conditional relationships among slow-moving variables. Whether due to common economic shocks, cross-border financial holdings, or coordinated monetary policies, there is reason to believe that country-specific effects may not be independent of one another. Missing data may pose inferential challenges. Standard fixed-effects (within-country) models for panel data analysis suffer in such situations. We adopt a fully Bayesian hierarchical framework for

[72] Adolph 2013.
[73] World Bank n.d.
[74] International Monetary Fund n.d.
[75] European Central Bank n.d.

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the flexibility needed to address these issues. We build a hierarchical linear normal error correction model incorporating temporal dynamics and nonconstant variance over time and space.[76] Letting Δ be the first difference operator, the model for country i in year t is

$$\Delta\text{credit}_{it} \sim N(\theta_{it},\sigma^2_{it}), \tag{3}$$

$$\theta_{it} = \alpha_i + \lambda_i\text{credit}_{it-1} + \beta'\text{x}_{it-1} + \zeta'\Delta\text{x}_{it}, \tag{4}$$

$$\begin{aligned} = \alpha_i + \beta_1\text{Ineq}_{it-1} + \beta_2\text{LeftGov}_{it} + \beta_3\text{Ineq}_{it-1} \times \text{LeftGov}_{it-1} + \\ \zeta_1\Delta\text{Ineq}_{it} + \zeta_2\Delta\text{Ineq}_{it} \times \text{LeftGov}_{it} + \tilde{\beta}'\text{z}_{it-1} + \tilde{\zeta}'\Delta\text{z}_{it}, \end{aligned} \tag{5}$$

$$\alpha_i \sim N(\mu_\alpha,\sigma^2_\alpha), \tag{6}$$

$$\sigma^2_{it} = \exp(\gamma_i + \eta_t + \xi\text{euro}), \tag{7}$$

$$\gamma_i \sim N(0,\sigma^2_\gamma), \tag{8}$$

$$\eta_t \sim N(0,\sigma^2_\eta). \tag{9}$$

The x_{it} are vectors of time varying covariates while β and ζ are vectors of to-be-estimated regression coefficients. Equation 5 makes explicit our modeling of the most theoretically interesting components, where z_{it} represents the remaining covariates and $\tilde{\beta}$ and $\tilde{\zeta}$ are β and ζ excluding β_1, β_2, β_3 and ζ_1 and ζ_2, respectively. λ_i is the error correction term, describing the rate at which the system returns to long-run equilibrium. Importantly, we allow this to vary by country. We assume independent negative beta (1,1) priors on the λ_i, reflecting the constraint that the error correction parameter lies in the (−1,0) interval. The α_i are the country-level effects. We explicitly model error variance in equations 7, 8, and 9 using country (γ_i) and year (η_t) effects, as well as a variable indicating membership in the Eurozone, under the hypothesis that credit variance should decline relative to country-specific means once in the Eurozone. We put diffuse normal priors on β, ζ, and ξ, while variance hyperparameters have diffuse uniform priors.

We generate samples from the joint posterior distribution of the model parameters by relying on Gibbs sampling and Markov Chain

[76] See De Boef and Keele 2008 on the use of the ECM outside of conventional analysis of cointegrated time series from a frequentist perspective.

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Monte Carlo (MCMC) techniques, as implemented in WinBUGS/GeoBUGS.[77] Data were mean centered and standardized[78] to speed MCMC convergence. Missing values for both covariates and the response were imputed as part of the MCMC estimation process.[79] We ran three chains for thirty thousand iterations each, discarding the first ten thousand draws as burn-in, and thinning the chain by saving every tenth iteration. Visual inspection of the trace plots and the Gelman-Rubin $\hat{R}$ statistics indicate that the chains in fact converged.[80]

Results

We first consider whether there is any evidence that the relatively complicated hierarchical structure was needed. Figure 3 displays the estimates for the higher-order variance terms in the model. In a pattern repeated in subsequent figures, the thinner bar represents the 95 percent Bayesian credible interval (BCI), the thicker bar represents 68 percent BCI, and the dot is the posterior median. We recover large standard deviations for the country effects (σ_α), identifying significant cross-national heterogeneity in credit variability. We also recover large standard deviations for the country (σ_γ) and year (σ_η) effects in the model for the error variance. The Eurozone dummy is negative and far from 0, as expected; country-years in the Eurozone have lower private sector credit volatility.

In Figure 4 we examine this cross-country heterogeneity in more detail. Panel (a) displays the country-level error correction parameters (λ_i) that describe the speed of reequilibration after a shock to a covariate. The differences across countries are noteworthy, although subject to substantial posterior uncertainty. In six of the countries, credit levels return to equilibrium relatively quickly (posterior median $\lambda_i \leq -0.6$), but in others the process is slow to adjust. Panel (b) displays the estimated country-level intercepts, again reinforcing cross-national differences.

Figure 5 displays the posterior distributions for the regression slope parameters. Interpretation of regression parameters in an error correction model (ECM) context is somewhat more complicated than in a

[77] Data and all estimation code are available at Ahlquist and Ansell 2017a.

[78] Note that this centering was variable by variable for the whole sample and *not* country by country. Indicator variables were not altered in any way.

[79] Results for models using only complete cases are in the supplementary material. Note that estimated relationships are stronger when we do not impute. We feel that imputation is the most principled and conservative way to proceed here. Ahlquist and Ansell 2017.

[80] Illustrative convergence diagnostics for the regression parameter on the lag inequality left government interaction term are in the supplementary material; plots for other parameters displayed similar convergence properties. Ahlquist and Ansell 2017.

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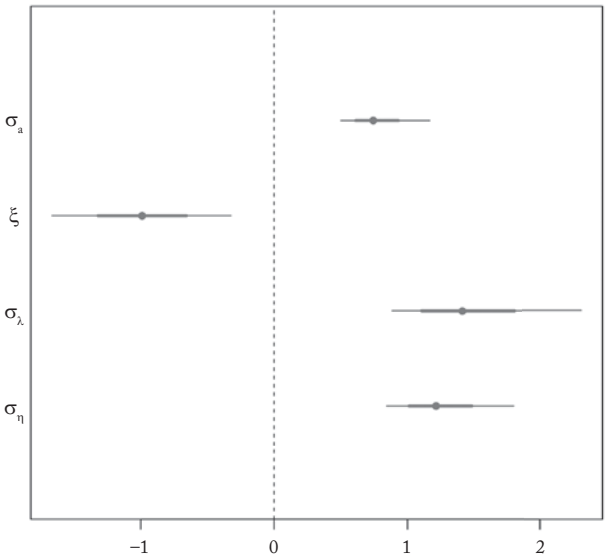


FIGURE 3
POSTERIOR MEDIANS WITH 68 PERCENT AND 95 PERCENT BCI FOR HIGHER-ORDER VARIANCE PARAMETERS[a]

[a]N = 558, number of countries = 18.

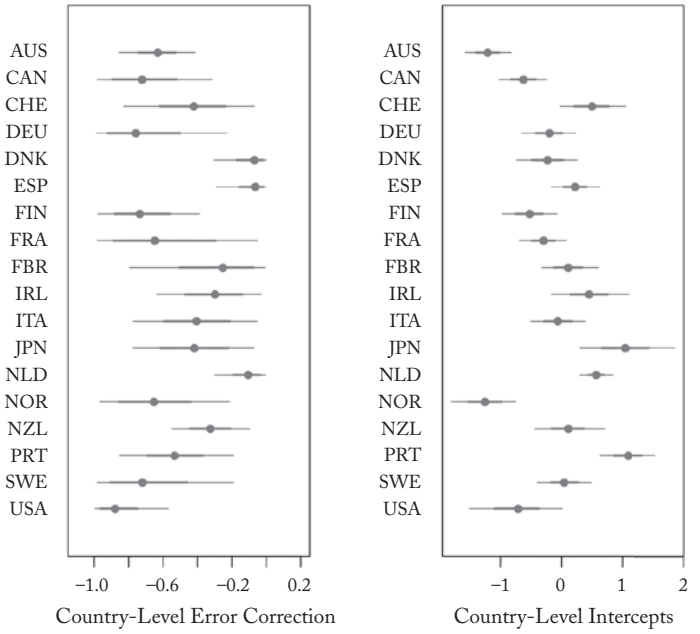


FIGURE 4
CROSS-COUNTRY HETEROGENEITY: POSTERIOR MEDIANS WITH 68 PERCENT AND 95 PERCENT BCI[a]

[a]N = 558, number of countries = 18.

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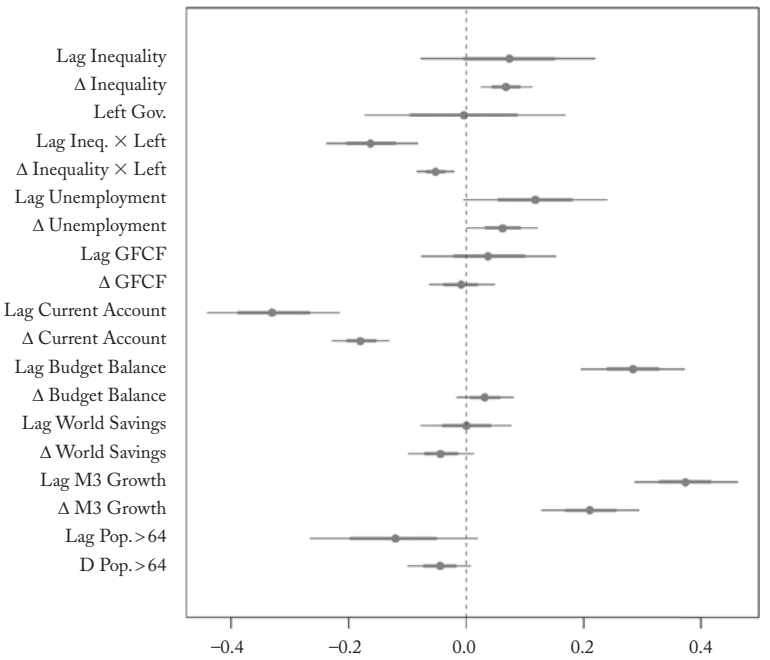


FIGURE 5
POSTERIOR MEDIANS WITH 68 PERCENT AND 95 PERCENT BCI FOR REGRESSION SLOPE PARAMETERS[a]

[a] N = 558, number of countries = 18. Parameters for log GDP, GDP growth, population, and population growth are omitted for ease of visualization.

standard regression since the effect of a covariate perturbation is distributed over future periods.[81] The coefficients on the first differenced terms represent the immediate (within period) impact of a shock to that variable. The long-run multiplier, total effect on credit in country i generated by a permanent change in covariate k is given by $-\frac{\beta_k}{\lambda_i}$ (recall that β is the vector of coefficients on the lagged covariate). In this figure we omit the coefficients for GDP, GDP growth, population, and population growth because they are relatively uninteresting and large enough to make the plot difficult to read for the remaining parameters. GDP and population are both strongly distinguishable from zero and, respectively, positively and negatively signed. The BCI for both growth variables are wide and include 0.

Looking first at the control variables, we see that government borrowing appears to crowd out private sector credit in the long term while

[81] De Boef and Keele 2008.

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capital inflows (current account deficits) are associated with substantially more credit in both the short and long term. But once we account for local capital conditions, the global savings level has no noticeable relationship with domestic private credit. Monetary aggregates correlate with credit in the expected ways; looser monetary policy in the form of faster growth in M3 is associated with both short- and long-term increases in credit in the economy. Unemployment has both a short-term and long-term (albeit with less precision) positive relationship with credit growth. When we account for other covariates, investment levels by firms show no discernible relationship with credit levels.

Most important for our argument, we find strong evidence of a relationship between inequality and credit that is conditional on long run–government partisanship. Increases in inequality in the immediate period and the longer term are associated with more private sector credit use, but this effect goes away in countries with histories of electorally successful left-wing parties.

To interpret this more substantively, we calculate the implied long-run effect of a change in inequality equivalent to the increase seen in the United States between 1980 and 2000. For illustrative purposes we compare the predicted effect in the US to that in Germany. For both countries we set the value of cumulative left government to their respective 2001 levels. To calculate the equilibrium long-run effect we use each country's respective error correction parameter (λ_i). Panel (a) of Figure 6 displays the posterior median and 95 percent BCI for these long-run predictions. In the United States, this increase in inequality shows up as a large predicted increase in private sector credit whereas the same change in the German pretax income distribution has no consistent effect on German credit use. Although the shock to the income distribution considered here is large and unlikely to occur in a single year, the magnitude of the change does reflect the accumulated change witnessed in the US. To give a sense of the scale, the model predicts that this increase in inequality in the United States would increase credit in the country by about 1.2 standard deviations or 56 percent of GDP. The actual change in private credit in the US economy between 1980 and 2000 was 75 percent of GDP, or 1.6 standard deviations—well within the 95 percent BCI of the posterior prediction.

Panel (b) of Figure 6 reports the long-run predicted effect of this same shock to the income distributions for all the countries in the sample. Predicted effects are generated using country-specific error correction estimates and each country's 2001 cumulative left government value (standardized). Since 95 percent BCI bands overlap and some are

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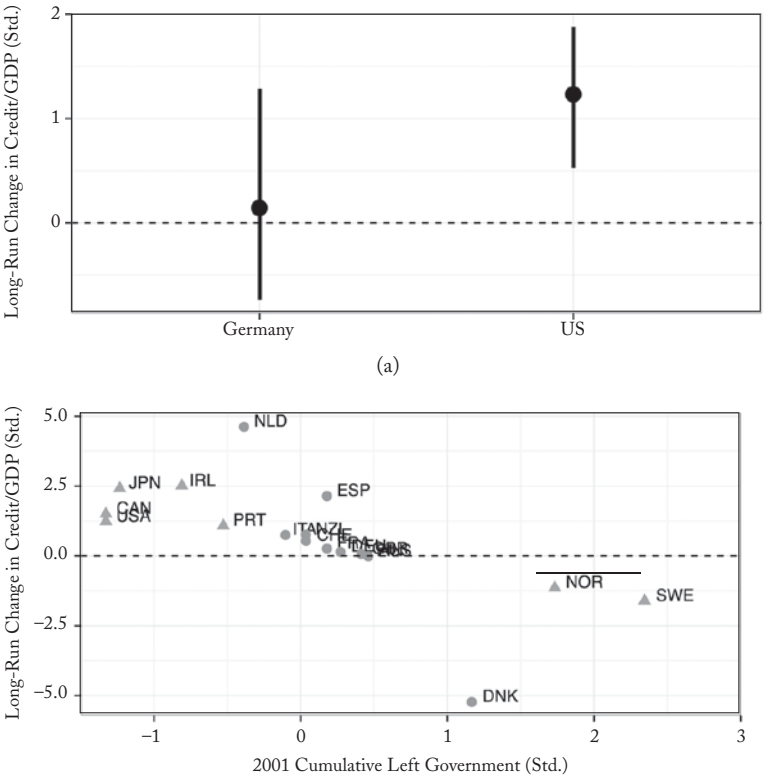


FIGURE 6
POSTERIOR PREDICTIVE DENSITY MEDIANS[a]

[a]Panel (a) shows posterior predictive density medians and 95 percent BCI for the long-run effect on credit of a change in top 1 percent income share equivalent to that observed in the United States from 1980 to 2000, for Germany and the US. Panel (b) shows posterior predictive density medians for the long-run effect on credit of the same shock to inequality for all eighteen countries in our study. Triangles represent countries with posterior 95 percent BCI that do not contain 0.

quite wide, we do not plot BCI bars. Countries for which the 95 percent BCI for the posterior predictive long-run effect do not contain zero, are identified using triangles; those for which $0 \in 95$, are denoted using circles. As expected, rising inequality is associated with greater credit in only those countries that had very low levels of left participation in government since 1960. Inequality has no discernible long-run relationship with credit in most of the countries, though much of this uncertainty is driven by the uncertainty in the error correction parameters, λ_i. In-

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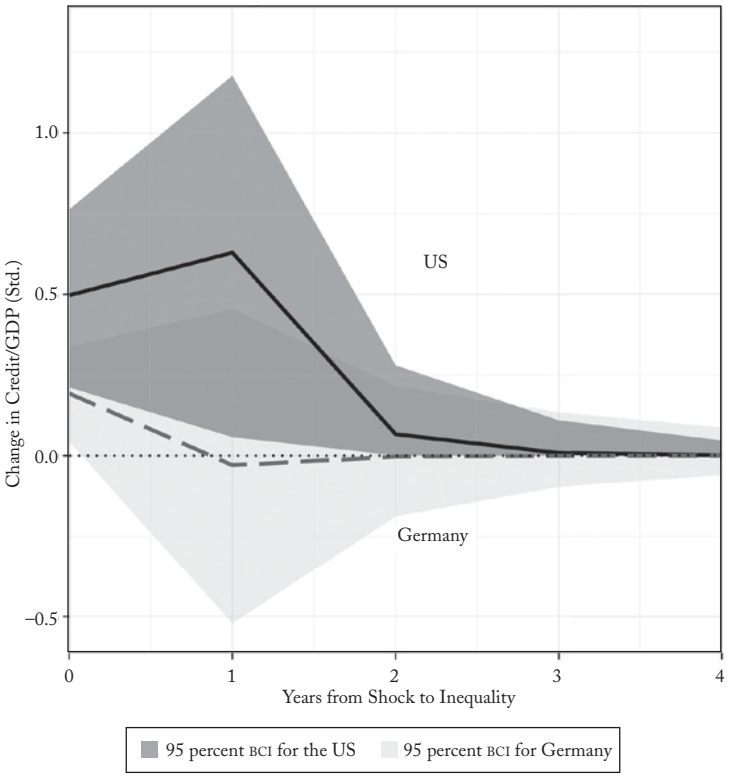


FIGURE 7
PREDICTED LAG DISTRIBUTION: EFFECT OF INCREASING INEQUALITY[a]

[a]Posterior predictive density medians for short-run distributed effect on credit of a one-time permanent shock to the top 1 percent income share equivalent to that observed in the US between 1980 and 2000, for Germany and the US. Cumulative left values are set at their 2001 values.

terestingly, Norway and Sweden appear at the other extreme, where increased pretax inequality shows a significant negative long-run effect on private sector credit usage.

The ECM specification lets us further examine the dynamics of a shock to inequality. Figure 7 illustrates how a one time, permanent shock to inequality plays out over time. The shaded regions represent 95 percent BCI around the predictive density. In the US the effects of the shock are incorporated in the first two years, with most of the influence becoming visible in the year after the shock. In Germany we again see that there is no meaningful effect on credit from a shock to the income distribution.

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Model Comparisons

For the sake of comparison, we also fit several alternative and simpler models. The first omits the conditioning relationship of left wing–cumulative government on inequality. The second omits equation 7, the model for the variance, but allows the error variance to differ by country. The third alternative relaxes the assumption that the country-level intercepts are uncorrelated, and allows us to account for possible spatial correlation in credit levels induced by extensive cross-border financial linkages and coordinated monetary policies, for example. In this model we put a conditionally autoregressive prior (CAR) on the α_i.[82] A CAR prior is defined as

$$\alpha_i \mid \alpha_{j \neq i} \sim N(\bar{\alpha}_i, \frac{\sigma_\alpha^2}{d_i}), \tag{10}$$

$$\bar{\alpha}_i = \frac{1}{d_i} \sum_{j \in \delta_i} \alpha_j. \tag{11}$$

Under this specification, the country effects are normally distributed with the mean equal to the mean of the random effects of country i's neighborhood.[83] The δ_i defines i's neighbors: $d_i = \| \delta_i \|$. For this application, we use two difference connectivity matrices. The first, distance, defines two countries as neighbors if they have a minimum distance of less than 501 kilometers; we also define Australia and New Zealand as neighbors.[84] Japan is the only isolate in the data set. The second connectivity matrix, language, defines countries as neighbors if they share at least one official language. In Table 1 we report the deviance information criterion (DIC) and an R^2 calculated from the posterior median residuals. The base model performs better than all the alternatives on a DIC basis. Looking at R^2, the base model performs better than all the alternatives except the model with a simpler variance expression, but the simpler variance model has a much higher posterior variance around the reported R^2. There is strong evidence that the model with the interaction terms in it is preferable to the one without. Our central finding—the relationship between inequality and credit is mediated by long run–government partisanship—holds in the simpler variance model and in both of the CAR models.

[82] Banerjee, Carlin, and Gelfand 2003.

[83] The CAR prior uses a sum-to-zero constraint on the random effect. This necessitates the inclusion of the constant term, which is assigned an improper flat prior (Besag and Kooperberg 1995). The CAR precision, $1/\sigma_\alpha^2$, is assigned a gamma (0.5,0.0005) prior.

[84] Gleditsch and Ward 2001.

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TABLE 1
IN-SAMPLE MODEL COMPARISON DIAGNOSTICS FOR THE BASE MODEL AND SEVERAL ALTERNATIVES[a]

Model	*DIC*	R^2
Base model	14190	0.47
Without interaction	14208	0.45
Without variance terms	14319	0.52
With CAR prior (distance)	14235	0.46
With CAR prior (language)	14339	0.34

[a] R^2 is the coefficient of determination calculated from the medians of posterior residuals.

PARTISANSHIP OR INSTITUTIONS?

In the theoretical section we mentioned the Iversen and Soskice model of electoral institutions.[85] In their model, proportional electoral rules induce postelection coalition formation more favorable to frequent center-left government, leading to more redistribution over the longer term. Left-wing partisanship may simply be a proxy for electoral institutions that might affect policy-making through other nonpartisan channels. For example, Chang and colleagues and Rosenbluth and Schaap argue that majoritarian systems are more responsive to consumers relative to producer groups.[86] David Austen-Smith highlights that proportional representation systems generate higher taxes and more distributive spending for parties to buy off and hold together governing coalitions.[87] We use alternative ways of measuring electoral institutions to further examine whether long run–government partisanship is the mechanism at work.

We refit our model, substituting three different indicators of electoral institutions for our cumulative left government variable. First, we use the simple indicator for majoritarian electoral systems taken from Matt Golder and extended through 2010 for the OECD cases we study.[88] Second, based on Rogowski, Kayser, and Chang's arguments about "seats-votes elasticity," we use a direct measure of the disproportionality of the electoral system (the Gallagher index) taken from Armingeon and colleagues.[89] Third, a series of well-known formal models of electoral

[85] Iversen and Soskice 2006.
[86] Chang et al. 2010; Rosenbluth and Schaap 2003.
[87] Austen-Smith 2000.
[88] Golder 2005.
[89] Chang et al. 2010; Rogowski and Kayser 2002; Chang, Kayser, and Rogowski 2008; Armingeon et al. 2012.

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systems and redistribution derive higher taxes and more distributive spending as the result of attempts to buy off and hold together governing coalitions.[90] Arend Lijphart shows that proportional representation induces a more fragmented party system and more frequent coalition governments.[91] To examine this mechanism we refit models using the effective number of legislative parties (ENLP), taken from Armingeon and associates.[92] For space considerations, we omit full descriptions of all model parameters and instead focus on the coefficient estimates and 95 percent BCI for lagged and differenced inequality, the institutional variable, and their interactions.[93] These results along with data on comparative model fit are shown in Figure 8.

Based on the DIC, all these alternative models present an inferior fit to the data when compared to the base model using historical left-wing cabinet participation. The majoritarian dummy model has a positive coefficient, but there is considerable uncertainty about this relationship, especially for the long-term effect. The Gallagher index model is similarly weak. But looking at ENLP, we again find results consistent with what is found in the base model: countries with less fragmented party systems show a stronger relationship between inequality and private credit.

These findings are noteworthy for several reasons. First, they reinforce our conclusion that long run–government partisanship is the most statistically visible relationship in the data.[94] Other variables encoding electoral institutions generate weaker in-sample fit and less precisely estimated relationships. Second, we see that although electoral institutions have consequences for the frequency of left-wing government, it is left government itself, presumably associated with more redistributive policies, that generates our strongest findings. Third, the majoritarian dummy variable is essentially collinear with so-called liberal market economies, or Anglo-Saxon countries.[95] Once we account for other covariates, we find no strong evidence linking this dummy variable to credit. This finding further strengthens our conclusion that the cross-national differences in credit relate to the level of fiscal redistribution

[90] Austen-Smith 2000; Lizzeri and Persico 2001; Persson and Tabellini 1999.

[91] Lijphart 2012.

[92] Armingeon et al. 2012.

[93] Correlations among the various indicators are presented in the supplementary material. Ahlquist and Ansell 2017b.

[94] Moreover, in our supplementary material we show that the effect of partisanship is driven by left-wing parties and not by centrist parties such as Christian Democratic parties that, while they may be common in countries with sizable welfare states in continental Europe, are not generally associated with higher redistribution, as shown in Bradley et al. 2003.

[95] Hall and Soskice 2001.

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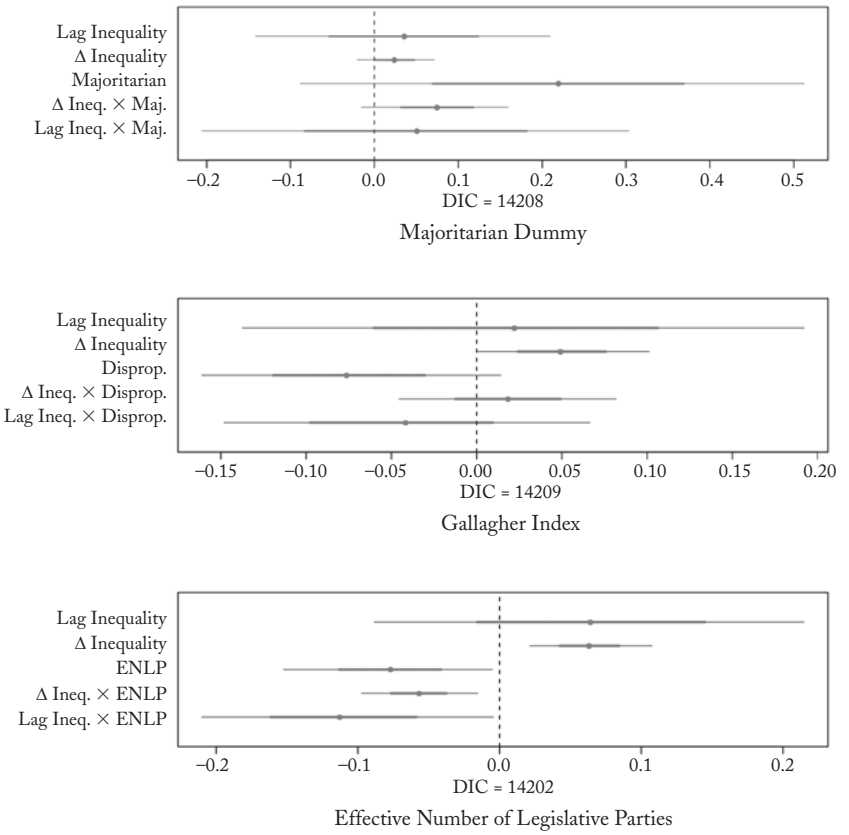


FIGURE 8
POSTERIOR MEDIANS WITH 68 PERCENT AND 95 PERCENT BCI FOR SELECTED REGRESSION SLOPE PARAMETERS USING ALTERNATIVE INDICATORS FOR ELECTORAL INSTITUTIONS[a]

[a] All other covariates are the same as in the base model. N = 558, number of countries = 18.

rather than the constellation of policies and institutions purporting to define liberal market economies.[96]

CONCLUSION

Rising income inequality and the global financial crisis were perhaps the two biggest economic stories of the first decade of the twenty-first

[96] See Ahlquist and Breunig 2012 on why we should not attempt to control for liberal market economy clusters using a categorical dummy variable.

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century. We argue that their joint emergence was not a coincidence, but neither was it inevitable. In fact, greater levels of borrowing appear closely related to changes in income inequality, but only in those countries where left-wing government is less frequent. We interpret this finding as reflecting long-run, systematic, and partisan differences in redistributive efforts. Redistribution, in turn, dampens the positional consumption incentives produced by stagnant real wages at the middle and bottom of the income distribution, and by rising incomes at the top. Thus, in countries with histories of left-wing government and substantial redistribution, rising inequality failed to produce an associated surge in borrowing. In countries where both left-wing government and redistribution were less prevalent, inequality and credit rose together.

Our finding that the relationship between top income shares and credit availability is conditioned by the long-run consequences of government partisanship is important for several reasons. First, it makes it difficult to sustain the argument that increased availability and use of credit is a common, cross-national response to rising top income shares. Countries that engage in greater fiscal redistribution dampen the turn to credit and borrowing. Political choices still matter, even in an era of rising inequality and global capital mobility.

Second, policy affecting the supply of credit, such as government underwriting of mortgages, backstopping banks, or loosely regulating consumer finance, clearly affect credit availability, even though we have not investigated such mechanisms here. If credit use is purely a demand-driven occurrence, then we should see higher prices for credit and financial services as wages and incomes diverge as the demand curve shifts outward. But, as noted above, credit and financial services are cheaper in countries with traditions of center-right governments that redistribute less.[97] Although global supply of credit is the crucial determinant of interest rates in an era of global capital flows, domestic credit access policies still matter at the margin. If low-redistribution countries are already prone to higher credit demand, this accommodating policy may accentuate the connection between inequality and credit. Renewed comparative investigation of specific policy levers is an important channel for future research.

Third, our finding has implications for future financial stability under conditions of rising inequality. In the industrialized world, countries that redistribute less may be more prone to instability in the finance sector as households resort to credit-based consumption.[98] Past expe-

[97] Rosenbluth and Schaap 2003.
[98] Kumhof, Rancière, and Winant 2015.

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riences with banking crises may not be a good predictor of the future risk insofar as past experience does not cover periods of such rapidly increasing pretax income inequality at the very top. As gaps between rich and poor grow in the largest economies in the world, how governments respond has implications for global financial stability. If governments fail to address rising consumption demands or choose to pursue myopic policies that enable borrowing through consumer credit policies, bankruptcy laws, or (de)regulation of the financial sector, the prospects for more frequent and dangerous financial crises increase. And we have all learned that spillover can be rapid and deep.

Supplementary Material

Supplementary material for this article can be found at https://doi.org/10.1017/S0043887117000089.

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