Inequality Aversion, Populism, and the Backlash Against Globalization

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Abstract

Motivated by the recent rise of populism in western democracies, we develop a model in which a populist backlash emerges endogenously in a growing economy. In the model, voters dislike inequality, especially the high consumption of "elites." Economic growth exacerbates inequality due to heterogeneity in risk aversion. In response to rising inequality, rich-country voters optimally elect a populist promising to end globalization. Countries with more inequality, higher financial development, and current account deficits are more vulnerable to populism, both in the model and in the data. Evidence on who voted for Brexit and Trump in 2016 also supports the model.

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"The gains from globalization are not evenly distributed." Milanović (2016, p.10).

1. Introduction

We develop a theory that relates two of the defining trends of our times: growing income inequality over the past four decades (e.g., Atkinson, Piketty, and Saez, 2011) and the ongoing rise of populism in the West. The latter trend goes hand in hand with a pushback against globalization. This pushback is best exemplified by two momentous 2016 votes: the British vote to leave the European Union ("Brexit") and the election of a protectionist, Donald Trump, to the U.S. presidency. In both cases, rich-country electorates voted to effectively take a step back from the long-lasting process of global integration.[1]

We connect the two trends in a tractable heterogeneous-agent equilibrium model. In it, a backlash against globalization emerges as the optimal response of rational voters to rising inequality, which in turn is a natural consequence of economic growth. In other words, growth aggravates inequality, which eventually subdues globalization. In the model, the backlash is inevitable, a matter of time. Globalization carries the seeds of its own destruction.

Populism is a political ideology pitching ordinary people, who are viewed as homogeneous and inherently good, against the established elites, who are deemed immoral and corrupt (e.g., Müller, 2016). While many forms of populism exist, anti-elitism is common to all of them. Anti-elitism enters our model through agent preferences. We assume that agents dislike inequality, which we measure by the variance of consumption shares across agents. Given our other assumptions, equilibrium consumption develops a right-skewed distribution across agents. As a result, inequality is driven by the high consumption of the rich rather than the low consumption of the poor. Aversion to inequality thus reflects envy of the economic elites rather than compassion for those left behind.

Another common feature of populism is its anti-globalism. Populists prioritize national interests over international cooperation, strong leadership over diplomacy, and protectionism over free trade. They often advocate anti-global policies such as tariffs and immigration controls. Some researchers attribute the recent rise of populism to economic insecurity stemming from exposure to globalization.[2] Sampson (2017) reports that 69% of the British who disliked globalization voted for Brexit in the EU referendum. Colantone and Stanig (2018a) show that support for Brexit was higher in the regions hit harder by globalization,

[1] In his keynote speech at the 2018 World Economic Forum in Davos, French President Emmanuel Macron remarked: "Let us not be naive. Today, globalization is going through a major crisis..."

[2] The recent rise of populism appears to have multiple causes besides exposure to globalization. Some attribute it to cultural backlash against the ascent of progressive values (Inglehart and Norris, 2016). Others blame economic insecurity stemming from exposure to the financial crisis (Algan et al., 2017).

as measured by import penetration from China. Autor et al. (2017) and Colantone and Stanig (2018b) find that imports from China boost support for populism in the U.S. and in 15 European countries. Guiso et al. (2017) use survey data to relate European voters' preference for populist parties to economic insecurity from global exposure. Guiso et al. (2018) find a strong effect of globalization on populist support in Eurozone countries. Rodrik (2018) presents similar arguments. Motivated by this evidence, we define a populist as a politician promising to reverse global integration and close her country's borders.[3]

The globalization process is sometimes believed to be irreversible, but history suggests otherwise. For almost a century before 1914, the world went through an era of globalization that by some metrics surpassed the level observed today. This era ended during World War I and was not resuscitated until after World War II (O'Rourke and Williamson, 2001; James, 2001). Globalization became a victim of a backlash driven by a variety of grievances, including inequality. The literature warns that history could repeat itself. Rodrik (2000) argues that we cannot have all three of global economic integration, the nation state, and democratic politics. Rodrik (1997) contends that globalization creates social tensions by clashing with domestic norms and social arrangements. We focus on one tension—inequality—and formalize the fragility of globalization in an equilibrium model.

In the model, agents like consumption but dislike inequality within their own country. There are two countries, the U.S. and the rest of the world ("RoW"). Both countries grow trees producing output. Agents have heterogeneous attitudes toward risk, with U.S. agents less risk-averse than RoW agents. They trade stocks and bonds. At the outset, the countries are financially integrated—there are no barriers to trade and risk is shared globally. At a given time, both countries hold elections featuring two candidates. The "mainstream" candidate promises to preserve globalization whereas the "populist" candidate promises to end it. If either country elects a populist, a move to autarky takes place. Going forward, each country consumes the output of its own tree and there is no cross-border trading.

We solve for optimal consumption and portfolio choices under global risk sharing. Agents who are more risk-averse choose safer portfolios and smoother consumption plans, effectively buying insurance from less risk-averse agents. Due to country-level differences in risk aversion, U.S. agents hold riskier portfolios than RoW agents, and the U.S. runs a current account deficit with RoW. Due to individual-level differences in risk aversion, economic growth raises inequality as less risk-averse agents consume a growing share of total output.

[3]Our definition departs from other theories of populism. For example, Guiso et al. (2017) define as populist a party that champions short-term protection policies while disregarding their long-term costs. Acemoglu, Egorov, and Sonin (2013) define populist policies as those to the left of the median voter's preferences.

When deciding whether to vote for the populist, U.S. agents face a tradeoff. If elected, the populist delivers lower consumption but also lower inequality to U.S. agents. Under autarky, U.S. agents can no longer borrow from RoW to finance their excess consumption. But their inequality drops, too, because the absence of cross-border leverage makes their portfolio positions less disperse. As output grows, the marginal utility of consumption declines, and U.S. agents are increasingly willing to sacrifice consumption in exchange for more equality. In that sense, equality is a luxury good. When output grows large enough, more than half of U.S. agents prefer autarky and the populist wins the U.S. election. This is our main result: in a growing economy, the populist eventually gets elected. In our model of a democratic society that values equality, globalization cannot survive in the long run.

Globalization would survive under a social planner. The competitive market solution differs from the social planner solution due to the negative externality that the elites impose on others through their high consumption. Inspired by the social planner, we could tax the consumption of the elites and subsidize the consumption of those left behind. But simpler and more realistic wealth redistribution policies, which do not get agents to internalize the consumption externality, fail to save globalization. We analyze a broad class of redistributive policies that transfer wealth from low-risk-aversion agents, who benefit the most from globalization, to high-risk-aversion agents, who benefit the least. Since markets are dynamically complete, these policies are equivalent to assigning higher initial endowments to high-risk-aversion agents. Starting from those modified endowments, the economy eventually reaches the point at which the populist gets elected. In that sense, simple wealth redistribution can delay the populist's victory, but cannot prevent it from happening eventually.

Our model predicts that support for populism should be stronger in countries with higher inequality, more financial development, and a lower current account balance. Looking across developed countries, we find evidence supporting these predictions. We measure the support for populism by the vote share of populist parties in recent elections, as well as by protectionist attitudes expressed in a survey of OECD households.

The model also predicts that populist voters should be more risk- and inequality-averse than mainstream voters, on average. Inequality-averse agents are "anti-elite;" they place a large weight on inequality in the consumption-inequality tradeoff. Risk-averse agents choose safe consumption plans; as a result, their consumption drops less after a move to autarky. The model suggests wealth and education as proxies for risk aversion. Like more-risk-averse agents, poorer and less-educated agents tend to benefit less from growth under globalization, and have less to lose from the end of globalization. The model thus predicts that less-educated, poorer, and anti-elite agents are more likely to vote populist. That is indeed what

we find empirically when we examine the characteristics of the voters who supported Brexit in the 2016 EU referendum and Trump in the 2016 presidential election.

The model also makes predictions for asset prices. Upon a shift to autarky, risk sharing changes from global to local, so the risk associated with U.S. output is borne by U.S. agents only. As these agents are less risk-averse than RoW agents, the U.S. market price of risk drops when autarky arrives. The opposite happens for RoW. As a result, the global market share of U.S. stocks rises in anticipation of the populist's victory. Consistent with this prediction, the U.S. share of the global stock market rose before the 2016 Trump election. The model also implies that U.S. bond yields should be low before the populist's victory. U.S. bonds are valuable when a move to autarky is likely because they deliver future consumption when its marginal utility to U.S. agents is high. Consistent with this prediction, bond yields in the West were low, sometimes negative, when the recent populist wave began.

Agents in our model dislike inequality. Inequality aversion has its roots in Thurow (1971), who advocates the inclusion of income distribution in the utility function. According to Thurow, individuals may like equality because it helps prevent crime and preserve social stability. Wilkinson and Pickett (2009, 2018) show that less equal societies suffer from social problems such as illiteracy, crime, and poor health. They argue that inequality causes status anxiety at all income levels, including the top. In Fehr and Schmidt's (1999) model, individuals willingly give up material payoffs to achieve more equality. Alesina and Angeletos (2005) employ preferences in which agents dislike unfair outcomes. Evidence also shows that individuals dislike inequality. Morawetz et al. (1977) compare two Israeli communities and find that individuals in the more egalitarian community report being happier. Alesina, Di Tella, and MacCulloch (2004) also find that people facing less inequality are happier. Dawes et al. (2007) find experimental evidence that subjects alter others' incomes, at a personal cost, to achieve more equality. Experimental results from dictator and ultimatum games also point to egalitarian preferences. Ferrer-i-Carbonell and Ramos (2014) review the evidence on happiness and inequality and "conclude that inequality correlates negatively with happiness in Western societies." Clark and D'Ambrosio (2015) reach similar conclusions.

Our modeling of globalization differs from its more common treatments in labor economics and international trade. Unlike labor economics, our model features no jobs, wages, or heterogeneity in skill, so it cannot speak to skill-biased technological change. Unlike models of international trade, our model has only one consumption good. Instead of trade in goods, we focus on trade in financial assets, comparing global and local risk sharing. While this focus omits important non-financial aspects of the problem, it delivers new insights regarding financial development, global imbalances, redistribution, and asset prices.

Heterogeneity in risk aversion has been of growing research interest.[4] Instead of interpreting it literally as representing differences in appetite for risk, we use it as a modeling tool to capture two phenomena. First, it generates rising inequality in a growing economy. In an endowment economy such as ours, inequality cannot rise due to technological change because production is not modeled explicitly.[5] We employ individual-level differences in risk aversion as a simple way of capturing the uneven distribution of benefits from global growth. Second, we interpret country-level differences in risk aversion as differences in financial development. Like Gourinchas, Rey, and Govillot (2017), we assume that U.S. agents are less risk-averse than RoW agents, capturing the idea that the U.S. is more financially developed than RoW. In their model, as well as ours, U.S. agents effectively provide insurance to RoW agents.[6] Maggiori (2017) microfounds this asymmetry by relying on cross-country differences in financial development. In his model, the country whose financial intermediaries are less constrained behaves as if it were less risk-averse. That country also runs a trade deficit, as it does in our model. Caballero, Farhi, and Gourinchas (2008) and Mendoza, Quadrini, and Ríos-Rull (2009) also link financial development to global imbalances. Pástor and Veronesi (2017) consider the political implications of time variation in risk aversion, whereas here we consider the political implications of its cross-sectional variation.

Our paper is also related to the literature on financial development. A key result in this large literature is that financial development facilitates economic growth (e.g., Rajan and Zingales, 1998). In contrast, our model emphasizes the dark side of financial development: it spurs the growth of inequality, which eventually leads to a populist backlash.

2. Model

There is a continuum of agents with unit mass spread across two countries, the U.S. and the rest of the world ("RoW"). Agents have preferences over their own consumption as well as the inequality in their own country. Agent i from country $k \in \{US, RoW\}$ has a time-separable utility function with instantaneous utility at time t given by

$$U_i\left(C_{it}, V_t^k, t\right) = e^{-\phi t}\left(\frac{C_{it}^{1-\gamma_i}}{1-\gamma_i} - \eta_i V_t^k\right) \qquad \forall i \in \mathcal{I}^k \ , \tag{1}$$

[4]See, for example, Dumas (1989), Chan and Kogan (2002), Gomes and Michaelides (2008), Longstaff and Wang (2012), Chabakauri (2013), Bhamra and Uppal (2014), and Garleanu and Panageas (2015).

[5]Recent studies of income inequality that do model production along with heterogeneous entrepreneurial skill include Pástor and Veronesi (2016) and Jones and Kim (2018), among others.

[6]Consistent with this mechanism, Gourinchas et al. provide empirical evidence of wealth transfers from the U.S. to RoW during recent financial crises. Unlike Gourinchas et al., we allow heterogeneous risk aversion not only across countries but also within countries, which allows us to analyze within-country inequality.

where C_{it} is the agent's consumption, V_t^k is inequality in country k, $\gamma_i > 1$ is the agent's risk aversion, $\eta_i \geq 0$ is his inequality aversion, and $\mathcal{I}^k$ is the set of agents living in country k. We measure inequality by the variance of consumption shares across agents:

$$V_t^k = \text{Var}\left(\frac{C_{it}}{\overline{C}_t^k} \,|\, i \in \mathcal{I}^k\right) \ , \tag{2}$$

where $\overline{C}_t^k = \text{E}^{\mathcal{I}}\left[C_{it} \,|\, i \in \mathcal{I}^k\right]$ denotes the average value of C_{it} across all agents in country k.[7] The scaling of C_{it} by $\overline{C}_t^k$ in equation (2) ensures that V_t^k is invariant to changes in average consumption so that it measures relative, not absolute, inequality.

The utility function in equation (1) increases in consumption but decreases in inequality. The idea that individuals dislike inequality is well established, but the way we model it is novel. In equilibrium, consumption shares develop a right-skewed distribution across agents. Therefore, V_t^k is driven by the right tail of the distribution, and inequality aversion can largely be thought of as anti-elitism: agents dislike being left behind the economic elites.[8] Agents effectively derive more disutility from envying the rich than from pitying the poor, similar to Fehr and Schmidt (1999).[9] Importantly, inequality aversion induces an externality: through their high consumption, the elites impose a negative externality on other agents.

We assume that U.S. agents are less risk-averse than RoW agents. The technical condition that we need is for the distribution of risk aversion, γ_i, across agents to satisfy

$$\lim_{x\to\infty} \frac{\text{E}^{\mathcal{I}}[e^{x/\gamma_i} \,|\, i \in \mathcal{I}^{RoW}]}{\text{E}^{\mathcal{I}}[e^{x/\gamma_j} \,|\, j \in \mathcal{I}^{US}]} \ = \ 0 \ . \tag{3}$$

The simplest example of an assumption that satisfies this condition is

$$\gamma_i < \gamma_j \qquad \forall i,j : \left\{i \in \mathcal{I}^{US},\ j \in \mathcal{I}^{RoW}\right\} \ , \tag{4}$$

so that U.S. agents are uniformly less risk-averse than RoW agents. The distributions of γ_i for the U.S. and RoW can also overlap. For example, condition (3) is satisfied when risk tolerances $\rho_i = 1/\gamma_i$ are uniformly distributed with the same lower bound for both countries but a higher upper bound for the U.S. The condition also holds if ρ_i in both countries is truncated normal, with the same truncation points and same dispersion for both countries

[7] Throughout the paper, $\text{E}^{\mathcal{I}}\left[.\right| i \in S]$ denotes an expected value computed across agents i in the set S.

[8] We interpret "elites" narrowly as economic elites, or the wealthy. Political scientists often think of elites more broadly as including also members of the political establishment, academia, military, etc.

[9] In Fehr and Schmidt's model, agents dislike inequality whether they are better or worse off than others, but they dislike it more if they are worse off. In our model, the agent's relative position in the income distribution does not appear in the utility function, but given the right skewness of consumption, the vast majority of agents are far behind the ultra-rich but only a bit ahead of the ultra-poor.

but a higher mean in the U.S. This is the example we use in our numerical illustrations. But our propositions rely only on the weaker assumption in equation (3).

The assumption that U.S. agents are less risk-averse than RoW agents—the defining difference between the two countries—is motivated by the literature that explores risk-sharing motives to analyze global trading imbalances, especially Gourinchas, Rey, and Govillot (2017) and Maggiori (2017). Following this literature, we view the lower risk aversion of U.S. agents as a proxy for higher financial development in the U.S. In that sense, we could replace US-RoW with UK-EU (United Kingdom–European Union), as the financial system is generally considered to be more developed in the UK than in continental Europe.

The two countries grow trees which produce continuous streams of perishable output denoted by D_t^{US} and D_t^{RoW} at time $t \in [0, T]$. Aggregate global output, D_t, is given by

$$D_t = D_t^{US} + D_t^{RoW} \ . \tag{5}$$

We assume that $\delta_t \equiv \log(D_t)$ evolves over time by following a simple stochastic process:

$$d\delta_t = \mu_\delta \, dt + \sigma_\delta \, dZ_t \ , \tag{6}$$

where $\mu_\delta > 0$ and Z_t is a Brownian motion. We also assume, for simplicity, that each country's share of global output is constant and equal to the country's population share:

$$\frac{D_t^{US}}{D_t} = m \ , \tag{7}$$

where m is the fraction of agents living in the U.S.[10] Since each country's output is perfectly correlated with global output, δ_t is the only state variable in the model. Even with a single shock (dZ_t), risk-sharing motives are critical due to heterogeneity in risk aversion.

Agents trade two types of financial assets: stocks and bonds. Stocks are in positive net supply. U.S. stocks are claims to U.S. output; RoW stocks are claims to RoW output. Since the two output streams are perfectly correlated, so are the two stock prices. Bonds, which are in zero net supply, allow agents to lend to each other in a risk-free manner.

Agents' trading is governed by one of two regimes: "globalization" or "autarky." Under globalization, there are no barriers to trade—U.S. agents can trade freely with RoW agents. Under autarky, cross-border trading is not allowed—U.S. agents can trade only with other U.S. agents, and RoW agents only with other RoW agents.

[10] In the Online Appendix, located on our websites, we relax this assumption by allowing the output shares to be stochastic. In the remainder of the paper, we refer to the Online Appendix simply as "Appendix."

From time 0 until time $\tau \in [0, T]$, the countries coexist under globalization. At the given time τ, both countries hold elections featuring two candidates. The "mainstream" candidate promises to maintain globalization through time T. The "populist" candidate promises to end it and move the country to autarky until time T. Each country's election is decided by that country's median voter. When elected, both candidates deliver on their promises. If either country elects a populist, the move to autarky takes place immediately—U.S. agents reclaim the possession of the U.S. tree (producing D_t^{US}), RoW agents reclaim the RoW tree (producing D_t^{RoW}), and any cross-border debt is settled. From that point on, each country consumes the output of its own tree and all trade takes place within countries.

A country can move to autarky only if it can afford to settle all of its cross-border debt. It cannot move to autarky if doing so would reduce the other country's consumption. We thus rule out expropriation of wealth. This assumption seems plausible given our focus on the rise of populism in developed countries, which tend to settle their debts. For example, following the Brexit vote, the UK agreed to settle its "divorce bill" from the EU.

The same no-default assumption would rule out autarky in models with standard utility over consumption. In such models, a country would move to autarky only to increase its own consumption, which would necessitate a consumption loss for the other country. That is not true in our model, given the presence of inequality in the utility function. In our model, a move to autarky by one country increases the consumption in the other country.

2.1. Optimal Consumption

Our assumptions imply that financial markets are dynamically complete, because the risk associated with the single shock (dZ_t) can be hedged by either of the two stocks (US or RoW), regardless of the trading regime, and time τ is known. Due to market completeness, we can write the optimization problem of each agent $i \in \mathcal{I}^k$, for $k \in \{US, RoW\}$, as

$$\max_{\{C_{it}\}} \mathrm{E}_0 \left[\int_0^T U_i \left(C_{it}, V_t^k, t \right) \, dt \right] \tag{8}$$

subject to the static budget constraint

$$\mathrm{E}_0 \left[\int_0^T \pi_t^k \, C_{it} \, dt \right] = w_i \ , \tag{9}$$

where w_i is agent i's initial wealth, $\mathrm{E}_0[.]$ is an expectation as of time 0, and π_t^k is the state price density for country k, which is determined in equilibrium. We normalize $\pi_0^k = 1$ and $\delta_0 = 0$ without loss of generality. Under globalization, the two countries' financial markets

are fully integrated, so that $\pi_t^{US} = \pi_t^{RoW}$. Under autarky, the markets are segmented, so that $\pi_t^{US} \neq \pi_t^{RoW}$. The Lagrangean for the constrained optimization problem is

$$L_i = \mathrm{E}_0 \left[\int_0^T U_i \left(C_{it}, V_t^k, t \right) \, dt \right] - \xi_i \left(\mathrm{E}_0 \left[\int_0^T \pi_t^k \, C_{it} \, dt \right] - w_i \right) \ , \tag{10}$$

where ξ_i is the Langrange multiplier. The maximization is performed state by state, period by period. The first-order conditions yield agent i's optimal consumption:

$$C_{it} = e^{\frac{g_t^k - \log(\xi_i)}{\gamma_i}} \ , \tag{11}$$

where g_t^k is a simple transformation of the state price density:

$$g_t^k = -\phi t - \log \left(\pi_t^k \right) \ . \tag{12}$$

2.2. Distribution of Initial Endowments

Substituting optimal consumption from equation (11) into the budget constraint in equation (9), we can express agents' initial endowments as

$$w_i \ = \ e^{-\frac{\log(\xi_i)}{\gamma_i}} \, \mathrm{E}_0 \left[\int_0^T e^{-\phi t + \left(\frac{1}{\gamma_i} - 1 \right) g_t^k} \, dt \right] \ . \tag{13}$$

To solve the model analytically, we make technical assumptions about the distribution of w_i across agents. For any given value of y, we define $\log(\widetilde{\xi}_i) = \log(\xi_i) - y$. We then define

$$\psi_i = -\frac{1}{\gamma_i} \log \left(\widetilde{\xi}_i \right) \tag{14}$$

and assume that it is independent of γ_i.[11] Once we draw the values of ψ_i and γ_i from their assumed distributions, we combine them with the chosen value of y to construct ξ_i, which then determines the initial endowments w_i in equation (13). In Section 4.3, we vary y to examine how the distribution of initial endowments affects the equilibrium outcomes.

Heterogeneous-agent models are often amenable only to numerical solutions. We derive analytical solutions under three-dimensional heterogeneity (γ_i, η_i, and ψ_i) and no assumptions about the functional forms of the distributions of the three parameters across agents. We only assume that the distribution of γ_i is bounded, $\gamma_i \in [\gamma_L, \gamma_H]$ with $\gamma_L > 1$, continuously differentiable, and that it has positive dispersion. The distributions of both ψ_i and $1/\gamma_i$ must have well-defined moment-generating functions.

[11] The independence between ψ_i and γ_i is ensured by choosing $\tilde{\xi}_i$ implied by the values of ψ_i and γ_i. Given two independent distributions of ψ_i and γ_i, the distribution of $\tilde{\xi}_i$ follows from $\log(\tilde{\xi}_i) = -\psi_i \gamma_i$.

We illustrate the model's implications in a parametric example. For each country, we choose the distribution of risk tolerance $\rho_i = 1/\gamma_i$ that is truncated normal with the same truncation points, restricting γ_i to the interval of $(2, 10)$. The standard deviation of ρ_i is also the same, 0.05, for both countries. But the means of ρ_i are different: 0.25 for the U.S. and 0.2 for RoW, so that RoW agents are more risk-averse, on average, than U.S. agents (condition (3) is satisfied). The distribution of η_i is normal truncated at zero, with the mean of 0.001 and standard deviation of 0.0003. The distribution of ψ_i is normal with standard deviation of 0.2 and the mean such that $\mathrm{E}^{\mathcal{I}}\left[e^{\psi_i} | i \in \mathcal{I}\right] = 1$. We also choose $y = 0$, $\phi = 0.02$, $\mu_\delta = 0.02$, $\sigma_\delta = 0.04$, $m = 0.2$, $\tau = 2$ years, and $T = \tau + 100$ years.

Global output, δ_t, follows the process in equation (6). Its drift is positive ($\mu_\delta > 0$), reflecting the tendency of output to grow over time. It is thus just a matter of time before δ_t exceeds any given value with probability close to one. In some of our subsequent results, we assume "when output is large enough," by which we mean $\delta_t > \underline{\delta}$, where $\underline{\delta}$ is a result-specific threshold. This is an innocuous assumption—we simply restrict our attention to time periods t for which enough time has passed so that $\delta_t > \underline{\delta}$.

3. Globalization

We now solve for the equilibrium under globalization. Since $\pi_t^{US} = \pi_t^{RoW}$, from equation (12), we have $g_t^{US} = g_t^{RoW}$. We denote the common value of g_t^{US} and g_t^{RoW} by g_t. Since output is perishable, aggregate output equals aggregate consumption in each period:

$$D_t = \int_{i \in \mathcal{I}} C_{it}\, di \ , \tag{15}$$

where $\mathcal{I}$ is the set of all agents. Substituting for consumption from equation (11), we obtain

$$\delta_t = \log\left(\frac{\mathrm{E}^{\mathcal{I}}\left[e^{(g_t - y)/\gamma_i} \,|\, i \in \mathcal{I}\right]}{\mathrm{E}^{\mathcal{I}}\left[e^{-y/\gamma_i} \,|\, i \in \mathcal{I}\right]}\right) \ . \tag{16}$$

The equilibrium value of g_t is the unique solution to this equation. We denote this solution by $g(\delta_t)$. The basic properties of this function are derived by Veronesi (2018). He shows that $g'(\delta_t)$ is the inverse of the consumption-weighted average of agents' risk tolerance. Since this value is positive, $g(\delta_t)$ is increasing in δ_t. In addition, $g'(\delta_t)$ decreases as δ_t increases because in a stronger economy, agents with lower risk aversion consume relatively more so that their higher risk tolerance receives a larger weight in the average. Finally, $g(\delta_t) \to \infty$ as $\delta_t \to \infty$ because the marginal utility of consumption shrinks to zero when consumption is infinite.

3.1. Inequality

From equations (2) and (11), we derive the following proposition. Its proof, along with the proofs of all of our other formal results, is in the Appendix.

Proposition 1. *When output is large enough, inequality V_t^k is uniformly increasing in output δ_t, with $\lim_{\delta_t \to \infty} V_t^k = \infty$, for both countries $k \in \{US, RoW\}$. Also, V_t^k is given by*

$$V_t^k = \frac{\mathrm{E}^{\mathcal{I}}\left[e^{2\psi_i} \mid i \in \mathcal{I}^k\right]}{\mathrm{E}^{\mathcal{I}}\left[e^{\psi_i} \mid i \in \mathcal{I}^k\right]^2} \frac{\mathrm{E}^{\mathcal{I}}\left[e^{2(g(\delta_t)-y)/\gamma_i} \mid i \in \mathcal{I}^k\right]}{\mathrm{E}^{\mathcal{I}}\left[e^{(g(\delta_t)-y)/\gamma_i} \mid i \in \mathcal{I}^k\right]^2} - 1 \ . \tag{17}$$

The result that inequality grows with output would be unsurprising if we were to measure inequality in *absolute* terms, as the cross-sectional variance of consumption levels, because those levels, and the differences between them, grow with the size of the economy. However, we measure inequality in *relative* terms, as the cross-sectional variance of consumption shares (equation (2)). The result is an outcome of optimal risk sharing. As the economy strengthens, agents with lower risk aversion consume an increasingly large fraction of total output. This follows from equation (11) because $g'(\delta_t) > 0$. Economic growth generates rising relative inequality due to heterogeneity in risk aversion.

Inequality is eventually driven by the right tail of the consumption distribution. Let $S_t^k = \text{Skewness}\left(\frac{C_{it}}{C_t^k} \mid i \in \mathcal{I}^k\right)$ denote the skewness of consumption shares across agents.

Corollary 1. *When output is large enough, we have $S_t^k > 0$, S_t^k uniformly increasing in δ_t, and $\lim_{\delta_t \to \infty} S_t^k = \infty$, for both countries $k \in \{US, RoW\}$.*

This result holds when output is large enough that the skeweness induced by heterogeneous wealth cumulation overcomes the arbitrary skewness of initial endowments. Inequality is driven by the high consumption of the rich, not the low consumption of the poor. Inequality aversion is related more to agents' dislike of the rich than to their concern for the poor. Figure 1 plots the substance of Proposition 1 and Corollary 1 for our example.

3.2. Current Account Balance

Heterogeneity in risk aversion generates an imbalance between the two countries.

Proposition 2. *Under globalization, when output is large enough, the U.S. runs a current account deficit whereas RoW runs a current account surplus. That is, U.S. agents consume*

more than their tree's output whereas RoW agents consume less:

$$\int_{i\in\mathcal{I}^{US}} C_{it}\,di \;>\; D_t^{US} \tag{18}$$

$$\int_{i\in\mathcal{I}^{RoW}} C_{it}\,di \;<\; D_t^{RoW}\ . \tag{19}$$

The intuition follows from efficient risk sharing. Since U.S. agents are less risk-averse, they insure RoW agents by selling them bonds, and they use the funds borrowed from RoW agents to establish aggressive portfolio positions in stocks. The dividends from these positions finance high consumption by U.S. agents when output is large. The opposite is true for RoW agents—their desire for smooth consumption leads them to hold conservative portfolios, from which they consume less. This pattern is illustrated in Figure 2.

In support of this intuition, we prove in the Appendix that U.S. agents are net borrowers, whereas RoW agents are net lenders. U.S. agents hold a levered position in the global stock market, as a result of which they benefit more from global growth than do RoW agents. We also show that U.S. agents' wealth exceeds the value of their own tree, while the opposite is true for RoW. The U.S. is thus "rich" relative to RoW.

4. Backlash Against Globalization

At time τ, both countries hold elections that may result in a move from globalization to autarky. Before analyzing how agents vote, we describe the equilibrium under autarky.

4.1. Autarky

Under autarky, each country consumes its own output, so that for both $k \in \{US, RoW\}$,

$$D_t^k = \int_{i\in\mathcal{I}^k} C_{it}\,di\ . \tag{20}$$

Substituting for consumption from equation (11) and rearranging, we obtain an equation identical to equation (16) but specific to country k. We denote its solution, the equilibrium value of g_t^k, by $g^k(\delta_t)$. Similar to $g(\delta_t)$, the function $g^k(\delta_t)$ is increasing and concave in δ_t, and it diverges as $\delta_t \to \infty$. In addition, when output is large enough,

$$g^{US}(\delta_t) \;<\; g(\delta_t) \;<\; g^{RoW}(\delta_t)\ . \tag{21}$$

Recall from equation (12) that $g^k(\delta_t)$ is a simple modification of the state price density, π_t^k, which can be interpreted as the marginal utility of consumption for the representative agent in country k. Equation (21) implies that the marginal utility of U.S. agents is higher under autarky than under globalization, whereas the opposite is true for RoW agents.

Inequality under autarky obeys equation (17), except that $g(\delta_t)$ is replaced by $g^k(\delta_t)$.

Proposition 3. *For every δ_t, U.S. inequality is lower under autarky than under globalization, whereas the opposite is true for RoW inequality:*

$$V_t^{US}\left[g^{US}\left(\delta_t\right)\right] < V_t^{US}\left[g\left(\delta_t\right)\right] \tag{22}$$

$$V_t^{RoW}\left[g^{RoW}\left(\delta_t\right)\right] > V_t^{RoW}\left[g\left(\delta_t\right)\right] . \tag{23}$$

The intuition follows from risk-sharing considerations. Under globalization, U.S. agents effectively provide consumption insurance to RoW agents. Therefore, U.S. agents' consumption paths are risky, resulting in significant dispersion in their consumption shares. Under autarky, the cross-border insurance is absent, U.S. agents' consumption paths are less risky, and U.S. inequality is lower. For RoW agents, the same arguments apply in reverse.

The explanation can also be recast in portfolio terms. Under globalization, U.S. agents borrow from RoW agents to finance levered stock positions. This leverage amplifies the differences in consumption across U.S. agents. Under autarky, the cross-border leverage is absent and so U.S. consumption inequality is smaller. For RoW agents, the opposite is true. Under globalization, they hold substantial positions in bonds issued by U.S. agents. Given the similarity of RoW agents' holdings, the differences in their consumption shares are relatively small. Under autarky, the cross-border bond holdings are absent and so RoW consumption inequality is larger. See Figure 1 for a parametric illustration.

4.2. Elections

At time $\tau \in [0, T]$, both countries vote for one of two candidates. The mainstream candidate commits to maintain globalization, whereas the populist commits to a shift to autarky, both lasting through time T. To determine who agent $i \in \mathcal{I}^k$ votes for, let U_i^G and U_i^A denote the agent's utilities from globalization and autarky, respectively, at time τ:

$$U_i^G(\delta_\tau; k, \tau, T) = \mathrm{E}_\tau\left[\int_\tau^T e^{-\phi(s-\tau)}\left(\frac{C_{is}^{1-\gamma_i}}{1-\gamma_i} - \eta^i V_s^k\right) ds \mid \text{mainstream elected}\right] \tag{24}$$

$$U_i^A(\delta_\tau; k, \tau, T) = \mathrm{E}_\tau\left[\int_\tau^T e^{-\phi(s-\tau)}\left(\frac{C_{is}^{1-\gamma_i}}{1-\gamma_i} - \eta^i V_s^k\right) ds \mid \text{populist elected}\right] . \tag{25}$$

We assume that the agent votes for the populist candidate if and only if

$$U_i^A(\delta_\tau; k, \tau, T) \quad > \quad U_i^G(\delta_\tau; k, \tau, T) \ . \tag{26}$$

This "truthful voting" assumption seems reasonable because, due to their infinitesimal size, agents cannot affect the election outcome through strategic voting.

4.2.1. Voting by U.S. Agents

When deciding who to vote for, agents assess the effects of a move to autarky on both consumption and inequality. A shift to autarky decreases the consumption of U.S. agents (compare equations (18) and (20)) but also reduces inequality (Proposition 3). This consumption-inequality tradeoff is at the heart of the voting decision of each U.S. agent.

Proposition 4. *For any U.S. agent i with $\eta_i > 0$, there exists $\overline{\delta}^i$ such that for any $\delta_\tau > \overline{\delta}^i$, the agent votes for the populist candidate.*

If δ_τ is large enough, the agent prefers autarky because the reduction in inequality more than outweighs the reduction in consumption. Lower consumption does not bother the agent much because his marginal utility of consumption is low in a strong economy (when $\delta_\tau \to \infty$, the marginal utility goes to zero). The reduction in inequality matters more because the drop in inequality, $V_\tau^{US}\left[g\left(\delta_\tau\right)\right] - V_\tau^{US}\left[g^{US}\left(\delta_\tau\right)\right]$, is bounded below as $\delta_\tau \to \infty$. Therefore, when δ_τ is large enough, the gain from a more equal society more than compensates for the loss of consumption that the agent suffers when moving to autarky.[12]

Equality can be interpreted as a luxury good in that society demands more of it when it becomes wealthier. When δ_τ increases, agents are more willing to sacrifice consumption in exchange for more equality. In the same spirit, voters might also treat culture, traditions, and other nonpecuniary values as luxury goods. If those values were to take the place of V_t^k in equation (1), agents would demand more of them when they become richer.[13] Consistent with this argument, the recent rise in populism appears predominantly in rich countries. In poor countries, the marginal utility of consumption is high and agents are not willing to sacrifice consumption in exchange for equality or other nonpecuniary values.

[12] Anecdotal evidence suggests that at least some Trump supporters accept lower consumption as a price they are willing to pay for Trump's effort to move the U.S. away from globalization, such as the tariffs he imposed in 2018: "Casey Jackson, a maintenance technician, said he would support the tariffs even if they cost him personally. "If it comes out of my paycheck, so be it," he said." (*Tariffs Trim a Factory's Profit, but Loyalty to Trump Endures*, The New York Times, July 23, 2018).

[13] In the context of Brexit, suppose some British voters worry that immigration dilutes their country's traditional values, which they hold dear. When Britain becomes rich enough, it might decide to restrict immigration, sacrificing consumption in exchange for the reinforcement of traditional values.

Corollary 2. *For any δ_τ, any U.S. agent i with $\eta_i = 0$ votes for the mainstream candidate.*

This result highlights the importance of inequality aversion for our results. Agents whose η_i is zero, or small, reject populism to preserve the risk-sharing benefits of globalization. Therefore, for our following result, we assume that $\eta_i > 0$ for more than half of U.S. agents.

The U.S. election is decided by the U.S. median voter. If the fraction of U.S. agents for whom the relation (26) holds exceeds one half, the election is won by the populist and the U.S. moves to autarky. We now present our main result.

Proposition 5. *There exists $\overline{\delta}$ such that for any $\delta_\tau > \overline{\delta}$, the populist wins the U.S. election.*

In a sufficiently strong economy, the populist wins the U.S. election because the median voter values the lower inequality under autarky more than the higher consumption under globalization. The result follows from Proposition 4, in which the threshold $\overline{\delta}_t^i$ varies across agents. The median value of $\overline{\delta}_t^i$ across all U.S. agents is equal to the value of $\overline{\delta}$ in Proposition 5. This value of $\overline{\delta}$ is indicated by the vertical line in Figure 3.

Proposition 5 highlights the fragility of globalization. By permitting the broadest possible risk sharing, globalization stimulates risk taking. Differences in risk aversion lead agents to adopt different exposures to economic shocks. Agents with the largest exposures—those with the highest tolerance for risk—benefit the most from global growth, while agents with the smallest exposures benefit the least. Economic growth thus deepens the wedge between the consumption levels of agents with different risk aversions, resulting in growing inequality. Given agents' preference for equality, in a growing economy, it is just a matter of time before output grows to a level at which more than half of the agents vote populist.

Proposition 5 maps well onto the recent populist backlash in the West. Both the Trump election and the Brexit vote occurred in 2016, after decades of prosperity. The only major recession since World War II was associated with the 2008 financial crisis. The 2009–2016 period witnessed uninterrupted growth in both the U.S. and UK, indicating a large value of δ_t by 2016. The fruits of this growth have not been shared equally, resulting in a steady rise of inequality in both countries.[14] By 2016, inequality rose to such a level that both countries voted populist in crucial polls, our model would suggest.

The populist's victory in the U.S. election is welcomed by some agents (populist voters) but not others (mainstream voters). The impact on RoW agents, who benefit from higher consumption but suffer from higher inequality, is also mixed. Of course, RoW agents have

[14]For example, the top 10% income share rose from 34.2% in 1980 to 47.0% in 2014 in the U.S., and from 28.4% in 1979 to 40.0% in 2014 in the UK, according to the World Inequality Database.

no say in the U.S. voters' decision. By electing the populist, the U.S. imposes an externality on RoW, which is forced to accept autarky.

4.2.2. Who Votes for the Populist?

We now analyze the cross section of U.S. agents' voting preferences.

Proposition 6. *Agents with higher values of γ_i and η_i are more likely to vote populist.*

The expression "more likely" should be interpreted as follows. Holding η_i and ψ_i constant, there exists a threshold $\overline{\gamma}$ such that agent i votes populist if and only if $\gamma_i > \overline{\gamma}$. Similarly, holding γ_i and ψ_i constant, there exists a threshold $\overline{\eta}$ such that agent i votes populist if and only if $\eta_i > \overline{\eta}$. Given the randomness in γ_i, η_i, and ψ_i, populist voters tend to exhibit more aversion to both risk and inequality, as illustrated in Figure 4.

The result that high-η_i agents vote populist is straightforward. Recall that a move to autarky benefits U.S. agents by reducing within-U.S. inequality but hurts them by reducing their consumption. In this consumption-inequality tradeoff, higher-η_i agents put a larger weight on inequality, which makes autarky more appealing to them.

The result that high-γ_i agents vote populist follows from their optimal choice of smooth consumption plans. Equation (11) shows that the equilibrium consumption of higher-γ_i agents is less sensitive to changes in g_t^k. As a result, such agents suffer a smaller drop in consumption when the global value g_t changes to the local value g_t^{US}, where $g_t^{US} < g_t$ (equation (21)). Since higher-γ_i agents are better insured against the adverse consumption consequences of a shift to autarky, they are more likely to vote populist.

The model produces a negative relation between γ_i and wealth at time τ. Lower-γ_i agents choose more aggressive portfolios, so they gradually accumulate more wealth than higher-γ_i agents. The negative relation between γ_i and wealth is not perfect, but it becomes stronger as time passes and the effect of initial endowments dwindles. The model thus suggests wealth as a natural empirical proxy for risk aversion. Panel C of Figure 4 shows that there are wealthy voters who vote populist, as well as poor voters who vote mainstream, but on average, mainstream voters are wealthier than populist ones. They also consume more than populist voters, on average, and suffer larger drops in consumption upon a move to autarky (Figure 5). We proxy for wealth by income in our empirical work.

Another natural proxy for risk aversion is education. Like low-γ_i agents, better-educated agents tend to benefit more from growth under globalization, so they suffer a larger drop in

consumption when autarky arrives. Better-educated agents are less likely to vote populist not because they are smarter but because they have more to lose when globalization ends.

Another argument supporting education as a proxy for γ_i is that the two concepts are linked in models of human capital investment. Because investment in education is risky, lower-γ_i agents are more likely to undertake it. Shaw (1996) establishes a negative relation between education and risk aversion, both theoretically and empirically.

4.2.3. Voting by RoW Agents

Proposition 7. *RoW agents never elect the populist candidate.*

To understand this result, recall that a move to autarky would increase not only RoW's inequality (Proposition 3) but also its consumption. Consumption would rise because under globalization, RoW agents consume less than their tree's output, whereas under autarky, they consume all of it (compare equations (19) and (20)). But this increase in RoW consumption would come at the expense of U.S. consumption, and we rule out expropriation.

4.3. Redistribution

According to Proposition 5, U.S. voters eventually put an end to globalization. Globalization is fragile in a democracy, but it would be resilient in a benevolent dictatorship. A social planner would eschew autarky because of its less efficient risk sharing. The social planner's problem is intractable, but we know its solution differs from our competitive market solution due to a consumption externality caused by the presence of inequality in the utility function. By consuming a lot, the elites raise inequality, imposing a negative externality on others. The planner can overcome this externality by constraining agents' consumption plans.

In the absence of a social planner, could we save globalization by redistributing wealth across agents? For many redistributive policies, the answer is no.

Proposition 8. *For any lump-sum tax policy* $\{\mathcal{T}_{i,t}\}$ *such that* $\int \mathcal{T}_i(\delta_t)di = 0$*, there exists a redistribution of the endowments at time 0 that achieves the same consumption plans.*

In other words, any state-contingent lump-sum redistributive tax policy is equivalent to a redistribution of initial endowments. This claim follows from dynamic market completeness.

Under redistribution, agent i's static budget constraint can be written as

$$\mathrm{E}_0\left[\int_0^T \pi_t^k\, C_{it}\, dt\right] = w_i + \mathrm{E}_0\left[\int_0^T \pi_t^k\, \mathcal{T}_{it}\, dt\right] \ . \tag{27}$$

Any redistributive policy $\{\mathcal{T}_{i,t}(\delta_t)\}$ can thus be implemented at time 0 by augmenting agent i's initial endowment with $\tilde{w}_i = \mathrm{E}_0\left[\int_0^T \pi_t^k\, \mathcal{T}_{it}\, dt\right]$. It is easy to verify that $\int \tilde{w}_i di = 0$.

Proposition 8 is in fact more general than stated. It applies not only to lump-sum taxes but also to any other redistributive policy that does not affect the equilibrium value of π_t^k. One example is a flat income tax. As we show in the Appendix, such a tax affects agents' optimal stock and bond allocations, but not their equilibrium consumption or π_t^k.[15]

Building on Proposition 8, we ask whether globalization can be saved by redistributing wealth from low-γ_i agents, who benefit the most from globalization, to high-γ_i agents, who benefit the least. Recall from Section 2.2 that, for tractability, we restrict the distribution of initial endowments w_i to those described by equation (13), which can be rewritten as

$$w_i \ = \ e^{\psi_i}\, \mathrm{E}_0\left[\int_0^T e^{-\phi t + \left(g_t^k - y\right)/\gamma_i - g_t^k}\, dt\right] \ . \tag{28}$$

We can pick any value of y and any distribution of ψ_i whose mean is $\mathrm{E}^{\mathcal{I}}\left[e^{\psi_i} | i \in \mathcal{I}\right] = 1/\mathrm{E}^{\mathcal{I}}\left[e^{-y/\gamma_i} | i \in \mathcal{I}\right]$. Equation (28) shows that by increasing the value of y, we redistribute wealth from low-γ_i agents to high-γ_i agents. This fact is also apparent from Panel A of Figure 6: as y increases, so does the correlation between γ_i and w_i. The most relevant type of redistribution—from the wealthy to the poor—can thus be implemented by varying y.

Because all of our prior results are independent of y, they hold for any redistribution captured by different values of y. We formalize this statement in the following corollary.

Corollary 3. *Suppose that the mainstream candidate promises to not only preserve globalization but also implement a redistributive policy that is equivalent to a change in y. For any y, there exists $\overline{\delta}$ such that for any $\delta_\tau > \overline{\delta}$, the populist candidate wins the U.S. election.*

This class of redistributive policies thus cannot prevent the breakdown of globalization. Panel B of Figure 6 shows that increased redistribution implies a higher value of the threshold $\overline{\delta}$ from Proposition 5. Therefore, increased redistribution makes it less likely that the populist gets elected at any given time τ. But for any finite redistributive policy y, when τ is large enough, $\delta_\tau > \overline{\delta}$ holds almost surely. In that sense, redistribution can "delay" the election of the populist but cannot prevent it from happening eventually.

[15] Income here derives from investments in financial assets. Recall that there is no labor income in our model. If we extended the model by adding labor income while preserving market completeness, Proposition 8 would apply also to any redistributive labor income tax because such a tax would not affect π_t^k.

Corollary 3 is noteworthy because redistribution is often proposed as a remedy for the inequality caused by global trade. It is commonly argued that to obtain the first-best solution, we should preserve globalization and make transfers from the beneficiaries of globalization to those adversely affected by it.[16] This argument has some merit in the context of our model because redistribution can reduce the probability of the populist getting elected, for any given τ. But it also has limitations because for any given finite redistributive policy y, there exists τ large enough that the populist almost surely gets elected. A related point is made by Musto and Yilmaz (2003), who show in a different setting that agents can trade away the effects of redistributive policies by trading in complete markets.

The mainstream candidate could save globalization by promising a Pigouvian tax on consumption, taxing agents based on their contribution to inequality (i.e., taxing those who increase consumption inequality and subsidizing those who reduce it). A consumption tax with agent-specific tax rates could address the externality by distorting agents' first-order conditions. Of course, such a tax would be difficult to implement in practice. Progressive income taxation could also in principle address the externality. Whereas a flat income tax does not affect the equilibrium state price density, heterogeneity in the tax rates does, as we show in the Appendix. The design of optimal tax policies is beyond the scope of this paper.

4.4. Model Extensions

In the Appendix, we extend the model in four different ways. First, we allow the countries' output shares to fluctuate over time, departing from equation (7). Second, we let the countries' population shares vary over time. Third, we assume that a move to autarky reduces subsequent output, either by destroying capital or by lowering the long-term growth rate of output. Finally, we assume that a shift to autarky makes output more volatile. In all four extensions, our main results, including Proposition 5, continue to hold.

The extensions also yield additional insights. The first extension shows that the populist victory in the U.S. is more likely after a decline in the U.S. share of global output. When RoW grows relative to the U.S., U.S. agents have more RoW risk to share, which deepens U.S. inequality. Autarky, in which RoW risk is no longer shared, then becomes more appealing. In recent decades, the U.S. share of global output indeed shrank, in part due to the fast growth of China. China grew even during the 2008 crisis, which impoverished the West.

[16] For example, Rodrik (1997, page 73) argues that "If the external risks that buffet national economies and workers were fully observable, a set of transfers contingent on the realization of the shocks would work best. But the world is obviously too complicated for first-best solutions..."

The second extension shows that immigration from RoW to the U.S. makes the populist victory in the U.S. more likely. Intuitively, when the mass of U.S. agents increases, autarky becomes more attractive to U.S. agents because they have more other U.S. agents to share local risk with. In reality, though, the role of immigration in the populist backlash is more likely driven by cultural reasons that are outside our model.

The third extension shows that the prospect of lower output in autarky does not discourage agents from voting populist. A loss of output implies lower consumption but also lower inequality because it hurts the rich more than the poor. Interpreting the 2016 EU referendum through our model, British voters understood that Brexit would reduce their consumption, but it was a price they were willing to pay for lower UK inequality. They accepted that Brexit would weaken the City of London because, given its riches, a weaker London implies lower UK inequality. More generally, when output is large enough, the median voter welcomes its reduction because the resulting decrease in inequality outweighs the decline in consumption. This holds even if we remove autarky from the model. When inequality grows large enough, agents find it optimal to destroy some capital to bring inequality down.

5. Asset Prices

The state price density under globalization is $\pi_t = e^{-\phi t - g(\delta_t)}$, which follows immediately from equation (12). Applying Ito's Lemma, we obtain

$$\frac{d\pi_t}{\pi_t} = -r\left(\delta_t\right) dt - \sigma_\pi\left(\delta_t\right) dZ_t \ , \tag{29}$$

where

$$r\left(\delta_t\right) = \phi + g'\left(\delta_t\right)\mu_\delta - \frac{1}{2}\left(g'\left(\delta_t\right)^2 - g''\left(\delta_t\right)\right)\sigma_\delta^2 \tag{30}$$

$$\sigma_\pi\left(\delta_t\right) = g'\left(\delta_t\right)\sigma_\delta \ . \tag{31}$$

The dependence of the interest rate, $r\left(\delta_t\right)$, on δ_t is unclear as the interplay between intertemporal substitution (the term that involves μ_δ) and precautionary savings (the term that involves σ_δ^2) is complicated. But the price of risk, $\sigma_\pi\left(\delta_t\right)$, always decreases with δ_t because $g''\left(\delta_t\right) < 0$. When δ_t is high, the price of risk is small because a large amount of consumption is attributed to low-γ_i agents who demand low compensation for risk.

Under autarky, equations (30) and (31) look identical, except that the common values $g\left(\delta_t\right)$, $r\left(\delta_t\right)$, and $\sigma_\pi\left(\delta_t\right)$ are replaced by the country-specific values $g^k\left(\delta_t\right)$, $r^k\left(\delta_t\right)$, and $\sigma_\pi^k\left(\delta_t\right)$.

To help us understand how the price of risk depends on the trading regime, we show that[17]

$$(g^{US})'(\delta_t) \;<\; g'(\delta_t) \;<\; (g^{RoW})'(\delta_t)\ . \tag{32}$$

From equations (31) and (32), we immediately obtain the following proposition.

Proposition 9. *The U.S. market price of risk, σ_π^{US}, is lower under autarky than under globalization, for any δ_t. The opposite is true for RoW.*

Consider the risk associated with the output of the U.S. tree. Under globalization, this risk is borne by both U.S. and RoW agents, whereas under autarky, it is borne by U.S. agents only. Since these agents are less risk-averse than RoW agents, they demand lower compensation for risk. The same arguments, but in reverse, hold for RoW. Proposition 9 is illustrated in Panel A of Figure 7 for a range of values of δ_t.

5.1. Stock Prices

The market price of country k's stock is the present value of dividends from country k's tree:

$$P_t^k = \mathrm{E}_t\left[\int_t^T \frac{\pi_s^k}{\pi_t^k}\, D_s^k\, ds\right]\ . \tag{33}$$

Proposition 10. *For $t < \tau$, an increase in δ_t leads to an increase in the global market share of U.S. stocks, $P_t^{US}/(P_t^{US} + P_t^{RoW})$.*

When δ_t increases, so does the probability of $\delta_\tau > \overline{\delta}$ in Proposition 5, which increases the probability of the populist's victory. This victory reduces the discount rate for U.S. stocks but raises it for RoW stocks (Proposition 9). As the market anticipates this outcome, the global market share of U.S. stocks rises. Panel B of Figure 7 visualizes Proposition 10 in the context of our example. Consistent with this prediction, the global share of the U.S. market rose before Trump's election, as we show in the Appendix.

5.2. Bond Prices

At time $t < \tau$, consider two zero-coupon risk-free bonds maturing at time $t' > \tau$. The "U.S. bond" pays one unit of consumption good in the U.S. at time t'; the "RoW bond" does the same in RoW.

[17] While equation (32) appears to hold generally, we can prove the first inequality, $(g^{US})'(\delta_t) < g'(\delta_t)$, only in the special case when the distribution of γ_i satisfies equation (4). Our proofs of the other two inequalities, $(g^{US})'(\delta_t) < (g^{RoW})'(\delta_t)$ and $g'(\delta_t) < (g^{RoW})'(\delta_t)$, are fully general (see the Appendix).

Proposition 11. *For $t < \tau$, an increase in δ_t leads to a decrease in the yield of the U.S. bond but an increase in the yield of the RoW bond.*

An increase in δ_t makes it more likely that $\delta_\tau > \overline{\delta}$, in which case autarky arrives at time τ (Proposition 5). Upon a shift to autarky, country k's state price density jumps from π_τ to π_τ^k, where $\pi_\tau^k/\pi_\tau = e^{g(\delta_\tau)-g^k(\delta_\tau)}$. Given equation (21), a move to autarky increases state prices in the U.S. but decreases them in RoW. The reason is that a move to autarky decreases U.S. agents' consumption, thereby increasing their marginal utility of consumption. Buying the U.S. bond allows U.S. agents to postpone consumption until after time τ when its marginal utility is higher. Since an increase in δ_t makes autarky more likely, it makes the U.S. bond more valuable, reducing its yield. The same arguments, in reverse, apply to RoW.

Panel C of Figure 7 visualizes Proposition 11. When δ_t is low, markets expect globalization to continue beyond time τ, resulting in similar bond yields in both countries. When δ_t grows, a move to autarky becomes more likely; the U.S. bond thus becomes more valuable and the RoW bond less so. When δ_t grows so much that a shift to autarky is all but certain, the U.S. bond's price rises so much that its yield turns negative. This happens because the U.S. bond guarantees a unit of consumption in a future state in which the marginal utility of consumption is very high. This prediction fits the observation that bond yields in the West were low, in some cases negative, when the recent populist wave began.

6. Evidence: Which Countries Are Populist?

In our two-country model, support for populism is stronger in the country (U.S.) that has higher inequality, higher financial development (i.e., lower risk aversion), and a current account deficit. In reality, the U.S. is indeed more unequal and more financially developed than the rest of the world, and it has run a current account deficit since the 1980s.

In this section, we interpret the model's predictions more broadly. Looking across countries, we test the hypotheses that the support for populism is stronger in countries with larger inequality, more financial development, and lower current account balance. Our focus on a recent cross-section of rich countries is motivated by the facts that the rise of populism in the West is a phenomenon from the 2010s, and that the economic variables of interest are highly persistent year to year. Our evidence is consistent with all three hypotheses.

6.1. Data

We measure the support for populism by the vote share of populist parties in recent elections. Our set of countries includes the U.S. and all EU countries. For each EU country, we consider the most recent national parliamentary election as of January 1, 2017. The list of all elections is in Table 1. If the country's most recent election took place before the May 2014 European Parliament (EP) election, we replace the national election with the EP election in the same country to align the timing of elections as closely as possible across countries.

We obtain data on election outcomes from the ParlGov database (Döring and Manow, 2011), which contains party-by-party vote shares from parliamentary and EP elections for all EU member states and most OECD countries. To identify populist parties, we match the ParlGov data to the 2014 Chapel Hill Survey of Experts (Bakker et al., 2015), which estimates the positioning of political parties on various ideological and policy issues. The data cover the views of 337 experts evaluating 268 political parties from all EU countries. We focus on the three dimensions of populism evaluated in the survey that seem the most closely related to skepticism toward globalization: (1) position toward nationalism, (2) position on immigration policy, and (3) the salience of anti-elite rhetoric.[18] We thus classify as populist the parties that experts consider to be nationalist, anti-immigrant, or anti-elite.

For each of the three dimensions of populism, individual experts rate each party on the scale of 0 to 10, with larger values indicating a more populist stance.[19] We classify a party as nationalist, anti-immigrant, or anti-elite if its average score across experts is at least six. For each election and each dimension of populism, we compute the populist vote share by adding up the vote shares of all populist parties. For example, we compute the nationalist vote share in the 2016 Irish election by adding up the 2016 vote shares of all Irish parties classified as nationalist. We report all parties' average scores in the Appendix.

The intersection of ParlGov and the Chapel Hill Survey covers the 28 EU member states. We augment this sample by adding the United States. The 2016 U.S. presidential election pitted Donald Trump against Hillary Clinton. We classify Trump as populist on all three

[18]The remaining policy dimensions evaluated in the survey include the party's position toward ethnic minorities, environmental issues, corruption, deregulation, state intervention in the economy, wealth redistribution, improving public services vs reducing taxes, regional decentralization, urban vs rural interests, religion, liberal social lifestyle, civil liberties vs law and order, integration of asylum seekers, and peacekeeping. None of these are strongly related to globalization. Probably the closest is the position toward ethnic minorities because their members often arrive from abroad. We view the position toward ethnic minorities as a fourth dimension of populism and report the results in the Appendix.

[19]See the Appendix for more detail on the scoring for each of the three dimensions. The number of experts scoring each party in the 2014 survey ranges from 3 to 22, averaging 11.6.

dimensions and Clinton on none. We thus assess the U.S. populist share as equal to Trump's share of the popular vote, 46.1%, in all three dimensions.

We measure inequality by the Gini coefficient of disposable income after taxes and transfers, obtained from the OECD, and by the top 10% income share, from the World Bank. Data on current account balance and financial development also come from the World Bank. We measure financial development by the ratio of the country's stock market capitalization to GDP, in percent.[20] The current account balance is also in percent of GDP. We match the timing of each variable to the corresponding election, as described in the Appendix.

6.2. Election Evidence

Panels A and B of Figure 8 plot the cross-country relation between inequality and the vote share of nationalist parties, or "nationalism." The relation is positive, with the t-statistic of 2.82 for the Gini coefficient and 2.16 for the top 10% income share. The relation is also economically significant: a one-standard-deviation increase in the Gini (top 10% income share) is associated with a 5.8 (4.8) percentage point increase in the nationalist vote share. In the regression analysis throughout Section 6, we weight each country by its GDP. But the relation is present also on an equal-weighted basis, especially among large countries. If we restrict the sample to the eight largest countries with the GDP of Poland or higher, there is a 43% (18%) simple correlation between nationalism and the Gini (top 10% income share). Even across all countries, the correlations are nontrivial: 21% and 13%, respectively. More unequal countries thus exhibit more nationalism, consistent with the model.

Panel C of Figure 8 shows a negative relation between nationalism and the current account balance ($t = -4.59$). A one-standard-deviation increase in the current account balance is associated with an 8.6 percentage point decrease in the nationalist vote share. Panel D shows that financial development is positively related to nationalism ($t = 2.94$). A one-standard-deviation increase in financial development is associated with a 5.2 percentage point increase in the nationalist vote share. If we equal-weight all countries, the correlations in both panels are close to zero. But after eliminating countries with GDP smaller than Poland's, the simple correlations are strong: -51% in Panel C and 48% in Panel D.

Figures 9 and 10 show similar results when we replace the vote shares of nationalist parties by those of anti-immigrant and anti-elite parties, respectively. All three measures of

[20] We also consider three other measures of financial development, all scaled by GDP: private credit, stock market trading volume, and the sum of stock and bond market capitalizations. The results based on these measures are similar to those reported here. For details, see the Appendix.

populism are thus negatively related to the current account balance and positively related to both income inequality and financial development.

Recall that, for each country, we use either the national election or the May 2014 EP election, whichever is more recent as of January 1, 2017. For robustness, we also conduct the analysis in two other ways: by using only the national elections, and by using only the EP elections. In both cases, the results are very similar to those reported here. See the Appendix. In general, the advantage of using EP elections is that they take place at the same time in all EU countries. The disadvantage is that the voter turnout in EP elections is lower: 43.4%, compared to 66.1% for the national elections in our sample.

The largest-GDP country, the U.S., has relatively large inequality, a current account deficit, and highly developed financial markets. Its presence in our sample thus significantly contributes to our conclusions. However, even when we exclude the U.S., the results are qualitatively similar: 11 of the 12 slopes in Figures 8 through 10 have the same signs and most of them remain statistically significant. See the Appendix. Overall, the electoral support for populist parties is stronger in countries with more inequality, more financial development, and larger current account deficits, consistent with our model.

6.3. Survey Evidence

We complement our election analysis with survey evidence on attitudes toward globalization. Survey responses are not always reliable because they have no real consequences. Yet surveys also have their advantages. While there are many reasons why one might vote for a populist, a survey can isolate the issue of globalization by asking a well-targeted question.

We use data from the International Social Survey Programme (ISSP; `www.issp.org`). ISSP's cross-country surveys cover most OECD members as well as a few non-members; we use OECD countries in our analysis. We use the 2013 ISSP segment on national identity. The survey question that we find the most relevant given our focus is "Country should limit the import of foreign products." Individual responses are on the scale of 1 to 5, with higher values indicating stronger agreement. We average the individual responses within countries and interpret a higher country-level average score as stronger support for protectionism. We match these country-level protectionism scores to our 2013 data on inequality, financial development, and current account balance. See the Appendix for details.

Panels A and B of Figure 11 plot the cross-country relation between income inequality and the protectionism score. Cross-country regressions reveal positive relations between

protectionism and both the Gini coefficient ($t = 2.65$) and the top 10% income share ($t = 3.57$). A one-standard-deviation increase in the Gini (top 10% income share) is associated with an increase of 0.18 (0.23) in the protectionism score. This result is similar to the election-based results in Section 6.2, but it is less driven by large countries. Even when the countries are equal-weighted, the correlation between inequality and protectionism is positive and high, 43% for the Gini and 45% for the top 10% income share. Citizens of more unequal countries show more support for protectionism, consistent with the model.

Panel C of Figure 11 shows a negative relation between the current account balance and the protectionism score ($t = -4.08$). A one-standard-deviation increase in the current account balance is associated with a 0.25 decrease in protectionism. This result echoes the election-based results, except it is again less driven by large economies: even the equal-weighted correlation between the two variables is -57%. Panel D shows a positive but insignificant relation between financial development and the protectionism score ($t = 1.50$). A one-standard-deviation increase in financial development is associated with a 0.12 increase in protectionism. The equal-weighted correlation is close to zero when calculated across all countries, but it is 42% when calculated across the six largest countries only.

In the Appendix, we provide more detail on the ISSP, including the list of all national-identity survey questions. We also include the results based on two other survey questions that are somewhat related to globalization, and the results obtained when we exclude the U.S. from the sample. The results are qualitatively similar to those reported here.

To summarize, the survey results are consistent with the model. Protectionist attitudes are stronger in countries with more inequality and larger current account deficits. They are also stronger, but not significantly so, in countries with more financial development.

7. Evidence: Who Are the Populist Voters?

In this section, we examine the characteristics of populist voters. The model predicts that agents with higher aversions to risk and inequality are more likely to vote populist. We test these predictions in two settings. In Section 7.1, we analyze the characteristics of the British voters who supported Brexit in the 2016 referendum. In Section 7.2, we examine which Americans voted for Trump in the 2016 presidential election. Neither Brexit nor Trump fit our model perfectly—such complex phenomena cannot be captured by a simple model.

7.1. Evidence from the Brexit Referendum

We obtain data from the British Election Study (BES, `www.britishelectionstudy.com`). We use the BES panel study dataset, which consists of responses to an online survey conducted between 2014 and 2018 in 13 waves. We use data primarily from wave eight, which was conducted shortly before the EU referendum (between May 6 and June 22 of 2016) on 33,502 respondents. We also add data from other waves, as described in the Appendix.

The left-hand side variable in our regressions is a dummy variable that we call *SupportForBrexit*. This variable is equal to one if the respondent either voted to "Leave the EU" in the referendum or expressed the intent to do so. The variable is equal to zero otherwise.

We use three proxies for risk aversion. *Income* is an integer between 1 and 15 indicating the income range of the respondent's household income. *Education* is equal to one if the respondent's education extends beyond high school and zero otherwise. Both income and education are suitable proxies for risk aversion in the context of our model because they capture the economic mechanism through which risk aversion affects the voting decision. What causes high-γ_i agents to vote populist is that their consumption is less adversely affected by a shift to autarky than is the consumption of low-γ_i agents. Our proxies for γ_i should therefore capture the extent to which the agent's consumption is affected by a shift to autarky. Both income and education fit the bill, as we explain in Section 4.2.2. Our third proxy, *WillingnessToTakeRisk* is an integer between 0 and 3 summarizing the response to the question "Generally speaking, how willing are you to take risks?".

We use seven proxies for inequality aversion. The first proxy is *Income*. Lower-income households are likely to dislike inequality more because it makes their income handicap more pronounced. *InequalityBad* is an integer between 1 and 3, constructed from the responses to two questions: "Do you think the difference in incomes between rich people and poor people in the UK today is larger, smaller, or about the same as it was 20 years ago?", followed by "And do you think this is a good thing, a bad thing, or haven't you thought about it?" We view respondents as inequality-averse if they perceive a rise in inequality and dislike it, or if they perceive a fall in inequality and like it.[21] Our third proxy is the left-right orientation, *LeftRight*, which ranges from 0 (extreme left) to 10 (extreme right). *Religious* is equal to one if the respondent reports having a religious affiliation and zero otherwise. It seems plausible that religious people care more about equality. Religions often emphasize the need

[21]The correct answer to the first question is "Larger," as UK inequality has risen. For example, the top 10% income share rose from 38% in 1994 to 40% in 2014, according to the World Income Database. Among the 68,625 survey respondents in our sample, 43% said "Larger," 7.5% said "About the same," and only 3% said "Smaller" (the remaining respondents either said "Don't know" or did not respond).

for fairness and compassion while encouraging followers to care less about mammon.[22]

Our three remaining proxies for inequality aversion aim to capture the fact that η_i is driven largely by the envy of the rich. In the model, a move to autarky reduces inequality mostly by cutting the consumption of the rich. Applying the model to the EU referendum, high-η_i agents vote for Brexit because they derive utility from the reduced consumption of London's bankers and oligarchs. Our first proxy for the envy of the rich, *PoliticiansFavorTheRich*, measures the extent to which the respondent agrees with the statement "Politicians only care about people with money." *LawFavorsTheRich* is based on the extent to which the respondent agrees with "There is one law for the rich and one for the poor." *DoNotTrustExperts* is based on the extent to which the respondent agrees with "I'd rather put my trust in the wisdom of ordinary people than the opinions of experts." All three variables take integer values from 1 ('Strongly disagree') to 5 ('Strongly agree'). Finally, we include controls for the respondent's age, gender, ethnic minority status, and feminist attitude. The details about all of our variables are in the Appendix.

Table 2 shows the results from the logit regression of *SupportForBrexit* on our right-hand-side variables.[23] Agents with higher incomes and more education are less likely to support Brexit, consistent with the model. Interpreting the evidence through the lens of our model, higher-income and better-educated agents oppose Brexit not because they are better-informed but because they suffer a larger drop in consumption under Brexit.

Agents who report higher *WillingnessToTakeRisk* are more likely to support Brexit. We find this evidence hard to interpret. In our complete-markets model, agents share all risks efficiently. In equilibrium, high-γ_i agents effectively buy insurance from low-γ_i agents. If asked whether she is willing to take risks, a high-γ_i agent in our model could very well respond yes because she is well insured.[24] If we take the model seriously, it is unclear whether we should interpret *WillingnessToTakeRisk* as a sign of risk tolerance or risk aversion, and thus also whether the related evidence is or is not consistent with the model.

The three risk aversion proxies jointly explain 11% of the variance in *SupportForBrexit*.

[22]For example, Christianity, Britain's majority religion, preaches: "Again I tell you, it is easier for a camel to pass through the eye of a needle than for a rich man to enter the kingdom of God." (Matthew 19:24). Islam, Britain's second most popular religion, preaches: "Those who give away their wealth by night and day, secretly and openly, will have their reward with their Lord. They will feel no fear and will know no sorrow." (Quran 2:274).

[23]The results based on probit estimation are very similar, as we show in the Appendix.

[24]For example, consider two agents with different risk aversions who both own a sailboat. The more risk-averse agent has insured her boat for its full value whereas the less risk-averse agent has no insurance. If asked whether they are willing to take risk, the more risk-averse agent might say "yes, I'm willing, because I'm perfectly insured," whereas the less risk-averse agent might say "no because I have no insurance."

Education by itself explains 9% while *Income* explains 2% and *WillingnessToTakeRisk* only 0.2%. A one-standard-deviation change in *Education* (*Income*; *WillingnessToTakeRisk*) affects *SupportForBrexit* by 0.63 (0.32; 0.08) in a simple regression. The economic significance of *Income* and *Education* is thus much stronger than that of *WillingnessToTakeRisk*.

The support for Brexit is stronger among people with a religious affiliation. Assuming such people are more inequality-averse than non-believers, this evidence supports the model. Brexit support is also stronger among right-wing respondents. If these are less inequality-averse then the coefficient on *LeftRight* goes against the model's prediction. However, the left-right orientation may be more closely related to compassion for the poor than to the envy of the rich. It may also be determined by many non-economic influences. Survey evidence reveals a complicated relation between the left-right orientation and attitudes toward inequality (Alesina, Di Tella, and MacCulloch, 2004). After controlling for *LeftRight* and *Religious*, *InequalityBad* is positively related to *SupportForBrexit*, consistent with the model. However, this relation vanishes after adding our "anti-elite" proxies. The role of *InequalityBad* appears to be driven by the envy of the rich.

All three measures of the envy of the rich exhibit strong positive relations to *SupportForBrexit*. In the all-inclusive specification, a one-standard-deviation change in *PoliticiansFavorTheRich* (*LawFavorsTheRich*; *DoNotTrustExperts*) is associated with a change in *SupportForBrexit* of 0.32 (0.08; 0.75). This evidence is consistent with the model. Finally, to the extent that lower-income people dislike inequality more (e.g., Fehr and Schmidt, 1999), the previously-discussed negative relation between *SupportForBrexit* and *Income* also supports the model's prediction regarding inequality aversion.

7.2. Evidence from the Trump Election

On the campaign trail before the 2016 U.S. presidential election, Donald Trump promised to put "America first," pull the U.S. out of international agreements, build a wall on the border with Mexico, impose tariffs, restrict immigration, etc. We thus interpret a vote for Trump as a vote to pull back from globalization.

We use data from the 2016 Cooperative Congressional Election Survey (CCES; Ansolabehere and Schaffner, 2016). This survey of U.S. voters is similar to the BES but less comprehensive in terms of the questions asked. For example, unlike the BES, the 2016 CCES contains no direct questions about attitudes toward the elites, risk, or inequality.

The left-hand side variable in our regressions is *SupportForTrump*: a dummy variable

equal to one if the respondent voted for Trump in the 2016 election and zero otherwise. On the right-hand side, we use variables similar to those from the BES whenever available. *Income* takes integer values from 1 to 16 depending on the income range of the respondent family's annual income. *Education* takes integer values from 1 to 6 depending on the highest level of education completed. *Religious* takes integer values from 0 to 3 depending on the importance of religion in the respondent's life. We include controls for the respondent's age, gender, and ethnicity. Finally, because Trump was the nominee of the Republican party, we add a control for the dummy variable indicating whether the respondent thinks of herself as a *Republican*. For more detail about all of our variables, see the Appendix.

Table 3 shows that both *Income* and *Education* are negatively related to *SupportForTrump*. While *Income* is significant in Panel A, where we control for *Republican*, it is insignificant in Panel B, where we do not. *Income* squared is significantly negatively related to *SupportForTrump* in both panels. When we include both *Income* and its square, the former enters positively and the latter negatively, indicating a nonlinear relation. Apart from that, the results are similar to those in Table 2. Interpreting them through our model, higher-income and higher-education voters behave as if they were less risk-averse: they oppose Trump because they suffer a larger drop in consumption when a move to autarky happens.

More religious people are more likely to vote for Trump. This result echoes Table 2 and is consistent with the model to the extent that more religious people exhibit more inequality aversion. If we view Republicans as less inequality-averse, then the positive slope on *Republican* goes against the model's prediction. However, many Republicans must have voted for Trump regardless of their attitude toward inequality because Trump was their party's nominee. In addition, the Republican-Democrat divide in the U.S. is well known to be related to many non-economic variables that are outside our model.

8. Conclusions

We highlight the fragility of globalization in a democratic society that values equality. In our model, a pushback against globalization arises endogenously as a rational voter response to growing inequality. If policymakers want to save globalization, they need to keep inequality in check. In our model, they could achieve this by distortive (but not lump-sum) taxation, or by eliminating cross-country differences in financial development. While abstracting from many realistic complications, our frictionless, complete-markets model can serve as a simple rational benchmark for thinking about the long-term survival of globalization.

Countries with high inequality, high financial development, and current account deficits are especially vulnerable to anti-global backlash, according to the model. Both the U.S. and Britain fit the bill; perhaps it is no coincidence that they led the populist wave with the Brexit vote and the Trump election. In the model, the backlash occurs when inequality grows large enough. Since inequality tends to rise with economic growth, the model helps us understand how Brexit and Trump could happen in good times, after seven years of growth. Funke, Schularick, and Trebesch (2016) show that far-right populism tends to rise after financial crises. We speculate that crises might elevate aversion to inequality, especially if voters feel, as many did during the 2008 crisis, that elites' high incomes have not been earned fairly. The model's extensions imply the backlash is more likely when there is immigration and when the rest of the world grows faster. The rapid growth of China in recent decades may thus have also spurred populism in the slower-growing West.

Our model is related to two well-known theories of the dynamics of inequality. Kuznets (1955) suggests that inequality first rises due to industrialization but then falls after industries attract much of the rural labor force. Piketty (2014) argues that inequality naturally rises because the rate of return on capital exceeds the rate of economic growth, and it falls as a result of state intervention or conflict. Unlike Kuznets or Piketty, we have a formal model. Our model also predicts a rise and fall in inequality, but the mechanism is different—inequality first rises as a consequence of heterogeneous exposure to global growth, but then it falls as a result of political decisions that reverse global integration.

The political decisions that reduce inequality in our model could also take other forms. Some of the largest historical reductions in inequality were caused by violent political events such as wars and revolutions (Scheidel, 2017). While Scheidel describes the effects of violence on inequality, our mechanism can deliver reverse causality in which rising inequality causes violence. When inequality grows large enough, inequality-averse agents find it optimal to upset the elites by destroying some of the endowment, as we show in one of our model extensions. Such destruction reduces inequality because it hurts the rich more than the poor.[25] Our model thus highlights perils beyond a possible reversal of globalization. The model's broader implication is that when inequality grows large enough, it becomes unsustainable because inequality-averse agents take political action to reverse it.

[25]This result is somewhat reminiscent of Ljungqvist and Uhlig (2015), who find that in the Campbell-Cochrane habit model, government interventions that destroy part of the endowment can improve welfare. Alesina and Perotti (1996) show empirically that high income inequality causes socio-political instability. High inequality leads to political instability also in the model of Acemoglu and Robinson (2001).

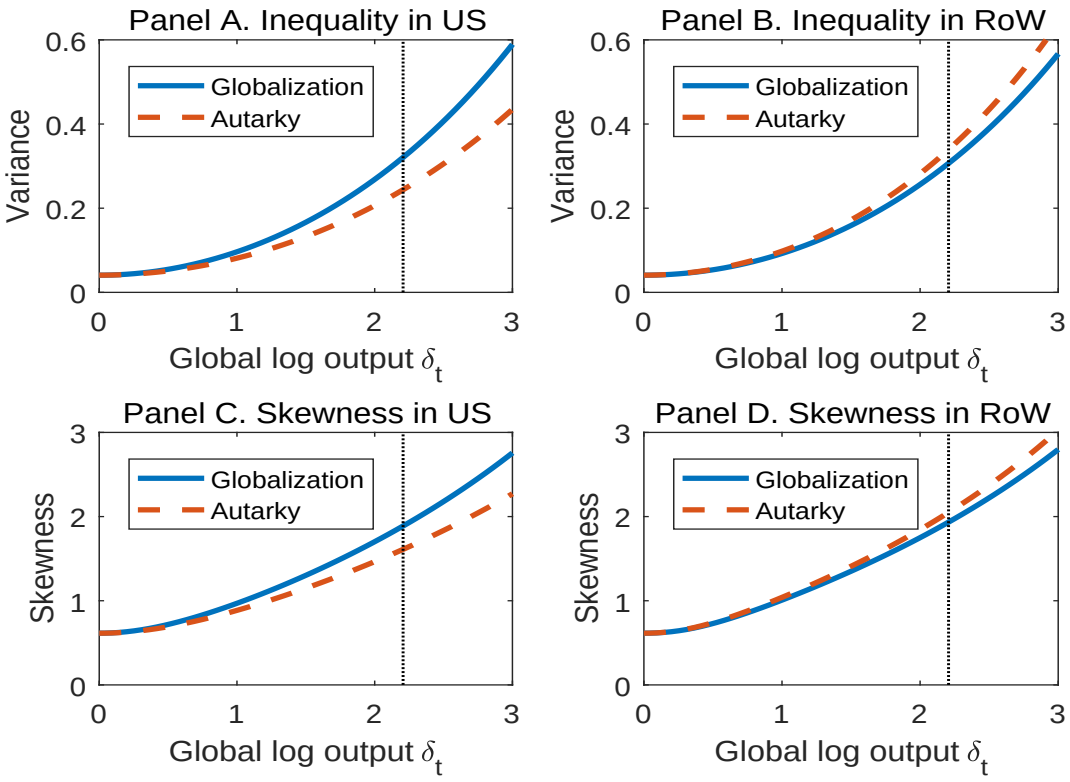


Figure 1. Inequality and Skewness of the Consumption Distribution. This figure plots V_t^k and S_t^k as a function of δ_t for $k \in \{US, RoW\}$, under globalization (solid line) and autarky (dashed line).

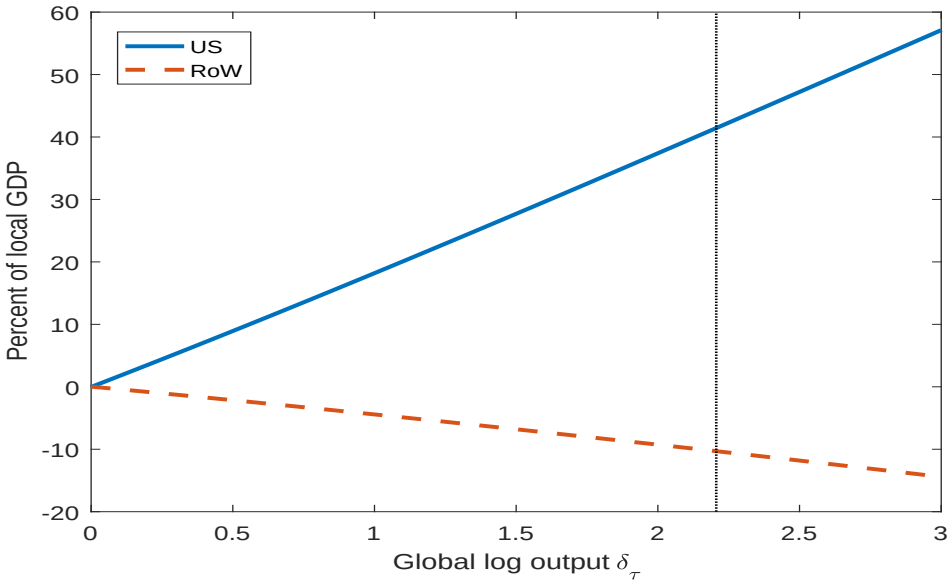


Figure 2. Current Account Deficit. This figure plots the current account deficits of the two countries, as a percentage share of local GDP, against δ_t.

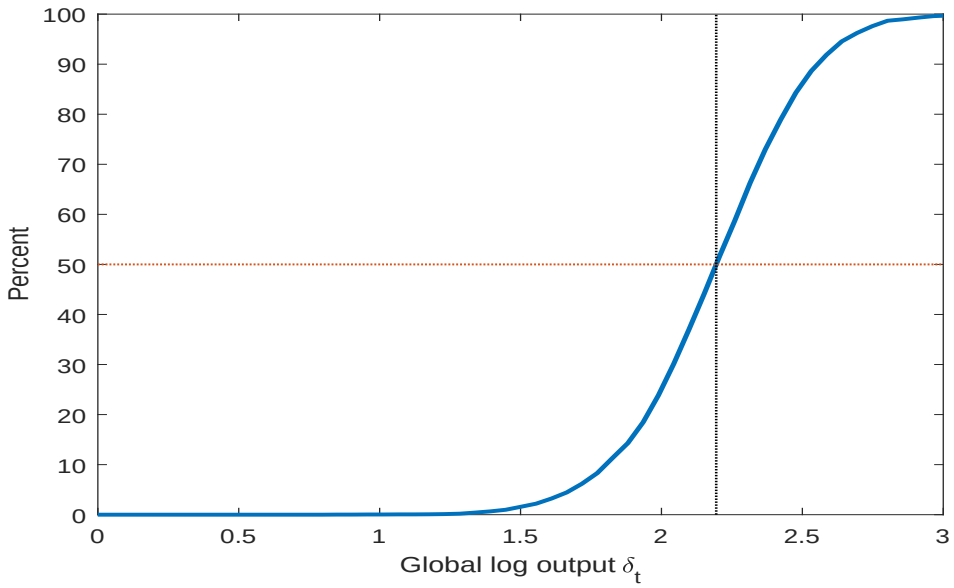


Figure 3. The Populist Vote Share. This figure plots the fraction of U.S. agents voting for the populist candidate, in percent. The vertical line denotes $\bar{\delta}$ from Proposition 5.

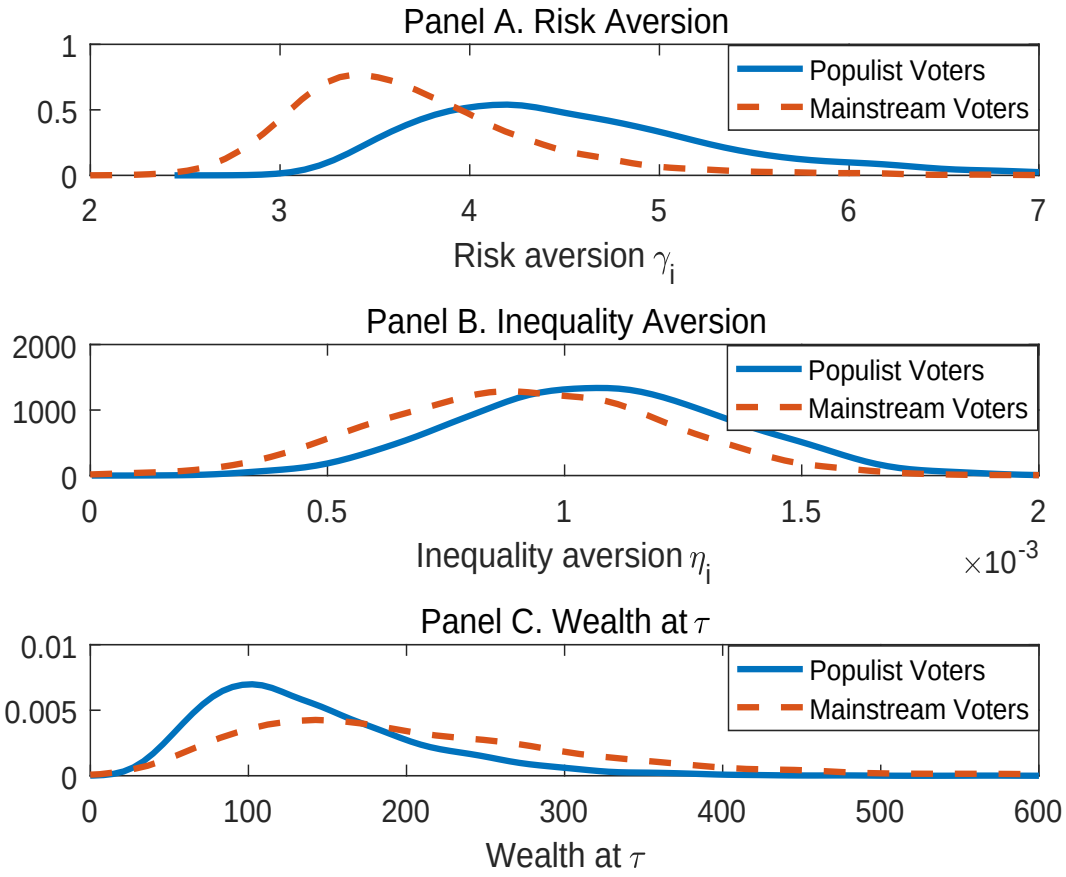


Figure 4. Characteristics of Populist and Mainstream Voters. This figure plots the distributions of γ_i (Panel A), η_i (Panel B), and wealth at the time of the election (Panel C) across populist voters (solid line) as well as mainstream voters (dashed line).

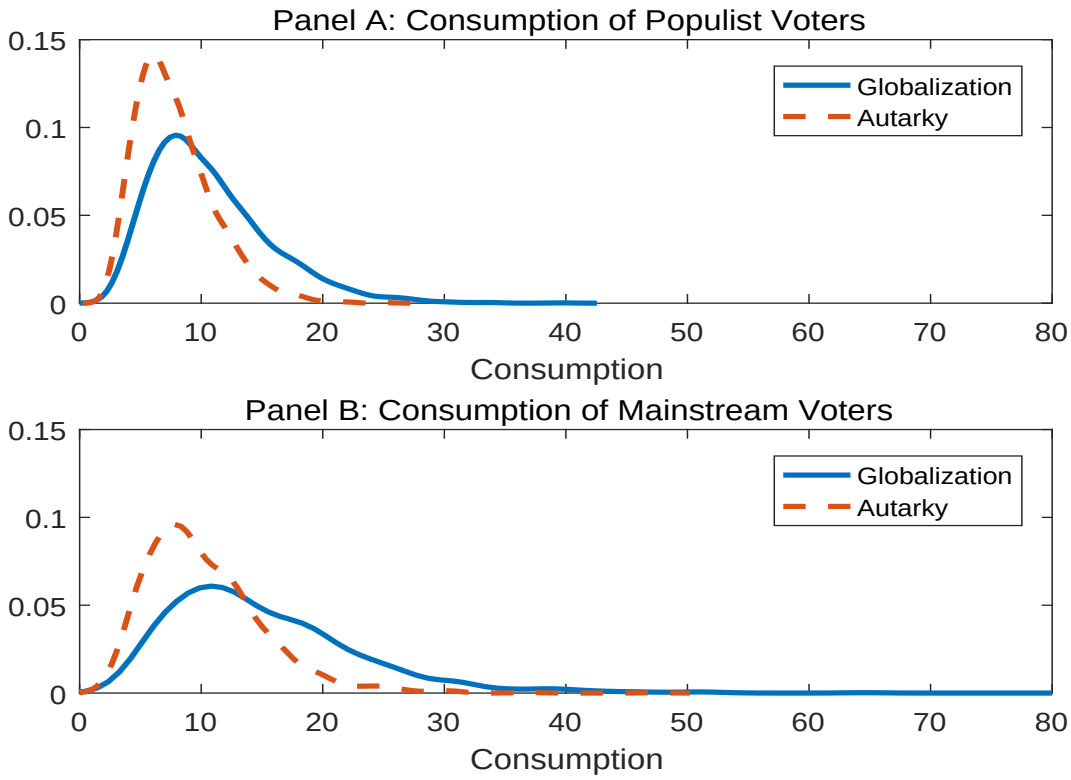


Figure 5. The Distribution of Consumption. This figure plots the distribution of consumption at time τ across populist voters (Panel A) and mainstream voters (Panel B) under two regimes: globalization (solid line) and autarky (dashed line). The value of δ_τ is such that one half of U.S. agents favor each regime.

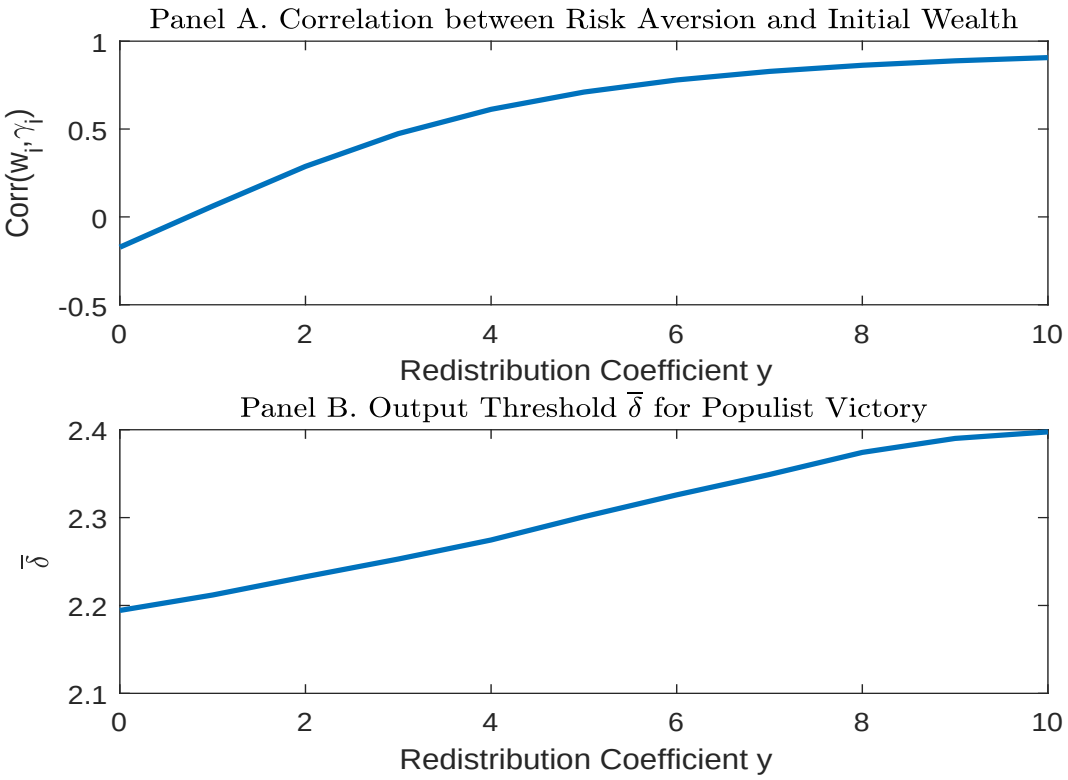


Figure 6. The Effects of Redistribution. This figure plots the correlation between risk aversion γ_i and initial endowment w_i across U.S. agents (Panel A) and the threshold $\overline{\delta}$ from Proposition 5 (Panel B) for different values of the redistribution coefficient y.

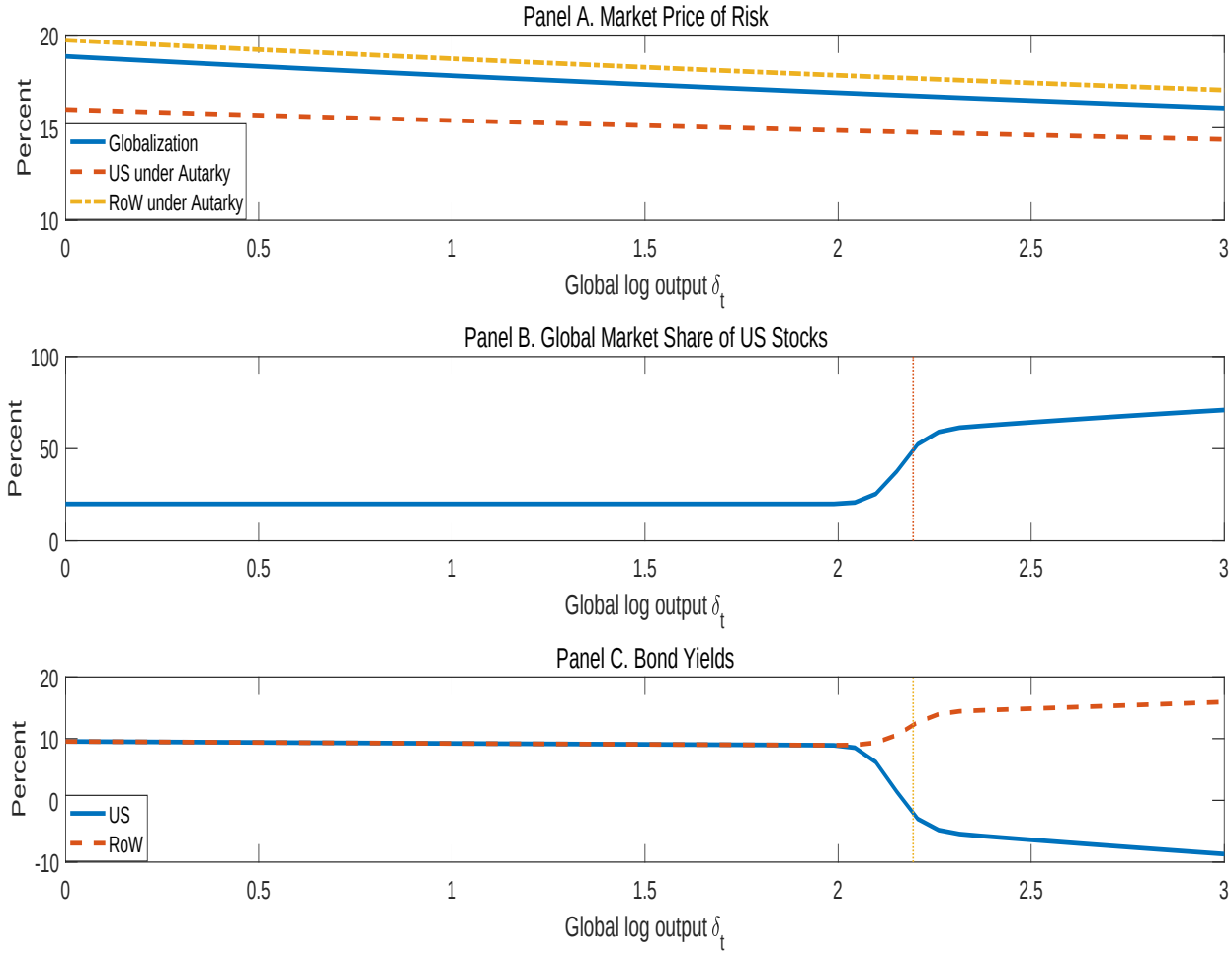


Figure 7. Asset Pricing Implications. This figure plots asset pricing quantities as a function of δ_t at time $t = \tau - 2$ years. Panel A plots the market prices of risk, σ_π^{US} and σ_π^{RoW}, under globalization (solid line) and under autarky (dashed and dash-dot lines, respectively). Panel B plots the global market share of U.S. stocks, $P_t^{US}/(P_t^{US} + P_t^{RoW})$. Panel C plots the yields on U.S. and RoW 10-year zero-coupon bonds. The vertical line in Panels B and C denotes the threshold $\overline{\delta}$ from Proposition 5.

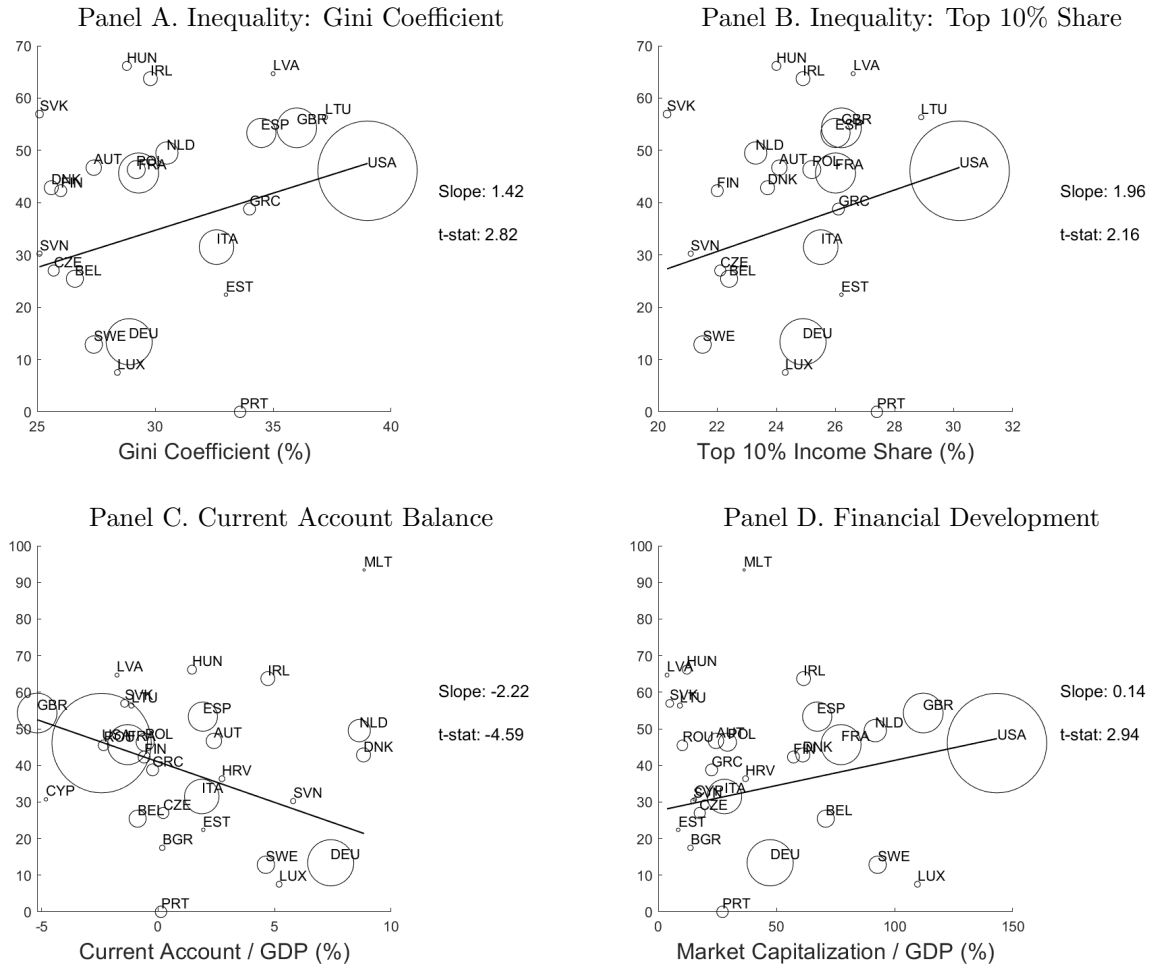


Figure 8. Vote Share of Nationalist Parties. This figure plots the election vote share of the parties we classify as nationalist, in percent. For each country, we use either the most recent national parliamentary election as of January 1, 2017 or the same country's May 2014 European Parliament election, whichever occurs later. The vote share is plotted against country-level measures of the Gini coefficient of disposable net income (Panel A), the share of income going to the top 10% of earners (Panel B), the current account balance as a fraction of GDP (Panel C), and the ratio of stock market capitalization to GDP (Panel D). The circle around each country's observation has an area proportional to the country's GDP. The slope and its t-statistic are from the GDP-weighted cross-country regression.

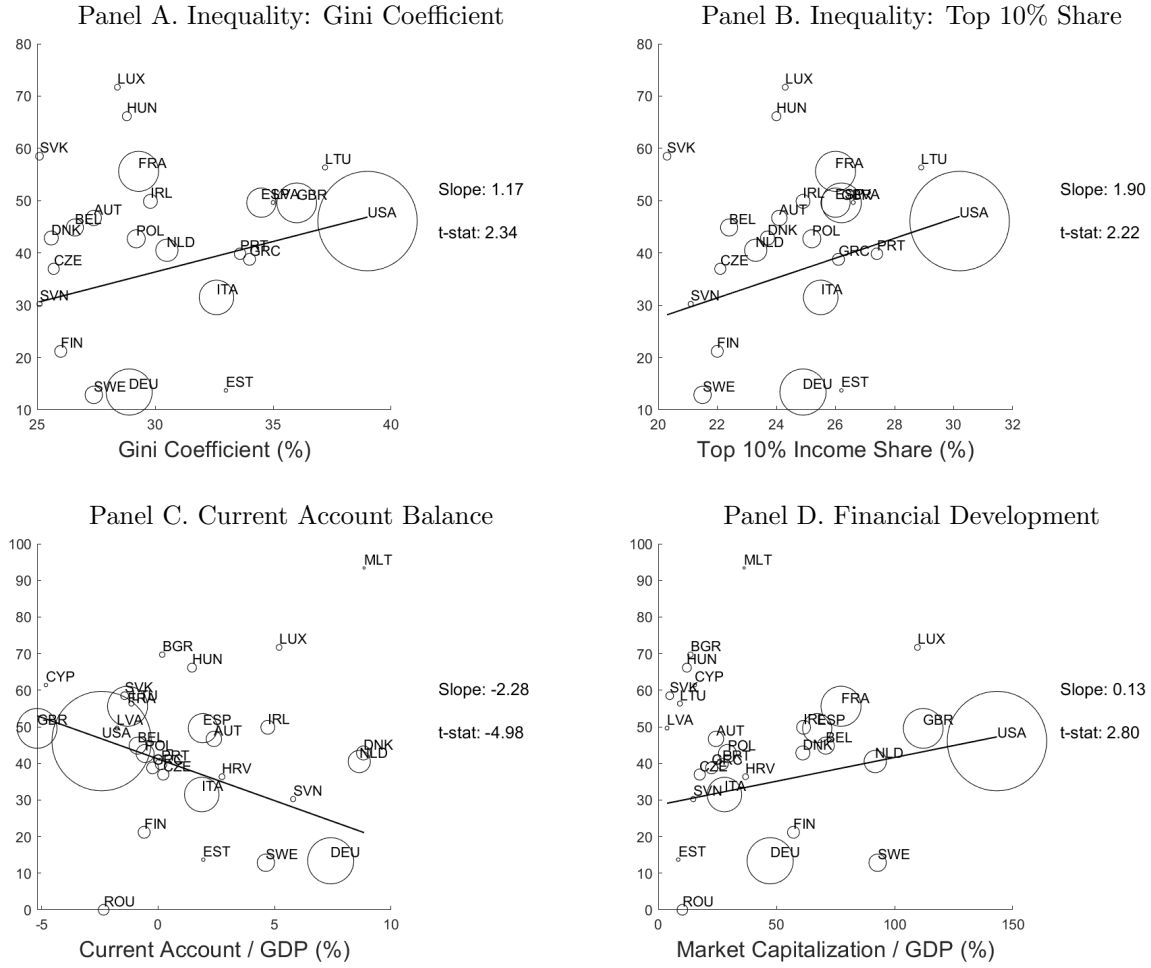


Figure 9. Vote Share of Anti-Immigrant Parties. This figure plots the election vote share of the parties we classify as anti-immigrant, in percent. For each country, we use either the most recent national parliamentary election as of January 1, 2017 or the same country's May 2014 European Parliament election, whichever occurs later. The vote share is plotted against country-level measures of the Gini coefficient of disposable net income (Panel A), the share of income going to the top 10% of earners (Panel B), the current account balance as a fraction of GDP (Panel C), and the ratio of stock market capitalization to GDP (Panel D). The circle around each country's observation has an area proportional to the country's GDP. The slope and its t-statistic are from the GDP-weighted cross-country regression.

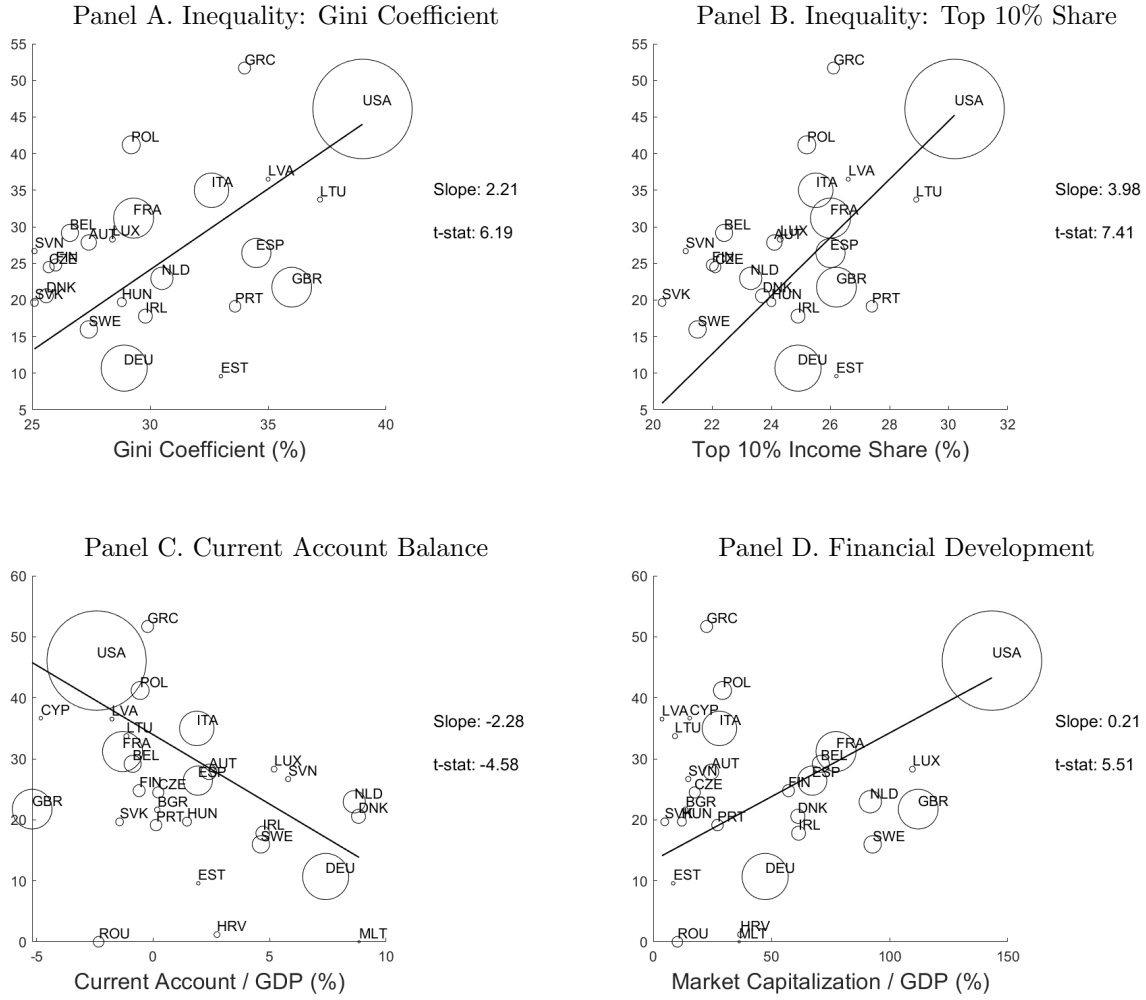


Figure 10. Vote Share of Anti-Elite Parties. This figure plots the election vote share of the parties we classify as anti-elite, in percent. For each country, we use either the most recent national parliamentary election as of January 1, 2017 or the same country's May 2014 European Parliament election, whichever occurs later. The vote share is plotted against country-level measures of the Gini coefficient of disposable net income (Panel A), the share of income going to the top 10% of earners (Panel B), the current account balance as a fraction of GDP (Panel C), and the ratio of stock market capitalization to GDP (Panel D). The circle around each country's observation has an area proportional to the country's GDP. The slope and its t-statistic are from the GDP-weighted cross-country regression.

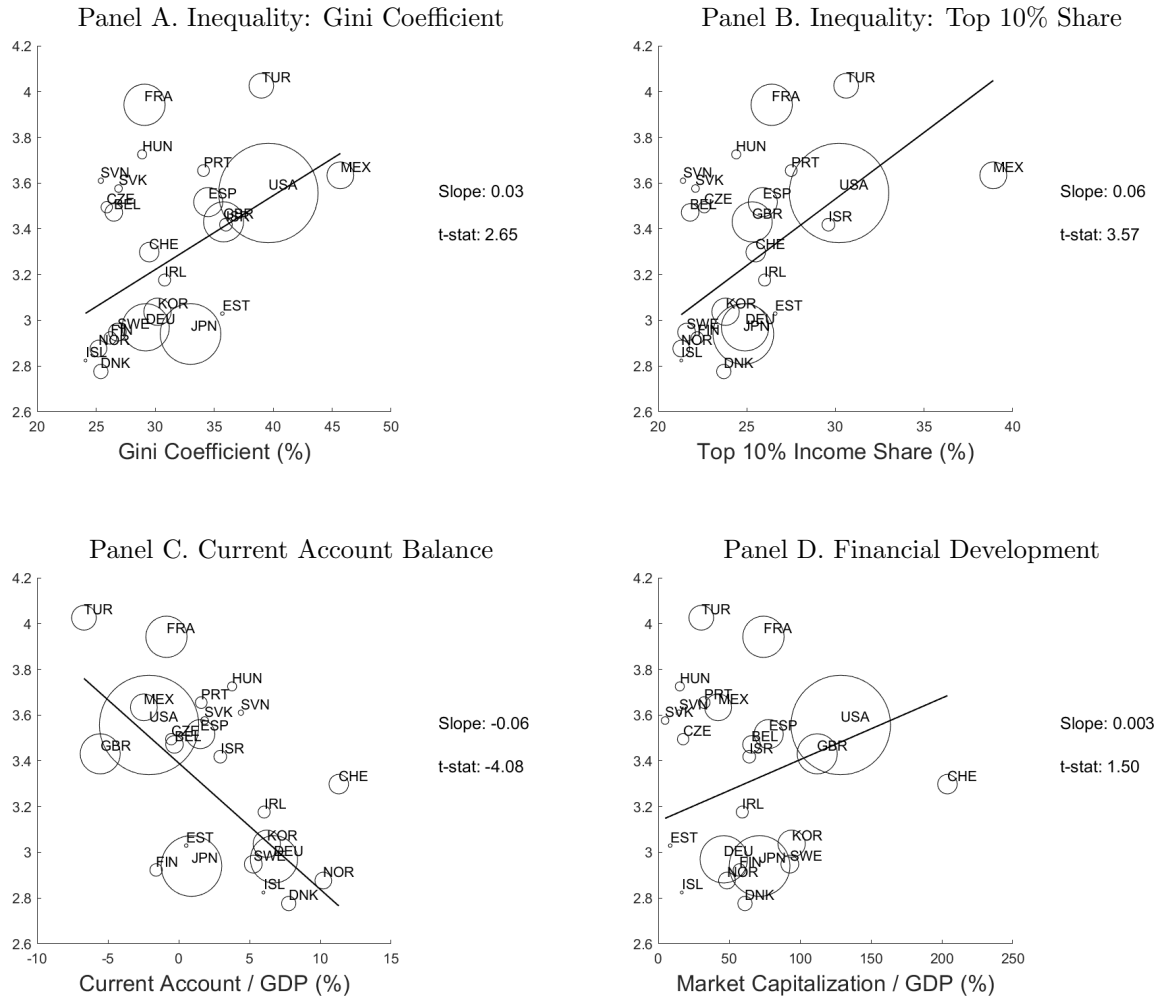


Figure 11. Support for Protectionism. This figure plots the extent to which the country's respondents in the 2013 ISSP survey agree with the statement "Country should limit the import of foreign products." The survey responses range from 1 to 5, with 5 indicating "agree strongly" and 1 "disagree strongly," so that a higher score indicates stronger support for protectionism. The country-level score is the average of all individual responses in the country. This score is plotted against country-level measures of the Gini coefficient of disposable net income (Panel A), the share of income going to the top 10% of earners (Panel B), the current account balance as a fraction of GDP (Panel C), and the ratio of stock market capitalization to GDP (Panel D). The circle around each country's observation has an area proportional to the country's GDP. The slope and its t-statistic are from the GDP-weighted cross-country regression.

Table 1
Elections in Our Sample

This table reports the dates of the national elections in our sample. For each country, we use its most recent national election as of January 1, 2017 as long as it occurred in or after May 2014. If the national election occurred before May 2014, we replace it by the May 2014 European Parliament election in the same country.

Country	National Election Date	European Parliament Election Used? (Y/N)
Austria	2013-09-29	Y
Belgium	2014-05-25	N
Bulgaria	2014-10-05	N
Croatia	2016-09-11	N
Cyprus	2016-05-22	N
Czech Republic	2013-10-25	Y
Denmark	2015-06-18	N
Estonia	2015-03-01	N
Finland	2015-04-19	N
France	2012-06-17	Y
Germany	2013-09-22	Y
Greece	2015-09-20	N
Hungary	2014-04-06	Y
Ireland	2016-02-26	N
Italy	2013-02-25	Y
Latvia	2014-10-04	N
Lithuania	2016-10-09	N
Luxembourg	2013-10-20	Y
Malta	2013-03-09	Y
Netherlands	2012-09-12	Y
Poland	2015-10-25	N
Portugal	2015-10-04	N
Romania	2016-12-11	N
Slovakia	2016-03-06	N
Slovenia	2014-07-13	N
Spain	2016-06-26	N
Sweden	2014-09-14	N
United Kingdom	2015-05-07	N
United States	2016-11-08	N

Table 2
Determinants of the Support for Brexit

This table reports the slope coefficients from a cross-sectional logit regression. The left-hand-side variable is the support for Brexit among the respondents to the British Election Survey. The right-hand-side variables are listed in the first column. The intercept is included in the regression. The t-statistics are in parentheses.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Income	-0.09			-0.06			-0.06	-0.06
	(-27.04)			(-15.04)			(-7.86)	(-7.28)
Education		-1.27		-1.22			-0.65	-0.55
		(-60.29)		(-44.27)			(-12.57)	(-9.83)
WillingnessToTakeRisk			0.11	0.21			0.17	0.20
			(7.86)	(10.97)			(4.98)	(5.54)
LeftRight					0.44	0.47	0.45	0.42
					(47.88)	(41.71)	(35.20)	(31.07)
Religious					0.31	0.15	0.16	0.11
					(8.52)	(3.43)	(3.16)	(2.07)
InequalityBad					0.12	-0.04	-0.03	-0.02
					(3.40)	(-0.89)	(-0.62)	(-0.37)
PoliticiansFavorTheRich						0.29	0.27	0.30
						(10.82)	(8.73)	(9.34)
LawFavorsTheRich						0.11	0.07	0.08
						(3.71)	(1.92)	(2.17)
DoNotTrustExperts						0.78	0.68	0.66
						(36.94)	(27.76)	(25.90)
Minority								-0.54
								(-5.53)
Age								0.01
								(4.23)
Gender (Male)								-0.14
								(-2.55)
Feminist								-0.36
								(-11.47)
Observations	31095	40783	40890	25328	15631	13953	10838	10370
R^2	0.02	0.09	0.002	0.11	0.21	0.35	0.36	0.38

Table 3
Determinants of the Support for Trump

This table reports the slope coefficients from a cross-sectional logit regression. The left-hand-side variable is the support for Donald Trump in the November 2016 presidential election. Panel A controls for whether the survey respondent self-identifies as Republican; Panel B does not. The right-hand-side variables are listed in the first column. The intercept is included in the regression. The t-statistics are in parentheses.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				Panel A. Controlling for Republican Dummy			
Republican	3.06	3.06	3.06	3.05	2.92	2.92	2.86
	(95.92)	(95.93)	(95.83)	(94.51)	(94.66)	(89.32)	(84.45)
Income	-0.02		0.06	0.10		0.11	0.08
	(-4.64)		(3.86)	(6.41)		(6.70)	(4.82)
Income^2		-0.002	-0.01	-0.01		-0.005	-0.004
		(-5.72)	(-5.11)	(-4.85)		(-4.43)	(-3.80)
Education				-0.27		-0.26	-0.24
				(-28.72)		(-27.31)	(-23.82)
Religious					0.40	0.37	0.46
					(37.84)	(32.59)	(37.82)
Minority							-1.28
							(-34.04)
Age							0.01
							(14.76)
Gender (Male)							0.57
							(21.14)
Observations	40445	40445	40445	40445	45209	40426	40426
R^2	0.32	0.32	0.32	0.33	0.34	0.35	0.40
				Panel B. No Control for Republican Dummy			
Income	-0.001		0.10	0.14		0.15	0.12
	(-0.27)		(7.30)	(10.42)		(10.52)	(8.15)
Income^2		-0.0004	-0.01	-0.01		-0.01	-0.01
		(-2.10)	(-7.58)	(-7.22)		(-6.36)	(-5.43)
Education				-0.28		-0.27	-0.25
				(-35.71)		(-33.09)	(-28.58)
Religious					0.53	0.51	0.61
					(58.25)	(52.02)	(57.66)
Minority							-1.59
							(-47.71)
Age							0.01
							(14.54)
Gender (Male)							0.47
							(20.32)
Observations	40456	40456	40456	40456	45222	40437	40437
R^2	0.00	0.0001	0.001	0.03	0.08	0.10	0.19

REFERENCES

Acemoglu, Daron, and James A. Robinson, 2001, A theory of political transitions, *American Economic Review* 91, 938–963.

Alesina, Alberto, and George-Marios Angeletos, 2005, Fairness and redistribution, *American Economic Review* 95, 960–980.

Alesina, Alberto, Rafael Di Tella, and Robert MacCulloch, 2004, Inequality and happiness: are Europeans and Americans different? *Journal of Public Economics* 88, 2009–2042.

Alesina, Alberto, and Roberto Perotti, 1996, Income distribution, political instability, and investment, *European Economic Review* 40, 1203–1228.

Algan, Yann, Sergei Guriev, Elias Papaioannou, and Evgenia Passari, 2017, The European trust crisis and the rise of populism, *Brookings Papers on Economic Activity* 2, 309–400.

Ansolabehere, Stephen and Brian F. Schaffner, 2016, Cooperative Congressional Election Study, Common Content. Release 2: August 4, 2017. Cambridge, MA: Harvard University, `http://cces.gov.harvard.edu`.

Atkinson, Anthony B., Thomas Piketty, and Emmanuel Saez, 2011, Top incomes in the long run of history, *Journal of Economic Literature* 49, 3–71.

Autor, David, David Dorn, Gordon Hanson, and Kaveh Majlesi, 2017, Importing political polarization? The electoral consequences of rising trade exposure, Working paper.

Bakker, Ryan, Erica Edwards, Liesbet Hooghe, Seth Jolly, Jelle Koedam, Filip Kostelka, Gary Marks, Jonathan Polk, Jan Rovny, Gijs Schumacher, Marco Steenbergen, Milada Vachudova, and Marko Zilovic, 2015, *1999–2014 Chapel Hill Expert Survey Trend File, Version 1.1.* University of North Carolina, Chapel Hill. `www.chesdata.eu`.

Bhamra, Harjoat S., and Raman Uppal, 2014, Asset prices with heterogeneity in preferences and beliefs, *Review of Financial Studies* 27, 519–580.

Caballero, Ricardo J., Emmanuel Farhi, and Pierre-Olivier Gourinchas, 2008, An equilibrium model of global imbalances and low interest rates, *American Economic Review* 98, 358–93.

Chabakauri, Georgy, 2013, Dynamic equilibrium with two stocks, heterogeneous investors, and portfolio constraints, *Review of Financial Studies* 26, 3104–3141.

Chan, Yeung Lewis, and Leonid Kogan, Catching up with the Joneses: Heterogeneous preferences and the dynamics of asset prices, *Journal of Political Economy* 110, 1255–1285.

Clark, Andrew E., and Conchita D'Ambrosio, 2015, Attitudes to income inequality: experimental and survey evidence, *Handbook of Income Distribution* Vol. 2, 1147–1208.

Colantone, Italo, and Piero Stanig, 2018a, Global competition and Brexit, *American Political Science Review* 112, 201–218.

Colantone, Italo, and Piero Stanig, 2018b, The trade origins of economic nationalism: Import competition and voting behavior in Western Europe, *American Journal of Political Science*, forthcoming.

Dawes, Christopher T., James H. Fowler, Tim Johnson, Richard McElreath, and Oleg Smirnov, 2007, Egalitarian motives in humans, *Nature* 446, 794–796.

Döring, Holger and Philip Manow, 2011, Parliament and government composition database (ParlGov), Working paper, University of Bremen. www.parlgov.org.

Dumas, Bernard, 1989, Two-person dynamic equilibrium in the capital market, *Review of Financial Studies* 2, 157–188.

Fehr, Ernst, and Klaus M. Schmidt, 1999, A theory of fairness, competition, and cooperation, *Quarterly Journal of Economics* 114, 817–868.

Ferrer-i-Carbonell, Ada, and Xavier Ramos, 2014, Inequality and happiness, *Journal of Economic Surveys* 28, 1016–1027.

Funke, Manuel, Moritz Schularick, and Christoph Trebesch, 2016, Going to extremes: Politics after financial crises, 1870-2014, *European Economic Review* 88, 227–260.

Garleanu, Nicolae, and Stavros Panageas, 2015, Young, old, conservative, and bold: The implications of heterogeneity and finite lives for asset pricing, *Journal of Political Economy* 123, 670–685.

Gomes, Francisco, and Alexander Michaelides, 2008, Asset pricing with limited risk sharing and heterogeneous agents, *Review of Financial Studies* 21, 415–448.

Gourinchas, Pierre-Olivier, Helene Rey, and Nicolas Govillot, 2017, Exorbitant privilege and exorbitant duty, Working paper, 2017.

Guiso, Luigi, Helios Herrera, Massimo Morelli, and Tommaso Sonno, 2017, Demand and supply of populism, Working paper.

Guiso, Luigi, Helios Herrera, Massimo Morelli, and Tommaso Sonno, 2018, Global crises and populism: the role of Eurozone institutions, Working paper.

Inglehart, Ronald, and Pippa Norris, 2016, Trump, Brexit, and the rise of populism: Economic have-nots and cultural backlash, Working paper, University of Michigan.

James, Harold, 2001, *The End of Globalization: Lessons from the Great Depression*, Harvard University Press, Cambridge, MA.

Jones, Charles I., and Jihee Kim, 2018, A Schumpeterian model of top income inequality, *Journal of Political Economy*, forthcoming.

Kuznets, Simon, 1955, Economic growth and income inequality, *American Economic Review* 45, 1–28.

Ljungqvist, Lars, and Harald Uhlig, 2015, Comment on the Campbell-Cochrane habit model, *Journal of Political Economy* 123, 1201–1213.

Longstaff, Francis A., and Jiang Wang, 2012, Asset pricing and the credit market, *Review of Financial Studies* 25, 3169–3215.

Maggiori, Matteo, 2017, Financial intermediation, international risk sharing, and reserve currencies, *American Economic Review* 107, 3038–71.

Mendoza, Enrique G., Vincenzo Quadrini, and Jose-Victor Rios-Rull, 2009, Financial integration, financial development, and global imbalances, *Journal of Political Economy* 117, 371–416.

Menzly, Lior, Tano Santos, and Pietro Veronesi, 2004, Understanding predictability, *Journal of Political Economy* 112, 1–47.

Milanović, Branko, 2016, *Global Inequality: A New Approach for the Age of Globalization*, Harvard University Press, Cambridge, MA.

Morawetz, David, et al., 1977, Income distribution and self-rated happiness: some empirical evidence, *Economic Journal* 87, 511–522.

Musto, David K., and Bilge Yilmaz, 2003, Trading and voting, *Journal of Political Economy* 111, 990–1003.

Müller, Jan-Werner, 2016, *What is Populism?* University of Pennsylvania Press.

O'Rourke, Kevin H., and Jeffrey G. Williamson, 2001, *Globalization and History: The Evolution of a Nineteenth-Century Atlantic Economy*, MIT Press, 2001.

Pástor, Ľuboš, and Pietro Veronesi, 2016, Income inequality and asset prices under redistributive taxation, *Journal of Monetary Economics* 81, 1–20.

Pástor, Ľuboš, and Pietro Veronesi, 2017, Political cycles and stock returns, NBER WP.

Piketty, Thomas, 2014, *Capital in the 21st Century*, Harvard University Press, Cambridge.

Rajan, Raghuram G., and Luigi Zingales, 1998, Financial dependence and growth, *American Economic Review* 88, 559–586.

Rodrik, Dani, 1997, *Has Globalization Gone Too Far?*, Institute for International Economics, Washington, DC.

Rodrik, Dani, 2000, How far will international economic integration go? *Journal of Economic Perspectives* 14, 177–186.

Rodrik, Dani, 2018, Populism and the economics of globalization, *Journal of International Business Policy* 1, 12–33.

Sampson, Thomas, 2017, Brexit: the economics of international disintegration, *Journal of Economic Perspectives* 31, 163–84.

Scheidel, Walter, 2017, *The Great Leveler: Violence and the History of Inequality from the Stone Age to the Twenty-First Century,* Princeton University Press.

Shaw, Kathryn L., 1996, An empirical analysis of risk aversion and income growth, *Journal of Labor Economics* 14, 626–653.

Thurow, Lester C., 1971, The income distribution as a pure public good, *Quarterly Journal of Economics* 85, 327–336.

Veronesi, Pietro, 2018, Heterogeneous households under uncertainty, Working paper.

Wilkinson, Richard, and Kate Pickett, 2009, *The Spirit Level: Why More Equal Societies Almost Always Do Better*, Penguin, London.

Wilkinson, Richard, and Kate Pickett, 2018, *The Inner Level: How More Equal Societies Reduce Stress, Restore Sanity and Improve Everyone's Well-being*, Penguin, London.