Democratization, Inequality, and Risk Premia*

Max Miller†
The Wharton School, University of Pennsylvania

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Abstract

Risk premia are significantly elevated during periods of democratization in a cross-country panel of equity data covering 85 countries over 200 years, despite little effect on GDP or dividends. This result is explained in an asset pricing model in which wealthy asset market participants face redistribution if democracy consolidates. Finally, in a quasi-natural experiment emanating from a shift in Catholic church doctrine in support of democracy, majority Catholic autocracies display significantly higher average excess returns relative to other countries in a difference-in-differences framework. These results are key to understanding how the redistribution of economic and political power influence financial decisions.

Keywords: Risk Premia, Democratization, Inequality, Political Institutions, Catholic Church
JEL codes: G10, G15, G18, N40, P16

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†Email: maxmil@wharton.upenn.edu

1 Introduction

The last two centuries have seen more than half of all countries transition to democracy. These successful "democratizations," broadly defined as extensions of political rights to groups of people previously excluded from political processes, are times of uncertainty as they correspond with a redistribution of political and economic power within a society. Democratizations, therefore, provide a unique window to understanding how the large-scale redistribution of political power and economic resources affect asset prices. To this point, the finance literature has mainly focused on small-scale redistribution and political uncertainty within a given political system, or risk brought about by changes to the "rules of the game," while uncertainty over "the game" itself has been largely put aside.

This study fills this gap using a cross-country panel of financial market data consisting of 85 countries and spanning 200 years to ascertain how democratizations affect asset prices. Analysis of asset prices are particularly useful in this context, as they provide a unique vantage point to observe how relatively wealthy asset market participants viewed democratizations in real time. The analysis yields three main results.

The first result is a stylized fact; risk premia are significantly elevated—on the order of 2 to 5 percentage points—across a number of proxies during two different indicators for democratizations, suggesting that these are periods of increased systematic risk for investors. The results are not driven by just an increase in political uncertainty; other periods of political uncertainty, such as autocratizations—transitions from democracy to autocracy—and political crises do not exhibit increases in risk premia of the same magnitude.

Puzzlingly, periods of democratization have little effect on macroeconomic aggregates, such as consumption or dividend growth. Indeed, the entire distribution of realized consumption growth inside democratizations displays higher growth and no visible increase in volatility, presenting a challenge for asset pricing models that rely on increases in risk to aggregate consumption to match increases in risk premia.

The second result reconciles this apparent puzzle, noting that high risk premia during democratizations are explained by embedding a game theoretic political economy model in the style of Acemoglu and Robinson (2006) into a heterogeneous agent asset pricing framework. In the model, the elites are the only financial market participants, have all the political power, and try to avoid redistributing their income to poor, hand-to-mouth citizens who outnumber the elites and can revolt. The cost the citizens bear from starting a revolution, along with the revolutionary threat the elites face, varies over time. To prevent the revolution from occurring, the elites grant the citizens transfers.

The elites, however, face a commitment problem: they cannot credibly commit to future transfers when there is no revolutionary threat. Democracy acts as a mechanism for the elites to commit to future redistribution and prevent a revolution. But, the redistribution that democracy brings is costly, making it a deleterious state for the elites. Since the elites price assets, as the citizens do not participate in markets, the uncertainty over whether a democratization will succeed or fail increases the risk to the future consumption of the elites, causing discount rates to rise and, therefore, asset prices to fall. In this way, the consolidation of democracy, and the redistribution of income and political power it brings, acts as rare and disastrous outcomes for the elites, explaining the increased risk premia observed during democratizations (Rietz, 1988, Barro, 2006, Gabaix, 2012, Wachter, 2013). Indeed, the large-scale redistribution the model requires to match high risk premia is observed in the data: The Gini coefficient declines and government revenues rise after successful democratizations, but not after failed democratizations. This result is consistent with previous findings by Acemoglu, Naidu, Restrepo and Robinson (2015) who find that tax revenues-to-GDP rise by as much as 20 percentage points on average after a democratization.

While democratizations in the model have a causal impact on risk premia, the stylized fact of high risk premia during democratizations mentioned above is merely correlative: There may be an omitted variable driving the results. The third result, therefore, provides evidence of a casual relationship between democratizations and risk premia using exogenous movement in the probability that a successful democratization occurs coming from a shift in Catholic church doctrine in favor of democracy, made official in April of

1963. This shift particularly impacted the political path of many then majority Catholic, autocratic countries, so much so that the seminal book Huntington (1991) labels the shock as one of five reasons the third wave of democratization of the 1970s, 1980s, and early 1990s occurred. Consistent with this view, democratic mobilizations and the threat to the governing regime posed by civil society organizations rose dramatically in majority Catholic autocracies, but remained constant in non-Catholic autocracies. Using a triple difference-in-differences strategy, this quasi-natural experiment was associated with a 9.2 to 9.3 percentage point treatment effect with a net increase of 11.2 to 15.1 percentage points in average excess returns for majority Catholic, autocratic countries. The results display no pre-trends and are robust to alternative specifications and various sample windows, and are not driven by any particular countries or regions.

These results contribute to an understanding of what drives risk premia, providing a new mechanism for why risk premia vary over time: redistributive political shocks that primarily affect wealthy asset market participants emanating from the consolidation of democratic political institutions. Spikes in risk premia coming through this channel give insight into the barriers that countries face during the democratization process, particularly true for developing and autocratic societies where economic and political inequalities are far greater. Better understanding these frictions is important for the nearly 45%[1] of countries still living under autocratic political institutions.

The results are also relevant for the remaining 55% of democratic countries, as well. Over the last four decades, the developed world has experienced a sharp rise in income and financial wealth inequality. The evidence from democratizations suggests that in curtailing wealth and income inequality through redistribution, countries may face elevated risk premia in the short run.

Related Literature The main contribution of this paper is to show that political risk in the form of redistributive shocks have large consequences for asset prices in models with limited participation. As such, it builds on several papers in the political economy,

[1] In 2018, according to the Varieties of Democracy (V-Dem) database.

asset pricing, and political finance literatures.

This paper builds on a literature looking at political shocks and uncertainty within rare disaster models.[2] Berkman, Jacobsen and Lee (2011) use the International Crisis Behavior data on political crises and show that global equity premia rise during times of political uncertainty and that industries that are more exposed to this uncertainty earn a higher premium. Manela and Moreira (2017) show that variation a text-based measure of uncertainty co-moves with risk premia, lending credence to rare disasters theories. Muir (2017) shows, using a similar data set, that equity and bond risk premia spike during financial crises despite modest declines in consumption, but only increase slightly in wars and deep recessions where consumption steeply declines.

This project also advances the literature examining policy and political uncertainty in macroeconomics and finance. Bloom (2009) provides a structural framework to analyze the impact of these uncertainty shocks. Baker, Bloom and Davis (2016) develop an index of economic policy uncertainty and finds that increases in this index are associated with greater stock price volatility and reduced investment and employment. Baker, Bloom, Davis and Kost (2019) build on this by creating a newspaper based policy uncertainty index, which allows them to decompose the relative importance of policy shocks in different policy areas. My paper differs from these by studying uncertainty over political institutions rather than over particular policy decisions. As such this work is complementary to this body of research, showing that uncertainty over the institutions as well as policy are priced in stock and corporate bond markets.

This paper also contributes to the political economy and development literature. The model put forth in this paper builds on the seminal work by Acemoglu and Robinson (2006) by adding asset prices and examining their dynamics. This paper also adds to the evidence in Acemoglu, Naidu, Restrepo and Robinson (2015), which shows that after periods of democratization government revenues rise and the effect on inequality is dubious, by providing evidence using asset prices that periods of democratization are times of

[2] For a review of the recent theory literature on rare disaster models, see Tsai and Wachter (2015).

great uncertainty for the political elites. One particular difficulty faced by Acemoglu et al. is that the *ex ante* elite, the elites prior to democracy, are not the same as the *ex post* elite, the new class of elites that emerge under the more democratic institutions. On this issue, asset markets provided a unique vantage point, as they capture the expectations of the *ex ante* wealthy stock market participants at the time of the democratization.

Further, this paper builds on a literature looking at the impact of politics on asset prices. Pástor and Veronesi (2012, 2013) propose a theoretical model in which there is a risk premium associated with policy uncertainty, with the magnitude of the rise governed by state of the economy. Kelly, Pástor and Veronesi (2016) provide empirical support for this argument, finding that political uncertainty is priced in the equity options market. Pástor and Veronesi (2016) models the effect of redistributive taxation on inequality jointly with the effect on aggregate productivity and asset prices. Grotteria (2019) shows that firms with greater lobbying expenditures have higher excess returns and rationalizes this result in a model of incumbents and entrepreneurs where lobbying acts a device to slow the progress of new entrants. Pástor and Veronesi (2020) shows that the "presidential puzzle" can be solved in a model where agents have time varying risk aversion, finding that when the risk aversion of voters is elevated they vote for the party that advocates for redistribution, in their model, the Democrats. Cassidy (2020) also addresses the presidential puzzle, but proposes a different solution which is similar to the mechanism I propose for democratizations: that Democrats will increase the tax burden of equity holders, leading to greater uncertainty in Democratic regimes. Delis, Hasan and Ongena (2020) examines corporate credit spreads around democratizations, finding, seemingly counter to the results I have described, that corporate credit spreads fall during periods of democratization from 1984 to 2014. However, I too find evidence that, after 1984, corporate credit spreads fall during periods of democratization, but rise in the pre-1984 sample. The different effects on credit spreads pre- and post-1984 is a fruitful area for future research.

2 Data

The empirical analyses performed below relies on several databases. I first describe the data employed in this project and the construction of all the variables of interest, and then move on to a discussion of the empirical facts.

Asset market data Equity and fixed income data come from Global Financial Data[3] (GFD) and the Jorda-Schularik-Taylor Macrohistory Database (JST) which is used in Jorda et al. (2019). GFD provides two main historical stock return indices for each country: the first is the aggregate return on stock exchanges within the country, and the second is the aggregate return of all companies headquartered in the country and listed on the London Stock Exchange. The JST data covers 17 developed countries over, roughly, 150 years. All together, the returns data covers 85 countries over 200 years. To aggregate the data, I fill in the GFD home stock market series first with the JST data, and then with the GFD data coming from the London Stock Exchange. Note that I only do this for rate variables, such as rates of return or dividend growth, or changes in level variables like dividend yields.

This gives me an large unbalanced panel data set of ex- and cum-dividend returns, dividend yields, dividend growth, and government and corporate bond yields. The cum-dividend returns data, for example, spans 203 years across 85 countries, with an average of 88.4 years per country. However, due to different coverage for each series, the observation counts will differ throughout the paper. For example, the corporate bond yield series (which comes only from GFD) covers a significantly smaller panel than does the return data, featuring an unbalanced panel of 21 countries over 164 years. For more information on the asset market data, see Appendix Section A.

Political institutions data Data on political institutions come from the Varieties of Democracy (V-Dem) database. V-Dem uses a team of researchers to quantify levels of

[3] A list of papers using Global Financial Data is available here.

and trends in historical political institutions for every country around the globe over the last two centuries. They also aggregate all of the leading democratic institutions data from different sources—their data include the Freedom House and Polity data used extensively in the political economy literature, for example. V-Dem constructs indices ranking the level of democratic institutions in every country on five overarching principles of democracy: electoral, deliberative, liberal, participatory, and egalitarian. V-Dem also provides measures on various political outcomes not immediately related to democracy, such as the level of political violence, political polarization, and civil society activity. For more information on the construction of these measures see Coppedge et al. (2020).

Macroeconomic and inequality data Data on consumption and real GDP come from Maddison Historical Statistics, who use and expand upon data from Barro and Ursua (2008). Data on income inequality come from two sources: the Standardized World Income Inequality Database (SWIID) and the Varieties of Democracy (V-Dem) database. From these data, I construct the longest time series and largest panel possible for the Gini coefficient by taking an equal weighted average of the growth rates in the Gini Coefficient, and applying it to the first observed Gini coefficient observation. Finally, data on government revenues come from GFD and the JST Macrohistory Database.

Events data I collect data on a variety of events, primarily used as controls in the regressions below, to assure that any variation in my proxies for risk premia observed in democratizations is not driven by adverse macroeconomic, political, or financial events. Data on financial crises come from JST and Reinhart and Rogoff (2009), and are combined into a single financial crisis variable. Each of these datasets use a narrative approach in constructing historical financial crises, often looking at large scale bank runs or asset market failures, and are used extensively by other scholars. I also obtain data from Reinhart and Rogoff (2009) on sovereign defaults.

Data on recessions come from the GFD Dates database, which compiles events throughout history on various topics. Data on wars come from the Correlates of War (CoW) data from the University of Michigan and Pennsylvania State University, which contains data on interstate, intrastate, and extra-state wars, as well, as all non-war military conflicts from 1816–2007. From the CoW dataset, I also obtain country-level data on religious demographics from 1945–2010.

Data on political crises come from the International Crisis Behavior (ICB) database used in Berkman et al. (2011). Data on head of government and head of state deaths come from V-Dem and are supplemented with data from Wikipedia. Data on head of government and head of state attempted and successful assassination attempts come from Jones and Olken (2009).

2.1 Constructing democratizations

Democratization dates are taken from two sources: the first I construct using the democratic indices supplied by the V-Dem database, and the second are taken from Lindberg et al. (2018).

The first set of democratization dates are constructed as an indicator variable equal to one when the growth rate in the V-Dem electoral democracy index is in the top fifth percentile of all electoral index growth rates. To account for other types of democratization not included in the electoral category, I take a equally weighted average of the other four democracy indices and define years in the top fifth percentile of growth rates of this index as periods of democratization, as well. I then fill in years between two democratization years. For example, if 1910 and 1912 are defined as periods of democratization for country i, I define 1911 as a period of democratization. I then remove all democratizations associated financial crises, wars, recessions, or sovereign default episodes to cleanly measure the effects of democratizations without picking up the effects of adverse macroeconomic events. This procedure yields 150 unique democratizations, on average lasting 1.5 years, for which I also have asset pricing data, and allows me to assess the effect of sudden and large democratization events on asset prices. As such, I call these *fast democratizations* for the remainder of the paper.

The process of democratizations, however, oftentimes unfolds slowly. The second measure, taken from Lindberg et al. (2018), allows me to assess the long-term effects of democratizations on asset prices. The Lindberg et al. measure, spanning the years 1900–2017, yields 86 unique democratizations, lasting an average of 10 years each. Lindberg et al. further decompose these democratizations into either "successful" or "failed" depending on how long the new democratic institutions stay in place. For example, 52% of democratizations, for which I have asset pricing data, fail, showing that democracy is not predestined outcome of democratization. Indeed, there is tremendous uncertainty which political institutions will result. Since these democratizations occur slowly, I refer to them as *slow democratizations* for the remainder of the paper.

Finally, I construct a similar measure for jumps from democracy to autocracy, which I call "autocratizations." These episodes are defined as growth rates in top fifth percentile in one minus the electoral index and the equal weighted average of all indices other than the electoral index,the same methodology used to construct democratizations.

3 Stylized facts

Risk premia (i.e. expected returns in excess of the riskfree rate) are fundamentally unobservable and, therefore, must be proxied for. The proxies I use are as follows: (1) changes in the log dividend yield, (2) average cum-dividend returns, and (3) vector-autoregression (VAR) decomposed discount rate shocks. The results for each of these proxies is presented separately.

Changes in log dividend yields Following Muir (2017), I use the 5-year change in the log dividend yield as a proxy for the equity premium. The change in the dividend yield roughly corresponds to the percent change in the discount rate (risk premium plus the riskfree rate), provided that the future cash flows expected by investors do not change.

Figure 1 shows the change in the dividend yield around two events: democratizations and financial crises. The headline result is clear: the change in the dividend yield observed during democratizations is large and economically significant, of the same order of magnitude as what is observed in financial crises.

Figure 1: Change in log dividend yield — democratizations vs. financial crises

This figure presents the coefficients of the change in log dividend yields on indicator variables for the time to/from a democratization start and a financial crisis. The regressions estimated takes the form

$$\text{Change in Dividend Yield}_{c,t} = \alpha + \sum_{s=-3}^{6} \beta_s \mathbb{1}_{c,t}\{s \times \text{Event Start}\} + \epsilon_{c,t}.$$

Standard errors are heteroskedasticity robust, and a 90% confidence interval is plotted.

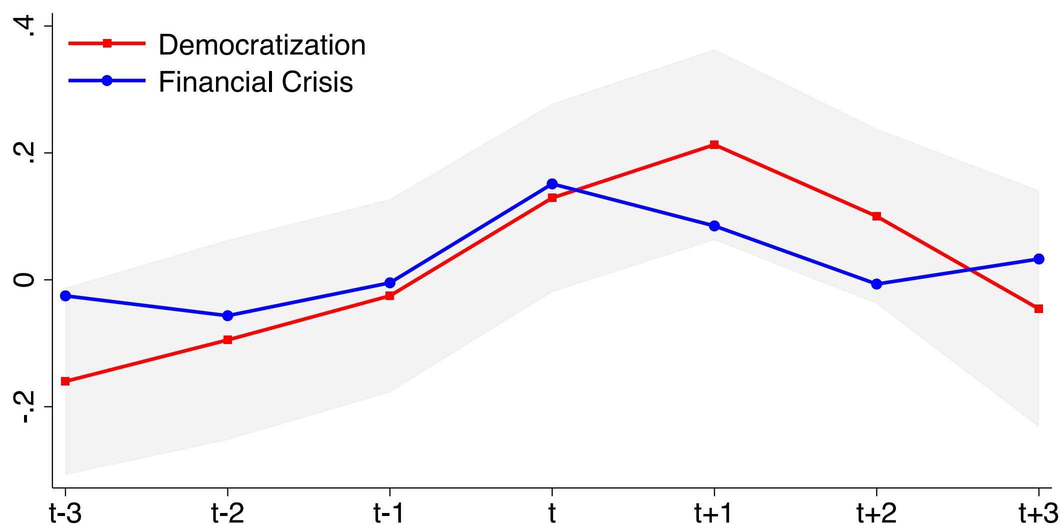


Table 1 breaks the result down further, showing that dividend yields rise during both fast and slow democratizations. Dividend yields are substantially elevated in fast democratizations in particular, corresponding to an average rise of 23.9% over five years, as shown in Column (1). However, countries that experience democratizations may have more volatile dividend yields in general, and democratizations may occur in years which many countries experience large changes in dividend yields. Further, democratizations may co-occur with adverse political events such as the escalation of military activity or the death of the head of government. For this reason, I include country and year fixed effects and numerous event controls in Column (2). The result is unchanged: the point estimate implies an average increase in risk premia of 22.5% over five years and remains significant at the 5% level.

The results are weaker for the slow democratizations, where, after adding event controls and fixed effects, dividend yields rise by 10.3% on average over five years. The weaker results during slow democratizations are to be expected, however, since these are longer episodes where in some years the dividend yield moves quite a bit, but in other years it doesn't move at all.

Table 1: Periods of democratization and the change in log dividend yields

This table presents regressions of the change in log dividend yields on indicator variables for periods of democratization. The regressions estimated take the form

$$\text{Change in Dividend Yield}_{c,t} = \alpha + \beta \mathbb{1}_{c,t}\{\text{Democratization}\} + \epsilon_{c,t}.$$

When there are no fixed effects added, standard errors are heteroskedasticity robust. When fixed effects are added, standard errors are clustered by country and year.All coefficients have been multiplied by 100 for presentation, and t statistics are in parentheses.

	Five-year change in log dividend yield			
	(1)	(2)	(3)	(4)
Fast Democratization	23.90***	22.49**		
	(3.60)	(2.26)		
Slow Democratization			3.642	10.25*
			(0.99)	(1.84)
Autocratization	1.098	1.299		
	(0.29)	(0.26)		
ICB Political Crisis	8.631	9.471	8.883	10.55
	(1.58)	(1.11)	(1.61)	(1.22)
Year FE	✗	✓	✗	✓
Country FE	✗	✓	✗	✓
Event Controls	✗	✓	✗	✓
N	5242	5242	4275	4275

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

How can we be sure the results are driven by democratization and not just a rise in political uncertainty, in general? Indeed, it may be that there is nothing special about democratizations and that all the movement in dividend yields is driven entirely by political risk. If this were the case, then a similar movement in valuation ratios should be observed in other events where political uncertainty is also high. To test this, I include indicator variables for autocratizations in the regressions on fast democratizations, and ICB political crises in all regressions.[4]

Both of these events plausibly display similarly high levels of political uncertainty when compared to democratizations, but are not followed by a transition to democratic political institutions upon completion (provided the democratization is successful). As such, they serve as something of a reasonable "control" group. Autocratizations and ICB political crises display dividend yield changes in the same direction as in democratizations, but of roughly one-twentieth and one-third the magnitude.

Table 2: Change in electoral index and changes in prices

This table presents regressions of the change in log dividend yields and log equity prices on the change in the electoral democracy index multiplied by an indicator that is equal to 1 if a country is autocratic or democratic. The regressions estimated take the form

$$\text{Outcome}_{c,t} = \alpha + \beta_1 \Delta\text{Electoral Index}_{c,t} \mathbb{1}_{c,t}\{\text{Autocracy}\} + \beta_2 \Delta\text{Electoral Index}_{c,t} \mathbb{1}_{c,t}\{\text{Democracy}\} + \epsilon_{c,t}.$$

When there are no fixed effects added, standard errors are heteroskedasticity robust. When fixed effects are added, standard errors are clustered by country and year. t statistics are in parentheses.

	Change in log dividend yield		Change in log price	
	(1)	(2)	(3)	(4)
Δ Electoral Index (Autocracy)	0.607***	0.459*	-0.567**	-0.448*
	(2.71)	(1.70)	(-2.06)	(-1.89)
Δ Electoral Index (Democracy)	-0.241	-0.317	-0.130	0.0568
	(-0.60)	(-1.01)	(-1.02)	(0.52)
Year FE	✗	✓	✗	✓
Country FE	✗	✓	✗	✓
Event Controls	✗	✓	✗	✓
N	5533	5533	5533	5533

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Further, the link between changes in the democracy indices and changes in asset prices is strongest in autocratic countries. Table 2 regresses the year-over-year change in the electoral democracy index on the year-over-year change in the log dividend yield and log equity price in both autocracies and democracies. In autocracies, a 1 percentage

[4]The autocratization variable I construct is the mirror image of the fast democratization variable. Unfortunately, I have no data on the autocratization counterpart to the slow democratization variable.

point change in the electoral democracy index is associated with a 0.46 to 0.61 percent statistically significant increase in the dividend yield, as shown in Columns (1) and (2), and a 0.45 to 0.57 statistically significant decrease in log prices, as shown in Columns (3) and (4). Changes in the electoral democracy index in democracies, conversely, have no statistically significant impact on either quantity. This provides evidence that the results are driven by autocratic countries.

As mentioned above, the change in the log dividend yield is a valid proxy for changes in risk premia if expected growth remains (relatively) constant. Evidence in support of the stability of cashflows is presented in Table 3. Log consumption growth is flat during and after fast democratizations, and significantly positive during and after slow democratizations, while it is negative or flat during and after autocratizations and ICB political crises. Dividend growth, on the other hand, is negative during and after fast democratizations, ICB political crises, and autocratizations, and mixed in slow democratizations.

Overall, the results from cash flows paint a good, but not perfect picture of the validity of valuation ratios as proxies for risk premia. While the shocks to dividend growth are mostly not statistically significant, they may partially contribute to the rise in dividend yields during democratizations, and, therefore, positively bias the coefficients in Table 1. It is, however, worth noting that low dividend growth needs to correspond with democratizations some of the time, or else equity would not command a higher risk premium: low cashflows need to correspond with high marginal utility states for the marginal investor to demand an increased risk premia. The slightly positive dividend growth during slow democratizations, conversely, biases the coefficients downward, meaning the results may be understated. As such, I provide evidence from additional proxies that do not suffer from the same issues below.

Table 3: Periods of democratization and cash flows

This table presents regressions of log consumption and dividend growth on indicator variables for periods of democratization. The regressions estimated take the form

$$\text{Cash Flow Growth}_{c,t} = \alpha + \beta_1 \mathbb{1}_{c,t}\{\text{Democratization}\} + \beta_2 \mathbb{1}_{c,t}\{\text{Five-years after Democratization}\} + \epsilon_{c,t}.$$

When there are no fixed effects added, standard errors are heteroskedasticity robust. When fixed effects are added, standard errors are clustered by country and year. All coefficients have been multiplied by 100, and t statistics are in parentheses, and t statistics are in parentheses.

	Log consumption growth				Log dividend growth			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fast Democratization	0.755**	0.0917			-0.203	-2.105		
	(2.05)	(0.25)			(-0.05)	(-0.55)		
Post Fast Democratization	0.795***	0.237			-2.676	-2.954*		
	(5.29)	(1.18)			(-1.16)	(-1.81)		
Slow Democratization			0.590***	0.670***			-0.0327	0.949
			(3.82)	(2.96)			(-0.02)	(0.44)
Post Slow Democratization			0.514***	0.467*			1.166	-0.876
			(2.77)	(1.94)			(0.38)	(-0.30)
Autocratization	-0.231	-0.788***			1.504	-3.086*		
	(-1.36)	(-4.08)			(0.76)	(-1.77)		
Post Autocratization	-0.113	-0.195			1.989	0.923		
	(-0.81)	(-0.95)			(1.30)	(0.62)		
ICB Political Crisis	-0.502	-0.479	-0.550	-0.349	-2.863	-0.257	-2.834	-0.0929
	(-1.34)	(-1.23)	(-1.46)	(-0.92)	(-1.01)	(-0.07)	(-0.99)	(-0.02)
Post ICB Political Crisis	0.370*	0.207	0.237	0.245	-0.385	-1.179	-0.431	-1.502
	(1.70)	(0.83)	(1.08)	(1.05)	(-0.19)	(-0.48)	(-0.21)	(-0.59)
Year FE	✗	✓	✗	✓	✗	✓	✗	✓
Country FE	✗	✓	✗	✓	✗	✓	✗	✓
Event Controls	✗	✓	✗	✓	✗	✓	✗	✓
N	13764	13764	12786	12786	5355	5354	4412	4411

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Average excess returns I also examine average cum-dividend stock returns in an 10-year window 3-years[5] after the start of fast and slow democratizations. Average cum-

[5] 3-years after the start of the democratization, all discount rate shocks have occurred making estimation of expected returns easier.

dividend stock returns are high when expected returns are high, and fall when there are positive shocks to discount rates, or negative shocks to expected dividend growth. This is clear using the decomposition from Campbell (1991):

$$r_{t+1} = \mathbb{E}_t r_{t+1} + v^r_{t+1} \tag{3.1}$$

$$v^r_{t+1} = \eta^d_{t+1} - \eta^r_{t+1} \tag{3.2}$$

where

$$\eta^r_{t+1} \equiv (\mathbb{E}_{t+1} - \mathbb{E}_t) \sum_{j=1}^{\infty} \rho^j r_{t+1+j} \tag{3.3}$$

are discount rate shocks,

$$\eta^d_{t+1} \equiv (\mathbb{E}_{t+1} - \mathbb{E}_t) \sum_{j=1}^{\infty} \rho^{j-1} \Delta d_{t+j} \tag{3.4}$$

are cash flow shocks and $\rho \equiv \frac{\overline{pd}}{1+\exp\{\overline{pd}\}}$ as in Campbell and Shiller (1988) where $\overline{pd}$ is the average log price-dividend ratio. If there are persistent discount rate shocks early in democratizations and no significantly positive innovations to expected future dividends, than changes in average cum-dividend stock returns (after those early discount rate shocks) are a proxy for changes in risk premia. Note that this is the opposite condition needed for dividend yields to be a valid proxy, where negative innovations to expected growth cause bias. Pairing these two proxies, therefore, allows for a clear picture of how risk premia change in times of democratization.

Table 4 presents the results. Columns (1) and (2) show that average excess returns are elevated 2.4 and 0.8 percentage points after fast democratizations, in-line with the 25% increase in risk premia observed using the dividend yield. Other periods of political uncertainty, however, show either slight increases or reductions according to this measure and are statistically insignificant. Slow democratizations display stronger results, with average total returns elevated by 3.3 to 4.8 percentage points. Again, this makes sense, as the long duration of slow democratizations makes the estimation of expected returns more precise, as there are 871 democratization years in the sample.

Table 4: Periods of democratization and average returns

This table presents regressions of cum-dividend returns on indicator variables for periods of democratization. The regressions estimated take the form

$$\text{Cum-Dividend Returns}_{c,t} = \alpha + \beta \mathbb{1}_{c,t}\{\text{10-Years After Democratization Start}\} + \epsilon_{c,t}.$$

All 10-year windows begins 3-years after the event start. In Columns (1) and (3), year fixed effects are added to account for inflation, as all returns are in US dollars. In Columns (1) and (3) standard errors are heteroskedasticity robust. In Columns (2) and (4) standard errors are clustered by country and year. All coefficients have been multiplied by 100, and t statistics are in parentheses. Note that one observation is dropped in moving from Column (1) to Column (2) as the fixed effects lead there to be 1 singleton observation.

	Cum-dividend returns			
	(1)	(2)	(3)	(4)
Fast Democratization (10-year window)	2.403**	0.759		
	(2.12)	(0.73)		
Slow Democratization (10-year window)			4.759***	3.259*
			(2.77)	(1.75)
Autocratization (10-year window)	0.302	0.0416		
	(0.28)	(0.03)		
ICB Crisis (10-year window)	-1.121	-1.142	-1.119	-1.950
	(-0.75)	(-0.76)	(-0.76)	(-1.17)
Year FE	✓	✓	✓	✓
Country FE	✗	✓	✗	✓
Event Controls	✗	✓	✗	✓
N	7512	7512	5908	5908

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Why use average returns instead of returns in excess of the riskfree rate? There are two answers to the question. The first answer is that by including year fixed effects, I am implicitly differencing out the riskfree rate, provided that there is a single riskfree asset in the global economy. The second answer is that a local riskfree rate is not observable for most, if not all, of the countries I examine. Normally, one would use the return or yield on sovereign debt less expected (or realized) inflation as a proxy for the riskfree rate. However, this proxy misses the risk premium term on nominal sovereign debt, namely risk coming from unexpected inflation or default as pointed out by Miller, Paron and Wachter (2020).

Table 5: Periods of democratization and government bond yields and inflation

This table presents regressions of government bond yields and inflation on indicator variables for democratizations. The regressions estimated take the form

$$\text{Outcome}_{c,t} = \alpha + \beta \mathbb{1}_{c,t}\{\text{Democratization}\} + \epsilon_{c,t}.$$

When there are no fixed effects added, standard errors are heteroskedasticity robust. When fixed effects are added, standard errors are clustered by country and year. Due to the high levels of persistence in government bond yields and inflation, lag terms are added based on which gives the best model fit according to the Akaike and Schwarz information criteria. All coefficients have been multiplied by 100 for presentation, and t statistics are in parentheses.

	Government bond yields				Inflation			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fast Democratization	-0.0979	-0.120			17.97	23.36		
	(-0.49)	(-1.04)			(1.15)	(1.41)		
Slow Democratization			0.135	0.266**			16.57**	19.91*
			(1.11)	(2.37)			(2.11)	(1.86)
Autocratization	-0.194	-0.167			-11.84***	-2.404		
	(-1.36)	(-1.44)			(-5.48)	(-0.76)		
ICB Political Crisis	-0.0276	-0.0577	-0.0122	0.0166	33.03	13.03	27.27	6.035
	(-0.18)	(-0.38)	(-0.08)	(0.11)	(1.39)	(0.42)	(1.15)	(0.21)
Year FE	✗	✗	✗	✗	✗	✗	✗	✗
Country FE	✗	✗	✗	✗	✗	✗	✗	✗
Event Controls	✗	✗	✗	✗	✗	✗	✗	✗
# of lags	1	1	1	1	1	1	2	2
N	4864	4864	3594	3594	14609	14609	11974	11974

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5 reports the results for government bond yields and inflation during democratizations. In each of these regressions, I include lag terms to account for the high degree of persistence in government bond yields where the lag structure is determined by the specification that minimizes the Akaike and Schwarz information criteria. Fast democratizations display a small and insignificant decrease in government bond rates, while slow democratizations display a significant increase (after adding controls and country fixed effects) of 27 basis points. These results are puzzling, as theory would predict that increased risk should lead to a greater precautionary savings motive, and thus a decline in the riskfree rate.

The puzzle is resolved upon examining inflation, presented in Columns (5)–(8). Both fast and slow democratizations display large increases in inflation, on average, ranging from 16.6 to 23.4 percentage points. The result mainly comes from several episodes which display very large increases in inflation (in particular, 99 slow democratization years, out of 2,308 in the inflation sample, display inflation rates in excess of 100%), but the risk of large increases in inflation seems to be higher in democratization episodes. As such, nominal government debt ceases to be riskfree during these periods, and subtracting the government bond returns or yields from average returns will understate the true increase in risk premia.

VAR decomposed discount rate shocks The discount rate and cash flow shocks given in Equations (3.3) and (3.4) can be estimated directly using the procedure from Campbell (1991). To do this, I assume a first-order vector autoregressive (VAR) structure for log cum-dividend returns, dividend growth, consumption growth, government bond yields, and capital gains given by

$$\tilde{\mathbf{X}}_{t+1} = \mathbf{\Phi}\tilde{\mathbf{X}}_t + \mathbf{w}_{t+1} \tag{3.5}$$

where $\tilde{\mathbf{X}}_t = \mathbf{X}_t - \bar{\mathbf{X}}$ and $\mathbf{X}_t$ is the data vector with cum-dividend returns, r_t, in the first position.[6] Now, define $\mathbf{e}_1$ as an elementary column vector with a 1 in the first position and 0s elsewhere, meaning that Equation (3.2) can be written as $v^r_{t+1} = \mathbf{e}_1'\mathbf{w}_{t+1}$. Under the assumed VAR structure, Equation (3.3) becomes

$$\eta^r_{t+1} = \lambda'\mathbf{w}_{t+1}. \tag{3.6}$$

where $\lambda' \equiv \mathbf{e}_1'\rho\mathbf{\Phi}(\mathbf{I} - \rho\mathbf{\Phi})^{-1}$. Combining Equations (3.2) and (3.6) gives the cashflow shock as

$$\eta^d_{t+1} = (\mathbf{e}_1' + \lambda')\mathbf{w}_{t+1}. \tag{3.7}$$

[6] To estimate the vector autoregression, I use the combination of control variables that give the largest sample. For example, if I have 100 cum-dividend returns observations, 100 dividend growth observations, and 80 riskfree rate observations, I will estimate the VAR using only cum-dividend returns and dividend growth.

The cashflow and discount rate shocks are, therefore, immediately given after estimating the VAR coefficients and residuals.

Table 6: Periods of democratization and discount rate shocks

This table presents regressions of discount rate shocks estimated from a vector autoregression on indicator variables for democratization starts. The regressions estimated take the form

$$\eta^r_{c,t} = \alpha + \beta \mathbb{1}_{c,t}\{\text{Democratization Start}\} + \epsilon_{c,t}.$$

The discount rate shock variable is winsorized at the 1% and 99% levels. In Columns (1) and (3), year fixed effects are added to account for inflation, as all returns are in US dollars. In Columns (1) and (3) standard errors are heteroskedasticity robust. In Columns (2) and (4) standard errors are clustered by country and year. All coefficients have been multiplied by 100, and t statistics are in parentheses.

	Discount rate shocks			
	(1)	(2)	(3)	(4)
Year Before Fast Democratization Start	1.673**	1.571*		
	(2.06)	(1.95)		
Fast Democratization Start	1.488**	1.309		
	(2.05)	(1.47)		
Year Before Slow Democratization Start			2.129*	1.767*
			(1.80)	(1.86)
Slow Democratization			0.154	-0.0148
			(0.42)	(-0.04)
Year Before Autocratization Start	-0.508	-0.225		
	(-0.82)	(-0.38)		
Autocratization Start	-0.198	-0.0545		
	(-0.31)	(-0.08)		
Year Before ICB Political Crisis Start	0.756	0.246	0.713	0.268
	(0.78)	(0.19)	(0.73)	(0.21)
ICB Political Crisis Start	0.976	0.783	0.897	0.827
	(1.02)	(0.70)	(0.94)	(0.74)
Year FE	✗	✓	✗	✓
Country FE	✗	✓	✗	✓
Event Controls	✗	✓	✗	✓
N	6568	6568	5153	5153

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6 shows that large discount rate shocks are concentrated around democratization starts. Columns (1) shows that the combined discount rate shock around a fast democratization start is 3.2 percentage points, in line with the findings from dividend yields and cum-dividend returns. Adding year and country fixed effects reduces the rise in discount rates to 2.9 percentage points. Slow democratizations display similar discount rate shocks in the year before the democratization start, between 1.8 and 2.1 percentage points cumulatively and then on average no discount rate shocks over the rest of the democratization. Discount rate rates shocks during autocratizations are essentially zero, while ICB political crises see insignificant discount rate shocks which are smaller in magnitude than both democratizations.

Corporate bond yields The final proxy I employ is corporate bond yields, which is also used by Muir (2017). When risk premia rise, so do corporate bond yields, making them a valid proxy for risk premia. However, corporate bond yields also rise with the expected probability of default; as such, I provide evidence that the probability of default does not rise in democratizations.

Table 7 shows that, prior to 1984, corporate bond yields were elevated between 31 to 47 basis points during periods of democratization. In the sample after 1984, however, corporate bond yields seem to fall or remained flat, in line with the findings of Delis et al. (2020) on a sample of corporate bonds from 1984–2016. Slow democratizations, conversely, display the opposite pattern, declining in democratizations before 1984 and rising by roughly 54 basis points in democratizations after 1984. The number of companies, my proxy for the default probability, seems not to change, a positive sign that corporate bond yields are a reasonable proxy for risk premia.

Table 7: Periods of democratization and corporate bond yields

This table presents regressions of corporate bond yields and the log growth rate of the number of publicly traded companies on indicator variables for democratization starts. The regressions estimated take the form

$$\text{Outcome}_{c,t} = \alpha + \beta_1 \mathbb{1}_{c,t}\{\text{Democratization (Pre-1984)}\} + \beta_2 \mathbb{1}_{c,t}\{\text{Democratization (Post-1984)}\} + \epsilon_{c,t}.$$

When there are no fixed effects added, standard errors are heteroskedasticity robust. When fixed effects are added, standard errors are heteroskedasticity robust and clustered by country. Due to the high levels of persistence in corporate bond yields, one lag term is added., which gives the best model fit according to the Akaike and Schwarz information criteria. All coefficients have been multiplied by 100 for presentation, and t statistics are in parentheses.

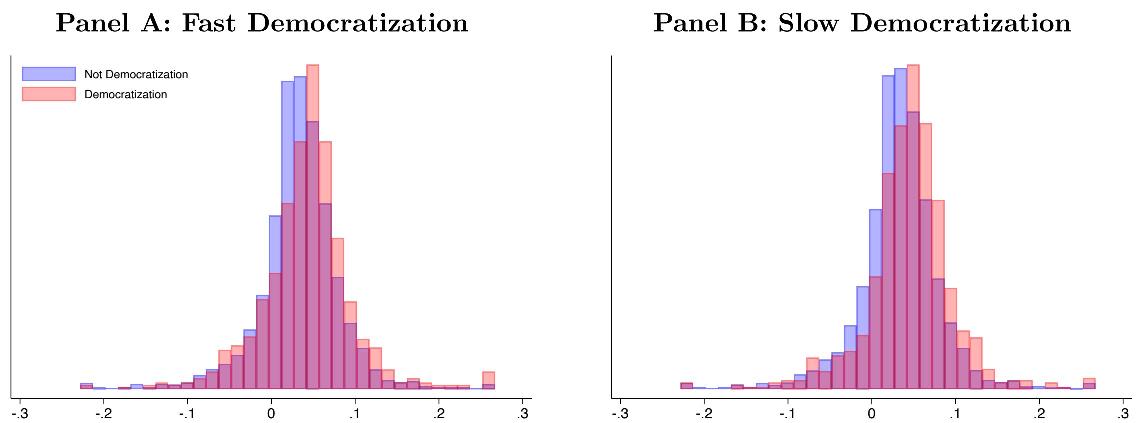
	Corporate bond yields				Log growth in number of companies			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fast Democratization Start (Pre-1984)	0.314**	0.472*			5.285	7.695*		
	(2.39)	(2.04)			(1.24)	(1.67)		
Fast Democratization Start (Post-1984)	0.0820	0.121			5.491	3.988		
	(0.30)	(0.68)			(0.71)	(0.52)		
Slow Democratization (Pre-1984)			-0.00984	0.0789			-0.178	0.364
			(-0.07)	(0.32)			(-0.16)	(0.33)
Slow Democratization (Post-1984)			-0.298	0.543***			3.650**	0.229
			(-0.76)	(2.85)			(2.44)	(0.14)
Autocratization	0.164	0.195			-3.367***	-0.904		
	(0.85)	(0.96)			(-3.78)	(-0.70)		
ICB Political Crisis	0.366	0.352*	0.349	0.357*	-0.375	-1.667	-0.0348	-1.656
	(1.17)	(1.76)	(1.10)	(1.78)	(-0.24)	(-0.72)	(-0.02)	(-0.71)
Year FE	✗	✓	✗	✓	✗	✓	✗	✓
Country FE	✗	✓	✗	✓	✗	✓	✗	✓
Event Controls	✗	✓	✗	✓	✗	✓	✗	✓
# of lags	1	1	1	1	0	0	0	0
N	1517	1503	1363	1363	3691	3679	3626	3626

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Interpretation A preponderance of the evidence suggests that risk premia are high during periods of democratization. Each proxy for risk premia shown above, shows economically large increases, and, while none of the proxies employed is perfect, together they speak volumes. Further, the increase in risk does not solely come from an increase in political uncertainty, as it is unique to democratizations. Periods of autocratization, show no such increase in risk premia, and ICB political crises see only a fraction of the increase in risk premia observed in periods of democratization.

Figure 2: Distribution of consumption in fast and slow democratizations

Log consumption growth is winsorized at the 0.5% and 99.5% level. Consumption data come from the Maddison Historical Statistics database.



A question remains: What can explain the large increase in risk premia observed in democratizations? Theories based on declines in aggregate consumption face difficulty explaining this fact since, as shown in Table 3, average consumption growth is not lower during democratizations; if anything it increases. The same is true for the volatility of consumption. In fact, the entire distribution of log consumption growth looks nearly identical inside and outside of democratizations, as shown in Figure 2. While there is a small increase in the mass of realizations around -10%, and some positive skewness, this is not enough to explain the large increase in risk premia described above.

If not consumption, then what? The representative agent consumption-based approach masks heterogeneity within a society, papering over political fault lines: There is no classed-based conflict in a representative agent model. In the political economy literature, democratizations are often modeled as a struggle for resources between the rich and the poor. Such an approach is a promising avenue to explain the aforementioned stylized facts, an approach I turn to next.

4 Model

The model presents a mechanism to explain why risk premia are high during democratizations, building on work by Acemoglu and Robinson (2006) and Barro (2006). A consortium of political elites in an autocracy attempt to maintain control of the state from a larger group of citizens. If democracy is implemented, the citizens institute tax and transfer schemes. For the elites the risk that redistribution occurs acts as a "rare disaster" (in the asset pricing sense), and is priced by financial markets, leading to high risk premia and dividend yields.

Macroeconomic environment A closed economy is populated by $\delta < \frac{1}{2}$ identical Elites and $1 - \delta$ identical Citizens that share coconuts (Y) from a Lucas tree. The log growth rate of coconuts from the Lucas tree is

$$\log \frac{Y_t}{Y_{t-1}} = \bar{y} + \vartheta \varepsilon_t. \tag{4.1}$$

where $\varepsilon \sim \mathcal{N}(0, 1)$ and is independent and identically distributed. The Elites receive a proportion $\theta > \delta$ of the coconuts, meaning the average coconuts for each type of agent in each group is given by

$$\bar{Y}_t^r = \frac{\theta Y_t}{\delta} \tag{4.2}$$

$$\bar{Y}_t^p = \frac{(1-\theta) Y_t}{(1-\delta)}, \tag{4.3}$$

where the superscript r denotes the (rich) Elites and the superscript p denotes the (poor) Citizens. The parameter θ dictates the level of income inequality in the economy: The higher is θ, the more unequal is the economy.

Preferences and financial markets The Citizens have linear utility over coconuts and do not trade in markets, meaning that they are hand-to-mouth consumers, as they have no ability to store consumption over time. The Elites, conversely, have Epstein and Zin (1989) preferences over coconuts and can trade in a riskfree bond and a claim to their portion of consumption.

Taxes and transfers Coconuts are subject to non-negative taxes (τ) imposed by whoever has political power. Tax revenue is then redistributed as an equal transfer to all agents, meaning that the average coconuts available to members of each group, after taxes, is given by

$$\hat{Y}_t^i(\tau_t) = (1-\tau_t)\bar{Y}_t^i + (\tau_t - \frac{1}{2}\tau_t^2)Y_t \tag{4.4}$$

where $i \in \{r, p\}$ and $\frac{1}{2}\tau_t^2$ is the cost of taxation, which could either be from distortions or administrative costs arising from increased tax rates. It is akin to introducing a Laffer curve in the economy exogenously.

The optimal tax rate for the Elites is $\tau^{r*} = 0$ as any positive tax leads their post-tax income to be less than their pre-tax income. The optimal tax rate for the Citizens, on the other hand, is positive and given by

$$\tau^{p*} = \frac{\theta - \delta}{1-\delta}, \tag{4.5}$$

which, assuming $1 > \theta > \delta$, is between zero and one. When the Citizens preferred tax rate is implemented their average post-tax income is given by

$$\hat{Y}_t^p(\tau^{p*}) = \underbrace{\bar{Y}_t^p}_{\text{Endowed income}} + \underbrace{\frac{1}{2}\left(\frac{\theta-\delta}{1-\delta}\right)^2 Y_t}_{\text{Maximum transfers}}. \tag{4.6}$$

Voting and revolution In each period, taxes are decided by majority rule voting, where who has the right to vote depends on the political institutions in place. There are two different types of political institutions in the model: autocracy and democracy. In the autocratic regime, in which the model starts, only the Elites have the right to vote, meaning whatever policy they choose will be enacted.

Absent any changes, the Citizens would never receiving voting rights, the Elites would set taxes to be zero in each period, and autocracy would chug along its merry way. The numerically superior Citizens, however, can indirectly control the the choices of the Elites through the threat of revolution. If the Citizens revolt, they are assumed to be successful and all the Elites are killed. But, this victory comes at a cost; a fraction μ of the Lucas tree is permanently destroyed. Since the Citizens have linear utility, the expected present value of their utility in this case is given by

$$V^p(R, \mu_t) = \frac{1 - \mu_t}{(1 - \delta)(1 - \beta^{p\star})} \tag{4.7}$$

where $\beta^{p\star} \equiv \beta^p e^{\bar{y} + \frac{1}{2}\vartheta^2}$ and β^p is the rate of time discounting for the Citizens and is derived in Appendix B.1.

The destruction of the Lucas tree is the cost the Citizens bare to bring about revolution. Random variation in this cost μ drives dynamics in the model. When μ is high, the Citizens cannot credibly threaten revolution, as the destruction it brings makes them better off under autocracy. When μ is low, conversely, the Citizens can credibly threaten revolution, which constrains the Elites from setting their optimal policy, and, if the threat is great enough, causes them to extend voting rights to the Citizens.

The cost of revolution μ is a simple way of modeling a complex collective action problem that the Citizens must solve to successfully mount a revolution. A revolution cannot be successful if just one Citizen wakes up one morning and decides to revolt; she must be accompanied by others to pose a true threat. The randomness of μ represents that solving this problem is hit-or-miss. Explicitly modeling the collective action problem that the Citizens face is beyond the scope of this paper.

Conceding democracy If they choose, the Elites can extend the vote to the Citizens, thus conceding democracy. In democracy, the more numerous Citizens become the median voter, meaning their preferred tax rate is always implemented. Further, once the economy becomes a democracy, it is a democracy forever. As such, the present value of the Citizens' utility is given by

$$V^p(D) = \frac{1 - \theta}{(1 - \delta)(1 - \beta^{p\star})} + \frac{(\theta - \delta)^2}{2(1 - \delta)^2(1 - \beta^{p\star})}. \tag{4.8}$$

which is the expected present value of receiving the maximum transfer income from Equation (4.6) in each period under linear utility.

What is the role of democracy in this model? It is essentially a commitment device for the Elites to promise future redistribution. When the Elites face a credible revolutionary threat from the Citizens, they make concessions (i.e. higher taxes and more transfers) to avoid an untimely demise. If the revolutionary threat is large enough (meaning μ is low enough), the Elites are not able to make sufficient one period transfers (i.e. implementing the preferred tax rate of the Citizens τ^{p*} for one period is not enough) to avert a revolution. In this case, the Elites would like to promise high taxes and redistribution in the future, but such promises are not credible; as soon as the revolutionary threat subsides, the Elites have no incentive to follow through with the transfers they promised.[7] Democracy makes the offer to redistribute in future periods credible, as it places tax policy decisions with the Citizens.

Political environment as a game The political environment can be modeled formally as a game. The order of the decisions is as follows (with mathematical notation in parentheses):

1. Nature reveals the cost of revolution (μ_t) to both the Elites and the Citizens.
2. The Elites choose to either concede democracy ($\phi_t = 1$) or keep autocracy ($\phi_t = 0$).
3. Both the Elites and Citizens choose the tax rate (τ_t^i) they want to implement. If the society is an autocratic, then the tax rate chosen by the Elites is implemented; if the society is democratic then the tax rate chosen by the Citizens is implemented.
4. The Citizens, after observing the tax rate, choose to revolt ($\rho_t = 1$) or not revolt ($\rho_t = 0$).

The choice set of the Elites in time t is given by $\sigma_t^r = \{\tau_t^r(\mu_t), \phi_t(\mu_t)\}$ where their chosen tax rate and the choice of whether to concede democracy are functions of the cost

[7]This is true for any Markovian equilibrium, where strategies must only depend the current state variables. Other path dependent equilibria do exist and could make future promises of redistribution credible, though I do not examine them in this paper. Acemoglu and Robinson (2006) provide an extension of this setup to include path dependency and find that it does not change the overall conclusions of the model.

of a revolution. Further, if $\phi_t = 1$ then $\phi_{t+s} = 1$ for $s > 0$, meaning that once democracy is conceded, it is conceded forever.

The choice set of the Citizens in time t is given by $\sigma_t^p = \{\tau_t(\phi_t), \rho_t(\mu_t, \phi_t)\}$ where their chosen tax rate and the choice to revolt are functions of the political institutions in place and the cost of a revolution. Further, if $\rho_t = 1$ then $\rho_{t+s} = 1$ for $s > 0$, meaning if the revolution occurs, its effects are permanent.

The Citizens' problem There are, in essence, three relevant political institutions for the Citizens: autocracy, democracy, and revolution. The value functions for the Citizens in the revolution and democracy are given by Equations (4.7) and (4.8) above, and the payoff in autocracy is given by

$$V^p(A, \mu_t; \tau_t) = \max_{\rho_t \in \{0,1\}} \Bigg\{ (1-\rho_t)(1-\phi_t) \left(\frac{\hat{Y}_t^p(\tau_t)}{Y_t} + \beta^{p\star} \mathbb{E}_t[V^p(A, \mu_{t+1}; \tau_{t+1})] \right) \\ + (1-\rho_t)\phi_t V^p(D) + \rho_t V^p(R, \mu_t) \Bigg\} \tag{4.9}$$

where I add the tax rate (even though it is not a state variable) after the semi-colon for the purpose of exposition.

The revolution constraint Since the Elites die if a revolution occurs (to them, a highly undesirable fate), they are always willing to transfer coconuts to the Citizens to avoid a revolution (a less undesirable fate). The Citizens, in essence, impose a *revolution constraint* on the tax rate the Elites can choose in autocracy in that the present value of coconuts the Citizens receive in autocracy must be greater than or equal to the present value of coconuts they receive in revolution:

$$V^p(A, \mu_t; \tau_t) \geq V^p(R, \mu_t). \tag{4.10}$$

The revolution constraint introduces two critical values of μ: the first is where Equation (4.10) holds with equality when the preferred tax rate of the Elites is in place,

$$V^p(A, \underline{\mu}; \tau_t = 0) = V^p(R, \underline{\mu}), \tag{4.11}$$

and the second is where Equation (4.10) holds with equality when the preferred tax rate of the Citizens is in place,

$$V^p(A, \mu^*; \tau_t = \tau^{p*}) = V^p(R, \mu^*). \tag{4.12}$$

When $\mu \in [\underline{\mu}, 1]$ then the revolution constraint does not bind; the Elites need not make any transfers to avert a revolution, as the Citizens are better off under autocracy. As the cost of revolution falls such that $\mu \in [\mu^*, \underline{\mu})$, the Elites must raise taxes and transfers to prevent the Citizens from revolting. I define the tax rate that prevents a revolution as $\hat{\tau}(\mu_t)$, which satisfies

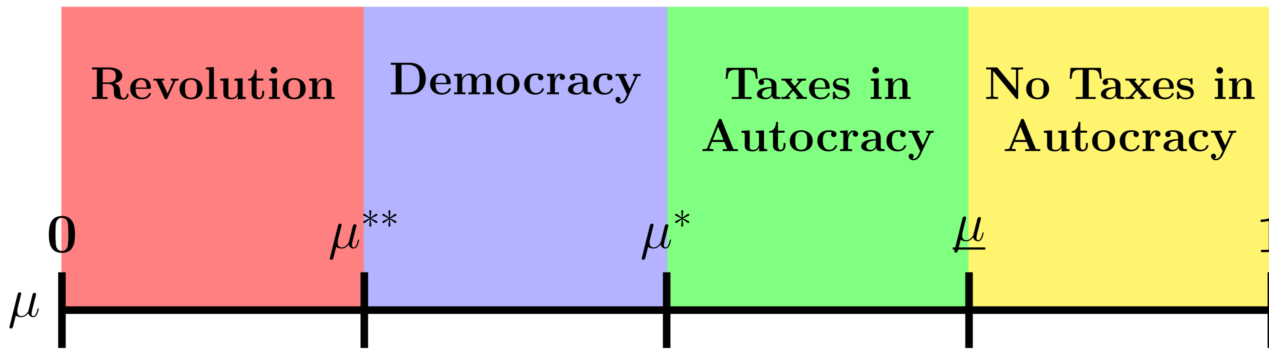
$$V^p(A, \mu_t; \tau_t = \hat{\tau}(\mu_t)) = V^p(R, \mu_t). \tag{4.13}$$

What happens if μ falls below μ^*? It is no longer sufficient for the Elites to raise taxes for just one period, and the commitment problem they face makes promises of future redistribution incredible. As a result, the Elites must concede democracy to prevent a revolution. Conceding democracy prevents a revolution provided that $\mu \in [\mu^{**}, \mu^*)$ where μ^{**} equates Equation (4.7) and Equation (4.8) and is given by

$$\mu^{**} = \theta - \frac{(\theta - \delta)^2}{2(1 - \delta)}. \tag{4.14}$$

Finally, if $\mu \in [0, \mu^{**})$, the Elites can do nothing to prevent a revolution, as the Citizens are better off in the revolutionary state than in democracy. In the special case of this economy I solve, however, I only examine cases where $\mu \in [\mu^{**}, 1]$. The action regions and their associated thresholds are shown in Figure 3.

Figure 3: Equilibrium Outcome for Regions of μ



Stochastic process for $\boldsymbol{\mu}$ The cost of revolution μ evolves according to a three-state, Markov process with the transition matrix

$$P(\mu) = \begin{pmatrix} 1-q & q & 0 \\ p & 1-2p & p \\ 0 & q & 1-q \end{pmatrix} \tag{4.15}$$

and $\mu^1 = \mu^2 = 1$ and $\mu^3 = \mu$. In the first state, the *stable autocracy state*, the Elites do not face a revolutionary threat in this period or the next. This changes when μ transitions to the second state, the *democratization state*, as the Elites do not face a current revolutionary threat, but may need to concede large transfers or democracy in the next period. In the third state, either democracy is consolidated, provided that $\mu \in [\mu^{**}, \mu^*)$, or society remains an autocracy, with transfers if $\mu \in [\mu^*, \underline{\mu})$ and without transfers if $[\underline{\mu}, 1]$.

Equilibrium I consider Markov perfect equilibria, meaning that all strategies must be a best response and can only depend on the current state, not the history of past states. A Markov perfect equilibrium consists of a choice set for the Elites and the Citizens for each combination of state variables (namely, the current value of μ and political institutions from the previous period). But, all of the consequential choices take place in autocracy: If the revolution occurs, taxes are always zero, as the Elites have been killed, and the Citizens have equal income, and, therefore, no desire for taxes and transfers; in democracy, the Citizens preferred tax rate is always chosen.[8]

In autocracy, there will be no transfers in the first two states of μ, as the Citizens cannot credibly threaten revolution. In the third state, however, there may be transfers, or even the concession of democracy, depending on the value of μ. We can, therefore, solve for the three thresholds, $\underline{\mu}$, μ^*, and μ^{**}, under Equation (4.15), which will determine the equilibrium actions.

To obtain the first threshold, $\underline{\mu}$, notice that the present value of coconuts when the Citizens receive no transfers in any period is

$$V^p(A, \mu_t; \tau_t = 0\ \forall t) = \frac{1-\theta}{(1-\delta)(1-\beta^{p\star})}. \tag{4.16}$$

Equating Equation (4.7) with Equation (4.16) shows that

$$\underline{\mu} = \theta. \tag{4.17}$$

The second threshold, μ^*, is given by

$$\mu^* = \theta - \frac{\varpi(\theta-\delta)^2}{2(1-\delta)}, \tag{4.18}$$

where

$$\varpi = \left(\frac{(1-\beta^{p\star}(1-q))(1-\beta^{p\star}(1-2p-q)) + \beta^{p\star}q(1-\beta^{p\star}(1-p-q))}{(1-\beta^{p\star}(1-q))(1-\beta^{p\star}(1-2p-q))}\right) \tag{4.19}$$

which is shown in Appendix B.2. In addition, when μ is in the range $\mu \in [\mu^*, \underline{\mu})$, the minimum tax the Elites can offer to avoid revolution is given by

$$\hat{\tau}(\mu) = \frac{\theta-\delta}{1-\delta} - \frac{\sqrt{(\theta-\delta)^2 - 2\left(\frac{\theta-\mu}{\varpi}\right)(1-\delta)}}{1-\delta}. \tag{4.20}$$

The final threshold, μ^{**} is described above in Equation (4.14).

Proposition 1. *If the transition matrix for μ follows Equation (4.15) and $\mu^1 = \mu^2 = 1$ and $\mu^3 = \mu$, and the regularity conditions $\beta^{p\star} < 1$ and $\theta > \delta$ hold, then:*

[8] The Citizens do possess the ability to revolt in this state, but, for simplicity, I assume that this is never a best response for them.

- *For $\mu \in [\underline{\mu}, 1]$, the economy is an autocracy and taxes are set to 0 in all periods;*
- *For $\mu \in [\mu^*, \underline{\mu})$, the economy is an autocracy in all periods and taxes are set to 0 in the stable autocracy state and the democratization state, and to $\hat{\tau}(\mu)$, as specified in Equation (4.20), in the third state;*
- *For $\mu \in [\mu^{**}, \mu^*)$, the economy is an autocracy and taxes are set to 0 in the stable autocracy state and the democratization state, and the economy becomes a democracy in the third state and taxes are set to τ^{p*}. Once the third state is reached, the economy remains a democracy forever;*
- *For $\mu \in [0, \mu^{**})$, the economy is an autocracy and taxes are set to 0 in the stable autocracy state and the democratization state, and the Citizens revolt in the third state;*

is a Markov perfect equilibrium with the threshold points $\underline{\mu}$, μ^*, and μ^{**} described by Equations (4.17), (4.18), and (4.14).

4.1 Asset pricing implications

Asset prices are set by the Elites, as they are the only agents who participate in financial markets. For simplicity, for the remainder of this section, I assume that $\mu^3 = \mu^{**}$ which means that the Elites must concede democracy when the third state of the Markov chain is first reached. For this reason, I now call this the *stable democracy state*.

The Elites' problem The Elites have Epstein and Zin utility and trade in the consumption claim and a zero-net supply riskfree bond. The recursive formulation of their utility is given by

$$V(W_t, \mu_t) = \max \left[(1-\beta^r) C_t^{1-1/\psi} + \beta^r \left(E_t \left[V(W_{t+1}, \mu_{t+1})^{1-\gamma} \right] \right)^{\frac{1-1/\psi}{1-\gamma}} \right]^{\frac{1}{1-1/\psi}}, \qquad (4.21)$$

with the budget constraint

$$W_{t+1} = (W_t - C_t) R_{W,t+1} \qquad (4.22)$$

and a market clearing condition $Y_t^r = C_t$, where C_t is consumption, W_t wealth, β^r the rate of time discount, γ risk aversion, ψ the elasticity of intertemporal substitution (EIS), and $R_{W,t+1} \equiv \frac{W_{t+1}}{W_t - C_t}$ the return on the wealth portfolio. In most periods, the growth rate of coconuts for the Elites is equal to the growth rate of the Lucas tree, Equation (4.1). This is not the case when μ transitions from the democratization state to the stable democracy state for the first time, as the Elites must concede democracy. Therefore, the endowment process for the Elites is given by

$$\Delta y_t^r(\phi_t, \phi_{t-1}) = \bar{y} + \vartheta\varepsilon_t + \log(1 - b(\phi_t, \phi_{t-1})) \tag{4.23}$$

with

$$b(\phi_t, \phi_{t-1}) = \begin{cases} Z & \text{if } \phi_t = 1 \text{ and } \phi_{t-1} = 0 \\ 0 & \text{otherwise} \end{cases} \tag{4.24}$$

where $Z \equiv \frac{(\theta-\delta)^2(1-\frac{1}{2}\delta)}{\theta(1-\delta)^2}$ which is decreasing in the level of inequality, meaning the the redistribution required to avert a revolution is higher the more unequal is the economy.

Consumption-wealth ratio Under Epstein-Zin utility, the stochastic discount factor of the Elites is

$$M_{t+1} = (\beta^r)^\alpha \left(\frac{C_{t+1}}{C_t}\right)^{-\frac{\alpha}{\psi}} R_{W,t+1}^{(\alpha-1)}$$

where $\alpha \equiv \frac{1-\gamma}{1-\frac{1}{\psi}}$. I conjecture that the wealth-consumption ratio, $\kappa(\mu^i)$, is constant in each state. In the stable democracy state, this gives

$$\kappa(\mu^3) = \frac{1}{1 - \beta^r e^{(1-\frac{1}{\psi})\bar{y} + \frac{1}{2}(1-\gamma)(1-\frac{1}{\psi})\vartheta^2}}.$$

In the stable autocracy and democratization states, this gives two equations in two unknowns

$$\begin{aligned}
\kappa(\mu^1) - 1 =& \beta^r e^{(1-\frac{1}{\psi})\bar{y} + \frac{1}{2}(1-\gamma)(1-\frac{1}{\psi})\vartheta^2} \left((1-q)\kappa(\mu^1)^\alpha + q\kappa(\mu^2)^\alpha\right)^{\frac{1}{\alpha}} \\
\kappa(\mu^2) - 1 =& \beta^r e^{(1-\frac{1}{\psi})\bar{y} + \frac{1}{2}(1-\gamma)(1-\frac{1}{\psi})\vartheta^2} \\
& \times \left(p\kappa(\mu^1)^\alpha + (1-2p)\kappa(\mu^2)^\alpha + p(1-Z)^{1-\gamma}\kappa(\mu^3)^\alpha\right)^{\frac{1}{\alpha}}
\end{aligned}$$

which can be solved numerically. Note, that I am not including the dependency on political institutions (i.e. ϕ, since the revolution will not occur in equilibrium). The full notation should be $\kappa(\mu^i, \phi_t, \phi_{t-1})$ where $\kappa(\mu^1, 0, 0) \equiv \kappa(\mu^1)$, $\kappa(\mu^2, 0, 0) \equiv \kappa(\mu^2)$, and $\kappa(\mu^i, 1, \phi_{t-1}) \equiv \kappa(\mu^3)$ in the notation above, a convention I keep for the remainder of the section.

Riskfree rate and risk premium The riskfree rate, similar to the wealth-consumption ratio, is constant in each state, and is

$$\begin{aligned}
R_f(\mu^1) =&(\beta^r)^{-\alpha} e^{\gamma\bar{y}-\frac{1}{2}\gamma^2\vartheta^2} \left(\kappa(\mu^1)-1\right)^{\alpha-1} \left[(1-q)\kappa(\mu^1)^{\alpha-1} + q\kappa(\mu^2)^{\alpha-1}\right]^{-1} \\
R_f(\mu^2) =&(\beta^r)^{-\alpha} e^{\gamma\bar{y}-\frac{1}{2}\gamma^2\vartheta^2} \left(\kappa(\mu^2)-1\right)^{\alpha-1} \\
&\times \left[p\kappa(\mu^1)^{\alpha-1} + (1-2p)\kappa(\mu^2)^{\alpha-1} + p(1-Z)^{-\gamma}\kappa(\mu^3)^{\alpha-1}\right]^{-1} \\
R_f(\mu^3) =&(\beta^r)^{-1} e^{\frac{1}{\psi}\bar{y}-\frac{1}{2}(\gamma-\frac{1}{\psi}(1-\gamma))\vartheta^2}.
\end{aligned}$$

Moreover, since consumption growth, the wealth-consumption ratio, and the riskfree rate are all constant in each state, so too is the excess return on the consumption claim ($R^e(\mu^i) \equiv \mathbb{E}\left[\frac{R_W(\mu^i)}{R_f(\mu^i)}\right]$), which is given by

$$\begin{aligned}
R^e(\mu^1) =&(\beta^r)^{\alpha} e^{(1-\gamma)\bar{y}+\frac{1}{2}(1+\gamma^2)\vartheta^2} \left(\kappa(\mu^1)-1\right)^{-\alpha} \times \\
&\left((1-q)\kappa(\mu^1) + q\kappa(\mu^2)\right)\left((1-q)\kappa(\mu^1)^{\alpha-1} + q\kappa(\mu^2)^{\alpha-1}\right) \\
R^e(\mu^2) =&(\beta^r)^{\alpha} e^{(1-\gamma)\bar{y}+\frac{1}{2}(1+\gamma^2)\vartheta^2} \left(\kappa(\mu^2)-1\right)^{-\alpha} \times \\
&\left(p\kappa(\mu^1) + (1-2p)\kappa(\mu^2) + p(1-Z)\kappa(\mu^3)\right) \times \\
&\left(p\kappa(\mu^1)^{\alpha-1} + (1-2p)\kappa(\mu^2)^{\alpha-1} + p(1-Z)^{-\gamma}\kappa(\mu^3)^{\alpha-1}\right) \\
R^e(\mu^3) =&e^{\gamma\vartheta^2}.
\end{aligned}$$

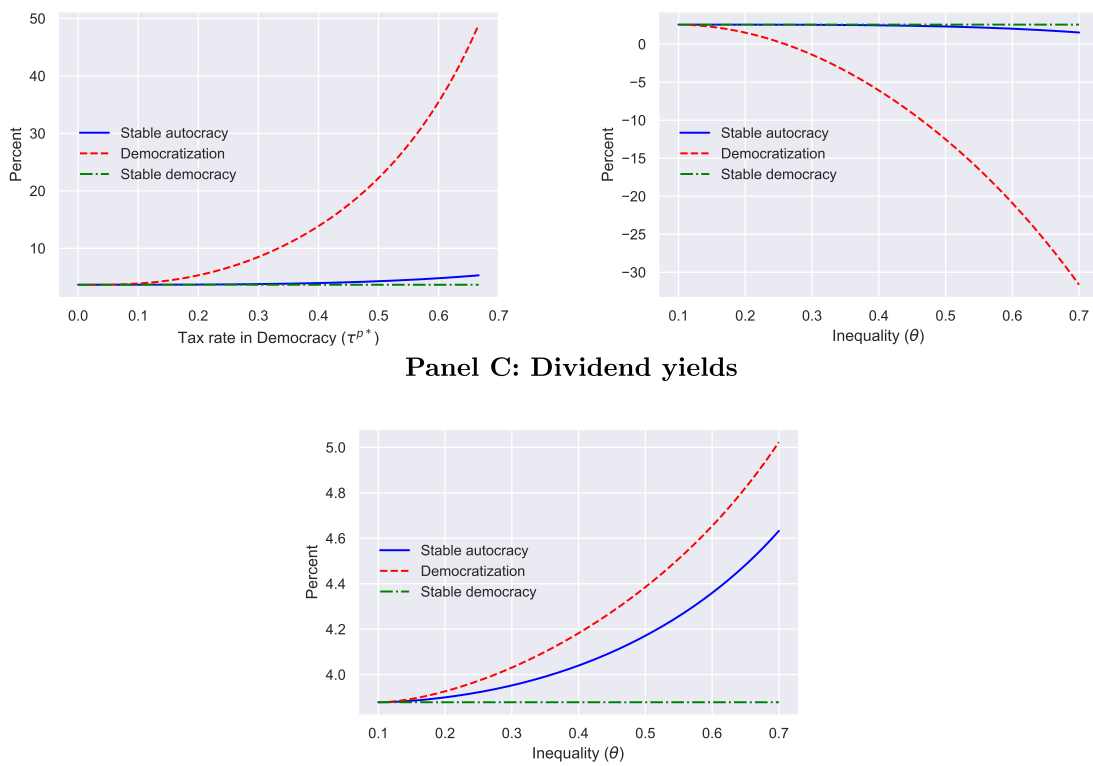
I use the excess return on the consumption claim as a proxy for the risk premium and the consumption-wealth ratio as a proxy for the dividend yield. The comparative statics of the equity premium, the riskfree rate, and the dividend yield with respect to changes in the inequality parameter, θ, are shown in Figure 4.

Figure 4: Comparative statics on inequality for dividend yields, riskfree rates, and risk premia

The parameter calibration used here sets risk aversion $\gamma = 5$, the EIS $\psi = 2$, the patience parameter $\beta^r = .96$, the growth rate of the endowment $\bar{y} = .02$, the volatility of the endowment $\vartheta = .06$, the probability of transition in states 1 and 3 $q = .02$, the probability of transition in state 2 $p = .1$, and the proportion of the population that are Elites $\delta = .1$.

Panel A: Risk premium **Panel B: Riskfree rate**

Panel C: Dividend yields



The equity premium rises and riskfree rate falls when there is a chance that the Elites will concede democracy in the next period. The intuition is that of a standard disaster model; the Elites face increased risk that drives up their demand for the riskfree asset, pushing down the riskfree rate. Likewise, the equity premium must rise to incentivize the Elites to hold it. The dividend yield increases because the equity premium and consumption growth effects dominate the riskfree rate effect which is due to the Elites having Epstein and Zin preferences with $\psi > 1$.

4.2 Interpretation

The model provides a compelling mechanism for why risk premia rise during periods of democratization: the Elites fear their income will be redistributed to the Citizens. Redistribution through taxes and transfers acts as a shock to the consumption of the Elites. Such redistribution shocks coming from the consolidation of democracy act as rare disasters for the Elites in the asset pricing sense. Moving from the stable autocracy state to the democratization state, increases the probability that democracy will occur, bringing about the same effects as in Wachter (2013) associated with an increase in the disaster probability. The increase in proxies for risk premia in the data are, therefore, a response to the uncertainty over whether and when democracy—and thus redistribution—will be conceded.

Redistribution shocks provide an additional interpretation for models in the rare disaster literature. Since only the Elites participate in financial markets, variation in their consumption is all that matters for asset prices. The rare disasters literature, however, has primarily examined the consumption of all people in the economy. Yet, in the model, there is no need for aggregate consumption to decline to achieve the same result. As such, the probability of a consumption disaster implied by Barro and Ursua (2008)—around 4% annually—may be an understatement once limited financial market participation is taken into account.

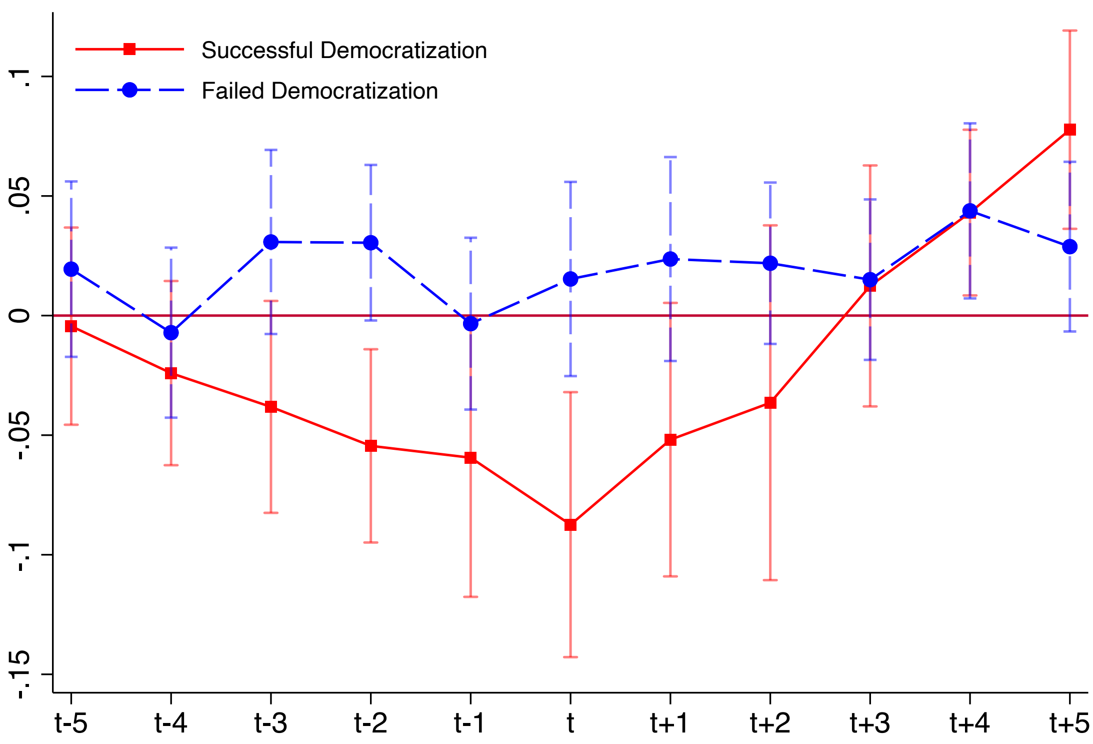
However, for a disaster interpretation of democratizations to be reasonable, realized returns must be low upon the realization of successful democratization. Is this true in the data? Figure 5 shows a 5-year moving average of log cum-dividend returns around successful and failed democratization end years, where the end year is defined as in Lindberg et al. (2018). Returns are significantly lower around the end of successful democratizations than failed democratizations by around 10 percentage points. To put this in perspective, investors in the market of a country undergoing a successful democratization earn a cumulative return of -15 percentage points (after subtracting the intercept) over 5-years. This estimate is also likely a lower bound on the effect, as there is attenuation bias: some successful democratizations in the data may not be accompanied by redistribution, meaning theoretically we would expect no effect. These results are consistent with the disaster interpretation of successful democratizations (from the perspective of the Elites) presented in the model.

Figure 5: Returns around successful and failed democratization ends

This figure presents the coefficients of the a 5-year moving average of log cum-dividend returns on indicator variables for the time to/from a successful or failed democratization end year. The regressions estimated take the form

$$\text{5-year average log cum-dividend returns}_{c,t} = \alpha + \sum_{s=-5}^{5} \beta_s \mathbb{1}_{c,t}\{s \times \text{Democratization End}\} + \epsilon_{c,t}.$$

Standard errors are heteroskedasticity robust, and a 90% confidence interval is plotted.



Though the uncertainty the Elites face, in the model, comes from sudden increases in taxes and transfers, this is not the only mechanism by which the threat of democracy can increase risk premia. For example, an alternative model where the consolidation of democracy challenges the control the Elites have over state-sanctioned monopolies may generate similar results. Further, the Elites in a society may gain non-pecuniary benefits from their elite status that is lost in democracy, leading to higher marginal utility in the stable democracy state. My goal is not to take a strong stance on the exact mechanism of redistribution in democracy; certainly, every democracy redistributes in its own way. I do not want readers to interpret the taxes and transfers in the model literally: They are a stand in for any and all means of redistribution in democracy.

I find evidence that democracy redistributes when examining the slow democratizations from Section 3, presented in Table 8. The Gini coefficient declines an average of 18 basis points per year 5-years after a successful slow democratization, and government revenue rises by 3.5% annually (much larger than the increase in GDP growth) after controlling for country and year fixed effects. The same cannot be said after failed slow democratizations, where the Gini coefficient rises and government revenue remains flat.[9]

It is important to note, however, that the results in Table 8 are not conclusive. The political economy literature is mixed on exactly how redistribution occurs after democratizations. A comprehensive review of this literature comes from Acemoglu, Naidu, Restrepo and Robinson (2015), where the authors show that, while tax revenues-to-GDP rise between 10 to 20 percentage points after democratizations, there is no robust effect on inequality. They then offer reasons why inequality may not fall after democratizations. Despite the dearth of robust evidence declines in inequality after democratizations, risk for the elites may still be high. For example, if the political elites lose political power, markets may democratize leading to opportunities for entrepreneurs that were previously shut out of markets. These entrepreneurs may become wealthy at the expense of the elites, which will lead to a reduction in aggregate elite wealth, but no change in standard inequality measure.s Here, the *ex ante* political elites are not the same as the *ex post* economic

[9]I present only data for slow democratizations, as I do not have a measure for the success of fast democratizations. I rely on the judgment of Lindberg et al. (2018) to determine the success or failure of a democratization.

elites. For this reason, it is difficult to identify how successful democracy is in fostering economic equality. Regardless, the primary mechanism in the model—implementation of large-scale redistributive tax and transfer schemes in democracy—requires no reduction in pre-tax inequality (i.e. lower θ in the model); it only requires a reduction in post-tax inequality.

Table 8: Democratizations, inequality, and government revenue

This table presents regressions of the Gini coefficient and the log growth rate of government revenue on indicator variables for democratization starts. The regressions estimated take the form

$$\text{Outcome}_{c,t} = \alpha_c + \alpha_t + \beta \mathbb{1}_{c,t}\{\text{5-years after a Democratization}\} + \epsilon_{c,t}.$$

Standard errors are clustered by country and year. All coefficients have been multiplied by 100 for presentation, and t statistics are in parentheses.

	Change in Gini Coefficient		Log growth in government revenue	
	(1)	(2)	(3)	(4)
Post Successful Slow Democratization	-0.180*		3.523*	
	(-1.93)		(1.81)	
Post Failed Slow Democratization		0.333**		0.319
		(2.44)		(0.21)
Year FE	✓	✓	✓	✓
Country FE	✓	✓	✓	✓
Event Controls	✓	✓	✓	✓
N	7410	7410	7036	7036

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Finally, there is also a slight disconnect between democratizations in the model and in the data. In the data, democratizations are measured by the growth rates in indices of democratic institutions whereas in the model, they represent an increase in the probability that the Elites must concede democracy. Democratizations in the model, while less complex than their data counterpart, do account for the essential ingredient for the rise in risk premia: the possibility that democratizations may fail. The uncertainty over whether the Elites will conceded democracy or will return to their happy (at least, for them) existence in autocracy is what causes premia to rise. To see this, note that risk premia and dividend yields are low once democracy is conceded, as there is no more uncertainty over whether redistribution will occur. Such uncertainty over the success or failure of a democratization is present in the data; Lindberg et al. (2018) find that just over 57% of democratizations fail meaning that the society becomes autocratic only a short time after an initial jump in measures of democratic institutions.

5 Pope John XXIII and the Second Vatican Council

The evidence presented thus far is either correlative (high risk premia correspond with democratizations) or theoretical (democracy causes redistributive shocks leading to high risk premia), but not causal. The empirical evidence presented in Section 3 does not have a causal interpretation, as many things change in democratizations: A missing or unobserved variable may be causing both democratizations and high risk premia.

This section addresses this challenge by using a quasi-natural experiment of a doctrinal shift in favor of democracy by the Catholic church in the early 1960s as an exogenous shock to the probability that democracy consolidates for majority Catholic, autocratic countries.

Historical context For much of its history, of the Catholic church was no friend to democracy. Prior to the early 1960s the Catholic church often helped legitimize autocratic regimes, serving as a "bulwark of the status quo" (Huntington, 1991).[10] This arrangement changed in the late 1958 with the election of Cardinal Angelo Giuseppe Roncalli to the papacy. Donning the name John XXIII, not much was expected of the old Pope, who was nearing 77 years old when he began his pontificate. He shocked the world, however, when he called for a major review of Catholic church doctrine in January 1959, just four months into his papacy. The review he called for turned into the Second Vatican Council (Vatican-II), which began in 1962 and lasted into 1965, outlasting John XXIII, who died

[10]Prior to 1963, the Catholic church was widely considered to be a barrier to the consolidation of democracy. For example, Hook (1940) writes of the Catholic church, "Catholicism is the oldest and greatest totalitarian movement in history." Similarly, Blanshard (1949) writes "You cannot find in the entire literature of Catholicism a single unequivocal endorsement by any Pope of democracy as a superior form of government."

in June 1963 of stomach cancer.[11]

Before he passed, John XXIII made the doctrinal shift official with his publication of *Pacem in Terris*. This text was the first in Catholic church history to explicitly endorse democracy.[12] Sigmund (1987) marks *Pacem in Terris* as the beginning of the decisive shift of Catholic church policy in support of liberal democracy, and, according to Huntington (1991), the publication of *Pacem in Terris*, and Vatican-II which succeeded it, is one of five main reasons the third wave of democratization—which took place from the mid-1970s to the 1990s—occurred. After 1963, the Catholic church played an active role in opposing authoritarian regimes in places like Argentina, Brazil, Chile, the Philippines, Poland, and many Central American countries, actively working as an advocate of democracy (Huntington, 1991).

The doctrinal shift of the Catholic church in favor of democracy was likely not foreseen by investors and constitutes a plausibly exogenous shock to the probability that democracy consolidates in majority Catholic and autocratic countries. What evidence is there that majority Catholic and autocratic countries were primarily affected by this shock? First, most of the countries that underwent successful democratizations (according to the Lindberg et al. data) from 1964 to 1983 were majority Catholic: In 1963, 25% of autocracies were majority Catholic, yet these countries made up 55% of all successful democratizations over the next 20 years.[13]

[11] Vatican-II was a fitting follow-up to the First Vatican Council in which the Catholic church condemned liberal democracy.

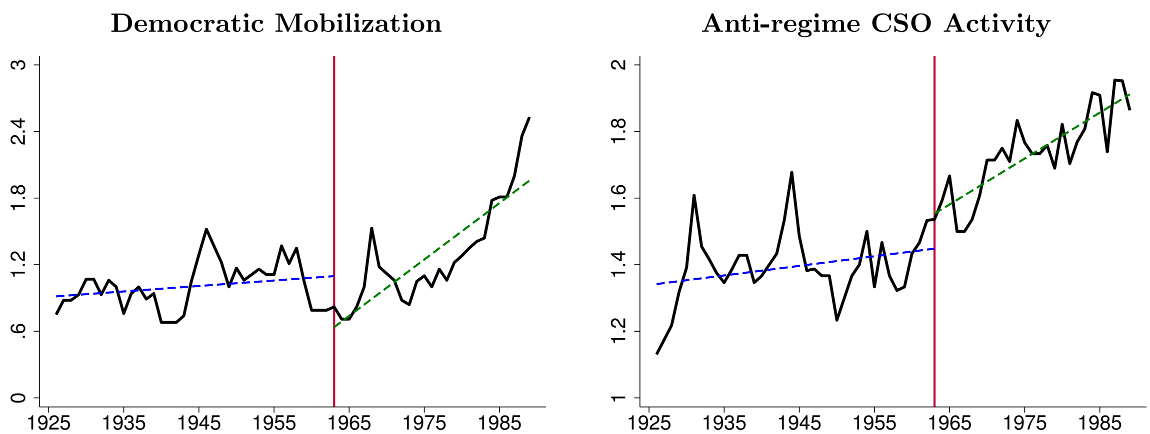
[12] In particular, *Pacem in Terris* says "[...] the dignity of the human person involves the right to take an active part in public affairs and to contribute one's part to the common good of the citizens. [...] The human person is also entitled to the juridical protection of his rights." This support is followed up with support for democracy explicitly in Point 52: "The fact that authority comes from God does not mean that men have no power to choose those who are to rule the State, or to decide upon the type of government they want, and determine the procedure and limitations of rulers in the exercise of their authority. Hence the above teaching is consonant with any genuinely democratic form of government."

[13] This is based on successful democratization *starts* meaning that the democratizations that were initiated during this time were were more likely to be successful.

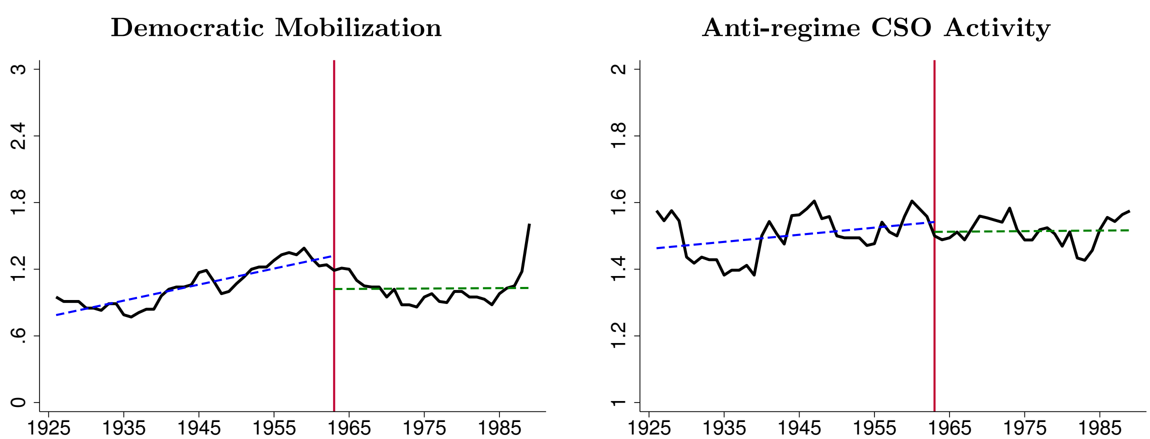
Figure 6: Democratic mobilizations and the threat posed by anti-system civil society organizations

Data on democratic mobilizations and anti-system civil society organization activity come from the Varieties of Democracy (V-Dem) database. The mean across countries in each group are plotted. The democratic mobilization variable is plotted in the first column, and assess the number of small- and large-scale demonstrations in favor of democracy in a given year. The maximum value is 4. The threat posed by anti-system civil society organization index is plotted in the second column, and ranks the threat posed by anti-system civil society organizations on a scale of 0 to 4, where 0 is no anti-system civil society organization activity, and 4 is a major present threat from anti-system civil society organizations. The autocracy designation is also constructed from V-Dem data, and includes all closed or electoral autocracies. Data on the percentage of the population that is Catholic comes from the Correlates of War database.

Panel A: Catholic, Autocratic



Panel B: Non-Catholic, Autocratic



Second, democratic mobilizations—small and large scale mobilizations in favor of democracy—became significantly more prevalent in majority Catholic autocracies compared to non-Catholic autocracies, as shown in the first column of Figure 6. From 1925–1963, the democratic demonstrations were sparse in all autocratic countries, indicating a secure grip on power for the governing regime. After 1963 and *Pacem in Terris*, the tight grip of autocracy began to loosen in the majority Catholic countries and by 1989, large-scale democratic mobilizations were commonplace. The same such treatment is not present in non-Catholic autocracies.[14]

Third, anti-system civil society organizations became a much larger threat to autocratic regimes in majority Catholic countries after 1963, as shown in Figure 6. The same threat, however, did not materialize in non-Catholic autocracies, which saw, if anything, a declining threat level from anti-system civil society organizations after 1963. Moreover, prior to 1963, the trend in the threat posed by anti-system civil society organizations was identical in the two groups of countries.

Identifying assumptions Of course, political institutions and religion are not randomly assigned; they are the result of myriad historical and cultural events that mold society over centuries. The identifying assumption underlying this exercise, therefore, does *not* rely on random assignment of religious demographics or political institutions. Instead, it relies on the assumption that absent the doctrinal shift, the treated (majority Catholic and autocratic countries) and control (all other countries) groups would have experienced similar returns, after adding controls and fixed effects. In essence, the parallel trends assumption must hold. Evidence in favor of the parallel trends assumption is provided in Figure 6, where the political treatment—a higher probability that democracy is consolidated—seems to be present in majority Catholic autocracies after the doctrinal shift, but not non-Catholic autocracies.

Additionally, the countries must be balanced on observable characteristics in the preperiod (1951–1962), which is shown in Table 9. Majority Catholic autocracies tend to be poorer, have higher inflation, higher resource inequality, and lower debt-to-GDP ratios

[14] A structural break test on sample from 1935–1985 on the time series of differences between majority Catholic and non-Catholic autocracies reveals structural break years of 1960 for democratic mobilizations, and of 1961 for the anti-system civil society organization activity. However, these break dates are dependent on the chosen start and end dates of the time series. Regardless, I perform the same analysis taking 1960 and 1961 as the treatment years and find that the results are actually stronger than using 1963 as the treatment year. These results are reported in Appendix Section C.

than the average country in the sample. To address this, I directly control for GDP per capita, resource inequality, and inflation[15] in all regressions and add country fixed effects, which capture differences in persistent variables like the debt-GDP ratio.

Table 9: Balance Test — Groups of countries

This table shows various characteristics of each of the different types countries in the triple difference-in-differences framework. In the first 4 columns, means are reported. The "Diff." column reports the point estimates on the regression

$$\text{Outcome}_{c,t} = \alpha + \beta \mathbb{1}_{c,t}\{\text{Majority Catholic Autocracy}\} + \epsilon_{c,t}.$$

Standard errors are clustered by country and year. The coefficients on rate variables have been multiplied by 100. The risk adjustment procedure for returns uses a two-factor model. The first factor is the GDP-weight return on the global market portfolio, and the second factor is the GDP-weighted return on a regional market portfolio, where the regions used are North America, South and Central America, Europe, the Middle East, Asia, and Oceania.

	Maj. Cath. Autocracy	Non-Cath. Autocracy	Maj. Cath. Democracy	Non-Cath. Democracy	Diff.	S.E.
Excess Returns	7.8	12.8	11.5	11.4	-4.2	4.6
Risk-adjusted Returns	-5.0	-0.5	-1.3	-0.7	-4.3	3.3
GDP Per Capita	4349.7	2516.6	8657.1	10628.2	-3027.7**	1082.8
Inflation (%)	19.7	5.7	4.8	3.5	15.2*	7.5
Annual GDP Growth	5.0	5.1	4.1	4.5	0.3	0.7
Debt/GDP	20.6	42.6	45.3	47.5	-25.2***	7.7
Gini Coeficient	48.0	52.2	44.3	41.2	4.2	2.6
Resource Inequality Index	0.71	0.79	0.26	0.23	0.27***	0.08
Dividend Growth	9.5	17.5	10.9	6.3	0.6	8.5

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Further, I treat the doctrinal shift in favor of democracy as exogenous, implicitly assuming away any reverse causality—in essence, identification by God. In reality, things are not so clear cut. While the sources in the Catholic theology literature do not point to economic reasons as the basis for the doctrinal shift in favor of democracy, the change may, in part, be due to the relatively high growth rates of protestant democracies compared to majority Catholic autocracies. The timing of the decision to change church doctrine, however, does seem random, as is the date at which the information was made public. And it is unlikely that John XXIII took asset prices or the asset portfolio of the Catholic church into account when making decisions on religious doctrine.

Finally, I also assume that investors have access to the same riskfree investment,

[15] When controlling for inflation three observations are lost. However, the results are basically identical with or without inflation as a control.

meaning that cum-dividend returns are equal to excess returns when time fixed effects are added, which serves two purposes in the analysis. The first is practical; stock prices have a greater availability in the data than government bond returns. A substantial portion of the sample would be lost by constructing excess returns in this way. The second is theoretical; as shown in Section 3, the observed government bond rate in many of the countries in the sample is not riskfree. Constructing excess returns using government bonds may, therefore, erase part of the risk premium I seek to measure.

Identifying the treatment window The final decision is using 1963, the year *Pacem in Terris* was published, as the year of treatment. *Pacem in Terris* contained the first statement in the history of the Catholic church that unambiguously supported democratic political institutions. As such, 1963 is the first year I can be sure that investors were aware of the doctrinal shift in favor of democracy.

There are, however, many potential dates to choose from, as it is difficult to know if investors could have inferred the change prior to 1963. For example, the unexpected election of John XXIII in October of 1958 was surprising, and may have signaled change, as his stance toward democracy was well known, and investors could have foreseen his policies would help bring about a wave of Catholic country democratizations early in his tenure. At the time of his election, however, many expected the old Pope to enjoy a quiet pontificate. It is, therefore, not an ideal date for the year of treatment. Another candidate is January 1959 when Pope John XXIII unexpectedly called Vatican II to update Church doctrine. Vatican-II convened from late 1962-1965, but the direct announcements regarding democracy were focused in 1963 and toward the end of Vatican-II in 1965.

Other likely candidates center around the writings of Pope John XXIII from early in his papacy. For example, his 1961 writing, *Mater et Magistra*, singles out economic and political inequalities on a number of occasions.[16] These early writings, while falling short

[16] In particular "Among citizens of the same political community there is often a marked degree of economic and social inequality. [...] Where this situation obtains, justice and equity demand that public authority try to eliminate or reduce such imbalances. It should ensure that the less developed areas receive

of explicitly endorsing democratic institutions, may very well have signaled to investors that change was on the horizon. Treatment may have also occurred later, as he doctrinal shift in favor of democracy was fully solidified in 1965 in the statements released at the end of the Vatican-II.

In short, 1963 is the earliest year where I can be sure investors were aware of the doctrinal shift. However, there are other potential options: for example, the publication of *Mater et Magistra* in 1961, the papacy of John XXIII from 1959–1963, and the entire Second Vatican Council from 1962–1965. I test each of these as potential shocks windows in Appendix Section C.1 and show that the results are unchanged.

Specification To assess the treatment effect on majority Catholic, autocratic countries, I employ a triple difference-in-differences framework. One reason to a triple difference-in-differences framework, as opposed to a single difference framework, is that non-Catholic autocracies and majority Catholic democracies are also likely treated, to a lesser degree, than the majority Catholic autocracies. Democratizations tend to happen in waves, meaning that when democratic pressure builds in one part of the world, it is likely to build in other parts, as well. Non-Catholic autocracies are, therefore, likely to be affected by this pressure, which could lead to increased risk and higher risk premia. The triple difference-in-differences framework addresses this by explicitly controlling for the post-treatment effect on all autocratic countries. On the other hand, the doctrinal shift may also lead to less political instability in majority Catholic democracies, leading risk premia to fall after the shock. The triple difference-in-differences framework addresses this by controlling for the post-treatment effect on majority Catholic countries, too.

The triple difference-in-differences specification also helps to address other potential

such essential public services as their circumstances require, in order to bring the standard of living in these areas into line with the national average. Furthermore, a suitable economic and social policy must be devised which will take into account the supply of labor, the drift of population, wages, taxes, credit, and the investing of money, especially in expanding industries. In short, it should be a policy designed to promote useful employment, enterprising initiative, and the exploitation of local resources."

stories that may explain the results. For example, it is possible that other events, such as the assassination of JFK, the rise to power of Fidel Castro in Cuba, or general anxiety during the Cold War (for example, the Bay of Pigs Invasion in 1961 or the Cuban Missile Crisis in 1962) could be relevant, but would also require some explanation as to why majority Catholic autocracies are differentially affected by these events. Using a triple difference-in-differences methodology means that any other stories for the results must describe why the risk premia of majority Catholic, autocratic countries are particularly affected, and not just risk premia for autocratic or majority Catholic countries, in general.

I use two different triple difference-in-differences specifications. The first uses the continuous autocratic institutions index (constructed as 1 minus the V-Dem democratic institutions index) and fraction of the population that is Catholic, which is available every 5 years from 1945 from the Correlates of War Database, which I fill in using linear imputation.[17] The specification is given by

$$\begin{aligned}\text{Returns}_{c,t} =& \alpha_c + \alpha_t + \beta_1 \text{Autocracy Index}_{c,t} + \beta_2 \text{Pecent Catholic}_{c,t} \\ &+ \beta_3 \text{Autocracy Index}_{c,t} \times \text{Pecent Catholic}_{c,t} \\ &+ \beta_4 \mathbb{1}_{c,t}\{\text{Post}\} \times \text{Pecent Catholic}_{c,t} \\ &+ \beta_5 \mathbb{1}_{c,t}\{\text{Post}\} \times \text{Autocracy Index}_{c,t} \\ &+ \beta_6 \mathbb{1}_{c,t}\{\text{Post}\} \times \text{Pecent Catholic}_{c,t} \times \text{Autocracy Index}_{c,t} \\ &+ \omega \text{Controls}_{c,t} + \epsilon_{c,t}\end{aligned} \tag{5.1}$$

where the c subscript represents the country and the t subscript represents the year. Coefficients β_1, β_2, and β_3 control for the pre-treatment differences in returns driven by differences in political institutions, the Catholic proportion of the population, and the interaction of the two. Coefficients β_4 and β_5 control for the post-treatment effects due to differences in returns due to differences in the proportion of the population that is Catholic and the level of autocratic institutions of a county. Finally, β_6 is the treatment

[17] The particular way of filling in the missing data doesn't not matter much. The percentage of the population that is Catholic in each country is fairly stable, declining slowly over the sample in most countries.

effect of interest. A significant treatment coefficient implies that the treatment is monotonic; highly autocratic and Catholic countries are more effected by treatment than other countries. The matrix of controls include a series of event controls, and non-event controls for macroeconomic conditions such as log GDP growth and log per capita GDP, and political conditions, such as level of political violence and democratic mobilizations. Such controls allow me to smooth out discount rate and cashflow shocks that occur within the sample window, better allowing me to identify expected returns.

In addition to the continuous approach in Equation (5.1), I also employ a standard discrete triple difference-in-differences specification, using three indicator variables—one if a country is majority Catholic, one of a country is an autocracy, and one if the year is after treatment—and their interactions. The triple difference-in-differences framework is, therefore, given by

$$\begin{aligned}\text{Returns}_{c,t} =& \alpha_c + \alpha_t + \beta_1 \mathbb{1}_{c,t}\{\text{Autocracy}\} + \beta_2 \mathbb{1}_{c,t}\{\text{Catholic}\} \\ &+ \beta_3 \mathbb{1}_{c,t}\{\text{Catholic} \times \text{Autocracy}\} + \beta_4 \mathbb{1}_{c,t}\{\text{Post} \times \text{Catholic}\} \\ &+ \beta_5 \mathbb{1}_{c,t}\{\text{Post} \times \text{Autocracy}\} + \beta_6 \mathbb{1}_{c,t}\{\text{Post} \times \text{Catholic} \times \text{Autocracy}\} \\ &+ \omega \text{Controls}_{c,t} + \epsilon_{c,t}\end{aligned} \tag{5.2}$$

where β_6 is, once again, the treatment effect of interest, and the other coefficients have a similar interpretation to what I described in the previous paragraph.

Finally, I also estimate a single difference-in-differences specification which takes the form

$$\text{Returns}_{c,t} =\alpha_c + \alpha_t + \beta \mathbb{1}_{c,t}\{\text{Post} \times \text{Catholic} \times \text{Autocracy}\} + \omega \text{Controls}_{c,t} + \epsilon_{c,t} \tag{5.3}$$

The estimation window begins in 1951 for all specification as some control variables have missing information prior to that year. Further, 1951 is far enough away from World War II to be confident that it is not influencing the results. However, the exact start date does not matter much for the results. In Appendix XX, I show that the results are similar when using 1946 as the start date for the analysis.

Controls and risk-adjustment The matrix of controls includes several binary controls for events and continuous controls to allow for more clean identification of risk premia from realized returns. In particular, binary event controls for head of government deaths, financial crises, ICB political crises, wars, sovereign defaults, and recessions are included. Additional political controls are also added that account for the threat to the existing regime from civil society organizations, the level of political violence, and the frequency and size of democratic mobilizations in each country-year. Controls for the macroeconomic environment are also added, and include log-GDP growth, the level of GDP per capita, and inflation. Each of these controls allow for more clean identification of risk premia, as they absorb potential cash flow and discount rate shocks that would attenuate the estimate.

In addition to the above controls, I also include financial controls that adjust for systematic risk that is not associated with risk coming from an increased probability of democratization. In particular, estimated β's multiplied by factor returns from a two factor risk model on the time series of returns for each country are included. This is done by estimating the time series model

$$r^e_{c,j,t} = \alpha_{c,t} + \beta_{1,t} r^{global}_t + \beta_{2,t,j} r^{continent}_{j,t} + \varepsilon_{c,j,t} \tag{5.4}$$

where r^{global}_t denotes the return in excess of the return of a 10-year U.S. treasury bond on a GDP-weighted global market portfolio, $r^{continent}_t$ denotes the return in excess of the return of a 10-year U.S. treasury bond on a GDP-weighted region-specific market portfolio, and c denotes the country, j denotes the region,[18] and t denotes the year. The β's are estimated on a rolling basis over 10-years, and require a minimum of 5-years to

[18] The regions used include: 1) South and Central America, 2) North America, 3) Europe, 4) Asia (less the Middle East), 5) The Middle East, and 6) Oceania. Note, I do not include the continent market portfolio in the time series regressions for North America and the Middle East. This is because in the sample from 1951–1983, North America has only two countries (the U.S. and Canada) and the Middle East has one country (Egypt). In these cases, the continent specific market portfolio has (nearly) perfect explanatory power due to the lack of countries, and is, therefore, excluded.

be estimated.[19] The two-factor risk model has good explanatory power for returns in the cross-section of countries, with an average (median) coefficient of determination (R^2) of 0.54 (0.55). Adjusting for non-democratization-related systematic risk allows for a more clean identification of treatment, as it removes differences in returns due to changes in risk exposure to either global or regional risk factors.

Table 10: Triple difference-in-differences — Shock in 1963

This table shows the regression coefficients of the triple differences-in-differences regression given by Equations (5.1) and (5.2) and the single difference-in-differences specification in Equation (5.3). In each regression, 1963 is the year of treatment and is excluded. Standard errors are heteroskedasticity robust and clustered by country and year. Included countries must have at least 20 observations from 1951–1983. All coefficients have been multiplied by 100, and t statistics are in parentheses.The controls used are a series of "event controls" meaning indicator variables for whether there is a war, financial crisis, recession, sovereign default, a head of government death, and ICB political crisis. In addition to the event controls, I also employ a series of additional controls: log GDP growth, GDP per capita, inflation, the level of political violence, the level of anti-system regime activity, the level of democratic mobilization, the level of resource inequality, and estimated β's multiplied by factor returns from a two factor risk model shown in Equation (5.4).

	Continuous Specification		Discrete Specification		Net Effect	
	(1)	(2)	(3)	(4)	(5)	(6)
Autocracy	-8.667	2.244	5.684	0.0587		
	(-0.72)	(0.29)	(0.81)	(0.01)		
Catholic	2.749	10.72	-11.69*	-12.63**		
	(0.04)	(0.17)	(-1.73)	(-2.70)		
Autocracy × Catholic	8.047	-21.55	-1.879	0.614		
	(0.17)	(-1.30)	(-0.18)	(0.07)		
Post × Catholic	-14.27*	-16.73**	-0.977	-1.230		
	(-1.79)	(-2.40)	(-0.27)	(-0.41)		
Post × Autocracy	-8.136	-9.632	-2.557	-4.946		
	(-1.10)	(-1.02)	(-0.72)	(-0.92)		
Post × Catholic × Autocracy	36.59***	37.14***	17.08***	15.16**	15.14***	11.20**
	(4.57)	(3.86)	(2.89)	(2.26)	(3.23)	(2.22)
Year FE	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
Sample	1951–1975	1951–1983	1951–1975	1951–1983	1951–1975	1951–1983
N	944	1216	944	1216	944	1216

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

[19]The 5-year minimum requirement causes 12 observations to be lost.

Results The results for the two triple differences-in-differences regressions are shown in Table 10. Columns (1) and (2) shows the results for the continuous triple differences-in-differences specification estimated on a 24-year and 32-year sample period. The treatment effect on average excess returns is between 36.6 and 37.1 percentage points, implying that at country with a 50 percentage point larger Catholic population, and 50 percentage point more autocratic institutions saw a 9.2 to 9.3 percentage point increase in risk premia after the doctrinal shift. Somewhat concerning are the significant negative coefficients after treatment for majority Catholic countries and autocratic countries. This means that the significant positive treatment effect may be driven by lower returns in majority Catholic democracies and non-Catholic autocracies rather than higher risk premia in majority Catholic autocracies. I will address this potential concern in greater detail bellow.

The discrete specification, shown in Columns (3) and (4) provides similar results, though without significant negative coefficients after treatment for majority Catholic countries and autocratic countries. Treatment effect on the triple interaction term is between 15.2 to 17.1 percentage points.

The net effect is given by estimating a single difference-in-differences specification, taking majority Catholic autocracies as the treated group, and all other countries as the control group. This specification displays a 11.2 to 15.1 percentage point rise in rise premia after the doctrinal shift of the Catholic church.

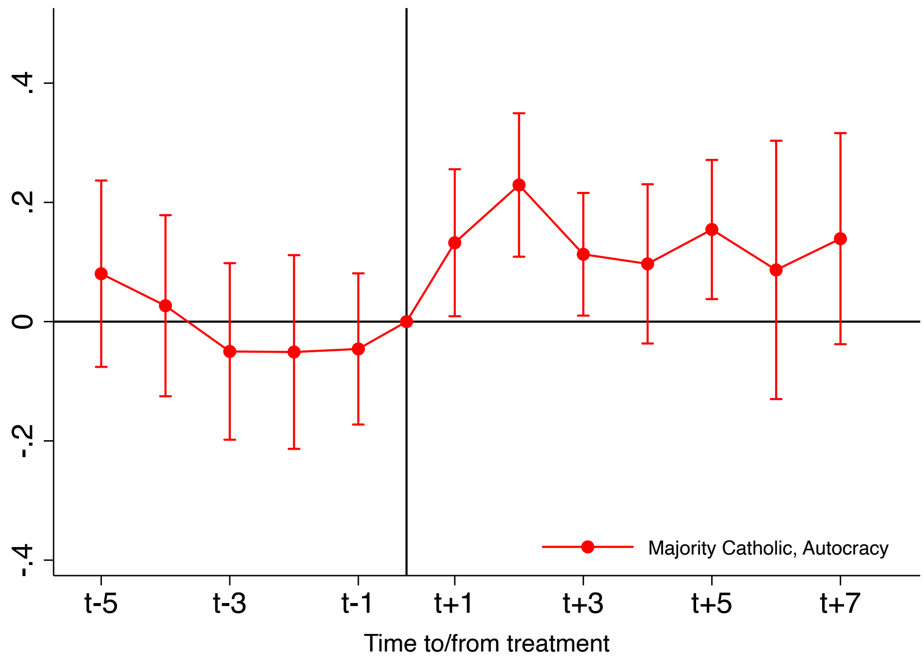
The parallel trends assumption is supported by Figure 7 which presents coefficients from a regression of average returns on two-year grouped time indicator variables (meaning each dot represents a 2-year time dummy) interacted with indicator variables for majority Catholic autocracies. Majority Catholic autocracies have a large positive treatment after 1963, with low and stable returns 10-years prior to treatment. The point estimates are also surprisingly stable, around 12-15% per year which the six three years significant at the 90% level. The lack of pre-trends in returns, as well as the lack of pre-trends in democratic mobilizations and anti-regime activity (Figure 6), provide strong evidence that the identifying assumptions are valid.

Figure 7: Parallel trends and dynamic difference-in-differences

This figure presents the regression coefficients β_s for the regression

$$\text{Returns}_{c,t} = \alpha_c + \alpha_t + \sum_{s=t-5}^{t+7} \beta_s \mathbb{1}_{c,t}\{s \times \text{Catholic} \times \text{Autocracy}\} + \omega \text{Controls}_{c,t} + \epsilon_{c,t}$$

where s are dummies grouped at the 2-year level. The sample shows goes from 1953–1977. Standard errors are clustered by country and year. The standard error bars represent a 90% confidence interval. The vertical black line shows the year of treatment, 1963.



Single difference-in-differences on subsamples Which subsample are the results coming from? Table 10 gives some evidence the results in the triple differences specification may be coming from lower returns post treatment, as opposed to higher returns for majority Catholic autocracies. Table 11 dispels this notion by showing the results of single difference-in-differences regressions on the autocratic, majority Catholic, and non-Catholic democratic. In the subsample that contains only autocratic countries, majority Catholic autocracies had 14.5 to 18.7 percentage point higher returns in the post-period, relative to non-Catholic autocracies. Similarly, majority Catholic autocracies had 9.1 to 10.6 percentage point higher returns than majority Catholic democracies. Finally, relative to non-Catholic democracies, the treatment effect on majority Catholic autocracies is from 7.5 to 12.3 percentage points.

The results from the single difference-in-differences subsample regressions show that majority Catholic autocracies displayed higher excess returns than all the groups used in the triple difference-in-differences specification. Moreover, the treatment effect is largest when the majority Catholic autocracies are compared to the non-Catholic autocracies, who are arguable the most comparable control group. Regardless, the difference in outcomes between the two groups of autocratic countries do not drive the results: majority Catholic autocracies displayed similarly higher excess returns when compared to all the democracies, too.Along this dimension, the difference in average excess returns between non-Catholic democracies and majority Catholic autocracies is particularly informative. Since non-Catholic democracies are unlikely to be treated at all by the shift in Catholic church doctrine, this difference-in-differences specification is likely very cleanly measured.

Table 11: Single Difference-in-Differences — Shock in 1963

This table shows the treatment coefficients on single differences-in-differences regressions of returns before and after 1963. The regression is estimated on subsamples of either autocratic or majority Catholic countries, and is given by

$$\text{Returns}_{c,t} = \alpha_c + \alpha_t + \beta \mathbb{1}_{c,t}\{\text{Post}\} \times \mathbb{1}_{c,t}\{\text{Catholic}\} \times \mathbb{1}_{c,t}\{\text{Autocracy}\} + \gamma \text{Controls}_{c,t} + \epsilon_{c,t}.$$

In each regression, 1963 is the year of treatment and is excluded. Standard errors are clustered by country and year. Included countries must have at least 20 observations from 1951–1983. All coefficients have been multiplied by 100, and t statistics are in parentheses.

	Non-Catholic Aut.		Majority Catholic Dem.		Non-Catholic Dem.	
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Catholic × Autocracy	18.69***	14.47*	10.63	9.113	12.28**	7.453
	(3.06)	(1.96)	(1.50)	(1.73)	(2.23)	(1.06)
Year FE	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
Sample	1951–1975	1951–1983	1951–1975	1951–1983	1951–1975	1951–1983
N	458	560	325	416	589	757

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Robustness Appendix Section C provides additional robustness checks. The results are robust to different treatment dates. In particular, I estimate both triple difference-in-differences specifications and the single difference-in-differences specification using 1960 and 1961 (the years chosen by the structural break tests on the democratic mobilization and anti-CSO threat variables) as the treatment years instead of 1963. The results are identical to those reported above. I do the same exercise taking 1959–1963 (the papacy of John XXIII) and 1962–1965 (all the years of the Second Vatican Council) as the treatment years, and the results are also nearly identical. The results for these robustness checks are reported in Appendix Section C.1.

Appendix Section C.2 reports the results for both triple difference-in-differences specifications and the single difference-in-differences specification using different end dates for the estimation windows, which also does not materially effect the results. The results are significant regardless of the particular end date chosen from 1970–1985, but the point estimates get smaller as the end date moves further in the future.

Appendix Section C.3 provides two falsification tests for the results. The first runs the triple discrete triple difference-in-differences specification and the single difference-in-differences specification using the First Vatican Council (Vatican-I) from 1868–1870 as treatment. Vatican-I provides an interesting test, as this council centered around a rejection of liberalism and democratic principals, and likely strengthened the hold on power of for autocrats in majority Catholic countries. Consistent with this, I find significantly lower average excess returns for majority Catholic autocracies after 1870. However, these results should be treated with caution, as I have far fewer observations in the estimating sample.

The second falsification test runs the single difference-in-differences specification on a 24-year window around the treatment year, taking each year from 1948 to 1978 as the year of treatment. The results are only significant for specifications taking the years 1959 to 1966 as the year of treatment with the strong results coming from using 1962 to 1964 as the year of treatment. This suggests that 1963 is, indeed, the actual year of treatment, corroborating the evidence from history.

The results are also robust to excluding Latin America, and excluding non-Latin American Catholic autocracies and excluding every pair of countries from the estimation, which is shown in Appendix Section C.4. In addition, the results are not driven by outliers. Appendix Section C.5 winsorizes the excess returns variable at the 5% and 10% levels and shows that results are still highly statistically significant. However, winsorizing does reduce the point estimates of the treatment effect to around 7.4 to 8.7 percentage points. Quantile regressions at the median deliver similar results, with point estimates of between 5 to 6 percentage points, in line with the results from Section 3.

Interpretation The results above provide strong evidence for a causal relationship of democratizations on risk premia. The triple difference-in-differences specification points to a 9.2 to 9.3 percentage point increase in risk premia, while a single difference-in-differences specification shows a treatment effect of 11.2 and 15.1 percentage points. The effects estimated from the doctrinal shift in the Catholic church are larger than the estimates presented in Section 3. One potential explanation for this result is that the estimates from the triple difference-in-differences exercise are less representative than the estimates from Section 3, as they cover a smaller time series and cross-section. In this case, the true increase in risk premia may be smaller than the point estimates above suggest. Further, as I show in Appendix Section C.5, the results for observations within 10% to 90% of the distribution of returns, display a net effect of around 7.4 to 8.7 percentage points and median regressions deliver point estimates of 5 to 6 percentage points.

However, the treatment effect of democratizations on risk premia is also better identified in using the doctrinal shift in the Catholic church, a indicating that the true effect from Section 3 is indeed larger. Whatever the case may be, both results point to large, economically meaningful increases in risk premia during times of democratization.

6 Conclusion

Risk premia are significantly elevated during periods of democratization, a fact that can be verified across multiple proxies in 85 countries over 200 years. Puzzlingly, consumption risk and risk to cashflows are not particularly elevated during democratizations. Combining a standard political economy model in the style of Acemoglu and Robinson (2006) into a consumption-based asset pricing model with limited asset market participation can reconcile this puzzle, showing that the risk of redistribution from rich to poor increases during periods of democratizations, leading to high risk premia. Finally, exogenous variation in the probability that democracy consolidates causes marked increases in average returns for treated countries using a differences-in-differences framework.

While the results in this paper go a long way to describing how redistributive shocks from rich to poor coming from changes in political institutions affect asset markets, the exact mechanism through which redistribution occurs is still left somewhat ambiguous. The model I provide suggests one culprit—increased redistributive tax and transfer schemes—which I find support of in the data, and is supported by past research (Acemoglu, Naidu, Restrepo and Robinson, 2015). However, future research into the exact mechanisms through which this mechanism operates is necessary to understand not just periods of democratization, but how policy and political risk affect individual, firm, and government decision making more broadly. Further, understanding the increased globalization of asset markets influence the results would be a fruitful road to explore, as well.

Finally, this paper provides new avenues of study in rare events models, particularly focused on the political institutions and how they interact with the distribution (and redistribution) of resources. In particular, I show that a large drop in aggregate consumption is not necessary, but rather that the drop in consumption need only be experienced by relatively wealthy equity market participants, paving a new road through which heterogeneity can explain increases in risk premia.

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INTERNET APPENDIX

A Data appendix

Equity returns and dividend yields I construct the longest possible equity return series by combining data from three main sources: the Global Financial Data (GFD) Main Dataset, the Jorda-Schularik-Taylor Macrohistory Database (JST), and the GFD London Stock Exchange (GFD-LSE) Dataset. From both the main GFD dataset and the GFD-LSE dataset, I obtain the dividend yield, total return index, and price index for each country. Cum-dividend returns are therefore given by

$$R_{c,t}^{tot} = \frac{\text{Total Return Index}_{c,t}}{\text{Total Return Index}_{c,t-1}}$$

and ex-dividend returns (capital gains) by

$$R_{c,t}^{cap.\ gains} = \frac{\text{Price Index}_{c,t}}{\text{Price Index}_{c,t-1}}.$$

The GFD return series are in downloaded in U.S. dollars and then adjusted for expected U.S. inflation, which is calculated by fitting an AR(1) process to realized inflation, to put them in real terms. The JST returns data must be change to U.S. dollars, which is done using the `xusd` variable they provide. Using the dividend yield and capital gains, I also construct a dividend growth series, which is given by

$$\frac{D_{c,t}}{D_{c,t-1}} = \frac{\text{Dividend Yield}_{c,t}}{\text{Dividend Yield}_{c,t-1}}(R_{c,t}^{cap.\ gains})^{-1}.$$

Using these data, I construct the longest possible cum-dividend returns series possible. To do this, I create an all cum-dividend returns variable and populate it with returns from GFD's Main Dataset, and then fill in missing observations with the JST data. The JST data only covers 17 countries compared to the 64 countries the main GFD dataset covers. However, the two datasets are highly correlated, with a correlation coefficient of .73 for their overlapping observations. Next, I fill in an remaining missing observation with cum-dividend returns from the GFD-LSE data. The GFD-LSE data covers a different universe of companies than the other two datasets, usually large, global firms, and therefore have a less strong correlation (.44) with the main GFD data. The combined cum-dividend returns variable covers a sample of 85 countries that spans 200 years.

I use the same procedure to combine the ex-dividend returns data and dividend growth data, and to combine the *changes* in the dividend yield, rather than the levels. Indeed, the levels vary somewhat across data sources, so combining them would lead to arbitrary jumps in the series. Using the changes, on the other hand, does not have this issue. The ex-dividend returns data covers 115 countries and the change in the log dividend yield series covers 73 countries. Individual information for the time periods each country is in both GFD datasets is provided in Appendix Table D.10; for more information about the JST data and it's coverage, see the Jorda-Schularik-Taylor Macrohistory Database web resource.

Fixed income and inflation The government bond yields come from the GFD main dataset and the JST data. For most every series, these represent the yield on the 10-year government bond. Corporate bond yields data only come from one data source, the GFD main dataset. This series covers 21 countries over 164 years, respectively.

Inflation data come from the GFD main dataset, the JST data, and the Varieties of Democracy (V-Dem) database. The aggregate series is created by taking an equal weighted average over all these series.

B Model calculations and proofs

B.1 Deriving the Bellman equation for the Citizens

The Citizens have linear utility over coconuts. The problem they solve can be represented as a standard dynamic program, where the Bellman equation is given by

$$\begin{aligned} V^p(\mu_t, Y_t, \rho_{t-1}, \phi_{t-1}) = \max_{\rho_t \in \{0,1\}} \Bigg\{ &(1-\rho_t)(1-\phi_t)\left(\hat{Y}_t^p(\tau_t) + \beta^p \mathbb{E}_t[V^p(\mu_{t+1}, Y_{t+1}, 0, 0)]\right) \\ &+ (1-\rho_t)\phi_t\left(\hat{Y}_t^p(\tau^{p*}) + \beta^p \mathbb{E}_t[V^p(Y_{t+1}, 0, 1)]\right) \\ &+ \rho_t\left(\frac{1-\mu_t}{1-\delta} Y_t + \beta^p \mathbb{E}_t[V^p(\mu_t, Y_{t+1}, 1, 0)]\right) \Bigg\}. \end{aligned}$$

where the second expression, the continuation value of the democratic economy, no longer relies on μ as the Citizens are assumed to have no desire to revolt once democracy is conceded, and the third expression, the continuation value of the economy after revolution, depends on μ_t as this value is "locked in" at the time the revolution occurs. Since the Citizens have linear utility, the value function is homogeneous of degree one in coconuts. This means that the value function can be rewritten as

$$\begin{aligned} V^p(\mu_t, \rho_{t-1}, \phi_{t-1}) = \max_{\rho_t \in \{0,1\}} \Bigg\{ &(1-\rho_t)(1-\phi_t)\left((1-\tau_t)\frac{1-\theta}{1-\delta} + (\tau_t - C(\tau_t)) + \beta^p \mathbb{E}_t[e^{\bar{y}+\vartheta\varepsilon_t} V^p(\mu_{t+1}, 0, 0)]\right) \\ &+ (1-\rho_t)\phi_t\left((1-\tau^{p*})\frac{1-\theta}{1-\delta} + (\tau^{p*} - C(\tau^{p*})) + \beta^p \mathbb{E}_t[e^{\bar{y}+\vartheta\varepsilon_t} V^p(0, 1)]\right) \\ &+ \rho_t\left(\frac{1-\mu_t}{1-\delta} + \beta^p \mathbb{E}_t[e^{\bar{y}+\vartheta\varepsilon_t} V^p(\mu_t, 1, 0)]\right) \Bigg\}. \end{aligned}$$

Further, if the revolution occurs or democracy is conceded, the economy remains in the same political state for the rest of eternity. This fact gives the following two expressions:

$$V^p(\mu_t, 1, 0) = \frac{1-\mu_t}{1-\delta} + \beta^{p\star} V^p(\mu_t, 1, 0)$$
$$V^p(0, 1) = (1-\tau^{p*})\frac{1-\theta}{1-\delta} + (\tau^{p*} - C(\tau^{p*})) + \beta^{p\star} V^p(0, 1)$$

where $\beta^{p\star} \equiv \beta^p e^{\bar{y}+\frac{1}{2}\vartheta^2}$. Simplifying yields

$$V^p(R, \mu_t) \equiv V^p(\mu_t, 1, 0) = \frac{(1-\mu_t)}{(1-\delta)(1-\beta^{p\star})}$$
$$V^p(D) \equiv V^p(0, 1) = \frac{(1-\tau^{p*})\frac{1-\theta}{1-\delta} + (\tau^{p*} - C(\tau^{p*}))}{(1-\beta^{p\star})}.$$

and are finite under the assumption $\beta^{p\star} < 1$. This means that the value function in the autocracy state can be written as

$$V^p(A, \mu_t) \equiv V^p(\mu_t, 0, 0) = \max_{\rho_t \in \{0,1\}} \Bigg\{ (1-\rho_t)(1-\phi_t)\left(\frac{\hat{Y}_t^p(\tau_t)}{Y_t} + \beta^{p\star}\mathbb{E}_t[V^p(A, \mu_{t+1})]\right) + (1-\rho_t)\phi_t V^p(D) + \rho_t V^p(R, \mu_t)\Bigg\}$$

B.2 Finding μ^* and $\hat{\tau}(\mu)$

The second threshold, μ^*, can be found by solving the system of equations

$$V^p(A, \mu^1; \tau_t = 0) = \frac{1-\theta}{1-\delta} + \beta^{p\star}[(1-q)V^p(A, \mu^1; \tau_t = 0) + qV^p(A, \mu^2; \tau_t = 0)] \tag{B.1}$$

$$V^p(A, \mu^2; \tau_t = 0) = \frac{1-\theta}{1-\delta} + \beta^{p\star}[pV^p(A, \mu^1; \tau_t = 0) + (1-2p)V^p(A, \mu^2; \tau_t = 0) + pV^p(A, \mu^3; \tau_t = \tau^{p*})] \tag{B.2}$$

$$V^p(A, \mu^3; \tau_t = \tau^{p*}) = \frac{1-\theta}{1-\delta} + \frac{1}{2}\left(\frac{\theta-\delta}{1-\delta}\right)^2 + \beta^{p\star}[qV^p(A, \mu^2; \tau_t = 0) + (1-q)V^p(A, \mu^3; \tau_t = \tau^{p*})]. \tag{B.3}$$

Subtracting Equation (B.1) from Equation (B.3) gives

$$V^p(A, \mu^3; \tau_t = \tau^{p*}) = V^p(A, \mu^1; \tau_t = 0) + \frac{1}{2}\left(\frac{\theta-\delta}{1-\delta}\right)^2\left(\frac{1}{1-\beta^{p\star}(1-q)}\right). \tag{B.4}$$

Plugging Equation (B.4) into Equation (B.2) gives

$$V^p(A, \mu^2; \tau_t = 0) = \frac{1-\theta}{1-\delta} + \frac{1}{2}\left(\frac{\theta-\delta}{1-\delta}\right)^2\left(\frac{p\beta^{p\star}}{1-\beta^{p\star}(1-q)}\right) + \beta^{p\star}[2pV^p(A, \mu^1; \tau_t = 0) + (1-2p)V^p(A, \mu^2; \tau_t = 0)]$$

which, after subtracting Equation (B.1), is

$$V^p(A, \mu^2; \tau_t = 0) = V^p(A, \mu^1; \tau_t = 0) + \frac{1}{2}\left(\frac{\theta-\delta}{1-\delta}\right)^2 \frac{p\beta^{p\star}}{(1-\beta^{p\star}(1-q))(1-\beta^{p\star}(1-2p-q))}. \tag{B.5}$$

Subtracting Equation (B.5) from Equation (B.4) gives

$$V^p(A,\mu^3;\tau_t=\tau^{p*}) = V^p(A,\mu^2;\tau_t=0) + \frac{1}{2}\left(\frac{\theta-\delta}{1-\delta}\right)^2 \frac{1-\beta^{p\star}(1-2p-q)-\beta^{p\star}p}{(1-\beta^{p\star}(1-q))(1-\beta^{p\star}(1-2p-q))},$$

which, plugging into Equation (B.3), yields

$$V^p(A,\mu^3;\tau_t=\tau^{p*}) = \frac{1-\theta}{(1-\delta)(1-\beta^{p\star})} + \left(\frac{\varpi(\theta-\delta)^2}{2(1-\delta)^2(1-\beta^{p\star})}\right) \tag{B.6}$$

where

$$\varpi = \left(\frac{(1-\beta^{p\star}(1-q))(1-\beta^{p\star}(1-2p-q))+\beta^{p\star}q(1-\beta^{p\star}(1-p-q))}{(1-\beta^{p\star}(1-q))(1-\beta^{p\star}(1-2p-q))}\right). \tag{B.7}$$

Note that ϖ is less than 1 provided $q>0$ and equal to 1 when $q=0$. The threshold μ^* is then given by setting Equation (B.6) equal to Equation (4.7) at μ^*, which gives

$$\mu^* = \theta - \frac{\varpi(\theta-\delta)^2}{2(1-\delta)}.$$

Note that $\mu^* > \mu^{**}$ when $p>0$ and $\mu^*=\mu^{**}$ when $p=0$. This makes sense, since when $p=0$, there is no chance of transitioning out of the third state. Therefore, the payoff is exactly equal under autocracy and democracy, as the Citizens can always credibly threaten revolution if their preferred tax rate is not put in place. If $p>0$, conversely, than there is some probability the Citizens will transition back to a state where $\mu=1$ and redistribution will be withdrawn. This raises the threshold μ^*, meaning revolution is attractive to the Citizens in this case.

The same procedure gives the expression for the minimum tax rate the Elites can offer to avoid a revolution, $\hat{\tau}(\mu)$, when $\mu\in[\mu^*,\underline{\mu})$. All that needs to be done is to replace the transfer term $\frac{1}{2}\left(\frac{\theta-\delta}{1-\delta}\right)^2$ in Equation (B.3) with the more general $\frac{\theta-\delta}{1-\delta}\hat{\tau}(\mu)-\frac{1}{2}\hat{\tau}(\mu)^2$, yielding the expression

$$\mu = \theta - \varpi\left((\theta-\delta)\hat{\tau}(\mu) - \frac{1}{2}(1-\delta)\hat{\tau}(\mu)^2\right).$$

Therefore, $\hat{\tau}(\mu)$ is the solution to the quadratic

$$0 = \frac{\theta-\mu}{\varpi} - (\theta-\delta)\hat{\tau}(\mu) + \frac{1}{2}(1-\delta)\hat{\tau}(\mu)^2,$$

which is (selecting the economically correct root)

$$\hat{\tau}(\mu) = \frac{\theta-\delta}{1-\delta} - \frac{\sqrt{(\theta-\delta)^2 - 2\left(\frac{\theta-\mu}{\varpi}\right)(1-\delta)}}{1-\delta}$$

which is equal to τ^{p*} when $\mu=\mu^*$ and 0 when $\mu=\theta$.

C Quasi-natural experiment appendix

C.1 Alternative windows

Now, I test alternative shock windows to 1963. The first alternative window performs the triple difference-in-differences from Table 10 taking 1960 and 1961, instead of 1963, as the year of treatment. The years 1960 and 1961 are indicated as the structural break years in the difference in anti-system civil society activity and democratic mobilizations between majority Catholic and non-Catholic autocracies. Further, the year 1961 corresponds to the publication of *Mater et Magistra*, written by Pope John XXIII. *Mater et Magistra* endorsed many elements of democracy and was strongly in favor of fighting political and economic inequality, but fell short of endorsing democracy.

Table C.1 reports the results. The treatment effect is nearly identical in magnitude to what is obtained using 1963 as the year of treatment, with a continuous treatment effect of 6.7 to 7.2 percentage points for a country that is 50 percentage points more autocratic and has a 50 percentage point larger Catholic population. The discrete treatment effect is also positive at around 14.3 to 15.9 percentage points, and a significant net effect of 10.4 to 13.4 percentage points.

Table C.1: Triple Difference-in-Differences — Shock from 1960–1961

This table shows the regression coefficients of the triple differences-in-differences regression given by Equations (5.1) and (5.2). In each regression, 1961 is the year of treatment and is excluded. Standard errors are clustered by country and year. Included countries must have at least 20 observations from 1951–1983. All coefficients have been multiplied by 100, and t statistics are in parentheses.

	Continuous Specification		Discrete Specification		Net Effect	
	(1)	(2)	(3)	(4)	(5)	(6)
Autocracy	-0.766	5.725	5.827	-0.976		
	(-0.06)	(0.84)	(0.78)	(-0.19)		
Catholic	24.59	32.84	-10.31	-11.28*		
	(0.34)	(0.58)	(-1.38)	(-2.04)		
Autocracy × Catholic	7.037	-24.41	-5.323	-2.134		
	(0.14)	(-1.42)	(-0.48)	(-0.27)		
Post × Catholic	-9.071	-12.19	-2.013	-2.124		
	(-0.86)	(-1.37)	(-0.46)	(-0.60)		
Post × Autocracy	-5.276	-4.895	-1.737	-2.559		
	(-0.61)	(-0.55)	(-0.41)	(-0.48)		
Post × Catholic × Autocracy	26.87**	28.89**	15.88**	14.30*	13.41***	10.42**
	(2.36)	(2.69)	(2.46)	(2.01)	(3.06)	(2.24)
Year FE	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
Sample	1951–1975	1951–1983	1951–1975	1951–1983	1951–1975	1951–1983
N	905	1177	905	1177	905	1177

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The second alternative window estimates the triple difference-in-differences with the entire papacy of John XXIII, 1959–1963, as the years of treatment. Since more years are excluded using this window, I extend the start year of the sample to 1946. The Second Vatican Council was announced in 1959, meaning it is the first potential year of treatment. However, the the first announcements hinting at a doctrinal shift arrive after this in 1961 and the theological literature (Sigmund, 1987) date the full doctrinal shift to 1963, though it does not mean it could not have been anticipated. As such, the 1959–1963 shock window provides a plausible lower bound for the effect size. Table C.2 shows the results. The discrete treatment effect is between 10.5 and 13.6 percentage points and are still statistically significant. The net effects are slightly reduced from the baseline results, around 8.0 to 11.9 percentage points.

Table C.2: Triple Difference-in-Differences — Shock from 1959–1963

This table shows the regression coefficients of the triple differences-in-differences regression given by Equations (5.1) and (5.2). In each regression, 1959–1963 are the years of treatment and are excluded. Standard errors are clustered by country and year. Included countries must have at least 20 observations from 1946–1983. All coefficients have been multiplied by 100, and t statistics are in parentheses.

	Continuous Specification		Discrete Specification		Net Effect	
	(1)	(2)	(3)	(4)	(5)	(6)
Autocracy	23.90	17.11	8.221	2.416		
	(1.10)	(0.87)	(1.06)	(0.32)		
Catholic	-8.864	5.029	-10.62	-11.73**		
	(-0.13)	(0.09)	(-1.57)	(-2.55)		
Autocracy × Catholic	-16.26	-28.46	-7.335	-3.294		
	(-0.43)	(-1.07)	(-0.72)	(-0.35)		
Post × Catholic	-14.86*	-15.12*	-2.535	-1.839		
	(-1.90)	(-1.77)	(-0.80)	(-0.63)		
Post × Autocracy	-8.494	-6.796	-0.321	-1.568		
	(-0.85)	(-0.68)	(-0.07)	(-0.30)		
Post × Catholic × Autocracy	30.10***	26.97**	13.56***	10.54**	11.94***	8.036**
	(3.58)	(2.61)	(2.89)	(2.14)	(3.24)	(2.26)
Year FE	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
Sample	1946–1975	1946–1983	1946–1975	1946–1983	1946–1975	1946–1983
N	958	1230	958	1230	958	1230

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The third alternative window estimates the triple difference-in-differences with the entire Second Vatican Council, 1962–1965, as the years of treatment. This window is also conservative, as investors became aware of the doctrinal shift in favor of democracy at least two years earlier. However, if this information was picked up and incorporated slowly, the 1962–1965 window is appropriate. Table C.3 shows the results. The treatment effect is also roughly as large as in the baseline, 1963 treatment, specification with a continuous treatment effect of 8.6 to 9.3 percentage points for a country that is 50 percentage points more autocratic and has a 50 percentage point larger Catholic population. The discrete triple difference-in-differences treatment effect is marginally significant, between 17.4 and 20.7 percentage points, and net effects between 11.7 and 16.3 percentage points.

Table C.3: Triple Difference-in-Differences — Shock from 1962–1965

This table shows the regression coefficients of the triple differences-in-differences regression given by Equations (5.1) and (5.2). In each regression, 1962–1965 are the years of treatment and are excluded. Standard errors are clustered by country and year. Included countries must have at least 20 observations from 1951–1983. All coefficients have been multiplied by 100, and t statistics are in parentheses.

	Continuous Specification		Discrete Specification		Net Effect	
	(1)	(2)	(3)	(4)	(5)	(6)
Autocracy	-10.98	3.506	4.722	-0.634		
	(-0.83)	(0.36)	(0.66)	(-0.12)		
Catholic	0.222	5.615	-7.781	-10.31**		
	(0.00)	(0.08)	(-1.14)	(-2.24)		
Autocracy × Catholic	42.11	-11.54	6.268	5.113		
	(0.83)	(-0.61)	(0.50)	(0.56)		
Post × Catholic	-13.09	-17.18*	-3.817	-2.987		
	(-1.17)	(-1.94)	(-1.05)	(-1.23)		
Post × Autocracy	-9.471	-12.40	-3.565	-6.556		
	(-0.97)	(-1.08)	(-0.82)	(-1.05)		
Post × Catholic × Autocracy	34.31**	37.24***	20.74***	17.43**	16.28**	11.67**
	(2.76)	(3.13)	(3.08)	(2.46)	(2.80)	(2.14)
Year FE	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
Sample	1951–1975	1951–1983	1951–1975	1951–1983	1951–1975	1951–1983
N	821	1093	821	1093	821	1093

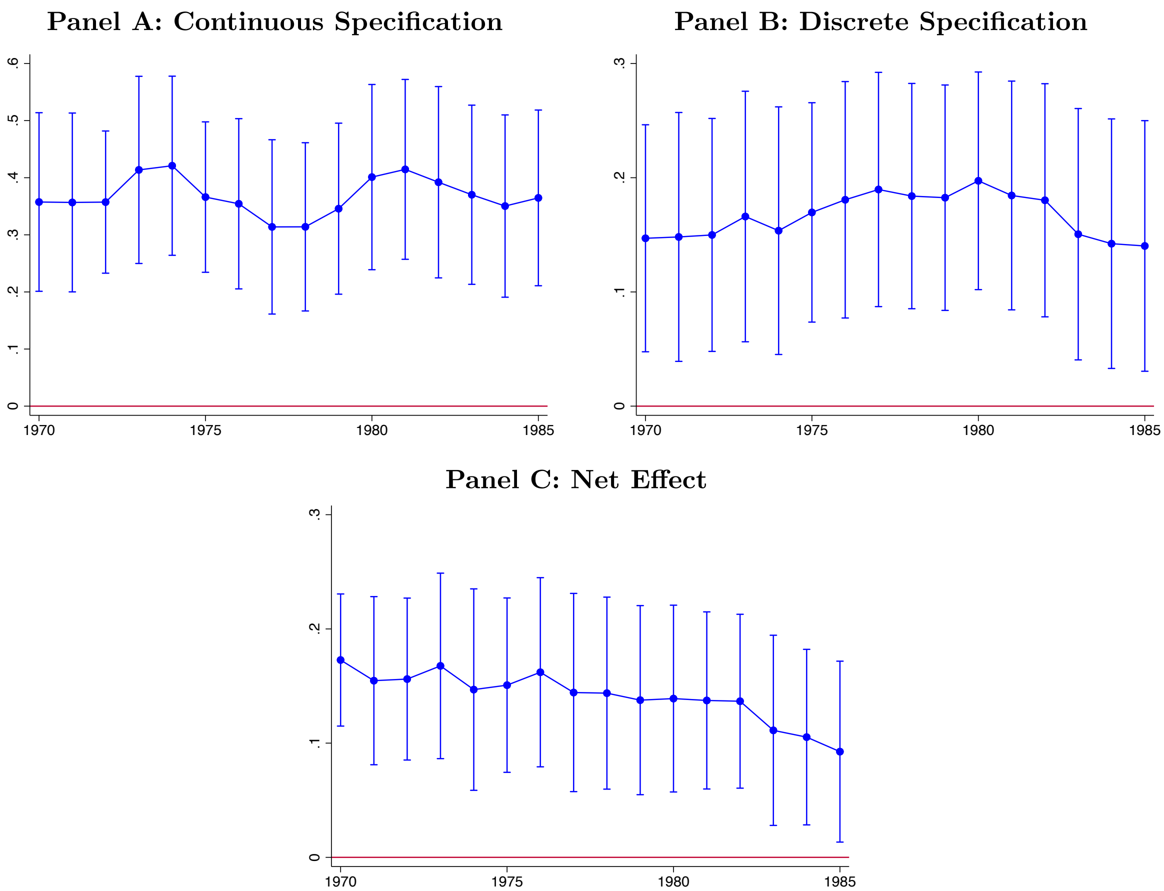
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

C.2 Estimation end date

The end year of the estimation window in Section 5 is chosen somewhat arbitrarily. To show that the results for the continuous triple difference-in-differences regression specification are robust to different choices, I provide the point estimate and 90% confidence interval for the treatment effect with the estimation window ending in each year from 1970–1985, shown in Figure C.1. In every year and in all specifications, 0 is not in the 90% confidence interval.

Figure C.1: Different estimation window end dates

This figure estimates the specification from Equations (5.1) using different estimation window end dates from 1970–1985. The β_6 coefficient point estimates and 90% confidence interval are provided.



C.3 Falsification Tests

The First Vatican Council It is possible that the results are driven by the change in the Catholic churches doctrine, and have nothing to do with an increases probability of democratization. Assess the validity of this challenge. I estimate the triple and single difference-in-differences specifications on another major change in Catholic church doctrine: the First Vatican Council of 1868–1870 (Vatican-I). Vatican-I is distinct from Vatican-II in that it reaffirmed the Catholic churches rejection of liberalism and democratic principles. As such, it serves as an excellent test of whether changes in religious doctrine, in general, lead to high risk premia. For the estimation window, I use all years from 1864–1870,as Vatican-I was announced in 1864. The start year for the estimation window is 1845 and the end year is 1890.

The results, reported in Table C.4, display a negative, statistically significant double and single difference-in-differences estimate. This is consistent with the theory underlying the shock: The Vatican-I likely reduced the probability of democratization, thereby reducing risk premia. However, this reaffirmation was not as surprising as the doctrinal shift in Vatican-II, and therefore has smaller point estimates, approximately a 6.5 to 7.3 percentage point reduction in risk premia.

Table C.4: Triple Difference-in-Differences — First Vatican Council

This table shows the regression coefficients of the triple differences-in-differences regression given by Equation (5.2) and the single differences-in-differences specification from Equation (5.3). The continuous specification is not able to be run due to data limitations. In each regression, 1869–1870 are the years of treatment and are excluded. Standard errors are clustered by country and year. Included countries must have at least 10 observations from 1850–1890. All coefficients have been multiplied by 100, and t statistics are in parentheses.

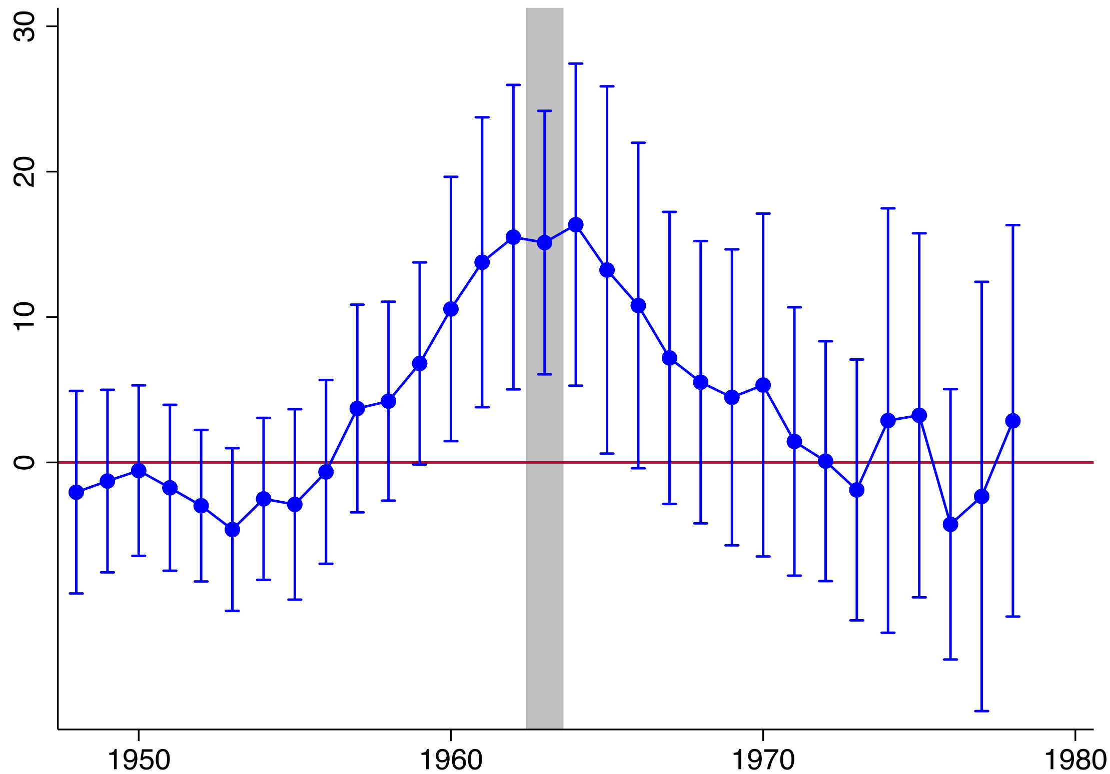
	Discrete Specification		Net Effect	
	(1)	(2)	(3)	(4)
Autocracy	-3.939	-2.981		
	(-1.04)	(-0.72)		
Autocracy × Catholic	2.270	3.059		
	(0.79)	(1.22)		
Post × Autocracy	1.243	0.485		
	(0.26)	(0.11)		
Post × Catholic × Autocracy	-7.071	-6.331*	-7.277**	-6.466**
	(-1.60)	(-1.72)	(-2.06)	(-2.14)
Year FE	✓	✓	✓	✓
Country FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	1855–1885	1850–1890	1855–1885	1850–1890
N	756	994	756	994

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Different estimation windows Another potential issue is that using essentially any treatment date or window would give identical results to what is reported in the main text. To dispel this notion, I run the specification from Equation (5.3) on a 24-year window around all potential treatment dates from 1948 to 1978. The results are reported in Figure C.2. The figure shows that the results would only hold in a 7-year window around 1963, and that they are strongest from 1962–1964. This provides solid evidence that 1963 is, indeed, the year of treatment.

Figure C.2: Falsification test — different treatment dates

This figure reports the point estimates and 95% confidence interval from estimating Equation (5.3) on a 24-year window around all potential treatment dates from 1948 to 1978. The regressions include country and year fixed effects and controls. The standard errors are clustered by country and year. The gray bar highlights 1963, the treatment year used in the main text.



C.4 Excluding countries and regions

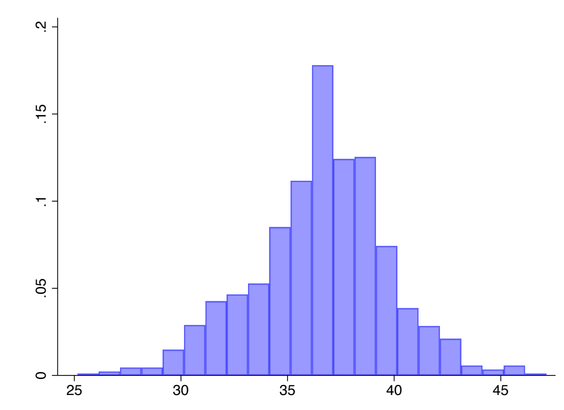
Dropping every pair To assure the results are not driven by any one or two countries, I estimate the continuous triple difference-in-differences regression excluding every possible combination of countries. This means that each regression is estimated on 39 countries from 1951–1975. Figure C.3 shows the results. No pairs of countries drive the results, which are strongly significant in nearly every specification. The lowest point estimate is just under 30 and the highest around 55, indicating a continuous treatment effect of between 7.5 to 13.5 percentage points for a country that is 50 percentage points more autocratic and has a 50 percentage point large Catholic population.

Figure C.3: Dropping every country pair — point estimates and t-statistics

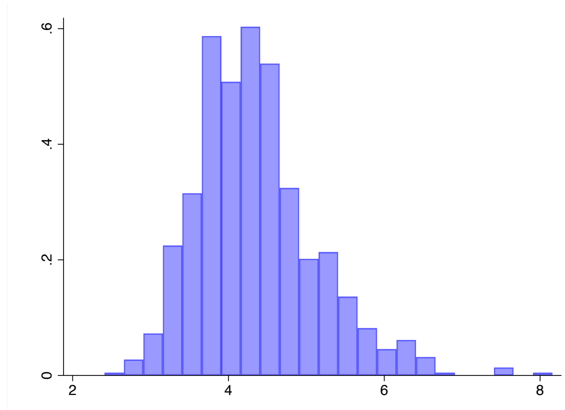
This figure estimates the specification from Equations (5.1) excluding each possible country pair. The β_6 coefficient point estimates are provided in Panel A, and their corresponding t-Statistics in Panel B. Panels C and D report the results from estimating the specification from Equation (5.2). Finally, Panels E and F report the results from estimating the specification from Equation (5.3).

Continuous Specification

Panel A: Point Estimates

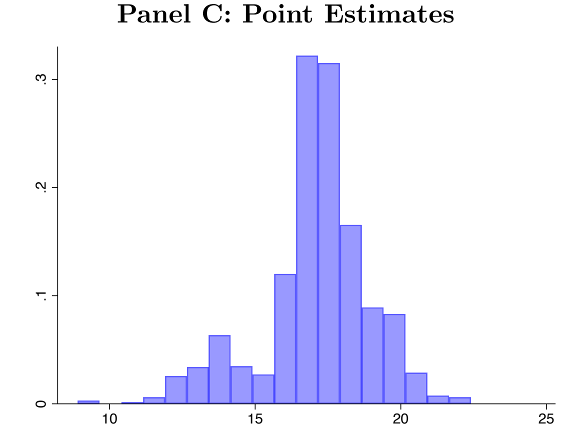


Panel B: t-Statistics

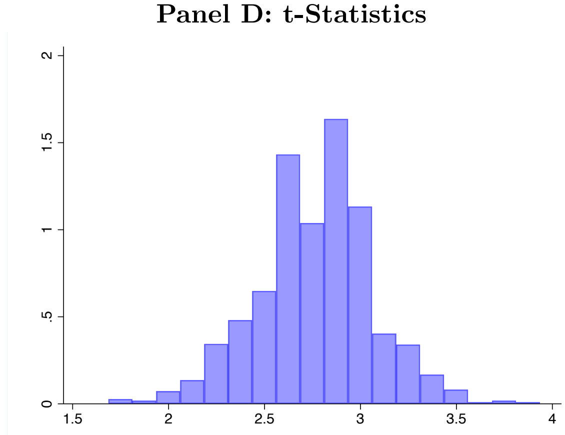


Discrete Specification

Panel C: Point Estimates

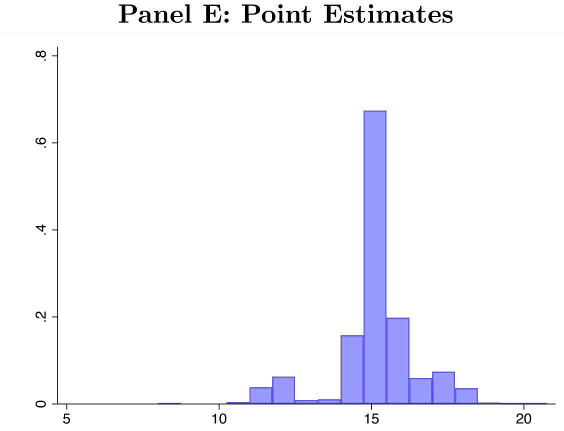


Panel D: t-Statistics

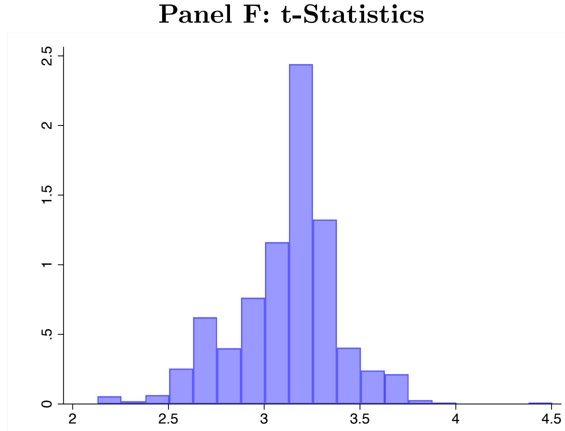


Net Effect

Panel E: Point Estimates



Panel F: t-Statistics



Dropping regions The results are not driven by particular regions. Table C.5 reports the results of the main specification excluding all South and Central American countries, which are consistent with the results reported in the main text. The results, however, should be interpreted with caution, as only 3 of the 10 majority Catholic autocracies in the sample are not in Latin America.

For completeness, I also include the result excluding the 3 non-Latin American countries, reported in Table C.6. The results are also consistent with what is reported in the main text.

Table C.5: Triple Difference-in-Differences — excluding Latin America

This table shows the regression coefficients of the triple differences-in-differences regression given by Equations (5.1) and (5.2) excluding all Latin American countries. In each regression, 1963 is the year of treatment and is excluded. Standard errors are heteroskedasticity robust and clustered by country. Included countries must have at least 20 observations from 1951–1983. All coefficients have been multiplied by 100, and t statistics are in parentheses.

	Continuous Specification		Discrete Specification		Net Effect	
	(1)	(2)	(3)	(4)	(5)	(6)
Autocracy	-15.98	5.786	-1.211	0.999		
	(-0.82)	(0.38)	(-0.26)	(0.28)		
Catholic	27.01	36.11	-5.202	-6.405		
	(0.26)	(0.63)	(-0.89)	(-1.47)		
Autocracy × Catholic	63.78***	-39.64*	0	-19.84**		
	(3.17)	(-1.83)	(0.00)	(-2.28)		
Post × Catholic	-7.447	-18.04*	-2.928	-3.241		
	(-0.75)	(-1.88)	(-1.00)	(-1.32)		
Post × Autocracy	-4.335	-9.764	-0.717	-2.856		
	(-0.55)	(-0.96)	(-0.18)	(-0.53)		
Post × Catholic × Autocracy	33.99*	41.93**	23.79**	20.55**	20.72**	12.15**
	(1.83)	(2.72)	(2.60)	(2.69)	(2.64)	(2.05)
Year FE	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
Sample	1951–1975	1951–1983	1951–1975	1951–1983	1951–1975	1951–1983
N	763	992	763	992	763	992

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table C.6: Triple Difference-in-Differences — only Latin America

This table shows the regression coefficients of the triple differences-in-differences regression given by Equations (5.1) and (5.2) excluding the non-Latin American majority Catholic autocracies (i.e. the Philippines, Portugal, and Spain). In each regression, 1963 is the year of treatment and is excluded. Standard errors are heteroskedasticity robust and clustered by country. Included countries must have at least 20 observations from 1951–1983. All coefficients have been multiplied by 100, and t statistics are in parentheses.

	Continuous Specification		Discrete Specification		Net Effect	
	(1)	(2)	(3)	(4)	(5)	(6)
Autocracy	-3.799	5.513	5.837	-0.574		
	(-0.29)	(0.52)	(0.77)	(-0.10)		
Catholic	-29.46	-17.13	-16.13**	-16.96***		
	(-0.50)	(-0.32)	(-2.38)	(-3.45)		
Autocracy × Catholic	-10.95	-14.23	-0.479	12.01		
	(-0.22)	(-0.28)	(-0.05)	(1.15)		
Post × Catholic	-20.05**	-18.85*	-1.472	-1.340		
	(-2.44)	(-1.92)	(-0.40)	(-0.51)		
Post × Autocracy	-7.397	-9.592	-1.791	-4.742		
	(-0.98)	(-1.00)	(-0.49)	(-0.92)		
Post × Catholic × Autocracy	39.65**	37.33**	13.92*	12.95	12.24*	10.51
	(2.50)	(2.15)	(1.91)	(1.69)	(1.77)	(1.56)
Year FE	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
Sample	1951–1975	1951–1983	1951–1975	1951–1983	1951–1975	1951–1983
N	872	1120	872	1120	872	1120

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

C.5 Extreme values driving the results

Another possibility is that extreme observations in returns are driving the results. To show this is not the case, I winsorize the excess returns data at the 5% and 10% levels. This means that excess returns are truncated at the 5th and 95th percentiles and the 10th and 90th percentiles. The results are shown in Tables C.7 and C.8. The results are still highly statistically significant, though the point estimates are slightly lower. When winsorized at the 10% level, the treatment effects is between 7.4 and 8.7 percentage points, indicating that about 40% of the treatment effect reported in the main text is coming from large realized excess return observations.

Another test to see if extreme values are driving the results is to run quantile regressions at the median, which provide the conditional median average excess returns for countries treated by the doctrinal shift. This is shown in Table C.9. The triple interaction term is directionally similar under this specification, but no longer significant. The single difference-in-differences estimator remains significant at the 10% level, but is reduced. While outliers are partially driving the results, there is still an economically significant effect at the median.

Table C.7: Triple difference-in-differences — winsorized at 5%

This table shows the regression coefficients of the triple differences-in-differences regression given by Equations (5.1) and (5.2) and the single difference-in-differences specification in Equation (5.3) with excess returns winsorized at the 5% level, meaning that excess returns are truncated at the 5th and 95th percentiles. In each regression, 1963 is the year of treatment and is excluded. Standard errors are heteroskedasticity robust and clustered by country and year. Included countries must have at least 20 observations from 1951–1983. All coefficients have been multiplied by 100, and t statistics are in parentheses.The controls used are a series of "event controls" meaning indicator variables for whether there is a war, financial crisis, recession, sovereign default, a head of government death, and ICB political crisis. In addition to the event controls, I also employ a series of additional controls: log GDP growth, GDP per capita, inflation, the level of political violence, the level of anti-system regime activity, the level of democratic mobilization,and estimated β's multiplied by factor returns from a two factor risk model shown in Equation (5.4).

	Continuous Specification		Discrete Specification		Net Effect	
	(1)	(2)	(3)	(4)	(5)	(6)
Autocracy	-5.426	2.661	4.004	0.280		
	(-0.58)	(0.43)	(0.63)	(0.07)		
Catholic	0.620	-6.168	-8.464	-11.08**		
	(0.01)	(-0.14)	(-1.36)	(-2.62)		
Autocracy × Catholic	-19.99	-15.10	-4.848	2.820		
	(-0.59)	(-1.28)	(-0.53)	(0.40)		
Post × Catholic	-15.54**	-15.08**	-0.573	-0.480		
	(-2.13)	(-2.32)	(-0.13)	(-0.14)		
Post × Autocracy	-4.430	-5.261	-0.0816	-1.558		
	(-0.73)	(-0.78)	(-0.03)	(-0.40)		
Post × Catholic × Autocracy	32.78***	30.09***	11.11**	9.825**	10.60***	9.006**
	(4.22)	(3.65)	(2.29)	(2.13)	(3.07)	(2.72)
Year FE	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
Sample	1951–1975	1951–1983	1951–1975	1951–1983	1951–1975	1951–1983
N	944	1220	944	1220	944	1220

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table C.8: Triple difference-in-differences — winsorized at 10%

This table shows the regression coefficients of the triple differences-in-differences regression given by Equations (5.1) and (5.2) and the single difference-in-differences specification in Equation (5.3) with excess returns winsorized at the 10% level, meaning that excess returns are truncated at the 10th and 90th percentiles. In each regression, 1963 is the year of treatment and is excluded. Standard errors are heteroskedasticity robust and clustered by country and year. Included countries must have at least 20 observations from 1951–1983. All coefficients have been multiplied by 100, and t statistics are in parentheses.The controls used are a series of "event controls" meaning indicator variables for whether there is a war, financial crisis, recession, sovereign default, a head of government death, and ICB political crisis. In addition to the event controls, I also employ a series of additional controls: log GDP growth, GDP per capita, inflation, the level of political violence, the level of anti-system regime activity, the level of democratic mobilization,and estimated β's multiplied by factor returns from a two factor risk model shown in Equation (5.4).

	Continuous Specification		Discrete Specification		Net Effect	
	(1)	(2)	(3)	(4)	(5)	(6)
Autocracy	-11.61	-3.057	2.070	-0.464		
	(-1.30)	(-0.63)	(0.36)	(-0.12)		
Catholic	-0.271	-6.139	-6.443	-9.380**		
	(-0.00)	(-0.17)	(-1.23)	(-2.57)		
Autocracy × Catholic	-15.04	-8.119	-4.676	1.893		
	(-0.57)	(-0.72)	(-0.59)	(0.34)		
Post × Catholic	-13.33*	-13.07*	-1.175	-1.361		
	(-1.86)	(-2.00)	(-0.32)	(-0.47)		
Post × Autocracy	-1.218	-1.542	1.345	0.332		
	(-0.26)	(-0.29)	(0.51)	(0.11)		
Post × Catholic × Autocracy	26.84***	24.22***	9.035**	7.982**	8.697**	7.371**
	(3.59)	(3.05)	(2.29)	(2.09)	(2.63)	(2.37)
Year FE	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓	✓
Sample	1951–1975	1951–1983	1951–1975	1951–1983	1951–1975	1951–1983
N	944	1220	944	1220	944	1220

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table C.9: Triple difference-in-differences — median regressions

This table shows the regression coefficients of a median quantile regression for the triple differences-in-differences regression given by Equations (5.1) and (5.2) and the single difference-in-differences specification in Equation (5.3). In each regression, 1963 is the year of treatment and is excluded. Standard errors are heteroskedasticity robust. Included countries must have at least 20 observations from 1951–1983. All coefficients have been multiplied by 100, and t statistics are in parentheses.The controls used are a series of "event controls" meaning indicator variables for whether there is a war, financial crisis, recession, sovereign default, a head of government death, and ICB political crisis. In addition to the event controls, I also employ a series of additional controls: log GDP growth, GDP per capita, inflation, the level of political violence, the level of anti-system regime activity, the level of democratic mobilization,and estimated β's multiplied by factor returns from a two factor risk model shown in Equation (5.4).

	Continuous Specification		Discrete Specification		Net Effect	
	(1)	(2)	(3)	(4)	(5)	(6)
Autocracy	9.232	6.492	3.379	0.338		
	(1.30)	(1.05)	(0.86)	(0.10)		
Catholic	4.799	6.785	1.410	0.878		
	(0.87)	(1.29)	(0.51)	(0.35)		
Autocracy × Catholic	-14.92*	-17.66**	-7.308*	-6.119		
	(-1.73)	(-2.05)	(-1.67)	(-1.56)		
Post × Catholic	-4.324	-9.373	0.218	-0.298		
	(-0.68)	(-1.62)	(0.06)	(-0.10)		
Post × Autocracy	-0.327	0.603	1.708	1.402		
	(-0.07)	(0.17)	(0.39)	(0.43)		
Post × Catholic × Autocracy	17.31	22.97**	7.928	8.631	6.067*	4.998*
	(1.60)	(2.26)	(1.11)	(1.52)	(1.82)	(1.68)
Year FE	✗	✗	✗	✗	✗	✗
Country FE	✗	✗	✗	✗	✗	✗
Controls	✓	✓	✓	✓	✓	✓
Sample	1951–1975	1951–1975	1951–1975	1951–1975	1951–1975	1951–1975
N	944	1216	944	1216	944	1216

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

D Appendix Tables and Figures

Table D.10: Global Financial Data Availability

	Dividend Yields		Cum-Dividend Returns		Ex-Dividend Returns	
	Main	**LSE**	**Main**	**LSE**	**Main**	**LSE**
Argentina	1866–2017	1865–1980	1967–2017	1866–1989	1948–2017	1866–1989
Australia	1834–1899; 1902–2017	1836–1844; 1849–1899; 1902–1989	1826–1899; 1902–2017	1826–1899; 1902–1989	1826–1899; 1902–2017	1826–1899; 1902–1989
Austria	1925–1938; 1969–2017	N/A	1970–2017	1857–1861; 1864; 1866–1870; 1873–1914; 1929–1932	1925–1938; 1969–2017	1857–1861; 1864; 1866–1870; 1873–1914; 1929–1932
Belgium	1838; 1848; 1870; 1885; 1892–1894; 1901–2017	N/A	1901–2017	1848; 1870; 1885; 1892–1894; 1908–1914; 1966–1989	1885; 1892–1894; 1901–1913; 1919–2017	1848; 1870; 1885; 1892–1894; 1908–1914; 1966–1989
Bolivia	N/A	N/A	N/A	1828–1836; 1882–1887; 1903–1982; 1985	N/A	1828–1836; 1882–1887; 1903–1982; 1985
Brazil	1829–1960; 1962–2017	1826–1839; 1849–1984	1955–2017	1826–1984	1826–2017	1826–1984
Bulgaria	1999–2008; 2015–2017	N/A	N/A	N/A	2001–2008; 2015–2017	N/A
Canada	1837; 1843–2017	1837; 1843–1845; 1848–1955; 1957; 1960	1837; 1843–2017	1837; 1843–1985	1837; 1843–2017	1837; 1843–1985

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	Dividend Yields		Cum-Dividend Returns		Ex-Dividend Returns	
	Main	LSE	Main	LSE	Main	LSE
Chile	1879–1883; 1890–1891; 1899; 1901–1966; 1983–2017	1865–1866; 1879–1883; 1890–1891; 1899; 1901–1969	1976–2017	1865–1866; 1879–1883; 1890–1891; 1899; 1901–1969	1899; 1901–1969; 1976–2017	1865–1866; 1879–1883; 1890–1891; 1899; 1901–1969
China	1908–1930; 1995–2017	N/A	1995–2017	1883–1886; 1897–1930	1995–2017	1883–1886; 1897–1930
Colombia	1985–2017	N/A	1988–2017	1826–1836; 1852–1962	1928–1962; 1985–2017	1826–1836; 1852–1913; 1916–1962
Costa Rica	N/A	N/A	N/A	1887–1932	N/A	1887–1932
Cuba	N/A	N/A	N/A	1839–1867; 1871–1961	N/A	1839–1867; 1871–1961
Czech Republic	1926–1938; 1995–2017	N/A	1995–2017	N/A	1926–1938; 1995–2017	N/A
Vietnam	2006–2008; 2015–2017	N/A	N/A	N/A	2006–2008; 2015–2017	N/A
Denmark	1874–1937; 1969–2017	1874–1937	1874–2017	1854–1864; 1870–1937; 1966–1969; 1978–1984	1874–2017	1874–1937
Ecuador	1996–2008	N/A	N/A	1925–1952; 1958–1975	1996–2008	1925–1952; 1958–1975
Egypt	1857–1865; 1868–1882; 1907; 1914–1969; 1996–2008; 2015–2017	N/A	1995–2006	1857–1865; 1868–1882; 1907; 1914–1969	1857–1865; 1868–1882; 1907; 1914–1969; 1995–2008; 2015–2017	1857–1865; 1868–1882; 1907; 1914–1969
El Salvador	N/A	N/A	N/A	1909–1930; 1979–1986	N/A	1909–1930; 1979–1986

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	Dividend Yields		Cum-Dividend Returns		Ex-Dividend Returns	
	Main	LSE	Main	LSE	Main	LSE
Finland	1962–2017	N/A	1913–2017	N/A	1913–2017	N/A
France	1817–1914; 1919–2017	N/A	1817–2017	1817–1941; 1962–1996	1817–2017	1817–1940; 1962–1996
Germany	1841–1944; 1951–2017	N/A	1836–2017	1836–1843; 1854–1921; 1929–1989	1836–1914; 1919–2017	1836–1843; 1854–1921; 1929–1989
Ghana	1996–2008; 2016–2017	N/A	N/A	1903–1976; 1985	2016–2017	1903–1976; 1985
Greece	1977–2017	N/A	1977–2017	1840–1843; 1865–1930	1977–2017	1840–1843; 1865–1930
Guatemala	N/A	N/A	N/A	1924–1963	N/A	1924–1963
Hong Kong	1901–2017	N/A	1970–2017	1901–1985	1965–2017	1901–1985
Hungary	1873–1898; 1993–2017	N/A	1992–2017	N/A	1992–2017	N/A
India	1817–2017	1817–1985	1988–2017	1817–1985	1921–2017	1817–1985
Indonesia	1990–2017	1906–1981	1988–2017	1892–1981	N/A	1892–1981
Iran	N/A	N/A	1999–2008	N/A	1999–2008	N/A
Ireland	1990–2017	1836; 1928–1930; 1959–1985	1935–2017	1836; 1920–1930; 1960–1985	1935–2017	1836; 1920–1930; 1960–1985
Italy	1925–1944; 1946–2017	N/A	1925–2017	N/A	1925–2017	1925–1940; 1958–1985
Ivory Coast	1996–2008	N/A	N/A	N/A	1996–2008	N/A
Jamaica	1983–2008; 2016–2017	N/A	N/A	1922–1924; 1966–1969	1983–2008; 2016–2017	1922–1924; 1966–1969

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	Dividend Yields		Cum-Dividend Returns		Ex-Dividend Returns	
	Main	LSE	Main	LSE	Main	LSE
Japan	1886–1945; 1949–2017	1907–1914; 1965–1985; 1988; 1997–2003	1886–2017	1908–1930; 1963–1989; 1994–2003	1886–2017	1908–1930; 1963–1989; 1994–2003
Kenya	1983–2008; 2016–2017	N/A	N/A	1908–1924; 1928–1930; 1950–1970	1965–1970; 1983–2008; 2016–2017	1908–1924; 1928–1930; 1950–1970
Malawi	N/A	N/A	N/A	1966–1974	N/A	N/A
Malaysia	1972–2017	N/A	1973–2017	1901–1985	1974–2017	1901–1985
Mauritius	1996–2008; 2015–2017	N/A	1990–2017	1901–1915	1990–2017	1901–1915
Mexico	1832–1849; 1851–1860; 1862–1866; 1868–1914; 1916–1944; 1946–1948; 1950–1961; 1963	1824–1845; 1848–1989	1983–2017	1825–1989	1931–2017	1825–1989
Mozambique	N/A	N/A	N/A	1901–1932; 1966–1973	N/A	1901–1932; 1966–1973
Netherlands	1891–2017	N/A	1951–2017	1846–2014	1891–1944; 1947–2017	1846–2014
New Zealand	1863–2017	1862–1980	1987–2017	1863–1980	1927–2017	1863–1980
Nicaragua	N/A	N/A	N/A	1864–1874	N/A	1864–1874
Nigeria	1985–2017	1915–1976	1988–2017	1915–1976	1985–2017	1915–1976
Norway	1969–2017	N/A	1970–2001	N/A	1969–2017	N/A

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	Dividend Yields		Cum-Dividend Returns		Ex-Dividend Returns	
	Main	LSE	Main	LSE	Main	LSE
Paraguay	N/A	N/A	N/A	1890–1893; 1908–1914; 1921–1922; 1930–1965	N/A	1890–1893; 1908–1914; 1921–1922; 1930–1965
Peru	1993–2017	N/A	1993–2017	1826; 1868–1907; 1910–1975	1927–1975; 1993–2017	1826; 1868–1907; 1910–1975
Philippines	1982–2017	N/A	1982–2017	1911–1994	1953–2017	1911–1994
Portugal	1986–2017	N/A	1989–2017	1856–1879; 1883–1930; 1961–1981	1961–1974; 1978–1981; 1986–2017	1856–1879; 1883–1930; 1961–1981
Romania	1998–2014; 2016–2017	N/A	N/A	1871–1940	1998–2014; 2016–2017	1871–1940
Russia	1871–1915; 1996–2017	1865–1888; 1907–1932	1995–2017	1916–1932	1866–1930; 1995–2017	1866–1914
Sierra Leone	N/A	N/A	N/A	1926–1930	N/A	1926–1930
Singapore	1972–2017	N/A	1970–2017	1952–1957; 1962–1977	1966–2017	1952–1957; 1962–1977
South Africa	1877; 1890; 1911–2017	1877; 1890; 1911–1989	1961–2017	1877; 1890; 1911–1989	1877; 1890; 1911–2017	1877; 1890; 1911–1989
South Korea	1963–2017	N/A	1963–2017	1926–1930	1963–2017	1926–1930
Spain	1875–1930; 1940–2017	N/A	1941–2017	1846–1848; 1854–1931; 1951–1961; 1985–1989	1846–1848; 1854–1931; 1941–2017	1846–1848; 1854–1931; 1951–1961; 1985–1989
Sri Lanka	1901–1984; 1991–2017	1909–1984	1993–2017	1901–1984	1953–1974; 1991–2017	1901–1984

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	Dividend Yields		Cum-Dividend Returns		Ex-Dividend Returns	
	Main	**LSE**	**Main**	**LSE**	**Main**	**LSE**
Sweden	1871–2017	N/A	1871–2017	1854–1916; 1925–1940; 1952–1989	1871–2017	1854–1916; 1925–1940; 1952–1989
Switzerland	1918–1939; 1966–2017	N/A	1967–2017	1873–1876; 1879–1930	1900–1914; 1917–1939; 1966–2017	1873–1876; 1879–1930
Taiwan	1985–2017	N/A	1988–2017	N/A	1985–2017	N/A
Thailand	1975–2017	N/A	1976–2017	1920–1970	1976–2017	1920–1970
Trinidad and Tobago	1983–1988; 1996–2008; 2016–2017	N/A	N/A	1913–1985	1983–1988; 1996–2008; 2016–2017	1913–1985
Tunisia	1997–2008; 2015–2017	N/A	N/A	N/A	1997–2008; 2015–2017	N/A
Turkey	1986–2017	N/A	1987–2017	1857–1930	1987–2017	1857–1930
United Kingdom	1816–2017	N/A	1817–2017	N/A	1934–2017	1817–2017
U.S.A.	1871–2017	1821–1832; 1837–1838; 1852–1857; 1865–1940; 1948–1985	1872–2017	1822–1833; 1837–1839; 1853–1857; 1864–1940; 1949–1985	1872–2017	1821–1833; 1837–1839; 1852–1857; 1864–2017
Uruguay	N/A	N/A	N/A	1874–1940; 1966–1971	1926–1940; 1966–1971	1874–1940; 1966–1971
Venezuela	1985–2014	N/A	1988–2017	1853–1859; 1875–1882; 1885–1959; 1963–1971	1930–1959; 1963–1971; 1985–2017	1853–1859; 1875–1882; 1885–1959; 1963–1971
Zimbabwe	1975–2008	1904–1978; 1980–1985	N/A	1903–1978; 1981–1985	1976–2008	1903–1978; 1981–1985