Democracy in Decline: The Economic Implications of Democratic Collapse*

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Abstract

Previous research has established a link between democratic governance and sustainable economic growth. Yet, over the past decade, we have witnessed a global decline of democratic institutions across a wide range of political contexts. How has this erosion of democracy affected countries' economic trajectories over the 1999-2023 period? This paper investigates the economic consequences of democratic breakdowns, focusing on whether — and how — losing democracy comes with an economic cost. Using a heterogeneous difference-in-differences estimator and drawing on the hierarchical structure of the Varieties of Democracy dataset, we examine both high-level democracy definitions and their institutional building blocks.

Our analysis proceeds in three steps. First, we estimate the average treatment effect of regime collapse and find robust evidence of an *autocratic loss*: on average, countries that transition from democracy to autocracy experience a decline in income per capita of around 1.5%, with losses reaching 4-6% two decades after collapse. This effect is driven more strongly by the breakdown of electoral democracy than liberal democracy. Second, we disaggregate democracy into its low-level institutional components to identify the source of this loss. We find that the negative economic effects are primarily driven by the erosion of free and fair elections—while other components, such as freedom of expression or judicial constraints on the executive, play a much smaller role. Third, we explore transmission channels that explain how democratic collapse translates into economic decline. We find suggestive evidence that cuts to investment in social support and public goods — such as education — are among the key mechanisms through which autocratic loss materializes, with some effects emerging more immediately and others likely to deepen over time.

Our findings underscore the long-term risks posed by democratic erosion and highlight the central role of electoral integrity in safeguarding economic development.

Keywords: Democracy, Democratic Breakdown, Difference-in-Differences, Heterogeneous Treatment, Interactive Fixed Effects

JEL Classification: O10, P16

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1 Introduction

"Congratulations America! The Polity Project has downgraded its score for the USA from +8. . . to 0."
Monty G. Marshall, Center for Systemic Peace, February 12, 2025 (posted on LinkedIn)

The world is currently experiencing a wave of autocratization (Lührmann & Lindberg 2019), primarily driven by gradual democratic erosion, executive aggrandizement, and the strategic manipulation of electoral competition (Bermeo 2016). Between 1999 and 2023, there were 54 democratic regime collapses (see Figure 2), marking a significant shift in global democratic trends (Boese, Edgell, Hellmeier, Maerz & Lindberg 2021). At the same time, extensive research has established the positive economic effects of *democratic* regime change (Acemoglu et al. 2019, Eberhardt 2022, Knutsen 2021, Boese-Schlosser & Eberhardt 2023, 2024).

This raises critical questions: given the growing number of democracies affected by autocratisation, what are the economic consequences of democratic breakdown[1] and how has the erosion of key democratic institutions, particularly those related to electoral and liberal aspects, impacted countries over the 1999-2023 period? This paper investigates the economic consequences of these processes, asking whether — and how — losing democracy comes with an economic cost. We refer to this effect as the *autocratic loss*. To answer this question, we proceed in three analytical steps:

First, we ask whether democratic breakdown lead to economic decline. Using a heterogeneous difference-in-differences estimator, we estimate the average treatment effect of democratic collapse on income per capita across a range of high- and mid-level democracy indicators. We find robust evidence of an autocratic loss: countries that transition from democracy to autocracy experience a measurable drop in income per capita — on average around 2%, with effects reaching 4–6% after two decades. The effect is notably stronger for collapse of electoral democracy than for the breakdown of liberal democracy.

Second, we examine which specific democratic institutions are responsible for this autocratic loss. By disaggregating high-level democracy indices into their underlying institutional components, we identify the erosion of free and fair elections as the key driver of the autocratic loss: undermining the ability of the people to remove an incumbent government through free and fair elections has substantial negative economic effects. In contrast, other institutional building blocks — such as constraints on the executive, rule of law, or freedom of expression — do not appear to significantly impact economic performance following democratic collapse.

Third, we explore the mechanisms through which democratic breakdown leads to economic decline. Drawing on existing literature, we assess a number of transmission channels, including growth uncertainty, changes in public expenditure, and implications for innovation and productivity. Our empirical evidence suggests that reductions in public spending — particularly on education and

[1] Throughout the paper, we use the terms democratic collapse and breakdown interchangeably to describe cases in which a country's institutions no longer meet the minimal criteria for democracy and the country is subsequently classified as an autocracy. Likewise, we use the terms democratic backsliding, erosion, decline, and regression interchangeably to refer to the process of deterioration of democratic institutions within countries that remain classified as democracies.

social services — play an important role in explaining how and why the autocratic loss manifests, with some effects likely to grow stronger over time.

To address these questions, we employ the principal component difference-in-differences (PC-DID) estimator developed by Chan & Kwok (2022), which allows for causal identification even in the presence of endogenous treatment and differential pre-treatment trends. The PCDID estimates country-specific regressions for each treated unit — countries that experienced democratic breakdown during the sample period — accounting for unobserved heterogeneity by using information from the control sample and hereby avoiding the pitfalls of conventional pooled estimators. Our analysis draws on the hierarchical structure of the Varieties of Democracy (V-Dem) dataset, which enables us to decompose democracy into its institutional components and trace the economic effects of democratic collapse from high-level regime measures to low-level building blocks. The sample includes 169 countries and covers a time period from 1999 to 2023.

The core contribution of this paper is to provide, to our knowledge, the first systematic and causal analysis of the economic consequences of democratic breakdown. While a large body of literature has documented the positive long-run economic effects of democratization — the *democratic dividend* — we reverse this perspective and demonstrate the existence of an *autocratic loss*: a measurable economic decline following transitions from democracy to autocracy. This contribution is particularly timely given the ongoing global wave of autocratization. Our findings underscore that democratic erosion is not only normatively troubling but also entails tangible economic costs that may deepen as the autocratic trend continues.

The remainder of this paper proceeds as follows. Section 2 reviews the existing literature on the relationship between democracy and economic growth, with a particular focus on the economic consequences of autocratization. Section 3 clarifies key concepts and outlines our theoretical framework, distinguishing between democratic backsliding, breakdown, and autocratization. Section 4 describes the data sources, operational definitions, and provide a first descriptive overview of democratic breakdown trends in our sample. We discuss our empirical strategy, including the heterogeneous difference-in-differences methodology in section 5. Section 6 presents our main empirical findings. Robustness Checks are presented in section 7. Section 8 adds perspective and relates our 'autocratic loss' results to the democratic dividend established in the democracy and growth literature. Section 9 concludes by discussing the broader implications of our findings and identifying directions for future research.

2 Existing Literature

While extensive research has examined the economic benefits of democratization (Acemoglu et al. 2019, Madsen et al. 2015, Eberhardt 2022, Boese-Schlosser & Eberhardt 2024), relatively little attention has been devoted to the opposite process—autocratization/democratic decline/erosion—and its consequences for economic performance. As Facchini (2024, pp.257) put it in his review of a volume on recent political history of Israel, another 'democracy in retreat': "While the literature on modernization has argued that economic growth can affect democratization and vice-versa, I am not aware of studies showing that the transition from a democratic government to an autocracy can

improve a country's economic performance." The economic mechanisms of autocratization potentially differ fundamentally from those of democratization (Higashijima 2024): autocratization does not simply reverse the mechanisms through which democracy fosters growth.

Several potential channels have been proposed to explain how autocratization could affect economic growth other than reversing the growth effects from democratization: One key mechanism is the role of public deliberation in fostering economic stability. Chandra & Rudra (2015) argue that higher levels of public deliberation within political systems, including autocratic regimes, reduce the likelihood of extreme policy swings and economic volatility. The structured negotiation process and implicit caution among policymakers prevent the implementation of untested and economically destabilizing policies, thereby contributing to more stable long-term growth outcomes.

Another critical mechanism is the underprovision of public goods. Son & Bellinger (2022) highlight that autocratization creates a governance structure that undermines both horizontal and vertical accountability, reducing incentives for political leaders to provide essential public services. Unlike democratic governments, which are subject to electoral pressures, autocratic rulers face fewer constraints and often prioritize regime security over public welfare. This results in systematic underinvestment in key areas such as public health, infrastructure, and education, leading to long-term economic inefficiencies.

Political instability is another major consequence of autocratization that negatively affects economic performance (Aisen & Veiga 2013). The primary channel through which this occurs is the adverse effect on total factor productivity growth,[2] as uncertain political environments discourage investment and innovation. Recent work by Benavente et al. (2024), for instance, suggests that expropriation risk (a popular proxy for 'economic institutions' but only quite imperfectly related to democratic collapse) reduces innovation effort (R&D investment) and output (patents).

Autocratization, on the other hand could also potentially have positive economic effects: One theoretical perspective suggests that democratic accountability leads governments to prioritize the interests of consumption-oriented masses over investment-oriented elites (see Baum & Lake 2003, 334f). In contrast, autocratic regimes may favor elite economic interests, potentially resulting in growth-enhancing policies under certain conditions (Higashijima 2024).

Taken together, these mechanisms illustrate that the economic effects of autocratization are not automatically the inverse of democratization but involve distinct institutional and policy-driven pathways.

3 Clarifying Concepts: Breakdown, Backsliding, and Autocratization

This section clarifies the conceptual distinctions between democratic backsliding, democratic breakdown, and autocratization, which are central to the empirical strategy of the paper. We highlight why democratic breakdown — understood as a regime change from democracy to autocracy — should not be treated as a simple reversal of democratization. Instead, we emphasize the institutional and

[2] Firm-level analysis using gradual local shift to *democratic* local elections (Abeberese et al. 2023) shows that business environment and increased reforms foster productivity growth when districts turn democratic.

conceptual heterogeneity that characterizes autocratic regimes, and the challenges this poses for measurement and causal inference. These distinctions motivate our focus on the dismantling of specific democratic institutions rather than relying solely on regime-type classifications.

This study examines the economic effects of the breakdown of democratic institutions. We use the terms democratic backsliding, erosion, and decline synonymously to refer to the deterioration of democratic institutions within democracies. These processes often span long periods of time and may (or may not) culminate in democratic breakdown (see Boese, Edgell, Hellmeier, Maerz & Lindberg 2021). Autocratization is a broader concept that encompasses both: these processes as well as the regression of political rights and freedoms within already autocratic regimes.

The distinction between democratic breakdown (an event), democratic backsliding (a process happening in democracies), and autocratization (a process happening in any regime) carries important implications for the analysis of economic effects because of the heterogeneity of autocratic regimes, as well as the dimensionality and negative definition issues.

Heterogeneity among autocracies All democracies share an adherence to democratic principles, such as the separation of powers and free and fair elections. While all democratic countries are alike in procedural institutional terms and there is an implicit power-sharing agreement, this is not the case for autocracies. Autocracies are fundamentally different in this regard, and how power is consolidated in the hands of the few varies significantly across autocratic regimes. This situation is captured by Leo Tolstoy's analogy of families: "All happy families are alike; each unhappy family is unhappy in its own way." (Tolstoy 2004, p.1).

Operationally, this has crucial implications for studying the economic effects of democractization versus those of autocratization: when measuring transitions to democracy and their effects on growth, the comparison involves political systems that become increasingly homogeneous and institutionally comparable. Even when focusing only on democracy, some studies argue for a multidimensional approach, contending that a single number (the default uni-dimensional approach) is not sufficient to capture differences between democratic countries (Boese et al. 2022). Democracies with similar values on a democracy index can still exhibit quite different manifestations of democracy.

Dimensionality and Negative Definition However, measuring the effect of autocratization on growth is even more complex. Empirically, the institutional setup of countries undergoing autocratization becomes increasingly heterogeneous and less comparable. This lack of comparability arises for two reasons: First, the dimensionality issue: Relying on a unidimensional democracy measure obscures institutional variation. Similar to the situation with democracies described above, two autocracies with the same low value on a democracy index can exhibit fundamentally different 'manifestations of autocracy'. Second, the issue of a negative definition of autocracy: We define autocracy in negative terms, i.e., as the absence of democracy. While this approach is intentional and allows for better comparison with democratizing cases, it inherently obscures institutional dimensions unique to autocracies, further concealing the heterogeneity between autocratic countries (for a broader discussion of this issue see Gerschewski 2023, pp.28).

This paper addresses the conceptual and operational challenges of studying democratic erosion and breakdown as follows: To mitigate issues arising from heterogeneity among autocracies, the

analysis relies on country-by-country regressions. Additionally, to address the heterogeneity among autocracies as well as the negative definition issue, the focus is placed on the economic consequences of dismantling specific democratic institutions. The dimensionality problem is addressed by disaggregating the high-level concept of '*democracy*' into its components and analyzing the economic effects of their demise. The economic consequences of the creation and consolidation of specific autocratic structures remain an important avenue for future research.

4 Data and Descriptives

4.1 Data, Transformations, and Samples

Data Sources We use two data sources: first, all our measures for democratic/institutional collapse are constructed using data from the Varieties of Democracy (V-Dem) Project. From the core V-Dem dataset (Coppedge et al. 2024, v14) we take the polyarchy and liberal component indices as well as their respective three relevant building blocks:[3] freedom of association, freedom of expression, and clean elections; rule of law, judicial and legislative constraints on the executive. For high-level democracy/autocracy analysis we also adopt the 'Regimes of the World' (Lührmann et al. 2018, ROW) definition of democracy (ROW>1), and from the 'Episodes of Regime Transformation' dataset (Maerz et al. 2024, ERT v14.0) we use the distinction of democratic/autocratic regimes.[4]

Second, we use the World Bank 'World Development Indicators' (accessed September 2024) for real GDP per capita (in 2015 US$) and a range of controls.[5] The income variable is transformed using logarithms and multiplied by 100: treatment effects can therefore be interpreted as percentage changes in income per capita.

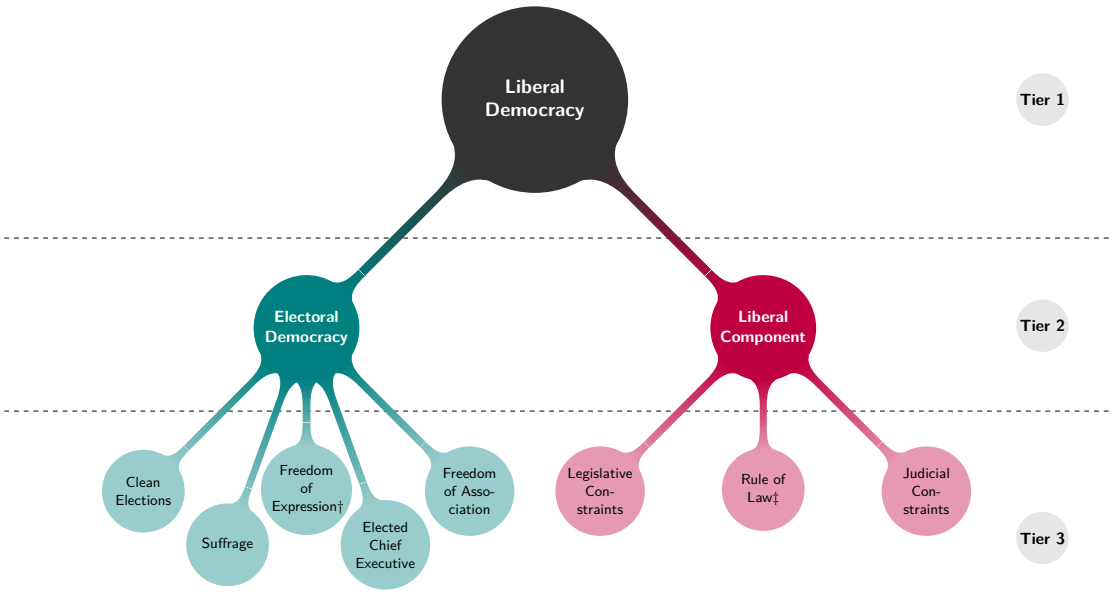
Concepts Our analysis begins with an encompassing concept of 'liberal democracy,' as illustrated in Figure 1, Tier 1. This entails examining the economic effects of democracies breaking down/falling below specific thresholds. We employ a range of democracy/autocracy thresholds, which are discussed in more detail below. Following the V-Dem conceptual framework (Coppedge et al. 2024), liberal democracy is subsequently divided into its two Tier 2 components: electoral democracy (polyarchy) and the liberal component. We then analyze the economic consequences of democracies falling below the thresholds set for each of these components. Each component is further disaggregated into its fundamental building blocks, as depicted in Tier 3. In the final step, we examine the economic effects resulting from the dismantling of each building block, where countries fall below the autocracy threshold for that specific building block.

[3] Two additional building blocks, suffrage and elected chief executive, have extremely limited variation over our time horizon and hence do not lend themselves to causal analysis.

[4] In Appendix Table C-1 we present results using regime breakdown based on Boix et al. (2013, BMR) and Marshall et al. (2017, Polity V), adjusting the sample to 1999-2020 for all alternative regime change dummies.

[5] Private bank credit (in percent of GDP), population growth (in percent), and merchandise trade (in percent of GDP). These are included as additional controls in the PCDID models of high- and mid-level democratic collapse, although since these specifications never pass the Alpha specification test we do not present the results in the paper.

Figure 1: Liberal Democracy and its Components



Notes: The diagram illustrates the underlying institutional components of 'liberal democracy'. Note that Suffrage and Elected Chief Executive are not investigated due to limited variation during our sample period.

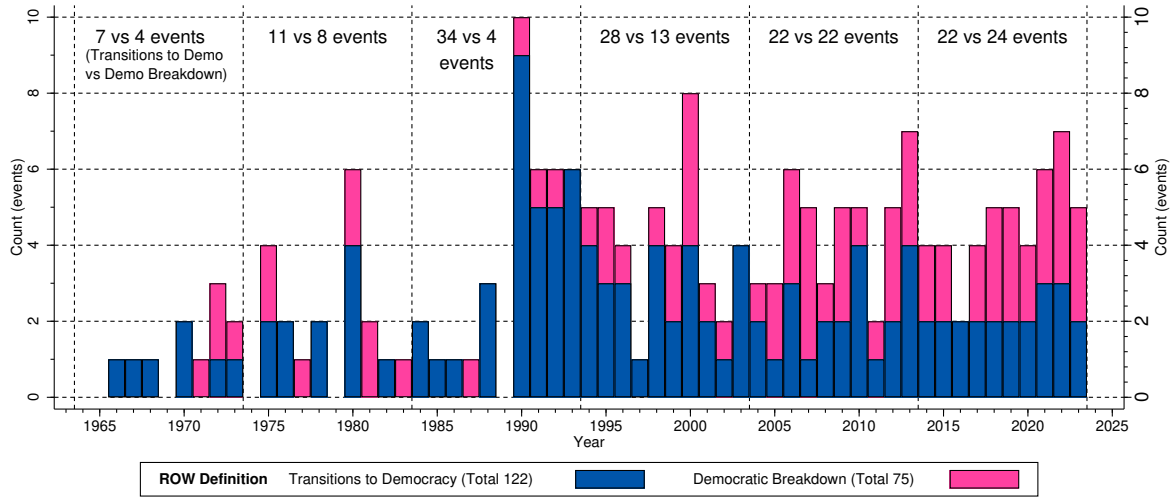
Democracy/Autocracy Thresholds Our empirical implementation relies on binary indicators of democratic institutional collapse, following the recent tradition in economics in the study of democracy and growth (Papaioannou & Siourounis 2008, Acemoglu et al. 2019, Eberhardt 2022, Boese-Schlosser & Eberhardt 2024). The goal of this paper is not to determine which conceptualization or measure of democracy is preferable, but to examine whether the economic effects of democratic collapse are consistent across a range of plausible definitions and thresholds. To this end, we report results for multiple high- and lower-level democracy indicators and include additional robustness checks with further measures in the Appendix.

Two of our higher-level democracy measures (ROW, ERT) are already binary, for all others (including the lower-level building blocks) we use the first and second moment of the respective V-Dem index over 1961-2023 to construct cut-offs in the sample of all 169 countries (including countries which always stayed autocratic, always stayed democratic, those which only experienced democratic transition, and those which experienced regime collapse).

In practice, we adopt five alternative thresholds: the index mean, the mean $\pm$ 1/8 of the standard deviation (sd) and the mean $\pm$ 1/4 of the standard deviation. This implies we have a range of indicators for democratic/institutional collapse which are more liberal (mean $-$ 1/4 or 1/8 sd) and others which are more conservative (mean $+$ 1/4 or 1/8 sd). The more liberal classification includes comparatively more countries as 'democracies' whereas the more conservative classifications make it more difficult for a country to be considered democratic. It is *a priori* meaningless to favour one definition over another, and in our analysis we focus on the robustness of the results across these different definitions.

Since the different cut-offs affect which countries are allocated to the treatment and control

Figure 2: The Recent Retreat of Democracy (1961-2023)



Notes: We adopt the ROW (Lührmann et al. 2018) definition of regime change and illustrate the number of transitions to democracy (in blue) and democratic breakdown events (in pink) between 1964 to 2023. This analysis is specific to our full sample of 169 countries. Decadal event counts are provided near the top of the plot.

samples, this definitional choice has implications for diagnostic testing: as will be laid out in the next section, we conduct a specification test to tell us whether the main identifying assumption of our PCDID estimator is valid, and this test builds on estimates from the treated and the control samples. Hence, this diagnostic test provides one way of discounting specific definitions of democratic/institutional collapse in our empirical analysis.[6] All thresholds and their associated (treatment, control) sample sizes are presented in Appendix Table A-2.

Full Sample Our main analysis builds on V-Dem data for 169 countries over the 1999 to 2023 time period (4,169 observations). This sample includes four distinct sub-groups, determined by the definition of our measure for democratic/institutional collapse: (i) countries which experienced regime collapse during the sample period (e.g. moving from democracy to autocracy); (ii) countries which remained democratic throughout the sample period; (iii) countries which were autocratic throughout the sample period; and (iv) countries which only experienced transition to democracy. In our analysis, the countries in (iii) and (iv) are discarded although they feed into the construction of the different thresholds for regime collapse described above. The countries in (ii) constitute the control sample (never-treated). Countries in (i) either experience one regime collapse or several (up to three and on average 1.4). In our analysis and robustness checks, we confirm that our findings are not distorted by those countries which moved back and forth between autocracy and democracy repeatedly. Similarly for our analysis of lower-tier institutional building blocks. Appendix Table A-1 provides details on the sample makeup and characteristics.

[6] As the sample sizes in Tables 1 and 2 indicate, alternative cutoffs *primarily* affect the size/makeup of the control sample, since using more 'liberal' definitions of regime collapse significantly affects how many countries are deemed 'always democratic'.

4.2 Descriptives and Sample Period

Figure 2 illustrates global regime change events from 1964 to 2023, based on the ROW definition of democracy by Lührmann et al. (2018). The surge in democratic transitions during the 1990s reflects the so-called 'Third Wave' of Democratization (Huntington 1993, Slater 2025), following the collapse of the Soviet bloc. In the most recent years, however, the balance has tilted towards more collapses than new (or renewed) democracies: nearly two-thirds of all democratic regime collapses over the entire period occurred since 2004, while just over one-third of all democratizations fall in the same timeframe. These trends are consistent with findings in the literature that document a global 'third wave of autocratization' (Lührmann & Lindberg 2019, Boese, Lindberg & Lührmann 2021, Haggard & Kaufman 2021), highlighting the widespread and ongoing retreat of democracy.

To capture this recent era of 'democracy in decline', we restrict our empirical analysis to the 1999–2023 period — allowing us to study the post-2004 democratic downturn and, for comparison, the preceding years, while avoiding the systemic disruptions of the early 1990s. The trend is clear: in the decade to 2003, democracy broke down in only 13 countries; this figure rose to 22 in the following decade and to 24 becoming autocratic in the decade leading up to 2023. In contrast, from the 1960s to the early 1990s, on average merely five countries per decade experienced democratic collapse. Meanwhile, the number of transitions to democracy has steadily declined — from a peak of 34 transitions in the decade around 1990 to 28, 22 and 22 across the following three decades. These patterns highlight the ongoing global shift toward autocratization. Although our empirical design does not extend to recent developments in countries such as the United States (see the quote at the start of the paper), these trends suggest that the retreat of democracy is likely to continue.

5 Empirical Methodology

Overview We study the causal effect of (binary) regime change on economic prosperity in a difference-in-differences framework (e.g. Papaioannou & Siourounis 2008, Acemoglu et al. 2019, Paglayan 2021, Imai et al. 2023, Boese-Schlosser & Eberhardt 2024). Our heterogeneous treatment effects estimator, the Principal Component DID (PCDID) estimator of Chan & Kwok (2022), estimates country-specific regressions for all treated countries (i.e. countries which experienced democratic collapse during the sample period). These country-specific regressions are augmented with common factors estimated from a sample of control countries that remained democratic throughout the sample period. These factors capture time-varying unobserved heterogeneity across countries, such as total factor productivity, and are explained in detail below. Under testable assumptions, the estimator identifies the causal effect of democratic collapse (the 'treatment') even if treatment and control countries are on different trajectories (non-parallel trends) prior to treatment and if treatment itself is endogenous.[7]

[7]Other empirical implementation which extract factors and add these to treatment regressions include Bai (2009) and Gobillon & Magnac (2016), as well as Xu (2017) for the synthetic control estimator.

Intuition of the common factor augmentation The intuition for our empirical implementation is that the unobserved time-*varying* heterogeneity affecting the timing of democratic collapse and whether a country experienced democratic collapse at all (i.e. the endogeneity of regime collapse) can be proxied by a set of common factors with country-specific parameters (factor loadings): $\lambda_i' f_t$.[8] These common factors are not extracted from the treated sample, but from the control sample, which enables us to claim causal identification. Consider a standard pooled fixed effects model: here, unobserved time-*invariant* heterogeneity, say λ_i, is correlated with a variable of interest x, and so if we ignore this endogeneity and run a least squares regression of y on x our estimate for the latter is biased: it captures the effect of x *and* λ_i. If, however, we provide a proxy for the time-invariant cross-country heterogeneity (in the form of country indicators in case of the least squares dummy variable estimator, or equivalently via the 'within transformation' for the 'fixed effects' estimator), then we can get an unbiased estimate for x with least squares: adding proxies of the unobservables correlated with x as additional variables solves the problem of correlation between x and the error term containing the time-invariant heterogeneity. The situation for our PCDID estimator is very similar but more general: we cannot identify x in the presence of unobserved time-*varying* heterogeneity. But if we provide a proxy for this time-varying heterogeneity (equivalent to adding the fixed effects in the simpler model), then we can. It should be noted that some parts of the literature adopting common factors refer to them as 'interactive fixed effects', which makes the country fixed effects analogy quite fitting.

The most important assumption for identification in the PCDID is that the 'information' contained in the estimated factors from the control sample is, on average, equally relevant in the treated sample. As an illustration by counter-example, imagine only very poor countries would experience the collapse of democracy, whereas only rich countries would remain democratic. Extracting unobserved time-varying heterogeneity (e.g. total factor productivity, absorptive capacity, etc.) from the sample of rich countries would then in all likelihood not be very informative to proxy the unobserved time-varying heterogeneity in the poor treated sample, given that, among many other aspects, economic structure, embeddedness in the global economy, or financial development for rich and poor countries are very different. We can conduct a formal hypothesis (Alpha) test whether the 'information' captured in our control sample of 'always democracies' is equally relevant in the treated sample of countries which experienced democratic collapse. We introduce the PCDID estimator and the Alpha specification test more formally in the following.

Principal Component DID Empirical Model We can write the outcome of a 'treatment' (here, democratic collapse) D_{it} for country i at some point in time T_{0i} using the potential outcomes

[8] Since estimated factors are orthogonal to each other and each can have a differential effect on each country (λ_i differs across factors), a small number of factors can capture highly idiosyncratic variation across countries. This dimensionality-reducing approach is popular in the forecasting literature (Stock & Watson 2002) but in various guises (Pesaran 2006, Bai 2009) has also been employed to account for total factor productivity or absorptive capacity in cross-country analysis (e.g. Eberhardt et al. 2013, Chirinko & Mallick 2017, De Visscher et al. 2020, Madsen et al. 2021), as well as in a range of applications in political science (e.g. Gaibulloev et al. 2014, Claassen 2020, Chin et al. 2023, Eibl & Hertog 2024, Meierrieks & Auer 2024).

framework as

$$y_{it} = D_{it}y_{it}(0) + (1 - D_{it})y_{it}(1) = \Delta_{it}\mathbf{1}_{\{i\in E\}}\mathbf{1}_{\{t>T_{0i}\}} + y_{it}(0) \tag{1}$$

$$\text{where} \qquad y_{it}(0) = \varsigma_i + \mu_i' f_t + \widetilde{\epsilon}_{it}. \tag{2}$$

Democratic collapse is represented by the two indicator variables $\mathbf{1}_{\{.\}}$, which are for (i) the individual country experience regime collapse, and (ii) the specific time period when the collapse takes place. Δ_{it} is the time-varying country-specific effect of democratic collapse, $\lambda_i' f_t$ represents a set of unobserved common factors f_t (which can be nonstationary) with country-specific factor loadings λ_i, and $\widetilde{\epsilon}_{it}$ is the error term.

The time-varying heterogeneous effect of regime collapse can be decomposed into $\Delta_{it} = \overline{\Delta}_i + \widetilde{\Delta}_{it}$, namely a treatment effect for country i averaged over the treatment period ($t > T_{0i}$) and a demeaned, time-varying idiosyncratic component of Δ_{it}. The former is referred to by Chan & Kwok (2022) as ITET (individual treatment effect on the treated) and represents our quantity of interest. The reduced-form model is then

$$y_{it} = \overline{\Delta}_i \mathbf{1}_{\{i\in E\}}\mathbf{1}_{\{t>T_{0i}\}} + \varsigma_i + \mu_i' f_t + \epsilon_{it}, \tag{3}$$

where $\epsilon_{it} = \widetilde{\epsilon}_{it} + \widetilde{\Delta}_{it}\mathbf{1}_{\{i\in E\}}\mathbf{1}_{\{t>T_{0i}\}}$. The setup extends to the inclusion of additional control variables which themselves can have a factor structure. As a consequence of the above decomposition of the treatment effect Δ_{it}, ϵ_{it} is mean zero but can be heteroskedastic and/or weakly dependent. The combination of common factors and heterogeneous parameters allows for non-parallel trends across countries. Most importantly, countries which did experience collapse and those which did not can have different trends — this is a major departure from the standard DID model, where the parallel trend assumption (or violation) translates to the weak exogeneity (or endogeneity) of the treatment variable, with relevant consequences for identification. In the PCDID empirical model, country trends can be non-parallel and *inter alia* the treatment timing or treatment sample can be correlated with the factor loadings to allow for endogenous regime collapse.

Principal Component DID Implementation To estimate the country-specific treatment effect ITET we proceed in two stages: first, we estimate proxies for the unobserved, time-varying common factors f, using Principal Component Analysis (PCA), from a control-sample regression — see more details below. Next, we add these factor proxies to a treatment regression at the country-level, estimated using least squares. This results in N country-specific treatment estimates.

The estimation equation for each country i which experienced regime collapse is:

$$y_{it} = b_{0i} + \delta_i \mathsf{Aut}_{it} + a_i' \hat{f}_t + u_{it}. \tag{4}$$

The $\hat{f}$ are the estimated factors, which we extract by PCA from the residuals $\hat{e}$ of the heterogeneous regression of $y_{it} = b_{0i} + e_{it}$ in the control sample. δ_i is the country-specific parameter of interest for

the regime collapse dummy Aut_{it}. y is income per capita (in logs, multiplied by 100).[9] We estimate (4) augmented with one to six common factors, given that determining the 'relevant' number of factors adopting information criteria is difficult and typically yields ambiguous results. Instead we rely on the common patterns across all specifications while at times focusing on the specification augmented with three estimated factors as a reasonable benchmark.

Assumptions The main identifying assumptions for the PCDID are that all unobserved determinants of income per capita are proxied by the estimated factors, a standard assumption in the panel time series literature (Pesaran 2006, Bai 2009) and related causal panel models (Athey & Imbens 2022). Individual factors are estimated with error, and so there is the potential for correlation between the residuals of treated and control countries, which will bias the regime collapse estimate. This bias asymptotically disappears if we require that $\sqrt{T}/N_c \to 0$, where T is the time series dimension and N_c is the number of control countries. Treated countries have to satisfy the 'weak parallel trend' test, which we have described above as a way of confirming that the 'information' (the space spanned by the estimated factors) from the control sample on average has the same effect in treatment and control sample — see discussion in the next paragraph.

Diagnostic Testing A standard pooled Difference-in-Differences model stands or falls with the empirical confirmation of the parallel trend assumption: if treatment is to be weakly exogenous, then treatment and control samples cannot *already* be on different trajectories before treatment takes place. The PCDID allows for non-parallel trends between treated and control samples since it employs common factors in association with heterogeneous factor loadings, but nevertheless requires a weaker condition to hold (the 'weak parallel trends' assumption). Above we have indicated that this relates to the 'information' extracted from the control sample being equally 'relevant' in the treated sample. More formally, the Alpha test (Chan & Kwok 2022) investigates the expected factor loading equality between treated and control samples. We estimate the following auxiliary regression in the treated sample:

$$y_{it} = \alpha_i + \beta_i \text{Aut}_{it} + \gamma_i \bar{\hat{e}}_t + \epsilon_{it}, \tag{5}$$

where $\bar{\hat{e}}_t$ is the cross-section average of the residuals from the country-specific control sample regression $y_{it} = b_{0i} + e_{it}$ (from which the PCDID extracts the common factors).[10] If treated and control samples are driven by the same set of common factors, then the factor loadings between the control sample and the factor-augmented treated sample should be on average the same. In the above auxiliary regression, this translates into the unweighted average (Mean Group) estimate $\hat{\gamma}^{MG} = N^{-1} \sum_i \gamma_i$ on the residual cross-section average being equal to 1. The test is implemented

[9] In extensions we add controls for trade/GDP, population growth, and/or financial development (credit/GDP) to both the treatment regressions and also to the auxiliary regressions in the control sample. While any of these controls or their combination virtually never yields any concerns that these constitute 'bad controls' in the sense of Angrist & Pischke (2008, 65), the Alpha specification test virtually always rejects.

[10] The test does not need to use the individual estimated factors but merely the control sample residual from which these are extracted via PCA. This implies that the Alpha test does not vary by specification using different factor augmentations.

via a t-test for the null hypothesis that $\hat{\gamma}^{MG} - 1 = 0$ using the Pesaran & Smith (1995) estimator for (5) and the variance estimator of Pesaran (2006).

DID without Control Variables In the standard (pooled) difference-in-differences context, the purpose of adding control variables is not to justify a conditional independence assumption between treated and control samples, but to ensure the conditional weak exogeneity of the treatment variable.

With income per capita as the outcome variable, we are less susceptible to a distinction between 'total effect' and 'mechanism of the effect': it is of interest that income per capita has been affected by the regime change, even if we cannot pinpoint the channels. The reverse situation is more contentious: if we were to study financial development or trade as outcomes, we would be interested whether the direct effect of regime collapse or an indirect effect via income (regime collapse affects income per capita, which in turn affects the outcome studied) were the causal mechanisms.

Given that, first, our empirical estimates for the model without additional controls satisfy the diagnostic tests, and second, we do not need to justify the results as 'direct' or 'indirect' effects of regime collapse, the causal identification in our models without controls is not undermined.

Presentation of Results The average treatment effect (ATET, $\hat{\delta}^{MG}$) is simply the average of the country estimates $\hat{\delta}_i$. We follow the practice in the literature and use a robust mean group estimator adopting an M-estimator (Rousseeuw & Leroy 1987) with the associated standard errors based on $\Sigma^{MG} = (N-1)^{-1} \sum_i (\hat{\delta}_i - \hat{\delta}^{MG})$ (Chan & Kwok 2022, Pesaran 2006): this weighted average puts lower weights on outliers. We further employ local predictions for the estimated regime collapse coefficients $\hat{\delta}_i$ (treatment effect) *relative to* (i.e. conditioned on) the time elapsed since the regime change (treatment length), following Boese-Schlosser & Eberhardt (2024). This also allows us to control for the practical issue that some countries have moved back and forth between democracy and autocracy. Our multivariate running line regressions (Royston & Cox 2005) are 'k nearest neighbour' locally linear regressions and allow us to *jointly* condition on these characteristics. We plot the *predicted* values from this multivariate smoothing procedure against the years since regime collapse. Standard errors are calculated based on the local weighted least squares fit and feed into our graphical presentation: filled (white) markers for country predictions from the running line regressions indicate statistical (in)significance at the 10% level.

One obvious motivation for this practice is that the length of time countries spend in autocracy after democratic breakdown varies substantially: for instance, using the ROW definition of regime collapse, around a quarter of the 39 countries in the treatment sample respectively spend 5 or fewer years, 6 to 11 years, 12 to 18 years and more than 18 years in autocracy. Secondly, we can also control for the frequency (1 to 3) with which countries have experienced democratic collapse.

In studying some of the underlying institutional building blocks of the liberal democracy variable we employ to construct regime collapse, we adopt a practice of presenting the ATETs for each of the factor augmentations as well as alternative definitions of the dichotomised institutional quality.

Preferred specification The analysis conducted in this study has many moving parts, such as different levels of institutions capturing democratic collapse, different index cut-offs for the treatment

dummies, and different PCDID specifications with 1 to 6 estimated factors, not to mention varying treated and control sample sizes. We have diagnostic tests to inform the validity of *some* specifications (or lack thereof), but overall we are faced with a myriad of results. Our view is that there cannot be a preferred specification if there is so much uncertainty in the specification of dummies and factor-augmentation, and we therefore emphasise the *consistency* of specific patterns across a wide range of models instead of individual results.

6 Empirical Results

Our analysis proceeds in three steps and we present our findings in corresponding subsections, each tied to a central research question:

First, is there an economic cost to democratic breakdown? We begin by testing whether democratic breakdown leads to negative economic outcomes. Using high- and mid-level democracy indicators, we estimate the average treatment effect of regime collapse on income per capita.

Second, we ask which democratic institutions are responsible for this loss? To unpack this effect, we disaggregate the democracy measures into their low-level institutional components (e.g., clean elections, freedom of association, constraints on the executive) and assess which specific aspects of democracy, when eroded, drive the observed economic decline.

Third and finally, we explore the transmission channels: how do the economic effects of democratic breakdown materialize? This subsection investigates mechanisms such as changes in investor confidence, institutional trust, or economic volatility that might explain why autocratization leads to economic decline.

6.1 Is there an economic cost to democratic breakdown?

In the following, we present both the average treatment effects and the results from the running line regressions, starting with high-level democracy measures and then moving on to mid- and low-level institutional components.

We report the robust mean PCDID estimates (ATETs) for both high-level and mid-level democracy indicators in Tables 1 and 2. Table 1 shows results for high-level democracy measures: The Regimes of the World (ROW) and Episodes of Regime Change (ERT) classifications, as well as for several binary versions of the Liberal Democracy Index. These binary indicators are constructed using the mean and standard deviation of the index across all countries between 1960 and 2023 as described above. Table 2 presents results for binary indicators based on mid-level institutional components, including variations of the Liberal Component Index and Polyarchy.

Similar to our approach with multiple democracy indices, we do not aim to privilege any one factor specification. Instead, our goal is to transparently demonstrate the consistency of results across a range of plausible assumptions regarding both the measurement of democracy and the structure of unobserved heterogeneity. Therefore, estimates in the upper panel of each Table are for the specification augmented with *three* estimated factors, in a lower panel we report the results for alternative specifications with 1 to 6 estimated factors.

Table 1: Democratic Breakdown: High-level Indicators (1999-2023)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
			Variations on Liberal Democracy				
Definition	n/a	n/a	M$-\frac{1}{4}$sd	M$-\frac{1}{8}$sd	Mean	M$+\frac{1}{8}$sd	M$+\frac{1}{4}$sd
ROW	-1.044						
	[0.770]						
ERT		-1.469*					
		[0.870]					
Liberal Democracy			-1.023	-0.594	-0.149	0.072	-0.185
			[0.765]	[0.730]	[0.514]	[0.624]	[0.576]
Treated Countries	39	34	34	33	35	37	37
Observations	961	836	843	818	861	911	907
Control Countries	64	65	73	69	61	57	52
Observations	1596	1621	1814	1714	1521	1421	1300
Alpha t-statistic	1.041	1.814	-0.283	1.475	3.193	3.001	4.472
Alternative specifications							
1 Factor	-1.889**	-1.931*	-1.191	0.875	0.940	0.112	1.705
2 Factors	-1.438*	-2.053**	-0.894	0.235	0.041	-0.023	-0.095
3 Factors	-1.044	-1.469*	-1.023	-0.594	-0.149	0.072	-0.185
4 Factors	-1.584**	-1.798**	-0.862	-0.563	-0.225	0.313	-0.017
5 Factors	-0.647	-0.502	-0.336	-0.186	0.313	0.282	0.108
6 Factors	-0.064	0.123	-0.107	-0.031	0.086	0.375	0.024

Notes: We present robust mean estimates from PCDID regressions of democratic breakdown, where the shift from democracy to autocracy is defined in different ways as indicated. These estimates can be interpreted as ATETs. The Alpha test rejects if the t-statistic is in excess of 1.96 (5% level significance), which implies that the model may be misspecified. The main estimates presented are for the augmentation with three estimated factors, results for alternative augmentations are presented in a lower panel of the table. These models do not include any additional control variables. Statistical significance is indicated using * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

High-Level Democracy Indices For the high-level democracy indices, diagnostic (Alpha) test results indicate that only the ROW and ERT models in columns (1) and (2) as well as the Liberal Democracy definitions in (3) and (4) satisfy the assumptions of the PCDID estimator: in these models the unobservables in treatment and control sample on average have the same impact on economic prosperity. The magnitude of the treatment effect of democratic collapse on average amounts to a 1 to 2% decline in income per capita (also considering alternative factor augmentations). The variations of the Liberal Democracy definition in columns (3) to (7) provide moderate-sized and imprecisely estimated ATETs, insignificant at conventional levels of statistical significance.

Mid-Level Democracy Indices Turning to the 'autocratic loss' estimates when adopting indicators of electoral democracy (polyarchy) and the liberal component, our diagnostics indicate that all polyarchy specifications except the most conservative definition in (5) and liberal component models in columns (6) to (8) are well-specified. The ATETs for polyarchy are mostly negative yet range from +0.1% to -1.8% (with only the specifications for the Mean and Mean$+1/8$sd consistently

Table 2: Democratic Breakdown: Mid-level Indicators (1999-2023)

	(1)	(2)	(3)	(4)	(5)
	Variations on Polyarchy				
Definition	M$-\frac{1}{4}$sd	M$-\frac{1}{8}$sd	Mean	M$+\frac{1}{8}$sd	M$+\frac{1}{4}$sd
Polyarchy	0.102	-0.602	-1.601**	-1.305*	-0.678
	[0.682]	[0.712]	[0.698]	[0.695]	[0.692]
Treated Countries	40	40	43	39	38
Observations	991	993	1068	961	936
Control Countries	77	74	67	65	62
Observations	1914	1839	1664	1621	1546
Alpha t-statistic	0.002	0.844	1.043	1.401	2.252
Alternative specifications					
1 Factor	-1.233*	-0.359	-0.118	-1.800**	-0.927
2 Factors	-0.104	-0.286	-1.483**	-1.704**	-0.764
3 Factors	0.102	-0.602	-1.601**	-1.305*	-0.678
4 Factors	-0.102	-0.674	-1.520**	-1.687**	-0.272
5 Factors	-0.266	-0.343	-0.650	-0.774	0.399
6 Factors	-0.277	-0.381	-0.703	-0.372	0.087

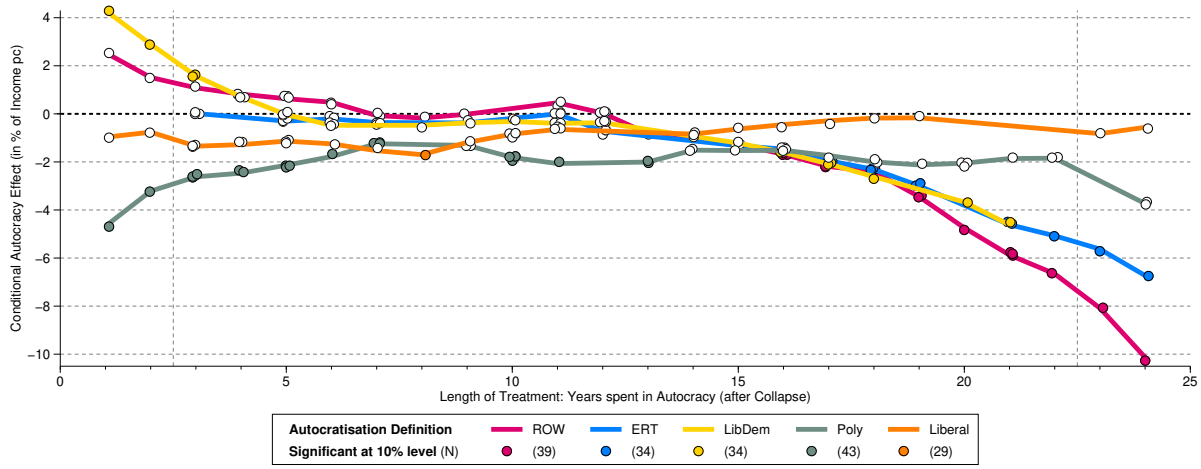
	(6)	(7)	(8)	(9)	(10)
	Variations on the Liberal Component				
Definition	M$-\frac{1}{4}$sd	M$-\frac{1}{8}$sd	Mean	M$+\frac{1}{8}$sd	M$+\frac{1}{4}$sd
Liberal Component	-0.794	0.191	-0.982	-0.592	0.211
	[1.014]	[0.913]	[0.697]	[0.633]	[0.714]
Treated Countries	28	29	29	32	31
Observations	700	725	718	792	768
Control Countries	88	83	78	72	69
Observations	2181	2056	1938	1789	1714
Alpha t-statistic	-1.354	-1.268	-0.107	2.090	2.826
Alternative specifications					
1 Factor	-0.044	-1.628	-1.045	-0.494	0.851
2 Factors	-0.662	-0.165	-0.854	-0.879	-0.174
3 Factors	-0.794	0.191	-0.982	-0.592	0.211
4 Factors	-0.810	0.531	-1.056	-0.322	0.604
5 Factors	-1.079	0.573	-0.229	0.520	0.635
6 Factors	0.323	1.096*	0.472	0.542	0.562

Notes: We present robust mean estimates from PCDID regressions of democratic breakdown, where the shift from democracy to autocracy is defined in different ways as indicated. These estimates can be interpreted as ATETs. The Alpha test rejects if the t-statistic is in excess of 1.64 (10% level significance), which implies that the model may be misspecified. The main estimates presented are for the augmentation with three estimated factors, results for alternative augmentations are presented in a lower panel of the table. These models do not include any additional control variables. Statistical significance is indicated using * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

statistically significant across different factor augmentations). In contrast, ATETs for the liberal component have more mixed signs and are virtually all statistically insignificant at conventional levels.[11] All results presented so far indicate that augmentation with five or six factors may be too ambitious given the short time series dimension of the panel.

For the average country, these results suggest that democratic collapse results in a loss of up to 1.8% of income per capita and it appears that this effect is driven by the collapse of institutions related to *electoral democracy*. While these findings are indicative, it bears reminding that they are contingent on specific definitions of the regime change cutoff.

Figure 3: Democratic Breakdown and Economic Decline — PCDID Results (1999-2023)



Notes: We present predictions from multivariate running line regressions illustrating the economic effect (income per capita) of democratic breakdown. All specifications presented augment the treatment regression with three estimated factors. The number of years since democratic breakdown are shown on the x-axis, the economic effect on the y-axis. We control for (i) the unbalancedness of the panel, and (ii) the number of times a country flipped between regimes. We exclude outliers which are given a zero weight in the full sample mean estimate using an M-estimator. We use *mean* thresholds for liberal democracy, polyarchy and the liberal component (index mean for 1960-2023). A filled (white) marker indicates statistical (in)significance at the 10% level.

Running Line Regression Results All of the above analysis investigates the *average* country by ignoring the time countries spend 'in treatment' following the collapse of democracy and also whether countries repeatedly moved back and forth between regimes. In Figure 3, we present predictions from multivariate running line regressions of the country-specific PCDID estimates which can provide a sense of the *dynamic evolution* of the autocracy-growth relationship since it provides average treatment estimates relative to the number of years since regime collapse — we focus on the specifications augmented with three estimated factors. These are *not* event plots: if a country experienced regime collapse five years ago, then its treatment estimate $\hat{\delta}_i$ only contributes to the

[11] For comparison, in Boese-Schlosser & Eberhardt (2023) PCDID ATETs for polyarchy and the liberal component in the analysis of *democratic* regime change over 1959-2018 are 3.1% and 4.9%, respectively (statistically significant at the 5% and 1% level).

mean estimate for $t = 5$ along the x-axis.

We present results for all high- and mid-level autocracy indicators, adopting the mean index definition for liberal democracy, polyarchy, and the liberal component — column (5) in Table 1 and columns (3) and (8) in Table 2. Focusing on the ROW definition of regime change (dark pink line and markers), we can see that in the first few years after regime collapse there is no statistically significant effect. From around 16 years onwards the 'autocratic loss' increases from -2%, reaching -4 to -6% after two decades — we ignore the estimates beyond 22 years as these countries only have three or fewer years in democracy to benchmark against their autocratic collapse (analogously for countries with just a couple of years after democratic collapse). The graphs for the LibDem and ERT definitions of democracy (in yellow and blue), after initial differences, appear relatively closely matched to that for ROW. The Liberal Component (in orange) indicates a flat and virtually entirely insignificant treatment effect. In contrast, for the electoral democracy variable (in teal), we have statistically significant negative effects on the order of -2% for the first dozen or so years. In Appendix Figure C-1 we present alternative definitions of regime change in the polyarchy and liberal component case (adopting different regime change cutoffs). These underscore the insignificance of the latter, and, once again contingent on the definition of regime change, suggest that the economic effect is to some extent driven by the collapse in institutions captured by electoral democracy.

Taken together, this analysis confirms that the ATETs presented in Table 2 do not provide a misleading picture: the economic consequences of regime collapse appear to be driven by electoral democracy, rather than the aspects of the liberal component. While we see some consistency in the patterns for the second tier of polyarchy and the liberal component, results could still be called merely indicative rather than clearcut. We now turn to 'drilling' further down to investigate the institutional building blocks of these concepts.

6.2 Which Democratic Institutions Drive the Autocratic Loss?

Here, we examine which specific democratic institutions are driving the autocratic loss identified above — that is, which components must break down for this economic decline to materialize. We do so by disaggregating democracy into its low-level institutional components and assess which specific aspects of democracy, when eroded, drive the observed economic decline. To be precise, we study the following six underlying institutional building blocks of polyarchy (Freedoms of Association and Expression, Clean Elections) and the liberal component (Rule of Law, Judicial and Legislative Constraints on the Executive).

In Figure 4 we present results from 180 alternative models: each plot represents one institutional building block and offers five definitions of institutional collapse using the mean index (for 1960-2023) and alternatives — each of these alternatives is represented using a different marker. Within each alternative, we have six specifications and hence six markers, since we allow for the augmentation of the PCDID estimator with one to six estimated factors. Markers are filled with white if these robust mean ATET estimates are statistically insignificantly different from zero, whereas we use teal and orange (and also somewhat larger markers) if they are statistically significant. For this analysis

the specification (Alpha) test rejects in a minority of specifications.[12] In general, we would perhaps discount PCDID models augmented with just a single estimated factor and put more emphasis on those with three or four instead — however, our results here are so stark that we do not need to indicate any preference for one over another specification.

As is immediately clear from the figure, only the results for 'free and fair elections' in panel (e) provide consistently strong and statistically significant results to indicate a negative effect of institutional collapse, on average between 1 and 2.5%. The autocratic loss is primarily driven by the breakdown of free and fair elections. Once electoral integrity collapses, the resulting erosion of democratic accountability appears to trigger a measurable decline in economic performance.

6.3 Transmission Channels

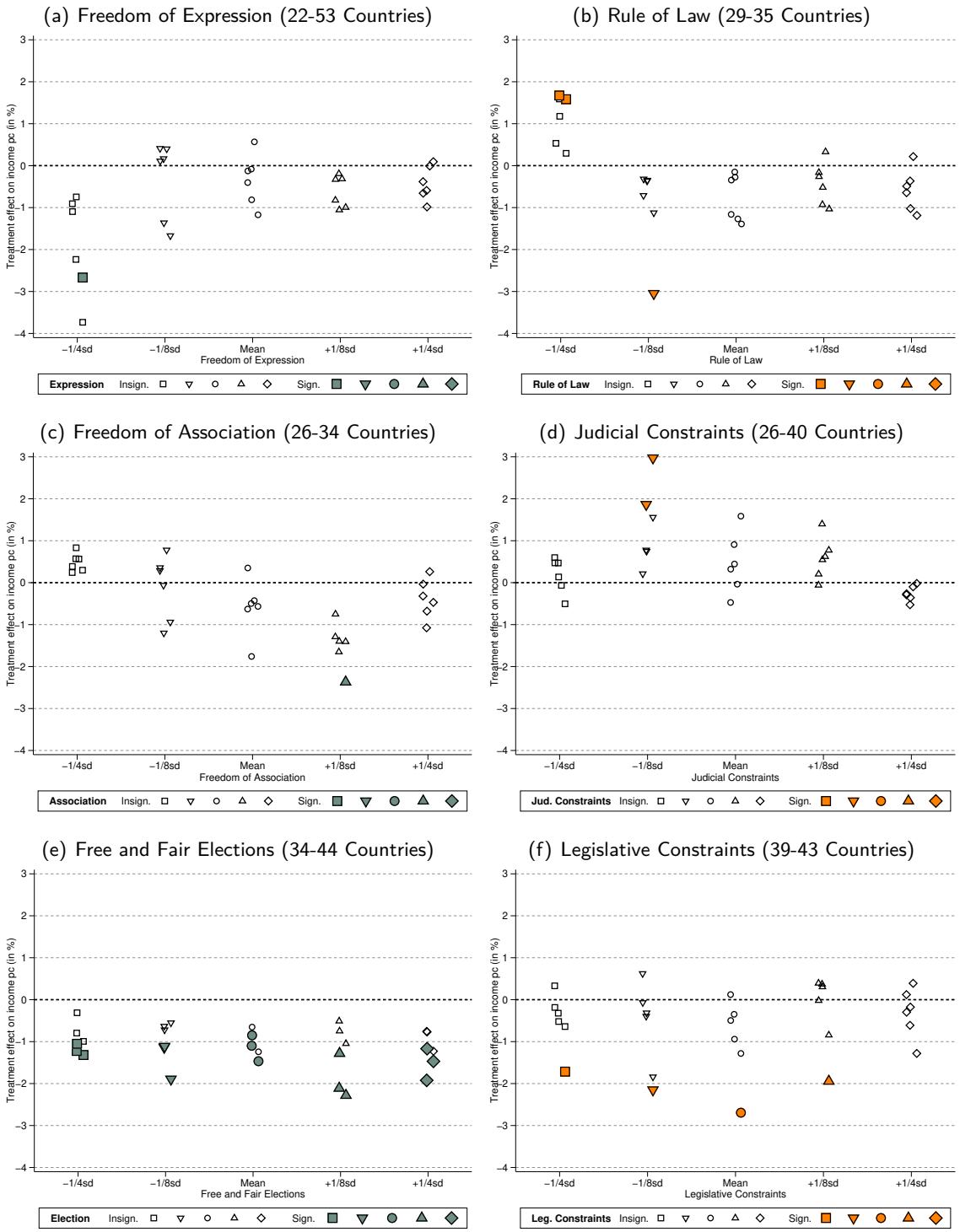
How does the 'autocratic loss' manifest itself? Do collapsing democracies dramatically cut back public spending (as exemplified by the actions of the Trump Administration's Department of Government Efficiency) and/or is there higher volatility in economic performance putting off investors and/or does the change in political institutions have any effect on domestic innovation efforts and productivity (Chandra & Rudra 2015, Aisen & Veiga 2013, Son & Bellinger 2022, Benavente et al. 2024). In this section, we extend our analysis of the autocratic loss to different transmission channels by replacing the dependent variable in our PCDID regressions.

Economic Uncertainty We adopt an empirical strategy common in the literature on commodity price volatility (e.g. Eberhardt & Presbitero 2021) and estimate annual per capita GDP growth uncertainty as conditional volatility from a GARCH(1,1) model of the annual data using a simple regression of the country-specific growth rates Δy_{it} on a constant term (see Bleaney & Greenaway 2001, Cavalcanti et al. 2015). Since the GARCH model is prone not to converge in short time series, we use the full data at our disposal for each country in constructing the volatility estimates (typically from 1960-2023) and then restrict our sample to 1999-2023 for our PCDID regressions.

When we use the high- and mid-level indices, whichever definition of democracy (including robustness checks for alternative thresholds) or factor augmentation we adopt, virtually no treatment estimates are statistically significantly different from zero (results available on request) — this is a pattern that will repeat itself in all the channels we consider in this section. Since a qualitative change in 'clean elections' appeared to be the most substantial trigger underlying the autocratic losses we found, we focus on this institutional building block in the following. Panel (a) of Figure 5 presents the ATETs for five alternative cutoffs of the clean election index (mean $\pm 1/4$ or $1/8$sd) along the x-axis for six different specifications (augmenting the treatment regressions with one to six factors extracted from the control sample regressions). We follow the practice in Figure 4 and use small, plain markers for statistically insignificant and larger, coloured markers for statistically significant ATETs. As can be seen, for growth volatility we find consistent patterns of a null effect.

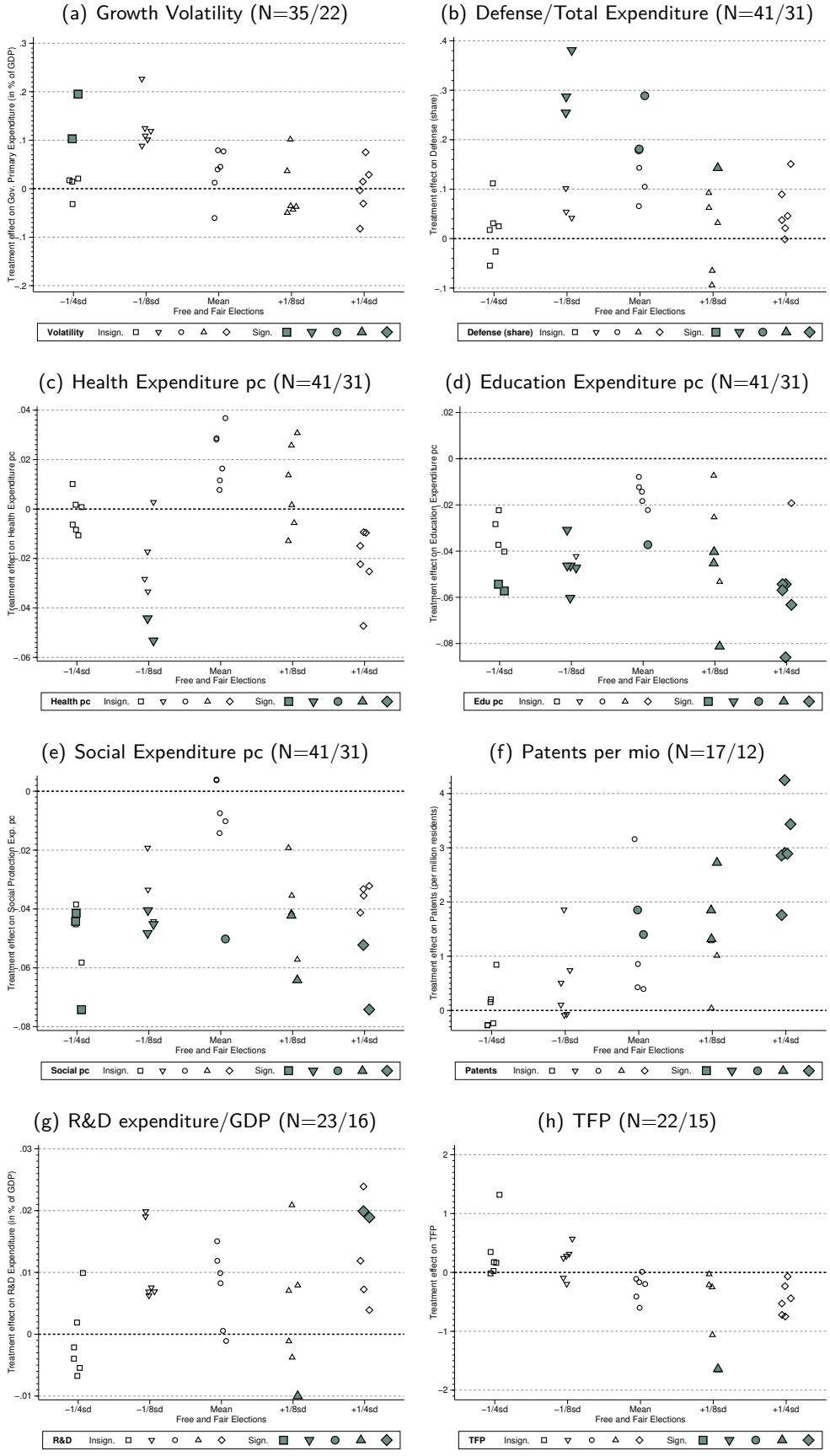
[12] Judicial constraints: specification based on mean, mean $+1/8$sd and $+1/4$sd; Freedom of expression: mean and mean $+1/8$sd; clean elections: mean $+1/8$sd and $+1/4$sd.

Figure 4: Which Democratic Institutions Drive the Autocratic Loss? — PCDID Results (1999-2023)



Notes: We present the robust mean treatment estimates (y-axis) for individual institutional building blocks of the V-Dem definition of polyarchy (left column) and the liberal component (right column). Each plot has 5 different definitions for institutional breakdown (x-axis) represented by different markers, i.e. different cut-offs, such as the *mean* V-Dem index. Each of these in turn has six estimates for PCDID models augmented with 1, 2, . . . , 6 estimated factors. Each of these can be interpreted as an ATET (this is computed from country-specific treatment estimates using an M-estimator). Finally, ATETs which are statistically insignificantly different from zero (10% level) are indicated using small, hollow markers, those that are statistically significant with larger, filled markers in teal or orange.

Figure 5: Transmission Channels: Collapse of Free and Fair Elections — PCDID Results



Notes: See Figure 4 for details. We indicate the treatment sample size range (N) — mean -1/2sd (+1/2sd) is always the largest (smallest) sample.

Investment in Public Goods We adopt proxies for a range of government investment in public goods using data from Gethin (2024) which cover 1999-2022 and sectoral expenditure in per capita terms or as a share of total expenditure. These cover expenditure in the military, health, education, and the social sector more widely. Panels (b) to (e) of Figure 5 present the results from this analysis. There are some indications that defence spending on average increases following regime collapse, although the statistical evidence is weak. Results for health expenditure are very mixed and largely insignificantly different from zero. In contrast, expenditure on education is shown to decline on average in the aftermath of regime collapse, a result which extends to both expenditure in primary and secondary education (available on request). Overall social spending is also detrimentally affected.

Innovation and Productivity For innovation we study innovation effort (R&D expenditure/GDP) and innovation outcomes (patents per inhabitant). The former variable is taken from the UNESCO data on gross domestic expenditure on R&D (two vintages, interpolation for single years of missing observations). Patent data are taken from WIPO (via the World Bank WDI) and constitute annual counts of patents filed with domestic patent offices by residents, which we transform into patents per million inhabitants. We use the Penn World Table (version 10.01) dataset to proxy productivity in form of the constant national price Total Factor Productivity series (1999-2015). It should be noted that the overall country coverage of these three measures is limited compared with that of the other channels analysed.

Panels (f) and (g) of Figure 5 illustrate the effects of clean elections for patenting and R&D investment. While treatment effects are typically positive, they are only statistically significant for some of the more conservative definitions of democratic collapse in the case of patenting. Panel (h) studies the treatment effect of clean elections on TFP, where we find no statistically significant effects and/or qualitative patterns.

Concluding remarks on channels Of the significant results revealed in this section, investment in social support represents one factor with more immediate implications on economic prosperity, whereas other aspects such as reduced expenditure on education are likely to manifest themselves even more significantly in the medium- to long-term (not necessarily captured in our present analysis). All results are undermined by the frequent failure of the Alpha specification test.

7 Robustness Checks

To assess the robustness of our main findings, we conduct a series of additional analyses, reported in Appendix Section B and C. The latter section presents robustness checks in terms of the definition of regime collapse and alternative specifications of the PCDID regressions. Results using 4 factors or alternative regime collapse thresholds are qualitatively very similar to our main findings. The former examines whether our estimated effects of democratic breakdown on economic performance are sensitive to cross-country differences in three key factors: democratic capital stock (e.g. Persson & Tabellini 2009), state capacity (e.g. Besley & Persson 2010), and violent conflict (e.g. Mac Ginty & Williams 2016). We implement this in three complementary ways: (1) by comparing subsamples of countries with high versus low levels of each factor; (2) by including each factor as an additional

control variable in the PCDID regressions for polyarchy; and (3) by repeating the analysis for our most robust lower-tier indicator, clean elections.

Overall, we find limited evidence of heterogeneous treatment effects and no substantial changes in our key findings when accounting for these factors. In particular, the core result — that the erosion of free and fair elections drives the autocratic loss — remains robust and largely unaffected in terms of statistical significance and economic magnitude across all specifications.

8 Putting Autocratic Loss in Perspective

A large body of research (e.g. Acemoglu et al. 2019, Madsen et al. 2015, Knutsen 2021, Boese-Schlosser & Eberhardt 2024) has documented the existence of a democratic dividend, i.e. positive long-run economic effects associated with transitions from autocracy to democracy. Using the same methodology and data framework, Boese-Schlosser & Eberhardt (2023) estimate average treatment effects (ATETs) of 3-4% increases in income per capita following democratic transitions. In our analysis, we find average declines in income per capita of approximately 1-2% following democratic collapse. While the autocratic loss is somewhat smaller in magnitude than the democratic dividend, several technical considerations are important for interpreting this difference.

First, the average post-treatment period in our sample is considerably shorter: countries in our dataset, on average, experienced only 11-12 years in autocracy following democratic breakdown (depending on the definition), whereas the analysis of democratic transitions by Boese-Schlosser & Eberhardt (2023) covers an average of 23 years post-transition. Second, many of the democratic breakdowns in our sample occurred in the aftermath of the Global Financial Crisis, during a period of generally weak global economic performance, particularly among advanced democracies that form part of our control group. Both factors likely contribute to a more conservative estimate of the autocratic loss.

Second, our Figure 3 offers further insight into the temporal dynamics of this effect. Focusing on the ROW definition of regime collapse (dark pink line and markers), we find no statistically significant effect in the first few years following regime change. However, beginning around year 16, the autocratic loss becomes more pronounced, reaching declines of 4–6% after two decades. These dynamics mirror the findings in the democratic dividend literature: Boese-Schlosser & Eberhardt (2023), applying the same estimation approach, found no statistically significant effect in the first decade of democracy, with the democratic dividend increasing to approximately 10% after 20-30 years in democracy. While our study covers a shorter post-treatment window, the upward trend of the autocratic loss beyond 15 years suggests that the economic consequences of democratic breakdown may deepen over time.

Taken together, our results complement and extend the democratic dividend literature by providing systematic evidence of the economic risks associated with democratic erosion and collapse.

9 Concluding Remarks

Motivated by the ongoing wave of autocratization, this study investigates the economic effects of democratic breakdowns using a heterogeneous difference-in-differences approach on panel data for 169 countries over the 1999 to 2023 time period. In particular, we examine the economic consequences of democratic institutions deteriorating below a certain democracy/autocracy threshold. Using the V-Dem conceptual framework (Coppedge et al. 2024), we disaggregate liberal democracy into its core components — electoral democracy and the liberal component — and further into their fundamental building blocks. The analysis then assesses the economic impact of the dismantling of these building blocks, capturing the effects of institutional erosion at different levels.

Our results reveal that among the six institutional building blocks of polyarchy (Freedom of Association and Expression, Clean Elections) and the liberal component (Rule of Law, Judicial and Legislative Constraints on the Executive), only the collapse of 'free and fair elections' consistently exhibits a strong and statistically significant negative effect on economic performance, with an average decline in income per capita of 2-4%. Countries in which free and fair elections are dismantled experience an average income per capita decline of approximately 2% within 6 to 15 years of institutional collapse, increasing to 4% thereafter. While this 'autocratic loss' is notably smaller than the well-established 'democratic dividend' — which ranges from 4% to 20% after three to four decades —— the shorter post-regime change periods observed in our sample may account for this difference.

Importantly, our disaggregated analysis highlights that the negative economic effects are primarily driven by the erosion of the electoral process: The people's diminished ability to remove incumbent governments through free and fair elections leads to substantial economic decline, unlike the effects of weakened freedom of expression, association, or constraints on the executive.

Given the timing of the Third Wave of Autocratisation, our analysis is focused on the most recent 25 years, and thus for the most part sidesteps the practical difficulty of countries which experience democratic collapse moving back and forth between democracy and autocracy, often repeatedly. Research identifying the causal effects of these more complex histories of regime change and reversal will require a more intricate empirical implementation in form of a repeated-treatment difference-in-differences approach incorporating multiple treatment variables (e.g. first democratic regime change, first reversal, second democratisation, etc.) as well as multiple control samples. We leave this exercise for future research.

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Online Appendix for "Democracy in Decline"
— not for publication —

Contents

A Data Appendix

Table A-1: Sample makeup (1999-2023)

				GDPpc			Regime Change (ROW definition)						
ISO	Obs	Start	End	Min	Mean	Max	Share	Type	Flips	Auto	Exp	NExp	Control
AFG	23	2000	2022	286	461	582	1.00	Autocratic					
AGO	25	1999	2023	1910	2673	3305	1.00	Autocratic					
ALB	25	1999	2023	1822	3524	5394	0.24	Democratiser					
ARE	25	1999	2023	34541	47329	62140	1.00	Autocratic					
ARG	25	1999	2023	8895	12287	14200	0.00	Control					25
ARM	25	1999	2023	1166	3159	5566	0.76	Democratiser					
AUS	25	1999	2023	44636	53929	61341	0.00	Control					25
AUT	25	1999	2023	37665	43168	46698	0.00	Control					25
AZE	25	1999	2023	1344	4207	5674	1.00	Autocratic					
BDI	25	1999	2023	262	292	319	1.00	Autocratic					
BEL	25	1999	2023	34480	39840	44283	0.00	Control					25
BEN	25	1999	2023	865	1022	1300	0.20	Treated	1	1	5	20	
BFA	25	1999	2023	430	584	742	0.16	Treated	4	2	4	21	
BGD	25	1999	2023	626	1100	1869	0.88	Treated	1	1	22	3	
BGR	25	1999	2023	3541	6474	9780	0.00	Control					25
BHR	22	2002	2023	21131	22594	24734	1.00	Autocratic					
BIH	25	1999	2023	2439	4195	6421	0.00	Control					25
BLR	25	1999	2023	2462	5046	6483	1.00	Autocratic					
BOL	25	1999	2023	2004	2596	3243	0.08	Treated	2	1	2	23	
BRA	25	1999	2023	6551	8107	9216	0.00	Control					25
BRB	25	1999	2023	14957	17026	18716	0.00	Control					25
BTN	24	1999	2022	1262	2334	3448	0.38	Democratiser					
BWA	25	1999	2023	4832	5756	6708	0.00	Control					25
CAF	25	1999	2023	338	421	535	1.00	Autocratic					
CAN	25	1999	2023	36392	41915	45227	0.00	Control					25
CHE	25	1999	2023	71341	81251	90057	0.00	Control					25
CHL	25	1999	2023	8238	11832	14248	0.00	Control					25
CHN	25	1999	2023	2038	6401	12174	1.00	Autocratic					
CIV	25	1999	2023	1507	1842	2493	0.84	Treated	2	1	21	4	
CMR	25	1999	2023	1125	1315	1461	1.00	Autocratic					
COD	25	1999	2023	322	420	556	1.00	Autocratic					
COG	25	1999	2023	1698	2100	2504	1.00	Autocratic					
COL	25	1999	2023	3954	5380	6850	0.00	Control					25
COM	25	1999	2023	1106	1283	1383	0.92	Treated	2	1	23	2	
CPV	25	1999	2023	1797	2915	3700	0.00	Control					25
CRI	25	1999	2023	7508	10443	14026	0.00	Control					25
CUB	22	1999	2020	3896	6264	8048	1.00	Autocratic					
CYP	25	1999	2023	21350	25645	30769	0.00	Control					25
CZE	25	1999	2023	11806	16636	20237	0.00	Control					25
DEU	25	1999	2023	33559	38924	43361	0.00	Control					25

(Continued overleaf.)

Table A-1: Sample makeup (1999-2023) — continued

				GDPpc			Regime Change (ROW definition)						
ISO	Obs	Start	End	Min	Mean	Max	Share	Type	Flips	Auto	Exp	NExp	Control
DJI	11	2013	2023	2167	2670	3123	1.00	Autocratic					
DNK	25	1999	2023	47622	53268	61032	0.00	Control					25
DOM	25	1999	2023	4051	6084	8856	0.00	Control					25
DZA	25	1999	2023	3486	4369	4829	1.00	Autocratic					
ECU	25	1999	2023	3973	5217	6166	0.00	Control					25
EGY	25	1999	2023	2416	3213	4178	1.00	Autocratic					
ERI	13	1999	2011	650	750	839	1.00	Autocratic					
ESP	25	1999	2023	22847	25905	28088	0.00	Control					25
EST	25	1999	2023	9091	16129	21525	0.00	Control					25
ETH	25	1999	2023	251	515	890	1.00	Autocratic					
FIN	25	1999	2023	35891	43194	46655	0.00	Control					25
FJI	25	1999	2023	4001	4645	5709	0.80	Treated	4	2	20	5	
FRA	25	1999	2023	32547	36120	38976	0.00	Control					25
GAB	25	1999	2023	6295	6957	7959	1.00	Autocratic					
GBR	25	1999	2023	37441	43416	47343	0.00	Control					25
GEO	25	1999	2023	1503	3445	6087	0.28	Treated	3	1	7	18	
GHA	25	1999	2023	1009	1503	2066	0.00	Control					25
GIN	25	1999	2023	618	762	1040	1.00	Autocratic					
GMB	25	1999	2023	605	654	708	0.76	Treated	3	1	19	6	
GNB	25	1999	2023	573	638	752	0.84	Treated	2	1	21	4	
GNQ	25	1999	2023	3487	8967	14223	1.00	Autocratic					
GRC	25	1999	2023	17283	19998	24073	0.00	Control					25
GTM	25	1999	2023	3160	3749	4596	0.04	Democratiser					
GUY	25	1999	2023	3788	6496	23325	0.00	Control					25
HKG	25	1999	2023	25238	37334	45280	1.00	Autocratic					
HND	25	1999	2023	1694	2130	2540	0.52	Treated	2	1	13	12	
HRV	25	1999	2023	8538	12317	17234	0.04	Democratiser					
HTI	25	1999	2023	1210	1341	1431	1.00	Autocratic					
HUN	25	1999	2023	8561	12214	16345	0.24	Treated	1	1	6	19	
IDN	25	1999	2023	1784	2888	4248	0.00	Control					25
IND	25	1999	2023	741	1355	2239	0.28	Treated	1	1	7	18	
IRL	25	1999	2023	38835	57842	97317	0.00	Control					25
IRN	25	1999	2023	3772	4970	5740	1.00	Autocratic					
IRQ	25	1999	2023	2228	4008	4904	1.00	Autocratic					
ISL	25	1999	2023	40726	50736	58393	0.00	Control					25
ISR	25	1999	2023	27704	34161	42711	0.00	Control					25
ITA	25	1999	2023	29375	32075	34081	0.00	Control					25
JAM	25	1999	2023	4770	5135	5440	0.00	Control					25
JOR	25	1999	2023	3561	4199	4921	1.00	Autocratic					
JPN	25	1999	2023	30636	33805	37079	0.00	Control					25
KAZ	25	1999	2023	4037	8826	11701	1.00	Autocratic					
KEN	25	1999	2023	1165	1407	1814	0.60	Treated	5	2	15	10	
KGZ	25	1999	2023	689	991	1264	1.00	Autocratic					
KHM	25	1999	2023	452	985	1553	1.00	Autocratic					
KOR	25	1999	2023	15714	25630	34121	0.00	Control					25
KWT	25	1999	2023	25353	32057	41161	1.00	Autocratic					
LAO	25	1999	2023	882	1738	2660	1.00	Autocratic					
LBN	25	1999	2023	5971	7347	9037	1.00	Autocratic					
LBR	25	1999	2023	534	648	771	0.28	Democratiser					
LBY	25	1999	2023	4042	10543	13729	0.96	Treated	2	1	24	1	

(Continued overleaf.)

Table A-1: Sample makeup (1999-2023) — continued

				GDPpc			Regime Change (ROW definition)						
ISO	Obs	Start	End	Min	Mean	Max	Share	Type	Flips	Auto	Exp	NExp	Control
LKA	25	1999	2023	1909	3228	4496	0.44	Treated	4	2	11	14	
LSO	25	1999	2023	702	943	1140	0.16	Democratiser					
LTU	25	1999	2023	6151	12532	18535	0.00	Control					25
LUX	25	1999	2023	87695	103809	112418	0.00	Control					25
LVA	25	1999	2023	6303	12263	17015	0.00	Control					25
MAR	25	1999	2023	1925	2765	3371	1.00	Autocratic					
MDA	25	1999	2023	1316	2459	3688	0.20	Treated	2	1	5	20	
MDG	25	1999	2023	415	461	501	0.84	Treated	5	3	21	4	
MDV	25	1999	2023	6646	8841	11535	0.64	Treated	3	1	16	9	
MEX	25	1999	2023	9152	9765	10343	0.00	Control					25
MKD	25	1999	2023	3155	4650	6350	0.36	Treated	3	1	9	16	
MLI	25	1999	2023	557	693	779	0.32	Treated	3	2	8	17	
MLT	25	1999	2023	14456	22237	31190	0.00	Control					25
MMR	25	1999	2023	264	854	1430	1.00	Autocratic					
MNE	18	2006	2023	5436	6634	8375	0.78	Treated	3	1	19	-1	
MNG	25	1999	2023	1554	3035	4484	0.00	Control					25
MOZ	25	1999	2023	293	491	613	1.00	Autocratic					
MRT	25	1999	2023	1215	1475	1636	1.00	Autocratic					
MUS	25	1999	2023	5293	8234	11319	0.04	Treated	1	1	1	24	
MWI	25	1999	2023	388	492	573	0.44	Treated	4	2	11	14	
MYS	25	1999	2023	6089	8670	11691	0.96	Democratiser					
NAM	25	1999	2023	3047	4095	4966	0.00	Control					25
NER	25	1999	2023	389	455	547	0.16	Treated	4	2	4	21	
NGA	25	1999	2023	1429	2216	2680	0.64	Treated	2	1	16	9	
NIC	25	1999	2023	1393	1782	2185	0.68	Treated	1	1	17	8	
NLD	25	1999	2023	39106	44682	50547	0.00	Control					25
NOR	25	1999	2023	66095	73785	79435	0.00	Control					25
NPL	25	1999	2023	524	780	1092	0.48	Treated	3	1	12	13	
NZL	25	1999	2023	30164	36714	42321	0.00	Control					25
OMN	25	1999	2023	17662	19557	22880	1.00	Autocratic					
PAK	25	1999	2023	1042	1348	1697	1.00	Autocratic					
PAN	25	1999	2023	6925	11116	16294	0.00	Control					25
PER	25	1999	2023	3242	5106	6550	0.08	Democratiser					
PHL	25	1999	2023	1794	2622	3668	0.48	Treated	3	2	12	13	
PNG	25	1999	2023	1832	2199	2603	0.68	Treated	1	1	17	8	
POL	25	1999	2023	6951	11366	17270	0.00	Control					25
PRT	25	1999	2023	18232	19734	22378	0.00	Control					25
PRY	25	1999	2023	3898	5177	6415	0.00	Control					25
QAT	24	1999	2022	50851	61324	73493	1.00	Autocratic					
ROU	25	1999	2023	4452	8231	12386	0.00	Control					25
RUS	25	1999	2023	4819	8421	10421	1.00	Autocratic					
RWA	25	1999	2023	315	622	994	1.00	Autocratic					
SAU	25	1999	2023	15672	18786	21479	1.00	Autocratic					
SDN	25	1999	2023	879	1268	1449	1.00	Autocratic					
SEN	25	1999	2023	1061	1221	1476	0.00	Control					25
SGP	25	1999	2023	32557	49843	67949	1.00	Autocratic					
SLB	25	1999	2023	1528	1976	2218	0.20	Treated	4	2	5	20	
SLE	25	1999	2023	354	547	749	0.24	Treated	4	2	6	19	
SLV	25	1999	2023	2941	3544	4442	0.12	Treated	1	1	3	22	
SRB	18	2006	2023	4648	5890	7736	0.56	Treated	2	1	12	6	

(Continued overleaf.)

Table A-1: Sample makeup (1999-2023) — continued

				GDPpc			Regime Change (ROW definition)						
ISO	Obs	Start	End	Min	Mean	Max	Share	Type	Flips	Auto	Exp	NExp	Control
STP	25	1999	2023	962	1218	1423	0.00	Control					25
SUR	25	1999	2023	6081	7815	9387	0.00	Control					25
SVK	25	1999	2023	8800	14368	19217	0.00	Control					25
SVN	25	1999	2023	15712	20778	25643	0.00	Control					25
SWE	25	1999	2023	39310	48661	55894	0.00	Control					25
SWZ	25	1999	2023	2398	3238	4175	1.00	Autocratic					
SYC	25	1999	2023	10412	14076	19482	0.64	Democratiser					
SYR	23	1999	2021	745	1155	1553	1.00	Autocratic					
TCD	25	1999	2023	379	623	778	1.00	Autocratic					
TGO	25	1999	2023	618	736	922	1.00	Autocratic					
THA	25	1999	2023	3395	5116	6454	0.72	Treated	1	1	18	7	
TJK	25	1999	2023	403	850	1441	1.00	Autocratic					
TKM	25	1999	2023	2177	4910	8906	1.00	Autocratic					
TLS	21	2003	2023	881	1279	2059	0.00	Control					21
TTO	25	1999	2023	9328	15001	18776	0.00	Control					25
TUN	25	1999	2023	2729	3604	4095	0.60	Treated	2	1	15	10	
TUR	25	1999	2023	5994	9584	14630	0.44	Treated	1	1	11	14	
TZA	25	1999	2023	543	821	1081	1.00	Autocratic					
UGA	25	1999	2023	509	756	956	1.00	Autocratic					
UKR	25	1999	2023	1328	2163	2599	0.72	Treated	4	2	18	7	
URY	25	1999	2023	9725	14368	18109	0.00	Control					25
USA	25	1999	2023	47234	55088	65020	0.00	Control					25
UZB	25	1999	2023	1247	2290	3604	1.00	Autocratic					
VNM	25	1999	2023	1121	2261	3817	1.00	Autocratic					
VUT	25	1999	2023	2377	2650	2839	0.00	Control					25
YEM	25	1999	2023	976	1889	2548	1.00	Autocratic					
ZAF	25	1999	2023	4589	5766	6263	0.00	Control					25
ZMB	25	1999	2023	806	1131	1347	0.64	Treated	3	1	16	9	
ZWE	25	1999	2023	825	1313	1747	1.00	Autocratic					
Total	4,169	1999	2023	9,677	12,370	15,119	0.46		2.54	1.33	12.62	12.03	24.94

Notes: We present the makeup of our sample (N=169) for the ROW definition of democratic collapse. ISO is the 3-digit isocode for the country, Start and End indicate the start and end years for the country time series, the next three columns detail the per capita GDP (in real 2015 US$). The remaining columns all refer to the ROW definition of regime change: Share indicates the share of years a country was in autocracy; Type allocates the country to one of four groups/subsamples: 'Treated' – experienced regime collapse; 'Control' – remained democratic throughout the sample period; 'Autocratic' – remained autocratic throughout the sample period (discarded); 'Democratiser' – switched from autocracy to democracy only (discarded). 'Flips' counts the number of times the country crossed the ROW threshold value of 2, 'Auto' the number of regime collapses; 'Exp' sums the years a treated country spent in autocracy, 'NExp' sums the years a treated country spent in democracy. Finally, 'Control' sums the number of years the control country spent in democracy (equals 'obs' for this set of countries).

Table A-2: Democratic Breakdown: Index Thresholds and Sample Sizes

Definition	M$-\frac{1}{4}$sd	M$-\frac{1}{8}$sd	Mean	M$+\frac{1}{8}$sd	M$+\frac{1}{4}$sd	sd
Liberal Democracy						
Index	0.289	0.323	0.358	0.392	0.427	0.275
Treated Countries	34	33	35	37	37	
Observations	843	818	861	911	907	
Control Countries	73	69	61	57	52	
Observations	1,814	1,714	1,521	1,421	1,300	
Polyarchy						
Index	0.385	0.420	0.455	0.491	0.526	0.283
Treated Countries	40	40	43	39	39	
Observations	991	993	1,068	961	936	
Control Countries	77	74	67	65	62	
Observations	1,914	1,839	1,664	1,621	1,546	
Liberal Component						
Index	0.494	0.529	0.565	0.600	0.636	0.284
Treated Countries	28	29	29	32	31	
Observations	700	725	718	792	768	
Control Countries	88	83	78	72	69	
Observations	2,181	2,056	1,938	1,789	1,714	
Freedom of Expression						
Index	0.506	0.546	0.586	0.626	0.666	0.320
Treated Countries	22	30	36	45	53	
Observations	541	741	892	1,116	1,316	
Control Countries	106	102	94	83	71	
Observations	2,639	2,539	2,339	2,064	1,764	
Freedom of Association						
Index	0.491	0.532	0.573	0.613	0.654	0.325
Treated Countries	26	26	28	31	34	
Observations	648	648	698	772	830	
Control Countries	112	108	102	95	85	
Observations	2,782	2,682	2,532	2,357	2,114	
Free and Fair Elections						
Index	0.385	0.428	0.472	0.515	0.559	0.348
Treated Countries	44	42	40	34	34	
Observations	1,083	1,036	986	836	836	
Control Countries	78	78	72	67	61	
Observations	1,946	1,946	1,796	1,671	1,521	

(Continued overleaf)

Table A-2: Democratic Breakdown: Index Thresholds and Sample Sizes (cont'd)

Definition	M$-\frac{1}{4}$sd	M$-\frac{1}{8}$sd	Mean	M$+\frac{1}{8}$sd	M$+\frac{1}{4}$sd	sd
Rule of Law						
Index	0.554	0.589	0.625	0.661	0.697	0.287
Treated Countries	29	29	30	34	35	
Observations	724	725	750	850	874	
Control Countries	99	92	88	84	75	
Observations	2,456	2,281	2,181	2,081	1,857	
Judicial Constraints						
Index	0.494	0.532	0.571	0.609	0.647	0.306
Treated Countries	26	32	34	33	40	
Observations	642	793	843	825	989	
Control Countries	89	81	73	70	64	
Observations	2,213	2,013	1,813	1,738	1,592	
Legislative Constraints						
Index	0.456	0.496	0.535	0.575	0.615	0.317
Treated Countries	40	39	39	41	43	
Observations	990	972	968	1011	1061	
Control Countries	84	80	74	69	63	
Observations	2,089	1,989	1,843	1,725	1,575	

Notes: We present the cutoffs applied to the various high-, mid-, and low-level democracy/political institution indices to create dichotomous variables. We also report the sample sizes for treated and control groups. Each V-Dem index nominally ranges from 0 to 1.

B Investigating Heterogeneity: Democratic Capital Stock, State Capacity, and Violent Conflict

Our main results are based on PCDID specifications without additional control variables and further do not distinguish ATETs or running line predictions between different 'types' of countries experiencing democratic collapse.

In this section, we investigate both the robustness as well as the heterogeneity of our findings, guided by contributions to the existing literature. We study the implications of democratic capital stock (e.g. Persson & Tabellini 2009), state capacity (e.g. Besley & Persson 2010) and violent conflict (e.g. Mac Ginty & Williams 2016) for our empirical findings.

We do so in three distinct ways: first, we study the distribution of each of these three aspects over the 1999-2023 period and crudely divide our treatment sample countries in two groups of 'high(er)' and 'low(er)' capital stock/state capacity/conflict propensity. We then plot the running line predictions within each of these subsamples alongside that of the full sample, adopting the country-specific treatment estimates for polyarchy (like in Figure 3). This analysis answers the question whether countries with limited capital stock/state capacity or latent violent conflict have very different treatment effects from better-endowed, 'safer' countries.

Second, we re-estimate our PCDID model for polyarchy (using the mean cutoff as well as the alternative definitions of regime collapse) with democratic capital/state capacity/conflict deaths as additional control variable. We then present the results in prediction plots adopting the running line regressions as in Figure 3. This analysis answers the question whether the relationship between the autocratic loss and years since regime collapse are substantially altered (weakened, strengthened) if we control for the respective determinant (democratic capital, state capacity, conflict).

Third, we drill down to our most striking results in the third tier of institutions, namely those for 'free and fair elections', re-estimating our PCDID models including with the respective control variable as in the case of polyarchy just described. We present all ATETs (for five definitions of regime collapse and six factor augmentations) in graphs as in Figure 4. This analysis asks whether our finding of the key role played by clean elections is strengthened or undermined or unchanged by these robustness checks.

In the following, we first motivate each of the additional factors based on the existing literature, describe the data sources and transformations applied, and report the corresponding empirical results.

Democratic Capital We use data for the V-Dem polyarchy (respectively, clean elections) index and the perpetual inventory method to construct democratic capital stock from a start year of 1960, adopting a depreciation rate of 1% (following Persson & Tabellini 2009). The sample split is applied at a maximum capital stock of 20 and results for the predictions of the running line regressions by sub-sample are presented in panel (a) of Figure B-1. As can be seen, the 'low' and 'high' capital stock initially are next to identical, before some divergence for 16-20 years after regime collapse. However, since the latter is driven by a mere handful of treatment estimates, the general impression is still one of limited heterogeneity between these two 'types' in the impact of regime collapse on economic prosperity.

In panel (b) of the same Figure we report the running line plots based on PCDID regressions for different thresholds of the polyarchy index where democratic capital stock is an additional control variable — all results presented are for models augmented with three estimated factors. In comparison with the benchmark results in Figure 3, panel (b), it is clear that democratic capital significantly attenuates the 'autocratic loss', which is now statistically insignificant for all 'treatment lengths' in virtually all iterations presented.

However, this significant attenuation does not appear to extend to our analysis of the lower-tier building blocks of polyarchy: the results for 'clean elections' from the PCDID models conditioning on democratic capital in panel (d) of the Figure are qualitatively unchanged from those in our benchmark results (without additional controls), reprinted in panel (c) for ease of comparison.

State Capacity We build on O'Reilly & Murphy (2022) and construct a measure of state capacity as the first principal component of two V-Dem indices (for 1999-2023) which we first standardize: 'State fiscal source of revenue' and 'State authority over territory'.[13] We again begin by splitting countries into two groups on the basis of their maximum state capacity over the 1999-2023 period. Figure B-2, panel (a), shows that the graphs for the two subsamples are closely matched until (as in the democratic capital case) some divergence beyond 16 years since regime collapse (which is albeit statistically insignificant).

Adding our state capacity measure as additional control in heterogeneous difference-in-differences regressions yields a stronger effect for 'autocratic loss' in case of the polyarchy definition, presented in panel (b). Effects are insignificant in the first few years, then rise to around -2% after a decade since regime collapse, further increasing in absolute magnitude after a decade and a half.

Finally, results for clean elections when conditioning on state capacity, presented in panel (d) are again qualitatively very similar to the benchmark results in panel (c).

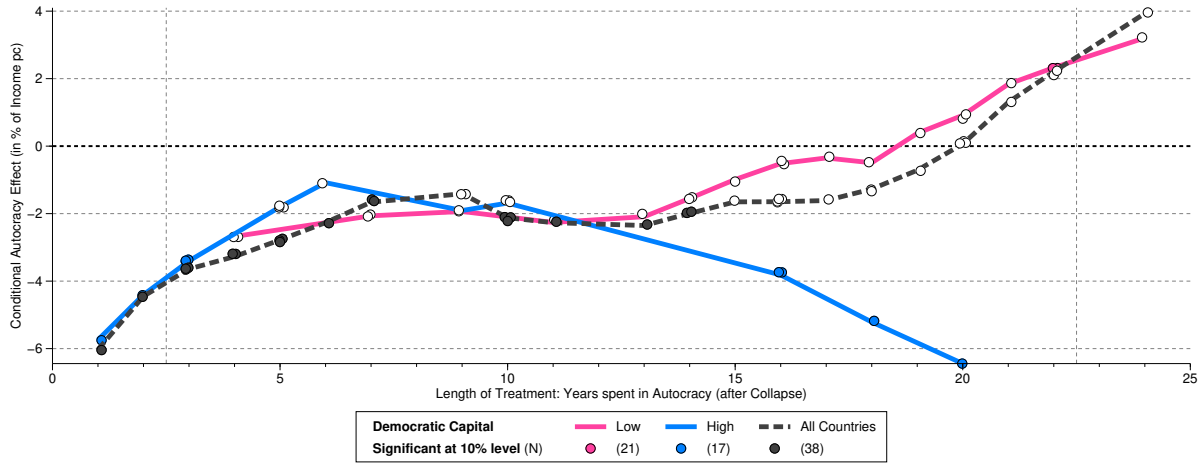
Democratic Peace, Autocratic Conflict? We adopt the count of deaths among civilians and agents of the state from the UCDP Organized Violence within Country Borders dataset (Sundberg & Melander 2013, Davies et al. 2024, version 24.1). In panel (a) of Figure B-3 we split treated countries into two groups, on the basis of whether they have at least one year with 100 or more casualties ('high' conflict deaths). As can be seen, the prediction plots from running line regressions for the two subgroups match each other almost perfectly.

Conditioning on the count of conflict deaths in PCDID regressions adopting the polyarchy variable yields results not dissimilar to those in the benchmark results without controls presented above: the prediction plots in panel (b) of Figure B-3 indicate statistically significant negative effects in the early years after regime collapse, but then converge to zero — for many years after regime collapse there is even a suggestion of positive significant effects!

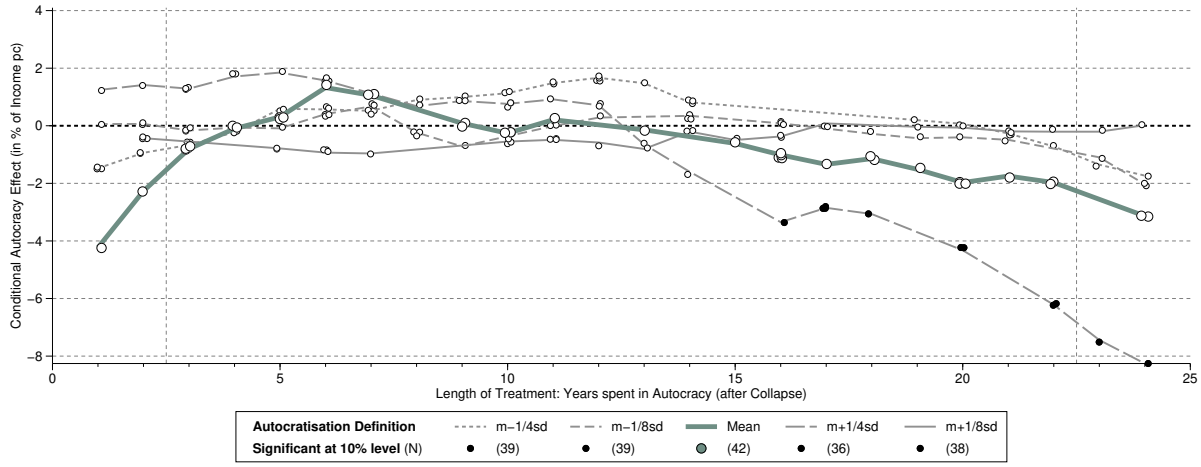
[13] Our approach deviates from these authors in two important ways: first, we only select the two most prominent elements of common definitions of state capacity related to the ability to raise taxes and the ability to defend the territory, while O'Reilly & Murphy (2022) *inter alia* also adopt the 'rule of law' index which would interfere with our notion of lower-tier building blocks of liberal democracy; second, we apply PCA to data for the time period under analysis, rather than the entire period for which data are available (from the 1780s onwards).

Figure B-1: Democratic Collapse and Democratic Capital — PCDID Results (1999-2023)

(a) Polyarchy: Estimates by High/Low Democratic Capital Stock 'Type'

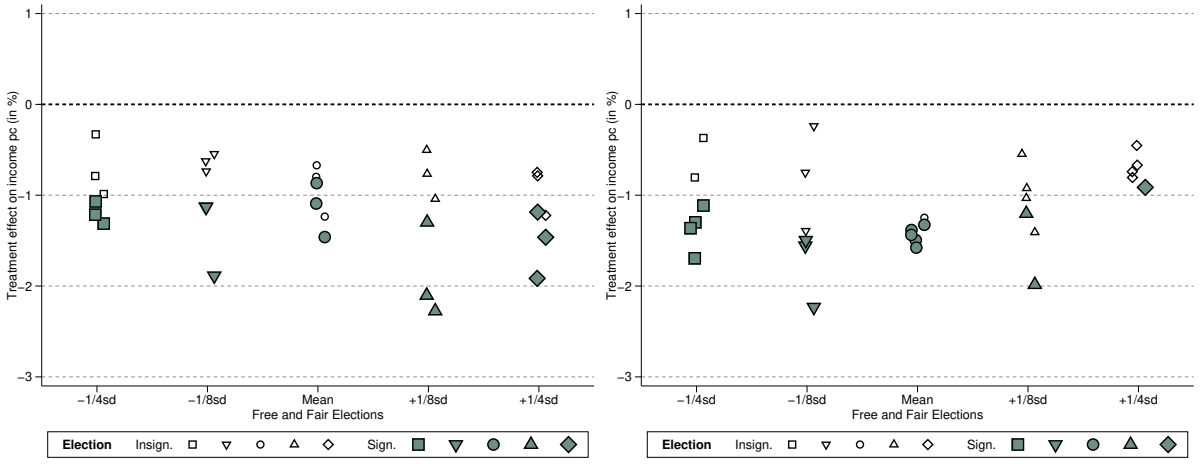


(b) Polyarchy: Conditioning on Democratic Capital



(c) Clean Elections: Benchmark

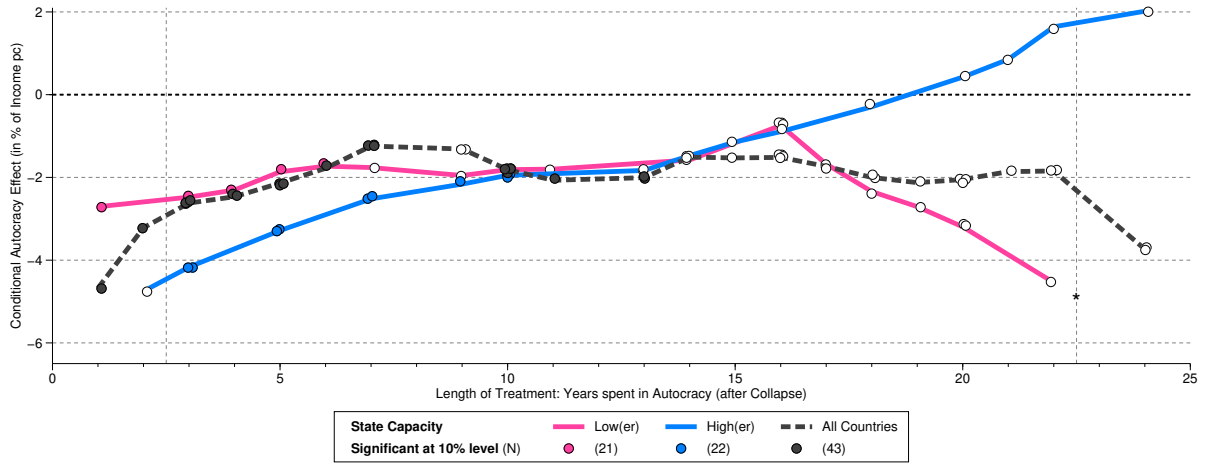
(d) dto., Conditioning on Democratic Capital



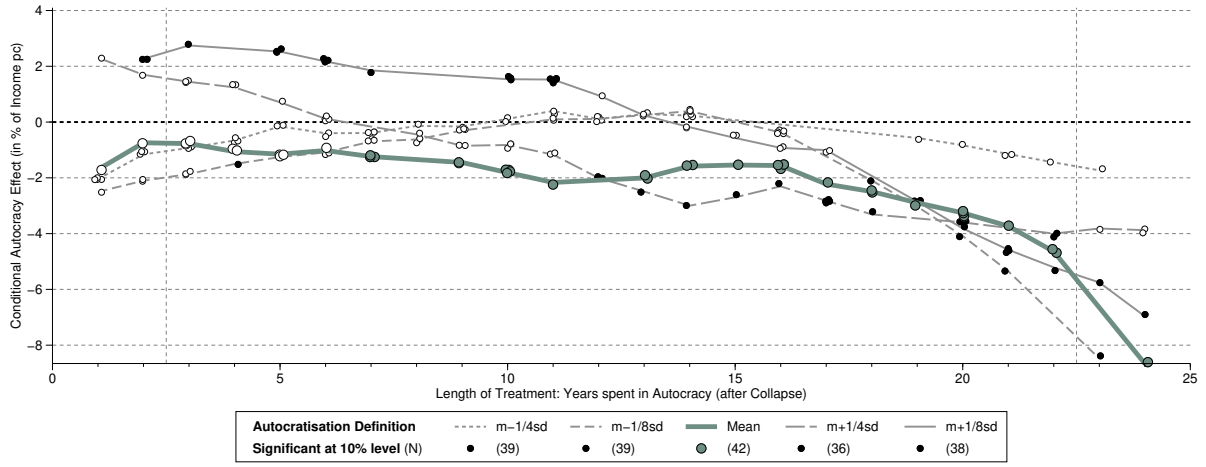
Notes: We present predictions from multivariate running line regressions illustrating the economic effect (income per capita) of democratic breakdown. Ib panel (a) we split the results by conflict incidence: countries with at least one year if 100 conflict deaths since 1999 and those with fewer or none. In panel (b) we include the conflict death variable as additional control in the PCDID regressions. The number of years since collapse are shown on the x-axis, the economic effect on the y-axis. We control for (i) the unbalancedness of the panel, and (ii) the number of times a country flipped between regimes. We exclude outliers which are given a zero weight in the full sample mean estimate using an M-estimator. A filled (white) marker indicates statistical (in)significance at the 10% level.

Figure B-2: Democratic Collapse and State Capacity — PCDID Results (1999-2023)

(a) Polyarchy: Estimates by Latent State Capacity Type

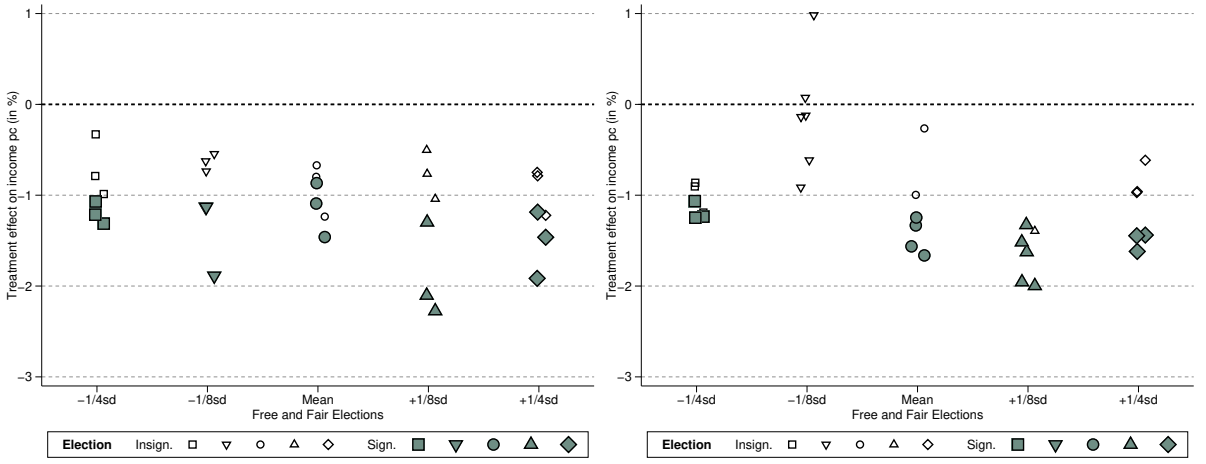


(b) Polyarchy: Conditioning on State Capacity



(c) Clean Elections: Benchmark

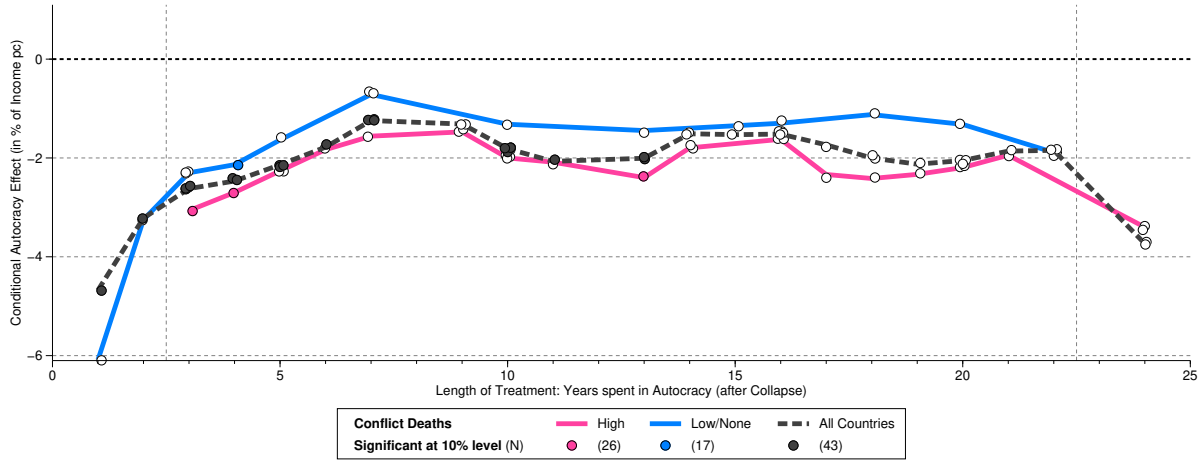
(d) dto., Conditioning on State Capacity



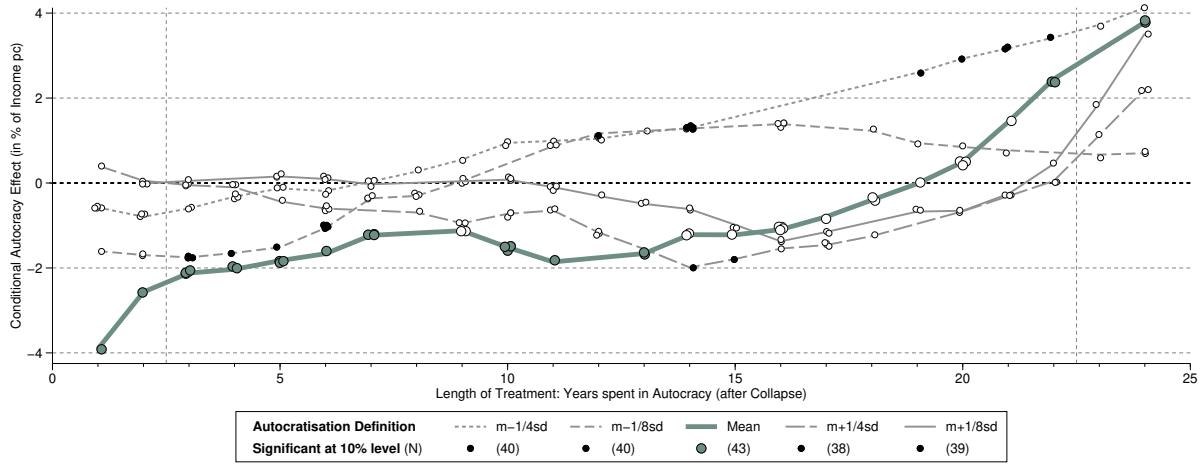
Notes: We present predictions from multivariate running line regressions illustrating the economic effect (income per capita) of democratic breakdown. Ib panel (a) we split the results by conflict incidence: countries with at least one year if 100 conflict deaths since 1999 and those with fewer or none. In panel (b) we include the conflict death variable as additional control in the PCDID regressions. The number of years since collapse are shown on the x-axis, the economic effect on the y-axis. We control for (i) the unbalancedness of the panel, and (ii) the number of times a country flipped between regimes. We exclude outliers which are given a zero weight in the full sample mean estimate using an M-estimator. A filled (white) marker indicates statistical (in)significance at the 10% level. * For ease of presentation we exclude one negative, insignificant prediction.

Figure B-3: Democratic Collapse and Conflict — PCDID Results (1999-2023)

(a) Polyarchy: Estimates by Latent Conflict Type

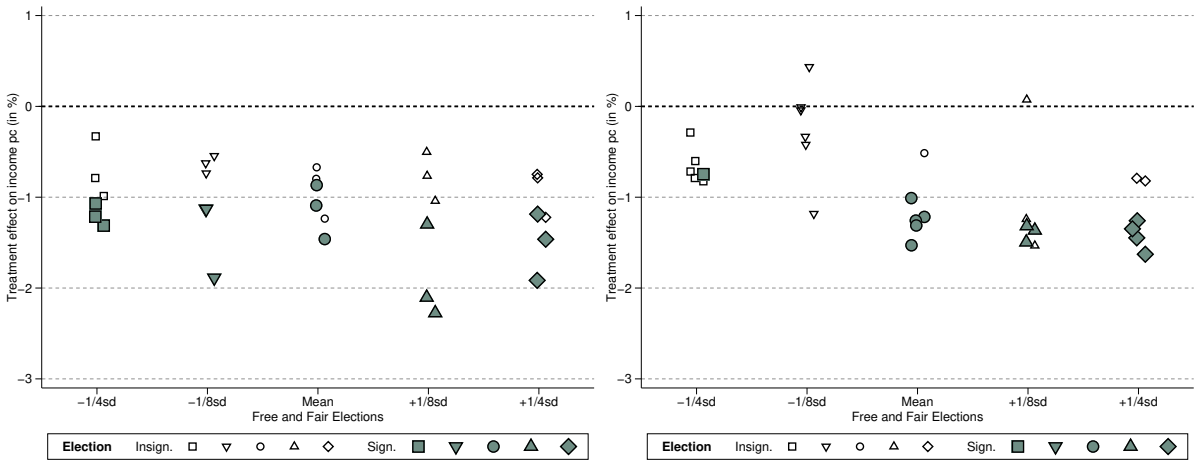


(b) Polyarchy: Conditioning on Conflict Deaths



(c) Clean Elections: Benchmark

(d) dto., Conditioning on Conflict Deaths



Notes: We present predictions from multivariate running line regressions illustrating the economic effect (income per capita) of democratic breakdown. Ib panel (a) we split the results by conflict incidence: countries with at least one year if 100 conflict deaths since 1999 and those with fewer or none. In panel (b) we include the conflict death variable as additional control in the PCDID regressions. The number of years since collapse are shown on the x-axis, the economic effect on the y-axis. We control for (i) the unbalancedness of the panel, and (ii) the number of times a country flipped between regimes. We exclude outliers which are given a zero weight in the full sample mean estimate using an M-estimator. A filled (white) marker indicates statistical (in)significance at the 10% level.

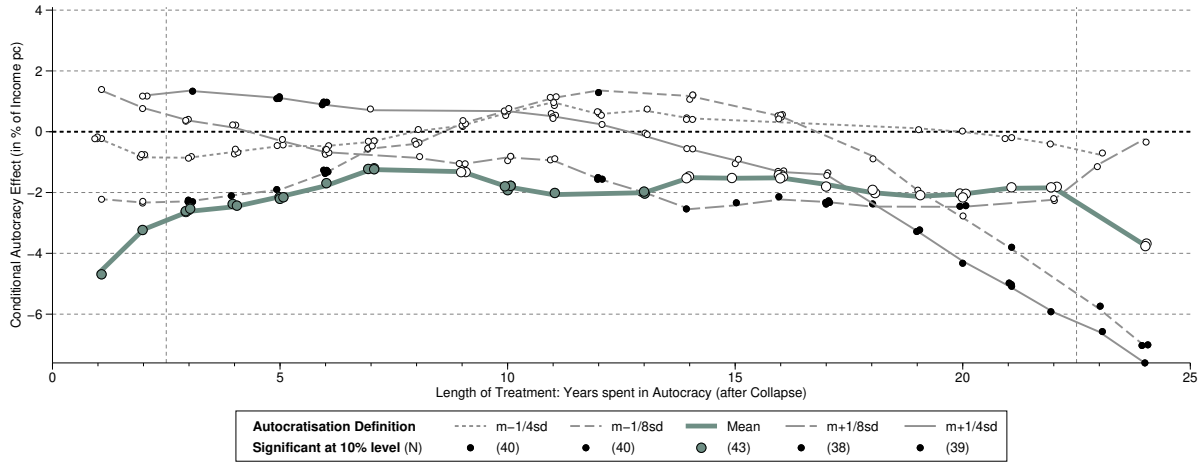
Turning to the PCDID results for clean elections conditioning on conflict deaths in panel (d) once again demonstrates the robustness of our baseline result, reprinted in panel (c).

Concluding remarks on robustness Taken together, the above results find little evidence for heterogeneous treatment effects based on the three factors investigated. The analysis of polyarchy in the context of adding the respective factor as an additional control in the PCDID regressions yields mixed results, weakening (democratic capital), strengthening (state capacity) and not altering (conflict deaths) the treatment effects. Most notably, when studying the robustness of treatment effects of a collapse in 'clean elections', none of the three factors included as additional controls substantially change our result patterns.

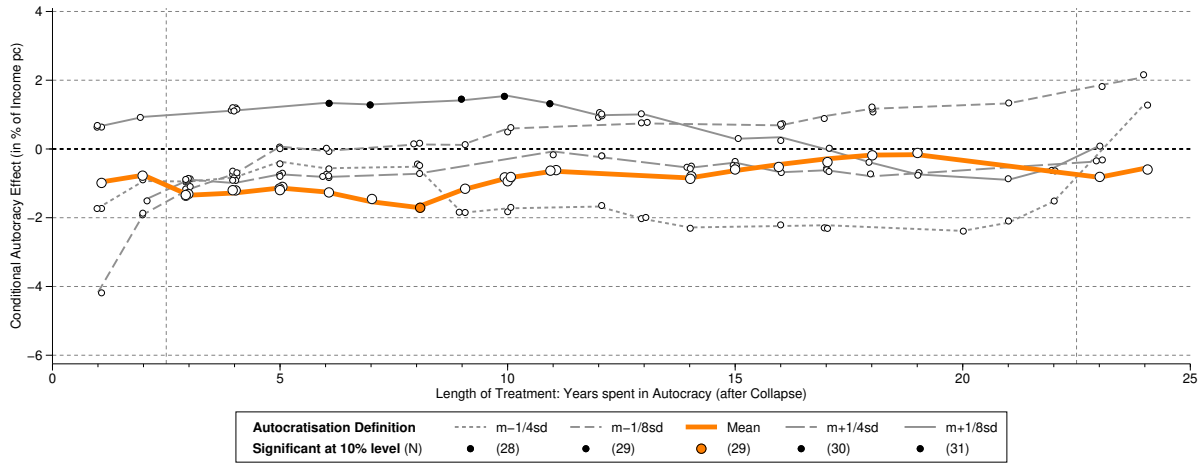
C Alternative Breakdown Definitions & PCDID specifications

Figure C-1: Democratic Breakdown and Economic Decline — PCDID Results (1999-2023)

(a) Mid-Level Democracy Index: Treatment Effects for **Polyarchy** (various thresholds)



(b) Mid-Level Democracy Index: Treatment Effects for the **Liberal Component Index** (various thresholds)



Notes: We present predictions from multivariate running line regressions illustrating the economic effect (income per capita) of democratic breakdown. All specifications presented augment the treatment regression with three estimated factors. The number of years since democratic breakdown are shown on the x-axis, the economic effect on the y-axis. We control for (i) the unbalancedness of the panel, and (ii) the number of times a country flipped between regimes. We exclude outliers which are given a zero weight in the full sample mean estimate using an M-estimator. In panel (a) we use *mean* thresholds for liberal democracy, polyarchy and the liberal component (index mean for 1960-2023), in panels (b) and (c) we provide alternative thresholds for the latter two: mean $\pm$ 1/8 or 1/4 of the standard deviation of the index (over 1960-2023). A filled (white) marker indicates statistical (in)significance at the 10% level.

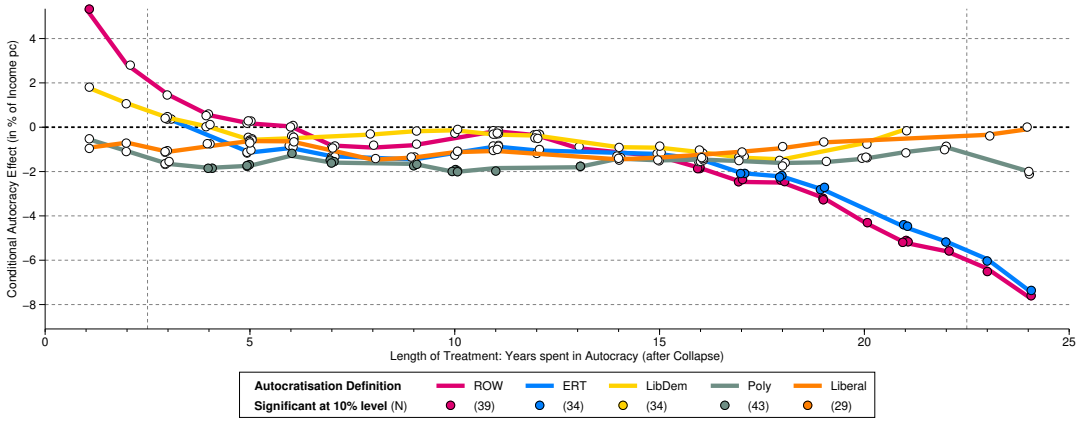
Table C-1: Democratic Breakdown: Alternative Autocracy Indicators (1999-2018/2020)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Variations on Autocracy						
Definition	ROW	ERT	LibDem	Poly	Liberal	BMR	PolityV
Regime Collapse	-2.183***	-2.386***	-0.736	-1.505**	-2.263***	-0.384	-1.717*
	[0.721]	[0.882]	[0.619]	[0.707]	[0.704]	[0.890]	[0.892]
Final Year	2020	2020	2020	2020	2020	2020	2018
Treated Countries	34	30	31	39	24	19	18
Observations	734	646	668	851	528	418	359
Control Countries	66	66	62	69	80	69	68
Observations	1448	1448	1360	1507	1742	1518	1347
Alpha t-statistic	0.989	2.037	3.359	1.258	0.182	-0.731	0.284
Alternative specifications							
1 Factor	-1.935*	-1.806	0.760	-1.382	-1.541	1.038	-1.083
2 Factors	-1.260	-1.198	0.597	-0.875	-1.007	0.348	-0.841
3 Factors	-2.183***	-2.386***	-0.736	-1.505**	-2.263***	-0.384	-1.717*
4 Factors	-1.021	-0.730	-0.924	-1.250**	-0.885	-0.546	-1.727**
5 Factors	-0.587	-0.496	-0.962*	-1.148**	-0.288	0.035	-1.746***
6 Factors	-0.660	-0.469	-0.677	-0.982*	-0.648	-0.206	-2.095***

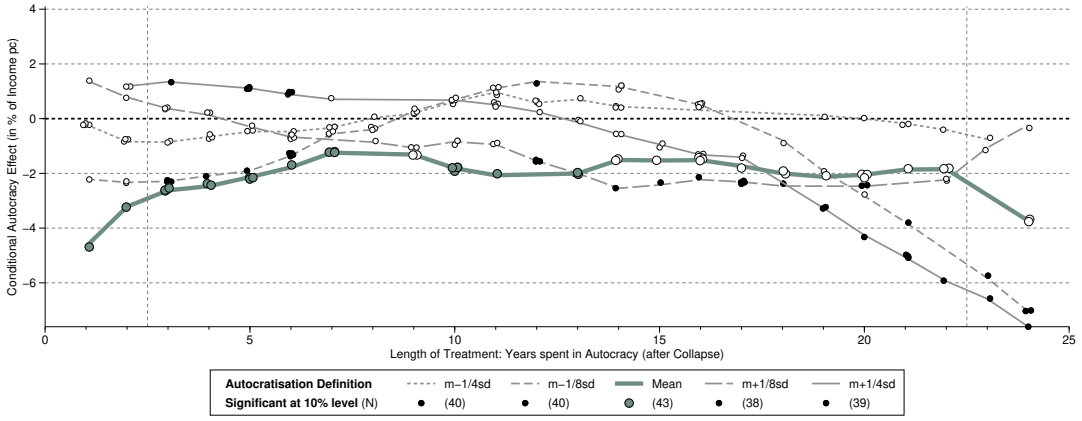
Notes: We present robust mean estimates from PCDID regressions of democratic breakdown, where the shift from democracy to autocracy is defined in different ways as indicated. We introduce results based on the Boix et al. (BMR, 2013, version 4) definition of autocracy in column (6) and for the cut-off of ≤ 5 in the Marshall et al. (2017) Polity V variable polity2 in column (7). All models presented revise the sample to the 1999-2020 time period available for BMR, with the exception of the PolityV one which ends in 2018. For all other details see Tables 1 and 2 in the maintext.

Figure C-2: The Retreat of Democracy and Economic Decline — PCDID Results with 4 factors (1999-2023)

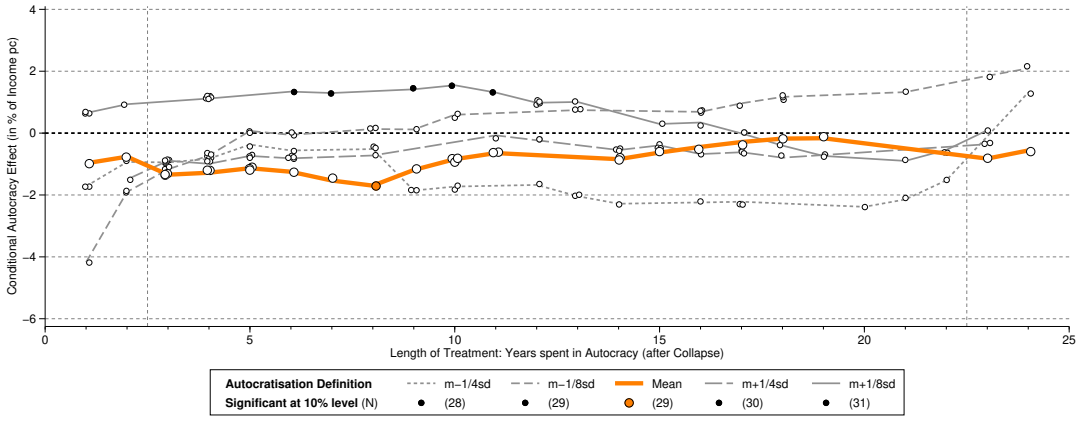
(a) Democratic Breakdown: Treatment Effects using Mean Index Thresholds



(b) Democratic Breakdown: Treatment Effects for Polyarchy (various thresholds)



(c) Democratic Breakdown: Treatment Effects for the Liberal Component (various thresholds)



Notes: We present predictions from multivariate running line regressions illustrating the economic effect (income per capita) of democratic breakdown. The number of years since democratic breakdown are shown on the x-axis, the economic effect on the y-axis. For all other details see notes to Figure 3 in the maintext.