

Appendix for “Schools of Thought: Leader Education and Policy Outcomes”

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This appendix provides additional information to supplement that of the main manuscript, and is divided into five sections. First, we provide information as to how the original leader education data were constructed. Second, we present a correlation matrix of our dependent variables to demonstrate that they are capturing different policies. Third, we address whether our main results are sensitive to the inclusion of military schools. Fourth, we provide a thorough discussion of potential endogeneity and present results, using a variety of research designs, to demonstrate that our results are robust. Finally, we discuss model fit and outliers from our main analyses.

1 Data Construction

The data include all non-OECD countries—with state membership defined using the Correlates of War state membership criteria (Correlates of War Project 2017). We use the Archigos dataset (Goemans, Gleditsch, and Chiozza 2009) to identify state leaders. A team of research assistants used this list to gather education data for each leader. The research assistants were asked to record (1) the university attended, (2) the type of degree earned (e.g., bachelor's, masters), (3) the university type (e.g., educational, military), and (4) the subject studied.

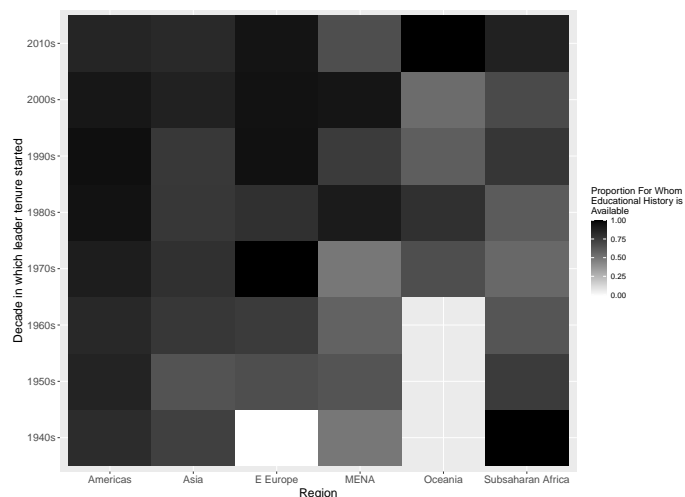
Multiple research assistants independently searched for information on leaders' educational history using a variety of sources. Most common sources included print or online encyclopedias, history books, biographies, obituaries, and newspaper articles. Other sources included government web pages, websites of various NGOs, IGOs, and sometimes of the leaders themselves. Information on the same set of leaders was independently coded by multiple coders. Discrepancies among coders were resolved by further searches by the two primary investigators.

The resulting dataset contains the following variables: Archigos observation number, leader name, the name and three letter abbreviation of the state where the leader led the government, the name of the leader's tertiary institution, the type of tertiary institution (educational, military, religious, vocational), the country name and three letter abbreviation hosting each leader's educational institution, and leaders' subject of study. We include only educational tertiary institutions in our educational model analysis, and educational and military in our specialization model, with religious and vocational excluded due to their lack of emphasis on classical liberal norms and values. Several leaders earned more than one major, or earned advanced degrees in majors other than that of their undergraduate degree. For the purposes of testing our theory, we code these leader's institutions and majors by selecting the institution/major that associated with the greatest exposure to the classical liberal norms and values (out of the institutions/majors they attended/studied). For example, Nyerere of Tanzania, who earned an undergraduate degree in education from Makerere College, Uganda, and an MA in economics and history from Edinburgh, UK, is coded as having an Anglo-American education in the field of economics.

The distribution of leaders educated by country features a relatively small number of countries educating many non-OECD leaders and a long tail of countries with few or no leaders educated. In decreasing order of frequency, the non-OECD leaders are educated in the US (123), the UK (104), France (53), Russia (30), India (19), Bosnia (12), Guatemala (12), Uruguay (12), Brazil (11), Ecuador (11), Romania (11), and Thailand (11), with all other countries educating 10 or fewer leaders.

Information on leaders' higher educational history was found for a large majority of leaders (80.8%), while no known educational history was found for the remaining 19.2%. A handful of sources explicitly stated that a leader did not receive higher education, which is noted accordingly in the data, but for most leaders with no known educational history, our

Figure A.1: Heat Map of Leader Education Data Availability, by Region and Decade of Leader Tenure Onset.



Note: There were no independent non-OECD Oceananic states until 1970. The only one Eastern European leader whose term began in the 1940s, Georghiu-Dej of Romania, had no confirmed tertiary education.

coders simply did not find any indications that a leader received higher education. We treat these cases as the leader having no tertiary education in our analysis. Data missingness on leaders' educational history is relatively evenly distributed over time, while the regional distribution is slightly skewed towards Oceania, sub-Saharan Africa and the Middle East/North Africa. Figure A.1 presents a heat map displaying the proportion of leaders, by region and decade in which the leader spell began, for whom higher educational history is available.

2 Correlation of Dependent Variables

Table A.1 reports the correlation matrix for the five outcome variables. The table shows that while some of the indicators have moderate correlations with one another, it is clear that there is substantial variation. While change in rule of law has a moderate positive correlation with change in democracy, the remaining variables have only relatively weak correlations to one another. These results are consistent with the observation that states do not always liberalize in all policy areas simultaneously, e.g., China.

That the indicators capture different aspects of liberalization is useful in two key ways. First, looking at multiple indicators allows us to separate our theoretical account from competing theories, meeting a call by Krmaric, Nelson, and Roberts (2020) in their recent review article on country leaders to better parse specific mechanisms. By using multiple indicators, for example, we can examine whether some fields of study have larger liberalizing effects than others, or whether spill-over effects occur outside of a leader's specialization.

Second, it is helpful to see which policy areas are most affected by education. Within the literature, for example, debate continues regarding the sequencing of liberal change. One group argues that economic liberalization leads to political liberalization and consolidation (e.g., Lipset 1959; Dahl 1971; Linz and Stepan 1996; Przeworski and Limongi 1997; Mousseau 2003; Boix 2011), while another contends that political reforms encourage economic liberalization and growth (e.g., Bueno de Mesquita et al. 2003; Acemoglu and Robinson 2006; Gerring, Thacker, and Alfaro 2012; Acemoglu et al. 2019). Within the latter, some argue that only specific institutional and legal reforms (e.g., strengthening rule of law, independent central banks) lead to economic growth, rather than broad-based democratic reform (e.g., Li and Resnick 2003; Doucouliagos and Ulubaşoğlu 2008).

The results from Tables 4 and 5 in the manuscript help shed light on how education affects these debates. Predicted probabilities from these tables indicate that educational models and specialization affect which policy areas liberalize, with the effects of specialization being conditional on the educational model. Specifically, holding all else equal, Anglo-American educations make both trade liberalization and democratic reform substantively much more likely, with the impact on financial reform and improvements in rule of law moderate more moderate. Coupling Anglo-American education with a specialization in law or economics, however, significantly increases the substantive impact in all policy areas except for financial openness.

Table A.1: Correlation Matrix of Dependent Variables

	Trade Liberalization	Rule of Law	Financial Openness	Human Rights
Rule of Law	0.039			
Financial Openness	0.370	0.042		
Human Rights	0.195	0.302	0.159	
Liberal Democracy	0.159	0.535	-0.053	0.361

3 Military Schools

We treat military educations as distinct from those tertiary institutions with a more traditional focus on education. Table A.2 reports the frequency tabulation for the 34 leaders attending military schools located in countries following the Anglo-American education model. With the possible exceptions of the US Military Academy at West Point (Nicaragua’s Somoza, 1946) and Valley Forge Military Academy and College (Bulgaria’s Saksgoburgotski, 1959), most of the remaining schools focus primarily on military training in strategy and tactics for officers—rather than traditional coursework—and have shorter programs than traditional BA/MA/PhD programs. Thus, we excluded them from the analysis in Table 4 in the article.¹

As a robustness check, we relax the distinction between military and non-military institutions in models displayed in Table A.3. Our main findings are robust to this specification. The primary differences between this model and Table 4 in the manuscript is that *Other Western Education* is now statistically significant in the *Trade liberalization* model.

Table A.2: Frequency of Anglo-American Military Schools.

Military School	Country	Frequency
Royal Military Academy Sandhurst	UK	12
Mons Officer Cadet School	UK	6
Army Command and General Staff College (Ft. Leavenworth)	US	5
Armour Centre	UK	1
Australian Joint Services Staff College	AUL	1
Britannia Royal Naval College	UK	1
International Military Education and Training	US	1
Inter-American Defense College	US	1
Royal College of Defence Studies	UK	1
Royal Naval Gunnery School	UK	1
United States Army War College	US	1
United States Military Academy at West Point	US	1
Valley Forge Military Academy and College	US	1
Armored Cavalry School at Fort Hood	US	1

¹We did include include military schools from both *Anglo-American* and *non-Anglo-American* states in Table 5, which looked at the effect of specialization, conditioned by educational model, on policy outcomes. Neither type of military school was associated with liberal reform, compared to a leader with no tertiary education, across any outcome (*non-Anglo-American military schools* were associated with democratic backsliding); that military schools were statistically indistinguishable from having no tertiary education helps validate the decision to exclude them from the models reported in Table 4.

Table A.3: Effect of Pooling Military and Education Types on Political Outcomes.

	<i>Dependent variable:</i>				
	Trade Liberalization	Rule of Law	Financial Openness	Human Rights	Liberal Democracy
	(1)	(2)	(3)	(4)	(5)
Anglo-American Education	1.927** (0.684)	0.033** (0.009)	0.224** (0.107)	0.147** (0.057)	0.042** (0.009)
Other Western Education	1.263* (0.672)	0.019* (0.011)	-0.212* (0.117)	0.145+ (0.095)	0.046** (0.018)
Hierarchical Education	0.801+ (0.595)	0.018** (0.009)	0.068 (0.096)	0.047 (0.056)	0.024** (0.007)
Economic Development	0.059 (0.242)	0.011** (0.004)	0.037 (0.051)	0.076** (0.026)	0.013** (0.004)
Oil Producer	-0.590 (0.570)	-0.022+ (0.015)	-0.064 (0.123)	-0.165** (0.081)	-0.022** (0.010)
Executive Constraints	2.241** (0.890)		0.268* (0.157)	0.450** (0.113)	
Former British Colony	-0.642 (0.509)	0.003 (0.010)	-0.170** (0.082)	-0.088* (0.050)	-0.004 (0.007)
US Ally	-0.019 (0.496)	0.010+ (0.007)	0.108 (0.085)	-0.118** (0.051)	0.0004 (0.008)
Ethnic Fractionalization	0.007 (0.727)	-0.011 (0.016)	-0.237+ (0.149)	-0.139+ (0.093)	0.010 (0.011)
Population	0.062 (0.149)	-0.004* (0.002)	-0.029+ (0.022)	-0.092** (0.018)	-0.003+ (0.002)
Time in Office	0.024 (0.025)	0.0004 (0.001)	0.019** (0.010)	-0.001 (0.004)	-0.001* (0.001)
DV Entering Office		-0.104** (0.020)	-0.224** (0.029)	-0.255** (0.031)	-0.161** (0.025)
Constant	-4.626* (2.437)	-0.014 (0.036)	-0.170 (0.467)	0.004 (0.268)	-0.029 (0.039)
Observations	240	730	588	850	847
R ²		0.075	0.135	0.128	0.085
Log Likelihood	-95.625				

Note: **p<0.05,*p<0.1, two-tailed; +p<0.1, one-tailed. Model 1 estimated with logistic regression; models 2-5 estimated with OLS. Standard errors clustered by country.

4 Addressing Potential Endogeneity

We address possible leader self-selection in three ways: on theoretical grounds, referring to the existing literature on international students' choice of schools, and by implementing several research designs to rule out endogeneity—difference-of-means tests comparing elite/non-elite attendance to different university types; a natural experiment; replicating our main results on a subsample of political elites; implementing a matched design; testing whether structural conditions make Anglo-American leaders more likely to be chosen; replicating our main results on a subsample of leaders whose entry into office was as-if random owing to their predecessor dying of natural causes; and using an instrumental variable regression approach. We think that, taken together, our triangulation approach offers strong evidence against concerns arising from selection effects.

Self-Selection by Liberal-inclined Leaders

We start by considering a future leader's decision to attend an Anglo-American university. A possible source of endogeneity is that would-be leaders self-select into colleges based on their existing ideological orientations, i.e. liberally-oriented would-be leaders may choose to attend Anglo-American universities, while those with more illiberal orientations may choose to attend college elsewhere.

The option to attend college abroad, especially at an Anglo-American institution, is only available to a select few members of the economic elite (that can afford the cost of tuition, travel and accommodations, etc).² The overwhelming majority of the leaders in our sample grew up in illiberal countries,³ where the economic and political elites are inextricably linked: the leader or regime distributes economic rents in exchange for political support, and vice versa (Bueno de Mesquita et al. 2003). Both parties derive great benefits from the status quo and neither has an incentive to change it. The strength of the co-dependence increases with wealth and political power: since future leaders often come from the families of the top political elites, their families have the strongest incentive to preserve the status quo.⁴ Therefore, following the self-selection logic, none of the elites that are grooming their children to become future political leaders have any incentive to expose their children to liberal values. If anything, students from illiberal countries that do attend Anglo-American universities are likely primed to be skeptical of liberal norms and values.

Their pro-status quo bias notwithstanding, a sizable proportion of illiberal elites do send their children to Anglo-American universities. Among the Chinese elites that sent their children to US universities are President Xi Jinping, whose daughter Xi Mingze (expected

²Scholarships for international students are relatively rare.

³In our sample, out of the leaders that were born in independent states, only 7% were in democracies and 15% in economically open states at the time they turned 18. These figures are calculated using V-Dem's *liberal democracy* measure and Wacziarg and Welch's (2008) trade liberalization data. We follow V-Dem recommendations for dichotomizing their liberal democracy measure, with those states scoring above 0.5 being coded as democratic and those below 0.5 coded as non-democratic.

⁴Indeed, most leaders in our sample of non-OECD countries grew up in relatively privileged families—financially, politically, and socially.

to be a future party chair and president) studied at Harvard, and Bo Xilai, a dismissed party boss, whose son also attended Harvard (*International Business Times* 2012). Children of other illiberal leaders that studied in the UK include Syria's Bashar al-Assad, Egypt's Gamal Mubarak, and Libya's Seif al-Islam, each groomed by their fathers as their successors (Danin 2011). Jordan's King Abdullah was educated at Sundhurst, a British military school, and Bahrain's crown prince Salman bin Hamad bin Isa al-Khalifa earned degrees from both American University and Cambridge (Danin 2011). The list goes on: Sergei Zheleznyak, deputy speaker of the Russian Duma, sent two children to study in Switzerland and one to the UK; Pakistani leader Perves Musharraf's son studied in the US, as did Lebanon president Saad Hariri, son of former president Rafik Hariri, and the daughters of both Philippines leader Marcos and Indonesian ruler Sukarno (Braw 2014).

Beyond these anecdotes, illiberal political elite's preference for Anglo-American education for their children is well-documented. According to a report by the *International Business Times* (2012), 90% of Chinese citizens with assets over \$16 million, and 85% of those with assets over \$1 million, say they will send their children to study abroad, with the US being the top choice, while 7 of the top 8 recipient countries are English-speaking (Switzerland is the exception).⁵ The main explanation offered for preferring the US and other Anglo-American universities is that the education of a family's (often) only child is a critical investment, and that US universities are the gold standard. These families specifically mention that American universities offer cross-disciplinary fields and a focus on critical thinking. Parents complained that China's educational methods and standards for measuring student talent are too rigid compared to the US, and believed that US schools place greater value on all-around development and quality-oriented education.

The relationship between obtaining an Anglo-American education and family wealth and political power is also systematically supported in our data. Table A.4 tabulates leader's education backgrounds by their father's occupation.⁶ Leaders from elite families (royalty or nobility, high-ranking government or military position, large plantation owner) are more likely than those from non-elite families to attend Anglo-American universities—the opposite of what we would expect, based on the liberal self-selection logic.⁷ The liberal self-selection mechanism leads to the expectation of, on average, an inverse relationship between wealth

⁵Li and Feng (2018), using survey data, also find that Chinese students that study abroad are more likely to come from affluent families.

⁶Using data from Ellis, Horowitz, and Stam (2015), we code leaders as coming from *politically elite families* if their father's occupation was either: (a) royalty or nobility; (b) a high-ranking government position; (c) a wealthy land-owner; or (d) a high-ranking military position. The Ellis, Horowitz, and Stam (2015) data reduces the end of our time frame to 2004, so our sample including family backgrounds consists of 155 leaders with politically elite families out of a total of 608 leaders.

⁷There is no difference between leaders from elite families or non-elite families in attending other Western or non-Western universities. Father's occupation is also not a statistically significant predictor of whether a leader studies abroad or at a home university ($p\text{-value} > 0.35$): about 59% of leaders with political elite backgrounds obtained their education at a foreign university (while 41% studies at a domestic university), compared to 54% of leaders from non-elite families (46% went to a domestic university). Finally, leaders from both elite and non-elite families receive military educations at roughly the same rate: 14% for elite backgrounds vs 17% for non-elite backgrounds ($p\text{-value} > 0.35$).

Table A.4: Educational Background of Leaders from Elite and Non-elite Families.

	Political Elite	Not Political Elite	P-value (t-test)
Attend Anglo-American University	36 (23%)	70 (15%)	<.05
Attend Other Western University	11 (7%)	28 (6%)	>.69
Attend Hierarchical (Non-Western) University	48 (31%)	164 (36%)	>.23
No University Education	60 (39%)	191 (42%)	>.44
Total	155 (100%)	453 (100%)	

and connectedness to the ruling regime and attending an Anglo-American institution (i.e., those who derive fewer benefits from the regime are more likely to support liberal reform).

The results in Table A.4 show that, if anything, another type of selection effect may be at work—that in which the wealthy status-quo elites are more, not less, likely to send their children to Anglo-American institutions. This indicates that (1) the choice of school may be driven by factors other than ideology, e.g., prestige, and (2) the illiberal elites are either unaware of or discount the possible socialization effects of attending a liberal institution. The latter implication is rather intuitive, though somewhat outside of the scope of the current study. The former implication is widely supported in the literature (Mazzarol and Soutar 2002; Cebolla-Boado, Hu, and Soysal 2018; Aslanbeigui and Montecinos 1998).

According to surveys of international students, university quality and prestige are the deciding factors in their choice of university (Mazzarol and Soutar 2002; Aslanbeigui and Montecinos 1998). A survey by Mazzarol and Soutar (2002) showed that large majorities of international students (over 79%) chose to study abroad to obtain a better quality education. They also find that, compared to domestic students, international students treated university reputation, quality, and alumni network as more important to their choice of where to study. Cebolla-Boado, Hu, and Soysal (2018) used data from 120 British universities and found prestige was, by far, the strongest predictor of the number of Chinese international students, explaining 8 times more of the variation than the second highest predictor (costs).

A strong focus on reputation among international students creates an obvious bias towards famous and highly ranked universities. Parents from all over the world want to send their children to highly ranked schools (Kaba 2012). Though many countries seek to develop world-class universities, such institutions tend to cluster in a small set of countries (Marginson 2006; Guri-Rosenblit 2015; Curaj et al. 2015). The US (32 of the top 100, 54 of the top 200) and the UK (29 of the top 200) dominate the list of world-class universities; overall, the US, UK, Canada, and Europe make up 75% of the top 200 ranked world universities (Kaba 2012). A survey by Institute of International Education and US State Department of prospective study-abroad students from 11 countries (Vietnam, India, Mexico, Thailand, Hong Kong, Brazil, Germany, Turkey, UK, Nigeria, and South Africa) found that 75% had the US as their first choice; the next three spots were the UK (8%), Canada (5%), and Australia (3%) (Wojciuk 2018). The US had significantly higher ratings for having the widest range of schools and programs, highest quality higher education system, and being welcoming to foreign students, with its main disadvantage being high tuition.

Given the overwhelming demand to attend Anglo-American universities, as well as the large number of high quality schools within this educational model, it is no surprise that 42% of all students crossing borders to study do so in either the US or UK, with another 14% going to other English-speaking countries whose universities also follow the Anglo-American model (Marginson 2006). In other words, most students want to attend the top universities—which are more likely to follow the Anglo-American model—and these schools select which students to admit. Thus, the opportunity to attend an Anglo-American university—as well as internalize the classical liberal content making up the curriculum—is determined primarily by factors other than ideology. And given the strong correlation between the family’s status-quo bias and the ability to afford to send an offspring to an Anglo-American university, the distribution of the ideology of would-be leaders at Anglo-American institutions is likely skewed illiberal, at least on the first day they arrive on campus.

Accounting for Endogeneity using Research Design

While in the previous section, we used the data and the literature to rule out self-selection on theoretical grounds, in this section we take an alternative approach. We start with the premise that self-selection may, in fact, be at work, and implement several research designs that help isolate the causal effect of our primary theoretical variable (Anglo-American learning model), even in the presence of self-selection in the full sample.

A Natural Experiment

First, as described in the manuscript, we take advantage of a natural experiment opportunity resulting from the overwhelming number of applications at top ranked universities that happen to be located countries with either Anglo-American or other Western education models. The differences in the empirical results for the Anglo-American and other Western institutions can be interpreted as the causal effect of educational background (i.e., the liberalization, rule of law, and financial openness outcomes in Table 4 of the manuscript).

Political Elite Sub-Sample

Second, we replicate our analysis on the subset of the data that constitutes an especially “hard test” of our theory, if the results are driven by student self-selection: leaders from the families of the political elite (as defined earlier using data obtained from Ellis, Horowitz, and Stam (2015)). We expect that leaders in this subsample are the least likely to implement liberal reforms, as they and their families derive the greatest benefits from the status quo. If liberal bias is the selective mechanism at work, leaders from these families should be the least likely to be affected. The results of this additional analysis, displayed in Table A.5, replicate our general finding that, even for this subset of leaders, attending an Anglo-American institution increases the likelihood of liberal reform in trade, rule of law, and democracy.

Table A.5: Tertiary Educational Model and Political Outcomes, Subset of Politically Elite Families.

	<i>Dependent variable:</i>				
	Trade Liberalization	Rule of Law	Financial Openness	Human Rights	Liberal Democracy
	(1)	(2)	(3)	(4)	(5)
Anglo-American Education	2.012** (0.874)	0.048** (0.018)	-0.024 (0.224)	0.001 (0.140)	0.063** (0.028)
Economic Development	0.569 (0.543)	0.027** (0.008)	-0.154+ (0.119)	0.168** (0.067)	0.014+ (0.011)
Oil Producer	0.922 (1.221)	-0.063** (0.024)	0.335+ (0.216)	-0.179 (0.190)	-0.017 (0.031)
Executive Constraints	0.009 (1.573)		0.389 (0.562)	0.298 (0.303)	
Former British Colony	1.581 (1.375)	-0.028* (0.016)	-0.666** (0.198)	-0.090 (0.119)	-0.022 (0.019)
US Ally	1.334 (1.403)	-0.0004 (0.012)	0.050 (0.203)	-0.052 (0.119)	-0.010 (0.021)
Ethnic Fractionalization	-1.262 (1.842)	0.022 (0.029)	0.775** (0.332)	-0.071 (0.215)	0.022 (0.039)
Population	-0.208 (0.332)	0.006+ (0.004)	-0.130** (0.064)	-0.072+ (0.050)	0.003 (0.006)
Time in Office	0.042 (0.055)	0.002* (0.001)	-0.010 (0.021)	0.001 (0.007)	-0.002+ (0.001)
DV Entering Office		-0.113** (0.037)	-0.231** (0.091)	-0.260** (0.087)	-0.246** (0.071)
Constant	-5.177 (4.719)	-0.230** (0.078)	2.206* (1.167)	-0.980+ (0.663)	-0.057 (0.087)
Observations	56	133	67	142	142
R ²		0.246	0.316	0.153	0.169
Log Likelihood	-23.315				

Note: **p<0.05, *p<0.1, two-tailed; +p<0.1, one-tailed. Model 1 estimated with logistic regression; models 2-5 estimated with OLS. Standard errors clustered by country.

A Matched Design

Third, we implement a matched design. The idea is that, although the potentially offending variable—a would-be leader liberal bias—is unobservable, it may correlate and follow the same empirical distribution as the observed ones, such as *former British colony* or *US Ally*. If this assumption holds, performing the analysis on a sample matched of the observable covariates would allow for recovering unbiased estimates of the treatment variable (Imai, King, and Stuart 2008, 483–485). In our case, this assumption seems fairly reasonable, e.g., there is a likely positive correlation between leaders studying at an Anglo-American university if they are from a former British colony or a US ally due to either self-selection or because they simply have more opportunities to do so through exchange programs or streamlined visa processes.

We use coarsened exact matching to pair the observations from the full sample on all independent variables, other than the treatment (attending an Anglo-American university) (Iacus, King, and Porro 2011, 2012).⁸ The resulting sample consists of pairs of observations

⁸Coarsening consists of dichotomizing or multi-chotomizing of all continuous variables prior to matching to increase the number of matches (Iacus, King, and Porro 2011, 2012). The number of thresholds used for coarsening is optimized to achieve the balance between the treatment and control groups.

Table A.6: Tertiary Educational Model and Political Outcomes, Matched Sample.

	<i>Dependent variable:</i>				
	Trade Liberalization	Rule of Law	Financial Openness	Human Rights	Liberal Democracy
	(1)	(2)	(3)	(4)	(5)
Anglo-American Education	1.642** (0.751)	0.015* (0.009)	0.297** (0.115)	0.132** (0.054)	0.021** (0.010)
Economic Development	-0.024 (0.365)	0.015** (0.007)	0.068 (0.074)	0.007 (0.032)	0.017** (0.007)
Oil Producer	1.289 ⁺ (0.992)	-0.004 (0.012)	-0.140 (0.164)	-0.170* (0.099)	-0.016 (0.016)
Executive Constraints	1.486 (1.633)		0.181 (0.319)	0.535** (0.203)	
Former British Colony	-2.841** (1.371)	-0.012 (0.012)	-0.274** (0.108)	-0.149** (0.070)	-0.022** (0.009)
US Ally	-0.666 (0.809)	0.015 ⁺ (0.010)	0.078 (0.116)	-0.075 (0.065)	0.010 (0.009)
Ethnic Fractionalization	-2.180 ⁺ (1.563)	-0.035 ⁺ (0.027)	0.037 (0.205)	-0.255** (0.119)	-0.005 (0.017)
Population	0.093 (0.373)	-0.011** (0.003)	-0.066** (0.031)	-0.120** (0.022)	-0.006** (0.002)
Time in Office	0.115 (0.125)	0.004** (0.002)	0.022 (0.018)	0.003 (0.012)	0.004** (0.002)
DV Entering Office		-0.104** (0.030)	-0.208** (0.038)	-0.189** (0.041)	-0.165** (0.043)
Constant	-2.426 (2.950)	0.028 (0.049)	-0.166 (0.698)	0.847** (0.283)	-0.023 (0.050)
Observations	87	336	296	378	378
R ²		0.130	0.143	0.117	0.117
Log Likelihood	-31.623				

Note: **p<0.05,*p<0.1, two-tailed; ⁺p<0.1, one-tailed. Model 1 estimated with logistic regression; models 2–5 estimated with OLS. Standard errors clustered by country.

(leaders) that have the same (coarsened) values on all covariates. The treatment group consists of leaders that went to an Anglo-American school, whereas the control group consists of their exact (coarsened) matches that did not attend an Anglo-American institution. We allow for multiple matches per case and discard the unmatched observations. The results of this matched analysis are presented in Table A.6 and support our finding that leaders with Anglo-American education are more likely to implement liberal reforms than those without.

Taken together, this discussion and results provide a clearer view of the processes that lead to the treatment assignment in our study. We see no systematic evidence that leaders may self-select in colleges based on their ideological predisposition. If anything, the opposite may be true: attending Anglo-American institutions is a privilege that is almost exclusively available to the status-quo elites rather than their (possibly more liberal) opposition. This type of selection effect, of course, induces a conservative bias, making it more difficult for us to find support for our hypothesis. Interpreting our main results through the lens of a natural experiment in the size of the “treatment dose” indicates that, among the subset of students attending Western universities, there is variation in liberal policy reform between leaders that attended Anglo-American universities to compared to those that attended other Western universities. Our robustness checks using the “hardest test” and matching designs also provide further evidence for our theory.

Structural Conditions

Endogeneity may also arise if countries that are already on the path to liberalization are more likely to choose leaders educated at Anglo-American institutions. In other words, changing structural conditions create a type of path dependence, where reforms make it easier for liberal-minded leaders to enter office. If these liberal-minded leaders are more likely to be educated in Anglophone or other Western countries, then our results may be attributing previously initiated policy changes to the education of subsequent leaders.

We address this source of endogeneity in three ways: first, we explore whether leaders with Anglo-American educational backgrounds are more likely to be selected once liberalizing reforms have been implemented. Here, we treat leader education as the dependent variable and *DV Δ by Previous Leader* as the key independent variable. If a selection process arising from is indeed at work, we would expect that policy changes (liberalization) implemented by the previous leader would increase the probability that a leader with Anglo-American education enter office—we test this by using these new variables, along with some controls, as predictors of the next leader’s education.

The results are presented in Table A.7. We estimate separate models for democracies (models 1–3) and non-democracies (4–6), and for leaders with each of education background: *Anglo-American*, *Other Western*, and *Hierarchical*. Looking at both democratically-elected and non-democratically selected leaders accounts for both whether Western-educated leaders are more likely to be elected after reforms are underway, as well as subjects our theory to a “hard test”—we would expect that winning coalitions in autocracies are unlikely to intentionally choose liberal reformers that could change the existing distribution of resources. We follow the recommendations of the V-Dem team and treat states with a value greater than 0.5 on the *liberal democracy* scale as being democratic.

Focusing on the five *DV Δ by Previous Leader* variables, there is little systematic evidence that states are more likely to choose leaders with specific educational backgrounds in a way that would bias our main results. Anglo-American educated leaders—our primary theoretical variable of interest—are not significantly more likely to take office, in either democratic or autocratic regimes, following liberal reforms; the only statistically significant result a *negative* effect on financial openness, which would make it *more difficult* for leaders with Anglo-American educational backgrounds to come to office. Leaders with other Western educational backgrounds are less likely to be elected following reform in rule of law. Conversely, leaders with *Other Western* education are more likely to come to power following democratic reforms (in both pre-existing democracies and autocracies), which is evidence of possible structural selection effect for *Other Western*-educated leaders. Despite this, we did not find evidence that leaders with other Western educations are associated with liberal policy reform in our main analysis for four of the five policy outcomes. These results do suggest, however, that previous findings that leaders with Western educations *writ large*—rather than just Anglo-American ones—may be associated with greatest degree of democratic reform, should be taken with a grain of salt.

Table A.7: The Effect of Prior Liberalizing on Next Leader's Education.

	<i>Dependent variable:</i>					
	AA Elected	Other West. Elected	Hier. Elected	AA Selected	Other West. Selected	Hier. Selected
Economic Development	-0.087 (0.106)	-0.096 (0.062)	0.322** (0.145)	-0.083** (0.042)	-0.004 (0.023)	0.194** (0.046)
Oil Producer	-0.321 (0.211)	0.080 (0.061)	0.158 (0.203)	-0.175 (0.113)	0.034 (0.071)	0.050 (0.149)
Former British Colony	0.487** (0.149)	0.084 (0.098)	-0.419** (0.139)	0.180** (0.091)	-0.062 (0.045)	0.035 (0.118)
US Ally	0.319** (0.125)	-0.093 (0.077)	-0.109 (0.163)	0.425** (0.086)	-0.044 (0.050)	-0.123 (0.096)
Ethnic Fractionalization	0.831** (0.300)	-0.672** (0.288)	-0.286 (0.423)	0.209 (0.140)	0.081 (0.085)	-0.353** (0.162)
Population	-0.019 (0.029)	-0.002 (0.028)	0.025 (0.035)	-0.024 (0.029)	-0.030* (0.017)	0.039 (0.029)
Prior Leader's Δ in Trade	-0.038 (0.191)	0.142 (0.090)	-0.001 (0.186)	-0.098 (0.089)	0.014 (0.057)	0.173 (0.113)
Prior Leader's Δ in Rule of Law	0.232 (0.700)	-1.086** (0.486)	1.054 (0.693)	0.143 (0.426)	-0.092 (0.170)	-0.253 (0.370)
Prior Leader's Δ in Financial Openness	0.059 (0.066)	0.031 (0.039)	-0.104* (0.057)	-0.078* (0.043)	0.027 (0.025)	0.002 (0.050)
Prior Leader's Δ in Human Rights	-0.180 (0.146)	0.021 (0.044)	0.108 (0.167)	0.041 (0.041)	-0.036 (0.035)	0.128** (0.048)
Prior Leader's Δ in Liberal Democracy	-0.127 (0.435)	0.955** (0.393)	-0.703 (0.519)	0.100 (0.455)	0.590* (0.346)	-0.580 (0.398)
Constant	0.663 (1.140)	1.185** (0.553)	-2.311 (1.601)	0.805* (0.430)	0.350 (0.245)	-1.222** (0.332)
Observations	52	52	52	142	142	142
Log Likelihood	-21.847	17.667	-28.821	-60.784	-8.722	-80.545

*Note:***p<0.05,*p<0.1, two-tailed. All models estimated with logistic regression. Standard errors clustered by country.

Liberal reforms also have no effect of the probability of electing/selecting leaders with hierarchical educational backgrounds, with two exceptions: autocracies are less likely to elect leaders educated at a hierarchical institution following increases in financial openness, and autocracies are more likely to select leaders educated at a hierarchical institution following improvements in human rights protections. Overall, there is little evidence that liberal reforms increase the probability of electing/selecting a leader with a more liberal education background.

Second, we look at turnover arising from leaders dying of natural causes while in office. The timing of death is as-if random, in that the timing of death and succession is exogenous to the policy outcome variables (Jones and Olken 2005; Krcmaric, Nelson, and Roberts 2020). We follow Jones and Olken (2005) and include only those leaders that took office following a regular process. Within our data, there are 67 such leader changes. Among the subsample, 10 are from the Americas, 20 from Asia, 6 from Eastern Europe, 13 from the Middle East and North Africa, and 18 from sub-Saharan Africa. Temporally, leaders within the subsample are distributed relatively evenly, with 3 that started their tenures during the 1940s, 6 during the 1950s, 8 during the 1960s, 12 during the 1970s, 11 during the 1980s, 11 during the 1990s, 7 during the 2000s, and 9 during the 2010s. Among the subsample, leaders with no education are observed at frequency greater than expected (22 out of 67, or 33%) compared to those leaders whose predecessor did not die of natural causes in office (198 out of

914); a difference-of means tests show that this difference is statistically significant ($p < .07$, two-tailed). Conversely, none of the frequencies of the other educational backgrounds are observed at a statistically different rate between those leaders whose predecessor's died of natural causes in office and those whose did not.

Given the small sample size, we include only the *DV entering office* as a control in our analysis. In addition, the sample size necessitates a change in one of our dependent variables—*Trade Liberalization*—in order to have enough observations to recover reasonable estimates. Recall that trade liberalization is measured as a binary variable, where states are coded as 1 if none of 5 conditions of a closed economy outlined by Wacziarg and Welch (2008) are met⁹ and, owing to the overwhelming tendency of states to stay open once they have transitioned from a closed economy, our sample included only leaders with closed economy when they took office. Among leaders that took power in a regular process owing to their predecessor's natural death, there are only eighteen observations.

Instead, we use a proxy measure that captures a key observable implication of trade liberalization: imports as a percent of total trade flows. While a focus on policy is preferred, owing to the more direct control that a leader has on it compared to outcomes, an increase in the proportion of imports of the course is a relatively straightforward implication of domestic trade liberalization. In contrast to other trade and developmental models, such as mercantilism or either import substitution or export-oriented industrialization, liberal trade models treat imports as reducing opportunity costs and consider unilateral liberalization as economically beneficial on its own.¹⁰ Therefore, we expect that leaders that liberalize to have a relative rise in imports. Moreover, in comparison to alternative measures, imports as a percentage of total trade flows is the one most directly implicated by government policy and least sensitive to other external factors. Conversely, an alternative measure like trade as a percent of GDP is an implication of not just government policy but also many external factors that are outside of a leader's control, such as a country's location, its economic size, the economic size and growth rates of its neighbors, as well as macro global economic conditions.

The results of this additional analysis are displayed in Tables A.8 and are consistent our finding that attending an Anglo-American institution increases the likelihood of liberal reform in trade, rule of law, and democracy. The coefficients for the other two outcomes, while not statistically significant at conventional levels, are in the expected direction. Given the very small sample size for successors of leaders that died from natural causes and followed a regular process, these results are suggestive, especially taken together with the results from our previous tests.

⁹The five conditions—any of which is sufficient to treat an economy is closed—are: average trade tariffs of $\geq 40\%$, non-tariff barriers $\geq 40\%$ of trade, black market exchange rate depreciated by $\geq 20\%$ relative to exchange rate during the 1970s and 1980s, a state monopoly on major exports, or a social economic system as defined by Kornai (2002) (Wacziarg and Welch 2008, 190).

¹⁰This argument was first laid out by Smith ([1776] 2003) and is offered as the standard “trade is good for consumers” supply and demand open market–logic laid out in most introduction to economics, introduction to international relations, and introduction to international political economy textbooks (see, for example, Mankiw (2020, Ch 3), Frieden, Lake, and Schultz (2021, Ch 7), and Oatley (2019, Ch 3)).

Table A.8: Tertiary Educational Model and Political Outcomes, Predecessor Died.

	<i>Dependent variable:</i>				
	Alt. Trade Measure	Rule of Law	Financial Openness	Human Rights	Liberal Democracy
	(1)	(2)	(3)	(4)	(5)
Anglo-American Education	0.052* (0.030)	0.093** (0.031)	0.004 (0.230)	0.148 (0.197)	0.045* (0.023)
DV Entering Office	-0.195** (0.067)	-0.115** (0.049)	-0.081 (0.066)	-0.242** (0.062)	-0.128** (0.050)
Constant	0.112** (0.037)	0.063** (0.017)	0.064 (0.111)	-0.085 (0.083)	0.034** (0.013)
Observations	58	48	39	67	65
R ²	0.169	0.203	0.041	0.192	0.124

Note: **p<0.05,*p<0.1, two-tailed; +p<0.1, one-tailed.

Table A.9: Additional Tertiary Educational Models and Political Outcomes, Predecessor Died.

	<i>Dependent variable:</i>				
	Alt. Trade Measure	Rule of Law	Financial Openness	Human Rights	Liberal Democracy
	(1)	(2)	(3)	(4)	(5)
Anglo-American Education	0.058* (0.033)	0.085** (0.032)	-0.003 (0.262)	0.078 (0.208)	0.048* (0.025)
Other Western Education	0.0004 (0.043)	0.031 (0.038)	-0.174 (0.399)	0.179 (0.287)	0.035 (0.037)
Hierarchical Education	0.014 (0.026)	-0.031 (0.024)	0.034 (0.244)	-0.233+ (0.170)	-0.0003 (0.020)
DV Entering Office	-0.196** (0.070)	-0.119** (0.049)	-0.087 (0.070)	-0.254** (0.063)	-0.126** (0.051)
Constant	0.106** (0.039)	0.072** (0.020)	0.068 (0.154)	-0.014 (0.109)	0.032** (0.015)
Observations	58	48	39	67	65
R ²	0.173	0.255	0.048	0.229	0.137

Note: **p<0.05,*p<0.1, two-tailed; +p<0.1, one-tailed.

We further replicate this analysis in Table A.9, this time including the other education models. These results highlight that the effect of education on each outcome is unique to Anglo-American educational background only. There is no evidence of any effect of other Western or hierarchical education models exerting any liberal effect on policy outcomes.

Third, we apply instrumental variable (IV) regression to account for either self-selection or structural sources of endogeneity. IV regression allows us to rule out endogeneity as long as the instrumental variable meets two conditions: exogeneity and relevancy (Wooldridge 2016). Our instrument for Anglo-American education is whether a leader attended boarding school. The variable *Boarding school*, were obtained from Ellis, Horowitz, and Stam (2015), and is coded as 1 if a leader attended a boarding school, and 0 otherwise. Our instrument meets the exogeneity requirement, as there is no theoretical reason to expect future policy preferences to be directly affected by whether a child attended a boarding school (a decision the child generally has only minimal role in). There is also no reason to expect any relationship between a leader's boarding school attendance and the structural conditions

surrounding their entry to office. The instrument also meets the relevancy assumption, as boarding schools tend to improve the prospects of their pupils' admissions to Anglo-American universities.¹¹

Since the endogenous variable we are instrumenting is binary, we adopt appropriate maximum likelihood analog to the standard a two-stage least squares by estimating a series of endogenous treatment-effects models (Heckman 1978; Maddala 1983; Wooldridge 2010). The idea is that fitted values for the endogenous treatment variable (Anglo-American education) are obtained from a probit regression (regressed on all exogenous variables and the instrumental variable *boarding*).¹² These fitted values are then used in place of the original treatment variable in the outcome equation.¹³

The results for the outcome equation of each of these models are reported in Table A.10. The instrumented Anglo-American education variable is statistically significant in all models. These results indicate that Anglo-American education exerts an independent affect on each policy outcome.

In sum, we address endogeneity using a variety of research designs. We first employ difference-of-means tests to demonstrate that leaders from wealthy, illiberal families are actually more likely to attend Anglo-American universities. Next, we apply three research designs to further account for self-selection on the part of liberal-inclined leaders—a natural experiment arising from institutional differences in Western institutions unbeknownst to liberal-inclined leaders; a subsample of wealthy, illiberal leaders; and a matched sample—to show leaders with Anglo-American educational backgrounds are more likely to liberalize than leaders with other educational backgrounds. Finally, we implement three research designs to account of structural conditions that may impact the selection of liberal-inclined leaders—we model whether previous liberalization by makes Anglo-American leaders more likely be selected into office; look at a subsample of leaders that assumed office via regular processes after the natural death of their predecessor; and apply an instrumental variable approach. Across each of these various approaches, we find little evidence that the central finding that education models affect policy outcomes—and, in particular, that leaders with Anglo-American educational backgrounds are the most likely to liberalize—are driven by either self-selection or structural conditions.

¹¹Exogeneity assumption, is of course, theoretical and cannot be tested. The relevancy assumption is supported: *Boarding school* has a positive and statistically significant effect ($p < .01$) on attending an Anglo-American university.

¹²We do not include *Other Western* and *Hierarchical* in the first-stage estimates, since these education models are alternatives to *Anglo-American*.

¹³The trade liberalization model is estimated as a linear probability model in the second stage. This is appropriate since the linear probability model recovers consistent estimates of the average treatment effect for the instrumented variable in the second stage for both linear and nonlinear instruments (Heckman 1978, 946–947; Angrist 2001, 8).

Table A.10: Educational Models and Political Outcomes, Instrumental Variables.

	<i>Dependent variable:</i>				
	Trade Liberalization	Rule of Law	Financial Openness	Human Rights	Liberal Democracy
	(1)	(2)	(3)	(4)	(5)
Anglo-American Education (instrumented)	0.198 ⁺ (0.136)	0.053** (0.024)	1.284** (0.408)	0.677 ⁺ (0.416)	0.122* (0.070)
Other Western Education	0.009 (0.115)	0.033* (0.018)	-0.078 (0.308)	0.284** (0.137)	0.088** (0.021)
Hierarchical Education	0.061 (0.061)	0.011 (0.012)	0.219 (0.185)	0.137 ⁺ (0.093)	0.058** (0.014)
Economic Development	-0.023 (0.031)	0.021** (0.006)	-0.018 (0.088)	0.099** (0.044)	0.019** (0.006)
Oil Producer	0.004 (0.081)	-0.034** (0.013)	0.170 (0.245)	-0.068 (0.128)	-0.016 (0.017)
Executive Constraints	0.130 (0.140)		-0.058 (0.399)	0.043 (0.233)	
Former British Colony	-0.018 (0.076)	-0.011 (0.012)	-0.327** (0.166)	-0.105 (0.119)	-0.017 (0.017)
US Ally	0.122* (0.070)	0.007 (0.011)	-0.068 (0.177)	-0.161 ⁺ (0.098)	-0.008 (0.015)
Ethnic Fractionalization	0.004 (0.104)	-0.019 (0.021)	-0.488 ⁺ (0.343)	-0.231 ⁺ (0.172)	0.001 (0.027)
Population	-0.012 (0.018)	-0.002 (0.003)	0.008 (0.041)	-0.099** (0.030)	-0.002 (0.003)
Time in Office	0.006 (0.004)	-0.000 (0.001)	0.025* (0.015)	0.001 (0.005)	-0.002** (0.001)
DV Entering Office		-0.154** (0.029)	-0.329** (0.056)	-0.337** (0.046)	-0.253** (0.055)
Constant	0.246 (0.284)	-0.072 ⁺ (0.055)	-0.102 (0.814)	-0.162 (0.448)	-0.068 (0.057)
Observations	173	386	234	410	407

Note: **p<0.05,*p<0.1, two-tailed; ⁺p<0.1, one-tailed. *Boarding school* is statistically significant in each instrument equation.

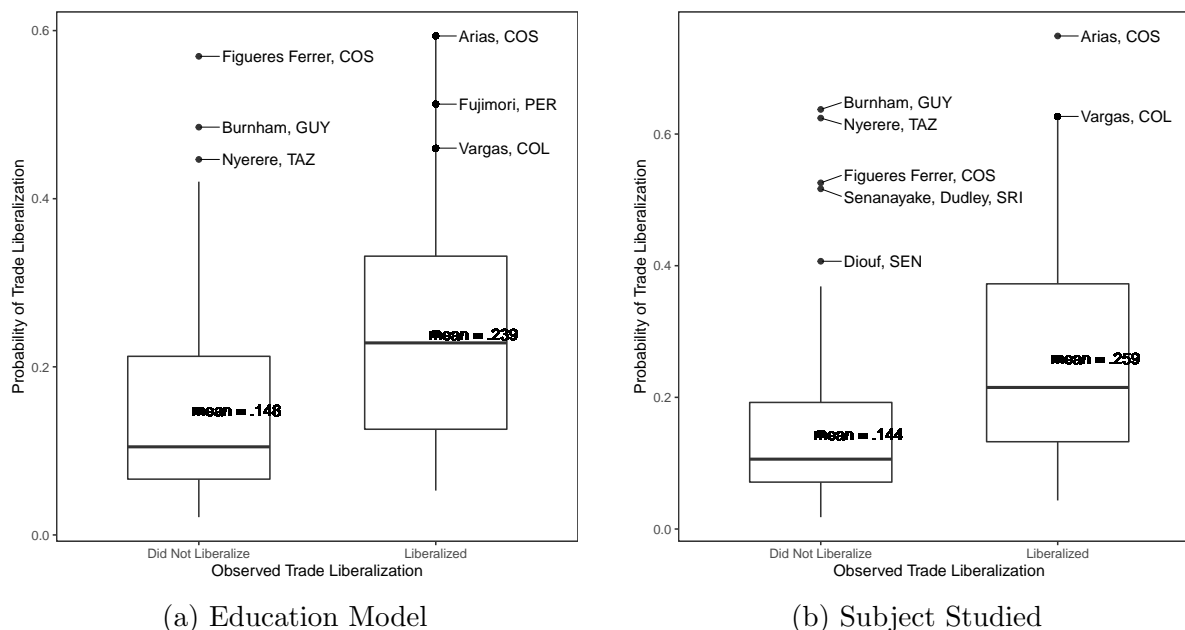
5 Case Fit and Outliers

We present a series of visualizations in Figures A.2a–A.6 to assess the fit of each of our main analyses from the manuscript, as well as to identify outlying cases. Figure A.2a displays the predicted probability of trade liberalization from the logistic regression using the three education models (model 1 of Table 4) on the y-axis, and the two observed outcomes (did not liberalize, liberalized) on the x-axis. The boxplots show the distributions in the predictions for each outcome, along with the conditional means.

As expected, the average predicted probability of trade liberalization for the cases that did liberalize are higher ($\Pr(Y=1)=0.239$) than for those that did not ($\Pr(Y=0)=0.148$). As a reference, the unconditional mean for whether a leader liberalized trade in the sample is $\Pr(Y=1)=0.163$, suggesting that the model does a moderately good job separating cases. Among the cases that the model classified well (upper right and lower left quadrants) are Óscar Arias Sánchez of Costa Rica (PhD in political science, University of Essex), Alberto Fujimori of Peru (MA in mathematics, University of Wisconsin–Milwaukee), and Virgilio Barco Vargas of Colombia (PhD in economics, Boston University). Each of these leaders were educated at Anglo-American schools and implemented drastic reform to open the domestic economies of their countries.

According to this analysis, there are three cases of outliers (using the standard of 1.5 times the inter-quartile range). All three are cases that did not liberalize, despite having relatively high predicted probabilities of liberalization (> 0.4), according to our model. These include José Figueres Ferrer of Costa Rica (engineering, MIT), who implemented some liberal reform—e.g., improved rule of law, expanded suffrage and citizenship—but

Figure A.2: Model Fit and Outliers for Estimates of Trade Liberalization.



also nationalized the banking industry; Forbes Burnham of Guyana (law, London School of Economics), who despite the initial backing of the US and UK ended up nationalizing industries with large foreign-ownership and banning trade imports; and Julius Nyerere of Tanzania (MA in economics, Edinburgh University), an anti-colonialist and pan-Africanist who pursued an economic ‘third way’ during the Cold War that combined socialism with traditional communal living.

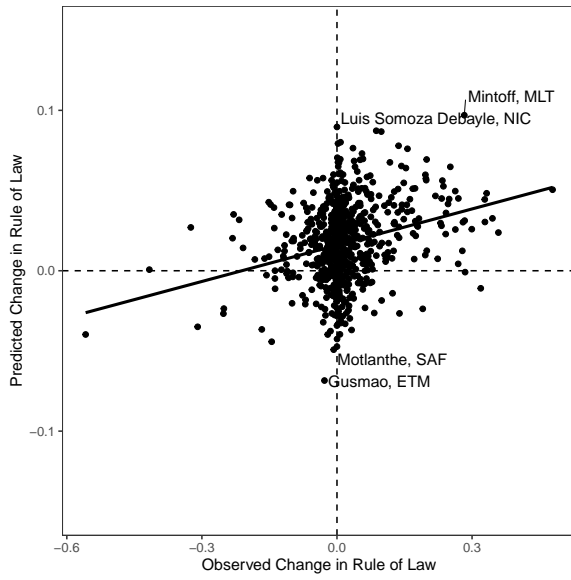
Next, we use a rough metric of classifying cases as “correctly classified” if (1) those that did not liberalize have predicted probabilities below the unconditional mean and (2) those that did liberalize have predicted probabilities above the unconditional mean. Observations that did not meeting these conditions being classified as “incorrectly classified”. According to the metric, the model is able to correctly classify 151 cases (63%), compared to incorrectly classifying 89 cases (37%).

Figure A.2b presents predicated probabilities of trade liberalization from the logistic regression using the subject studied while accounting for education model (model 1 of Table 5). In this case, the average predicted probability of trade liberalization for the cases that did liberalize increases ($\Pr(Y=1)=0.258$) while the average predicted probability of trade liberalization for the cases that did not liberalize decreases slightly ($\Pr(Y=0)=0.143$). This indicates a slightly better fit in terms of case classification, compared to the first model. Using the same classification criteria as before, the number of correctly classified cases improves to 159 cases (66%) while the number of incorrectly classified cases decreases to 81 (34%).

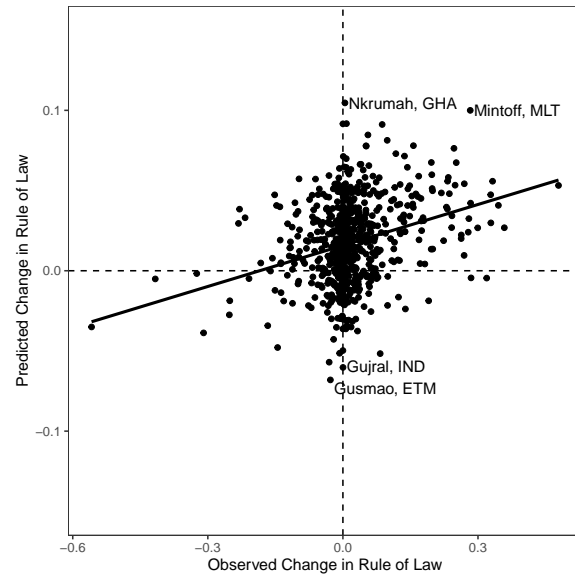
Next, we present visualizations for the four outcomes that are estimated using OLS: rule of law (Figure A.3), financial openness (Figure A.4), human rights (Figure A.5), and liberal democracy (Figure A.6). The subfigures on the left display results from the education learning models (model 3, 5, 7, and 9 from Table 4), while those on the right also account for the field of study (model 3, 5, 7, and 9 from Table 5). In each figure, the y-axis reports predicted values for each outcome and the x-axis reports their observed values, overlaid with the corresponding lines of best fit. The largest outliers are labeled.

These figures highlight two points: first, it is evident that each of the models does a fairly good job of estimating the general trend in the data. The models are able to correctly predict the direction of changes in policy, though they often under-estimate the magnitude. Second, there is clear evidence of a strong status quo bias (the crowding around the $x=0$ line); most of the cases experienced small or no policy changes. In fact, the largest outliers are the cases, for which the model incorrectly predicts a change in policy, but one is not observed, rather than cases where the predicted policy change is substantially in the wrong direction (the relative dearth of cases in the upper left and lower right quadrants).

Figure A.3: Model Fit and Outliers for Estimates of Rule of Law.

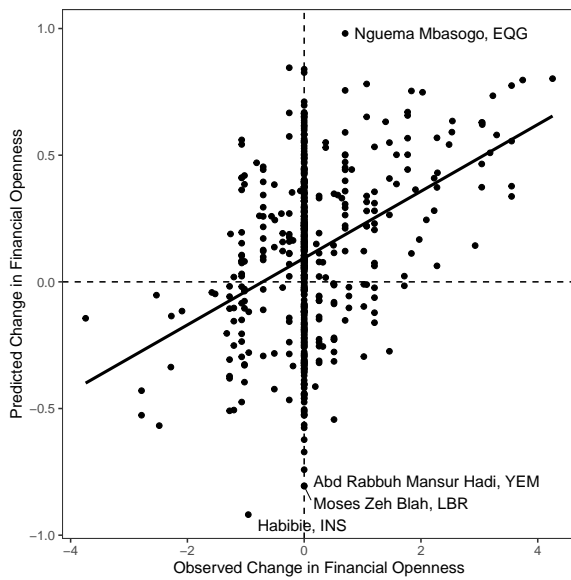


(a) Education Model

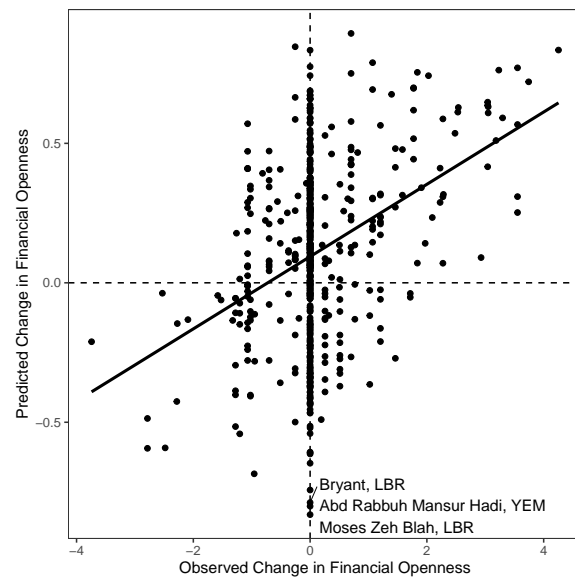


(b) Subject Studied

Figure A.4: Model Fit and Outliers for Estimates of Financial Openness.

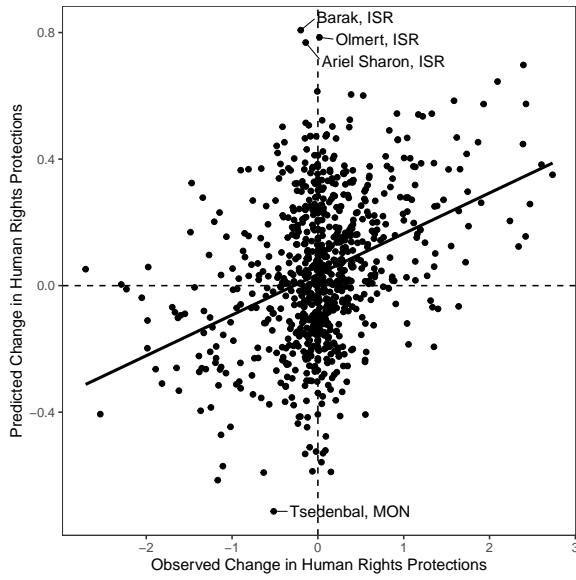


(a) Education Model

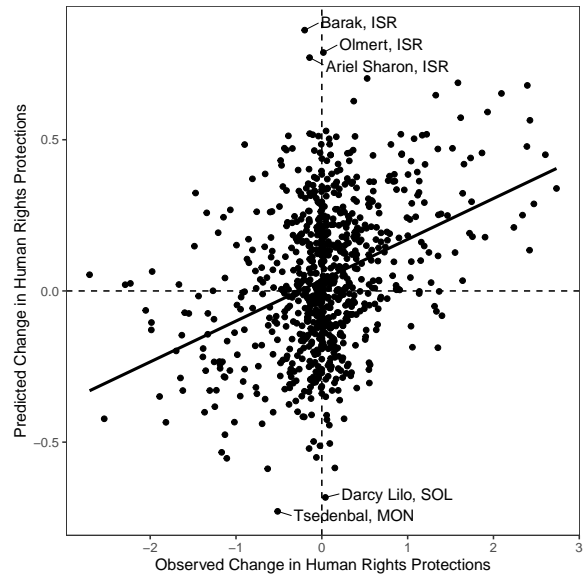


(b) Subject Studied

Figure A.5: Model Fit and Outliers for Estimates of Human Rights.

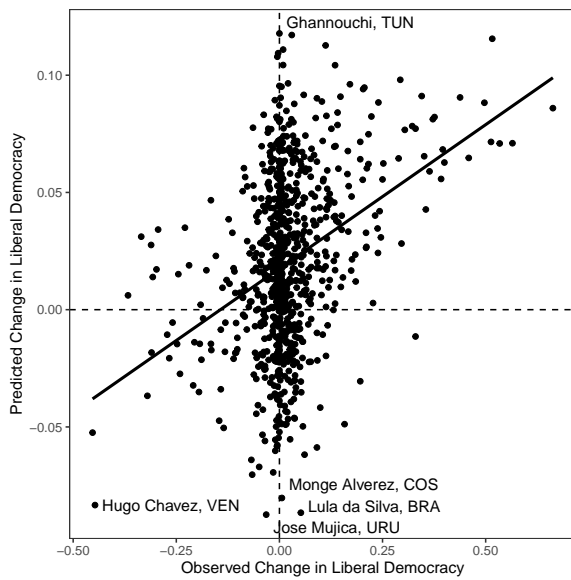


(a) Education Model

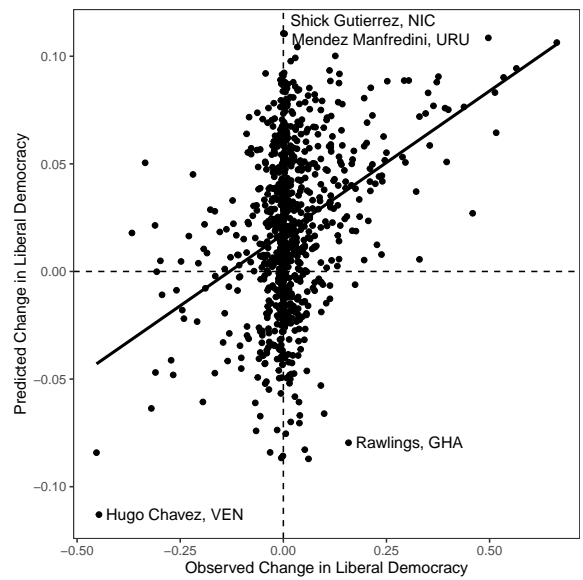


(b) Subject Studied

Figure A.6: Model Fit and Outliers for Estimates of Liberal Democracy.



(a) Education Model



(b) Subject Studied

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