August 21st, 2025

3rd version

Net Appendix to two papers Pa1 and Pa2:

The OPEC/MENA/Arab nexus and the missing democratic transition

European Journal of Political Economy online first

And

The economic system of oil countries. Political capitalism?

Joint work with Jamael Saadaoui for Miklós, R.,Vahabi, M., eds. *Handbook of Political Capitalism. Cambridge University Press* 2026 or 2027

Martin Paldam, Aarhus University, Denmark[1]

Pa1 and Pa2 are parallel. Pa1 concentrates on the political system and considers three overlapping country groups: OPEC, MENA, and Arab. Pa2 focuses on the economic system but examines only the OPEC group, which is the most distinct economically.

The variables considered are defined in Table 1. The appendix uses the abbreviation *ci* for the 95% confidence interval. All graphs were created using Stata. The kernel estimates are computed with the *lpoly* command, using default settings, including the Epanechnikov kernel.

Graphs of kernel regressions and frequency distributions are bulky to present in the main text. Thus, the main paper limits the number of such graphs. Moreover, reporting confidence intervals (*ci*) makes the graphs visually cluttered. Therefore, this appendix expands the supply of graphs, including many with confidence intervals.

The numbering of table and figures starts at 1 in each of the 17 sections. Thus, cross-references between sections also mention the section. Thai is Table 3.1 is Table 1 in section 3.

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Content

Table 1. Variables, sources, and samples

Variables with net addresses of sources (https://www. deleted)

GDP,	Gross National Product/National income, in real PPP prices, per capita.
gdp	Source: ggdc.net/maddison/maddison-project/home.htm.
y	Income, the natural logarithm to *gdp* same source.
P	Polity democracy index. Source: systemicpeace.org/polityproject.html (not updated).
V	Polyarchy democracy index. Source: V-Dem project: v-dem.net/.
FH	Freedom House index, only used in section 8. Source: freedomhouse.org/country/scores.
SC	Index of state capture in percent. Range]0,100[. Falling when capture does. Source: governanceactionhub.org
T	10 – TI. From Transparency International's TI index. Range]0, 10[. Falling when corruption does. Source: transparency.org/en/cpi/2024
EF	Fraser Institute index of economic freedom. Range]0, 10[. Rising for more freedom. Source: fraserinstitute.org/studies/economic-freedom-of-the-world-2024-annual-report
EFA#	The index has 5 areas, # = 1 to 5.

Sample structure (number of countries)

All data	Main (130)	OPA (26) see Pa1				
Groups		OPEC (18) see Pa2		MENA (18)	Arab (16)	
Sub-groups		OPEC-only (8)	Overlap (10)	MENA-only (8)	O-Arab (9)	N-Arab (7)

OPEC is the Organization of Petroleum Exporting Countries. Data covers past and present members plus, Bahrain and Oman. The 18 OPEC countries are divided in the 6AP group on the Arab peninsula and 12oO others. Pa2 and sections 10 and 15 use this division.

MENA is the Middle East and North Africa.

Arab are the MENA countries except Iran and Turkey. O-Arabs (has oil and N-Arabs (has not); see Table 1section 12

1. Main sample. Income and time kernels for *P* and *V* with cis. Period 1950-2018

Figure 1. Income-kernels for Main sample, transitions

Figure 1a. Polity, income: $K^P(y, 0.3)$

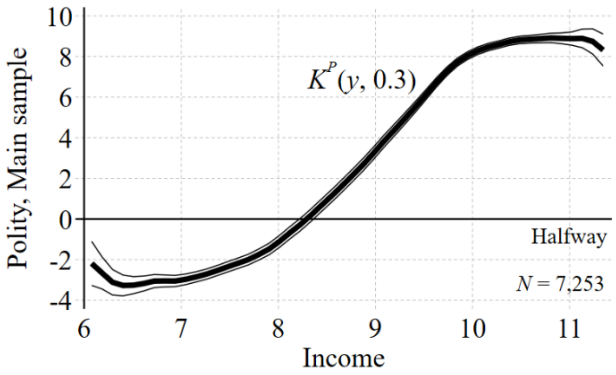


Figure 1b. Polyarchy, income: $K^V(y, 0.3)$

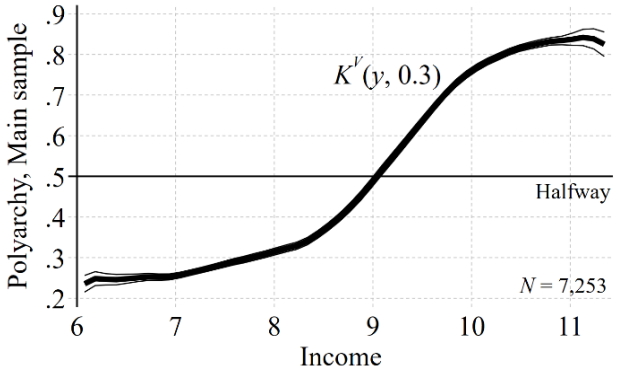


Figure 2. Time-kernels for Main sample, development 1950-2018

Figure 2a. Polity, time: $K^P(t, 2.7)$

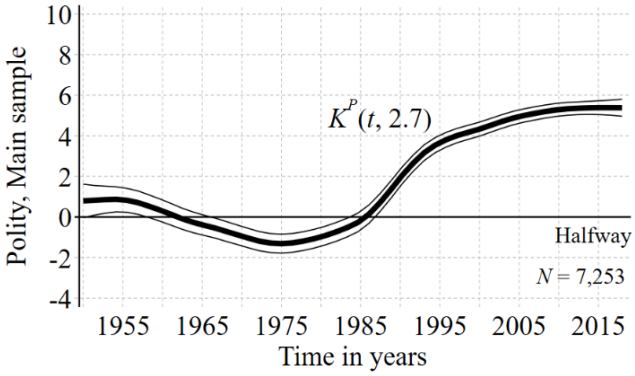
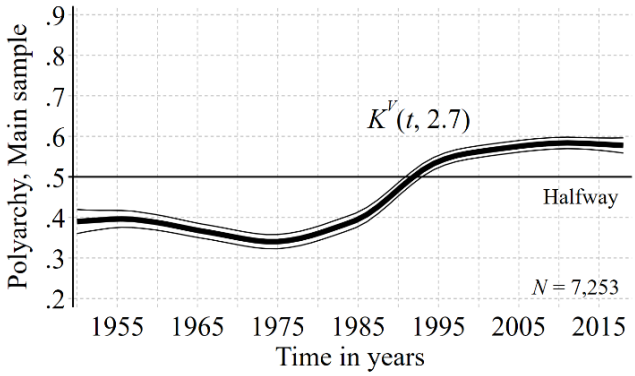


Figure 2b. Polyarchy, time: $K^V(t, 2.7)$



The figures call for three comments:

1. They are very similar to Pa1 Figures 1 and 2, even though the time period is shorter. In other papers, the curves are estimated for the period 1960 to 2018, and from 1972 onward to include the Freedom House index—the curves are robust.
2. The four curves have narrow confidence intervals. These are even narrower for the curves in Pa1, where *N* is higher.
3. The two income kernels are 'better' than the two time-kernels. The income-kernels resemble perfect transition curves, whereas no theory explains the time kernels. The confidence intervals are narrower for the income kernels.

As income grows over time, the income and time graphs are connected; however, the income path is primary, while the time path represents a secondary effect.

2. OMA sample. Income and time kernels for *P* and *V* with cis. Period 1950-2018

The three comments made in Section 1 also apply to the present section, but there are no transitions in the three figures, and the curves exhibit a smaller range, as reported in Table 1. During the period from 1975 to 2014, the curves rise, but then they decline. It is noteworthy that the income curves have their strongest rise before the time curves, suggesting that the income rise affects the time curves with a considerable lag.

Figure 1. Income-kernels for OMA sample, 1950-2018

Figure 1a. Polity explained by income

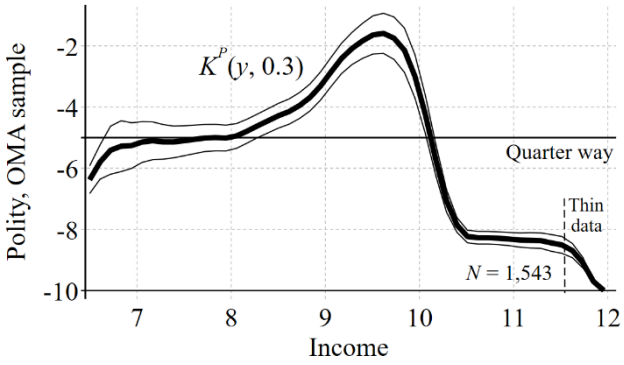


Figure 1b. Polyarchy explained by income

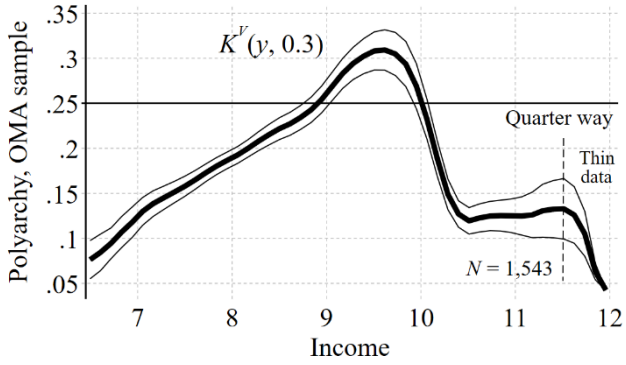


Figure 2. Time-kernels for OMA sample. Development, 1950-2018

Figure 2a. Polity explained by time

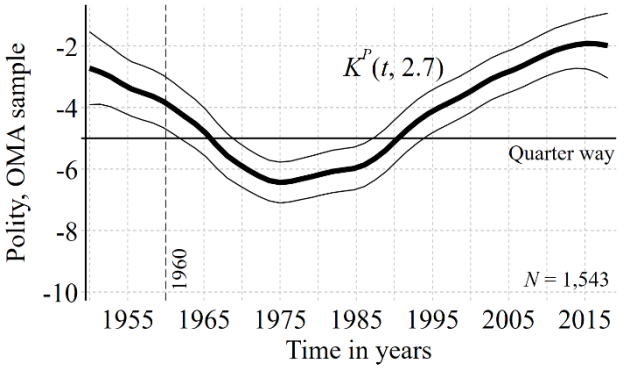


Figure 2b. Polyarchy explained by time

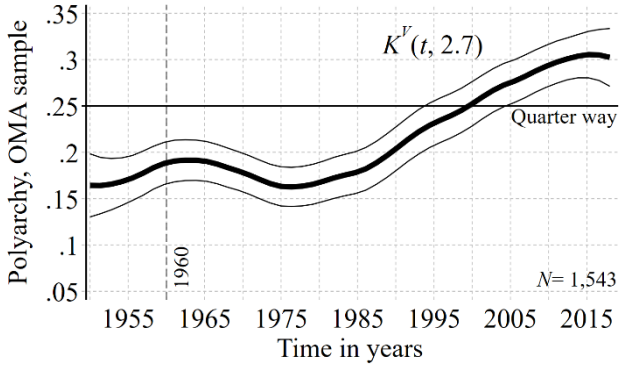


Table 1. The range of the curves

Samples	Income kernels			Time kernels		
	Figure	Polity	Polyarchy	Figure	Polity	Polyarchy
Main sample	1 of paper	11.9	0.58	2 of paper	6.7	0.25
OMA sample	3 of paper	6.6	0.19	4 of paper	3.7	0.14

The tails with thin data on Figures 3 (Pa1) are disregarded

3. The gap between the *P* and *V* curves for the Main and OMA samples

Figure 1 shows the difference between the curves for the Main sample from Figure 1 Pa1 and the corresponding curves for the OMA samples (from Figure 3 Pa1). The figures demonstrate a strong divergence in political systems. The range for polity is [−10,10], i.e., 20 polity points, and for polyarchy]0,1[, i.e., one polyarchy point. The gap starts at 10% of the range at low income and increases to almost 80% on average at the high-income end. Similarly, Figure 2 illustrates how the gap between the curves on Figures 2 Pa1 and 4 Pa1 also diverge.

Figure 1. The difference in income-kernels for the Main and the OMA groups

Figure 1a. Gap for polity

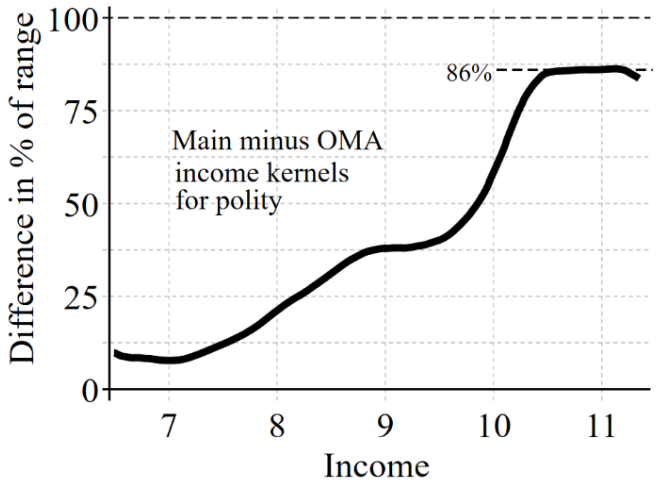


Figure 1b. Gap for Polyarchy

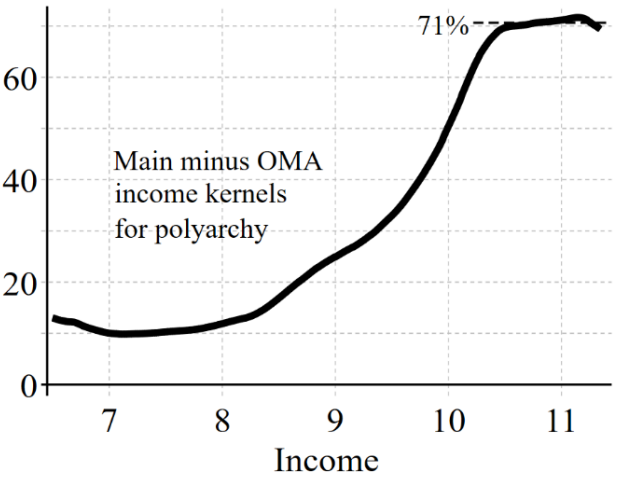


Figure 2. The difference of time-kernels for the Main and the OMA groups

Figure 2a. Gap for polity

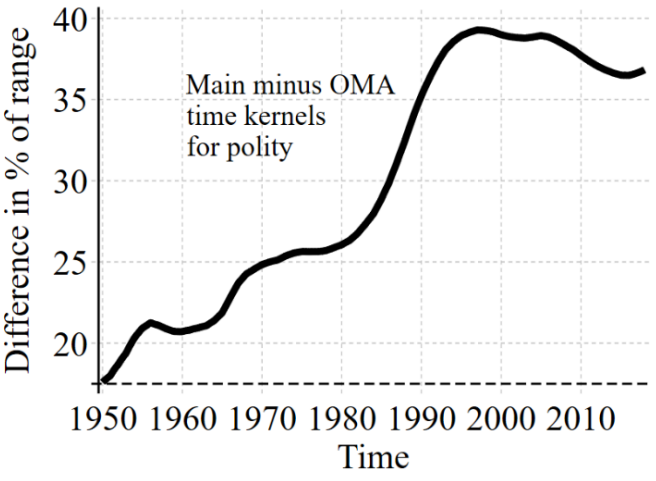
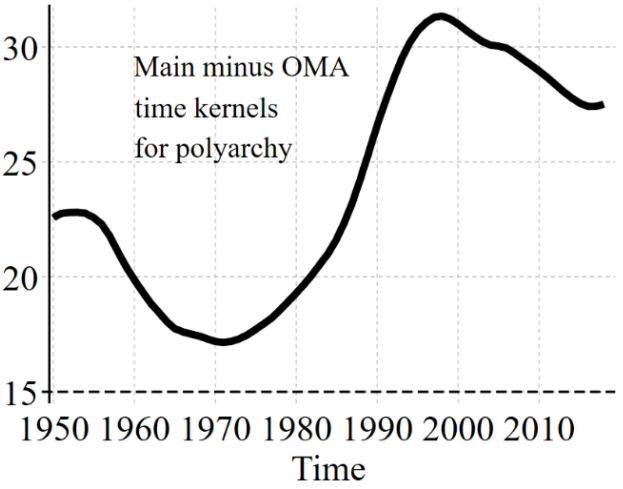


Figure 2b. Gap for Polyarchy



4. OMA sample. Robustness of the *P* and *V* curves to the bandwidth, *bw*

Figure 1 shows the robustness of the two OMA kernels. The basic form is robust, especially the segment before the hump. The hump shifts slightly in Figure 1a, and all curves decline after the hump. The kernel curves from Pa1 and Pa2 are highlighted as the bold black curve. Experiments demonstrating the robustness of the kernels to the bandwidth (*bw*) for the Main sample are reported in Paldam (2021).

Figure 1. Kernel from Figure 3 Pa1. Experiments with bw = 0.1, 0.2, …, 0.6

Figure 1a. $K^P(y, bw)$ for polity Pa1 Fig 1 and Pa2 Fig 2a

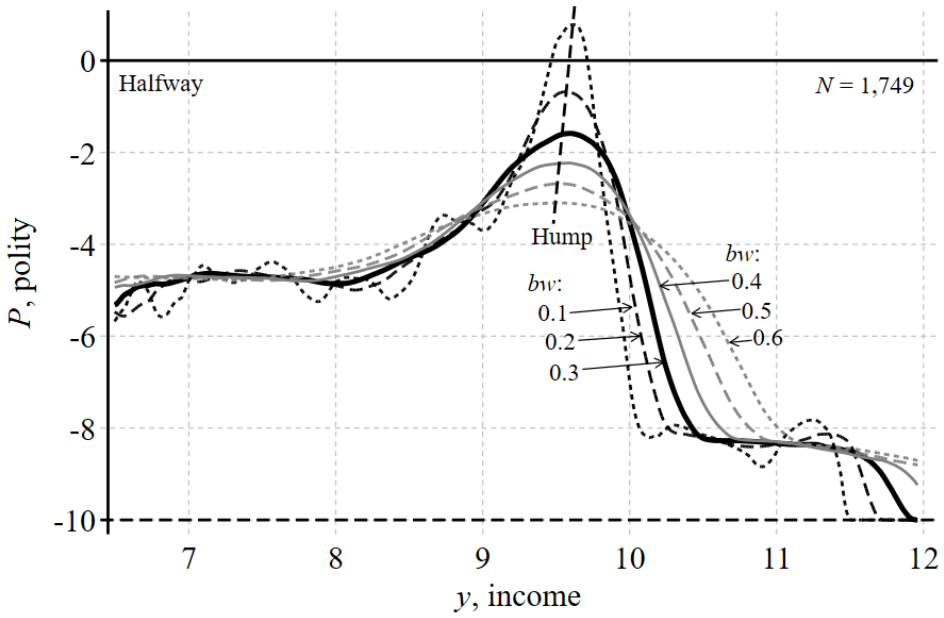
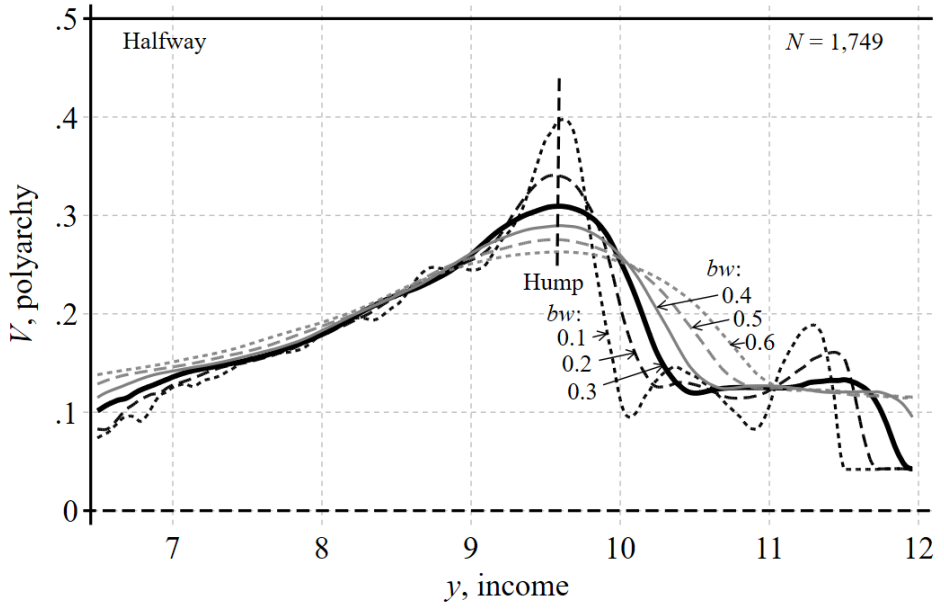


Figure 1b. $K^V(y, bw)$ for polyarchy Pa1 Fig 1 and Pa2 Fig 2b



5. Frequency distribution (%) of the *P* and *V* indices for the three groups: OPEC, MENA, and Arab

Figures 1–3 show the frequency distributions for the three groups: OPEC, MENA, and Arab. They closely resemble the figures for OMA in Pa1, Figures 4b and 5b. As expected, the curves for polyarchy are more left-skewed than the polity curves. The most skewed distribution—consistent with Pa1 Table 5a and Figure 5—is found among the Arab group, which has low levels of democracy.

Figure 1. OPEC group, $N = 1{,}224$

Figure 1a. Polity

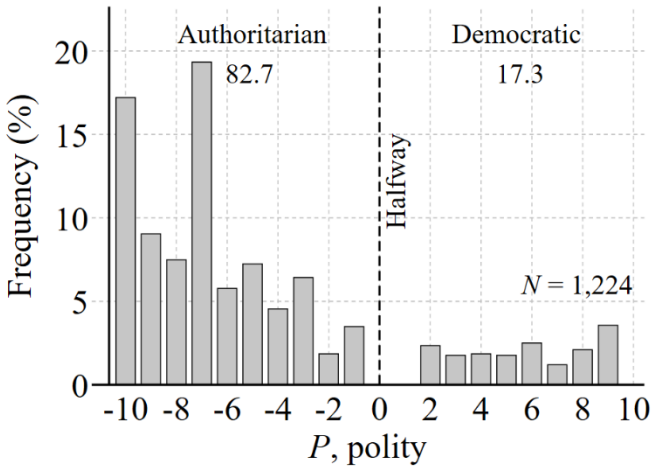


Figure 1b. Polyarchy

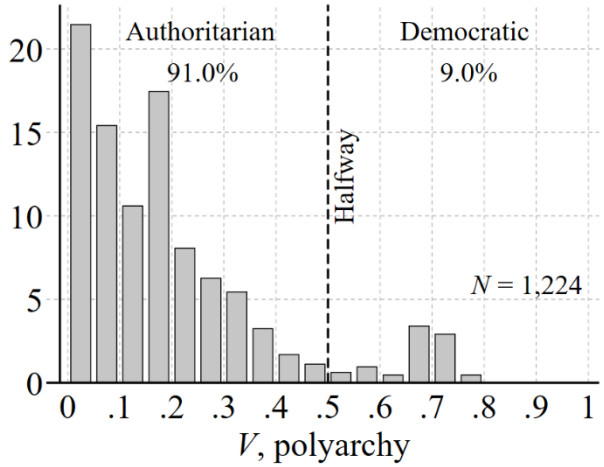


Figure 2. MENA group, $N = 1{,}107$

Figure 12. Polity

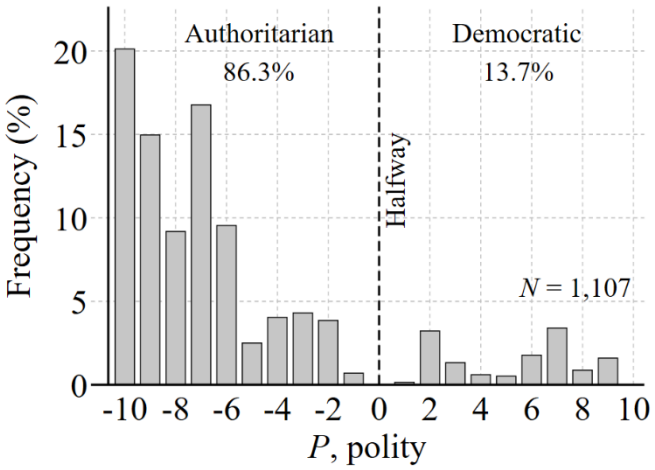


Figure 2b. Polyarchy

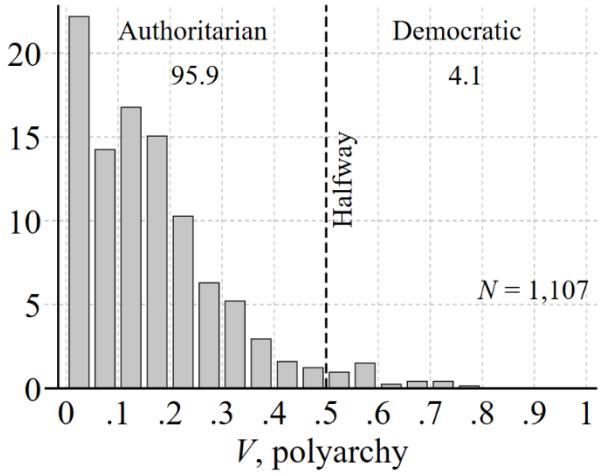


Figure 3. Arab group, $N = 940$

Figure 3a. Polity

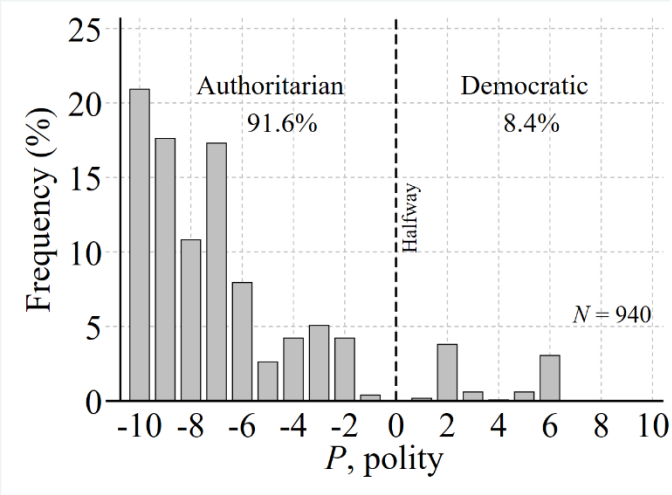
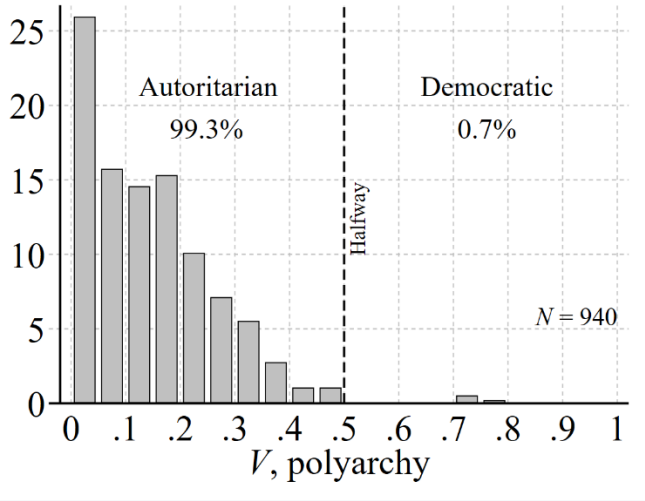


Figure 3b. Polyarchy



The frequency distributions from Pa1 for the Main sample are cited as Figure 4 for ease of comparison. When the distributions for the three group samples are compared with those in Figure 4, they certainly differ.

Figure 4. Figures for Main sample from Pa1 for comparison

Figure 4a. Polity Pa1 Fig 4a

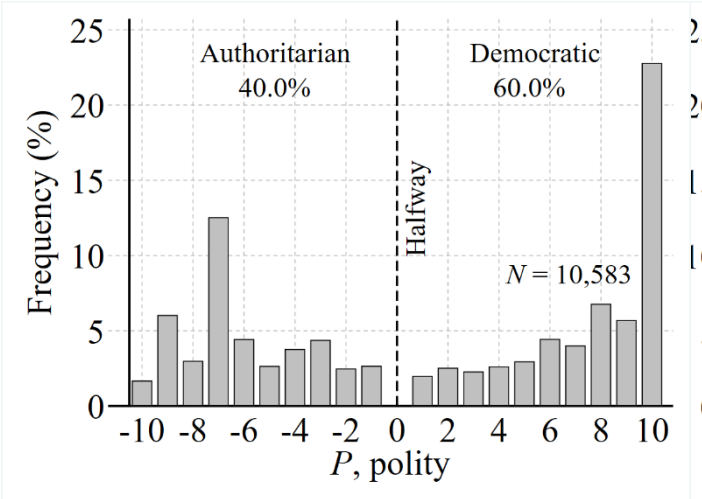
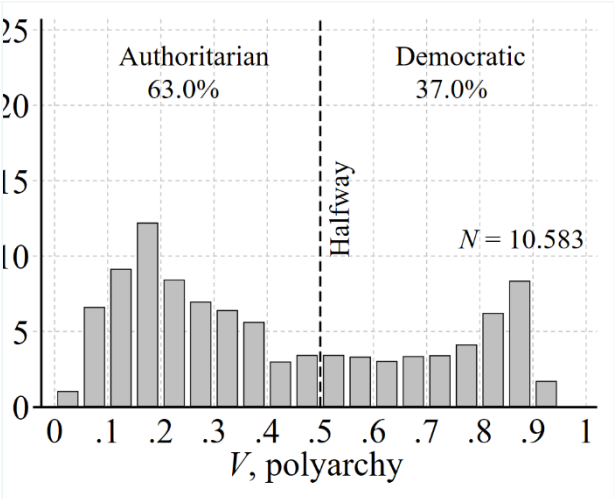


Figure 4b. Polyarchy Pa1 Fig5a



Section 12 compares the frequency distribution of P and V for the O-Arab (oil) and the N-Arab (no oil) countries.

6. The robustness of the *P* and *V* income curves for the sub-groups: OPEC-only, MENA-only, and Overlap

This section examines the robustness of the 2 × 3 curves for the two indices and the three subgroups—specifically, the curves shown in Pa1, Figures 7a and 7b. For each of the three subgroups, four graphs (a, b, c, and d) are presented. Graphs a and b are for polity, while graphs c and d are for polyarchy. Graphs a and c display the original curves with confidence intervals (cis).

Graphs b and d present bundles of curves. Figures 1 and 2 are for the OPEC-only and MENA-only subgroups, respectively. Each includes eight countries, resulting in eight lines within each bundle. Each line represents a kernel estimate with one country omitted. Figure 3 is for the Overlap subgroup, of ten countries, and thus the bundle contains ten lines, computed in the same way. The two countries that most influence the kernel are also identified. These 8–10 curves per bundle serve as a robustness test, illustrating the sensitivity of the kernel to the data from individual countries.

Section 3 of Pa1 presents two theories: (T1) *the oil theory* and (T2) *the institutional genes theory*. Section 3.5 applies these theories to generate predictions for each of the three subgroups. All three curves are predicted to be below the transition curve for the main sample.

OPEC-only: Predictions are based on (T1), the oil theory. The curves are expected to be high and to have a clear peak. Since these countries are neither Arab nor within the MENA region, spatial effects from the other two groups are unlikely. These predictions are confirmed for all 2 × 8 curves, although one curve is too short to display the hump.

MENA-only: Predictions are derived from (T2), the institutional genes theory. The curves are expected to be high and without a peak. Seven of the eight countries are Arab, and all are in the MENA region. The theory does not predict a hump, only a slower transition. These predictions hold across all 2 × 8 curves; however, note that the series are too short to reveal a hump even if one were present.

Overlap: These are the lowest curves. Both theories apply here, and the curves are expected to be low and to exhibit a hump—though the curves may be so low that the hump appears weak. All 2 × 10 curves are indeed very low, as predicted. The hump is clear in Figure 1a but less distinct in Figure 3c and d. The robustness of the results is satisfactory. The experiments thus support the analysis presented in Pa1.

Figure 1. The OPEC-only sub-group for eight countries

Figure 1a. Polity. As in Pa1 with confidence intervals.

Figure 1b. Polity. Bundle for the eight countries.

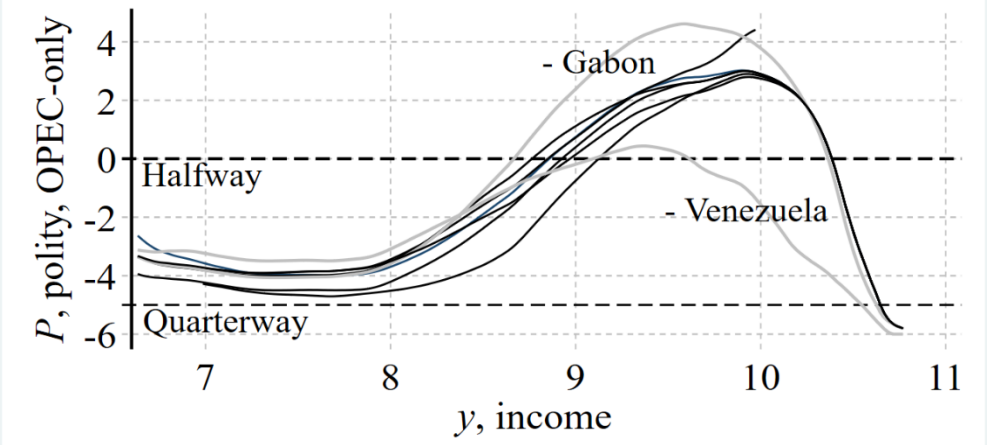


Figure 1c. Polyarchy. As in Pa1 with confidence intervals.

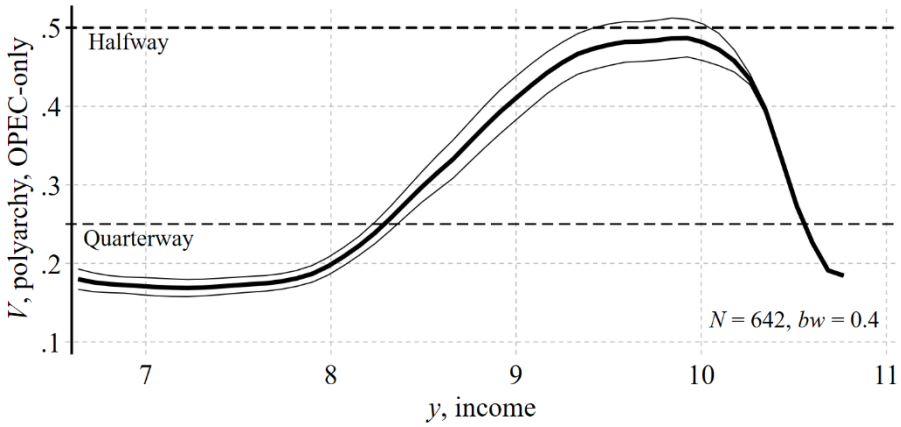


Figure 1d. Polyarchy. Bundle for the eight countries.

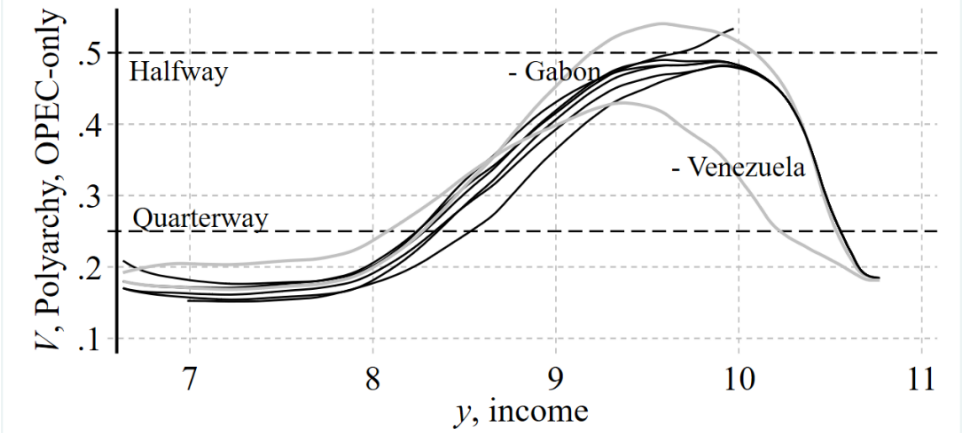


Figure 2. The MENA-only sub-group of eight countries

Figure 2a. Polity. As in Pa1 with confidence intervals.

Figure 2b. Polity. Bundle for the eight countries.

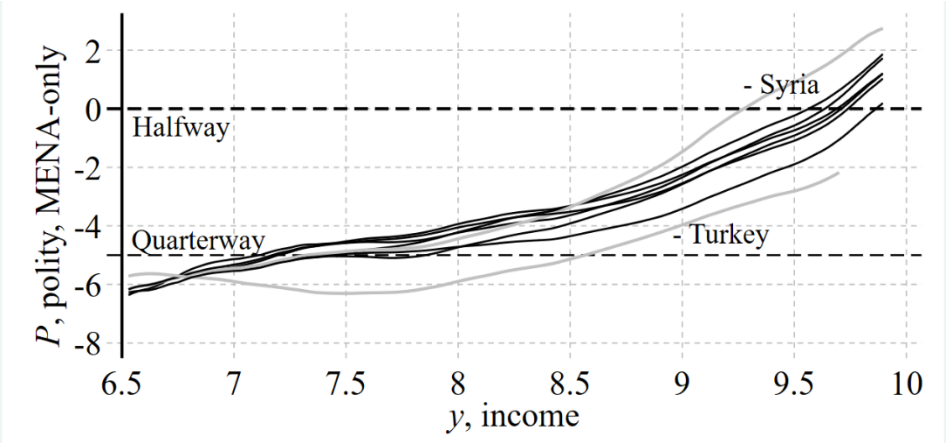


Figure 2c. Polyarchy. As in Pa1 with confidence intervals.

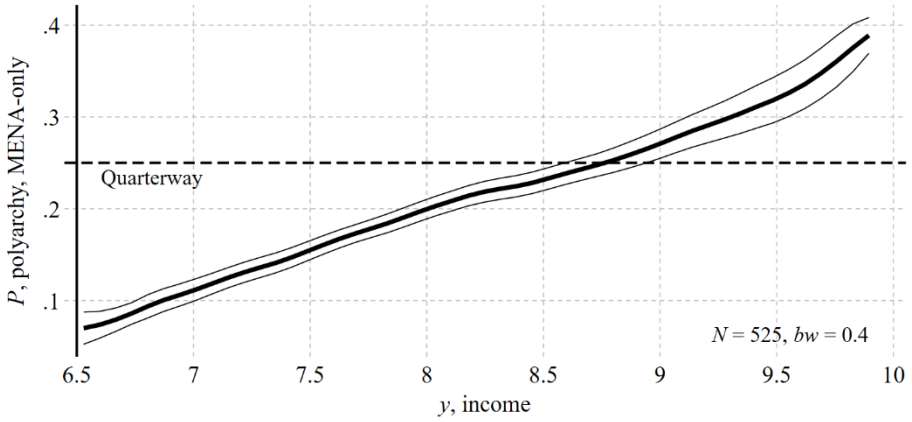


Figure 2d Polyarchy. Bundle for the eight countries.

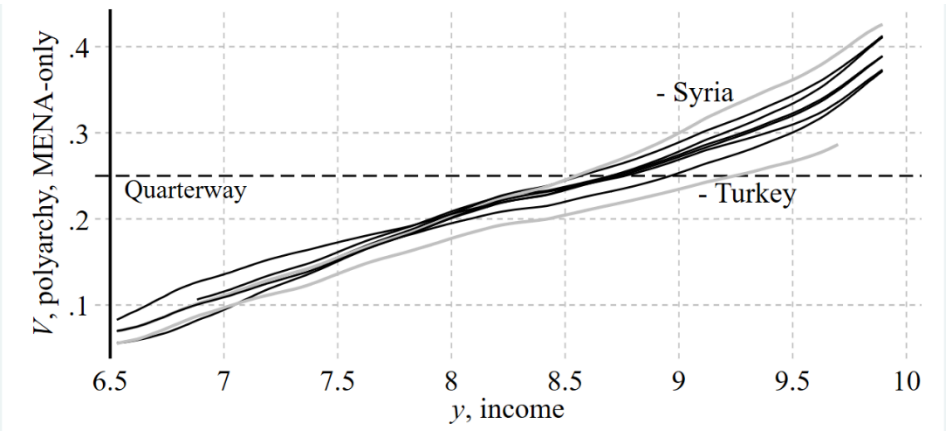


Figure 13. The Overlap sub-group of ten countries

Figure 3a. Polity, As in Pa1 with confidence intervals.

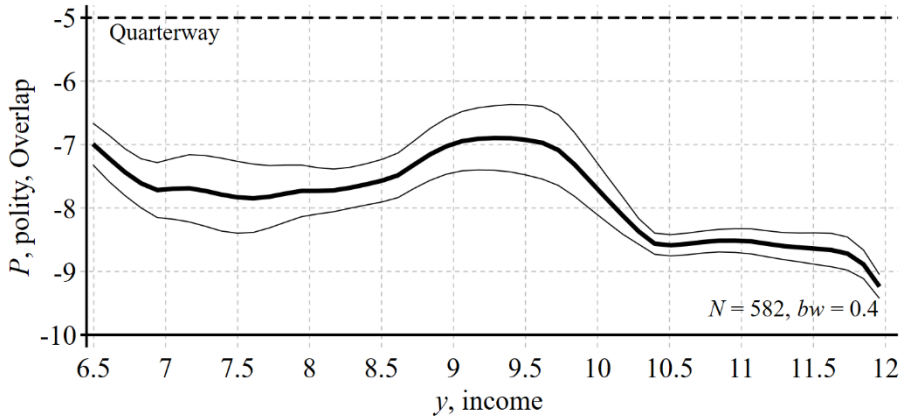


Figure 3b. Polity. Bundle for the eight countries.

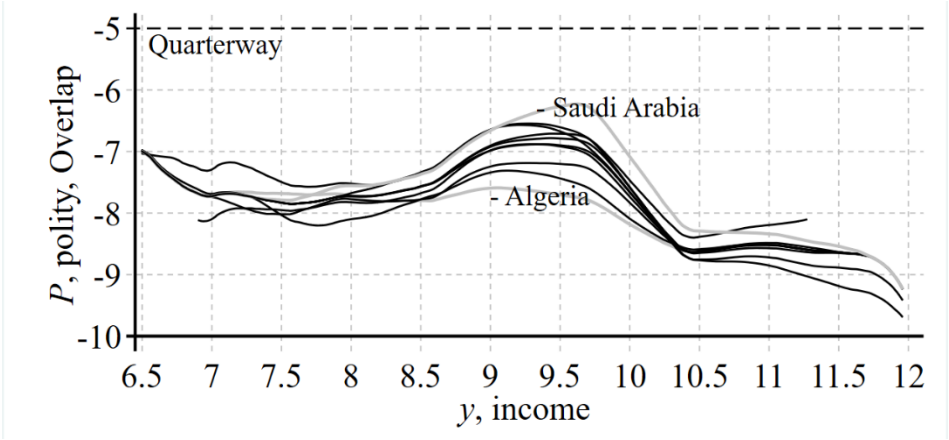


Figure 3c. Polyarchy. As in Pa1 with confidence intervals.

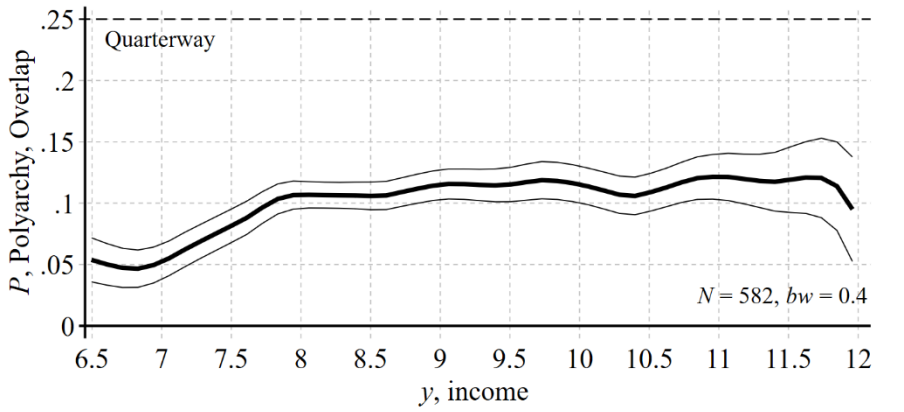
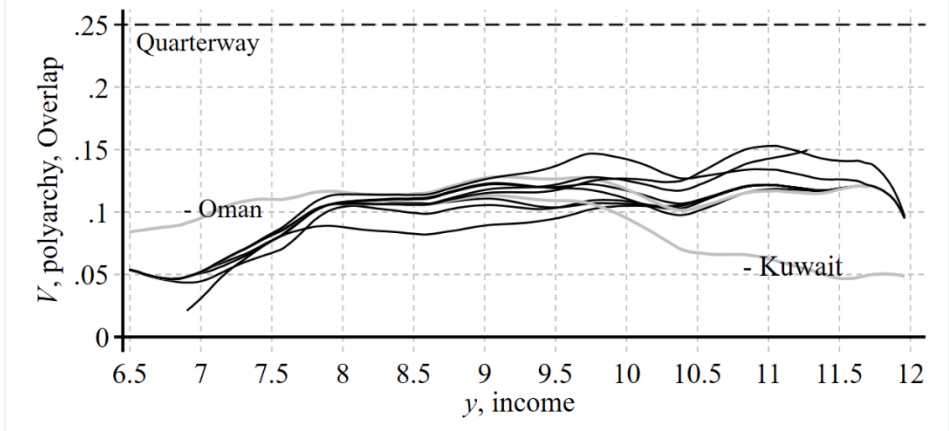


Figure 3d. Polyarchy. Bundle for the eight countries.



7. Averages of *P* and *V* over time – the importance of sample changes

Section 2.2 of Pa1 and Figure 2.1 on page 4 examine political development over time using kernel regressions with time as the explanatory variable. The composition of country samples changes over time, but kernel regressions do not account for these changes. This issue is addressed in Figure 1, which presents annual averages. The general shape of the curves in Figure 1 closely resembles those of the corresponding time-based kernel regressions in Figure 2.2.

Each figure displays four average lines. The thick black line represents all available data. The moderately thick black line reflects averages for countries with at least 50 observations. The thick gray line includes countries with at least 60 observations. Finally, the moderately thick gray line represents six countries with all 69 observations (including Iran, where one polity observation is interpolated).

Figure 1a. Annual averages for the OMA sample

Figure 14a. P, polity

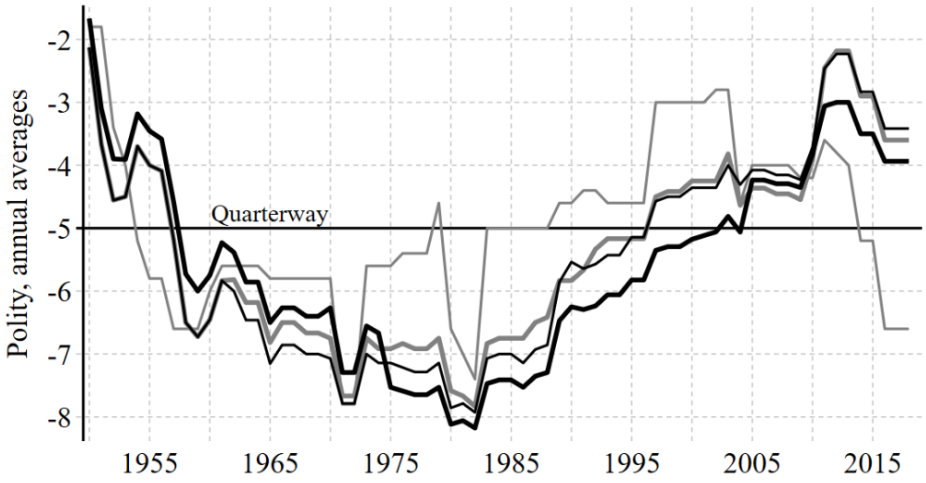
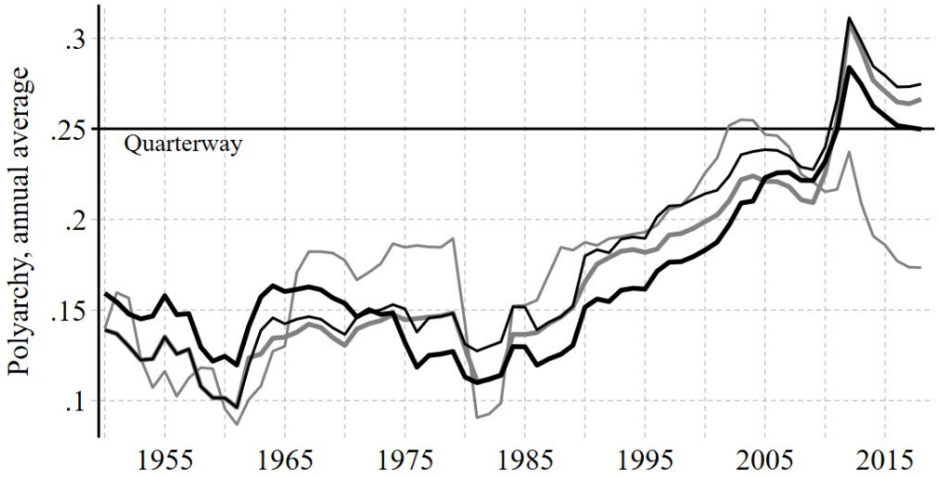


Figure 1b. V, polyarchy



8. The democracy indices extended from 2018 to 2023

Everything until now has been done using the data defined in Table 1 of the paper. However, some evidence exists for the four years from 2019 to 2023. The Polyarchy Index has been updated to 2023, and the Freedom House Index — which has not been used until now — is similarly updated. For the period 1990–2023, both indices are complete for all countries in the OMA sample. The Freedom House Index has two components: *PR* (political rights) and *CL* (civil liberties). Both are given on a 6-point integer scale, where seven is the most authoritarian and one the most democratic. To make the two figures comparable, the Freedom House Index is converted as follows: $FH = 7 - (PR + CL)/2$**,** which is defined on the interval [0, 6]. The trends for the two indices are surprisingly different. While the Polyarchy Index shows a small decline, the decline is substantial for the FH Index.

Figure 1a. The path of two democracy indices from 1990 to 2023 for the three sub-groups

Figure 1a. Polyarchy

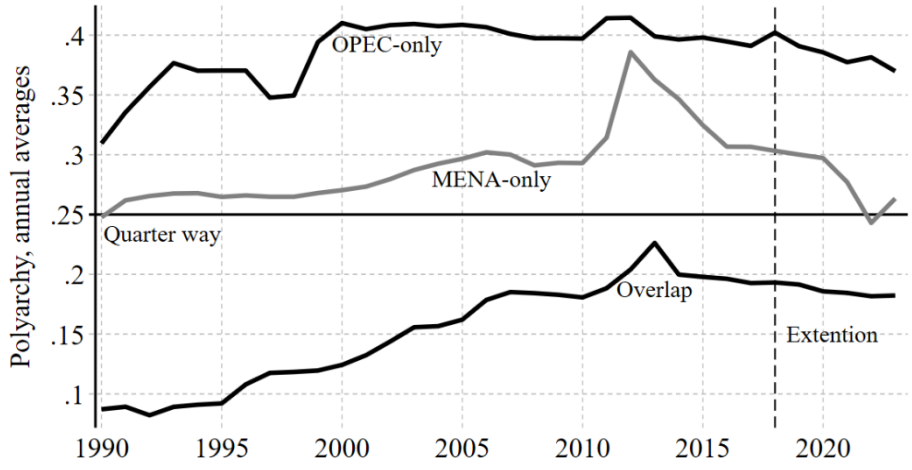
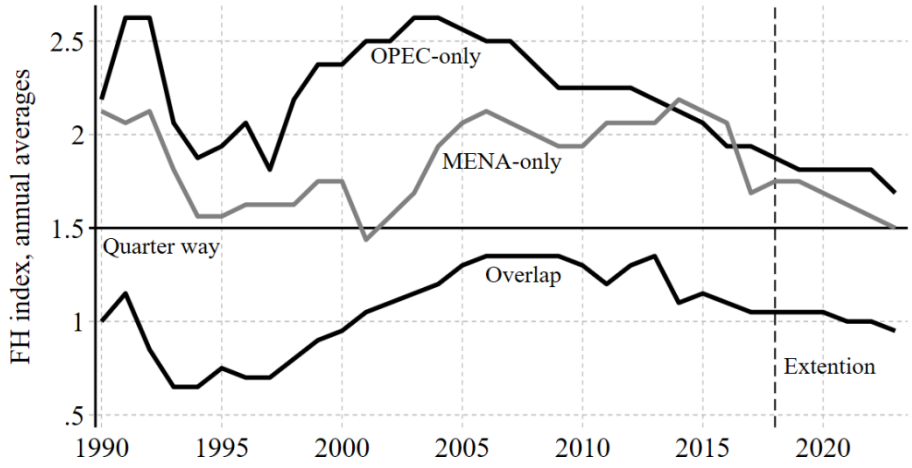


Figure 1b. Freedom House, $FH = 7 - (PR + CL)/2$



9. The effect of the two non-Arab MENA countries: Iran and Turkey

The MENA countries are all Arab except for Iran and Turkey. Both countries have their own language and a long history as independent states. Iran is the only Shi'a Muslim country, while Turkey was a colonial superpower that ruled much of the MENA region. It is a NATO member and extends into Europe. Both tables include all $N = 12{,}332$ observations and are used to estimate the relevant regressions presented in Pa1, Tables 3 and 4. The regressions cited from Pa1 are shaded in gray.

Table 1. The effect of the two countries on the relations for groups, compared with Pa1 Tab 3

Estimating equation: $X = Constant + a_1Income + a_2OMA + a_3Group + a_4Iran + a_5Turkey + u$

	Part A: $X = P$ polity						Explained	
	Constant	*Income*	*OMA*	*OPEC*	*Iran*		aR^2	ΔaR^2
(r3)	-26.7 (-62)	3.38 (67)	-5.23 (-20)	-2.52 (-8)			0.325	
(1)	-26.7 (-62)	3.38 (67)	-5.23 (-20)	-2.42 (-8)	-1.88 (-2.5)		0.326	0.001
	Constant	*Income*	*OMA*	*MENA*		*Turkey*	aR^2	ΔaR^2
(r4)	-27.4 (-64)	3.46 (69)	-3.27 (-14)	-5.92 (-20)			0.343	
(2)	-27.8 (-66)	3.51 (71)	-3.27 (-14)	-6.96 (-23)		11.30 (11)	0.361	0.018
	Part B: $X = V$ polyarchy						Explained	
	Constant	*Income*	*OMA*	*OPEC*	*Iran*		aR^2	ΔaR^2
(r3)	-0.92 (-64)	0.159 (95)	-0.198 (-22)	-0.093 (-9)			0.464	
(1)	-0.92 (-64)	0.159 (95)	-0.198 (-22)	0.090 (-9)	-0.058 (-2.3)		0.464	0.000
	Constant	*Income*	*OMA*	*MENA*		*Turkey*	aR^2	ΔaR^2
(r4)	-0.94 (-67)	0.162 (95)	-0.128 (-16)	-0.215 (-22)			0.481	
(2)	-0.95 (-68)	0.164 (99)	-0.127 (-16)	-0.244 (-24)		0.314 (15)	0.490	0.009

Table 2 The effects of the two countries on the relations for sub-groups, compared with Pa1 Tab 4

Estimating equation: $X = Constant + a_1Income + a_2OMA + a_3Sub\text{-}group + a_4Iran + a_5Turkey + u$

	Part A: $X = P$ polity						Explained	
	Constant	*Income*	*OMA*	*MENA-only*		*Turkey*	aR^2	ΔaR^2
(r4)	-26.7 (-62)	3.38 (67)	-7.75 (-43)	2.52 (8)			0.325	
(3)	-26.7 (-62)	3.38 (67)	-7.76 (-43)	1.06 (3.1)		7.76 (12)	0.333	0.012
	Constant	*Income*	*OMA*	*Overlap*	*Iran*		aR^2	ΔaR^2
(r6)	-28.6 (-68)	3.60 (72)	-4.15 (-23)	-8.75 (-29)			0.366	
(4)	-28.6 (-68)	3.61 (73)	-4.15 (-23)	-9.19 (-29)	3.72 (5)		0.367	0.001
	Part B: $X = V$ polyarchy						Explained	
	Constant	*Income*	*OMA*	*MENA-only*		*Turkey*	aR^2	ΔaR^2
(r4)	-0.92 (-64)	0.159 (95)	-0.291 (-48)	0.093 (9)			0.464	
(A10)	-0.92 (-64)	0.159 (95)	-0291 (-48)	0.060 (5)		0.173 (8)	0.466	0.002
(r6)	-0.98 (-71)	0.167 (102)	-0.159 (-27)	-0.319 (-32)			0.503	
(A12)	-0.99 (-71)	0.168 (102)	-0.159 (-27)	-0.337 (-33)	0.146 (6)		0.504	0.001

For both countries, a binary dummy variable is constructed in the standard way: it takes the value of one when the country is included and zero otherwise. Iran is an OPEC and MENA country, but treated as an OPEC country in Table 1 while Turkey is only a MENA country.

Table 1 builds on Table 3 in Pa1. The country dummies are included in the regression equations. The estimates taken directly from the paper are shaded in gray, and (r#) refers to the corresponding row number. Both country dummies become statistically significant; however, while the Iran dummy changes the regression results only marginally, the Turkey dummy has a small but noticeable effect.

Table 2 is constructed similarly to Table 1 but applies to the sub-groups. Turkey is part of the MENA-only sub-group, while Iran belongs to the Overlap sub-group. The pattern is similar to that in Table 2: the Iran dummy changes very little, whereas the Turkey dummy still shows an effect, though smaller than in Table 1.

Another way to illustrate the influence of the two countries is to examine the country bundles in Section 6. In the bundle for the MENA-only sub-group (Figure 6.1), the exclusion of Turkey has a clearly visible effect. In the bundle for the Overlap sub-group (Figure 6.3), the exclusion of Iran produces almost no change.

10. The Arab Peninsular – the extreme end of the democracy scale

The Arabian Peninsula comprises seven countries: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, the United Arab Emirates (UAE), and Yemen. The first six are collectively referred to as the 6AP countries. They are all oil-producing states, whereas Yemen is not.

The 6AP countries are known for their conservatism and are all governed by powerful monarchs—kings or emirs. Figure 1 shows the average value of the *V*-index dating back to 1900. Before 1960, the index remains flat, and historical narratives suggest that this level extends into antiquity. Since 1960, the 6AP countries have experimented modestly with local elections and elected advisory councils, but they continue to remain authoritarian. The Polyarchy Index has stabilized around 0.13. The largest country in the group—Saudi Arabia—is positioned at the bottom of the low range.

Yemen is by far the poorest country on the peninsula. Historically, it was divided into North and South Yemen. The North resembled the 6AP countries as a traditional kingdom, while the South was a British colony centered on the port of Aden, a key stopover between Europe (UK) and South Asia (India). Due to advances in shipping technology, Aden lost its strategic importance. Meanwhile, several guerrilla movements emerged, and in 1967 South Yemen gained independence. These movements continued fighting, and in 1969 the Marxist-Leninist faction took power. In 1990, South Yemen unified with North Yemen. Since then, the country has been afflicted by civil war.

Figure 1. The average path, 1900-2023, for the 6AP countries

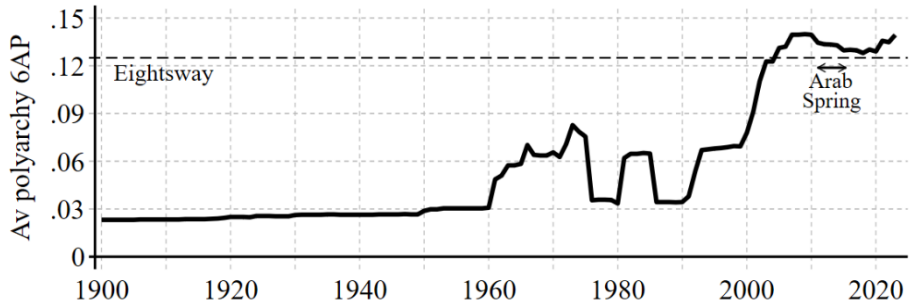
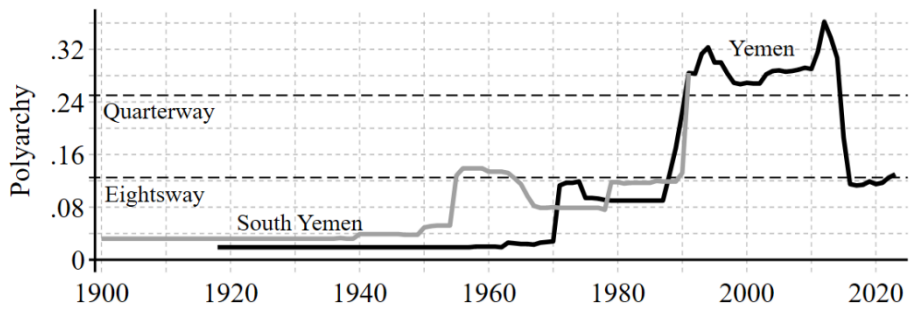


Figure 2. The path, 1900-2023, of Yemen



11. The Arab group, i.e., deleting Iran and Turkey from the MENA group

The Arab league has 22 countries. The Comoros, Djibouti, Mauritania, Somalia, and Sudan are s borderline Arab only. Palestine is excluded as it has sporadic data only and is only partly independent (yet?). Thus, the 16 MENA countries in Table 1 are taken to be the core group that are most comparable. The countries are divided onto O-Arab (oil) and N-Arab (no oil).

Table 1. The 16 Arab countries in the MENA region

N-Arab 7 Arab countries	O-Arab 9 Arab oil countries
1 Egypt	1 Algeria
2 Jordan	2 Bahrain
3 Lebanon	3 Iraq
4 Morocco	4 Kuwait
5 Syria	5 Libya
6 Tunisia	6 Oman
7 Yemen	7 Qatar
	8 Saudi Arabia
	9 UAE

13.1. Income and Fraser index over time

Figure 1 presents the average income of the N-Arab and O-Arab countries. The figure indicates that the two country groups differ in income level by 1.07 log points, which corresponds to a GDP ratio of approximately 2.9. Thus, the O-Arab countries are almost three times richer than the N-Arab countries. Figure 2 displays the corresponding data for the Fraser Economic Freedom Index. In this case, the difference between the two groups is smaller. The N-Arab countries rank as the most economically liberal—that is, closest to market capitalism—but this difference has disappeared since 2010.

Figure 1. Income measured as the logarithm to real gpd per capita

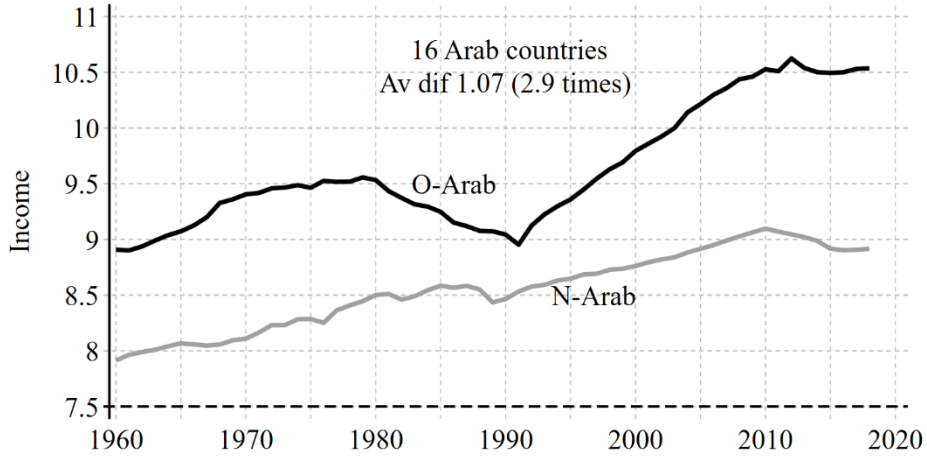


Figure 2. The aggregate Fraser index

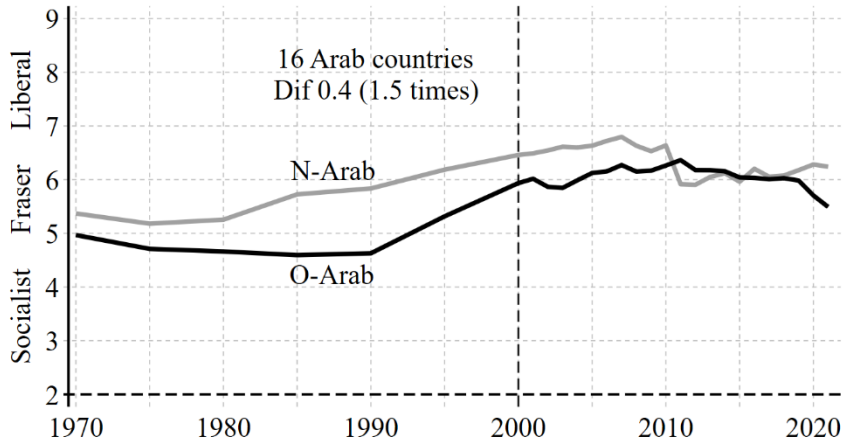


Table 2. State capture 1996-2022 from Kaufmann 2024

	O-Arab	N-Arab
Average	63.6	68.4
Standard deviation	11.8	17.8
Countries n_c	9	7
Standard error (n_c)	3.9	6.7
Observations n_o	81	63
Standard error (n_o)	1.3	2.2

The index is reported for every third year so there are nine times more observations than countries.

Table 3. The level of honesty/corruption, 1995-2023

	O-Arab	N-Arab
Average	4.70	6.61
Standard deviation	1.10	1.67
Countries n_c	9	7
Standard error (n_c)	0.4	0.6
Observations n_o	126	248
Standard error (n_o)	0.09	0.04

The index uses the interval [0, 10] from extreme corruption to extreme honesty.

Tables 2 and 3 present the differences between the O-Arab and A-Arab countries for the *SC* and *T* indices. As shown in Pa2, both indices convey the same underlying pattern.

The reduction in corruption associated with oil is smaller than expected – only about half of the typical decline. Figure 29 (p. 31) illustrates that economic freedom increases with income: the relationship is nearly linear, with an increase of approximately 0.6 points on the Fraser Index for each one-point increase in income (equivalent to a 2.7-fold increase in income). The OPEC curve is similarly linear but lies slightly below the general trend. This may be due to institutional inertia, as the onset of oil wealth results in a sudden increase in income that institutions must subsequently adjust to.

13.2. The five areas of the Fraser index

The following figures show the 5 Areas of the EF-index comparison O-Arabs and N-Arabs.

Figure 3. The development of EFA1-EFA5 over time

Figure 3.1, EFA1. Government size Public expenditure and taxes, including marginal taxes

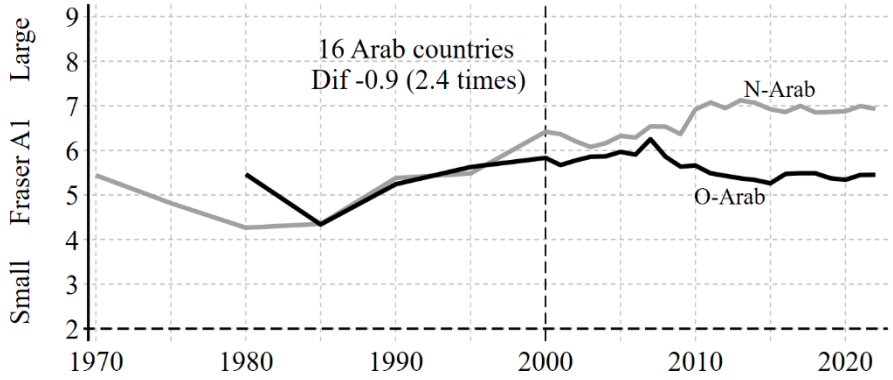


Figure 3.2, EFA2. Legal quality and property rights protection

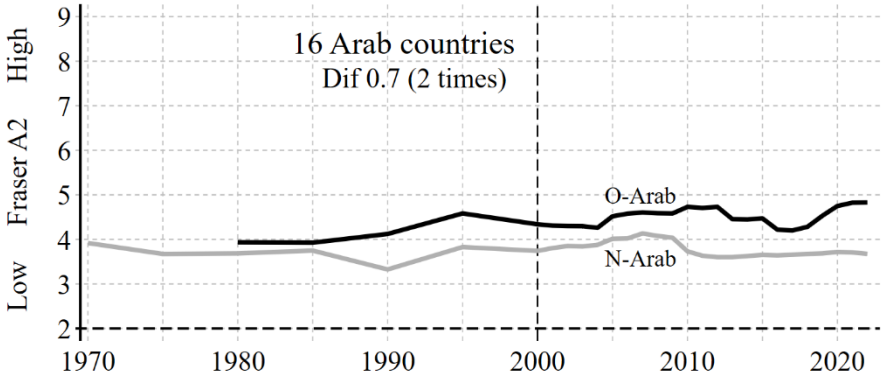


Figure 3.3, EFA3. Sound money Money growth, inflation, and its standard deviation

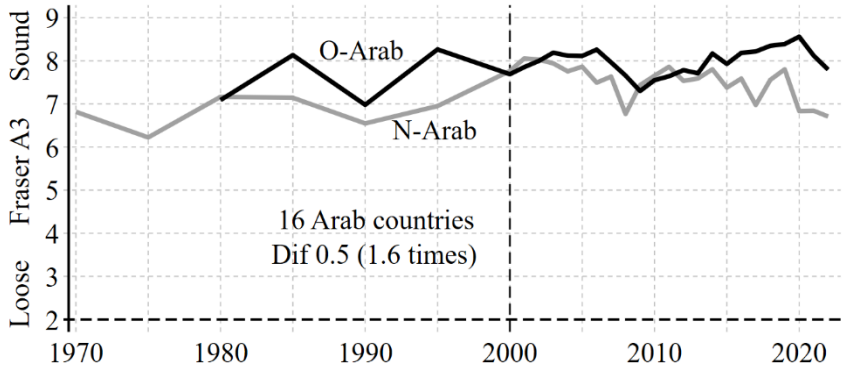


Figure 3.4, EFA4. Free to trade Trade taxes, and trade restrictions, black market exchange rates

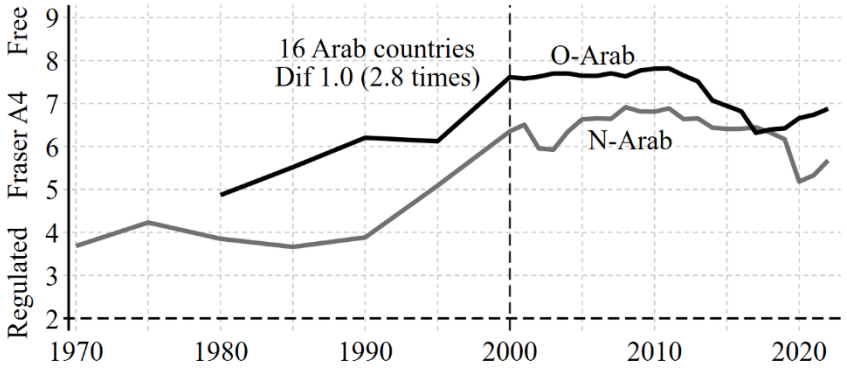
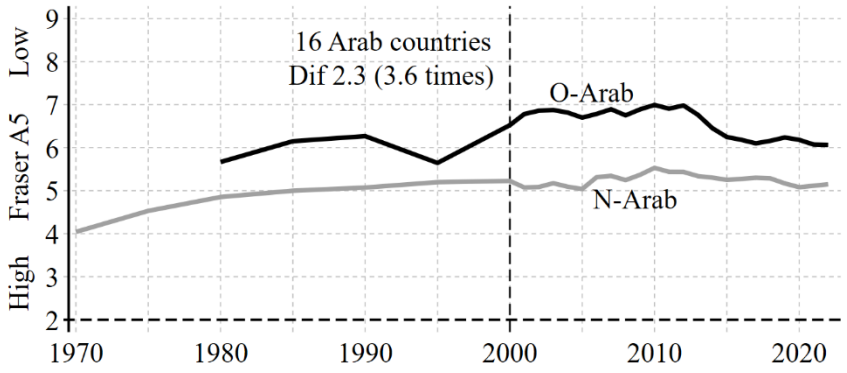


Figure 3.5, EFA5. Regulation of business In three main fields: credit, labor, and business in general



As usual, the FA1 area stands out: the N-Arab group is larger in this region. In contrast, all four of the other areas exhibit slightly higher levels of economic freedom in the O-Arab countries compared to their N-Arab counterparts. Given that we are dealing with an income difference of nearly threefold, the observed differences in economic freedom are relatively small. This interpretation is also supported by Pa2, Figures 8 through 12.

These findings reinforce the idea of spatial spillover effects among Arab countries. The only N-Arab country that does not share a border with an O-Arab country is Lebanon, while approximately half of the O-Arab countries do not border any N-Arab country. However, a large number of guest workers from N-Arab countries are employed in O-Arab countries.

12. Frequency distribution of PV indices for O-Arab (oil) and N-Arab (no oil)

This section presents a set of graphs constructed using the same format as in Section 5, but here the comparison is between O-Arab and N-Arab countries.

The four graphs indicate that Arab oil-producing countries are somewhat more authoritarian than other Arab countries. This finding is consistent with the oil theory (T1), as discussed in Pa1. A similar pattern emerges when OMA oil countries are compared with non-oil OMA countries.

Figure 1. O-Arab (oil countries)

Figure 1a. Polity

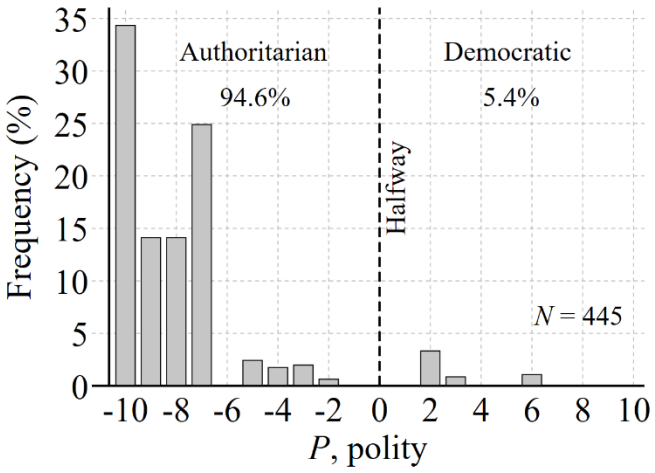


Figure 11b. Polyarchy

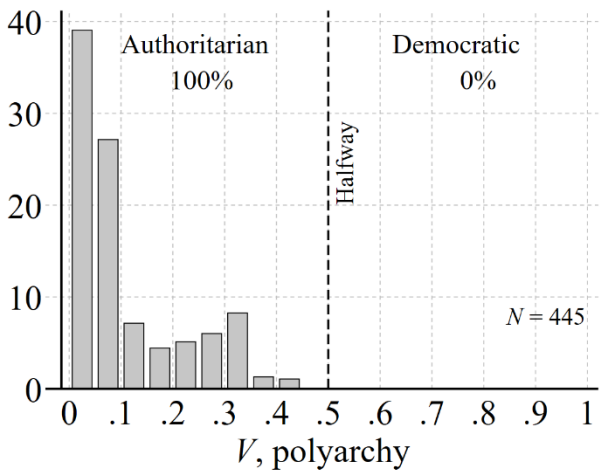


Figure 2. N-Arab (non-oil countries)

Figure 2a. Polity

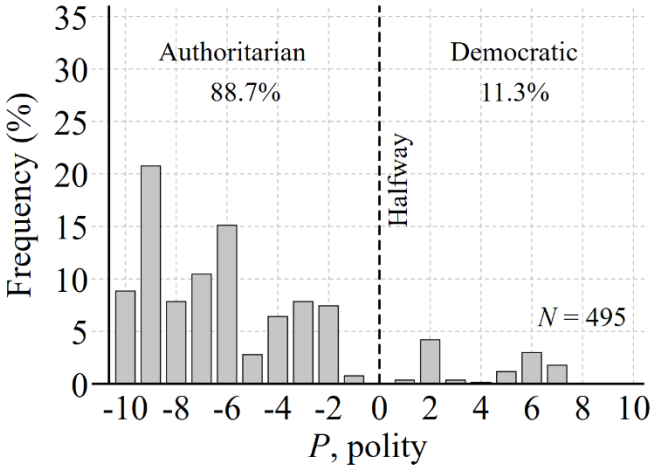
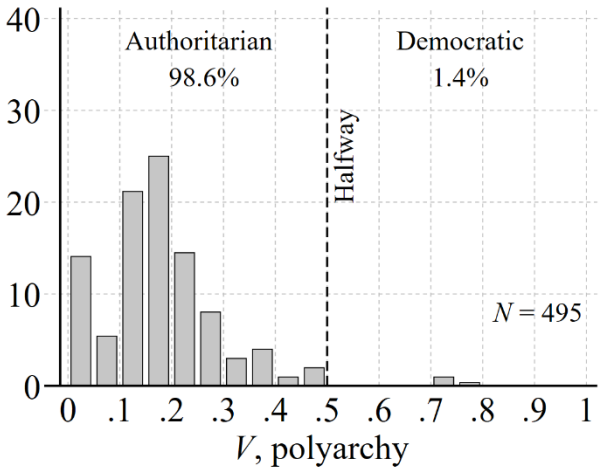


Figure 2b. Polyarchy



13. Figures for EF, economic freedom, SC, state capture, and T, corruption. Three graphs: (1) All but OPEC, (2) OPEC but Arab, (3) Arab but N-Arab

Pages 6 to 8 contain three graphs, each analyzing the development in one index giving an aspect of the economic system. Tables 1 and 2 summarize the three pages.

Table 1. The three figures (1). The transition in Main and OPEC samples

Figure	Index	Sample	Form of kernel curve
1.1	*EF*	Main	An almost linear rising transition curve with a slope of dEF/dy ≈ 0.6
		OPEC	Almost parallel, but one EF point lower
2.1	*SC*	Main	A perfect falling transition curve: Flat at SC ≈ 65 at y = 6 to 8. Then a fall that levels out at SC ≈ 7
		OPEC	Higher and falling less, so the gap rises from 10 SC-points to almost 50 points
3.1	*T*	Main	A fine transition curve looking much like the one for SC
		OPEC	Higher and falling less, so the gap rises from 0.5 T-points to almost three points. Much like for SC

Table 2. The three figures (2) and (3)

Figure	Index	Sample	Form of kernel curve
The three figures (2): The O-Arabs on the OPEC transition			
1.2	*EF*	Arab	Gray points. Significantly higher than others
2.2	*SC*	Arab	Gray points. Insignificantly lower than others
2.2	*TI*	Arab	Gray points. Significantly lower than others
The three figures (3): The N-Arabs and all Arabs			
3.3	*EF*	N-Arab	Gray points. Significantly higher than O-Arab
3.3	*SC*	N.-Arab	Gray points. Borderline significantly lower than O-Arab
3.3	*T*	N-Arab	Gray points. Significantly lower than O-Arab

Taken together, these findings show that both OPEC and Arab countries lag in development. Understanding this requires the application of both theoretical frameworks—Theory 1 (T1) and Theory 2 (T2). The data for the SC index follow a near-perfect transition curve, which should have resulted in an SC level approximately 40 points lower (see Figure 3.1). However, the observed level is only five points lower. This suggests that oil wealth has inhibited the typical decline in the SC index expected during the development process.

Figure 1. *EF* index. Kernel regressions for transition, with *bw* = 0.5

Figure 1.1. All but OPEC.
For OPEC see 1.2

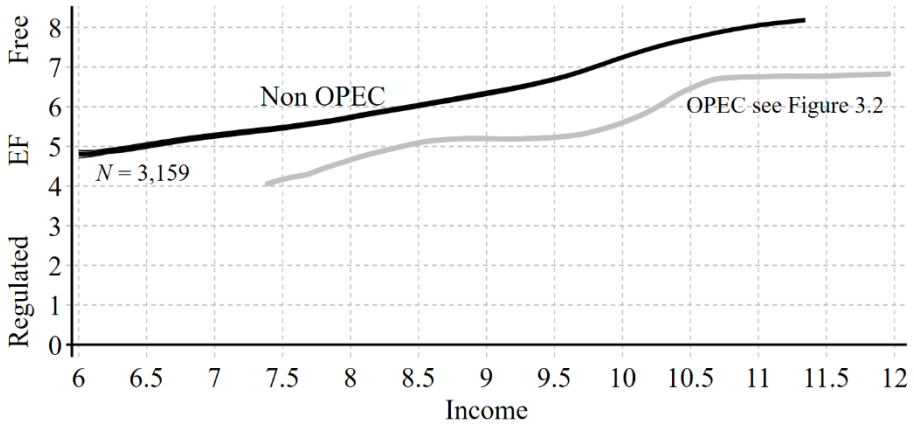


Figure 1.2. OPEC countries
Arab and Others

Figure 1.3. Arab countries
N- and O-group

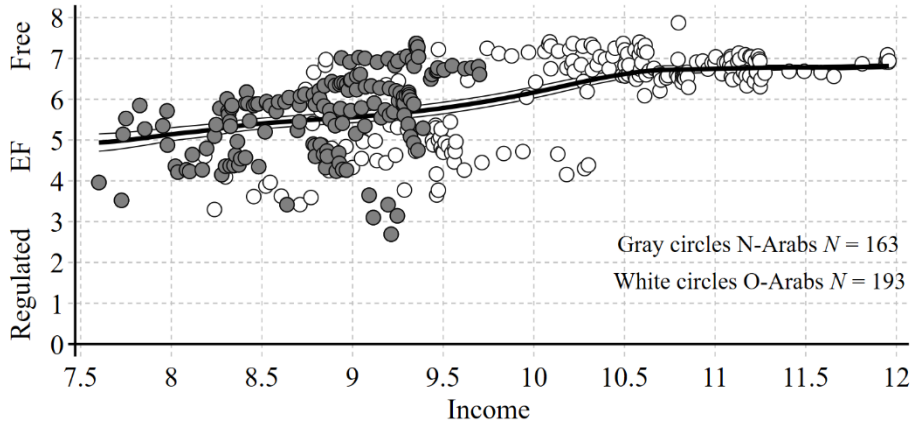


Table 3 to Figure 1. Regressions to reveal shifts

	Analyzing the 387 observations on Figure 1 for OPEC countries			
	Constant	Income	Arab dummy	R^2 adj
(1)	-1.58 -3.5)	0.75 (16)		0.39
(2)	-0.81 (.1.5)	0.65 (11)	0.29 (2.4)	0.40
	Analyzing the 356 observations of Figure 1 for Arab countries			
	Constant	Income	N-Arab dummy	R^2 adj
(3)	-0.67 (-0.2)	0.62 (13)		0.34
(4)	-2.94 (4.8)	0.89 (14)	0.77 (6.4)	0.41

Figure 2. *SC* index. Kernel regressions for transition, with *bw* = 0.5

Figure 2.1. All but OPEC.
For OPEC see 2.2

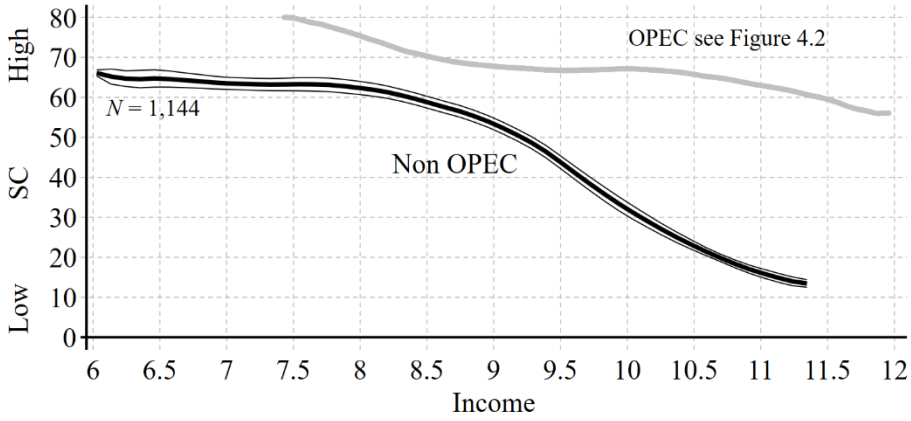


Figure 2.2. OPEC countries
Arab and Others

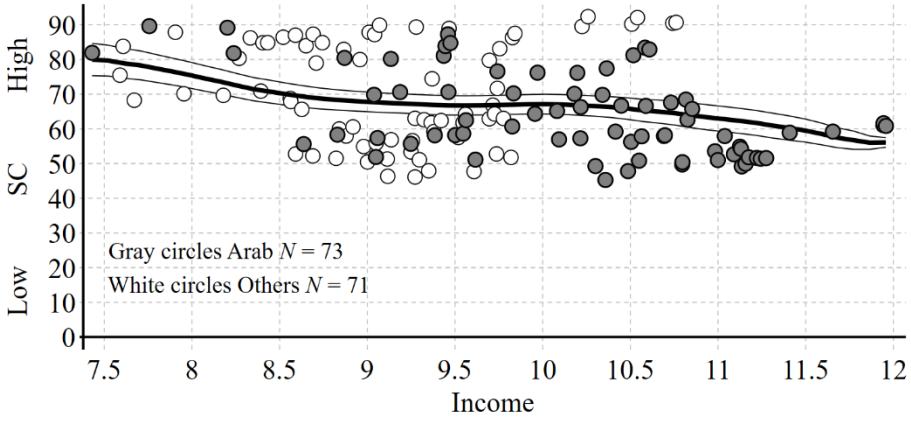


Figure 2.3. Arab countries
N- and O-group

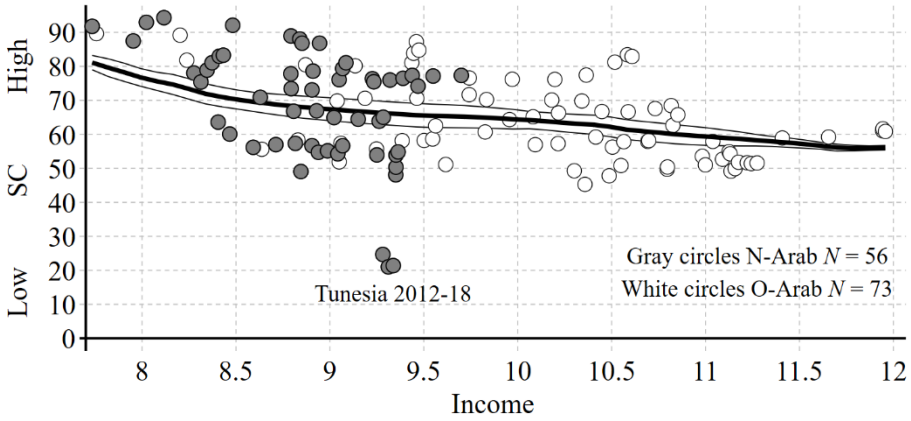


Table 4 to Figure 2. Regressions to reveal shifts

	Analyzing the 144 observations on Figure 2 for OPEC countries			
	Constant	Income	Arab dummy	R^2 adj
(1)	111 (10)	-4.55 (4.2)		0.10
(2)	105 (9)	-3.82 (3.0)	-2.71 (1.1)	0.10
	Analyzing the 129 observations of Figure 2 for Arab countries			
	Constant	Income	N-Arab dummy	R^2 adj
(3)	125 (11)	-6.17 (5.3)		0.17
(4)	145 (9)	-8.01 (5.2)	-5.55 (1.8)	0.19

Figure 3. *T* index. Kernel regressions for transition, with *bw* = 0.5

Figure 3.1. All but OPEC.
For OPEC see 3.2

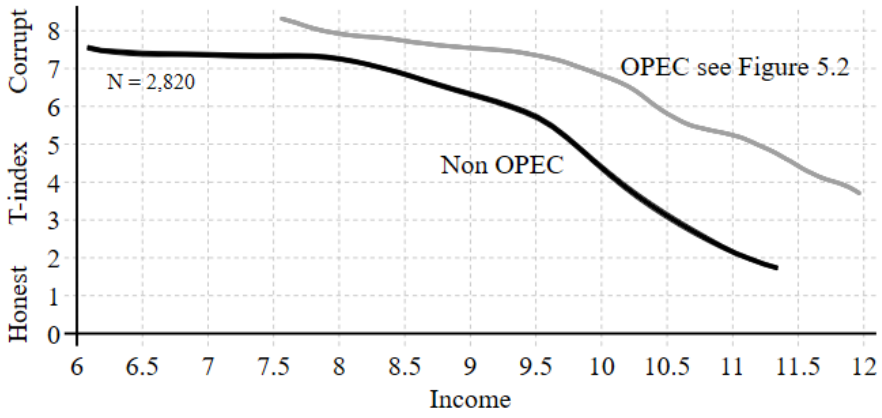


Figure 3.2. OPEC countries
Arab and Others

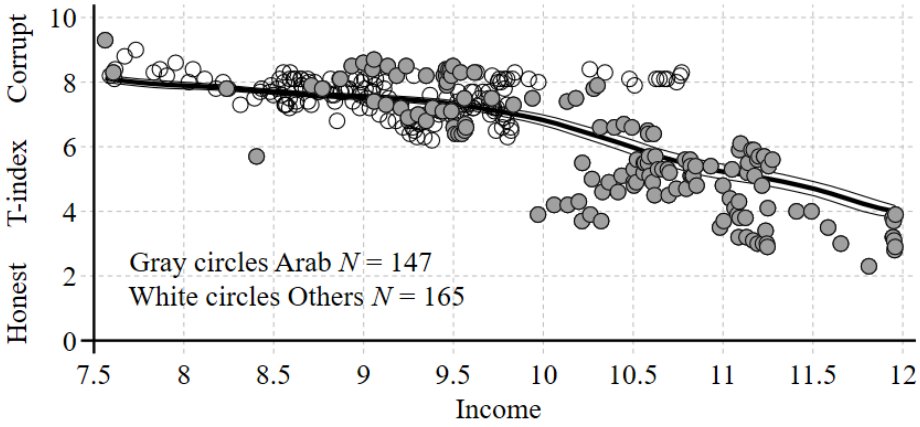


Figure 3.3. Arab countries
N- and O-group

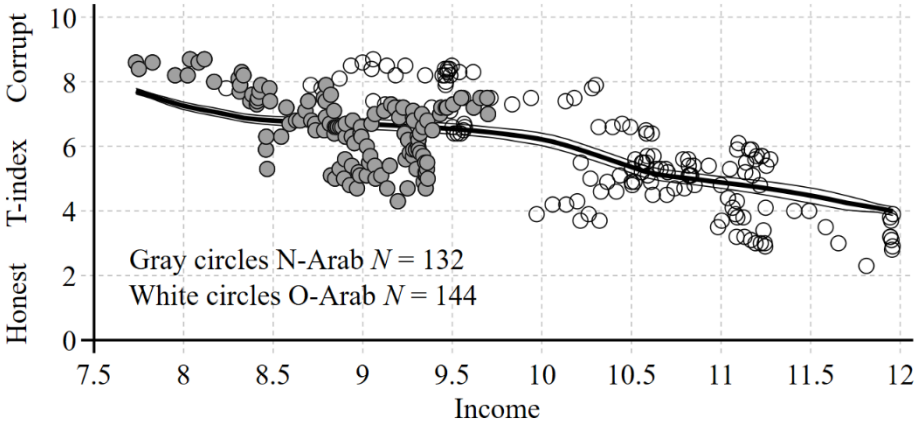


Table 5 to Figure 3. Regressions to reveal shifts

	Analyzing the 312 observations on Figure 3 for OPEC countries			
	Constant	Income	Arab dummy	R^2 adj
(1)	8.53 (16)	-1.22 (22)		0.61
(2)	7.99 (11)	-1.03 (15)	0.62 (4.6)	0.63
	Analyzing the 276 observations of Figure 3 for Arab countries			
	Constant	Income	N-Arab dummy	R^2 adj
(3)	6.20 (-10)	-1.04 (16)		0.49
(4)	12.29 (14)	-1.59 (19)	1.59 (19)	0.61

The two dummies are one for the gray points and zero for the white points on the two figures

14. The political system around independence

This section presents graphs constructed using the same method as in Section 7, but the focus is now on comparing political systems from 20 years before to 20 years after independence. The analysis sets the year of independence to year 0 and tracks changes from −20 to +20. The political indicator used is the V-index (Polyarchy), which covers the colonial period for many countries. Independence typically triggers political realignments, prompting institutional transformation. Two regional samples are used:

1. **Sub-Saharan Africa**: 44 cases
2. **MENA (Middle East and North Africa)**: 15 cases

In Figures 26 and 28, the average Polyarchy score is shown with confidence intervals of ±2 standard errors (SE). These intervals are relatively narrow during the colonial period, when colonial administrations often followed uniform governance models. After independence, the confidence intervals widen by approximately a factor of three, reflecting increasing national divergence.

The **independence line** is drawn as a wide gray band, as the data are annual and independence occurred on various dates within each year across the 44 countries. The 40-year window is divided into four sub-periods, marked by two dashed vertical lines:

A: Colonial

B: Pre-Independence

C: Post-Independence

D: Normalization

The bolded abbreviations are used in the accompanying graphs.

In most cases, independence occurred without major violence—except in countries with large settler populations, such as South Africa and Algeria, or in exceptional contexts like Jordan, from which Israel and Palestine emerged. These latter cases are excluded from the analysis: Palestine remains unsettled, and Israel is not categorized as a MENA country.

12.1. Sub-Saharan Africa: 44 Country Transitions

Sub-Saharan Africa includes approximately 48 countries, of which only two were continuously independent and two lack data. Thus, the sample comprises 44 countries gaining independence, primarily around 1960. In most cases, independence was negotiated between the colonial power and local political elites and occurred without violence. For South Africa and Zimbabwe, independence is defined as the transition from settler rule to majority rule. Figure 1 shows a well-defined pattern across the four time periods:

A Colonial, −20 to −5: Narrow confidence intervals, with an annual increase of 0.04 polyarchy points. While democratic levels were very low, many colonies allowed limited 'native' participation at local levels and granted some civil liberties. The Polyarchy index ranged between 0.05 and 0.1. Anglo- and Francophone countries show similar trajectories.

B Pre-Independence, −5 to 0: The index rose from 0.1 to 0.2, indicating that colonial administrations made (or permitted) preparations for political transition in the five years leading up to independence.

C Post-Independence, 0 to +10: A further increase of 0.06 polyarchy points, but then normalization starts occurred. The peak is 0.26. However, as the post-colonial period progressed, more than 0.06 points were lost. The net political gain from independence stabilized at 0.08 Polyarchy points.

D. Normalization +10 to +20 and onwards. A stabilization at about 0.2.

The total effect of independence is estimated at 0.175 points, as shown in the graph. This suggests that African countries remained so poor that their "natural" level of democracy—consistent with income-based expectations—was low. The early post-independence surge in democracy likely reflected a wave of optimism that proved overly ambitious, leading to reversion toward structural constraints.

Figure 1. The 44 observations from the Sub-Saharan Africa

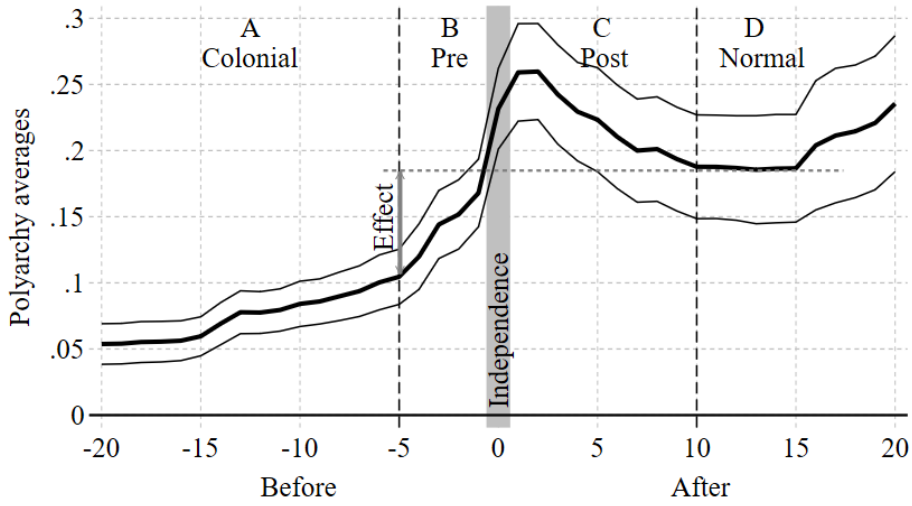


Figure 2. The countries divided by colonial master

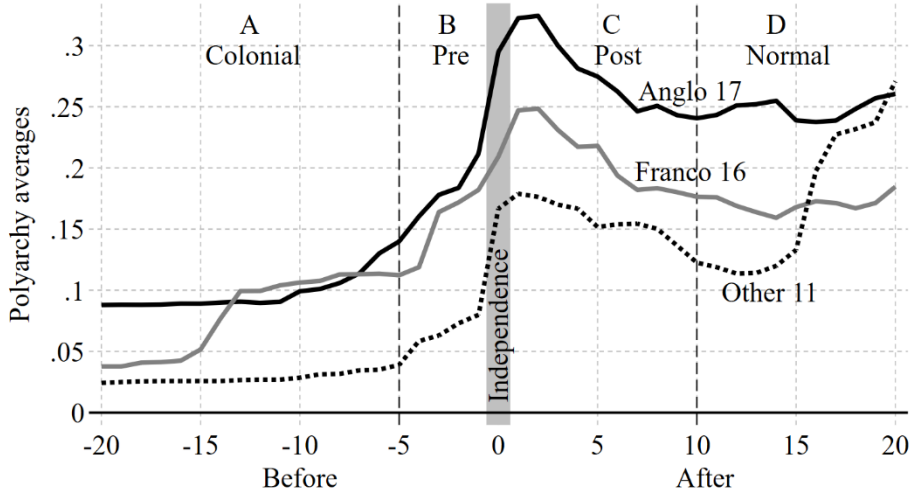


Figure 2 shows the disaggregated results by colonial master. While the "Other" category is heterogeneous, the Anglo and Francophone countries display clear patterns. The Anglo group gained independence with more democratic institutions and has managed to sustain that advantage, both politically and economically. The “Other” group followed a similar, though lower, trajectory until year +15, at which point a sharp increase is observed. This is largely due to rapid democratization in Cabo Verde and São Tomé and Príncipe—a development likely unrelated to independence that occurred 15 years earlier.

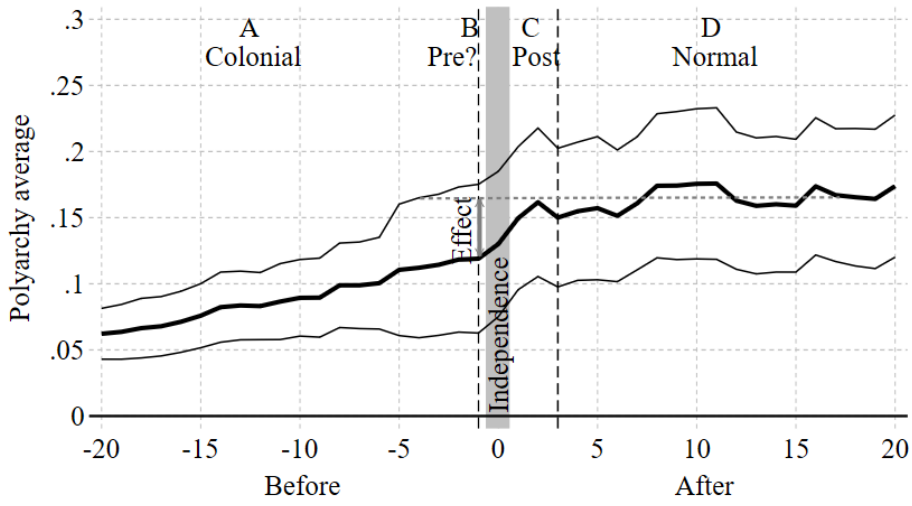
12.2. MENA: 15 Transitions in 14 Countries

The MENA region contains 18 countries. Four—Oman, Saudi Arabia, Turkey, and (North) Yemen—were independent for centuries. Thus, the dataset covers 15 transitions, including two for Iraq. For Iran, the relevant case is the 1979 regime change, and for South Yemen, it is independence from British colonial rule.

Tunisia, Algeria, and Morocco were traditional French colonies; Libya was under Italian rule. Several countries were also governed as League of Nations mandates following the defeat of the Ottoman Empire after World War I. These mandates were designed as transitional arrangements toward independence. The final stage of independence is used as the reference date in the analysis. Given these varied trajectories, the MENA dataset is more complex and less reliable than the African one. The results in Figure 3 are less conclusive. While the standard deviations are comparable to the African case, the confidence intervals are wider due to the smaller sample size.

The picture on Figure 3 for the MENA countries starts like Figure 1 for Africa, but then it differs a great deal

Figure 3. The 15 observations from MENA



A Colonial: As in Africa a small annual increase of 0.04 polyarchy points.

B Pre-Independence: It is unclear whether this period is observable at all.

C Post-Independenc: A small uptick is visible in years 1–3, but the change is minor.

D Normalization: After year 2, no clear trend is detectable.

The total effect of independence is a mere 0.04 Polyarchy points, as marked on the graph—a modest and somewhat puzzling outcome. However, it is consistent with the region's lack of democratic transition in the decades following independence.

The mandate territories established after World War I became independent in stages. In this paper, the final step in this process is used as the formal date of independence.

As a result, the MENA dataset is more complex and, in some respects, less robust. The patterns shown in Figure 3 are correspondingly less clear. Due to the smaller number of observations, the confidence intervals are considerably wider, even though the standard deviations are similar to those in the Sub-Saharan African sample. Figure 3 resembles Figure 1 in two important ways: first, the confidence intervals widen by a factor of three following independence; second, the Colonial period (A) displays a slow but steady increase in the Polyarchy Index, rising by approximately 0.04 points per year—in both samples.

15. The transitions of the 5 Areas of the EF-index

Figure 1 illustrates the income dependence of the five Economic Freedom Areas (EFAs), estimated using kernel regression with income as the explanatory variable. The black curves represent the OPEC sample (*N* = 239), a relatively modest sample size—especially given that it combines the 6AP and 10oO groups, where both Libya and Equatorial Guinea misses data. Each OPEC curve has a 95% confidence interval. Most of the curves reveal a bifurcated structure, distinguishing between the higher-income 6AP countries and the lower-income oO-group.

Figure 1. The path of the areas of the EF index for OPEC and Others. Kernel regressions.

Figure 1.1. EFA1, government size

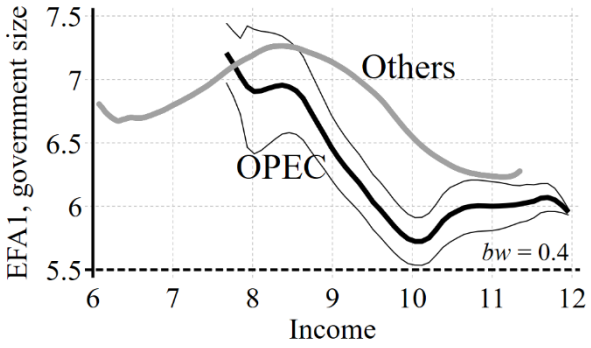


Figure 1.2. EFA2, legal quality

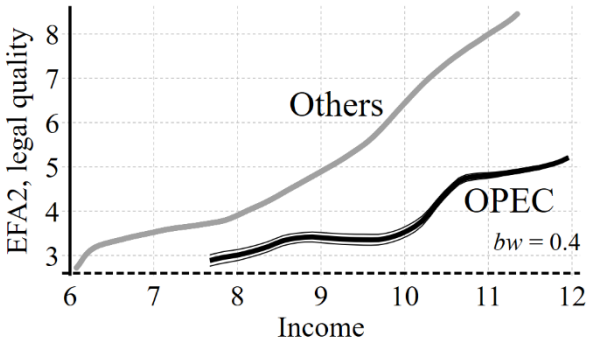


Figure 1.3. EFA3, sound money

Figure 1.4. EFA4, free trade

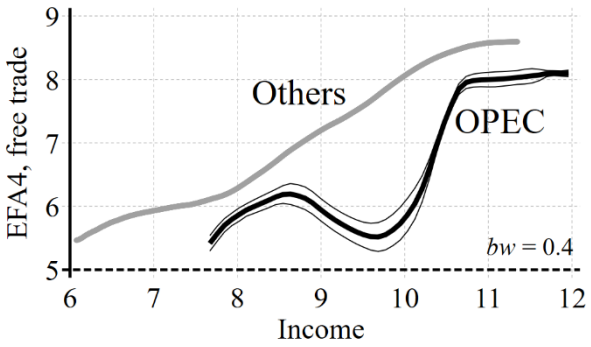
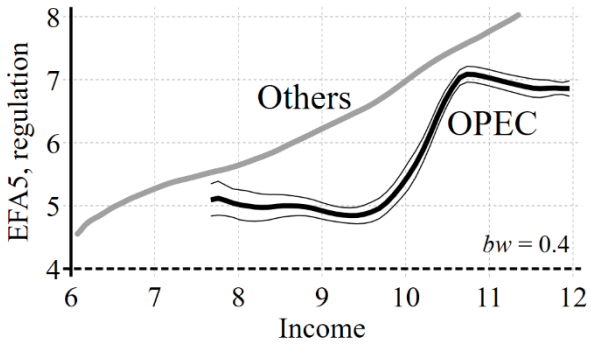


Figure 1.5. EFA5, regulation



For comparison, the five diagrams also show the curves for Others, where $N = 2{,}389$. Here the 95% confidence intervals are not shown, but they are much lower than for the OPEC curves. The EFA2 – EFA5 have transition curves as expected. The data contains few observations for low-income countries, so the flat curve expected for traditional societies is unclear. As expected, the curve for EFA1 deviates, and shows a strange hump shape. The key observation from Figure 1 is that the OPEC curves are always significantly lower than the curve for Others. EFA2, legal quality, is not only lower but increasingly so.

Table 1. The aggregate Fraser index per decade for the 18 OPEC countries

Year	1970-79	1980-89	1990-99	2000-10	2010-21
6AP countries at the Arabian Peninsula					
Bahrain	5.60	6.66	6.59	7.18	7.24
Kuwait	5.92	5.26	6.17	6.97	6.63
Oman	5.05	5.92	6.61	6.85	6.66
Qatar					6.98
Saudi Arabia					6.40
UAE	6.48	6.51	7.21	7.03	7.22
12oO other OPEC countries					
Algeria	3.84	3.12	3.49	4.98	4.85
Angola				4.34	5.08
Congo Br	3.54	2.84	2.80	4.43	5.28
Ecuador	5.11	5.43	6.11	6.08	6.30
Eqt. Guinea					
Gabon	3.96	4.74	5.35	5.23	5.21
Indonesia	4.45	5.18	5.95	6.33	7.00
Iran	5.95	4.14	4.34	5.64	5.05
Iraq					4.73
Libya					4.14
Nigeria	3.29	3.60	3.38	5.49	6.45
Venezuela	6.90	6.31	5.13	4.55	3.01
Averages					
Av 1	5.01	4.97	5.26	5.90	5.91
Av 2	5.01	4.97	5.26	5.78	5.78

Av 1 is for the 12 countries with data for all periods. Av 2 is for all available observations.

When observations are missing the cell is empty

Table 1 shows that the Fraser index is similar for the available observations from the Arab Peninsular. However, the EF-index of the 11oO countries differs a great deal. Notably Venezuela that has the reverse path of other countries.

The spatial pattern has been examined as a clustering of cross-country correlations. It is not as strong as expected, but this is a long story.

16. The five areas of the Economic Freedom index

The economic freedom index has five components termed areas EFA1 to EF5.

Table 1. Correlations: above the diagonal OPEC sample, below diagonal Others sample

	Income	*EFA3*	*EFA4*	*EFA5*	*EFA2*	*T*	*V*	*P*	*EFA1*	*Growth*
Income	1	0.52	0.54	0.62	0.69	-0.85	-0.62	-0.70	-0.25	-0.14
EFA3, money	0.64	1	0.62	0.74	0.73	-0.65	-0.26	-0.36	0.16	0.05
EFA4, free trade	0.74	0.75	1	0.81	0.77	-0.70	-0.20	-0.36	0.24	0.15
EFA5, regulation	0.72	0.66	0.77	1	0.76	-0.81	-0.33	-0.46	0.19	0.08
EFA2, legal qua.	0.82	0.61	0.76	0.81	1	-0.76	-0.2	-0.42	0.12	0.02
T, corruption	-0.75	-0.60	-0.70	-0.75	-0.91	1	0.59	0.64	0.11	-0.01
V, polyarchy	0.60	0.52	0.67	0.59	0.73	-0.67	1	0.90	0.47	0.01
P, polity	0.43	0.43	0.58	0.49	0.55	-0.46	0.86	1	0.33	0.03
EFA1, gov. size	-0.24	-0.04	-0.03	-0.03	-0.29	0.35	-0.13	0.04	1	0.1
Growth	0.01	-0.04	0.03	0.04	0.04	0.03	-0.03	-0.01	0.03	1

The consistent series for all 10 variables reduce the sample to 145 countries and N = 2,389 obs., divided into 16 OPEC and 129 Other countries with N = 239 and 2,150 obs., respectively. The same data is also used for Table 2

Table 2. The stability of the economic system, 1970-2022

		Gross changes First differences numerically				Net changes First differences			
		6AP	12oO	25West	125Other	6AP	12oO	25West	125Other
Area 1	Av	**0.308**	**0.382**	**0.219**	**0.363**	0.027	0.030	0.000	**0.047**
Size public	Se	(0.040)	(0.033)	(0.010)	(0.010)	(0.047)	(0.040)	(0.013)	(0.012)
Area 2	Av	**0.106**	**0.116**	**0.098**	**0.115**	**0.056**	0.012	**0.039**	**0.026**
Legal system	Se	(0.015)	(0.010)	(0.008)	(0.004)	(0.017)	(0.012)	(0.009)	(0.004)
Area 3	Av	**0.445**	**0.663**	**0.297**	**0.549**	0.028	0.009	0.029	0.033
Sound money	Se	(0.049)	(0.046)	(0.020)	(0.014)	(0.061)	(0.060)	(0.023)	(0.017)
Area 4	Av	**0.144**	**0.544**	**0.236**	**0.313**	-0.008	0.047	**0.068**	**0.082**
Free trade	Se	(0.018)	(0.063)	(0.015)	(0.012)	(0.022)	(0.076)	(0.018)	(0.013)
Area 5	Av	**0.223**	**0.212**	**0.199**	**0.236**	-0.007	**0.056**	**0.065**	**0.055**
Regulation	Se	(0.029)	(0.017)	(0.011)	(0.007)	(0.034)	(0.020)	(0.013)	(0.008)
	N	151	264	700	3,123	151	264	700	3,123

Av is average, Se is standard error. Some countries miss data, the N is an average. Bold results are significant.

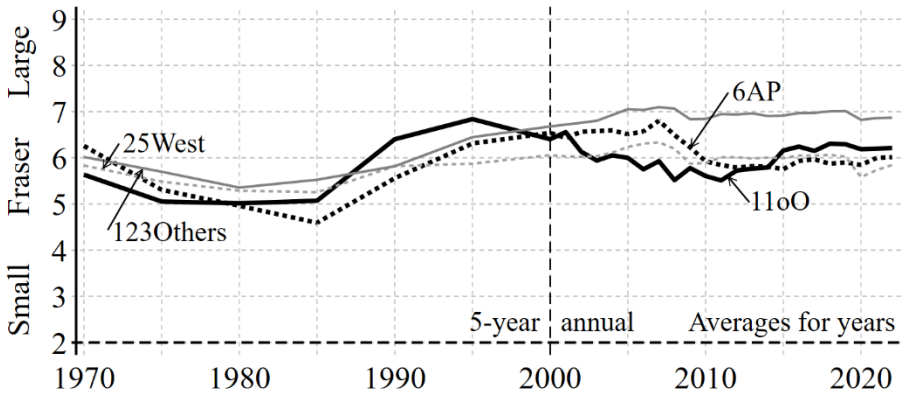
16.1 EFA1. Government size; see Figure 8

The following five sub-sections are a graphical analysis of the components of the Fraser index. The graphs use the same scale and color scheme. on the axis for easier comparisons. The four groups are the 6AP in dashed black, the 11oO in solid back, the 25West in dashed gray and 125Others in solid gray. The five graphs are robust, but Iran and Venezuela are often outliers.

The first component is *EFA1* for government size. This is the deviating component of the Fraser index. Here the four curves are closest together. However, the similarity of the four curves is deceptive. There are large differences in the underlying indicators.

Figure 1. EFA1. Government size

Public expenditure and taxes, including marginal taxes



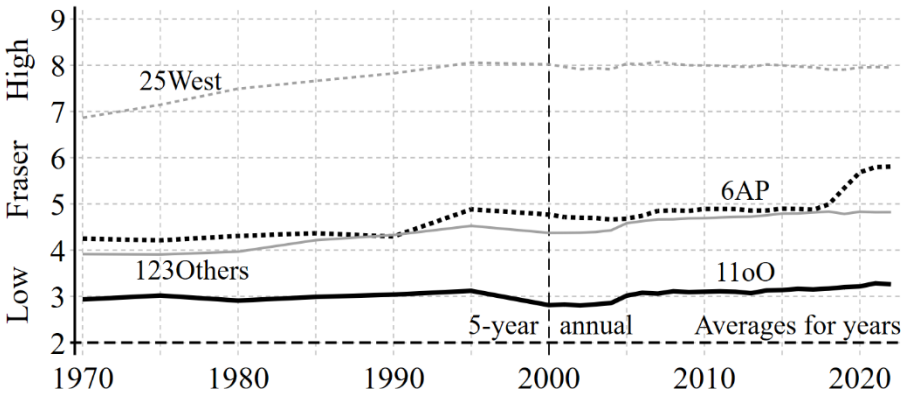
The OPEC countries score high on indicators that cover government expenditures and ownership of business, but they score low on taxes. They need only low taxes to finance these expenditures. In several of these countries, there are no income taxes.

16.2 EFA2. Legal quality and property rights protection; see Figure 2

This area is discussed in paper Pa2, so it will not be discussed here

Figure 2. EFA2. Legal system

Legal quality and property rights protection



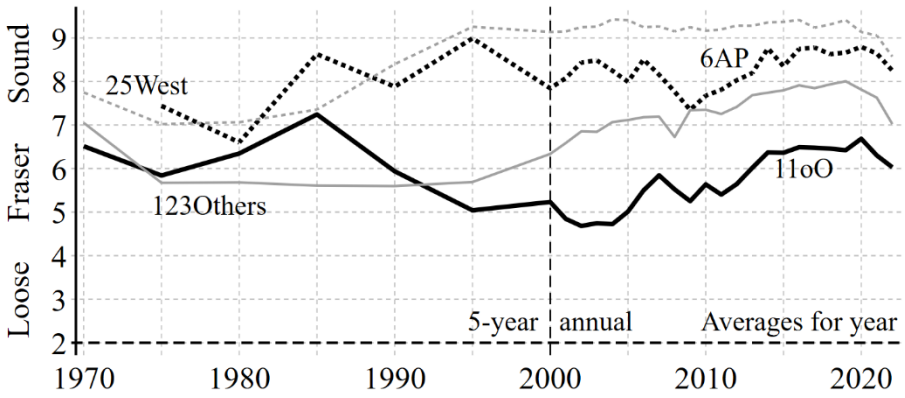
16.3 EFA3. Sound money; see Figure 3

The oil countries are not particularly successful in having sound money. The group behind the EF-index saw inflation as a particularly unjust tax, reflecting the strong influence of the school of monetarism in the group. Loose monetary policies have occurred in oil countries when oil prices have jumped – as it

generates expectation waves, which gives strong pressures from people to spend. It is unlikely that the capacity to implement public programs jumps correspondingly, and instead inflation jumps.

Figure 10. EFA3. Sound money

Money growth, inflation, and its standard deviation



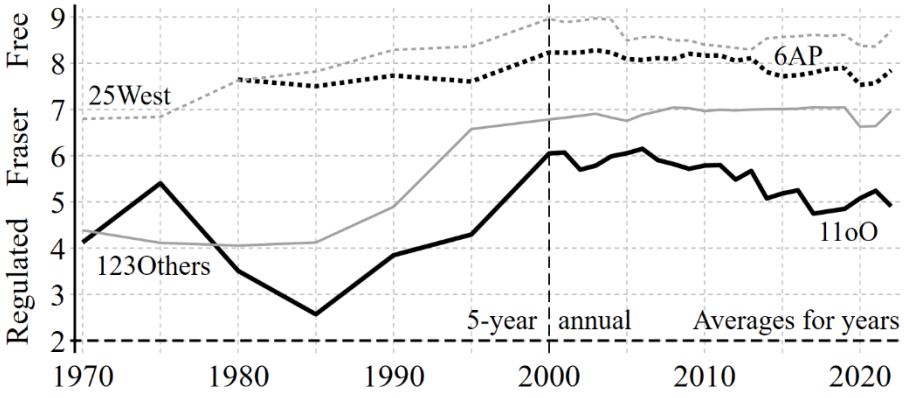
Venezuela has had one of the most spectacular inflations in the last decade. Other large inflation took place in Angola and Iran

16.4 EFA4. Freedom to trade internationally; see Figure 11

While the West has an old tradition for free trade, the LDC world did for long pursue an ISI (import substitution industrialization) strategy that was also a part of Arab Socialism. And sure enough, a large gap between the free to trade component in the West and the Others developed from 1975 to 85. However, the experience with the ISI strategy showed that it led to large-scale rent seeking; see the classical paper Krueger (1974). With substantial lags, this led to a wave of liberalization from 1985. The oil countries were large-scale exporters, and thus they could finance large-scale import as well, so even when the ISI school did have some effect (notably in Iraq, Algeria, and Venezuela) it was less important in the AP countries as seen in Figure 4.

Figure 4. EFA4. Free to trade

Trade taxes, and trade restrictions, black market exchange rates



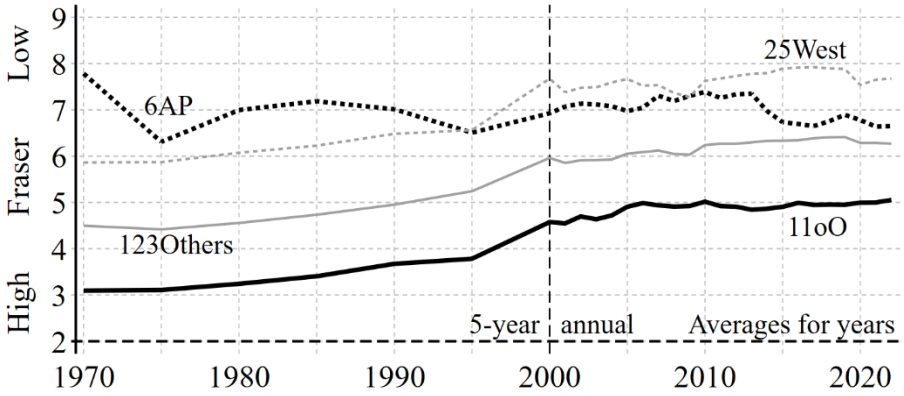
16.5 EFA5. Regulation of business, see Figure 5

This component is the most complex. It covers regulations that give distortions of market outcomes. Much the same story as the one on freedom to trade internationally applies.

Part of the ISI-complex was great optimism as regards the ability of the authorities to regulate business and create pro development distortions of markets. This optimism is smaller today than it was in 1960-80. In addition, there was the strong legacy of imperialism. Most countries had been colonies and now they rule themselves. Part of the reaction to their former masters was to exercise a great deal of control over foreign firms, which often were from the countries of the old imperial masters, especially during the last period of Western imperialism.

Figure 5. EFA5. Regulation of business

Regulations in three main fields: credit, labor, and business in general



The underlying indicators have a section about the regulations on the labor market, discussed below. The pattern on Figure 5 is much like the one on Figures 3 and 4, though the four curves are closer together. The oil countries are not so pro-business in their regulations.

17. A brief survey of the author's project

The project began as a collaboration with Erich Gundlach in 2005. Over the next 15 years, it resulted in a dozen papers—mostly co-authored—that were integrated and updated in the book *MP* (2021).

The central argument is that development follows a deep pattern: a cluster of highly confluent transitions occurs across virtually all socioeconomic time series. This cluster constitutes what the authors term **The Grand Transition**. These transitions, are overlaid with considerable short-run noise and irregular fluctuations. There are certainly exogenous shocks as well, but these tend to be scattered and do not dominate the system's long-term dynamics.

The transition pattern is also strong in the major institutional indices as well. While it is tempting to treat institutions as the primary drivers of development, the evidence suggests that institutional change is largely endogenous in the long run. The book examines several key institutional indicators, including democracy indices**,** economic freedom**,** corruption, and religiosity**.** Subsequent work expands the analysis to include human capital, and the SC index.

Transition curves are shaped either as  or ,  depending on the scale of the variable. The flat sections of the curve correspond to the two steady states—traditional (initial) and modern (final). When expressed in first differences (e.g., growth rates), these curves assume a hump-shaped form. The book places strong emphasis on empirical documentation, causal inference, and medium-term theory, particularly with respect to the democratic transition. The long-run theoretical framework is briefly summarized in Pa1 and developed further in MP (2025a). The causal structure is analyzed in MP (2021, 2024a, and 2024c).

Publications (Erich Gundlach is EG) see also Pa1 and Pa1 and the net appendices.

MP, 2021. *The Grand Pattern of Development and the Transition of Institutions*. Cambridge UP, New York

MP, 2024a. Income, Growth, and Democracy. Looking for the main causal directions in the nexus. *European Journal of Political Economy* 83, 102532 with net-appendix

MP, 2024b. The transition of education. A cross-country macro analysis. *European Journal of Political Economy* 84, 102362 with net appendix

MP, 2025. Explaining the Path of the Democratic Transition. *Kyklos* 78(3), 1142-57

MP, EG, 2008. Two Views on Institutions and Development: The Grand Transition vs the Primacy of Institutions. *Kyklos* 61, 65-100

Working papers

MP, 2024c. Do relatively democratic countries grow faster? With net-appendix

MP, 2024d. Can democracy and religiosity explain corruption? An empirical survey of cross-country data

The papers are posted at: http://martin.paldam.dk/GT-Main2.php. The published papers are in the pre-print version, while the working papers are in the latest version, this also applies to Pa1and Pa2.