

The jerky structure of democracy indices

A study of the constancy spells and jumps in the polyarchy index

Martin Paldam, Aarhus University, Denmark.¹

1. Introduction: Spells and jumps

One of the key variables in political economy is the democracy index. Such indices have the same peculiar structure, and so do the realities they try to measure. Today the main index is the polyarchy index from the V-Dem project, which is analyzed in this paper.

Polyarchy is limited to an open interval from zero to one, it has long **spells** of constancy and occasional **jumps** that explain most of their movements. It has no natural scale.² The index starts in 1789 and, p.t., ends in 2023. It has 26,595 annual observations. The index has tiny fluctuations almost every year, and occasional jumps. The measurement error is assessed to ± 0.05 in Paldam (2026). Most changes in the index are below that, so they are practically zero. This means that the index has many constancy spells lasting a decade or more in all countries, until they end with a jump. The spells and the jumps are analyzed in two ways:

Section 2 looks at frequency distributions for the ΔV data in different periods and identify the fraction of zeros. A typical finding is that it is 95%, so the average spell is $1/(1 - 0.95) \approx 20$ years.

Section 3 looks at jumps that are larger than 0.05. The average transition requires about 7 jumps, where 5 are up and 2 down. The net jumps are shown to explain about 75% of the total change in V . For a country with 140 observations which have 7 jumps, the average spell is 20 years.

¹ Department of Economics and Business, Universitetsbyen 51, DK-8000 Aarhus C. URL: <http://www.martin.paldam.dk>, e-mail mpaldam@econ.au.dk. The paper has benefitted from comments from Jamel Saadaoui.

² When a price index increases by 20% it means that the average price has gone up by 20%. But imagine that the V-index rises from 0.2 to 0.4 – what does it mean? Is it the same if the index rises from 0.6 to 0.8?

Table 1. Statistics for all V and ΔV that have both observations

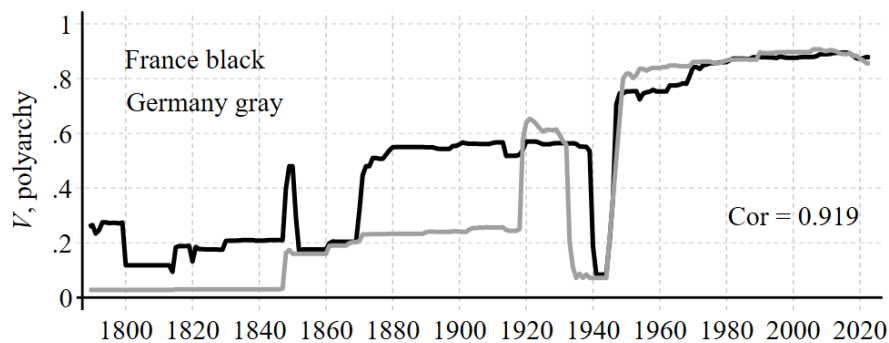
Count	All 26,340		Main sample 23,741		OPEC sample 2,599	
	V	ΔV	V	ΔV	V	ΔV
Average	0.2627	0.0026	0.2774	0.0027	0.1284	0.0015
Std dev.	0.2624	0.0338	0.2673	0.0345	0.1580	0.0258
Skewness	1.12	2.66	1.04	2.19	2.08	2.19
Kurtosis	0.03	74.0	-0.20	73.2	4.42	54.2

Table 1 provides some statistics for the polity data, divided into two samples the OPEC sample for the oil exporting countries, and all other countries termed the main sample.

The methods used in sections 2 and 3 are different approximations. The results are so similar that they allow a set of conclusions give in section 4. Political indices condense political history, to allow generalization. History research eschews generalizations and provides elaborate narratives about each country. In spite of the wealth of detail, it still says that most of the time countries have stable political systems, where governments change in accordance with a ‘constitution’, but occasionally triggering events happen and cause a system change. Such events are normally of a political nature and they happen seemingly exogenously. They may even be inspired by events in other countries. This is precisely what political indices try to catch. While there is a great difference in perspective there is no contradiction.

Figure 1 illustrates this point. France and Germany both have a complex and very different history described in a library of books. They have even fought four wars in the period. You can discuss the ups and downs on each of the two curves with few references to the other curve, but you may also note that their correlation is 0.92, so in the long run there is something – very strong – underlying both curves. Figure 3 shows what happens when you look at many countries.

Figure 1. V polyarchy for France and Germany, 1789 - 2023



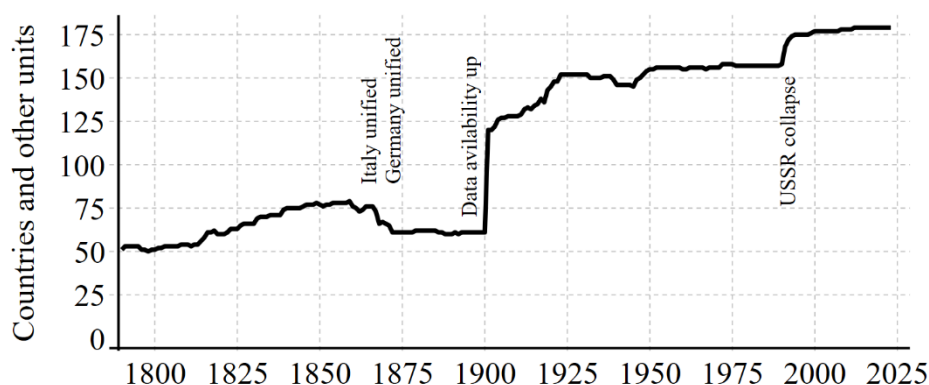
1.1 Countries and dependencies

The unit of measurement is a country which may not be independent. Figure 2 reports the number of countries covered by the data. Independent countries can decide to change their political system. Changes in V may be seen as exogenous, but the democratic transition is an underlying endogenous factor in the development.

Dependency is a term with a wide range. At one end is colony, with low and stable values of the V -index, at the other end is a practically independent country. The UK have had many colonies, but also semi-independent dependencies, such as Australia, Canada, Ireland, and New Zealand (and Wales, Scotland and Ulster which are not covered by the data).³ It is obvious that the UK has more democracy than, e.g., Ireland had when it was a UK dependency, but the index does not always provide numbers. The same applies to the Habsburg Empire that included Austria, Bohemia, Moravia, Slovakia, and Hungary, and other territories that were more like colonies.

Many countries change size or name. The Russian Empire expanded in all direction. Then it became the Soviet Union and lost and later regained much territory. When it broke down in 1990, it once again lost a great deal of territory, some of which it tries to reconquer. Estonia, Latvia, and Lithuania existed only from 1918 to 1940 and since 2000. They have only data for these years. Finland remained independent since 1918, even when Russia reconquered the eastern part (Karelia) in 1940.

Figure 2. Number of countries and other units covered by the V data each year



Romania had a murky start as parts of other countries but emerged as a country in the 1850s. It has changed borders substantially. Germany was composed of 16 states that merged in 1864-72 under the King of Prussia, so Germany was Prussia/Brandenburg before 1870. Italy has a similar

³ Until recently “white” colonial powers considered it natural to treat “white” dependencies better than others.

history. It was united under the King of Piedmonte and Sardinia. Poland had a complex history where the country was divided into parts included in Germany and Russia in some periods.

Korea, Madagascar, Morocco, Myanmar, Nepal, Tunisia, Yemen, and Vietnam had recorded periods before they became colonies. Korea and Vietnam were liberated in 1945, but they broke into two, where South Korea became the successor of Korea, while North Vietnam became Vietnam, and conquered South Vietnam. The Latin American countries were Spanish Colonies until the 1815-30, and Cuba even longer, Liberia was founded as a home for African slaves who wanted to return to Africa. An American NGO ruled it until it became independent in 1839. Most of the Middle East (MENA) was part of the Ottoman Empire in 1789, but today only Turkey itself remains of the empire. Already in the early 19th century several countries (as the North African ones) were de facto independent, before they became colonies of Spain and France. After 1918 the Arab countries of the eastern MENA area became mandate territories of the UK and France, who gradually introduced independence. Libya became an Italian colony.

Latin America has kept the borders made by Spain and Portugal. Now they are strongly consolidated. Africa was colonized in the middle of the 19th century, and the present borders are the colonial ones. They have remained fixed as countries do not want to open Pandora's box of border revisions, but it makes it difficult to take the data back to the time before colonialism. While the series for Latin America goes back to about 1810 most series for sub-Saharan Africa start in 1900.

Consequently, the count of countries is difficult and requires choices. The Polyarchy index has made many of these, see Figure 2. This study requires long series, and sometimes the index of a mother country that is almost independent is used to prolong series. These cases are used to identify jumps, assuming that if there is a jump in the mother country there also is a jump in the dependencies, but not necessarily in the colonies.

1.2 The grand transition and the democratic one⁴

The analysis below takes note of the fact that the data for the non-OPEC countries have a strong and robust transition shown by Figure 3. Which was the underlying common factor on Figure 1. Similar figures to Figure 3 have been estimated for other datasets. The explanation of this curve is that countries have two steady states:

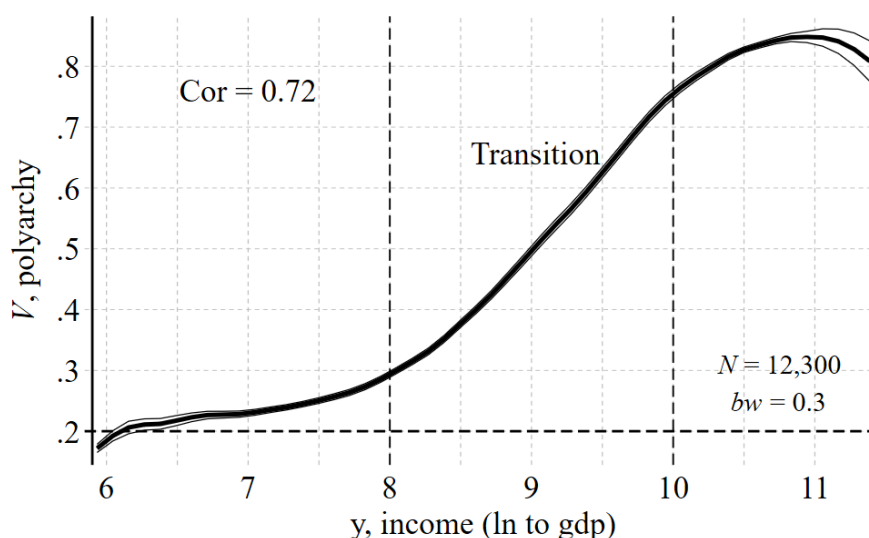
⁴ This section is based on Paldam (2021), discussing the transition, presenting the jumps model, and discussing the three pillars model, and its inevitable demise.

Traditional, where production uses stable old technologies, with low productivity giving low income. Human capital is limited and produced locally within the family. Growth was in order of 10% per century. The political system is the three-pillars model, with a king, a feudal aristocracy and monopoly church.

Modern, where production uses modern international technologies, with high productivity producing a high income. Here human capital is much higher and produced by a large formal educational system. Growth is stable and in order of 2%. The political system is democratic.

The change from the old steady state to the modern takes at least a century, and it causes transitions in all socio-economic variables, including institutions. The democratic transition is a change of about 0.75 in the polyarchy index that has range of one, so it is a large change. In the average country it is smooth as seen on the figure, but for the individual country it is a step curve with large steps. The transition starts as a divergence from the traditional steady state and ends when countries converge to the modern steady state.

Figure 3. Transition using data from 1960



The smooth transition curve on Figure 3 hides the fact that all political systems are based upon a power structure that wants to continue, so it makes large efforts of consolidation. Thus, countries are normally in a temporary status quo equilibrium. But sometimes a *triggering event* happens to break the status quo. Triggering events are very different and mostly due to political events. From an economic perspective triggering events are rare and random.

The division made by the two dashed vertical lines are used as a crude classification

For $y < 8$ the political system is traditional

For $8 < y < 10$ the political system is in transition

For $x > 10$ the political system is modern.

The two types of equilibria differ in their reaction to a disturbance. If a steady state is disturbed the system returns to the same equilibrium after some little time. If a status quo is disturbed, it is gone, and the system must find another, normally after a system jump.

The democratic transition is explained by two theories in Paldam (2021): Chapter 5 on the **jumps model** says that the transition path is an attractor for jumps that happens randomly. Chapter 6 shows how the grand transition undermined the power structure of the **three-pillars model** so that it broke down (reluctantly) and the development ended as democracy.

Together the two models explain why the average country has a strong transition path as shown in Figure 3. The path is highly non-linear. The jerky structure of the democracy indices and the non-linearity of the underlying long-run path explain why linear panel regression models for $V(y)$ show very little. In the short run there is little connection between political regime and income in individual countries.

However, both long-run series and wide cross-country samples the democratic transition $V(y)$ is strong. The theory predicts that the constancy spells are longer at two steady states than during the transition. This prediction will be confirmed in the next two parts.

2. Frequency distributions for ΔV showing long constancy spells

The analysis looks at eight samples by reporting a frequency histogram, and five variables, z , s , n , p , and γ : Two variables are related to the spells of constancy. z (zero) is the frequency of data that is 0 ± 0.05 , and $s = 1/(1 - z/100)$ estimates the average constancy spell. Three variables are related to the growth of V . The sums of negative and positive frequencies are n (< -0.05) p (> 0.05). The net ‘growth’ toward democracy is $\gamma = p - n$.

2.1 All 26,340 observations for ΔV , the first difference of polyarchy

The observations can be divided into two samples: 23,741 observations are the **Main sample**. 2,599 observations for the **OPEC sample** of present and past OPEC countries including Bahrain and Oman. Figure 4 shows the frequency distributions for these samples.

Figure 4a for the Main sample has $z = 94.5\%$, so the average constancy spell is $s = 18$ years. Thus, most observations for polyarchy are constant. The measure for growth is $\gamma = 1.77\%$ giving the polyarchy index slow growth towards democracy.

Figure 4. The frequency distribution for ΔV , the first differences or the polyarchy index

Figure 4a

Main sample

$N = 23,980$

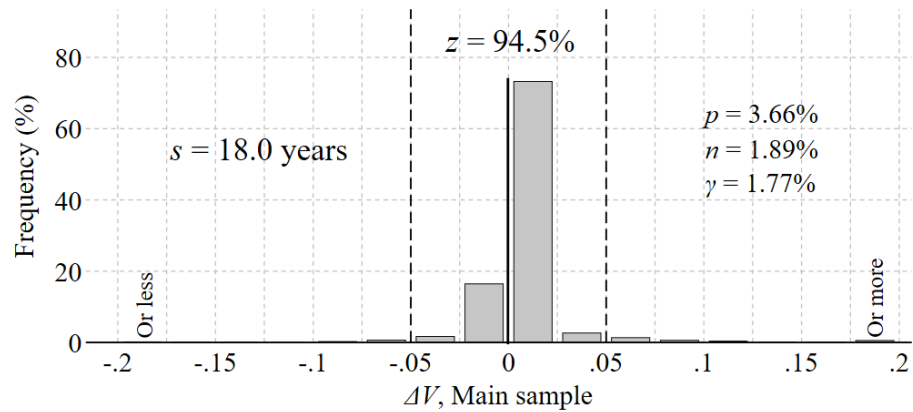


Figure 4b

OPEC sample

$N = 2,411$

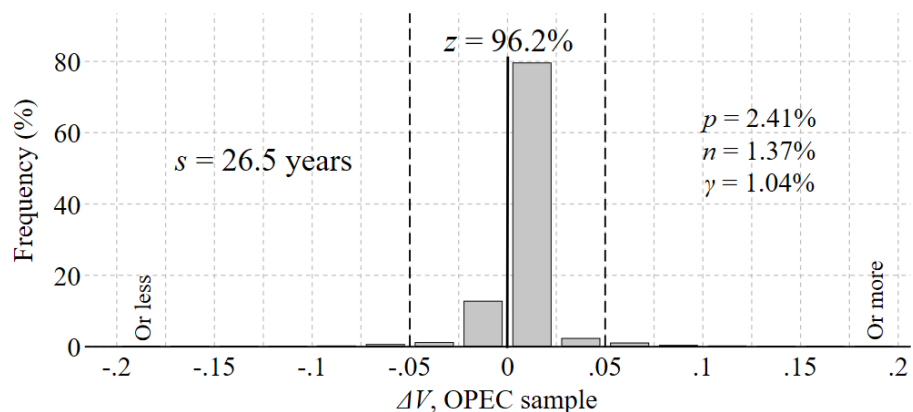
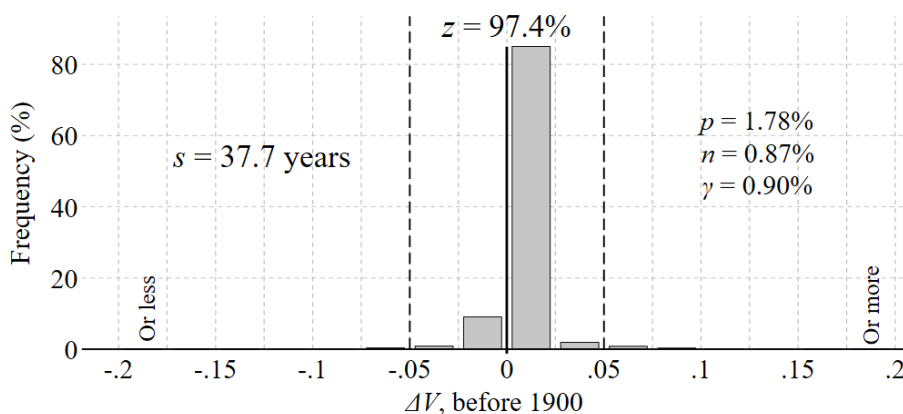


Figure 4b is for the OPEC countries, they have no democratic transition. The constancy spells are a bit longer $s = 26.5$ years. The net growth is slower in the OPEC sample. Still $\gamma = 1.04\%$.

This data does not contain income, so it is difficult to catch the three stages. However, Figure 5 is the ‘old’ sample stopping in 1900. About 20 countries had started the democratic transition, but the great majority had not. The sample includes many countries that are colonies.

Figure 5. All 7,093 observations before 1900

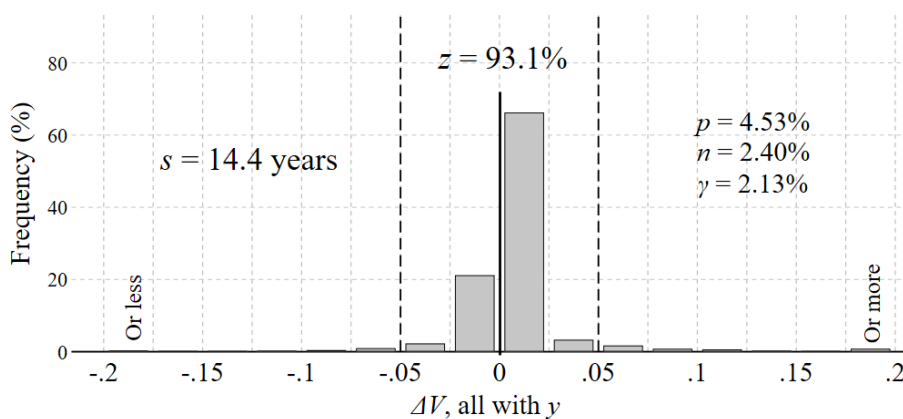


In the old sample the average constancy spell is $s = 37.7$ years. Stability increases a bit if the last 50 years for the 20 western countries is omitted. The growth measure, $\gamma = 0.90\%$.

2.2. The (V, y) pairs where polyarchy are combined with income

From now on the observations for the OPEC sample are deleted. Income, y , is the logarithm to real GDP per capital (from the Maddison project. From 1800 to 2023 this reduces the data to $N = 13,215$ pairs of non-OPEC $(y, \Delta V)$ observations. y is in $[5.9, 11.4]$ and ΔV in the $[-0.53, 0.66]$.

Figure 6. All 15,803 observations with $(\Delta V, y)$ data.



These data are shown in Figure 6. The missing data in this sample is mainly old data for colonies, reducing the stability spells. The polyarchy index is quite sensitive in the developed countries, where it has tiny changes every year. Recall that changes within ± 0.05 represent stability. Hereby, 93% of the observed first differences are zero showing that the political system is stable. Thus, the spells of stability are 14 years on average.

Figure 7. The frequency distribution of the ΔV in the three states with $(\Delta V, y)$ data.

The countries are divided by income using the vertical lines on Figure 3

Figure 7a
Close to traditional
steady state, $y < 8$
 $N = 6,976$

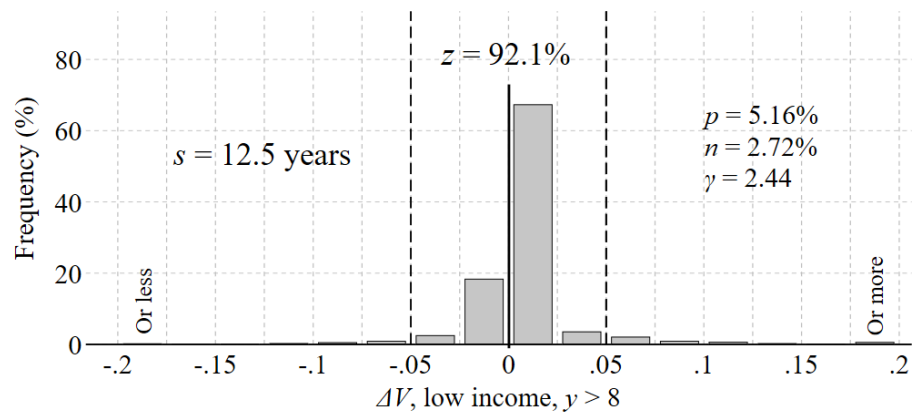


Figure 7b
During transition.
 $8 < y < 10$
 $N = 7,240$



Figure 7c
Modern steady state
 $y > 10$, $N = 1,589$

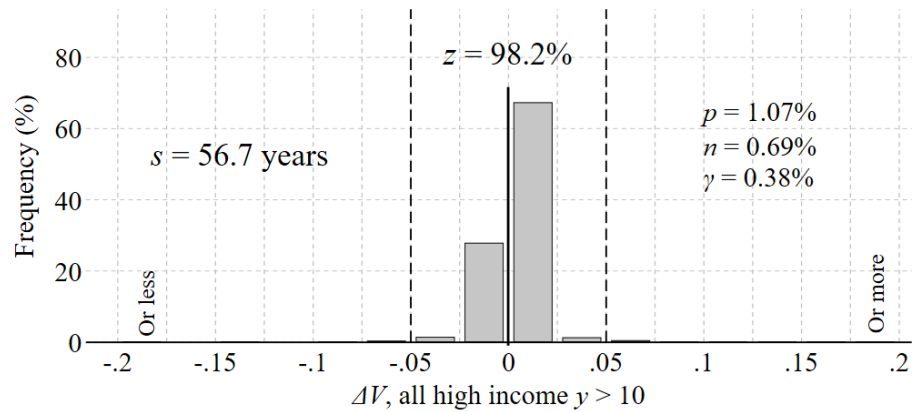


Figure 7 is an attempt to catch the three stages: Figure 7a is for the poorest countries that should be closest to the traditional steady state, but the figure shows that the transition has already started. Figure 7b looks at the transition period, while Figure 7c is close to the modern steady state. Figure 7c shows that the modern period has reached considerable stability with almost the same frequency of (small) increase and decreases. To get closer to the traditional steady state the data may be extended backward. If it is assumed that the income series would have grown or at least not fallen in the periods where polyarchy goes further back than income. Most Latin American countries have data back to 1850 or even before. If this is done. Figure 7a looks more like Figure 5.

2.3. Conclusions of section 2

Table 2 summarizes the 8 Figures of this section. Political indices are normally constant, especially in two steady states: the traditional on Figures 4 and 7 and the modern on Figure 5c. However, they are less stable in the period of the transition on Figures 6b and 6c, where there is clear upward drift, as modelled by the jumps model. But even during the transition the average constancy spells are more than a decade.

The average spell differs by a factor five between the samples, the differences are as predicted at the end of section 1.2. The higher the fraction of countries in either the traditional or modern steady state the longer are the spells. However, countries start the transition at different points in time, so the samples tend to have a mixture of countries at all stages in the transition. Also, even when the data covers a maximum of 234 years most of the series are shorter. And, of course, when an endpoint correction is made in section 3.3 the spells grow.

Table 2. Summary of the 8 Figures, ΔV is first differences to polyarchy, y is income

Figure	Sample	N	$p\%$	$n\%$	$\gamma\%$	$z\%$	s , spells
All ΔV							
3a	Main	23,980	3.66	1.89	1.77	94.5	18.0
3b	OPEC	2,411	2.41	1.37	1.04	96.2	26.5
4	Before 1900	7,093	1.78	0.87	0.90	97.4	37.7
Only ΔV , where data for y exist							
5	Main with y	15,803	4.53	2.40	2.13	93.1	14.4
6a	$8.0 > y$	6,976	5.16	2.72	2.44	92.8	12.5
6b	$8.0 < y < 10$	7,240	4.68	2.47	2.21	92.8	14.9
6c	$10 < y$	1,589	1.09	0.69	0.38	98.2	56.7

Main are all non-OPEC data. s is the frequency in % of the observations in $[-0.05, 0.05]$. $s = 1(1 - z/100)$ is an estimate of the average spell of constancy in years. n is the share of negative frequencies, p is the share positive frequencies, while γ is the net positive.

3. The jumps, their explanatory power and the average spell

This section contains 5 tables: Table 3 covers the 27 countries that are assessed to have made the full transition, though it includes four dubious cases. Table 4 reports on 41 countries with long series, but on average they have only made half of the transition. Table 5 covers 86 countries where the data starts in 1900. Table 6 looks at 27 countries with shorter time series. Finally, Table 7 covers 19 old states that became Germany and Italy for the years before 1870. Thus all 26,695 observations for the V-Dem polyarchy index are covered.

3.1. Six tables covering 200 countries

The tables have the same format: Column (1) and (2) gives the numbered countries in alphabetic order. Columns (3), (4) and (5) give the number of years where the countries were independent, dependent, or have missing data. Column (6) reports the change from the first year to 2023.⁵ Columns (7) and (8) give the number of upward or downward jumps larger than 0.05. **Some jumps take 2 or even 3 years** of a sequential reform process, where all changes are above 0.05. They are counted as one jump. Especially upward jumps may require a lengthy reform process. The size of the jumps is summed up as $\Sigma(u)$ and $\Sigma(d)$. Column (9) and (10) reports the net = $\Sigma(u) - \Sigma(d)$ and gross $\Sigma(u) + \Sigma(d)$. They are given in % of the total change from column (6). Most net fractions are smaller than 100%, while most gross sums are larger. This indicates that many jumps overshoot the transition path, so that they give rise to jump the other way.

Table 3 shows that old western democracies have changed by 0.75. This is the full transition. Chile, Japan, South Korea, and Taiwan (in Table 5a) have made the same change. A key result from Table 3 is that 80% of the transition is made in jumps. There are on average seven jumps where five are upwards and two downwards. However, the marginal fluctuations during spells sometimes form a *slide* of such changes to the same side. In countries where the result in column (9) is below 100 the sides are upward, while they are downward when the result is above 100. In Table 3 only four countries have downward slides. In Austria, Denmark, Germany, and Spain the jumps explain the full transition. The table gives a consistent transition picture: The Czech Republic, Greece, Hungary, and Korea (S) are provided with a (?) as their transition is dubious.

⁵ If the first year reported is the year the country was established an assessment of the last year before is used.

Table 3. 27 countries that are assessed to have completed the democratic transition

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Nr	Country (now)	Number of observations			Transition	Jumps		Explained by jumps	
		Free	Dependent	Missing	made	Up	Down	Net (%)	Gros
1	Australia	123	111	0	0.738	5	0	73.0	73.0
2	Austria	217	17	0	0.800	6	2	99.6	266.6
3	Belgium	185	49	0	0.849	6	2	54.4	266.4
4	Canada	157	77	0	0.856	4	0	79.4	79.4
5	Chile	206	28	0	0.825	7	4	52.5	264.8
6	Costa Rica	185	49	0	0.768	7	4	59.6	149.2
7	Czech R (?)	99	134	1	0.827	8	3	104.8	313.1
8	Denmark	229	5	0	0.806	4	2	98.9	247.8
9	Finland	107	127	0	0.760	5	2	96.7	112.0
10	France	229	5	0	0.612	5	4	48.4	369.6
11	Germany	229	6	0	0.828	3	1	98.6	207.0
12	Greece (?)	191	40	3	0.731	10	6	95.5	374.0
13	Hungary (?)	105	129	0	0.382	7	7	132.5	467.5
14	Iceland	102	132	0	0.725	2	0	82.8	82.8
15	Ireland	101	133	0	0.796	3	0	79.4	79.4
16	Italy	219	14	1	0.819	5	3	76.8	133.7
17	Japan	227	7	0	0.791	2	0	75.2	75.2
18	Korea (S) (?)	191	42	1	0.686	9	3	104.4	206.7
19	Netherlands	210	21	3	0.778	4	2	61.3	227.9
20	New Zealand	117	117	0	0.786	4	0	57.9	57.9
21	Norway	114	120	0	0.786	5	1	65.4	220.6
22	Portugal	233	1	0	0.829	7	4	87.5	184.9
23	Spain	230	40	0	0.824	5	5	102.5	271.5
24	Sweden	234	0	0	0.695	5	0	82.0	82.0
25	Switzerland	210	15	9	0.790	3	0	85.4	85.4
26	UK	234	0	0	0.586	2	0	52.2	52.2
27	USA	234	0	0	0.752	2	1	56.5	79.6
Average		182.2	52.6	0.7	0.756	5.00	2.07	80.1	186.3
Standard dev.		51.3	50.7	1.8	0.109	2.17	2.00	20.6	111.1

Table 4 cover 41 countries with long series, but where the transition is incomplete. The countries in transition are in Table 4a. It includes three Latin American countries – Argentina, Brazil, and Uruguay – have data indicating a full transition, but democracy may not be consolidated in these countries. The list also includes seven Muslim/OPEC countries that seem to have started on the transition: Ecuador, Indonesia, Kuwait, Morocco, Tunisia, Turkey, and Venezuela.

Table 4b cover 11 countries with no signs of transition. It includes three communist and five Muslim countries, plus Haiti, Myanmar, and Russia, where the transition is likely to return. The case of the OPEC/Muslim exception is analysed in Paldam (2025b).

Table 4a. 41 countries with long series who are in transition

(1)	(2)	(3) (4) (5) Number of observations			(6)	(7) (8) Jumps		(9) (10) Explained by jumps	
Nr	Country (now)	Free	Dependent	Missing	Transition made	Up	Down	Net	Gros
1	Argentina	208	26	0	0.755	9	6	56.2	537.0
2	Bolivia	198	36	0	0.466	11	9	97.4	502.1
3	Brazil	198	34	2	0.770	9	5	72.2	224.7
4	Colombia	205	29	0	0.654	5	2	48.8	95.6
5	Dominican R	179	44	11	0.672	12	7	102.7	329.2
6	Ecuador	193	30	11	0.556	9	7	93.5	382.7
7	El Salvador	135	49	50	0.288	4	5	-4.9	317.4
8	Ethiopia	229	5	0	0.273	3	0	63.7	63.7
9	Guatemala	203	26	5	0.477	6	4	26.6	248.0
10	Honduras	152	39	43	0.387	8	5	90.4	271.3
11	India	77	157	0	0.324	4	2	155.9	312.7
12	Indonesia	75	148	11	0.523	4	2	119.9	245.7
13	Kuwait	171	63	0	0.258	4	2	46.5	334.9
14	Liberia	185	17	32	0.608	5	3	116.9	187.3
15	Madagascar	142	64	28	0.452	6	3	81.2	242.3
17	Mexico	203	31	0	0.506	4	2	18.0	80.4
18	Morocco	178	56	0	0.250	1	0	32.8	32.8
19	Nepal	105	129	0	0.674	5	3	88.3	222.7
20	Nicaragua (?)	173	61	0	0.148	6	5	158.8	702.0
21	Paraguay	205	29	0	0.579	2	2	32.3	85.1
22	Peru	193	34	7	0.599	14	9	114.2	587.0
23	Poland	163	0	71	0.390	4	7	185.6	605.1
24	Romania	160	32	42	0.633	3	2	54.0	104.9
26	Serbia	178	32	24	0.364	4	2	111.5	191.5
26	Thailand	234	0	0	0.263	4	2	-15.2	724.0
27	Tunisia	159	75	0	0.453	4	2	95.4	314.3
28	Turkey	234	0	0	0.267	10	5	137.8	784.3
29	Uruguay	196	38	0	0.745	7	5	35.7	294.0
30	Venezuela	197	26	11	0.204	6	8	107.8	965.7
Average		176.8	45.2	12.0	0.467	6.0	4.0	80.1	344.4
Standard dev.		39.6	38.7	18.5	0.178	3.1	2.5	48.0	234.3

Table 4b. Countries not in transition

31	Afghanistan	207	27	0	0.059	4	1	235.6	1191.5
32	China	234	0	0	0.037	1	0	154.1	154.1
33	Cuba	122	112	0	0.127	5	4	-84.3	799.2
34	Egypt	159	75	0	0.155	2	2	-15.5	377.4
35	Haiti	198	36	0	0.155	6	7	105.8	1020.6
36	Libya	72	162	0	0.176	1	2	119.9	475.6
37	Myanmar	174	60	0	0.061	4	3	-375.4	1788.5
38	Russia	234	0	0	0.170	2	1	143.5	210.6
39	Saudi Arabia	230	4	0	-0.001	0	0	na	na
40	Vietnam	160	59	15	0.111	1	1	122.5	237.8
41	Yemen	166	68	0	0.113	2	1	6.2	346.0
Average		177.8	54.8	1.4	0.106	2.5	2.0	41.2	660.1
Standard dev.		48.1	47.8	4.3	0.056	1.8	2.0	164.8	505.4

The *V*-data for many countries starts in 1900. Table 5 cover these countries and Bulgaria and Singapore. In this table half of the time is under dependency (mostly colonial). It contains all African countries except Liberia and Ethiopia. The net jumps are much as in Tables 3 and 4a.

Table 5a. Countries with data starting 1900 or just before (continued)

(1)	(2)	(3) (4) Number of obs.		(6) Transition made	(7)	(8) Jumps	(9)	(1)
Nr	Country	Free	Dependent		Up	Dow	Net	Gros
1	Albania	99	24	0.460	3	2	61.7	110.9
2	Algeria	62	62	0.229	4	2	121.4	311.8
3	Angola	49	74	0.340	3	0	60.0	60.0
4	Barbados	58	65	0.681	4	0	68.9	68.9
5	Benin	64	59	0.464	4	3	74.4	292.0
6	Bhutan	26	97	0.498	1	0	93.4	93.4
7	Botswana	58	65	0.527	2	1	79.5	103.0
8	Bulgaria	145	0	0.431	6	4	91.6	253.1
9	Cape Verde	49	74	0.731	3	0	93.3	93.3
10	CAR	64	59	0.287	6	3	90.6	237.6
11	Comoros	49	73	0.248	6	5	46.4	469.8
12	Cameroon	62	61	0.248	2	0	51.6	51.6
13	Congo Br	64	59	0.230	4	2	50.0	435.2
14	Congo Ki	64	59	0.310	2	1	69.7	194.8
15	Côte d'Ivoire	64	59	0.424	4	3	51.7	182.3
16	Cyprus	64	59	0.687	1	0	54.4	54.4
17	Djibouti	47	76	0.233	3	0	65.2	65.2
18	Fiji	54	69	0.359	7	3	53.2	637.0
19	Gabon	64	59	0.278	2	2	4.0	111.9
20	Gambia	59	64	0.588	7	1	74.0	191.3
21	Ghana	67	56	0.611	7	4	106.4	398.7
22	Guinea-Bissau	51	72	0.406	5	3	70.9	240.9
23	Guyana	58	65	0.297	5	3	84.2	227.6
24	Iraq	92	40	0.317	2	1	35.0	107.6
25	Israel	75	48	0.673	2	0	86.2	86.2
26	Jamaica	62	61	0.594	4	0	80.5	80.5
27	Jordan	78	24	0.206	1	0	35.0	35.0
28	Kenya	61	62	0.554	5	1	55.6	90.6
29	Lebanon	78	45	0.314	2	0	36.6	36.6
30	Lesotho	58	65	0.600	5	4	102.2	253.5
31	Luxembourg	106	21	0.828	3	1	86.0	209.2
32	Malawi	60	63	0.570	9	1	121.6	141.6
33	Malaysia	79	44	0.462	4	2	44.4	130.1
34	Maldives	57	66	0.584	5	2	85.4	138.2
35	Mali	66	57	0.201	6	4	87.6	704.5
36	Malta	60	63	0.586	7	4	85.2	306.7
37	Mauritania	64	55	0.333	5	4	109.6	244.1
38	Mauritius	56	67	0.337	4	1	82.2	170.6
39	Mongolia	112	2	0.511	5	0	119.8	119.8
40	Mozambique	49	74	0.324	2	0	86.4	86.4

Continuation of Table 5a

41	Namibia	34	89	0.616	5	0	107.0	107.0
42	Niger	64	59	0.373	8	7	90.9	588.5
43	Nigeria	64	59	0.441	6	2	85.7	174.6
44	Pakistan	76	47	0.244	3	3	20.1	259.4
45	Panama	45	78	0.705	5	5	54.9	181.1
46	Papua NG	49	74	0.389	3	0	88.4	88.4
47	Philippines	78	45	0.362	7	3	182.6	225.7
48	Sao Tome	49	74	0.650	2	0	80.3	80.3
49	Senegal	64	59	0.567	5	2	63.7	90.8
50	Seychelles	48	75	0.683	6	2	33.5	89.2
51	Sierra Leone	63	60	0.422	6	4	81.5	237.9
52	Singapore	59	96	0.312	3	1	55.8	97.4
53	Solomons	46	77	0.573	4	3	54.3	153.8
54	Somaliland	32	59	0.368	1	0	36.1	36.1
55	South Africa	123	10	0.529	2	0	72.6	72.6
56	Sri Lanka	76	47	0.439	6	2	147.4	210.3
57	Suriname	49	74	0.609	6	3	80.6	393.6
58	Taiwan	79	44	0.804	3	0	60.2	60.2
59	Tanzania	63	60	0.395	3	1	49.4	75.7
60	Tan-Zanzibar	61	62	0.254	3	1	24.8	165.7
61	Timor-Leste	49	74	0.680	4	1	63.7	83.7
62	Togo	64	59	0.401	4	2	15.2	127.9
63	Trinidad	62	61	0.672	4	0	51.9	51.9
64	Uganda	62	61	0.213	6	3	104.2	368.1
65	Vanuatu	44	79	0.724	7	1	84.7	102.1
66	Zambia	60	63	0.491	6	1	106.1	131.8
Average		64.0	59.3	0.462	4.2	1.7	73.5	183.1
Standard dev		19.5	18.4	0.166	1.9	1.6	30.6	142.9

Table 5b. Countries not in transitions

67	Bahrain	53	70	0.117	2	1	66.7	159.0
68	Burkina Faso	64	59	0.155	6	4	39.4	1140.0
69	Burundi	62	61	0.173	4	4	135.8	456.1
70	Cambodia	79	59	0.165	2	3	10.3	324.2
71	Chad	64	59	0.133	3	3	23.3	369.2
72	Eq Guinea	56	67	0.171	2	1	73.7	143.9
73	Eritrea	31	92	0.052	2	0	292.3	292.3
74	Eswatini	56	67	0.074	1	1	8.1	221.6
75	Guinea	66	57	0.148	4	4	53.4	415.5
76	Hong Kong	123	123	0.015	2	1	540.0	1300.0
77	Iran	123	0	0.125	5	1	104.8	343.2
78	Korea N	76	47	0.063	1	0	123.8	123.8
79	Laos	71	52	0.096	3	3	-91.7	485.4
80	Qatar	53	70	0.077	0	0	na	na
81	Rwanda	62	61	0.198	4	3	39.4	301.0
82	Somalia	55	68	0.135	3	2	51.1	446.7
83	Sudan	76	55	0.079	5	4	-241.8	1254.4
84	Syria	78	45	0.096	5	5	19.8	1044.8
85	Yemen S (past)	28	62	0.100	1	0	76.0	76.0
86	Zimbabwe	60	63	0.131	4	2	123.7	465.6
Average		66.8	61.9	0.115	3.0	2.1	76.2	492.8
Standard dev.		22.8	21.7	0.046	1.6	1.6	148.5	378.7

Table 5b holds 20 countries with little signs of the transition. Here 12 are Muslim/OPEC, two are communists, one is dependent. The remaining five countries are: Burundi, Cambodia, Eswatini, Rwanda, and Zimbabwe, where the transition is likely to resume.

3.2 Short series and old data

With the collapse of USSR and Yugoslavia in 1990 many new countries appeared. The data does not cover the period before, but I have guessed what the V -score would have been to calculate the first ΔV . (This is a bit uncertain, but better than the alternative).

Table 6a. Countries with short series, in transition

(1)	(2)	(3)	(6)	(7)	(8)	(9)	(10)
Nr	Country (now)	Free	Transition made	Up	Down	Explained by jumps Net	Gros
1	Armenia	33	0.399	2	5	107.3	290.2
2	Bangladesh	52	0.153	5	4	135.9	1115.0
3	Bosnia	29	0.362	2	2	103.3	169.6
4	Cameroon	62	0.137	2	0	49.6	49.6
5	Croatia	32	0.724	3	1	97.4	112.3
6	Estonia	105	0.795	4	2	96.4	274.5
7	Georgia	33	0.504	3	1	88.9	116.3
8	Kosovo	16	0.574	3	1	90.1	114.5
9	Kyrgyzstan	33	0.258	2	1	146.1	191.1
10	Latvia	103	0.752	2	1	88.0	247.6
11	Lithuania	105	0.698	2	1	102.6	227.2
12	Macedonia	32	0.460	4	1	101.3	153.0
13	Moldova	33	0.613	4	3	116.0	175.7
14	Montenegro	123	0.514	2	0	82.1	82.1
15	Slovakia	30	0.114	1	0	120.2	120.2
16	Slovenia	34	0.558	2	1	109.3	128.7
17	Ukraine	33	0.315	3	3	47.6	240.6
18	Uzbekistan	33	0.215	0	0	93.0	93.0
19	Vietnam S (past)	27	0.269	3	1	93.7	178.4
	Average	48.6	0.407	2.5	1.4	96.7	215.7
	Standard dev	30.8	0.231	1.1	1.3	22.8	216.3

Table 6b. Countries not in transition

20	Azerbaijan	33	-0.047	1	2	-36.2	-746.8
21	Belarus	33	-0.078	1	2	-128.2	-720.5
22	DDR (past)	40	0.083	1	0	74.7	74.7
23	Kazakhstan	32	0.184	0	0	0.0	0.0
24	Sudan S	12	-0.058	0	0	0.0	0.0
25	Tajikistan	33	0.068	0	1	216.2	389.7
26	Turkmenistan	32	0.050	2	1	88.0	376.0
27	UAE	52	0.080	0	0	0.0	0.0
	Average	32.5	0.025	0.3	0.8	8.6	-179.6
	Standard dev	11.6	0.094	0.5	0.9	103.3	415.4

Table 6a can be interpreted as a (small) part of the usual pattern, while Table 6b shows seven countries without transition. It is six Muslim countries one defunct communist country and Belarus, where transition may resume.

Finally, Table 7 looks at the period from 1790 to 1870 where states that became Germany and Italy were independent. This period is where the transition started. It is clear for 11 of the old countries, and though the countries have few jumps they explain 80% of the change. In eight of the countries, it not clear that the transition has started.

Table 7a. Former countries of Germany and Italy. From start of transition 1790-1870

(1)	(2)	(3)	(6)	(7)	(8)	(9)	(10)
Nr	Country (past)	Free	Transition Made	Up	Down	Net	Gros
1	Bavaria	82	0.129	1	0	38.8	38.8
2	Brunswick	35	0.061	1	0	98.4	98.4
3	Hamburg	78	0.163	1	0	58.3	58.3
4	Hesse-Darmstadt	81	0.153	2	2	92.8	317.6
5	Hesse-Kassel	77	0.109	2	1	61.5	195.4
6	Mecklenburg Schwerin	78	0.063	2	1	123.8	606.3
7	Nassau	59	0.164	2	1	102.4	212.2
8	Saxony	78	0.101	1	1	77.2	271.3
9	Württemberg	56	0.111	1	0	72.1	72.1
10	Piedmont-Sardinia	72	0.194	1	0	92.8	92.8
11	Tuscany	61	0.091	2	1	64.8	315.4
	Average	68.8	0.120	1.5	0.6	80.26	207.14
	Standard dev	13.9	0.040	0.5	0.6	23.17	159.90

Table 7b. Countries not (yet) in transition. No start of transition yet

12	Baden	52	0.040	0	0	0	0
13	Hanover	77	0.102	0	0	0	0
14	Oldenburg	19	0.000	0	0	0	0
15	Saxe-Weimar-Eisenach	52	0.007	0	0	0	0
16	Saxe-Weimar-Eisenach	52	0.007	0	0	0	0
17	Papal States	80	-0.019	1	1	-300.0	811.1
18	Modena	70	0.028	0	0	0	0
19	Parma	70	0.031	0	0	0	0
	Average	59.0	0.025	0.1	0.1	-37.5	101.4
	Standard dev	18.6	0.034	0.3	0.3	99.2	268.2

In nine of the 19 countries there were an upward jump in 1848/49 the famous revolutionary year. However, in seven of these cases there were a similar downward jump in one of the next couple of years. Thus, that traditional system was still the steady state. However, Table 3 show that both Germany and Italy have made the full transition.

3.3 Endpoint adjustment for 4 samples, and a summing up

The calculation of the average spell should start from the first spell and continue to the last observation before the last jump. In many cases, such as the USA, the series start at the year of the constitution. In these cases, there is no starting point adjustment. However, the data stops at a rather arbitrary endpoint except for the countries in Table 7 that ends where the countries does. The same is the case for the DDR, South Yemen, and South Vietnam. However, for all other countries an endpoint adjustment is needed. Table 8 show the average length of the last spell, which is randomly broken in all four tables except Table 7. The standard technique to make an endpoint adjustment is to multiply the broken spells by two. That is done by adding the last spell that is already counted once. In this way it is counted twice.

Table 8. Endpoint adjustment – Averages for tables

(1) Table	(2)	(3) Years	(4)	(5) Sum of jumps	(6)	(7)
	Independent	Dependent	Last spell		Average spell length not adjusted	adjusted
3	182.2	56.6	64.7	7.1	20.5	27.8
4	177.1	47.8	21.5	8.5	16.6	18.6
5	64.7	59.9	24.3	5.7	9.1	12.5
6	43.8	na	16.4	3.1	11.4	15.7
7	64.7	na	na	1.3	39.8	na

Tables 4 to 7 have two parts, columns (2) to (5) are sums weighted with the number of countries in the two parts.

The best estimate of the spell length in the modern steady state is twice the last spell in row 3 of column (4) in Table 8. It is 130 years. It is surely an uncertain estimate, but it indicates that the countries that have made the democratic transition have reached a political steady state. The Czech Republic, Greece, Hungary, and South Korea have a (?) in Table 3.⁶ They have 2, 4, 6, 1 respectively as the last spell, indicating that they may still lack the democratic consolidation. This is much as expected from the media coverage of these countries. If they are deleted the last spell increases to 75.3 years. Twice that is 150.6 years.

⁶ Both Hungary and South Korea have had a development back towards democracy since 2023, where the data stops. This suggests that they were in the modern steady state, but a shock happened making a short run deviation from the steady state, but then the system returned to the equilibrium.

4. Summary of the results from sections 2 and 3

The analysis in this paper estimates the constancy spells in the $N = 26,595$ annual observations for the polyarchy democracy index. The results in Tables 2 and 8 tallies reasonably well.

The analysis covers 200 countries, or 177 when the 20 from Table 7 and DDR are excluded. Of the 177 countries 36 countries have not started on the transition. It is 22 Muslim/OPEC countries, 5 are the remaining communist countries, and one is a dependent country (Hong Kong). The remaining 8 countries are likely to resume the transition. Thus, the democratic transition is a strong fact in the data.

For countries in the traditional steady state, the political system was of the three-pillar type, where power is concentrated in the king, the feudal nobility, and the church. Such systems are stable over centuries. In Europe where historical narrative exists for more than 1000 years, they persisted for at least 500 years before 1800. The polyarchy data starts in 1789 were the French revolution was changing into the Napoleonic wars, and the new country of the USA obtained its constitution, which came to define democracy.

The grand transition started in the UK and quickly spread to NW Europe and the USA. From there it has gradually spread to most countries in the World. But as late as 1990 many countries – especially landlocked countries in Africa, showed little signs of development. However, at the end of colonialism the idea of democracy spread. In the developed world it has consolidated and as of now it has lasted 100 to 150 years. Also, it appeared that all countries have made effort to start development – often with some success.

This means that the average length of the constancy spell follows the transition. At both ends it is longer than 100 years, but when the transition is fastest it falls to a decade.

The other important finding documented by the paper is that about 75% of the changes in the index are due to the jumps. The gross movements due to the jumps are on average about twice the net change, pointing to some zigzag in the movements from authoritarian royal rule to democracy.

Sources and references:

Sources:

y, income. The natural logarithm to GDP pc from: <https://www.rug.nl/ggdc/historicaldevelopment/maddison/releases/maddison-project-database-2023>

V, polyarchy, is from <https://v-dem.net/data/the-v-dem-dataset/>

References:

The book and the following papers are by the author. They include copious references to the literature.

MP, 2021. *The Grand Pattern of Development and the Transition of Institutions*. Cambridge UP, New York. The democratic transition is analyzed in part II of the book

MP, 2024. Income, Growth, and Democracy. Looking for the main causal directions in the nexus. *European Journal Political Economy* 83, 10253

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

MP, 2025b. The OPEC/MENA/Arab nexus and the missing democratic transition. *European Journal Political Economy* 90 102731

MP, 2026. Institutional indices: Distributions and measurement errors. Available from <http://martin.paldam.dk/Methodology.php>