

Does the improvement of institutions harm development? A comparative empirical study

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Abstract

The paper analyzes two key facts: (1) Development leads to better institutions. Good institutions should lead to higher income. Thus, (1) should lead to a positive interaction between institutions and development. However, (2) institutional changes are system instability that harms investment and growth. Consequently, (1) and (2) have a joint negative dynamic interaction that reduces the positive interaction. Poor countries have a high potential growth, as it is much easier to adopt existing technologies than to develop new ones. The negative dynamic interaction is a main reason why it is difficult to accomplish the potential.

Keywords Instability • Institutions • Development

Jel Classification O11 • O43

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1 Introduction

The paper analyzes the relations depicted as the black arrows on Figure 1:

(1) Development (measured as growth) causes a long-run improvement of institutions due to the long-run transitions, such as the democratic transition. The individual steps in the process are conditional on random triggering events. Better institutions should give more development. Hence, we expect a positive dynamic interaction between development and institutions.

(2) People experience changes of institutions – even if they are improvements – as system instability, which harms investment and growth. This gives a negative dynamic interaction between development and institutions, which reduces the positive dynamics from (1).

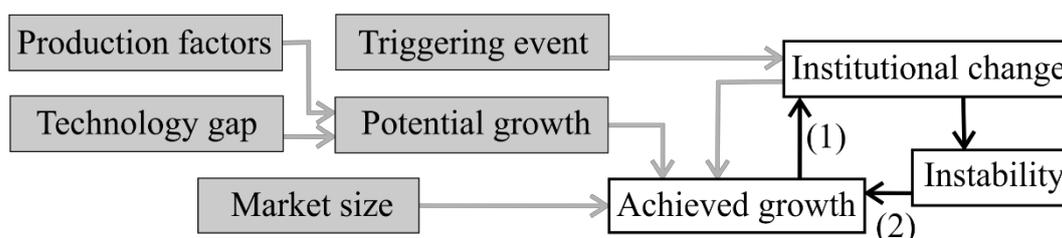


Fig 1. The causal structure. *Note:* At present the gray cells and arrows are exogenous. (1) the long-run transition link. (2) the short-run investment link. Normally the achieved growth falls short of the potential growth for two main reasons: (2) and the limited size of the domestic market.

It is easier to adopt existing technologies than to develop new ones, hence LDCs (Less Developed Countries) should potentially grow rather fast, such as by 8-10%. ‘Miracle growth’ has happened, but it is rare.² Several explanations exist why it is so difficult for LDCs to attain the potential high growth.³ The interaction of (1) and (2) is an important new explanation.

Section 2 presents the data and a few stylized facts. Section 3 surveys the large literature on development and political instability. The paper covers institutional instability only. What the paper loses in generality, it tries to win in two ways: In sharpness of focus and in the understanding of causality, as it builds on other papers in a project analyzing precisely that. I believe that the project has demonstrated that institutions – and hence their changes – are largely endogenous in the longer

2. The average middle-income country does catch up, but slower than it potentially could (Gundlach and Paldam, 2019).
 3. The small size of the market in most LDCs means that high growth needs the development of foreign trade. In addition, many of the policies caused by the instability might work to create and protect rents in the sectors hit by the instability.

run, as they follow clear transition paths.⁴

Section 4 brings a set of correlations and regressions analyzing the relation of average growth and the instability variables. Finally, section 5 concludes.

2 The data and some stylized facts

Sections 2.1 and 2.2 define the level and changes of the variables. Sections 2.3 and 2.4 look at the long-run pattern in the data, while section 2.5 considers the variation over time.

2.1 The level variables P , F and y

Both the economic system and the political one are multidimensional entities. Measurement requires an aggregate of a set of indicators into an index. The choice of indicators and the aggregation involve debatable choices, and difficult conceptual questions are involved. Especially as regards the political system a handful of indices exist – each have ardent proponents. Prior research found that the differences between the findings vanish in studies with high values of N (number of observations).⁵

The political system index is Polity2, which scores countries on a 20 point scale from dictatorship to democracy. Until 2019, Polity has published 17,300 observations, covering the period 1800 to 2017. I use the 7,000 observations from 1960 to 2016 that can be paired with income data. The joint data are available for 167 countries. Of these countries, 21 have perfect stability of P for all years covered.

The economic system measure is the Fraser index of economic freedom, which scores countries on a 10 point scale.⁶ It measures the freedom to run a private business. The F -index starts the annual series in year 2000. Since then the index has had small movements as shown by Figure A4 (Appendix). The 5-year data goes back to 1970.

The primary indicators used for the P and the F -indices have a marginal overlap only. Thus, it is not by construction that the correlation of the indices is about 0.45 (see Table 2a below).

4. In order to keep the paper within limits, I will not repeat published results, but give a couple of short summaries, so that new readers can start here. I know that some of our previous findings are controversial.

5. See Gundlach and Paldam (2009) and Paldam and Gundlach (2012, 2018), using different political indices.

6. The Fraser index is defined in Lawson *et al.* (1996). Since then it has been discussed in the annual volumes, latest Gwartney *et al.* (2018). For the period 1970 to 2000, it uses a time unit of 5 years – since 2000 it is annual.

The economic data used is the *cgdppc* series for 1960-2016 from the 2018 version of the Maddison Project Database.⁷ These data are close to The Penn World Tables. They measure *gdp*, which is per capita in fixed 2011 US\$. The (natural) logarithm to *gdp* is termed income, *y*, while the growth of *gdp* is *g*, the growth rate.

2.2 The variability measures: V^P , Z^P and V^F

Political systems quickly develop status quo equilibria, so the Polity index is constant most years, but from time to time they change, and some of the changes are large. To measure system instability, one has to consider averages over long periods. The measures are defined for country *i* for the period $T = t1, \dots, t2$, or at time *t* for $i = 1, \dots, n$ countries:

$$(1a) \quad V_{iT}^P = \sum_{t=t1}^{t2} |\Delta P_{it}| / (t2 - t1) \quad \text{or} \quad (1b) \quad V_t^P = \sum_{i=1}^n |\Delta P_{it}| / n$$

$$(2a) \quad Z_i^P \quad \text{or} \quad (2b) \quad Z_t^P \quad \text{that is the fraction of years or countries with } P = 0$$

V_i^P is the average numerical change per year. Given that the Polity index is a good measure of the political system, (1a) is the most straightforward measure of system instability possible.⁸ The indices can be used to analyze the development over time for one country, or across countries for one year.⁹

The instability measure V^F is calculated in parallel with V^P as follows:

$$(3a) \quad V_{iT}^F = \sum_{t=t1}^{t2} |\Delta F_{it}| / (t2 - t1) \quad \text{or} \quad (3b) \quad V_t^F = \sum_{i=1}^n |\Delta F_{it}| / n$$

The *P* and *F*-indices have different distributions as shown by Figures A1 and A2 (Appendix). Polity tends to go to the extremes, while Fraser is more normally distributed. This carries over to the first differences of the series as shown on the three distribution graphs of Figures A5 to A7. It tallies with the bang-bang nature of the political system in many middle-income countries. It is possible to

7. The Maddison project data reports two GDP per capita series – *cgdppc* and *rgdppnc* – it appears that the *cgdppc* is better in time series studies while *rgdppnc* is preferable in cross-country studies. Our study is a mixed cross-country time-series study. We have tried both series and the results are very similar, but marginally clearer for the *cgdppc* series.

8. Formula (1) for V^P was also tried with a quadratic metric, but it gave inferior results. I have also tried to divide into positive and negative changes.

9. 15 Western countries, Japan, and Costa Rica have $P = 10$, 3 Arab oil countries have $P = -10$, and Namibia has $P = 6$.

change the political system from dictatorship to democracy (or vice versa) within one year, but large changes in the economic system take time.

Note also that the V s have only moderately skew distributions, while Z has a very skew distribution. More than half of the Z s are zero, so the explanatory power of the Z -variable hinges upon few countries, and the utmost observation is indeed an outlier.

2.3 Some stylized facts: Transitions and the growth premium

The study of economic development has found two main steady states (see Kuznets 1966, Maddison 2001, and Galor 2011). The traditional steady state used an almost stable traditional technology that produced a low and stable income. The modern steady state uses a dynamic international technology that yields a much higher income and moderate growth. The change from the traditional steady state to the modern one is the grand transition. It may be simplified by a model with two sectors representing the two steady states, where the transition means that the modern sector gradually replaces the traditional one. During the transition most relations in the economy change substantially, and hence it is not a steady state.

Fig. 2a. The political system (*Polity index*)

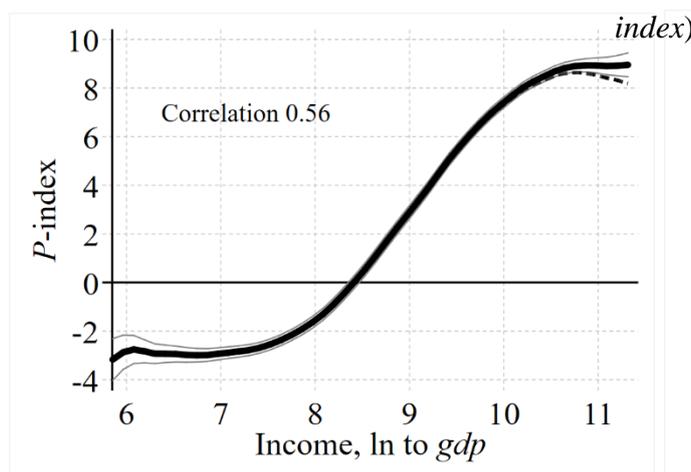


Fig. 2b. The economic system (*Fraser index*)

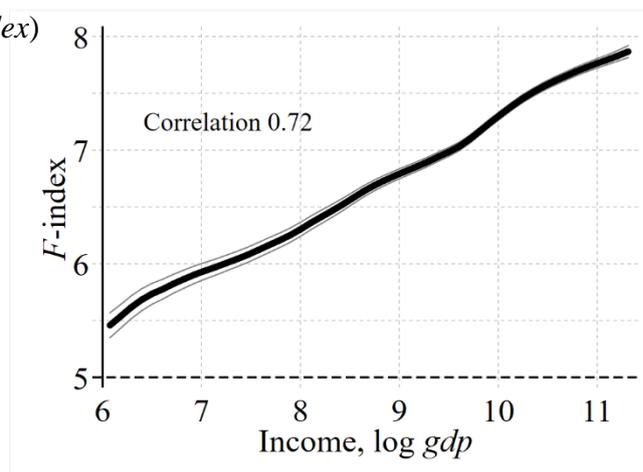


Fig. 2. Kernel regressions for the transition in the political and economic system. *Note:* Figure 2a is estimated on the 6,953 joint observations from the P -index and income in non-OPEC countries from 1960 to 2016. The thick line excludes the outlier Singapore, and the dashed line includes the outlier. Figure 2b is estimated on the 1,965 joint observations of the Fraser index and income from 2000 to 2016. Both figures use Epanechnikov's kernel with bandwidth 0.4. The gray lines are 95% confidence intervals.

The Grand Transition is reflected in most (if not all) socio-economic variables. We have found that the best way to see the transition is to calculate kernel regressions on large stacked cross-country time-series datasets.¹⁰ The present only looks at the transitions in the *P* and *F* variables.

The transition in the *P*-index is the *democratic transition* shown as Figure 2a.¹¹ The curve looks as the theory predicts with a flat section at both ends. While the flat part at low income is far from the lower bound of the index the upper part is close to the upper bound. In my judgement, most proposals for improving the typical western democracy are either marginal or utopian, so the upper bound reflects reality. The full transition amounts to about 12 *P*-points.

The transition in the *F*-index is the *transition to capitalism*.¹² It gives a pattern that looks as Figure 2b. The curve on Figure 2b also looks as predicted by the theory, even when it lacks the flat sections at the two ends. We also know that if data could be made for a longer period, they would show large movements. The full transition amounts to about 2½ *F*-points.

The countries do not cluster in groups with different paths, but scatter randomly around the path. Thus, the large number of observations give narrow confidence intervals around the two curves – the common underlying path is well determined.

The papers referred to report formal TSIV-causality tests between income and the institutional index. The tests use the *DP*-variables from Olsson and Hibbs (2005) as instrument. *DP* stands for development potential. These variables apply to the very long run. They are measures of geography and availability of domesticable animals and arable plants in Neolithic times. The test shows that the dominating long-run causality is from income to the institutional indices.

Growth consists of three parts during the transition: The first two are the internal growth in the two sectors assuming that they employ constant shares of the labor force. This gives growth of 1-2% as the weighted sum of the two growth rates. The third part is the growth *premium* from the transfer of resources from the low productivity traditional sector to the high productivity modern one. Imagine that it is possible to transfer 1% of the labor force per year. If the productivity gap is 7 times, such a transfer will produce an extra growth of 7 percentage points. Thus, countries may potentially grow by 8-9% at the middle of the Grand Transition. It has happened, but it is hard to achieve for many reasons, one of which is the uncertainty due to institutional changes – discussed in this paper.

10. The logic of this technique is explained in Gundlach and Paldam (2018, 2019).

11. See Paldam and Gundlach (2018) for robustness tests and references to the large literature.

12. See Bjørnskov and Paldam (2012), where the transition is analyzed by an alternative index that is calculated from the ownership item in the World Values Surveys. It shows people's preferences for private vs public ownership of businesses. It gives a transition pattern that is very similar.

2.4 The democratic transition in long time series

The P -data start in 1800, where they cover 23 of the present countries,¹³ including Germany that consisted of independent states before 1871. The USA had left colonial status just 17 years before, but the other 22 countries all had old royal systems with an average P -level of -8 . The king was from a ‘royal’ family. He ruled in alliance with the national ‘church’ and a small ‘noble’ class of large landowners. Thus, it was a feudal/religious system headed by a king. Such systems typically lasted a handful of centuries. Development undermines two of the three pillars in this power structure:

(a) The Agricultural Transition reduced the agricultural sector from 40-50% of GDP to well below 5%, greatly weakening the relative income and power of landowners. New sectors of manufacturing and services grew to produce capitalists, a large labor class, and eventually a large middle class, which became the main recipient of the large increase in human capital. Compared to the old ruling elite, the new classes were much more numerous, so they wanted mass representation.

(b) The Religious Transition reduced religiosity by 60-70%,¹⁴ and thus the power of the Church. The reduction in religiosity also seemed to have reduced the amount of religious fundamentalism and hereby the number of democratically problematic people with supreme values, as described in Bernholz (2017).

The result of all these changes proved to be democratic societies. If the king managed to remain on the throne, he (she) turned into a constitutional figurehead. The whole process of change is never smooth: Old players try to hold on to power, and the new classes grab power through demonstrations/riots/revolutions. These processes take place in large steps that often overshoot the transition path, resulting in cyclical jumps for some time before the system settles down, as mentioned. Often, periods of military rule occurred during the process.

This development is illustrated by Thailand, which is the most unstable country by the V^P -index. For the 58 years covered, the numerical changes add to 98 Polity-points. This corresponds to five changes from the top to the bottom of the scale due to over/undershooting cycles. Thailand has P -scores since 1800, and the Maddison GDP data exists for as many years, though they are very thin before 1950. Figure 3 looks at all 217 years.

13. Year 1800 was at the start of the Napoleonic Wars, where the political system in several countries was in a flux, so for three of the 23 countries I have made some assessments in the war-years. Two of the countries in this group – Korea and Morocco – had a period of about 40 years as colonies.

14. See Paldam and Gundlach (2012) and Paldam and Paldam (2017).

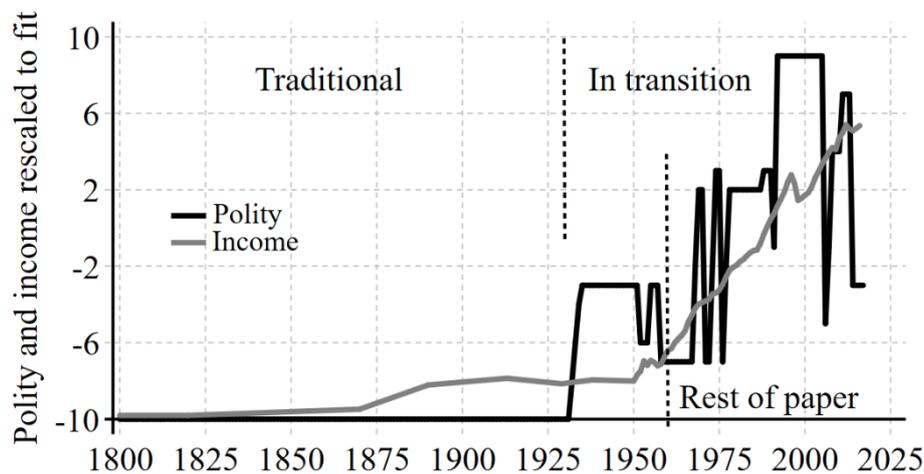


Fig. 3. The history of Thailand over two centuries as told by income and Polity. *Note:* Income is the logarithm to real GDP per capita in the Maddison project database. Income is rescaled by multiplying by 5 and deducing 42.5. See further Terziel (2011) on the history of Thailand. The rest of the paper covers the period after 1960 only. Democracy has not yet stabilized in Thailand, but I predict that it will.

Until the 1930s, Thailand was in the traditional steady state with a stable absolute kingdom and a stable low income. Development became strong around 1950. Since then Thailand has been unusually unstable politically, but *P* does have a rising trend, and in addition, the country has a stable real growth per capita of no less than 4½% pa. The main difference between Thailand and the typical western country is that development in the West started earlier and was slower. Consequently, the West experienced the zigzag of the Democratic Transition earlier and less compressed, though it was as dramatic, especially in Germany and the South European countries.

2.5 The path of variability over time – using equations (1b) and (3b)

The *V*-scores can be averaged across countries every year. This produces the *V_t*-scores that are the annual measures of global system instability depicted on Figure 4 and analyzed by the regressions in Table 1 below. The analysis shows a clear downward trend and a large peak rising no less than 1.5 polity points above the trend in connection with the demise of socialism and the dissolution of the USSR and Yugoslavia. Even when the new countries that emerged from the two federations are deleted, the peak still rises 0.9 points above the trend.

The post-socialist peak of 1989 to 92 was a unique set of events that has the character of a ‘ketchup effect’: After a long time where socialism did not live up to its promise, it finally broke, and this created a large demonstration effect. First, the Communist Party of the USSR collapsed, then the

whole regime, the union of the 15 countries, and the Russian superpower.

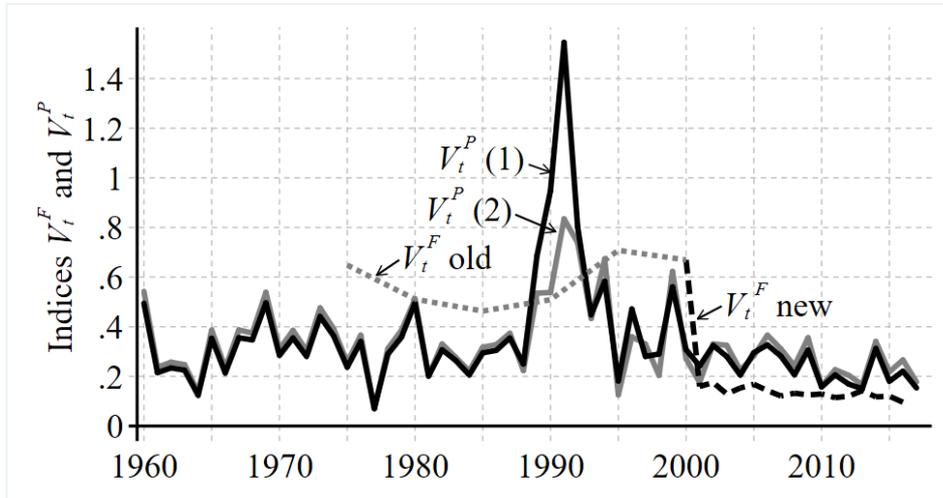


Fig. 4. Average V_t s for all years; see also Table 2. *Note:* V_t^P (1) is for all countries, while V_t^P (2) excludes the 21 new countries that came into being in 1990 after the dissolution of the USSR and Yugoslavia. They all started with a large change. The curve remains similar when these countries are deleted, but the peak goes to 0.83 only. V_t^F old is for the period before 2000, where the F index had a 5-year time unit, while V_t^F new is for the period from 2000 onward where the F -index is annual. Recall that the V -scores did not contain the countries of the socialist block.

The collapse of socialism in the Soviet Block also caused a collapse of socialism in many other countries, including the Yugoslavian Federation. The large shock to the political system resulted in large changes in the economic system and a deep crisis lasting 5-10 years throughout the ex-socialist countries. This whole process caused most state-owned enterprises to close or drastically downsize. This had large social consequences, but the process was amazingly peaceful.

Table 1. V_t^P explained by trends and the post-socialist peak, 1988-93. *Note:* 58 years are 5.8 decades. Parentheses hold t-ratios. Coefficients are bolded if they are significant at the 5% level.

$N = 58$	(1)	(2)	(3)	(4)
Decade	-0.01 (-0.5)	-0.01 (-1.6)	-0.01 (-1.6)	
Dummy for year	1988	-0.04 (-0.4)		-0.04 (-0.4)
	1989	0.39 (3.6)	0.39 (3.6)	0.39 (3.6)
	1990	0.66 (6.0)	0.66 (6.0)	0.66 (5.9)
	1991	1.26 (11.5)	1.26 (11.5)	1.25 (11.3)
	1992	0.52 (4.7)	0.51 (4.7)	0.51 (4.6)
	1993	0.16 (1.5)		0.16 (1.4)
Constant	2.23 (0.6)	3.03 (1.8)	2.93 (1.7)	0.29 (19.2)
R^2	0.005	0.800	0.790	0.789
R^2 adj	-0.013	0.771	0.770	0.764

Table 1 shows the significance of the pattern on Figure 4. A trend of -0.014 gives a fall of 0.08 V -points over the 58 years, so it is no wonder that it is insignificant. The table shows that the trend and the peak do not interact. We are dealing with two independent phenomena.

3 The literature and prior findings

Sections 3.1 and 3.2 surveys the literature on variability of the political and economic system and development. Section 3.3 restates the Jump Model from prior research, and section 3.4 states the investment link.

Instability is a measure of passed variability. Uncertainty is the expected future instability. If expectations are stable, instability becomes uncertainty. Variability may be within the system and of the system – the paper only deals with the latter.

3.1 Political system (P), its variability (V^P), and development ¹⁵

A large literature analyzes the relation between P -levels and growth, notably between democracy and growth. Doucouliagos and Ulubaşoğlu (2008) is a meta study of the 84 papers from 1983 to 2006. It concludes that researchers have found a wide range of results that have a small positive average with a dubious sign.¹⁶ New papers as Gründler and Krieger (2016) and Acemoglu *et al.*, (2019) find a small positive effect. It may cumulate to something in the end, but it is inadequate to explain the high correlation of the main political indices and income discussed above.¹⁷

The connection between V^P (P -changes) and growth is found to be largely negative, but highly variable. Most of the literature looks at within-system instability: Much research show that constitutional changes of governments in democracies have little effect on the growth rate due to the competition of the parties for the median voter. The median voter theorem applies in established democracies with a stable and well-defined issue space. Such democracies are mainly in wealthy countries. A family of studies deals with the interaction of elections and economic policies, studying cyclicity; Carmignani (2003) and de Haan and Klomp (2013). Such fluctuations have a small effect

15. The subject of this paper was also discussed at the IEA conference (Borner and Paldam 1998); see in particular the survey by Peter Bernholz that covers the literature back to Aristotele!

16. The funnel diagram looks as if the estimates have a positive publication bias, but this is not tested.

17. The key mechanism in the democracy-causing-growth theory is that democracies are more likely to increase education, causing growth. The lags involved are surely several decades, so it is a difficult mechanism to study.

on the medium-term growth rate, though they may affect the public debt.

Most countries have not (yet) reached such stability, but it is still possible to study within-system instability using the change of governments or even ministers as the instability indicator; see Aisen and Veiga (2013). Many authors do not distinguish the within-system and system variability, and some even say that the distinction is irrelevant (Alesina *et al.* 2009). Others, notably Jong-A-Pin (2009), study a wide range of instability measures; see also Bergh *et al.* (2012).

It is worth noting the diversity of country cases: Argentina and Haiti, does have had many institutional changes and low growth, but other countries, such as Thailand and Turkey, combine a fine economic development with an even greater instability of the political system.¹⁸

3.2 The economic system (F), its variability (V^F), and development

Most of the literature on the relation between F and income or growth looks at the effect of socialism vs capitalism. The literature is (already) quite old, but – very briefly – it showed why the soviet type of socialism disappeared. In spite of high investment ratios, soviet type socialism produced a relatively low level of income and consumption (and, in addition, low P -scores).¹⁹

A large literature analyze the relation between V^F and growth. It typically analyzes the effect of particular events and types of reforms. The largest events is the change out of socialism in 1988-95;²⁰ see e.g. Åslund (2002) or Gross and Steinherr (2004). In hindsight, we can see that the long-run effects have been largely beneficiary, but in the short to medium term it had great costs that peaked at a loss of about 40% in GDP, and it typically took a decade to recover. Most of the literature deals with ‘smaller’ cases, i.e. with the effect of trade liberalizations and other structural adjustments.²¹ They also tend to find a J-curve, of a downswing of a duration that depends upon the size of the change, and a positive effect that eventually exceeds the downswing. The paper looks at system changes irrespective of the direction.

Studies of the within-system instability analyze the longer-run consequences of economic

18. The stories of the four countries Haiti, Argentina, Thailand and Turkey are covered by: Lundahl and Silé (2005), Tanzi (2017), Terwiel (2011) and Pope and Pope (2011), respectively. It is also worth noting that one of the most thoughtful and successful practitioners of development, Lee Kuan Yew, often claimed that political stability is a key to development. Lee Kuan Yew ruled Singapore for all the 45 years of ‘miracle’ growth, where he practiced what he claimed.

19. See Gundlach and Paldam (2008) for a systematic comparison of twin-countries on both sides of the ‘Iron Curtain’.

20. Unfortunately, the F -index used below does not cover that change, but it is covered by the related Transition index from the EBRD (European Bank for Reconstruction and Development). By comparing the paths of the F -index and the EBRD-index where they overlap, I have assessed that the change amounted to about half the range of the F -index; see Paldam (2002). Thus, it is large relative to the transition showed on Figure 2b.

21. The survey above is limited indeed. The term ‘trade liberalization’ gave 17’000 hits in google scholar (18-09 2019).

fluctuations. A rather broad approach is Gavin and Hausmann (1998), who found that countries with high economic variability have low growth.

Later the literature has splintered into many sub-literatures dealing with the effect of specific types of instability/uncertainty on growth. Newer studies look at different types of uncertainty shocks and conclude that they affect growth, though sometimes only temporarily (Bloom 2009 and Basu and Bundick 2017). Another family of studies analyzes the effect of policy regimes and changes in such regimes. It defines a policy regime as a set of preferences for outcomes and policy instruments (Wilson 2000 and Fernández-Villaverde *et al.* 2015). The mechanisms analyzed are most diverse. The main one is probably the investment link discussed below, but authors also discuss other links such as the link to the propensity to consume.

3.3 Restating the jump model of the democratic transition

The democratic transition is a causal relation from income to P .²² Apart from the causality test already mentioned, Paldam and Gundlach (2018) present a new *jump model* that explains the process. The key to the model is the notion that the transition path is an attractor for jumps that happen randomly after a spell of system stability. The spells are highly variable, but on average, they last about 15 years. The model uses three variables: E , J and T :

E is a binary variable for *when* P changes. It is an almost random relative to economic development. J is the actual change in P . A *jump* is a numerical change larger than 3 P -points. T is the tension variable, which is the distance to the transition path. Jumps are explained by the tension. The coefficient to T is about 1.5, so jumps overshoot the transition path, giving some system cycling. It also means that the average system changes caused by a triggering event are three times larger than the tension.²³ Thus, the 12 P -points of the full transition gives about 36 points of P -changes.

The randomness of triggering events is further analyzed on a sample of 262 larger jumps in the P -index in Paldam (2019).²⁴ Articles in *The Economist* (historical archive) cover them all. The articles report what well-informed observers at the time thought were the triggering events. The

22. This is the reverse causality of the one expected from the PoI (Primacy of Institutions) view. The PoI-group (notably Acemoglu *at al.* 2009) showed that a regression explaining P by initial income, P lagged and fixed effects gives fickle results. We argue that P and income have a statistical structure that makes them unfit for such regressions. Income is close to linearity, but P is a stepwise constant variable with a bounded range, and infrequent jumps that may be quite large relative to the range.

23. Imagine that $T = 1$. The first step of 1.5 goes from 1 to -0.5. The second step of $-0.5 \cdot 1.5 = -0.75$ is from -0.5 to +0.25, etc. The third step is $0.25 \cdot 1.5 = 0.375$, so it is from +.25 to -0.125, etc. The numerical sum of these steps adds to 3.

24. We have also found that nearly all large jumps also appear as jumps in the Freedom House indices.

events cover a wide range, of which most are related to domestic politics.

The only non-random explanatory variable in the jump model is income. Hence, it is causal, but it works *indirectly* through the transition path, which is a long-run relation. As the actual *P*-values are scattered around the curve, income works poorly explaining Polity.

The Grand Transition normally takes a couple of centuries, but our data extend only half a century. They cover countries at all stages, including countries that have gone through the process and reached stable growth. Transitions also appears in long time series as already explained.

3.4 The investment link: Instability \Rightarrow low investments \Rightarrow low growth

The investment link has the two parts indicated in the section headline: Many studies of the investment motive, since Borner *et al.* (1995), have pointed out that the predictability and transparency of political decisions are of great importance for the willingness to invest. Obviously, system instability causes a loss of predictability and transparency and hence low investments. This is confirmed in many papers (at least) since Aizenman and Marion (1993).

Even more studies point to the second part of the link: Investment gives growth; see e.g. Barro (1991). By combining the two parts, instability becomes a strong impediment for growth. It does not appear that there is a difference between instability of the political and economic system in this theory. Both links in this theory apply rather generally to all types of uncertainty, so it might be difficult to sort out what is due to institutional instability.

4 Can system instability explain income and growth?

This section reports correlations and regressions analyzing the effect of instability on development. Section 4.1 considers the correlations. Section 4.2 reports regressions that try to handle the substantial underlying collinearity in the variables due to the common transition.

4.1 Basic correlations

Table 2 gives two ‘technical’ results: (1) The pattern in the three samples (A), (B) and (C) of the table are similar, but falling a little from (A) to (C) in most cases. (2) The Kendall rank correlation gives much the same pattern as Pearson’s (normal) correlation, so we need not be concerned about the non-

normality of the series, which does look substantial in the Appendix.

Table 2a. Cross-country correlations to the income level, y

Sample	Period 1: 1960-2016						Period 2: 2000-2016					
	Pearson			Kendall			Pearson			Kendall		
Sample	(A)	(B)	(C)	(A)	(B)	(C)	(A)	(B)	(C)	(A)	(B)	(C)
N , countries	111	127	156	111	127	156	103	115	140	103	115	140
(a) g , growth	0.45	0.34	0.33	0.29	0.24	0.22	-0.02	-0.03	-0.01	-0.07	-0.07	-0.07
(b) P , Polity	0.69	0.45	0.44	0.50	0.35	0.36	0.44	0.22	0.24	0.44	0.32	0.36
F , Fraser							0.78	0.69	0.68	0.63	0.55	0.53
(c) V^P	-0.39	-0.41	-0.36	-0.34	-0.35	-0.29	-0.40	-0.39	-0.40	-0.28	-0.29	-0.27
Z^P	-0.25	-0.24	-0.25	-0.25	-0.23	-0.20	-0.44	-0.43	-0.43	-0.15	-0.14	-0.12
V^F							-0.59	-0.51	-0.46	-0.43	-0.37	-0.32

Table 2b. Cross-country correlations to the growth rate, g

Sample	Period 1: 1960-2016						Period 2: 2000-2016					
	Pearson			Kendall			Pearson			Kendall		
Sample	(A)	(B)	(C)	(A)	(B)	(C)	(A)	(B)	(C)	(A)	(B)	(C)
N , countries	111	127	156	111	127	156	103	115	140	103	115	140
(a) y , income	0.45	0.34	0.33	0.29	0.24	0.22	-0.02	-0.03	-0.01	-0.07	-0.07	-0.07
(b) P , Polity	0.22	0.16	0.10	0.15	0.10	0.07	-0.15	-0.16	-0.14	-0.19	-0.20	-0.16
F , Fraser							0.02	-0.10	-0.05	-0.06	-0.13	-0.09
(c) V^P	-0.18	-0.17	-0.19	-0.11	-0.09	-0.12	-0.14	-0.13	-0.15	0.02	0.05	0.04
Z^P	-0.07	-0.07	-0.09	-0.12	-0.11	-0.11	-0.34	-0.34	-0.33	-0.08	-0.08	-0.08
V^F							-0.17	-0.06	-0.07	-0.02	0.05	0.06

Note: Rows (a) are the same. Bolded correlations are significant at the two-sided level of 5%. The country samples are: (A) is without OPEC and post-communist countries, (B) is without post-communist countries, and (C) is all countries. The Fraser index is available for fewer countries, so period 2 is estimated for fewer observations. The correlations of P and F for period 2 are 0.50, 0.43 and 0.44 for the samples A, B and C, respectively.

Row (a) is the same in Tables 2a and b. It differs greatly for the two periods. Figures 5a and b compare the two scatters used for correlations. They both have the typical hump shape, and look similar. The hump shape gives rather arbitrary results when the correlation enforces linearity. Another reason for the different sign on the growth income correlation in Table 3 is the seven deleted growth outliers (in Period 2) when the period is shorter.

Fig. 6a. For 1960-16

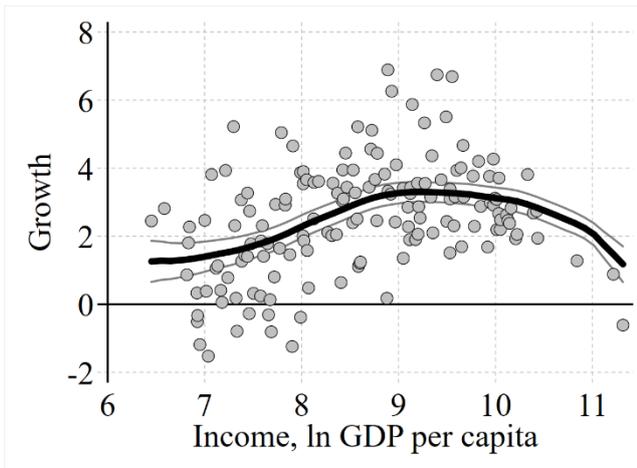


Fig 6b. For 2000-16

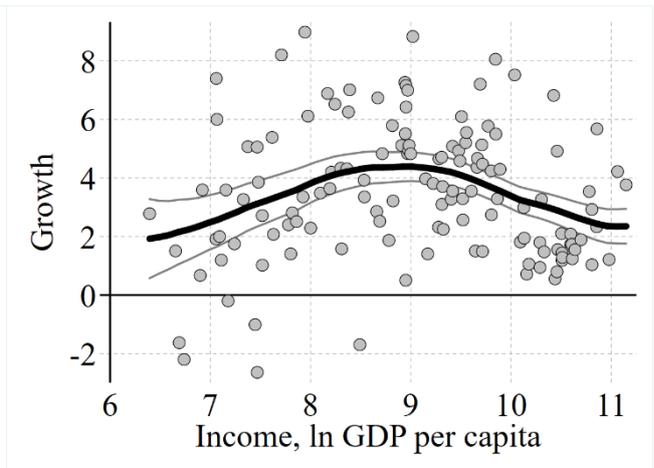


Fig. 6. Growth-income scatter. *Note:* The kernel curve included has $bw = 0.5$. Seven outliers are deleted from the data for Figure 6b. This does not affect the form of the curve – the confidence intervals of the two curves overlap. However, a linear approximation gives a positively sloped curve for Figure 6a and a negative one for Figure 6b as in rows (a) of Tables 4.

Table 2a reports the correlates to income: Rows (b) and (c) have a highly significant and consistent pattern. The (b) rows show that income is positively correlated to the levels of both the Polity and the Fraser index. One reason for this correlation is the transitions in the two system variables, as depicted on Figure 2. The next section shows that there are more reasons. The (c) rows report that income is negatively correlated to all three variability measures (V^P , Z^P and V^F) – especially to V^F .

Table 2b reports the correlates to the growth rate: Rows (a) are the same as in Table 2a, and rows (b) have the same problem as the (a) rows. The correlations in rows (c) are (nearly) all negative and often significant. It is important that the short- and long-run connections are the reverse. Thus, the short-run connection does not aggregate to the long run. We need a mechanism that reverses the short-run effect. The interpretation is that it has short-run costs to change the system, even when the changes have fine long-run consequences.

4.2 Some regressions

The results from Table 2 are further analyzed by the regressions reported in Table 3. Table 3a compares explanations of income. The coefficient to growth still changes from period to period, but now the coefficient is smaller. It also appears that Fraser, F , and its variability, V^F , are powerful

variables destroying the coefficients of Polity, P , and its variability, V^P . Economic freedom has a positive coefficient, while its variability has a large negative coefficient.

Table 3a. Cross-country regressions explaining income, y

	Full period 1960-2016		Period from 2000-2016		
	(Reg 1)	(Reg 2)	(Reg 3)	(Reg 4)	(Reg 5)
(a) g , growth	0.13 (3.1)		-0.09 (-3.2)		-0.09 (-2.4)
(b) P , Polity	0.08 (7.2)	0.09 (7.3)	-0.02 (-1.3)	-0.01 (-0.5)	0.04 (2.2)
F , Fraser	n.a.	n.a.	0.78 (7.3)	0.85 (7.9)	
(c) V^P	-0.80 (-4.2)	-0.90 (-4.7)	-0.11 (-0.8)	-0.09 (-0.7)	-0.47 (-2.7)
Z^P	-1.05 (-1.2)	-1.14 (-1.2)	-0.96 (-3.3)	-0.71 (-2.4)	-1.63 (-4.1)
V^F	n.a.	n.a.	-3.59 (-2.9)	-2.55 (-2.0)	
(d) Com/Post	0.44 (1.9)	0.61 (2.6)	0.63 (3.1)	0.32 (1.7)	0.45 (1.7)
OPEC	1.18 (5.1)	1.26 (5.3)	1.63 (6.6)	1.54 (6.1)	1.05 (3.1)
n , per	-0.00 (-0.4)	0.00 (0.1)	0.08 (3.1)	0.06 (2.3)	0.02 (0.5)
Constant	8.50 (19.2)	8.62 (19.0)	3.43 (3.8)	2.80 (3.1)	8.98 (17.4)
N , countries	156	156	140	140	140
R^2	0.480	0.447	0.664	0.638	0.341
R^2 adj.	0.455	0.424	0.641	0.616	0.306

Table 3b. Cross-country regressions explaining growth, g . Note: Sections (a) to (c) correspond to the rows in Table 4. Parentheses hold t-ratios. Coefficients are bolded if they are significant at the 5% level.

	Full period 1960-2016		Period from 2000-2016		
	(Reg 1)	(Reg 2)	(Reg 3)	(Reg 4)	(Reg 5)
(a) y , income	0.47 (3.1)		-0.85 (-3.2)		-0.49 (-2.4)
(b) P , Polity	-0.01 (-0.6)	0.03 (1.1)	-0.14 (-3.2)	-0.13 (-3.0)	-0.11 (-2.6)
F , Fraser	n.a.	n.a.	-0.12 (-0.3)	-0.84 (-2.5)	
(c) V^P	-0.39 (-1.0)	-0.81 (-2.2)	-0.32 (-0.7)	-0.24 (-0.5)	-0.17 (-0.4)
Z^P	-0.17 (-0.1)	-0.70 (-0.4)	-3.55 (-3.9)	-2.94 (-3.2)	-3.92 (-4.1)
V^F	n.a.	n.a.	- (-3.7)	- (-3.1)	
(d) Com/Post	1.01 (2.2)	1.29 (2.9)	3.86 (6.8)	3.58 (6.1)	3.31 (5.7)
OPEC	0.04 (0.1)	0.63 (1.4)	2.35 (2.7)	1.04 (1.3)	1.40 (1.7)
n , per	0.03 (2.1)	0.03 (2.1)	0.29 (3.6)	0.24 (3.0)	0.19 (2.4)
Constant	-3.12 (-2.0)	0.93 (1.1)	9.87 (3.4)	7.48 (2.6)	5.10 (2.3)
N , countries	156	156	140	140	140
R^2	0.152	0.098	0.400	0.354	0.332
R^2 adj.	0.112	0.062	0.359	0.314	0.297

Table 3b compares explanations of the growth rate. All 12 estimates of coefficients to V^P , V^F and Z^P in Table 3a and the same 12 estimates in Table 3b are negative, and most are significant. This result is consistent with the theory that increasing variability causes decreasing growth. Note that the V^F -variable is much stronger than the V^P -variable.

Section 3.3 estimated that the full transition gives a total $V^P = 36$ and V^F that is larger than

2½. Combined with a coefficient of about -0.5 to V^P and -13 to V^F it gives a growth reduction of at least $18 + 32 = 50$ percentage points. Even when they are distributed over the full transition it is still a substantial growth impediment.

The remaining coefficients show strong indications of confluence, notably between income and the Fraser index, much as suggested by Figure 2b. Still two results stand out: While the Fraser index has a positive coefficient to income, (i) changes in the index have substantial negative effects. Thus, while a liberalization has good effects in the long run, it is expensive in the short run – and vice versa for an increase in the level of regulation. In addition, it is nice to see that the post-socialist countries have relatively high growth. Thus, while the transition from socialism was expensive in the short to medium term, it gave higher growth during the recuperation period.

5. Conclusions

The findings in the paper confirm the standard result in the literature that system instability harms investment and hence growth. However, when combined with previous findings that growth causes institutional changes, it tells a story of growth that brakes itself in middle-income countries. It appears that the prevailing opinion of the East Asian growth miracle is that it should be explained by the growth premium reached from transfers of resources – notably labor – from the traditional to the modern sector. The paper argues that this transfer is normally quite problematic, as many people experience (high) growth instability that generates uncertainty and thus harms investment.

Thus, the growth miracle may rather be that the political systems of these countries were sufficiently stable to permit the good effects of the change to become visible to the majority of the population, and also that they managed to use the world market to overcome the limitations of the domestic market so that the modern sector could expand rapidly.

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Appendix: The distribution of the system indices and the instability indicators

Figure A1. Policy 1970-2000, annual

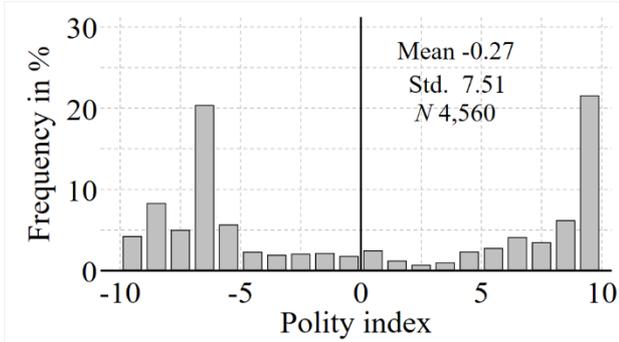


Figure A2. Fraser 1970-2000, 5-year interval

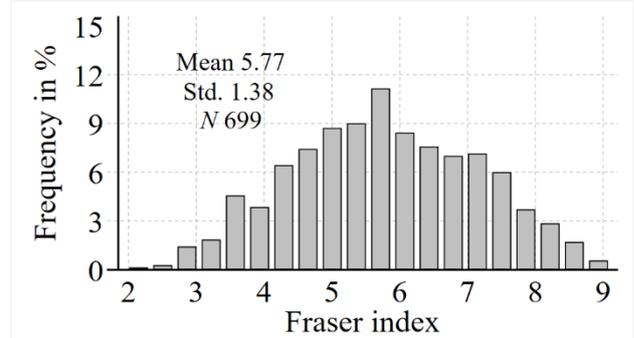


Figure A3. Policy 2001-2016, annual

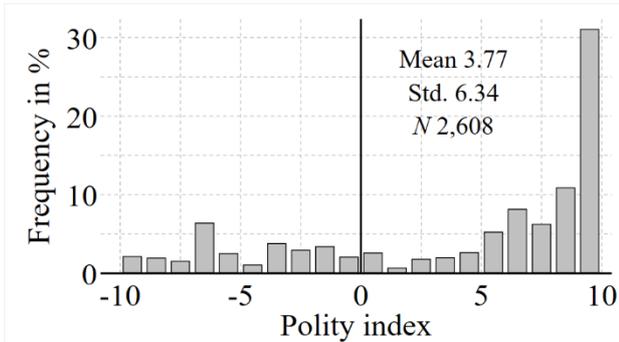


Figure A4. Fraser 2000-2016, annual

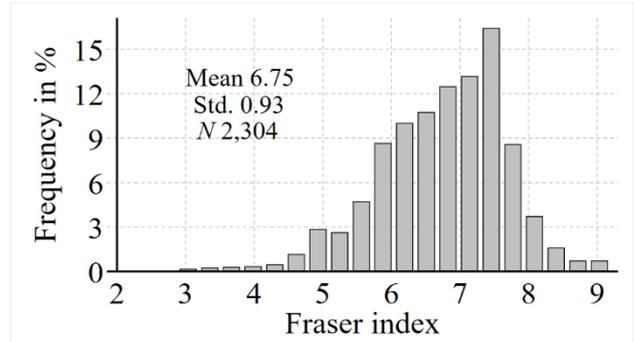


Figure A5. Distribution of V^P , 1960-2016

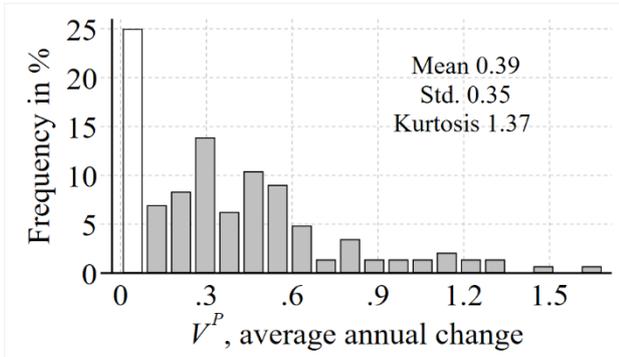


Figure A6. Distribution of Z^P , 1960-2016

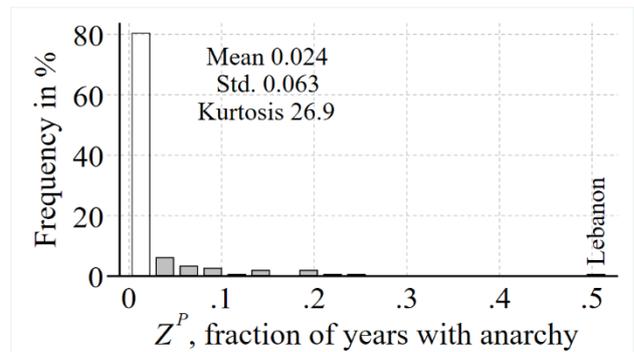
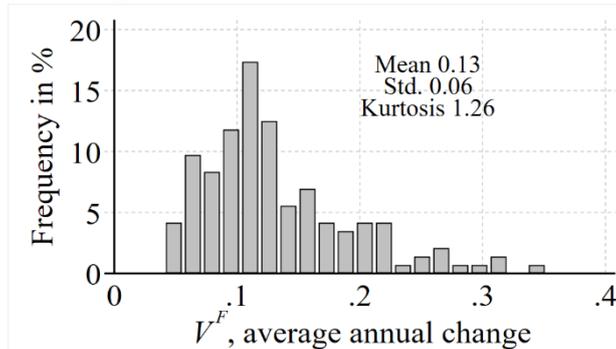


Figure A7. Distribution of V^F , 2000-2016



Note: Figures A5-A7 are made for overlapping data, 2000-16. Transparent columns are for observations of no change.

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