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Pillars of Prosperity: A Ten-Year Update

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JEL Classification: D72, E62, H11, H20, P14

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Pillars of Prosperity: A Ten-Year Update*

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Abstract

This paper provides an overview of a ten-year update of the empirical claims in Besley and Persson's (2011) 'Pillars of Prosperity: The Political Economics of Development Clusters'. In addition to assembling a new dataset that covers many of the themes in the book, we recreate almost all charts and tables with better data for a cross-section ten years later. New data further permitted the collection of additional variables relevant to the emerging literature in political economy on norms and values, in addition to measuring 'collective capacity' as our third dimension of state capacity. We also make comparisons of state effectiveness over time, using the panel structure of the dataset, and perform extensions that empirically identify state spaces and development clusters via unsupervised statistical learning techniques.

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“Little else is required to carry the state to the highest degree of opulence from the lowest barbarism, but peace, easy taxes, and a tolerable administration of justice, all the rest being brought about by the natural course of things.” – Adam Smith (1759)

1 Introduction

Over two-hundred and sixty years ago, Adam Smith famously came up with the quote above on the drivers of prosperity. Two-hundred and fifty years later – in a research program summarized in *Pillars of Prosperity: The Political Economics of Development Clusters* (hereafter *Pillars*) – we set out to evaluate Smith’s claim with the tools of modern economics (Besley and Person 2009, 2010, 2011a, 2011b). Starting from a core model of state capacity, we outlined the circumstances under which incumbents make purposeful investments in the state. We extended this core model to develop a unified theory of political violence. Combining our theoretical insights with a birds-eye view of cross-country data, we offered a reinterpretation of Smith’s insights.

We interpreted Smith’s notion of “easy taxes” not in terms of the level of taxes, but rather the state’s ability to extract broad-based taxes using a competent bureaucratic infrastructure; we called this *fiscal capacity*. We captured Smith’s notion of “a tolerable administration of justice” as the state’s ability to provide regulation and legal services to support markets and to reap their productivity benefits, in particular by building an infrastructure to protect property rights and enforce contracts; we called this *legal capacity*. Finally, we translated Smith’s idea of “peace” – and its importance for prosperity – into the absence of *civil conflict* and *state repression*.

In the spirit of Smith’s observations, the principal motivation of our research was to better understand *development clusters*, the fact that many development outcomes are strongly positively correlated. That is to say, rich (poor) countries also have strong (weak) states – they also typically resolve their internal conflicts in a peaceful (violent) way.

This update revisits the broad themes of the book ten years on. It summarizes some of the main empirical themes – further charts and tables appear in the lecture slides that accompany the book’s new and updated website.¹ It also follows up on Chapter 8 of *Pillars*, where we suggested an agenda for future research; we can now take stock of new research on state capacities over the past decade.

Our short paper is organized as follows. Section 2 outlines the general motivations for the update, in addition to reflecting on the broad patterns of the data. Section 3 discusses collective capacity – a third dimension of state capacity, which we now measure empirically. Section 4 highlights areas of real-world progress in state capacities since the publication of *Pillars*, especially with regards to fiscal capacity. Section 5, on the other hand, outlines areas of concern, especially in relation to political violence. Section 6 discusses our updated “Pillars-of-Prosperity index” for 2016, and tracks trends in countries’ levels of prosperity by way of ten-year long differences. Section 7 defines development clusters empirically, using techniques of unsupervised statistical learning and cluster analysis – these turn out to rhyme well with the “Anna Karenina principle of development” that we outlined theoretically in the book. Section 8 reviews an emerging literature in political economics, which ties state institutions and effectiveness to norms and values, and points to simple correlations between measures of state capacity and “civic culture”. Section 9 explores correlations between prosperity, state spaces, and life satisfaction – an aggregate measure of well-being. Section 10 concludes. Some details on data and methods are relegated to the Appendix.

¹The website can be found here: https://sticerd.lse.ac.uk/_new/publications/books/pillars-of-prosperity/. If there are issues opening this link, see the bibliography. All charts and tables in this piece can also be replicated using the new datasets and .do files provided online.

2 Motivation and Broad Patterns in the Data

Scholars in political economics – and social science at large – rarely return to their own previous theories and empirical findings with new and improved methods or data. Most evaluation and replication endeavors thus come in the form of critical comments (e.g., Albouy 2012 regarding Acemoglu et al. 2001), or larger meta-analyses (e.g., Blair et al. 2021) by other scholars. In the name of transparency, we therefore seek to reevaluate some of the main claims made in *Pillars* with new and better data. Where possible, we updated our initial dataset (*Pillars.dta*) with ten more years of data, so as to track changes in state capacities over a decade.²

The main focus of *Pillars* was to develop a theoretical framework to study state effectiveness. Supplementary empirical material mainly served to give a birds-eye view of the data rather than test our theoretical propositions. Thus, we made no attempts at causal identification. Neither do we do so in this ten-year update. Credible sources of exogenous variation are limited (Dincecco and Prado, 2013). But more importantly, our theory, and its emphasis on complementary two-way relations, suggested that even well-identified one-way relations are unlikely to explain the big-picture patterns in the data that are our main concern.

One criticism of *Pillars* made by Wade (2011) concerned the data itself: “[h]ow are the empirical conclusions affected by the poor quality of the data?” (p. 4). Even as a purely descriptive exercise, it may thus be useful to reexamine the broad cross-country correlations with new and better data to address this critique. Of course, it is also useful to reevaluate patterns in the data, in light of the theory, with the passage of time. Moreover, new data – with more observations in a panel format – allows us to consider changes in state capacities across time, something we were unable to do when *Pillars* was published.

Figures 1 through 3 replicate three key figures in Chapter 1 of the book. These figures outline part of the overall story, elucidating the positive correlation between two types of state capacity conditional on broad underlying determinants. The left panel in each figure reproduces a chart in the book, where we used cross sections of Baunsgaard and Keen’s (2005) tax data in addition to the International Country Risk Guide’s (ICRG) index of government anti-diversion policy for around 2000. The right panel adds ten more years of information, where we use new cross-sectional data from the International Centre for Taxation and Development (ICTD) and the Fraser Institute’s ‘legal quality’ index. Perhaps as expected – as a decade is not a massive amount of time for development trajectories to change – the broad cross-country patterns still hold up in the new data ten years later. As Figures 1 through 3 reveal, fiscal and legal capacity are still very much correlated with each other, and state capacity remains consistently high amongst countries with low levels of fragility, low levels of conflict, and high incomes.

²The codebook associated with the new dataset on the new website gives further details on all variables.

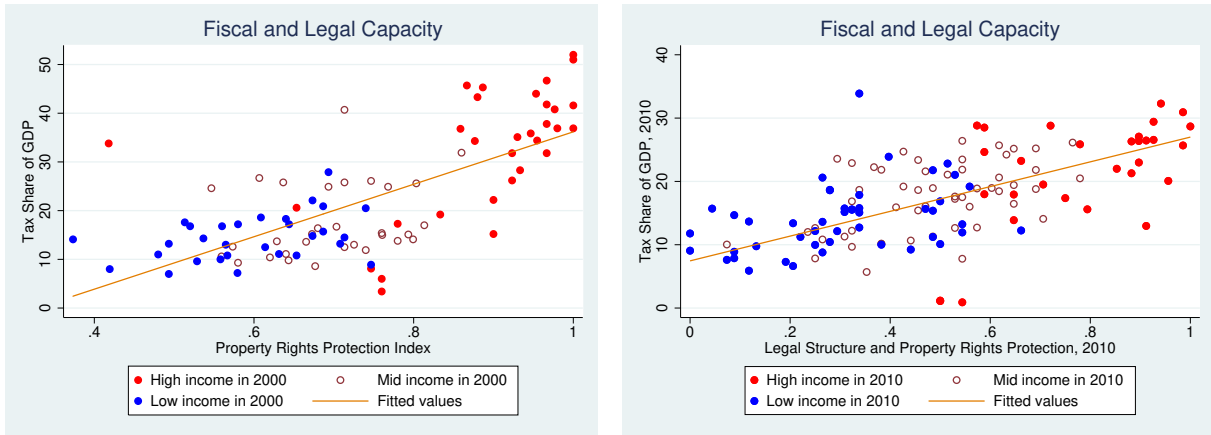


Figure 1: Fiscal and Legal Capacity Conditional on Income

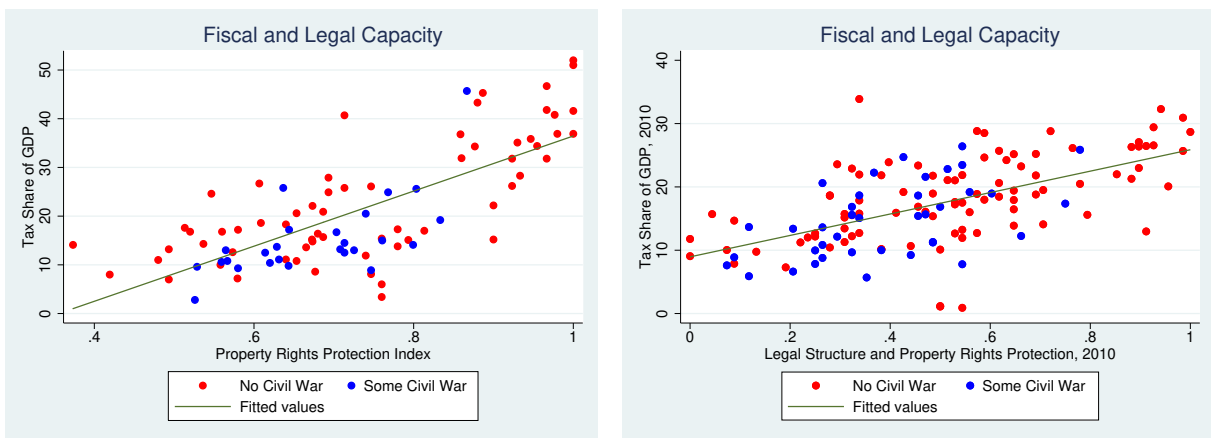


Figure 2: Fiscal and Legal Capacity Conditional on Civil War

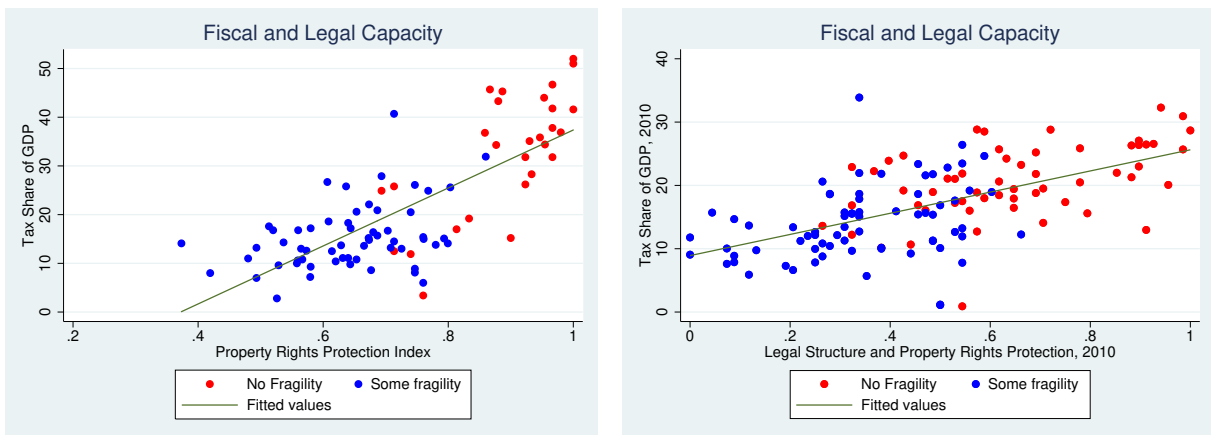


Figure 3: Fiscal and Legal Capacity Conditional on Fragility

3 Collective Capacity

A key third dimension of the state – on top of the fiscal and legal realms – is its *collective capacity*. By this, we mean the ability to turn resources into public goods and services. Although we did not directly model the strategic incentives for an incumbent to invest in collective capacity, other work we have carried out

has tried to empirically incorporate this dimension into our thinking on state effectiveness (e.g., Besley and Persson 2014a). As part of the ten-year update, we therefore include concrete measures of collective capacity to also explore the broad correlations of this component of state capacity using our new dataset. Specifically, we measure collective capacity by way of a basic index: the average of educational attainment, from Barro and Lee’s (2013) dataset, and life expectancy, from the World Development Indicators (this follows Besley and Persson 2014a).

Similar to fiscal and legal capacity, collective capacity is highly correlated with other elements of state effectiveness, as shown in Figures 4 through 6. Again, unsurprisingly, collective capacity is highest among nations with low fragility, low levels of political violence, and high income. Moreover, constraints on executive power, a key determinant of state capacity in the theoretical framework developed in *Pillars*, is also strongly correlated with collective capacity, even after conditioning out other relevant drivers, such as experience of external war (the Tilly hypothesis), openness of executive recruitment (basic government accountability), and ethnic fractionalization (a negative measure of social cohesion).³

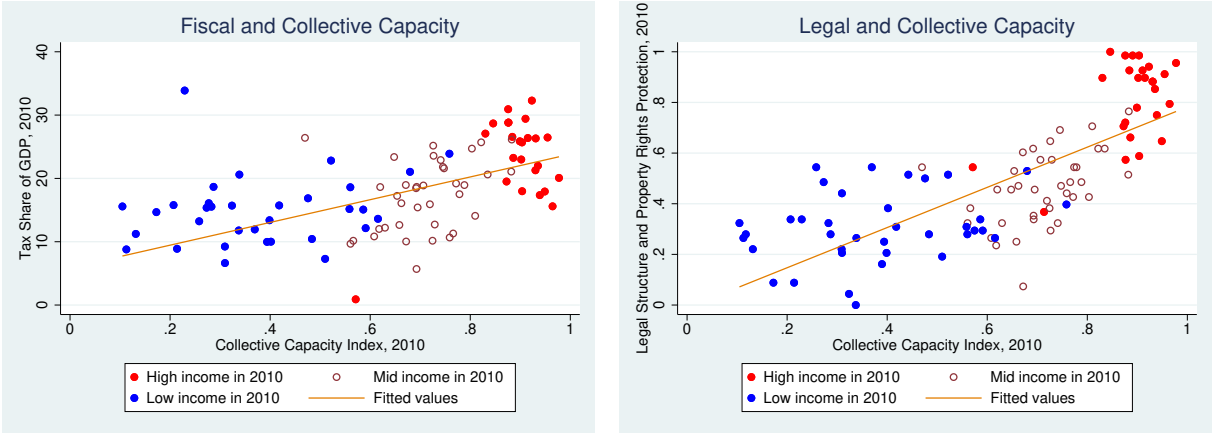


Figure 4: Collective Capacity and Fiscal and Legal Capacity, Conditional on Income

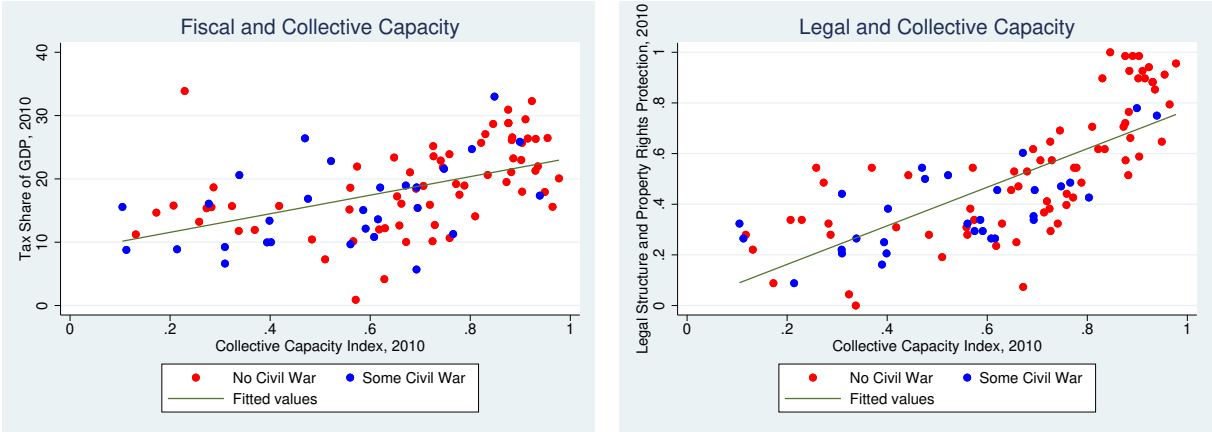


Figure 5: Collective Capacity and Fiscal and Legal Capacity, Conditional on Civil War

³See the updated Chapter 1 lecture slides on the new website for the charts that illustrate this.

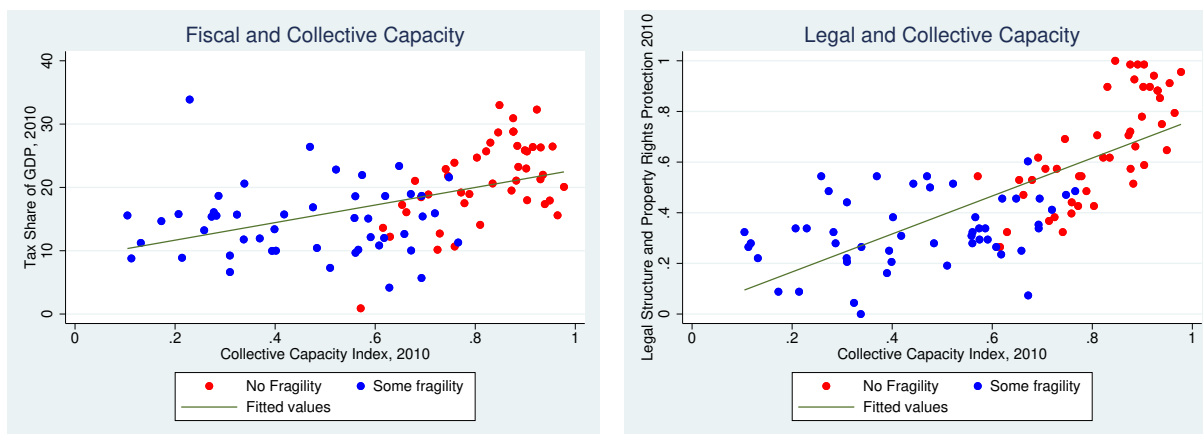


Figure 6: Collective Capacity and Fiscal and Legal Capacity, Conditional on Fragility

4 Areas of Progress

Even though progress or decline are possible, a decade is a short time for countries to develop in significant ways. That said, some dimensions of state capacity may still have undergone broad global improvements. This is primarily relevant for fiscal capacity. As identified in *Pillars*, we find a negative correlation between income taxes and trade taxes – both expressed as shares of the total tax take. Efficiently charging and collecting an income tax generally requires an extensive state infrastructure, such as a trained and effective bureaucracy to manage tax withholding. This is different to other more basic forms of taxation, such as tariffs on imported goods which can be collected based on monitoring flows of goods e.g., at ports. In Figure 7, we compare the original cross-section in *Pillars* for 2000 (the left panel) to a cross-section in our new data from the ICTD ten years later (the right panel). The negative correlation still exists in the more recent data. However, in the right panel more countries have moved leftwards on the trade-tax-share axis and upwards on the income-tax-share axis. This pattern suggests that more states have increased their fiscal capacity. The increase is especially visible for middle- and low-tax countries. In 2000, almost twenty countries had trade-tax-revenue shares over 40 percent, while in 2010 this is true for only seven countries.

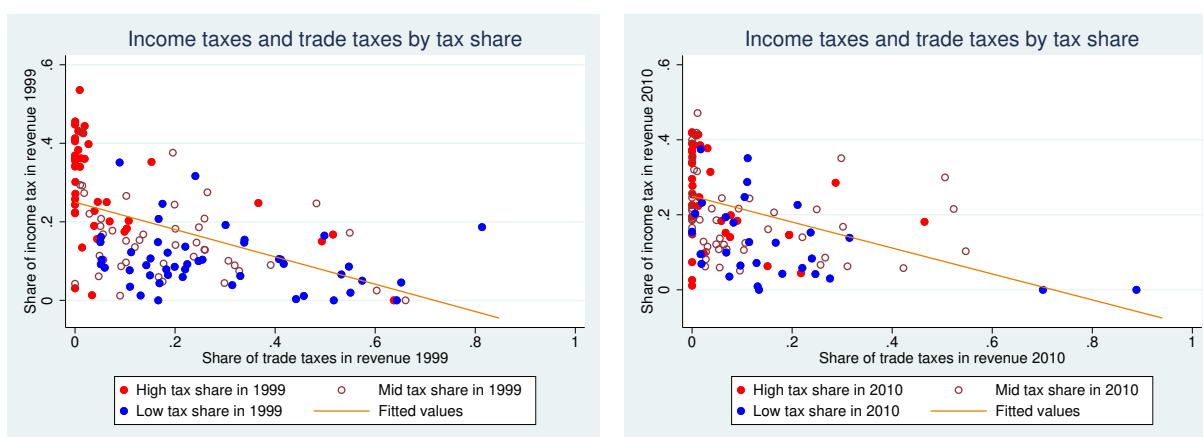


Figure 7: Income Tax Share and Trade Tax Share Conditional on Total Tax Intake

Although we did not feature this chart in *Pillars*, our later work showed a strong inverse correlation between the size of a country's informal sector and the income-tax-share of total revenue (Besley and Persson 2014b). This is important as choosing to operate in the informal sector to pay less tax is an

important extensive-margin decision for firms. Figure 8 uses our new data from the ICTD plus updates from Elgin and Oztunali (2012) on the informal-sector share of GDP to shed light on this. A negative association is present in both 1999 (the left panel) and 2008 (the right panel). However, similar to trade taxes, more countries have decreased the size of their informal sectors since 1999, moving leftwards on the horizontal axis, a trend the IMF has also reported (Alexander 2019). In 1999, thirteen countries had informal sectors in excess of 50 percent of GDP, while this was true for only four countries ten years later. By this measure too, fiscal capacity thus appears to have gone up over time. While there is much more to the story than simple cross-country scatter plots can reveal, these charts are useful to map broad global trends in fiscal capacity vis-a-vis the theoretical ideas developed in *Pillars*.

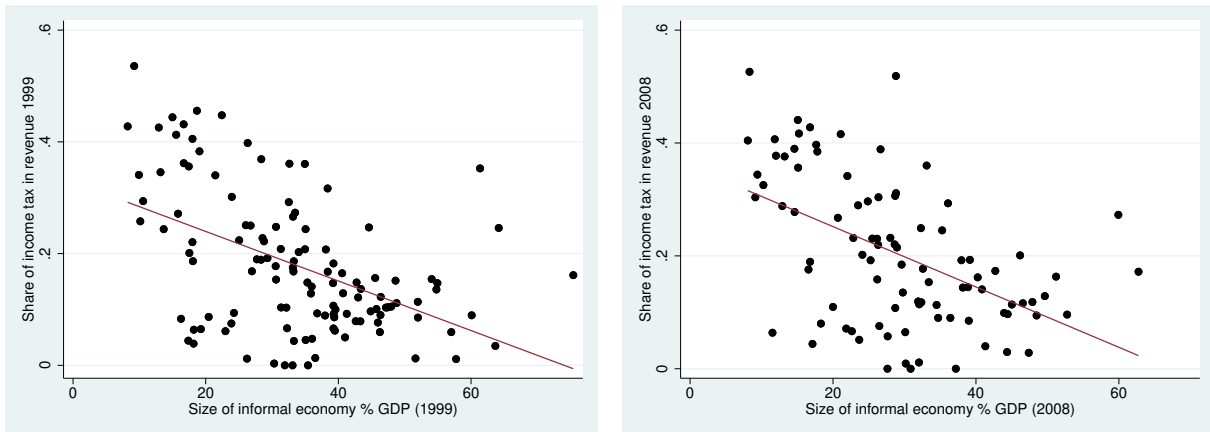


Figure 8: Income Tax Share and Informal Sector Share, 1999 and 2008

One question about the current Covid-19 pandemic is whether the lockdowns in many countries has led to an expansion in informal sector economic activity. The International Labour Organization (ILO) estimates that 1.6 billion workers in the informal sector were affected by the pandemic, leading to a 60 percent decline in their earnings (ILO 2020). It will thus be interesting to study the consequences of the pandemic on fiscal capacity. Another question for further research is whether Covid-19 has acted like a “positive shock” to common interests (a parameter in our basic model), which would stimulate state capacity contemporaneously, in analogy to the threats of external war historically.

5 Areas of Concern

Notwithstanding these global improvements, there are also some more negative developments, primarily when it comes to political violence. When *Pillars* was published, the global prevalence of civil war and repression was on a declining trend. The frequency of civil wars (measured via the UCDP/PRIO Armed Conflict dataset) over the post-war period had peaked in the 1980s and 1990s, and the proportion of countries with internal conflict steadily declined thereafter. The share of countries engaging in repression (measured by the presence of political purges in the Banks Cross-National Time-Series (CNTS) Data Archive) had fallen from 30-40 percent in the 1950s to near 0 by the late 1990s/early 2000s.

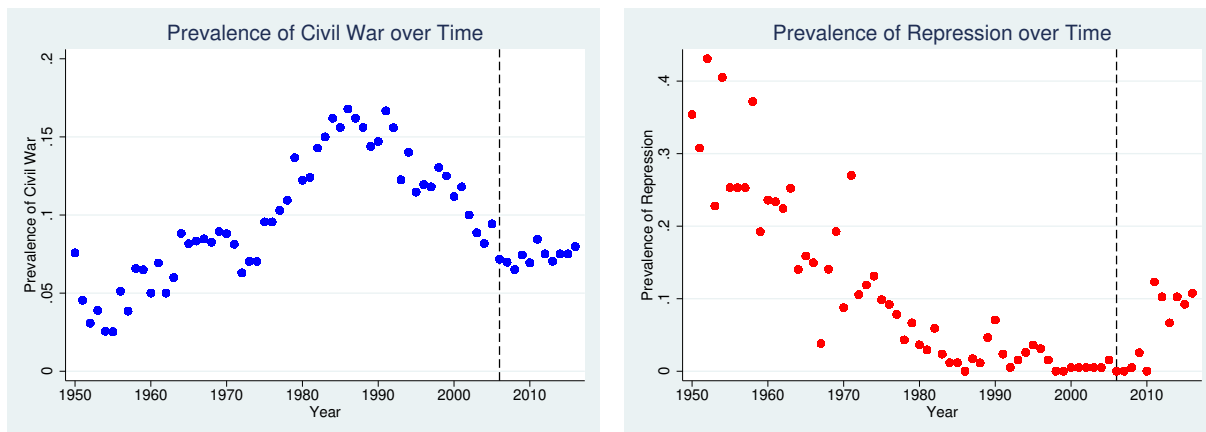


Figure 9: Global Prevalence of Civil War and Repression

However, as illustrated by Figure 9 (vertical dashed lines at 2006 show where new observations begin), these global trends have largely been broken. The left panel shows civil-war incidence levelling out at close to 10 percent in the 2010s.⁴ This reflects existing civil wars that had yet to end fully before 2006 (e.g., in Sri Lanka), and newly erupting ones (e.g., in Syria and Libya).

Table 1 outlines more precisely the countries that have experienced internal conflict since 2006, either as the continuation of a conflict episode or as the commencement of a new conflict. These conflicts only include episodes that at some point in its history reached a total of 1,000 battle-related deaths in a given year. Note that these conflicts also include countries who intervened in “internationalized intrastate wars”, such as the United States against Al Qaida in Afghanistan.

Table 1: Countries in Civil War, 2006-2016

| Country | Year | Country | Year |
|-------------|-----------------|---------------|----------------------|
| Afghanistan | 2006-2016 | Russia | 2006-2007 |
| Algeria | 2006-2016 | Rwanda | 2009-2012 |
| Burundi | 2006 | Somalia | 2006-2016 |
| Chad | 2006-2010 | Sri Lanka | 2006-2009 |
| Colombia | 2006-2016 | Sudan | 2006-2016 |
| India | 2006-2016 | Syria | 2011-2016 |
| Iraq | 2006-2016 | Turkey | 2006-2013, 2015-2016 |
| Israel | 2014 | Uganda | 2006-2011 |
| Libya | 2011, 2015-2016 | Ukraine | 2014-2016 |
| Nepal | 2006 | United States | 2006-2016 |
| Nigeria | 2011-2016 | Yemen | 2009-2016 |
| Pakistan | 2007-2016 | Zaire (DRC) | 2011-2014, 2016 |
| Philippines | 2006-2016 | | |

Note: data stems from UCDP/PRIO Armed Conflict Dataset. See *Pillars 2.dta* codebook for further details on construction of variable on new website. See Appendix for further details on each conflict episode.

The right panel in Figure 9 shows that repression has significantly increased since 2006, again with almost 10 percent of nations using some form of purge against the ranks of the regime itself or political opposition. This contrasts starkly with the limited use of such repression strategies by the turn of the Millennium. One possible interpretation is that increased repression is a manifestation of a general “democratic recession”, with the piecemeal erosion of democratic institutions and values. Table 2 spells

⁴This chart is similar to Figure 2 in Blattman and Miguel (2010).

out which countries have engaged in repression since 2006. Among the major democratic backsliders, we find the “usual suspects”, i.e. those with a history of turbulence: Brazil, the Philippines, Russia, Thailand, Turkey, and Venezuela.

Table 2: Countries in Repression, 2006-2016

| Country | Year | Country | Year | Country | Year |
|-------------------|----------------------------|-------------|-----------------|-------------|----------------------|
| Armenia | 2016 | Iran | 2011, 2015 | Rwanda | 2011 |
| Azerbaijan | 2011, 2014 | Iraq | 2011-2012 | Senegal | 2012 |
| Bahrain | 2011-2015 | Ivory Coast | 2011-2012, 2016 | South Korea | 2013-2014 |
| Bangladesh | 2013-2015 | Jordan | 2014 | Sudan | 2014-2016 |
| Belarus | 2011 | Kenya | 2014 | Syria | 2011 |
| Bolivia | 2012, 2015 | Kuwait | 2013 | Tajikistan | 2015 |
| Brazil | 2012 | Kyrgyzstan | 2016 | Tanzania | 2011, 2015 |
| Burundi | 2015-2016 | Lebanon | 2009 | Thailand | 2014 |
| Cambodia | 2014, 2016 | Madagascar | 2014 | Togo | 2009 |
| Cameroon | 2016 | Malaysia | 2011, 2013-2014 | Tunisia | 2011, 2013 |
| China | 2011-2012, 2014 | Maldives | 2012, 2015-2016 | Turkey | 2011-2013, 2015-2016 |
| Congo | 2015-2016 | | | | |
| Cuba | 2014, 2016 | Mali | 2012 | Uganda | 2011-2012, 2014-2016 |
| | | | | | |
| Egypt | 2011, 2013-2015 | Mongolia | 2012 | Ukraine | 2011, 2014 |
| Equatorial Guinea | 2009, 2015 | Mozambique | 2016 | Venezuela | 2014-2016 |
| Ethiopia | 2009, 2011-2012, 2015-2016 | Niger | 2015 | Vietnam | 2011 |
| | | | | | |
| Fiji | 2016 | Nigeria | 2011 | Yemen | 2011 |
| Gambia | 2012, 2016 | North Korea | 2012, 2016 | Zaire (DRC) | 2013-2014 |
| Georgia | 2012-2014 | Pakistan | 2013 | Zambia | 2016 |
| Greece | 2008 | Peru | 2011 | Zimbabwe | 2011, 2013 |
| Guinea-Bissau | 2009, 2012 | Philippines | 2011-2012 | | |
| Honduras | 2016 | Romania | 2012 | | |
| India | 2016 | Russia | 2011-2015 | | |

Note: data stems from Banks and Wilson’s (2020) Cross-National Time-Series Data Archive. Repression is defined as whether a political purge occurred in a given year, defined as “[a]ny systematic elimination by jailing or execution of political opposition within the ranks of the regime or the opposition”.

6 Development and the Pillars of Prosperity Index

In addition to internal concerns about the validity of the project and its messages, our update is strongly motivated by substantive concerns. In the grand scheme of political history, a decade is clearly a brief episode if we wanted to identify persistent institutional changes. But it is enough to explore trends in the prosperity of nations. Tying theory and data together, our book developed an index to map broadly construed development clusters. Even though building such an index is a hazardous and potentially crude exercise, it is useful when trying to paint a summary picture as to how states fare with regards to state capacity, political violence, and material well-being.⁵ The Pillars of Prosperity index was a simple average of three components (see Chapter 8 of *Pillars* for further details)⁶:

1. State capacity index

As in *Pillars*, we take the average of (i) the income tax as a share of total-tax intake (fiscal capacity) and (ii) the World Bank Doing Business Project’s contract enforcement index (legal capacity). But we now add (iii) the collective-capacity index (in Figures 4-6) as another dimension of state capacity.

2. Peacefulness index

We subtract from 1, first, the share of years since 1975 a country is in civil war; and second the share of years a country is in repression (but *not* civil war) divided by two.⁷

⁵See Høyland et al. (2012) for further discussion on the issues surrounding international indexes.

⁶The Legatum Institute presents another index of prosperity, which is regularly updated. It relies on 294 different variables, which are not theoretically motivated beyond a wisdom-of-experts approach. See also Savoia and Sen (2015) and O’Reilly and Murphy (2021) for other composite indices of state capacity.

⁷This treats both civil war and repression as forms of political violence with civil war as the more serious form, as in

3. Income

We use the country’s real income per capita (as measured by the Penn World Tables (PWT)), and normalized on a min-max scale.

To make comparisons consistent, we recreate our old 2006 index with the updated definition and then recalculate the same index for 2016.⁸ Figure 10 shows these indexes on a map with the help of a grey scale. Clearly, country positions on the index display a great deal of inertia – many “fragile” or “weak” states in 2006 find themselves at the same low prosperity levels ten years later, especially across Africa, South Asia and the Middle East. Even though the general pattern is unsurprising, a couple of changes are still worth mentioning.

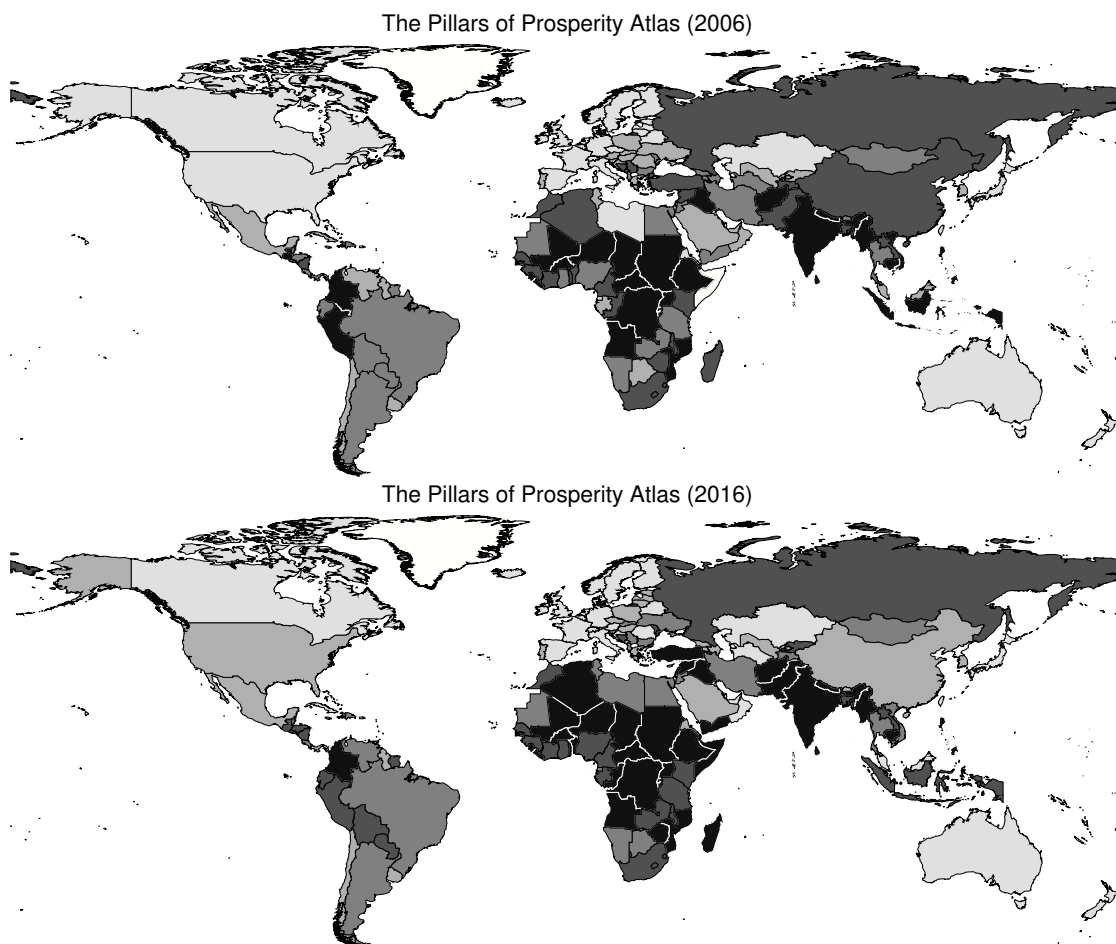


Figure 10: Pillars of Prosperity Atlas, 2006 and 2016

First, China has made definite improvements on the index, and is now shaded slightly lighter (see Section 7 for a further discussion). This mostly reflects the record economic growth China has experienced since the 2000s. Second, the United States appears to have moved down the index distribution, being shaded slightly darker in 2016 than in 2006. This reflects the country’s involvement in internal conflicts abroad (cf. the internationalized intrastate war coding by UCDP/PRIO). Another piece of the US decline stems from declining collective capacity: life expectancy on aggregate has plateaued and even decreased for certain segments of the population (Case and Deaton 2019). Notwithstanding the difficulties in defining meaningful international indexes, our broad index thus reflects some important global trends of the past decade.

Besley and Persson (2011b).

⁸See Appendix for full table of index values for both 2006 and 2016 across all countries.

In *Pillars* we also tried to predict the index based on proxies for the key parameters in our theoretical framework. Specifically, we used the fitted values from a regression of the overall index (and its three individual subindexes – see the Chapter 8 updated lecture slides on the website) on the proportion of years in external war, average executive constraints, average non-open recruitment of the executive, and ethnic homogeneity. By ranking countries on both the raw and predicted indexes, and comparing the deviations, we were able to highlight clear under-performers and over-performers – countries whose predicted rank was more than 50 steps off its raw rank (a lower rank means worse performance).

Table 3: Largest Underperformers (more than 50 steps off in ranking)

| Country | Actual Rank | Predicted Rank | Actual minus predicted index |
|-------------|-------------|----------------|------------------------------|
| Cambodia | 12 | 107 | -0.354 |
| India | 8 | 88 | -0.348 |
| Philippines | 10 | 84 | -0.330 |
| Myanmar | 15 | 85 | -0.250 |
| Yemen | 23 | 102 | -0.240 |
| Turkey | 30 | 101 | -0.209 |
| Sri Lanka | 31 | 97 | -0.197 |
| Moldova | 68 | 129 | -0.149 |
| Russia | 69 | 124 | -0.125 |
| Slovenia | 86 | 144 | -0.121 |

Note: countries in red were also predicted as underperformers for the 2006 values of the index.

Table 4: Largest Overperformers (more than 50 steps off in ranking)

| Country | Actual Rank | Predicted Rank | Actual minus predicted index |
|----------------------|-------------|----------------|------------------------------|
| Gabon | 57 | 4 | 0.128 |
| Bolivia | 70 | 15 | 0.133 |
| Uruguay | 112 | 59 | 0.187 |
| Mexico | 101 | 38 | 0.202 |
| Oman | 127 | 69 | 0.217 |
| Turkmenistan | 131 | 70 | 0.224 |
| Eritrea | 100 | 26 | 0.225 |
| Chile | 117 | 55 | 0.226 |
| Singapore | 136 | 64 | 0.253 |
| Kuwait | 129 | 57 | 0.255 |
| Kazakhstan | 143 | 67 | 0.276 |
| Cuba | 149 | 72 | 0.298 |
| United Arab Emirates | 153 | 86 | 0.306 |

Note: countries in red were also predicted as overperformers for the 2006 values of the index.

Table 3 (4) show the under- (over-) performers. Red highlights countries identified as the under- (over-) performers with the 2006 index. Again, we see a general “development inertia” at play, with more than half the countries in each table highlighted. In Table 3, long-lasting internal conflicts hamper the realized index relative to the predicted one – recall that India, the Philippines, Sri Lanka, Turkey and Yemen were all identified in Table 1 as civil-war stricken post-2006.

7 Identifying Development Clusters

As per the book’s title, one of the key themes of *Pillars* was to provide a theoretical framework for identifying development clusters. We let that notion refer to “the observed tendency for effective state institutions, the absence of political violence, and high income per capita to be positively correlated with one another” (p. xi). Based on the key parameters of our comprehensive theoretical framework, which combined our models of state capacity and of political violence, we developed a “state spaces” matrix:

| | Weak | Redistributive | Common Interest |
|------------|------|----------------|-----------------|
| Peace | | | |
| Repression | | | |
| Civil War | | | |

There are more elements to the matrix (such as natural resources and incumbent fighting advantages), but let us briefly recapitulate what kind of country institutions, parameters, and outcomes each state space represents:

- *Weak state* – weak executive constraints and no common interests, under peace, civil war or repression.
- *Redistributive state* – weak executive constraints but varying levels of common interests, under peace, civil war or repression.
- *Common interest state* – strong executive constraints and common interests with no political violence (i.e., peace).

We summarized the insights from our theory as the “Anna Karenina principle of development”. By reframing the very first lines of Leo Tolstoy’s famous novel, we interpreted development clusters as a pattern whereby

“all prosperous countries resemble each other; every non-prosperous country is non-prosperous in its own way”.

In *Pillars*, we did not try to empirically measure development clusters/state spaces beyond the overall prosperity index. But we noted that

“[a]n exciting challenge for future empirical work would be to see to what extent these different pathologies can be identified empirically” (p. 234).

As part of the ten-year update, we now use the new dataset together with statistical learning methods to classify countries into the cells of the state-space matrix. Thus we use cluster analysis, which relies on various algorithms to identify similar objects in terms of the underlying data and group them together into homogeneous clusters. Specifically, we adopt Husson et al.’s (2010) Hierarchical Clustering on Principal Components (HCPC) method. It has the advantage of allowing the algorithm itself to identify the number of clusters (rather than the researcher imposing a pre-specified number). Briefly, HCPC involves three steps (see Husson et al. 2010 and Hastie et al. 2008 section 14.3 for further details, and see Appendix for further discussion):

1. Perform principal components analysis (PCA) on the variables of interest to reduce the “dimensionality” of the data into a few principal components.

2. Apply a hierarchical agglomerative clustering (HAC) algorithm (Ward’s criterion) to develop a hierarchical tree, called a dendrogram.
3. A k -means algorithm, based on the suggested “partition” of the dendrogram, is performed to “consolidate” the clusters.

In Step 1, we use the raw variables that comprise the Pillars index (income tax as a share of total tax, legal-quality index, collective-capacity index, proportion of years since 1975 in repression, proportion of years since 1975 in civil war, and GDP per capita).⁹ To confirm the number of principal components, Kaiser’s criterion and the “elbow test” indicate that *two* components/dimensions are indeed optimal (see the Appendix for Scree plot figures).

To compare state spaces over time, we repeat the same analysis for three years: 1990, 2000 and 2016. The latter two years coincide with the years for which we computed the Pillars of Prosperity Index, while 1990 is of key interest, given that it marked the end of the Cold War and the downfall of communism.¹⁰ We have 67 countries with non-missing data across all six variables and all three years.

Table 5: Factor Loadings from PCA

| Variables | Principal Components/Dimensions | | | | | |
|--------------------------------------|---------------------------------|--------|--------|--------|--------|--------|
| | 1990 | | 2000 | | 2016 | |
| | 1 | 2 | 1 | 2 | 1 | 2 |
| Income tax share in total revenue | 0.759 | 0.377 | 0.751 | 0.313 | 0.756 | 0.320 |
| Legal quality index | 0.920 | -0.153 | 0.953 | -0.006 | 0.935 | -0.035 |
| Collective capacity index | 0.894 | -0.096 | 0.900 | -0.168 | 0.910 | -0.159 |
| Prop. of years in repression (1975-) | -0.107 | -0.892 | -0.149 | -0.867 | -0.266 | -0.780 |
| Prop. of years in civil war (1975-) | -0.479 | 0.454 | -0.365 | 0.467 | -0.284 | 0.655 |
| Log(GDP per capita) | 0.933 | 0.067 | 0.948 | -0.040 | 0.932 | -0.092 |

Note: the factor loadings represent the correlation coefficient of each variable with the underlying component/dimension. The PCA loading plots in the Appendix simply visualize these factor loadings as vectors.

Table 5 and the loading plots in the Appendix reveal that Dimension 1 broadly captures state capacity and income: all state capacity variables and GDP per capita correlate strongly with this dimension. Dimension 2, on the other hand, largely captures political violence. However, given the definition of the repression variable for the index (years with repression but *not* civil war), the two types of political violence appear as “substitutes”. Therefore, the positive region of Dimension 2 is associated with high(er) levels of civil war, and the negative region with high(er) levels of repression. Both dimensions are stable across all three time periods of interest, and the direction of the correlations further convey how state capacity, income and peace triangulate.

Figure 11 shows that the HCPC method consistently picks out three clusters, which largely correspond to the state-space matrix: **weak states**, **redistributive states**, and **common interest states**. Weak states are all positioned on the negative region of Dimension 1 and the positive region of Dimension 2. Thus they have relatively higher levels of civil war and lower levels of state capacity and income. Redistributive states

⁹Although one can of course impute data, generally PCA requires no missing data across all variables of interest, and so we use the earliest observations available in the 1990s for income tax share (if 1990 is missing). For 2000, we take the closest observation possible from 1995 onwards if data was missing. Finally, for legal capacity, we use the Fraser Institute’s ‘legal quality’ index, as used in Nunn (2007), versus our contract enforcement measure used in Section 6, given the World Bank Doing Business Project was not in operation pre-2004.

¹⁰In *Pillars*, we calculated the old 2006 index using observations from 2000 due to the limitations of the old dataset. The new data allowed us to compute values directly for 2006 as per section 6.

have medium levels of state capacity and income. But many of them are positioned on the negative region of Dimension 2, which represents high levels of repression. This is clearly evident for China. Common-interest states, finally, are plotted on the positive region of Dimension 1. Thus they have high levels of state capacity and income. Moreover, the fact that the cluster hovers around 0 on Dimension 2 captures low levels of both repression and civil war (though the US involvement in Afghanistan slightly changes its 2016 outcome). The overall “tightness” of the common-interest cluster rhymes well with the Anna Karenina principle of development: these countries are all prosperous in a similar way: high income, high state capacity, and no political violence.

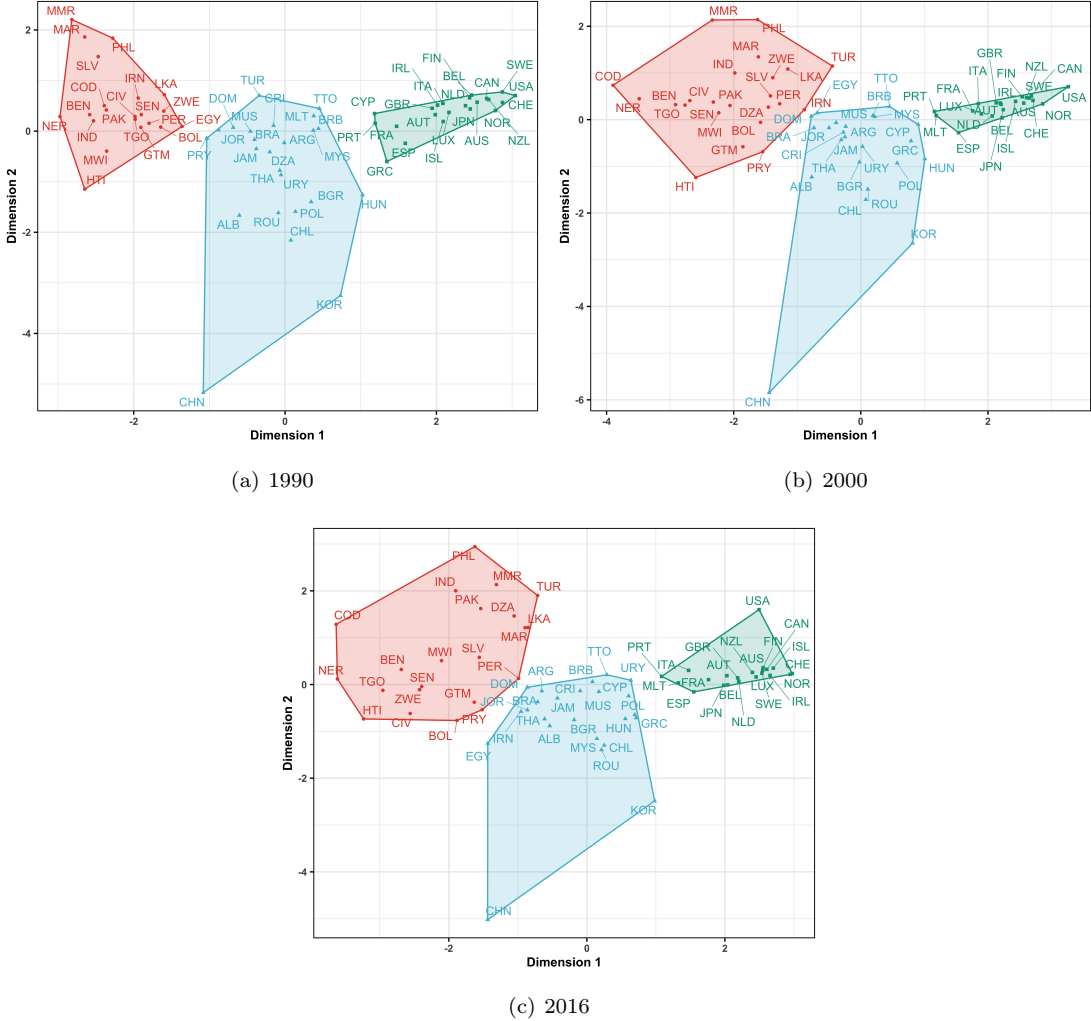


Figure 11: State Spaces Over Three Decades

Across all three years of measurement, most countries remain fixed in their cluster. To visualize this general inertia of state spaces, Table 6 outlines a long-difference transition matrix between 1990 and 2016. Most countries remain in their state space, but a few do change their positions. Among the switchers, Algeria, Paraguay and Turkey have become weak states since 1990, plausibly as a result of continued internal conflict (recall Table 1).¹¹ Egypt and Iran have transited from weak to redistributive states since 1990. Malta has become a common-interest state since 1990, possibly due to the effects of EU membership in 2004 and mostly positive growth rates over the last two decades. Finally, Cyprus

¹¹Although Paraguay is not categorised as experiencing civil conflict in Table 1, an ongoing “low-level” internal conflict between the Government of Paraguay and the Paraguayan People’s Army insurgency (EPP) began in 2005. This could plausibly contribute to its position as a weak state.

and Greece have transited from common-interest to redistributive states. Both countries have generally lagged behind other 1990 common-interest states with regards to state capacity and income.

Table 6: State Spaces Transition Matrix, 1990-2016

| | | State in 2016 | | |
|---------------|-----------------|---|--|--|
| | | Weak | Redistributive | Common interest |
| State in 1990 | Common interest | | CYP, GRC | AUS, AUT, BEL, CAN, CHE, ESP, FIN, FRA, GBR, IRL, ISL, ITA, JPN, LUX, NLD, NOR, NZL, PRT, SWE, USA |
| | Redistributive | DZA, PRY, TUR | ALB, ARG, BGR, BRA, BRB, CHL, CHN, CRI, DOM, HUN, JAM, JOR, KOR, MUS, MYS, POL, ROU, THA, TTO, URY | MLT |
| | Weak | BEN, BOL, CIV, COD, GTM, HTI, IND, LKA, MAR, MMR, MWI, NER, PAK, PER, PHL, SEN, SLV, TGO, ZWE | EGY, IRN | |

One can quibble with the minutiae of the HCPC method.¹² But the way to read the exercise is a structured basis for opening up a debate, rather than providing a definitive classification. Nonetheless, as Besley (2021) highlights, it is striking that the method consistently estimates precisely three clusters from the raw data. Hierarchical clustering also has the utility of looking at similarities *between* clusters. The dendrograms in the Appendix – following the 1990 and 2016 time periods for our transition matrix – show common-interest states being a completely distinct cluster, whereas redistributive and weak states are connected by another upper branch. Thus it seems that the Anna Karenina principle of development indeed has traction as a window on state effectiveness.¹³

Our definition of development clusters clarifies how certain development outcomes closely triangulate. The theory developed in Pillars tries to evince the mechanics behind this clustering within a dynamic framework. This suggests a general policy implication: it may be a futile exercise to try and improve merely one aspect of state effectiveness in isolation. One can make a parallel with the general health of a patient with co-morbidities – a good doctor should not aim at improving just one of her conditions. In line with the Anna Karenina principle, the fates of non-common interest states form a complex syndrome.

¹²The method is also robust to simply using the number of clusters decided by the HCPC method without performing the “consolidation” process via a k -means algorithm.

¹³These clusters are also robust to the inclusion of other relevant variables, such as indicators concerning liberty/freedom, as per Besley (2021).

Table 7: Share of Global Population and GDP and Average GDP per capita and Life Satisfaction by State Space, 1990-2016

| | Year | Population (%) | GDP (%) | Average GDP per capita | Average Life Satisfaction |
|------------------------|------|----------------|---------|------------------------|---------------------------|
| Weak states | 1990 | 36.5 | 11.1 | 3202.03 | – |
| | 2000 | 39.8 | 13.8 | 4357.98 | 4.56 |
| | 2016 | 41.8 | 17.2 | 6339.99 | 4.87 |
| Redistributive states | 1990 | 44.4 | 22.2 | 9069.99 | – |
| | 2000 | 42.6 | 24.6 | 12305.59 | 5.66 |
| | 2016 | 41.8 | 37.3 | 18441.11 | 5.67 |
| Common interest states | 1990 | 19.1 | 66.6 | 29785.14 | – |
| | 2000 | 17.6 | 61.6 | 37732.53 | 7.06 |
| | 2016 | 16.4 | 45.5 | 44953.25 | 6.92 |

Note: data stems from the Penn World Tables (PWT) and the World Happiness Report. The averages are taken relative only to the sample of countries that have been given a state space via the HCPC method (i.e. total of 67 countries where data is non-missing). GDP per capita refers to “real GDP at constant 2011 national prices”, as defined by PWT. Life satisfaction data for 2000 refers to the earliest observation up to 2010, given data was only available from 2005 onwards (it is not unreasonable to extrapolate backwards, given life satisfaction is largely slow-moving, although we do not extrapolate further back to 1990).

Table 7 further outlines the share of global population and GDP, alongside average GDP per capita, and life satisfaction (see further Section 9), across common interest, redistributive and weak states for our three time periods of interest. As the table shows, less than 20% of the planet’s inhabitants have lived in common-interest states since 1990. Moreover, although all three types of states have experienced economic growth over the last three decades, it remains true that common-interest states account for approximately half of all global output. Debates around the Easterlin paradox notwithstanding, life satisfaction is monotonically associated with our three state spaces.

8 Norms and Values

In Chapter 8 of *Pillars*, we argued that further research should incorporate the study of norms and values into a framework of state capacity. Since *Pillars* was published, a great deal of work in political economy has been done on this front, pushing the idea that there are formal as well as informal drivers of state effectiveness. This relates to an older literature in political science and sociology on the role of “democratic values” and “civic culture” as bedrocks of successful polities (Almond and Verba 1963, Putnam et al. 1993). Research before *Pillars*, like Bisin and Verdier (2001), provided foundations for the role of culture, partly building on the research on cultural evolution (Boyd and Richerson 1985) and evolutionary game theory (Weibull 1995).

This kind of work has become much more mainstream over the 2010s (for recent surveys see Bisin and Verdier 2017, Collier 2017, and Persson and Tabellini 2021). Among recent contributions, Acemoglu and Robinson (2019) provide rich historical evidence on the role of norms and values with regards to the evolution of liberty. Besley and Persson (2019) develop a model that synthesizes “strategic” and “cultural” approaches and show that some cross-cohort, within-country evidence is consistent with the model predictions. Besley (2020) further provides a theoretical framework to outline how exactly civic culture and institutions can reinforce each other to enhance a nation’s fiscal capacity. Fergusson et al. (2020) empirically tie such notions to Colombian microdata, and argue that the country is stuck in a “weak state trap”.

To illustrate these ideas, we use data from the World Values Survey (WVS) to proxy components of civic culture, broadly construed, and then correlate them with our measures of state capacity and the Pillars

index. Many charts appear in the lectures slides associated with our ten-year update (available online). We showcase just a few of them here.

With regards to legal capacity, two WVS questions ask respondents whether they believe that stealing property or accepting bribes is justifiable. If norms and institutions are indeed complementary, we would expect *less* acceptance of property theft and bribery to be positively correlated with legal capacity. Figure 12 shows that this is indeed the case in the raw data, with a clear right triangulation – no country with strong legal capacity displays high indifference to theft or bribery. Of course, such values could affect legal institutions in a plethora of ways, and vice versa. But the simple positive correlation is consistent with a complementarity between culture and institutions. The outliers on the left of both charts are Haiti, the Philippines and South Africa.¹⁴

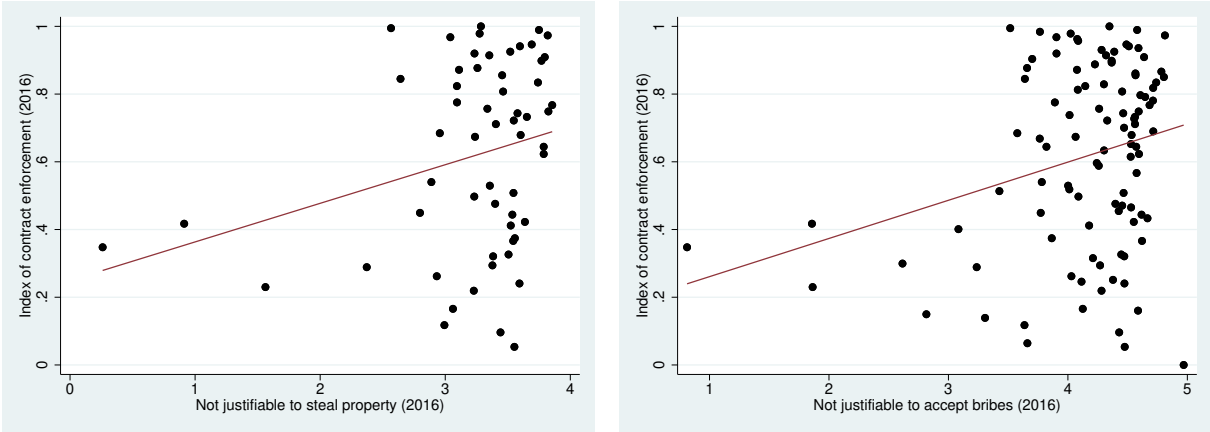


Figure 12: Pro-Civic Judicial Values and Legal Capacity

To develop a more comprehensive variable of “civic values”, we again use principal components analysis (PCA). Here, we look at five variables that should capture civic values: confidence in government, general trust in people, not justifiable to cheat on taxes, confidence in the justice system/courts, and not justifiable to accept bribes.¹⁵ The factor loadings for these variables with the first underlying principal component are, respectively, 0.4235, 0.3495, 0.4763, 0.5005, and 0.4703. This principal component thus largely measures a culture where people have confidence in government and the justice system, generally trust other people, and find it unjustifiable to cheat on taxes or accept bribes. Figure 13 shows that this measure of civic culture correlates positively with the Pillars-of-Prosperity index, albeit with some heterogeneity and noise.¹⁶ The correlation in Figure 13 is consistent with the notion that strong values may complement formal institutions in furthering state effectiveness. We believe that it would be valuable to bring these ideas into theoretical models of state capacity.

¹⁴Both negative correlations are robust to their omission.

¹⁵To maximise the sample size, we take the last available observation possible for each country and carry that forward as the 2016 observation. Given values and norms are slow-moving variables, this is not an entirely unreasonable exercise.

¹⁶Haiti is removed as an extreme outlier (especially for the ‘cheating on taxes’ variable), but the trend line is robust to its inclusion.

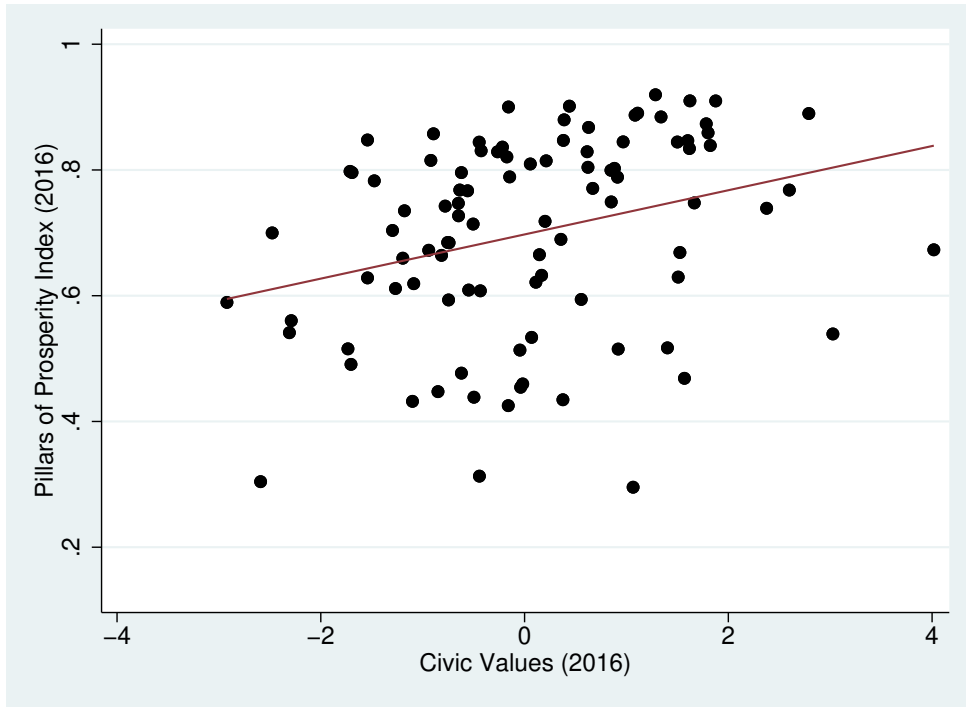


Figure 13: Civic Values and the Pillars of Prosperity Index, 2016

9 Life Satisfaction

Tangential work to the Pillars project by Besley and Kudamatsu (2008) argued that “[o]ne of the goals of political economy is to understand how institutional arrangements shape policy outcomes and human well-being” (p. 452). To take a first look at the difficult question regarding well-being, we correlate the Pillars index with average national life satisfaction. The latter is measured by Cantril ladder scores gauged by the World Happiness Report. This survey asks respondents to think of a ladder, with the best possible life for them a 10, and the worst possible life a 0, and then rate their current lives on this 0-10 scale.

Figure 14 shows that life satisfaction is sharply positively correlated with the Pillars of Prosperity Index, with essentially the same pattern for 2006 and 2016. The slope of the regression line conveys just how much a nation’s politico-economic environment – as crudely captured by the index – correlates with the average life satisfaction of its citizens.

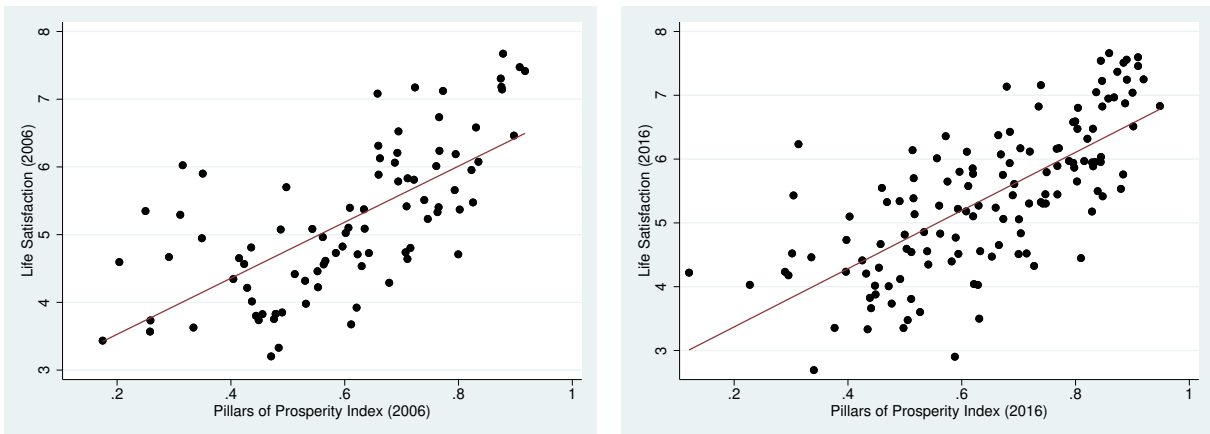


Figure 14: Life Satisfaction and the Pillars of Prosperity Index, 2006 and 2016

Figure 15 conditions the observations on the 2016 scores for the state spaces discussed earlier. These state spaces neatly line up with life satisfaction: average life satisfaction in different nations are more or less monotonically ordered by their institutional arrangements. This fact is also evidenced in Table 7.¹⁷

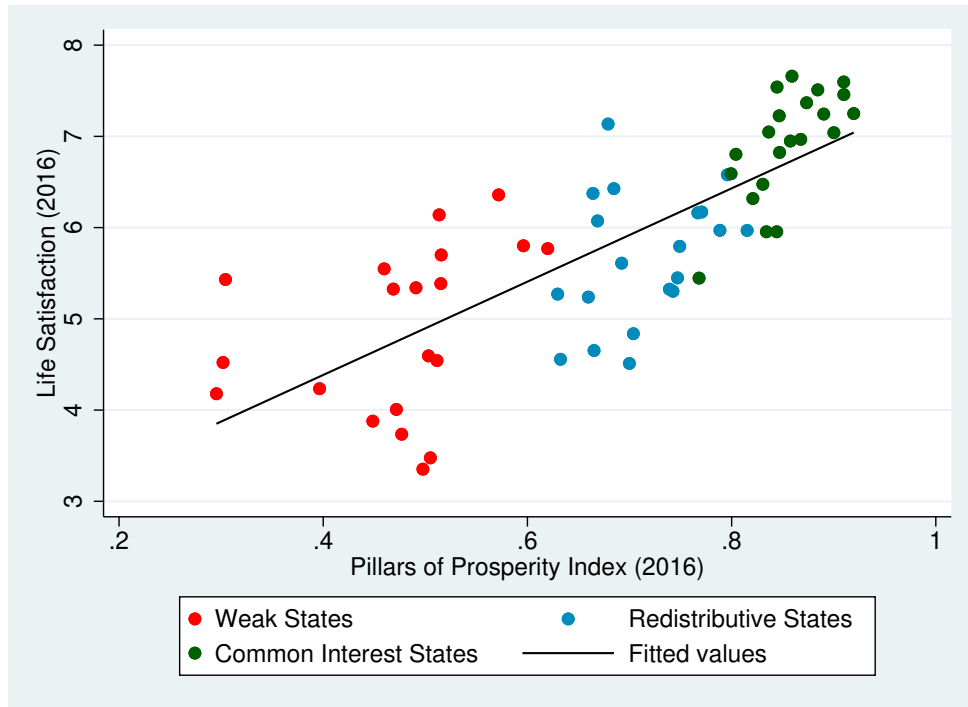


Figure 15: Life Satisfaction and the Pillars of Prosperity Index Conditional on State Spaces, 2016

10 Final Comments

This brief piece has showcased some of the main charts and tables from a ten-year update on *Pillars of Prosperity*. As stressed in the introduction, the evidence is correlational rather than causal. Nevertheless, empirical updates with new and better data/methods are useful to shed light on pre-existing theoretical ideas and sharpen the way that we interpret patterns in the data. We believe that our update shows that studying state effectiveness in terms of complementarities and clusters is indeed a fruitful way to approach debates on the political economy of development. Moreover, norms and values are an additional important piece of the puzzle that deserve more attention. All in all, the data strongly suggest that much work is still necessary to break fragility traps and help those countries caught in such traps turn onto a path towards higher prosperity.

¹⁷We get fewer observations when conditioning on state spaces due to the data requirements of the HCPC method (see above).

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Appendix

Appendix A Post-2006 Conflicts Details

The following paragraphs very briefly provide further details on the post-2006 conflicts identified in Table 1. See the UCDP/PRIO Armed Conflict dataset for further details, in addition to elaborations of the abbreviations behind the listed actors. Where multiple actors in a conflict have been mentioned, such actors may not have been concurrently fighting the government all at the same time during a given conflict episode (e.g. the Taleban became a part of “side B” during Afghanistan’s conflict in 1995, and then were the sole insurgent in 2004 until 2006). We have just pooled all actors over the relevant conflict episode below for the convenience of the reader, if they so choose to pursue further research.

Afghanistan

This is an ongoing conflict between the Government of Afghanistan and Jam’iyyat-i Islami-yi Afghanistan, the Taleban, UIFSA, Hizb-i Islami-yi Afghanistan, Harakat-i Inqilab-i Islami-yi Afghanistan, Hizb-i Islami-yi Afghanistan - Khalis faction, Jabha-yi Nijat-i Milli-yi Afghanistan, Mahaz-i Milli-yi Islami-yi Afghanistan, Hizb-i Wahdat, Jumbish-i Milli-yi Islami and a military faction (“forces of Shahnawaz Tanay”). It commenced in 1978 and is yet to end. Another ongoing conflict erupted in 2015 between the Government of Afghanistan and the Islamic State.

Algeria

This conflict began in 1991 and reached 1000+ battle-related deaths in 1994. It was fought between the Government of Algeria and Takfir wa’l Hijra, AIS, GIA, AQIM and MUJAO. It finally ended in 2018.

Burundi

Conflict began in 1994 and ended in 2006. It was fought between the Government of Burundi and Palipehutu, CNDD, Frolina, Palipehutu-FNL, RED-TABARA, FPB, and a military faction (“forces of Godefroid Niyombare”).

Chad

The conflict lasted between 2005-2010, and was between the Government of Chad and FUCD, RAFD, UFDD, AN, UFR and FPRN. The conflict episode reached 1000+ battle-related deaths in 2006.

Colombia

The conflict began in 1964 and ended in 2016. This was fought between the Government of Columbia and FARC, ELN, M-19, EPL and EPL - Matageo. It reached 1,000+ battle-related deaths for the first time in 1985.

India

This is an ongoing conflict between Kashmir insurgents and the Government of India in Kashmir. This conflict episode started in 1990, and is still yet to cease. It reached 1000+ battle-related deaths for the first-time in 2000.

Iraq

This conflict began in 2004 and is still ongoing. It was fought between the Government of Iraq and al-Mahdi Army, Ansar al-Islam, IS and RJF. It reached 1000+ battle-related deaths in 2004.

Israel

The conflict began in 2014, and lasted only for this year, reaching 1000+ battle-related deaths. It was fought between the Government of Israel and Hamas and PIJ in the territory of Palestine.

Libya

The conflict in 2011, reaching 1000+ battle-related deaths in this year, was fought between the Government of Libya and Forces of Muammar Gaddafi and NTC. The conflict commencing in 2015 was fought between the Government of Libya and IS, reaching 1000+ battle-related deaths for the first time in 2016.

Nepal

This conflict episode began in 1996 and ended in 2006, reaching 1000+ battle-related deaths for the first time in 2002. It was fought between the Government of Nepal and CPN-M.

Nigeria

This conflict episode began in 2016 and is still ongoing. It reached 1000+ battle-related deaths for the first time in 2013. It was fought between the Government of Nigeria and Jama'atu Ahlis Sunna Lidda'awati wal-Jihad.

Pakistan

This conflict episode began in 2007 and reached 1000+ battle-related deaths in 2008. It is still ongoing, and is being fought between the Government of Pakistan and Lashkar-e-Islam, TTP, TTP - TA, IMU, and Jamaat-ul-Ahrar.

Philippines

The conflict episode started in 1993 and is still ongoing as of today. It reached 1000+ battle-related deaths for the first time in 2000. It was fought between the Government of the Philippines and ASG, MNLF, MILF, MILF - NM, MNLF - HM, BIFM, BIFM - K, al-Harakat al-Islamiyah and Maute group. It is being fought on the island of Mindanao.

Russia

This conflict episode started in 1999 and ended in 2007. It reached 1000+ battle-related deaths in 1999, and was fought in Chechnya. It was fought between the Government of Russia and the Chechen Republic of Ichkeria.

Rwanda

The conflict episode began in 2009 and ended in 2012. It reached 1000+ battle-related deaths in 2009. It was fought between the Government of Rwanda and FDLR.

Somalia

The conflict episode began in 2006 and is still ongoing as of today. It reached 1000+ battle-related deaths in 2007. It was fought between the Government of Somalia and Al-Shabaab, ARS/UIC and Hizbul Islam.

Sri Lanka

The conflict episode began in 2005 and ended in 2009. It reached 1000+ battle-related deaths in 2006. It was fought between the Government of Sri Lanka and LTTE in the territory of Eelam.

Sudan

This conflict episode began in 1983 and finally ended in 2018. It reached 1000+ battle-related deaths in 1983. It was fought between the Government of Sudan and NDA, SPLM/A, JEM, SLM/A, NRF, SLM/A - MM, JEM, SLFA, SPLM/A-North, SRF, SSDM/A, SSLM/A, Darfur Joint Resistance Forces and SARC.

Syria

This conflict episode began in 2011 and is still ongoing. It was fought between the Government of Syria and Syrian insurgents. It reached 1000+ battle-related deaths in 2011.

Turkey

The first conflict episode began in 1984 and ended in 2013. It reached 1000+ battle-related deaths for the first time in 1992, and was fought in Kurdistan. It was fought between the Government of Turkey and the PKK. The second conflict episode commenced in 2015 and ended in 2017. It reached 1000+ battle-related deaths in 2016, and was fought between the Government of Turkey and IS.

Uganda

This conflict episode began in 1994 and ended in 2011. It reached 1000+ battle-related deaths for the first time in 1996. It was fought between the Government of Uganda and LRA, ADF, WNBF and UNRF II.

Ukraine

The first conflict commenced in 2014 in Donetsk, reaching 1000+ battle-related deaths in the same year. It was fought between the Government of Ukraine and DPR. This specific conflict lasted only one year. The next conflict episode also began in 2014, and was fought in Novorossiya. This was fought between the Government of Ukraine and United Armed Forces of Novorossiya, DPR and LPR. It too reached 1000+ battle-related deaths in 2014, and the conflict is still ongoing.

United States

This conflict episode commenced in 2001 and ended in 2017. It was fought between the Government of the United States and Al Qaida. It reached 1000+ battle-related deaths in the year of commencement, 2001. Note it was an internationalised intrastate war. Various other governments joined the United States, such as the Government of Australia, Government of Canada, Government of France, Government of Germany, Government of Italy, Government of Poland, Government of Turkey, Government of the United Kingdom beginning in 2001. Other governments also joined later on, such as the Government of Jordan in 2002.

Yemen

This conflict episode began in 2009 and is still ongoing as of today. It reached 1000+ battle-related deaths for the first time in 2011. It was fought between the Government of Yemen and AQAP, Ansarallah and Forces of Hadi.

DRC (Zaire)

The first conflict episode commenced in 2011 and ended in 2014. It reached 1000+ battle-related deaths for the first time in 2013. It was fought between the Government of the DRC and APCLS, Forces of Paul Joseph Mukungubila, M23 and CNPSC. The next conflict episode began in 2016 and is still ongoing as of today. It reached 1000+ battle-related deaths for the first time in 2017. It was fought between the Government of the DRC and CNPSC, Kamuina Nsapu, M23, MNR, UPLC and CMC.

Appendix B Pillars of Prosperity Index Values, 2006

| Country | Index Value | Peacefulness | State Capacity Index | Income |
|--------------------------|-------------|--------------|----------------------|--------|
| Zaire (DRC) | 0.121 | N/A | 0.212 | 0.030 |
| Afghanistan | 0.131 | 0.097 | 0.166 | N/A |
| Chad | 0.175 | 0.323 | 0.017 | 0.184 |
| Ethiopia | 0.194 | 0.129 | 0.371 | 0.083 |
| Mozambique | 0.204 | 0.468 | 0.068 | 0.076 |
| Sudan | 0.208 | 0.195 | 0.073 | 0.356 |
| Myanmar (Burma) | 0.238 | 0.032 | 0.394 | 0.288 |
| India | 0.250 | 0.049 | 0.346 | 0.354 |
| Cambodia | 0.258 | 0.307 | 0.219 | 0.247 |
| Uganda | 0.259 | 0.146 | 0.437 | 0.193 |
| Burundi | 0.267 | 0.516 | 0.214 | 0.070 |
| Angola | 0.271 | 0.129 | 0.237 | 0.448 |
| Philippines | 0.291 | 0.000 | 0.465 | 0.408 |
| Liberia | 0.297 | 0.630 | 0.261 | 0.000 |
| Vietnam | 0.311 | N/A | 0.267 | 0.355 |
| Colombia | 0.315 | 0.000 | 0.416 | 0.530 |
| Sierra Leone | 0.334 | 0.677 | 0.174 | 0.151 |
| Indonesia | 0.349 | 0.226 | 0.352 | 0.469 |
| Guatemala | 0.350 | 0.339 | 0.264 | 0.448 |
| Iraq | 0.384 | 0.226 | 0.398 | 0.529 |
| Central African Republic | 0.402 | 0.984 | 0.128 | 0.094 |
| Guinea-Bissau | 0.403 | 0.920 | 0.116 | 0.174 |
| Sri Lanka | 0.404 | 0.290 | 0.453 | 0.470 |
| Lebanon | 0.414 | 0.516 | 0.150 | 0.577 |
| Nepal | 0.423 | 0.645 | 0.394 | 0.231 |
| Rwanda | 0.429 | 0.645 | 0.492 | 0.148 |
| Peru | 0.436 | 0.356 | 0.465 | 0.486 |
| Mali | 0.437 | 0.969 | 0.163 | 0.179 |
| Burkina Faso | 0.444 | 1.000 | 0.179 | 0.153 |
| Niger | 0.449 | 1.000 | 0.270 | 0.076 |
| Zimbabwe | 0.455 | 0.855 | 0.400 | 0.111 |
| Turkey | 0.463 | 0.242 | 0.517 | 0.630 |
| Togo | 0.471 | 1.000 | 0.260 | 0.152 |
| Haiti | 0.476 | 0.953 | 0.261 | 0.213 |
| Morocco | 0.477 | 0.548 | 0.448 | 0.434 |
| Congo | 0.478 | 0.903 | 0.110 | 0.421 |
| Malawi | 0.479 | 0.984 | 0.355 | 0.097 |
| Djibouti | 0.480 | 1.000 | 0.193 | 0.247 |
| Benin | 0.484 | 1.000 | 0.223 | 0.229 |
| Laos | 0.488 | 0.969 | 0.158 | 0.336 |
| Cameroon | 0.490 | 1.000 | 0.173 | 0.297 |
| Algeria | 0.492 | 0.468 | 0.439 | 0.570 |
| El Salvador | 0.497 | 0.565 | 0.481 | 0.447 |
| Lesotho | 0.502 | 0.984 | 0.272 | 0.250 |
| Gambia | 0.503 | 1.000 | 0.232 | 0.276 |
| Guinea | 0.507 | 1.000 | 0.306 | 0.213 |
| Pakistan | 0.509 | 0.903 | 0.243 | 0.381 |
| Senegal | 0.512 | 1.000 | 0.241 | 0.296 |
| Bangladesh | 0.530 | 0.984 | 0.346 | 0.261 |
| Madagascar | 0.532 | 1.000 | 0.393 | 0.203 |

| Country | Index Value | Peacefulness | State Capacity Index | Income |
|--------------------|-------------|--------------|----------------------|--------|
| Syria | 0.539 | 0.871 | 0.339 | 0.407 |
| Ivory Coast | 0.540 | 1.000 | 0.331 | 0.287 |
| South Africa | 0.543 | 0.581 | 0.502 | 0.547 |
| Nicaragua | 0.552 | 0.645 | 0.652 | 0.359 |
| Kenya | 0.553 | 0.969 | 0.415 | 0.276 |
| Russia | 0.561 | 0.502 | 0.516 | 0.667 |
| Swaziland | 0.563 | 1.000 | 0.228 | 0.461 |
| China | 0.563 | 0.828 | 0.404 | 0.457 |
| Tajikistan | 0.566 | 0.625 | 0.780 | 0.293 |
| Paraguay | 0.584 | 0.984 | 0.324 | 0.445 |
| Bhutan | 0.596 | 1.000 | 0.373 | 0.414 |
| Zambia | 0.596 | 0.984 | 0.521 | 0.283 |
| Ecuador | 0.602 | 0.953 | 0.343 | 0.509 |
| Moldova | 0.607 | 1.000 | 0.451 | 0.369 |
| Honduras | 0.609 | 0.984 | 0.483 | 0.360 |
| Georgia | 0.611 | 0.813 | 0.563 | 0.458 |
| Mauritania | 0.614 | 1.000 | 0.514 | 0.326 |
| Tanzania | 0.621 | 1.000 | 0.630 | 0.233 |
| Nigeria | 0.623 | 0.952 | 0.534 | 0.382 |
| Ghana | 0.630 | 0.969 | 0.584 | 0.337 |
| Iran | 0.631 | 0.533 | 0.745 | 0.615 |
| Bolivia | 0.634 | 1.000 | 0.509 | 0.393 |
| Albania | 0.635 | 0.969 | 0.452 | 0.483 |
| Dominican Republic | 0.635 | 1.000 | 0.378 | 0.527 |
| Azerbaijan | 0.642 | 0.734 | 0.645 | 0.548 |
| Jordan | 0.645 | 1.000 | 0.399 | 0.535 |
| Egypt | 0.649 | 1.000 | 0.435 | 0.510 |
| Mongolia | 0.650 | 0.984 | 0.499 | 0.466 |
| Costa Rica | 0.658 | 1.000 | 0.426 | 0.548 |
| Brazil | 0.659 | 1.000 | 0.406 | 0.571 |
| Argentina | 0.659 | 0.935 | 0.447 | 0.594 |
| Thailand | 0.660 | 0.984 | 0.436 | 0.558 |
| Turkmenistan | 0.660 | 1.000 | 0.445 | 0.534 |
| Panama | 0.662 | 1.000 | 0.415 | 0.571 |
| Fiji | 0.665 | 1.000 | 0.523 | 0.472 |
| Mauritius | 0.667 | 1.000 | 0.416 | 0.586 |
| Namibia | 0.677 | 1.000 | 0.553 | 0.476 |
| Armenia | 0.678 | 1.000 | 0.545 | 0.489 |
| Bulgaria | 0.684 | 0.969 | 0.508 | 0.576 |
| Chile | 0.688 | 0.953 | 0.483 | 0.628 |
| Jamaica | 0.693 | 0.984 | 0.622 | 0.472 |
| Uruguay | 0.694 | 0.984 | 0.522 | 0.575 |
| Venezuela | 0.694 | 1.000 | 0.461 | 0.622 |
| Tunisia | 0.700 | 1.000 | 0.579 | 0.521 |
| Romania | 0.703 | 0.953 | 0.549 | 0.607 |
| Botswana | 0.707 | 1.000 | 0.561 | 0.560 |
| Cuba | 0.709 | 0.984 | 0.433 | N/A |
| Kyrgyzstan | 0.710 | 1.000 | 0.786 | 0.345 |
| Trinidad Tobago | 0.710 | 1.000 | 0.408 | 0.723 |
| Ukraine | 0.715 | 1.000 | 0.622 | 0.524 |

| Country | Index Value | Peacefulness | State Capacity Index | Income |
|------------------|-------------|--------------|----------------------|--------|
| Slovak Republic | 0.717 | 1.000 | 0.503 | 0.648 |
| Slovenia | 0.722 | 1.000 | 0.465 | 0.700 |
| Israel | 0.724 | 1.000 | 0.467 | 0.704 |
| Gabon | 0.726 | 1.000 | 0.561 | 0.616 |
| Oman | 0.738 | 1.000 | 0.422 | 0.792 |
| Croatia | 0.738 | 1.000 | 0.560 | 0.655 |
| Mexico | 0.744 | 1.000 | 0.620 | 0.610 |
| Uzbekistan | 0.746 | 1.000 | 0.832 | 0.406 |
| Poland | 0.748 | 0.969 | 0.643 | 0.634 |
| Saudi Arabia | 0.751 | 1.000 | 0.445 | 0.807 |
| Guyana | 0.758 | 1.000 | 0.516 | N/A |
| Malaysia | 0.761 | 1.000 | 0.652 | 0.630 |
| South Korea | 0.763 | 0.922 | 0.662 | 0.706 |
| Portugal | 0.765 | 1.000 | 0.602 | 0.693 |
| Cyprus | 0.766 | 1.000 | 0.583 | 0.716 |
| Austria | 0.773 | N/A | 0.769 | 0.777 |
| Hungary | 0.779 | 0.969 | 0.701 | 0.667 |
| Papua New Guinea | 0.786 | 1.000 | 0.572 | N/A |
| Greece | 0.789 | 0.984 | 0.672 | 0.711 |
| Czech Republic | 0.790 | 1.000 | 0.674 | 0.697 |
| Belarus | 0.793 | 1.000 | 0.798 | 0.582 |
| Taiwan | 0.795 | 1.000 | 0.647 | 0.738 |
| Latvia | 0.800 | 1.000 | 0.757 | 0.642 |
| Estonia | 0.802 | 1.000 | 0.727 | 0.679 |
| Libya | 0.804 | 0.969 | 0.638 | N/A |
| Eritrea | 0.820 | 0.969 | 0.671 | N/A |
| Spain | 0.820 | 0.984 | 0.737 | 0.739 |
| Lithuania | 0.823 | 1.000 | 0.831 | 0.637 |
| Germany | 0.823 | N/A | 0.870 | 0.775 |
| Kazakhstan | 0.825 | 1.000 | 0.850 | 0.627 |
| France | 0.831 | 1.000 | 0.733 | 0.759 |
| Kuwait | 0.835 | 1.000 | 0.572 | 0.933 |
| Netherlands | 0.841 | 1.000 | 0.734 | 0.790 |
| Japan | 0.848 | 1.000 | 0.786 | 0.759 |
| Italy | 0.857 | 1.000 | 0.809 | 0.763 |
| United Kingdom | 0.861 | 1.000 | 0.825 | 0.758 |
| Belgium | 0.871 | 0.984 | 0.863 | 0.764 |
| New Zealand | 0.874 | 1.000 | 0.892 | 0.731 |
| United States | 0.875 | 0.839 | 0.971 | 0.817 |
| Ireland | 0.877 | 1.000 | 0.809 | 0.821 |
| Finland | 0.878 | 1.000 | 0.864 | 0.770 |
| Australia | 0.883 | 1.000 | 0.856 | 0.793 |
| Bahrain | 0.887 | 1.000 | N/A | 0.775 |
| Singapore | 0.897 | 1.000 | 0.873 | 0.819 |
| Sweden | 0.899 | 1.000 | 0.916 | 0.782 |
| Canada | 0.899 | 1.000 | 0.914 | 0.783 |
| Switzerland | 0.908 | 1.000 | 0.880 | 0.843 |
| Denmark | 0.916 | 1.000 | 0.948 | 0.802 |
| Norway | 0.917 | 1.000 | 0.848 | 0.903 |

Appendix C Pillars of Prosperity Index Values, 2016

| Country | Index Value | Peacefulness | State Capacity | Income |
|--------------------------|-------------|--------------|----------------|--------|
| Afghanistan | 0.121 | 0.071 | 0.170 | N/A |
| Chad | 0.228 | 0.286 | 0.209 | 0.188 |
| Sudan | 0.263 | 0.167 | 0.273 | 0.349 |
| Mozambique | 0.271 | 0.595 | 0.119 | 0.098 |
| Angola | 0.282 | 0.381 | 0.016 | 0.449 |
| Uganda | 0.289 | 0.179 | 0.489 | 0.201 |
| Burundi | 0.293 | 0.667 | 0.176 | 0.035 |
| India | 0.295 | 0.179 | 0.286 | 0.422 |
| Zaire | 0.302 | 0.738 | 0.131 | 0.036 |
| Philippines | 0.304 | 0.000 | 0.460 | 0.453 |
| Colombia | 0.313 | 0.000 | 0.373 | 0.566 |
| Cambodia | 0.336 | 0.440 | 0.265 | 0.302 |
| Central African Republic | 0.340 | 0.988 | 0.032 | 0.000 |
| Liberia | 0.377 | 0.893 | 0.173 | 0.063 |
| Myanmar | 0.387 | 0.571 | 0.197 | 0.393 |
| Niger | 0.396 | 0.988 | 0.138 | 0.063 |
| Sierra Leone | 0.397 | 0.738 | 0.297 | 0.157 |
| Nepal | 0.403 | 0.738 | 0.221 | 0.249 |
| Guinea-Bissau | 0.409 | 0.964 | 0.107 | 0.157 |
| Iraq | 0.425 | 0.262 | 0.417 | 0.597 |
| Burkina Faso | 0.432 | 1.000 | 0.139 | 0.157 |
| Rwanda | 0.435 | 0.619 | 0.487 | 0.197 |
| Yemen | 0.439 | 0.786 | 0.318 | 0.212 |
| Madagascar | 0.441 | 0.988 | 0.171 | 0.163 |
| Mali | 0.447 | 0.964 | 0.134 | 0.245 |
| Togo | 0.449 | 0.988 | 0.202 | 0.156 |
| Ethiopia | 0.454 | 0.536 | 0.652 | 0.175 |
| Somalia | 0.457 | 0.476 | 0.439 | N/A |
| Pakistan | 0.460 | 0.690 | 0.307 | 0.382 |
| Turkey | 0.469 | 0.226 | 0.505 | 0.675 |
| Sri Lanka | 0.470 | 0.452 | 0.413 | 0.544 |
| Benin | 0.472 | 1.000 | 0.187 | 0.228 |
| Syria | 0.473 | 0.762 | 0.389 | 0.267 |
| Zimbabwe | 0.477 | 0.845 | 0.384 | 0.201 |
| Algeria | 0.491 | 0.369 | 0.529 | 0.575 |
| Congo | 0.492 | 0.905 | 0.182 | 0.389 |
| Djibouti | 0.496 | 1.000 | 0.198 | 0.290 |
| Haiti | 0.498 | 0.964 | 0.342 | 0.186 |
| Cameroon | 0.500 | 0.988 | 0.216 | 0.295 |
| Senegal | 0.503 | 0.988 | 0.235 | 0.286 |
| Malawi | 0.505 | 0.988 | 0.429 | 0.098 |
| Lesotho | 0.511 | 0.988 | 0.274 | 0.271 |
| Ivory Coast | 0.511 | 0.964 | 0.269 | 0.301 |
| El Salvador | 0.514 | 0.679 | 0.419 | 0.443 |
| Morocco | 0.515 | 0.643 | 0.432 | 0.470 |
| Peru | 0.516 | 0.536 | 0.472 | 0.539 |
| Indonesia | 0.517 | 0.667 | 0.361 | 0.524 |
| Gambia | 0.518 | 0.976 | 0.332 | 0.246 |
| Guinea | 0.527 | 1.000 | 0.358 | 0.222 |
| Laos | 0.531 | 0.976 | 0.183 | 0.435 |

| Country | Index Value | Peacefulness | State Capacity | Income |
|--------------------|-------------|--------------|----------------|--------|
| Kyrgyzstan | 0.534 | 0.988 | 0.239 | 0.374 |
| Bangladesh | 0.539 | 0.952 | 0.347 | 0.318 |
| Zambia | 0.541 | 0.976 | 0.334 | 0.313 |
| Papua New Guinea | 0.543 | 1.000 | 0.086 | N/A |
| Nicaragua | 0.556 | 0.714 | 0.571 | 0.384 |
| Lebanon | 0.560 | 0.821 | 0.289 | 0.571 |
| Gabon | 0.562 | 1.000 | 0.075 | 0.611 |
| Guatemala | 0.572 | 0.988 | 0.278 | 0.449 |
| Honduras | 0.575 | 0.976 | 0.392 | 0.357 |
| Kenya | 0.582 | 0.964 | 0.495 | 0.287 |
| Tanzania | 0.588 | 0.976 | 0.528 | 0.260 |
| South Africa | 0.589 | 0.667 | 0.557 | 0.544 |
| Swaziland | 0.592 | 1.000 | 0.322 | 0.455 |
| Nigeria | 0.593 | 0.845 | 0.540 | 0.395 |
| Ghana | 0.594 | 0.976 | 0.427 | 0.379 |
| Paraguay | 0.596 | 0.988 | 0.316 | 0.484 |
| Ecuador | 0.609 | 0.964 | 0.344 | 0.519 |
| Moldova | 0.611 | 1.000 | 0.425 | 0.409 |
| Russia | 0.619 | 0.619 | 0.553 | 0.686 |
| Bolivia | 0.620 | 0.976 | 0.457 | 0.427 |
| Tajikistan | 0.620 | 0.821 | 0.706 | 0.333 |
| Venezuela | 0.621 | 0.964 | 0.336 | 0.564 |
| Ukraine | 0.628 | 0.917 | 0.483 | 0.485 |
| Jordan | 0.630 | 0.988 | 0.403 | 0.498 |
| Botswana | 0.631 | 1.000 | 0.305 | 0.587 |
| Egypt | 0.632 | 0.952 | 0.417 | 0.528 |
| Mauritania | 0.653 | 1.000 | 0.658 | 0.301 |
| Jamaica | 0.654 | 0.988 | 0.533 | 0.440 |
| Dominican Republic | 0.660 | 1.000 | 0.399 | 0.580 |
| Brazil | 0.664 | 0.988 | 0.431 | 0.574 |
| Namibia | 0.665 | 1.000 | 0.498 | 0.498 |
| Iran | 0.665 | 0.726 | 0.644 | 0.625 |
| Thailand | 0.669 | 0.976 | 0.440 | 0.590 |
| Vietnam | 0.673 | 0.988 | 0.615 | 0.416 |
| Costa Rica | 0.679 | 1.000 | 0.458 | 0.579 |
| Slovenia | 0.684 | 1.000 | 0.354 | 0.698 |
| Argentina | 0.685 | 1.000 | 0.454 | 0.600 |
| Fiji | 0.687 | 0.988 | 0.602 | 0.472 |
| Libya | 0.690 | 0.905 | 0.475 | N/A |
| Mauritius | 0.692 | 1.000 | 0.438 | 0.639 |
| Albania | 0.700 | 0.976 | 0.595 | 0.529 |
| Mongolia | 0.700 | 0.976 | 0.578 | 0.548 |
| Trinidad & Tobago | 0.703 | 1.000 | 0.397 | 0.712 |
| Bahrain | 0.703 | 0.940 | 0.396 | 0.773 |
| Bulgaria | 0.704 | 0.976 | 0.523 | 0.612 |
| Tunisia | 0.714 | 0.976 | 0.638 | 0.527 |
| Slovak Republic | 0.717 | 1.000 | 0.460 | 0.691 |
| Panama | 0.720 | 1.000 | 0.508 | 0.651 |
| Armenia | 0.727 | 0.988 | 0.671 | 0.522 |
| Eritrea | 0.733 | 0.976 | 0.489 | N/A |

| Country | Index Value | Peacefulness | State Capacity | Income |
|----------------------|-------------|--------------|----------------|--------|
| Mexico | 0.735 | 1.000 | 0.600 | 0.606 |
| China | 0.739 | 0.833 | 0.825 | 0.559 |
| Israel | 0.739 | 0.976 | 0.514 | 0.727 |
| Greece | 0.743 | 0.976 | 0.599 | 0.653 |
| Hungary | 0.747 | 0.976 | 0.591 | 0.674 |
| Azerbaijan | 0.748 | 0.869 | 0.767 | 0.606 |
| Cyprus | 0.749 | 1.000 | 0.555 | 0.693 |
| Bhutan | 0.765 | 1.000 | 0.802 | 0.493 |
| Poland | 0.767 | 0.976 | 0.638 | 0.686 |
| Uzbekistan | 0.768 | 1.000 | 0.807 | 0.497 |
| Portugal | 0.768 | 1.000 | 0.629 | 0.676 |
| Uruguay | 0.771 | 0.988 | 0.691 | 0.633 |
| Guyana | 0.781 | 1.000 | 0.562 | N/A |
| Czech Republic | 0.783 | 1.000 | 0.637 | 0.711 |
| South Korea | 0.789 | 0.917 | 0.699 | 0.749 |
| Macedonia | 0.789 | 1.000 | 0.578 | N/A |
| Chile | 0.796 | 0.964 | 0.766 | 0.657 |
| Latvia | 0.796 | 1.000 | 0.726 | 0.662 |
| Lithuania | 0.798 | 1.000 | 0.709 | 0.684 |
| Estonia | 0.803 | 1.000 | 0.719 | 0.688 |
| Saudi Arabia | 0.803 | 1.000 | 0.588 | 0.822 |
| United States | 0.804 | 0.619 | 0.970 | 0.824 |
| Georgia | 0.810 | 0.917 | 0.973 | 0.539 |
| Malaysia | 0.815 | 0.964 | 0.809 | 0.670 |
| Romania | 0.815 | 0.952 | 0.844 | 0.650 |
| Spain | 0.821 | 0.988 | 0.743 | 0.731 |
| Oman | 0.823 | 1.000 | 0.695 | 0.774 |
| Belarus | 0.829 | 0.988 | 0.877 | 0.622 |
| Kuwait | 0.829 | 0.988 | 0.628 | 0.871 |
| France | 0.831 | 1.000 | 0.735 | 0.757 |
| Turkmenistan | 0.831 | 1.000 | N/A | 0.662 |
| Japan | 0.834 | 1.000 | 0.740 | 0.762 |
| Austria | 0.836 | 1.000 | 0.728 | 0.781 |
| Italy | 0.844 | 1.000 | 0.788 | 0.744 |
| Netherlands | 0.844 | 1.000 | 0.738 | 0.796 |
| Singapore | 0.845 | 1.000 | 0.667 | 0.867 |
| New Zealand | 0.847 | 1.000 | 0.793 | 0.747 |
| United Kingdom | 0.847 | 1.000 | 0.783 | 0.758 |
| Croatia | 0.848 | 1.000 | 0.893 | 0.650 |
| Belgium | 0.858 | 0.988 | 0.819 | 0.765 |
| Finland | 0.859 | 1.000 | 0.817 | 0.761 |
| Sweden | 0.873 | 1.000 | 0.828 | 0.792 |
| Kazakhstan | 0.880 | 1.000 | 0.968 | 0.671 |
| Germany | 0.887 | 1.000 | 0.869 | 0.793 |
| Denmark | 0.890 | 1.000 | 0.870 | 0.799 |
| Canada | 0.890 | 1.000 | 0.884 | 0.787 |
| Ireland | 0.900 | 1.000 | 0.829 | 0.871 |
| Taiwan | 0.901 | 1.000 | 0.925 | 0.779 |
| Cuba | 0.906 | 0.964 | 0.848 | N/A |
| Norway | 0.910 | 1.000 | 0.825 | 0.904 |
| Switzerland | 0.910 | 1.000 | 0.880 | 0.850 |
| Australia | 0.920 | 1.000 | 0.952 | 0.807 |
| United Arab Emirates | 0.948 | 1.000 | 0.952 | 0.893 |

Appendix D Scree Plots, Loading Plots and Dendrograms

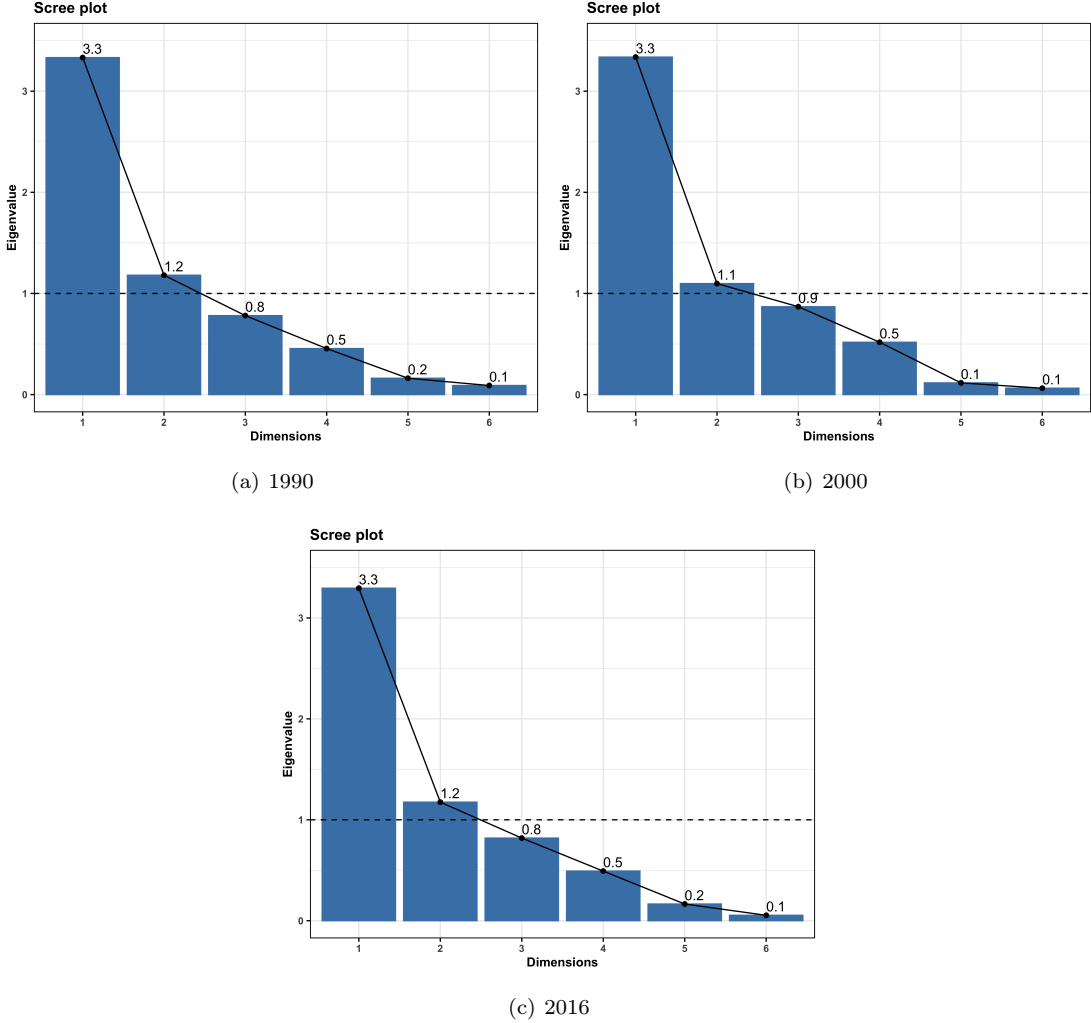
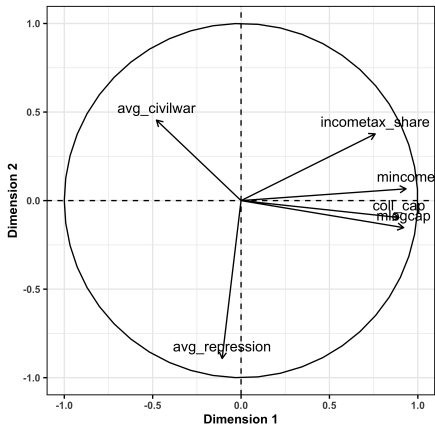
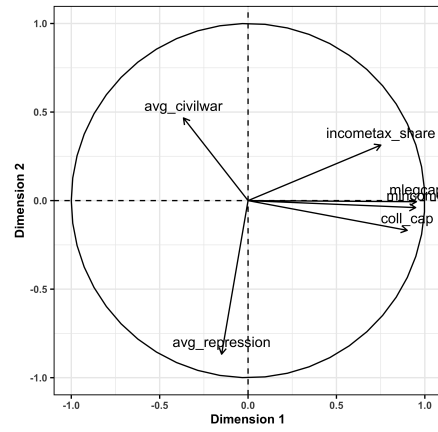


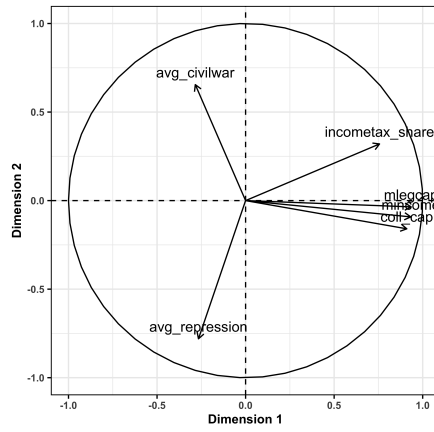
Figure D.1: Scree Plots



(a) 1990

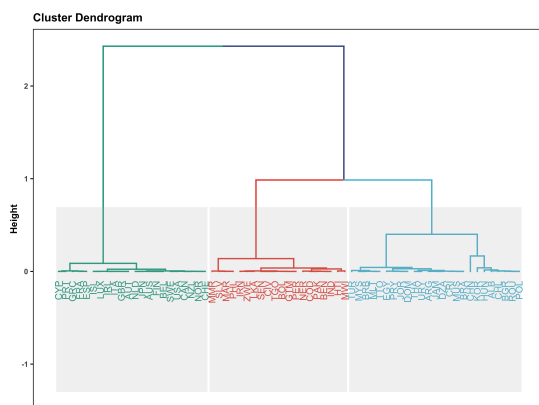


(b) 2000

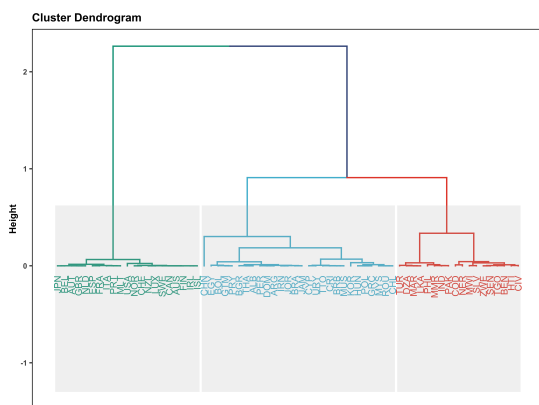


(c) 2016

Figure D.2: Loading Plots



(a) 1990



(b) 2016

Figure D.3: Dendrograms

Appendix E Hierarchical Clustering Method Explanation

For exhaustive details on the HCPC method, see Husson et al. (2010). As mentioned in the text, the HCPC method involves three basic steps:

1. Perform principal components analysis (PCA) on the variables of interest to reduce the “dimensionality” of the data into a few principal components.
2. Apply a hierarchical agglomerative clustering (HAC) algorithm (Ward’s criterion) to develop a hierarchical tree (dendrogram).
3. A k -means algorithm, based on the suggested “partition” of the dendrogram, is performed to “consolidate” the clusters.

With regards to step 2, a hierarchical clustering algorithm allows us to not only look at within-cluster variation, but also enables us to build dendrograms that explore between-cluster variation, as it may be the case that some clusters are more similar to others. The height of the tree and its branches reflect how dissimilar clusters are from each other. Agglomerative clustering is a “bottom-up” approach, whereby each datapoint (in our case, countries) is considered its own cluster initially, and a hierarchical tree is built by forming pairwise merges of clusters until only one cluster at the top of the tree is formed (i.e. every single datapoint is merged together).

Hierarchical clustering requires both a ‘distance’ measure to assess the similarity of data points and a corresponding ‘agglomeration’ method. With regards to distance, the standard Euclidean distance measure is used. Regarding agglomeration so as to merge clusters, whilst there are a variety of approaches, the HCPC method uses ‘Ward’s method’. Consider two clusters, $i \in A, B$ with corresponding number of points in each cluster n_i and respective cluster “centre” μ_i (a vector). Then Ward’s method shows that the distance between two clusters is measured via the following formula:

$$c(A, B) = \frac{n_A n_B}{n_A + n_B} \|\mu_A - \mu_B\|^2,$$

whereby $\|\mu_A - \mu_B\|$ is the Euclidean distance between clusters A and B , represented using Euclidean norm notation. This is weighted by the size of the two clusters, $\frac{n_A n_B}{n_A + n_B}$. Ward’s method will thus try to minimise this “merging cost”, $c(A, B)$, when combining clusters together to make the dendrogram. This method is reiterated until we achieve a cluster of 1, containing all data points.

Once the tree is built, we can then cut the tree so as to outline the number of partitions of the data we want to make. Unlike the k -means algorithm, Ward’s criterion provides some guidance as to where the tree should be cut. Each cluster has total inertia (total variance) that comprises both between-inertia (i.e. variance between distinct clusters) and within-inertia (i.e. variance within a distinct cluster based on its points, n_i). Ward’s criterion thus has the further property of trying to minimise the growth of within-inertia when two clusters are combined. From this, in choosing the optimal number of partitions of the data (i.e. where to cut the tree), Husson et al.’s (2010) method suggests that Q partitions should be formed when the growth in between-inertia upon merging clusters $Q - 1$ and Q is much greater than the growth in between-inertia when combining Q and $Q + 1$ clusters. Although one can of course cut the tree where they choose, this method is at least somewhat “inductive” in the sense that it allows the algorithm to provide an optimal, suggested number of clusters based on the raw, underlying data alone, hence removing “researcher degrees of freedom”.

Although we could stop here and simply partition the data based on the number Q suggested by Ward’s criterion, a better, more robust approach is to then perform the k -means clustering algorithm but using the Q number of partitions suggested. This is the beauty of combining HAC with k -means, as HAC provides

the suggested number of clusters, and k -means then finds these Q clusters in the data. Without HAC, we wouldn't know what Q was without simply making an educated guess or using mere intuition (although other statistical tests do exist). k -means essentially chooses Q random points in the data, assigns data points to each respective random point based on the minimum Euclidean distance to form a cluster, estimates the average of this newly formed cluster, and repeats this process p times until data points no longer change cluster. The only pitfall with using k -means versus just using the Q number of partitions suggested by the HAC method is that some of the hierarchical structure is lost (i.e. some countries from the dendrogram that were classified in one sub-cluster may change slightly). Notwithstanding this, as Husson et al. (2010) highlight, this final process is considered an improvement on the initial HAC partitioning to "consolidate" the clusters. Also, as mentioned in a footnote in the body of the paper, the three clusterings we obtain are robust to not performing this additional k -means algorithm (i.e. Step 3 above).