

# The spirits of capitalism and socialism

## A cross-country study of ideology

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**Abstract** The World Values Survey contains an item on ownership which is polled 200 times in 92 countries at the four waves of 1990, 1995, 2000 and 2005. These polls are developed into the CS-score that measures the aggregate mass support for capitalism and socialism. Four hypotheses are advanced and tested to explain the wide variation in the 200 CS-scores. It is due to: the cross-country distribution of income, and consequently the West stands out as the most capitalist-minded area of the world; institutions of the country such as legal quality; the left-right dimension in politics; and cultural differences.

**Keywords** Property rights · Ideology · Institutions

**JEL Classification** O43 · P14

### 1 Introduction: the mass support for capitalism and socialism

The most fundamental institutional choice countries face is the choice of economic system as characterized by the two main types of ownership: What ought to be privately owned and what should be publicly owned? This decision is taken politically at the national level—often in a process of small steps as parts of political compromises. Our analysis deals with the popular basis for the decision, i.e., the preferences of the population.

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We employ one item in the World Values Survey (WVS) (2010) which asks the respondents whether they prefer public or private ownership. The item has been polled in 92 countries, at least once in the four waves of 1990, 1995, 2000 and 2005, giving a total of 200 polls. This appears to be by far the most comprehensive data set on ownership preferences available.

The ownership question belongs to a series of questions about preferences that respondents may have about society. The question is formulated as: ‘*Private vs state ownership of business and industry should be increased: Indicate preference on a scale from 1 to 10. 1 is strongest preferences for private and 10 is the strongest preference for public ownership.*’

The two sentences in the formulation of the item may be a little contradictory. The first sentence uses the word ‘increased’ that points to a *change* of ownership. The second sentence asks people about their preferred *level* of ownership. Thus, the item has a potential level problem. This paper interprets the answers in line with the second sentence. Section 2.3 demonstrates that this is in accordance with the answers of most respondents, but it cannot be ruled out that some answers reflect the changes the respondents prefer.

The answers are taken to measure mass *ideology* as an ownership preference. The polls thus measure the preferences for *capitalism* versus *socialism*. The answers can be aggregated in many ways. Section 2 justifies the aggregate chosen as our CS-score (for Capitalism versus Socialism) and explains how it is calculated.

We measure this preference in a period of considerable actual change. The first data for the CS-scores are for 1990, which saw the triumph of capitalism: No less than 23 of the countries covered changed from socialism to capitalism, and many other countries privatized state owned enterprises around that time.<sup>1</sup> The CS-scores may thus have started at a peak, and have a falling trend in the following WVS waves.

The respondents’ stated preferences differ substantially between countries, and it has changed over time, enabling us to draw conclusions about the factors shaping the economic system. The CS-scores reflect preferences that may be related to almost any institutional and political structure. Recent literature in political economy and public choice explores how the choice of ownership system relates to the economic and political system.<sup>2</sup> Studies have found a complex causal network where choices about the legal system, public bureaucracy and democratic institutions are associated with economic development. In its turn, it is related to other relevant types of outcomes such as corruption and subjective well-being. Yet, while overall economic development influences institutional quality, recent studies find that beliefs and basic values are also associated with these choices. Consequently, we look at the relation of the CS-score to four types of factors (F1) to (F4), which are each measured by a representative variable defined and documented in Sect. 5.1:

- (F1) *Development*: average income.
- (F2) *Institutions*: components of the Economic Freedom Index.
- (F3) *Ideology*: two versions of the Left-Right dimension in politics.
- (F4) *Culture*: fixed effects for the standard regional classification of countries.

<sup>1</sup>The privatization wave is analyzed in Parker and Saal (2003) and (for Western Europe) in Köthenburger et al. (2006); see also Megginson and Netter (2001).

<sup>2</sup>Causality between institutions and development is complex, see, e.g., Knack and Keefer (1995), Acemoglu et al. (2005), de Haan (2007), Engerman and Sokoloff (2008), Paldam and Gundlach (2008) and Blume et al. (2009), and on beliefs and values and development see, e.g., Knack (2002), Uslander (2002) and Bjørnskov (2010).

As far as we know, the WVS ownership data have never been analyzed before, even though they deal with large questions which have been endlessly discussed by social scientists, historians and philosophers. Thus, they raise questions that may arguably seem ‘too big to analyze’, especially since the data only consists of 200 observations from 92 countries for one and a half decades; this is two observations per country on average. Furthermore, the observations have a potential level problem and some measurement error.<sup>3</sup> Hence, it is important to emphasize that in most cases throughout this paper it is easy to present alternative explanations. Nevertheless, we do establish causality in the very long run from income to the CS-score, and attempt to present a logically coherent overall structure; but a handful of variables are discussed, and the short and medium-run dynamics may differ from the long run.

The paper proceeds as follows. Section 2 defines and justifies the CS-score and discusses some measurement problems. The CS-score is a measure of ownership preferences and hence it concerns the large and complex structure of causal relations between ownership, and the economy. Section 3 briefly points out the parts of the potentially complex structure the paper discusses, and which part of the huge literature it refers to. It also shows where the variables chosen fit in. Section 4 brings some graphs and tables to show patterns in these data and a long-run causality test between income and the CS-score. Section 5 describes our other data and the empirical strategy, and reports a more systematic multivariate analysis covering the shorter run, while Sect. 6 concludes. The Appendix defines the country classification in Table A.1; the special instruments used in the long-run causality test are covered by Table A.2; the 200 CS-scores calculated are reported in Table A.3; and some averages and counts are given in Table A.4. Note that the prefix ‘A’ to a table number refers to the Appendix.<sup>4</sup>

## 2 The CS-score: the preference for socialism/capitalism

The ownership item in the WVS is repeated in Table 1, which also gives the answers for all 270,345 respondents reported. The item has been included in 200 polls, so the average number of respondents per poll is 1,352. The  $n$  answers represent the *intensity* of the support for capitalism (for 1 to 5) and socialism (6 to 10) with the highest intensity at the two ends.

### 2.1 The C-curve for capitalism and the I-line of indifference

Table 1 brings the number of respondents giving each answer  $n = 1, \dots, 10$  and the frequencies in percent of the answers. Also, it gives the *C-curve* and the *S-curve*, which are the cumulative frequencies for capitalism and socialism respectively. Per construction  $C(n) + S(n + 1) = 100$  for all relevant  $n$ , so most of the discussion will use the C-curve only. The C-curve from Table 1 is drawn in Fig. 1.

The C-curve is evaluated relative to the *I-line* that represents indifference. It is defined as follows: The respondents are indifferent to ownership when they choose the ten possible

<sup>3</sup>Many studies of polls exist. It appears that polls have measurement errors of 1–2 pp when the questions are perfectly clear and concrete. It is larger for more abstract items, and when the question is not perfectly clear the measurement error is even larger.

<sup>4</sup>A background paper (Bjørnskov and Paldam 2010) with a dozen extra tables studying the robustness of the variables to other combinations of the regressors is available from the authors. The paper is posted on <http://www.martin.paldam.dk> under ‘working papers’, ‘grand transition project’.

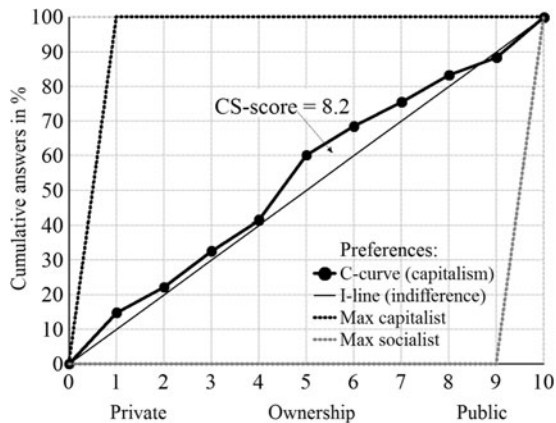
**Table 1** The ownership item: All 270,345 answers reported

<i>n</i>	Private					Public				
	1	2	3	4	5	6	7	8	9	10
Number	39,877	20,239	27,910	24,182	50,414	22,538	18,898	21,165	13,861	31,261
Percent	14.8	7.5	10.3	8.9	18.6	8.3	7.0	7.8	5.1	11.6
Data for	Cumulative preferences: $C = C(n)$ and $S = S(n)$									
C-curve	14.8	22.2	32.6	41.5	60.2	68.5	75.5	83.3	88.4	100
S-curve	100	85.2	77.8	67.4	58.5	39.8	31.5	24.5	16.7	11.6

Note: the C-curve is the cumulative preferences for capitalism shown in Fig. 1, while the S-curve is the cumulative preferences for socialism. The item is V251 in Inglehart et al. (1998) and E036 in Inglehart et al. (2004). It is V117 in the root version of the WVS 2005–2006 questionnaire. The wording is:

Private vs state ownership of business and industry should be increased: indicate preference on a scale from 1 to 10. 1 is strongest preferences for private and 10 is the strongest preference for public ownership

**Fig. 1** Calculating the CS-score from the data of Table 1. Note: The lines drawn are explained in text



answers ( $n = 1, \dots, 10$ ) with equal probability, so the expected frequency for each  $n$  is 10%. Hence the cumulative frequency is the straight line from (0, 0) to (10, 100). It is the I-line drawn in Fig. 1.

The C-curve contains the information from Table 1 and it is consequently the basis of the CS-score. It can be aggregated in many ways. The CS-score should be the aggregate that is the most relevant for political decision making. The next section argues that the best choice of CS-score is the area between the C-curve and the I-line.

### 2.2 Defining and calculating the CS-score<sup>5</sup>

With single-issue majority voting, the CS-score should reflect the ownership preference of the median voter. Under standard Downsian median-voting assumptions, we would just have to see if the C-curve is above or below the I-line at the intersection with the 50% line. However, logrolling is a fact of life, and decisions about property rights are typically made in the form of long-run political compromises involving other issues. Consequently, the

<sup>5</sup>The CS-score is introduced in Christoffersen and Paldam (2006). It is inspired by the Gini.

intensity of the preferences, and not only the preference per se, should be reflected in the ideal politically relevant CS-score.

In the data the intensity of preferences is measured as a distance relative to indifference, i.e., to the I-line. To measure the aggregate intensity, these intensities have to be added up. The sum is the area under the C-curve minus the area under the I-line. The first area is a set of trapezoids which consist of rectangles with a triangle on top. The second area is a triangle which is half the area of the whole graph. The steps between the  $n$ 's are 1, and the curve starts in  $C(0) = 0$  and ends in  $C(10) = 100$ , making the calculations rather simple:

$$\begin{aligned} CS_1 &= \int_0^{10} [C(n) - I(n)] dn \\ &= \sum_{n=1}^{10} \left[ 1 \cdot C(n-1) + \frac{1}{2} \cdot 1 \cdot (C(n) - C(n-1)) \right] - \frac{1}{2} \cdot 10 \cdot 100 \\ &= \frac{1}{2} \sum_{n=1}^{10} [C(n-1) + C(n)] - 500 = \sum_{n=1}^9 C(n) - 450 \end{aligned} \quad (1)$$

The CS-score in (2) is termed  $CS_1$ . It has a linear relation to the average of the C-curve.<sup>6</sup> We go one step further and calculate the score in percent. Hence, Fig. 1 also includes the two most extreme possibilities for the preferences: The *max capitalist* curve where all respondents answer '1' and the *max socialist* curve where they answer '10'. The  $CS_1$  calculation for the max capitalist curve is 450, and the final step to reach the CS-score is thus to rescale it as:

$$CS = 100 \frac{CS_1}{450} \quad (2)$$

This is a percentage scale, and the difference between two CS'es is thus in pp (percentage points). Formulas (1) and (2) are used to calculate the 200 CS-scores listed in Table A.3.

The C-curve in Table 1 for all respondents shows a small excess support for capitalism, which gives a positive CS-score of 8.2%. Thus, when the CS-score is calculated for a poll, a positive value shows that the respondents have an excess preference for capitalism, and a negative score shows an excess preference for socialism relative to indifference.

The CS-score is anchored at zero for indifference between the answers, yet this is not the only way people can be neutral toward capitalism and socialism. Neutrality means that the distribution of the answers are symmetric with respect to the mid-point, so that the two cumulative curves are exactly the same in reverse:  $C(n) = S(11 - n)$ , for all  $n = 1, \dots, 10$ . Thus, other neutral curves have areas  $A$  over and  $B$  below the I-line which are symmetrical with respect to (5, 50), so that  $A = -B$ . Hence, they deviate from the I-line by  $A + B = 0$ . This means that if the I-line is replaced with any neutral curve in the definition of the CS-score, it will produce precisely the same scores.<sup>7</sup>

In principle, the CS-score ranges from  $-100$  to  $+100$ . However, as each score is calculated from an average of 1,352 respondents, the law of averages tells us to expect the results

<sup>6</sup>The average C-curve is:  $\text{Avr}(C(n)) = (\sum_{n=1}^{10} C(n))/10$ , so that  $CS_1 = \sum_{n=1}^9 C(n) - 450 = 10(\text{Avr}(C(n)) - 55)$ .

<sup>7</sup>Imagine, e.g., a neutrality curve that is zero till (answer category) 5 and then jumps to 100. Relative to the I-curve the triangle with the corners (0, 0), (5, 50) and (5, 0) should be added, and the triangle with the corners (5, 50), (5, 100) and (10, 100) should be subtracted. As the two triangles are equivalent, the CS-score does not change.

**Table 2** Representativity of the data

Covers $N = 200$ polls for $M = 92$ countries		
(1)	Population of the 92 countries relative to world population, 1998	89.0%
(2)	Unweighted average income of the 92 countries relative to world gdp, 1995 <sup>a</sup>	1.54
Different averages of the CS-score		
(3)	For all data (from Table 1)	8.2
(4)	For the 200 polls: Unweighted average	9.7
(5)	For the 200 polls: Median	10.3
(6)	For the 92 countries: Unweighted average	9.2
(7)	For the 92 countries: Weighted with population	−0.8
(8)	Same calculation without China	5.5

<sup>a</sup>Note. Based on the Maddison country sample

to be non-extreme.<sup>8</sup> The closeness of the cumulative curve to the neutrality line confirms this idea. The respondents in the full data set have a capitalist ideology, but only by 8.2%.

### 2.3 The level problem: the false convergence-to-zero prediction

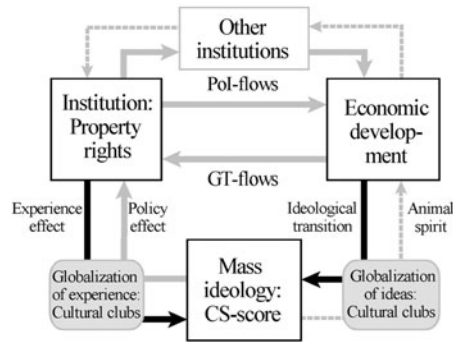
The introduction mentioned that the WVS ownership item had a level problem due to the term ‘*increased*’ in the first sentence of the wording of the item. This was contradicted in the second sentence, so two alternative hypotheses seem possible:

- (H1) People take the item as a question about the changes they want in the existing level of ownership.
- (H2) People consider the item as a question about their preferred level of ownership, as assumed till now.

However, let us—for a moment—accept (H1). This leads to a clear prediction about the CS-score in politically competitive democracies. Here the CS-score must adjust to the will of people, so after some time the median voter will want no more changes. This should cause the CS-score to converge to zero. In the most stable democracies it should consequently be zero.

Table A.1 contains three groups of democracies: The *Old West* where stable ownership systems are combined with old democracies; the *Convergers* are ‘new’ Western countries, which used to be middle-income countries (MICs) with little democracy; and the *ATigers* (Asian Tigers), which also are new democracies/developed countries (DCs). The average CS-scores in these groups are 29.9, 11.6 and 13.0 respectively. This is the reverse of the prediction from the convergence-to-zero property. The consistently high positive scores in the oldest and most stable capitalist democracies are particularly revealing. These observations are inconsistent with (H1). Consequently, most people must answer the question as a *level* item, as assumed in this paper.

<sup>8</sup>The probit diagram of the 200 CS-scores shows a near-normal distribution, but with relatively few extreme observations. Another sign of the built-in ‘moderation’ is that the response 5 is chosen too often, as illustrated in the C-curves shown on Figs. 1 and 4. This is a typical feature of many questions scaled 1–10 in the WVS. It implies that the median gets stuck at 5 too often, thereby making standard aggregation methods problematic.

**Fig. 2** Ownership, other institutions and development

## 2.4 The representativity of the data

Table 2 gives different aspects of the representativeness of the CS-data. The 92 countries included are (a little) less than half the countries of the world. Yet, the sample contains most DCs and the larger less developed countries (LDCs).<sup>9</sup> These countries hold 89% of the world population; but using countries as the unit, the sample is biased toward richer countries by no less than 54%.

Rows (3) to (8) of the table show six averages of the CS-scores. The first four are similar and indicate a robust average of about nine. However, if the countries are weighted with population size, the result changes to about zero. As shown in the last row, this is largely due to the large negative CS-score for China.

Table A.1 classifies the countries in the six groups. The second part of Table A.4 lists the numbers of countries in each group included in the four waves of the survey. It is obvious that the countries are not randomly polled across groups in the waves. The 1990 wave (*W1990*) includes too many countries from *West*, the 1995 wave (*W1995*) too many post communist (*PCom*) countries, and so on. This means that the sample has to be controlled for skewness. It is done by considering first differences in Sect. 4.2, and by fixed effects for waves in Sect. 5.3. The fixed effects for waves thus contain a mixture of time trends and sample biases, so they are difficult to interpret and, as shown in Bjørnskov and Paldam (2010), they do produce rather unstable coefficients.

## 3 The complex causal structure

As the introduction suggests, the CS-score may be linked to (F1) development, (F2) other institutions, (F3) other measures of ideology and (F4) culture. These factors can be represented by many variables, but as this is the first study analyzing the CS-score, the most representative variable from each factor has been chosen. The most obvious choice is: (F1) development as operationalized as *income*,  $y$ , which is the natural logarithm of GDP per capita. The variables chosen are defined and documented in Sect. 5.1.

Figure 2 shows our understanding of the potential causal relations (arrows) between the CS-score, development and other institutions. The discussion of these arrows is used to justify the choice of the remaining variables and to reach some broadly testable hypotheses.

<sup>9</sup>The World Bank terminology is used: It divides countries in DCs (developed) and LDCs (less developed), which are once again divided in LICs (low income) and MICs (middle income).

The paper concentrates on the two black arrows, while the eight gray arrows are discussed in the present section only. Three of the arrows on the outer rim are thin and broken to suggest that they may be too weak to matter much. They are left out in Sects. 2.1 and 2.2, which discuss the inner part of the figure: The top three say that institutions determine development, and the bottom three say that development determines institutions. The long run is taken to be well represented by the cross-country variation.<sup>10</sup>

Sections 3.1 and 3.2 consider literature covered in surveys, collections of readings, etc. The *general* sources used are Blaug (1997) on Marx and Marxism, and the readings in Pejovich (1997) on the property rights school. The interpretations of history in the light of property rights are found in North (2005) and Pipes (1999), which both sum up the work of the authors. The cross-country pattern in property rights is discussed by de Soto (2000). Acemoglu et al. (2005) is a survey of the Primacy of Institutions view, by the main proponents. The Grand Transition view originated gradually from a set of essays republished in Kuznets (1965); see also Chenery and Syrquin (1975).<sup>11</sup> Authors referred to in the general sources are listed with first names the first time they are mentioned.

### 3.1 The Primacy of Institutions flows: $CS \Rightarrow y$ (income)

Several schools of thought argue that property rights shape the path of development. This was a central part of the theory of Karl Marx, in which the economic ‘basis’ of ownership shaped the ‘superstructure’ that includes politics and culture. Furthermore Marx predicted that public ownership would generate great welfare gains. The theory also claimed that ownership systems contained dynamic processes, which in the long run generated irreversible stepwise system changes. The two final steps in Marx’s long-run development model were from feudalism to capitalism, and then to socialism through a political takeover by the proletariat.<sup>12</sup> Both steps would increase the relative size of the proletariat, that is, in favor of socialism. Marxism predicts that the correlation between the CS-score and income is negative.

The importance of ownership was taken up in a microeconomic perspective by the *property rights* school of Armen Alchian, Svetozar Pejovich and others. They looked at the causal relation from property rights to economic effectiveness, and argued that private ownership, enforced by effective and politically independent legal institutions, generates large efficiency gains. As shown by, e.g., North and Weingast’s (1989) study of the Glorious Revolution, the property rights school appears to tally well with the historical facts.

The broader macro-aspects were reintroduced by theoreticians of history such as Douglass North and Richard Pipes, who further developed the link between political and economic institutions, and economic development. Recently, the macro-perspective has been extended by the *Primacy of Institutions* (PoI) school of Daron Acemoglu and associates. It

<sup>10</sup>Consequently, part of the analysis relies on the equivalence assumption that the long-run and the cross-country pattern is the same. It cannot be formally tested in our case as the CS-scores span only  $1\frac{1}{2}$  decades. However, the equivalence holds for most similar cases where data are available (see Gundlach and Paldam 2010). Therefore the equivalence assumption is taken to be the default, which is true till disproved.

<sup>11</sup>Paldam and Gundlach (2008) survey the literature and the mixed evidence in favor of the Primacy of Institutions and the Grand Transition views.

<sup>12</sup>The data generated by the 20<sup>th</sup> century has largely rejected Marxist theory. This is illustrated by the many system changes which took place: Most changes to socialism were made by foreign military powers (notably by the Red Army of the USSR). They often occurred in semi-feudal societies. An equally high number of system changes were from socialism to capitalism. They happened due to the poor economic performance of socialism.



considers the property rights system to be the key institution for development, and uses periods with fragmented political power to explain why fair enforcement of effective property rights arose. In contrast, societies where political power is concentrated in small elites fail to develop incentives to provide private property rights for the great mass of people. This theme has also been developed by Hernando de Soto, who studies the wide gulf between formal and informal property rights systems in LDCs.

The PoI school argues that the causal flow is from property rights to development. Accordingly, support for capitalism would cause capitalism that in turn causes economic development. Thus the PoI theory predicts that the correlation between income and the CS-score is positive, and that causality is from the CS-score to income.

The three schools thus predict different patterns between income and ownership preferences. In addition to this general theory of institutions, we also explore the relations between other formal institutions and the CS-score.

### 3.2 The Grand Transition flows: $y \Rightarrow CS$

The reverse causality is argued by the *Grand Transition* (GT) view, which sees development as an interacting set of transitions in most fields, including economic structures, politics, and individual beliefs. This view was pioneered by Simon Kuznets and Hollis Chenery. It suggests that the change of ownership is a transition caused by development, which also influences beliefs, world views and demands for policies (see Inglehart and Baker 2000).

A transition of a variable  $x$  is defined as follows: The long-run/cross-country pattern in  $x$  has a sizable correlation (such as 0.4) to income, and the dominating long-run causality is from income to  $x$ . It is defined as a transition even if the short-run causal pattern is complex and includes other variables. The archetypical transition is the agricultural one, but transitions also occur for certain institutions such as democratic rights, civil liberties and corruption.

Yet, the process of the Grand Transition is fraught with simultaneity and collinearity as interacting transitions take place in many fields. Average income (logarithm of GDP per capita) is treated as the best proxy for the whole process. GT-theory suggests a *transition in the CS-score*: mass support for capitalism increases when countries become wealthier and thus ‘prove’ the success of capitalism. This gives two predictions: The CS-score and income have a positive correlation, and income is causal to the CS-score.

Thus, the PoI and GT views lead to the same prediction with respect to the correlation between income and the CS-score, but the correlation is caused by reverse causalities. Section 4.4 sorts out long-run causality by estimating a set of IV regressions, using instruments with a high degree of exogeneity. Before doing so, we explore the more basic structure of the data.

### 3.3 (F2) The CS-score and institutions

The CS-score deals with ownership, so it must relate to actual institutions in the field of property rights, and most likely also to related fields such as legal institutions and the size of the public sector. Thus we have looked for measures of the degrees of capitalism/socialism as the closest related variables. Socialism and capitalism are somewhat loaded terms that are often loosely defined. To be precise, we define the terms as implied in the CS-score.<sup>13</sup>

<sup>13</sup>Our definition of *socialism* appears the most widespread, but others exist. The term *communist* is used for countries ruled by a communist party. Nearly all communist countries were/are socialist as well, though China and Vietnam are gradually changing into de facto capitalist communist countries.

That is, GDP,  $Y$ , is divided into:  $Y = Y_K + Y_S$ , where  $Y_K$  is produced by privately owned real capital, while  $Y_S$  is produced by publicly owned real capital. Hence, the shares of capitalism,  $k$ , and socialism,  $s$ , are:

$$Y_K/Y + Y_S/Y = k + s = 1. \quad (3)$$

A country is thus capitalist if  $k > s$ , and vice versa. Western countries have  $k$  in the range from 0.7 to 0.8. The old *communist* bloc of the Soviet Union and its allies had  $k$  in the reverse range, i.e., from 0.1 to 0.3; see, e.g., Nove (1977).

Unfortunately, a data set for  $k$  and  $s$  does not exist. The closest to the desired data set we have found is the Fraser Institute Economic Freedom Index (2010) that measures the distance from an economy to *laissez faire*. These data are outlined in Sect. 5.1, and we devote Sect. 5.6 to the findings about relations between the CS-score and the components of this index.

The sample of the 92 countries contains 23 *PCom* (post-communist) countries that went through a change of economic system that typically increased  $k$  from 0.2 to 0.8 in the first decade after 1990. The costs of the system change were larger than expected as they were in the order of one to two years of GDP, and took/will take two to three decades.<sup>14</sup>

This leads to the prediction that the CS-score will have a cyclical path in these countries: Initially, people wanted a system change, but during the early stages of the change the score fell due to the disappointed expectations. As the new systems gradually came to work and their results became visible to the wider population, the score went back up as will be shown. Similar but weaker cycles may be seen in countries going through smaller reforms.

### 3.4 (F3) The CS-score as a measure of ideology and path dependency

We have termed the CS-score a measure of mass ideology, which means a set of opinions that are held by many, so the opinions within the ideology are correlated. Ideologies are typically based upon a common interpretation of past experiences. The black arrow from institutions to the CS-score at the bottom left side of the Fig. 2 deals with institutional experience, as is already mentioned in the dramatic case of the *PCom* countries.

The experience effect arrow may be seen as continuing from the CS-score to economic development. This is illustrated by the *Animal Spirit* arrow,<sup>15</sup> which is indicated as a dubious causal relation. The CS-score may here proxy for the amount of entrepreneurial spirit in the population. In its turn it may reflect beliefs about the returns to private efforts or attitudes as regards the social status of entrepreneurs. It has often been suggested that some such beliefs or attitudes have been crucial for the early development of capitalism.<sup>16</sup>

<sup>14</sup>In the official GDP-data the loss is larger. However, these data exaggerate the loss as parts of the loss were due to abolition of the production of useless goods and the dismantling of the massive Soviet military-industrial complex; see the assessments in Åslund (2002) and Paldam (2002b).

<sup>15</sup>Many have noted that the theory of development lacks some driving force. It has often been called *entrepreneurial* or *animal spirit*. However, this is often another name for the residual. One potential reason to disregard this arrow is the *China-puzzle* that China has a rather large negative CS-score, and at the same time China seems unusually well endowed with 'animal spirit'. On the other hand, the Chinese data from the WVS have been questioned. Uslaner (2002), for example, notes a number of discrepancies between the structure among different norms in most countries and in the Chinese polls.

<sup>16</sup>Here, a set of related possibilities could be at plays such as: (i) an exogenous bourgeois work ethic, (ii) a widespread acceptance of entrepreneurial ambitions, (iii) or the more mundane possibility that efforts are associated with increased factor productivity. See Bjørnskov (2005), Moky (2009) and McCloskey (2010).

A major complication causing system changes to be slow, and somewhat random, is due to status quo biases. The theory of Fernandez and Rodrik (1991), for example, explains that risk adverse people, who do not know their own payoff from a reform, may resist the change, even when the macro outcome of the reform is beneficial. This should show up as noise in the measured CS-scores. A different status quo bias applies to political systems where changes need more than 50% support, i.e., if the political system is characterized by veto players or complex coalition politics (Buchanan and Tullock 1962). Here, preference intensities become crucial.

The correlation of opinions within an ideology is a large specialized subject. We demonstrate that the CS-score is related to the Left/Right dimension in politics. This is done for the LR-index defined in Sect. 5.1, and the findings are discussed in Sect. 5.7. The hypothesis is that the CS-score is correlated with a right-wing political orientation.

### 3.5 (F4) Cultural clubs and the transition: within and between groups

The arrows at the bottom of the graph in Fig. 2 pass through two gray *globalization* boxes. They point to a mediating element in the relations that is hard to handle. People are surely most influenced by the perceived experiences of their own country, but the media disseminates about the policies pursued in other countries, and many people travel and have friends and family abroad, so political and economic experiences spread across borders. Also, it is well-known that many ideas and fads have large international elements.

A particularly complex part of globalization is that it partly happens in regional ‘clubs’ instead of through a fully global experience. The ‘neighbors’ of Spain are Germany, Belgium and even Sweden more than it is Morocco. In its turn, the relevant globalization experience of Morocco is the one of Syria and Egypt rather than the one of Spain. Thus, there is an Arab and a Western ‘club’, and countries within the two clubs converge to relatively similar levels of income, even when the clubs diverge.<sup>17</sup> Likewise, experiences with capitalism/public ownership also occur within regional/cultural clubs.

We try to catch the phenomenon of cultural clubs by including fixed effects for a set of country groups defined in Table A.1. Since our data are from 92 countries only, we are forced to work with the crude standard division in six groups only.<sup>18</sup> In a few cases the groups are subdivided as listed in the table.

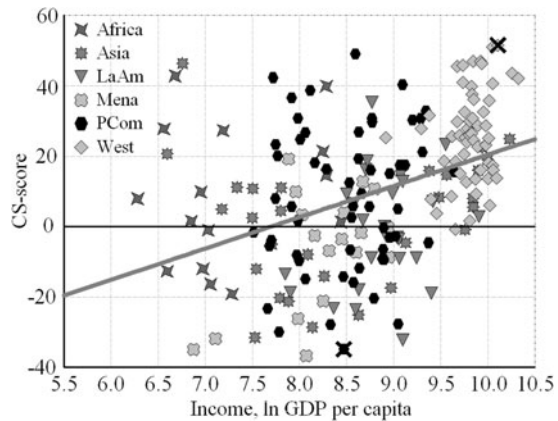
The cultural clubs imply that countries within the group influence each other much more than between the groups. The within-group convergence means that a good deal of the Grand Transition is a between-group phenomenon. When the pattern in the CS-score is explained by a set of cultural dummies, it consequently hides part of the Grand Transition in the patterns of group averages that are caused by medium-run cultural spillovers. The club dummies and income may be alternative partial representations of the Grand Transition, just as is the case for the transition of corruption (e.g., Paldam 2002a).

In summary, existing theories provide different views on what to expect from the cross-country structure of the CS-scores. The resulting predictions will be analyzed in the rest of the paper.

<sup>17</sup>These trends are documented in Paldam (2009). On the Latin American continent there is also some convergence, while the African countries diverge, though not as much as they do to the rest of the world.

<sup>18</sup>The classification used is the one of the WDI (2010). It is also used in Huntington (1996), who provides an elaborate justification. It is straightforward except in a few cases mentioned in Table A.1. Experiments were undertaken with a classification based on the colonial experience and hence legal systems of countries. If used as an alternative, they have less explanatory power. If added, they improve the explanations marginally. These results are not included to save space.

**Fig. 3** The relation between all CS-scores and income. Note: The six country groups are listed in Table A.1. The regression line “explaining” the scores with income is estimated as regression (1a) in Table 5. The C-curves for the two extreme points marked with the  $\times$ 's are shown on Fig. 4



#### 4 The pattern in the CS-scores: correlations and long-run causality

This section first looks at the distribution of the CS-scores as a scatter over income. The analysis shows that (F1) the CS-score has a significant positive correlation to income. Then the development over the 15-year span for the data is considered. Finally, we conduct a long-run causality test to show that income is causal to the CS-score. In the long run the CS-score has a transition to capitalism.

##### 4.1 The distribution of the 200 CS-scores

The distribution of the CS-scores is displayed as a scatter over income in Fig. 3. The source of the purchasing-power adjusted average income numbers (GDP per capita) is Maddison (2003), as updated on the Maddison home page (2010), supplemented by a few countries using the WDI (2010) data set. It includes the six groups listed in Table A.1. Also, two extreme countries are singled out by an  $\times$ . They are further analyzed in Fig. 4.

Two observations follow from Fig. 3: (1) The regression line covers about one third of the range of the data and the correlation between income and the CS-score is 0.41; and (2) the CS-data scatter a lot around the line, and the West sticks out as the group of countries with the strongest support for capitalism. The average curve shown is estimated in regression (1a) in Table 5. It shows that the CS-score increases by 8.25 for each  $lp$  (logarithmic point), which corresponds to an increase in income by a factor 2.72. The full transition of four  $lp$  thus gives a CS-change of about 33 pp.<sup>19</sup>

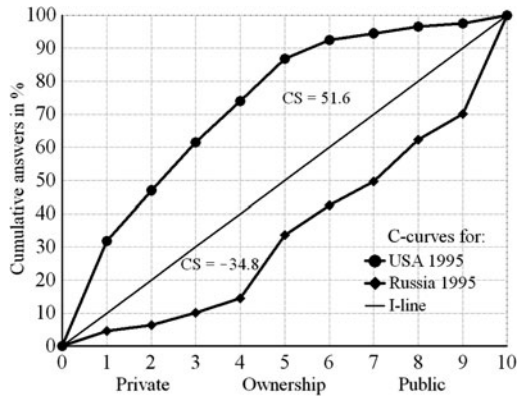
Observation (1) is contrary to Marxist analysis that predicts a negative correlation, but it is in accordance with both PoI and GT theory.<sup>20</sup> To distinguish between these theories, an analysis of long-run causality is needed; this analysis follows in Sect. 4.4.

Figure 4 shows the C-curves behind two of the most extreme CS-scores: The US and Russia, which were the main powers in the Cold War and thus the countries which most

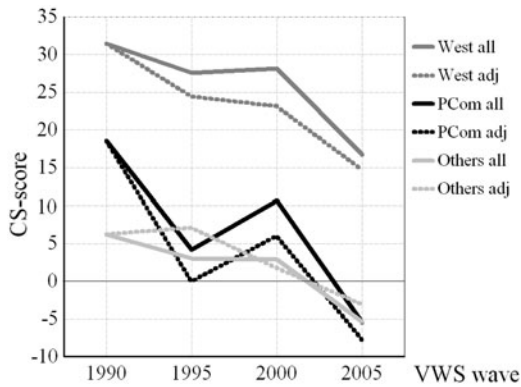
<sup>19</sup>It should be added that the linearity of the average curve is debatable. It appears that from 6 to 8 on the income axis there is no clear slope. So perhaps the average curve is a traditional transition curve that is flat and around zero at the start and then rises to about 25 at the income high end.

<sup>20</sup>If the 200 observations are divided into *West* (55), *PCom* (57) and *Others* (88), the correlations within the groups between income and the CS-scores are 0.25, 0.11 and 0.09 respectively. This indicates that the within-group correlation is smaller than the between-group correlation, as will be further discussed below.

**Fig. 4** The C-curves for two extreme CS-scores. Note: The CS-scores for the two countries are marked with an x on Fig. 3



**Fig. 5** The path over time for the CS-score, divided in three groups. Note: The groups are defined in Table A.1. *Unbroken lines* are all available observations. They may suffer from selection bias. The *broken lines* are started from the average in 1990. The figure for 1995 is then reached by adding all the available first differences 1990/1995. The figure for 2000 is then reached by adding all first differences 1995/2000, etc.



aggressively defended capitalism and socialism. The two extreme scores are from 1995, well after the end of that ‘war’, but they still show the range of 85 pp. It is reassuring that the two CS-scores differ as much as they do.<sup>21</sup>

4.2 The development over time for three groups

The years around 1990 saw the system change from socialism to capitalism in 29 countries.<sup>22</sup> Consequently, 1990 was probably a year with above-equilibrium CS-scores in much of the world. The 92 countries are divided in three groups: *West*, *PCom* and *Others*.

Figure 5 reports two curves for each group: one for *all* observations and one adjusted for sample consistency, as explained in the note. The deviation between the two lines points to selection bias in the data, yet it is reassuring that the curve-pairs are fairly similar for all three groups. Three observations follow from Fig. 5. Firstly, the CS-score falls throughout the period in all three groups, on average by about 16 points. Even if 1990 was an unusual

<sup>21</sup>The US-score of 52% supports the argument in Sect 3.1 that people treat the item as a question about levels. It would appear impossible that so many Americans want the country to privatize more than what is already private, though a few state-run enterprises do exist.

<sup>22</sup>The VWS-data cover 23 of these countries. In 1989 the *Socialist Bloc* of countries ruled by the Communist Party consisted of 17 countries, divided into various groups. These countries are now split into 36 countries, of which 2–3 have remained socialist.

**Table 3** Binominal trend tests

	5 years			10 years			15 years
From	1990	1995	2000	1900	1995	1990	All
To	1995	2000	2005	2000	2005	2005	
Possible	30	33	27	30	28	20	168
a. Increase	8	15	7	11	4	2	47
b. decrease	22	18	20	19	24	18	121
Net: a–b	–14	–3	–13	–8	–20	–16	–74
Test 2-sided	1.6%	72.8%	1.9%	26.5%	20.0%	0.0%	0.0%
Result	Fall		Fall			Fall	Fall

Note: *Possible* are the cases where both observations for both waves are available

year, the shift toward socialism is still substantial. Secondly, the *West* differs by being much more pro-capitalist than other country groups, just as on Fig. 3.

Thirdly, the *PCom* countries are close to other non-Western countries, but show the cyclicity intuitively predicted in Sect. 3.3. People in these countries badly wanted a capitalist system in 1990, but the costs of the system change proved unexpectedly high.<sup>23</sup> Thus, it is no wonder that capitalism had become less popular by 1995, but increased again as the new economic systems stabilized. However, for unknown reasons the trend once again turned down between 2000 and 2005 in line with the global pattern.

This picture is reconfirmed in Table 3, which contains a distribution free test for the significance of trends in the CS-score over time. It appears that the fall from 1990 to 1995 is significant, while there is no significant movement from 1995 to 2000. The fall from 2000 to 2005 is significant as well. This corresponds to the cyclicity expected from the argument in Sect. 3.3.<sup>24</sup>

#### 4.3 A method to analyze long-run causality

Economists chase causality, and the chase often starts from an observed correlation, such as the one between income and the CS-score. If long-run causality can be established, it would shed some light on the big discussions surveyed in Sect. 3. Also, it is needed for sorting out the causality in Sect. 5.

Non-marginal changes in the ownership system are rare, and in some countries, such as the US, there have been none. Most West European countries saw a change out of feudalism in the first half of the 19<sup>th</sup> century, but the CS-score is not formulated to catch that change.

<sup>23</sup>Two additional points should be made: The implementation of mass privatization is a very difficult process, which in most countries passed through a period of unclear property rights where former state property changed hands in murky ways. The expected life span at birth in post-communist countries is only around 70 years, so five years is 7% of the life span. Thus, cohort effects may explain some of the changes. We do not believe it is important for the movements observed, but to sort out opinions changes from cohort effects would need a long-run study of the micro data.

<sup>24</sup>It is worth mentioning that Bjørnskov and Paldam (2010) find that the average estimates for the fixed effects controlling for waves are 3.55, 0, –3.75 and –14.53, for W1990, . . . , W2005, where W1995 is chosen as basis. This pattern does not look very much like the pattern of Fig. 5, so it is clear that the fixed effects are strongly affected by the skewed country selection across waves.

So we are dealing with a variable that may have deep roots. Thus, instruments that are exogenous with a long horizon are needed.

Consequently, the test in Sect. 4.4 uses a method developed in Gundlach and Paldam (2009). The reader is referred to that source for a comprehensive discussion. The present section presents a short summary of the argument for new readers:

The method compares two parallel cross-country regressions. One is a simple OLS, and the other is an IV estimate using an extreme set of DP-instruments (for Development Potential). That is, they try to catch the nature-given Development Potential of countries. Table A.2 documents these variables. Most are collected by Hibbs and Olsson (2004) in accordance with Diamond (1997), who provides a set of highly suggestive ideas about the development potential of countries and how development spreads.

The DP-variables are biological or geographical. The biological variables are counts of the number of domesticable animals (*animals*) and arable plants (*plants*). The geographical variables proxy for climate (*climate*, *frost*) and ease of communication (*axis*, *coast*, *size*). Malaria prevalence is covered by *maleco*. The variables are entered mostly as averages (*bioavg*, *geoavg*) and—in our main model version—as principal components (*biofpc*, *geofpc*).

These instruments are time-invariant, so the average CS-score for each country is used as the explained variable. The DP-instruments are available only for 57 to 83 of the 92 countries, but we believe that they are truly exogenous. They allow us to make two versions of the two estimates, where income is  $y$ :

- A. Causality:  $y \Rightarrow CS$ . It considers two estimates of  $\partial CS/\partial y$ . (1a) the OLS estimate and (2a) the IV estimate using a handful of combinations of the DP-variables. This is the main section of Table 4.
- B. Causality:  $CS \Rightarrow y$ . It considers two estimates of  $\partial y/\partial CS$ . (1b) the OLS estimate and (2b) the IV estimate using a handful of combinations of the DP-variables. This is the bottom section of Table 4. It just shows that the instruments fail, as instruments that are valid under A should.

Obviously A and B cannot both work, so both are calculated to see which one is best. The theory of the DP-variables predicts that A is the superior estimate, as indeed it is. If the conditions of the IV-estimate are fulfilled, so that the instruments are valid and strong,<sup>25</sup> and the coefficient on income is significant, it has been proved that there is causality from income to the CS-score. A further point to observe is if the two estimates (1a) and (2a) of  $\partial CS/\partial y$  are the same. This is tested by the Hausman C-test. If they are, income explains the full correlation between the two variables. If they differ, something else is going on as well.

#### 4.4 The test results: causality from income to the CS-score<sup>26</sup>

The test works in case A though some of the CD tests (for Cragg-Donald) are on the borderline. Fortunately, the CD-test rejects the instruments (as it should) in case B. Thus, causality in the long run from income to the CS-score is accepted.

The results have a specific feature: They show that instrumented income in the IV-regressions explains the cross-country pattern in the CS-score better than the current income

<sup>25</sup>Formally the term *strong* is short for the *rejection of weak instruments*.

<sup>26</sup>In regression (1) the four overseas western countries are treated as they were in Neolithic times. In regression (2) they are treated as transferred West European countries. It is reassuring that it does not matter.



**Table 4** The long-run causality between income and the CS-score. The CS-score explained is the average of the available observations for each country

	Test of causality from income, $y$ , to the CS-score				
	Main model	Robustness of model to instrument variation			
Dependent variable: $CS_t$	(1)	(2)	(3)	(4)	(5)
No. of obs. (countries) $N$	57	62	57	57	83
	OLS estimates				
<i>Initial income (for 1995)</i> <sup>a</sup>	<b>5.25</b> (2.5)	<b>6.70</b> (3.4)	<b>5.25</b> (2.5)	<b>5.30</b> (1.8)	<b>7.39</b> (4.0)
Centered $R^2$	0.102	0.110	0.102	0.102	0.156
	IV estimates: $y$ is instrumented				
<i>Initial income (for 1995)</i>	<b>11.36</b> (3.1)	<b>10.43</b> (3.6)	<b>8.78</b> (2.6)	<b>5.25</b> (2.5)	<b>8.85</b> (3.2)
Instruments	<i>biofpc,</i> <i>geofpc</i>	<i>bioavg,</i> <i>geoavg</i>	<i>animals,</i> <i>plants</i>	<i>axis, size,</i> <i>climate</i>	<i>coast, frost,</i> <i>maleco</i>
	Hausman test for parameter consistency of OLS and IV estimate				
C-statistic ( $p$ -value)	<b>0.03</b>	<b>0.07</b>	0.18	0.98	0.47
	Tests of validity of the IV-procedure				
First stage partial $R^2$	0.360	0.483	0.378	0.493	0.448
Sargan test ( $p$ -value)	0.76	0.75	<b>0.07</b>	<b>0.10</b>	0.37
	Cragg-Donald test for the strength of the instruments in the IV estimate				
Presumed causality: $y \Rightarrow CS$	<b>15.19</b>	<b>27.61</b>	<b>16.42</b>	<b>17.17</b>	<b>21.41</b>
CD critical value (10% test size)	19.93	19.93	19.93	22.30	22.30
	Cragg-Donald test for the reverse causality analysis				
Reverse causality: $CS \Rightarrow y$	5.65	6.77	5.30	2.50	3.73

Notes: Parentheses hold  $t$ -tests. Significant coefficients (at the 5% level) are bolded. Borderline significant coefficients (at the 10% level) are in bold and italics. The same is done to the test results. All specifications include a constant term (not reported). A Cragg-Donald (CD) statistic *above* the critical value indicates strong instruments. Significance (above the 10% test size) are bolded, while borderline (above the 15% test size) are in bold and italics. The Sargan test for overidentification tests the joint null hypothesis that the instruments are valid and correctly excluded from the estimated equation

<sup>a</sup>Coefficient estimates in this line differ due to sample only

in the OLS-estimate in the two preferred regressions. The average IV estimate is 8.9, and the OLS estimate is 6.0. The difference is significant only in two of five cases, so it may a priori seem dubious. However, those two cases are the exact cases in which the Sargan test is clearly passed, while two other cases indicate clear identification problems, and the valid IV estimates are roughly 50–100% larger than the OLS estimates. As a minimum, it suggests that in addition to the long-run transition, other factors may operate in the short to medium run, or it may be due to two-way causality. The difference between causality in the medium run and very long run also applies to associations between income and other measures of institutions and basic political beliefs and values.<sup>27</sup>

<sup>27</sup>Some examples are found in Paldam and Gundlach (2008) and Gundlach and Paldam (2009). It is also studied in Inglehart and Baker (2000), and other studies of Inglehart, which argue that after the ‘hard’ materialist values in the countries that strive to be rich follow ‘softer’ post-materialist values in old wealthy countries. This might be interpreted to mean that there should be a downward bend in the support for the ‘hard’ system of capitalism in the wealthiest countries—this is not confirmed by the CS-data.



## 5 The multivariate analysis

We now turn to the short- to medium-run regression explaining the CS-score: This analysis holds more immediate political implications. Section 5.1 explains the data used in the medium-run analysis, and Sect. 5.2 covers the techniques used. Sections 5.3 and 5.4 report the regressions. Section 5.5 interprets the findings as regards (F1) income and (F4) cultures. Section 5.6 (F2) discusses the effects of institutions, while Sect. 5.7 considers the relation to (F3) other ideology. The tables of this section are estimated in a number of versions reported in Bjørnskov and Paldam (2010), covering three types of variation: (a) additional country divisions as listed in Table A.1; (b) additional combinations of the variables; (c) the robustness of the results correcting standard errors for the interdependence generated by the panel structure. The results reported below are the ones found to be robust, by the additional calculations as well.

### 5.1 The variables used in ‘explaining’ the CS-score

As mentioned in Sect. 3, the explanatory variables are from five types of factors:

(F1) Development is operationalized as *income*,  $y$ , which is the natural logarithm of purchasing-power adjusted GDP per capita. As before, the source is Maddison (2003) as updated on the Maddison home page (2010).

(F2) The economic freedom data are entered as six institutional variables. They are developed and published by the Fraser Institute (Gwartney et al. 2009). The five indices are rescaled to be distributed on a 1–10 scale: C1 measures the size of government (consumption, subsidies, enterprises and taxation); C2 the quality of the legal system; C3 the stability and predictability of monetary policy (sound money); C4 the freedom to trade internationally; and C5 freedom from regulations in credit, labor and commodities markets. Two alternatives to C4 are used: The aggregate trade share from the WDI (2010),<sup>28</sup> and the KOF index of economic globalization (see Dreher 2006).

(F3) The relation of the CS-score to other measures of ideology is analyzed by adding one of two measures, LR5 and LR20, of political orientation on a left to right scale. These data are averages of the government ideology index from Bjørnskov (2008) to which we refer for full details. The index is calculated by assigning political parties to three categories, left = -1, center = 0, and right = 1,<sup>29</sup> and weighing the ideology of the government parties with their number of seats in parliament. LR5 is an average over each five-year period, while LR20 is the average of government ideology in the preceding 20 years before an observation. LR20 is taken to be a proxy for the ideological orientation of the median voter.

For (F4), we enter fixed effects for the cultures of country groups listed in Table A.1. In addition fixed effects for waves are used. Both sets of fixed effects sum to 1, so that either of them replaces the constant.

### 5.2 The regression technique: pooled OLS and panel corrected standard errors

The 200 CS-data comprise a panel structure of 92 countries and four waves. Tables A.3 and A.4 show how the 200 observations are distributed over the panel: 29 countries have

<sup>28</sup>It is the sum of exports and imports of goods and services relative to GDP.

<sup>29</sup>The scale is from -1 for a fully socialist party to +1 for a (European) liberalist party. The LR-index is an uncertain assessment in some countries, and it has problems when used in cross-country regressions, so it is a measure of ideology with considerable measurement error. However, it is taken for granted at present.

only one observation; 33 countries have two observations, of which 19 are consecutive; 15 countries have three observations, of which eight are consecutive; only 15 countries have observations for all four waves, so the panel structure is barely usable.

Table 4 used country averages for the CS-score. Here  $N$  was in the interval from 57 to 83. Table 5 uses explanatory variables that are available for all 200 observations. Tables 6 and 8 include other variables that are available for fewer countries and periods—typically between 120 and 170—further eroding the panel structure. Therefore it was decided to disregard the panel structure and use pooled OLS. As a further control, panel-corrected standard errors (Beck and Katz 1995) are used in Tables 6 to 8. They are compared with the corresponding

**Table 5** CS-scores explained by income, culture and WVS-waves

Included	Income		Country clubs			Both income and country clubs		
	(1a)	(1c)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)
Income	<b>8.25</b> (6.1)	<b>8.25</b> (6.1)				<b>3.13</b> (3.4)	<b>2.94</b> (13.1)	<b>5.81</b> (4.4)
Africa			7.18 (1.3)			-11.79 (-1.5)		
Asia			2.56 (0.7)			<b>-22.19</b> (-2.7)	<b>-18.23</b> (-5.3)	<b>-14.71</b> (-4.1)
LaAm			-2.48 (-0.7)		<b>-8.88</b> (-2.6)	<b>-28.52</b> (-3.4)	<b>-24.81</b> (-6.8)	<b>-21.76</b> (-5.8)
Mena			-5.91 (-1.2)		<b>-12.00</b> (-2.8)	<b>-29.27</b> (-3.5)	<b>-25.31</b> (-5.7)	<b>-20.96</b> (-4.4)
PCom			<b>5.67</b> (2.0)	<b>6.97</b> (3.0)		<b>-19.43</b> (-2.5)	<b>-15.69</b> (-5.5)	<b>-11.88</b> (-3.8)
West			<b>24.33</b> (7.6)	<b>25.70</b> (9.9)	<b>18.31</b> (6.8)	-4.29 (-0.5)		
W1990	<b>9.13</b> (2.4)	<b>-54.07</b> (-4.3)	<b>8.48</b> (2.4)	<b>7.52</b> (2.5)	<b>13.99</b> (4.9)	<b>5.87</b> (1.7)		<b>-24.48</b> (-1.9)
W1995		<b>-63.20</b> (-5.3)			<b>6.76</b> (2.7)			<b>-30.33</b> (-2.4)
W2000	2.69 (0.8)	<b>-60.51</b> (-5.0)	3.85 (1.2)		<b>9.16</b> (3.8)	1.58 (0.5)		<b>-28.56</b> (-2.3)
W2005	<b>-9.69</b> (-2.7)	<b>-72.89</b> (-6.0)	<b>-7.12</b> (-2.1)	<b>-7.29</b> (-2.9)		<b>-10.20</b> (-3.0)	<b>-13.33</b> (-4.8)	<b>-40.88</b> (-3.3)
Constant	<b>-63.20</b> (-5.3)							
$N$	200	200	200	200	200	200	200	200
Adj $R^2$	0.250 <sup>a</sup>	0.384	0.453	0.446	0.464	0.482	0.477	0.492

Note: See notes to Table 4. The variables are defined in Sect. 5.1. Adj  $R^2$  is the  $R^2$  adjusted for degrees of freedom. All regressions have F-scores below the 0.005 level. Both the fixed effects for country groups and for waves sum to 1, so when either is included the constant is excluded. The gray areas show the excluded variables. Regressions (1a), (2a) and (3a) are the starting ones. They are modified in (2b) and (2c) by being tested down to significant coefficients only, and in (1c), (2c) and (3c) is a tested down version, which start with all country groups except the least significant

<sup>a</sup>In the corresponding column (#a) and with the four wave-dummies included

standard errors in the OLS estimates in Bjørnskov and Paldam (2010). Yet, due to the highly unbalanced nature of the panel, the differences are predictably small.

The discussion in Sect. 3.5 demonstrates that the fixed effects for country groups and income are correlated. Similarly, the analysis in Sect. 2.4 shows that the two sets of fixed effects are correlated. Both problems are indeed present in the data, so our regressions do suffer from a great deal of multicollinearity, as reported in the next two sections. To handle these problems, we present four tables that are fairly similar but use different combinations of the interacting variables. These tables are then jointly interpreted in Sects. 5.5 to 5.7.

### 5.3 Regressions with income and fixed effects for country groups and waves

Table 5 is a set of regressions using the three sets of variables available for all 200 polls. The table shows that income and clubs of countries have strong collinearity. The effect of income falls to less than half when relation (1a) and (3a) are compared, and the coefficients on the country club dummies change even more dramatically when (2a) and (3a) are compared. This means that the club coefficients also reflect the average income differences between the groups.

Table 5 shows that two of the clubs of countries, *Africa* and the *West*, can be replaced by income. In the additional regressions, the two groups prove very unstable. The coefficients on Africa and West are thus both fully explained by the relative income in the groups.

The coefficients on the remaining four country groups *Asia*, *LaAm*, *Mena* and *PCom* have negative coefficients, and they are rather stable as confirmed in Sect. 5.4 and discussed in Sect. 5.5.

Finally we note that the wave dummies interact quite strongly with the group dummies, giving unstable coefficients, precisely as expected from Sects. 2.4 and 4.2. This has caused us to exclude these fixed effects in the next section.

### 5.4 Regressions with income, fixed effects for country groups, institutions and ideology

Table 6 reports the results of estimating the effects on the CS-score of income, the Fraser Index components (the  $x$ 'es), and the two ideology variables; Table 7 replaces income and the constant with fixed effects for country groups; and Table 8 excludes the ideology variable, but includes both income and country groups. The country groups have higher Adj  $R^2$  values, but as shown in Table 5 this is largely an artifact of the way the  $R^2$  is defined. Tables 6 and 8 confirm that the CS-scores are positively associated with average income, as expected.

The tables show that less than half (2/5) of the coefficients on the five components of economic freedom are significant. The two most robust components are C2 (legal quality) and C4 (freedom to trade internationally), while the other components are less robust. The pattern in these effects is discussed in Sect. 5.6. The two variables for left/right ideology, *LR5* and *LR20*, always give positive coefficients and remain significant in Table 7. These findings are discussed in Sect. 5.7.

Table 5 suggested that explanations of the CS-score by either income or cultural dummies are similar. Table 8 combines the Fraser index variables, income and the cultural dummies. Here, income remains significant in most cases, although once again the size of the coefficient is cut roughly in half when the fixed effects for the country groups are included. This is not surprising since the cultural dummies take care of a substantial part of the between-group variation, and the remaining smaller coefficient on income in Table 8 essentially says that the within-group variation due to income, though significant, should not be overestimated

**Table 6** CS-scores explained by income, institutions and left-right variable

Fraser index component $x$	(C1) Government size	(C2) Legal quality	(C3) Sound money	(C4) Free to trade	(C5) No regulation	(F1) Aggregate
Left-right scale for 5-year average, $LR5$						
$x$	<b>-2.27</b> (-2.1)	<b>6.27</b> (5.1)	-0.01 (-0.0)	<b>-3.64</b> (-2.1)	-0.42 (-0.3)	-0.29 (-0.2)
$LR5$	2.57 (1.1)	1.94 (0.9)	0.41 (0.2)	0.41 (0.2)	0.08 (0.0)	0.21 (0.1)
<i>Income</i>	<b>7.10</b> (3.6)	-0.57 (-0.2)	<b>7.99</b> (3.4)	<b>11.10</b> (4.3)	<b>8.31</b> (3.9)	<b>8.23</b> (3.2)
<i>Constant</i>	<b>-39.78</b> (-2.0)	-25.29 (-1.3)	<b>-60.06</b> (-3.3)	<b>-62.74</b> (-3.5)	<b>-60.30</b> (-3.4)	<b>-60.26</b> (-3.4)
$N$	161	161	161	160	162	160
Adj $R^2$	0.161	0.244	0.136	0.160	0.136	0.136
Left-right scale for 20-year average, $LR20$						
$x$	<b>-2.36</b> (-1.7)	<b>6.44</b> (5.2)	-0.11 (-0.1)	-2.92 (-1.2)	1.97 (1.2)	1.04 (0.4)
$LR20$	<b>5.35</b> (1.7)	2.12 (0.7)	2.02 (0.7)	1.18 (0.4)	0.80 (0.3)	1.27 (0.4)
<i>Income</i>	<b>4.91</b> (2.1)	-2.42 (-0.9)	<b>5.98</b> (2.2)	<b>8.52</b> (2.5)	<b>4.84</b> (1.9)	<b>5.25</b> (1.8)
<i>Constant</i>	-20.87 (-0.9)	-11.86 (-0.6)	<b>-43.23</b> (-2.0)	<b>-46.33</b> (-2.2)	<b>-46.01</b> (-2.3)	<b>-44.38</b> (-2.2)
$N$	122	121	122	122	122	121
Adj $R^2$	0.111	0.221	0.089	0.101	0.098	0.090

Note: See notes to Fig. 5. All regressions have Wald  $\chi^2(7)$  values above the 0.00 pr. The standard deviations in the table are corrected for the panel structure by the Beck-Katz estimator

in the short to medium run. Table 8 confirms the pattern of the coefficients on the country group fixed effects from Table 5, and notably that Africa and West become insignificant when income is included.

### 5.5 Interpretation: the effects of (F1) development and (F4) culture

Section 4.4 showed that income has a strong long-run causal effect on the CS-score: when income raises so does the CS-score. When the country groups are disregarded the long-run effect dominates and produces precisely the same coefficient as did the long-run income effect, with one interesting exception: The *legal quality* variable, which is further discussed in Sect. 5.6, can replace income.

As there is a large difference in the average income of the groups, about half the income effect can be replaced by the between-group variation. For two of the groups, Africa and West, the full effect is an income effect, so that they are very significant without income in the regression, but insignificant when income is included.

The fact that the high CS-scores of the West seem to be due to the high income of the West is interesting for three reasons: (1) It confirms the argument in Sect. 2.3 that the CS-score is a preference for a level of property rights; (2) It contrasts to the West-is-different story presented by de Soto (2000).<sup>30</sup> This point will be further discussed in Sect. 5.6; (3) The

<sup>30</sup>The analysis of de Soto shows that the legal framework for ownership of capital is unavailable to most people in the LDC world, limiting capitalism to the small-scale, non-formal businesses sector. This tallies

**Table 7** CS-scores explained by culture, institutions and left-right variable

Fraser index component size	(C1) Government	(C2) Legal quality	(C3) Sound money	(C4) Free to trade	(C5) No regulation	(FI) Aggregate
Left-right scale with 5-year average, <i>LR5</i>						
<i>x</i>	-0.17 (-0.1)	<b>2.35</b> (1.8)	<b>-1.44</b> (-2.2)	<b>-3.89</b> (-3.0)	<b>-2.31</b> (-1.9)	<b>-2.80</b> (-1.8)
<i>LR5</i>	3.07 (1.5)	2.48 (1.2)	3.03 (1.5)	<b>3.87</b> (1.8)	<b>3.40</b> (1.7)	<b>3.53</b> (1.7)
<i>Africa</i>	<b>-14.58</b> (-2.6)	-7.10 (-1.0)	<b>-17.97</b> (-3.1)	<b>-22.21</b> (-3.54)	<b>-15.82</b> (-2.9)	<b>-18.49</b> (-3.2)
<i>Asia</i>	<b>-24.37</b> (-6.2)	<b>-19.01</b> (-4.7)	<b>-26.54</b> (-7.0)	<b>-29.53</b> (-7.8)	<b>-26.53</b> (-7.1)	<b>-27.26</b> (-7.2)
<i>LaAm</i>	<b>-30.68</b> (-7.1)	<b>-23.76</b> (-4.6)	<b>-35.32</b> (-9.1)	<b>-35.46</b> (-9.1)	<b>-32.81</b> (-9.2)	<b>-34.42</b> (-8.8)
<i>Mena</i>	<b>-29.30</b> (-6.1)	<b>-23.40</b> (-4.3)	<b>-32.95</b> (-7.1)	<b>-35.47</b> (-7.0)	<b>-33.07</b> (-6.8)	<b>-33.27</b> (-6.8)
<i>PCom</i>	<b>-18.72</b> (-4.3)	<b>-11.46</b> (-2.3)	<b>-23.68</b> (-5.1)	<b>-22.84</b> (-5.3)	<b>-21.49</b> (-4.7)	<b>-23.63</b> (-5.0)
<i>West</i>	<b>27.46</b> (4.5)	6.91 (0.6)	<b>39.78</b> (6.3)	<b>56.60</b> (5.6)	<b>41.96</b> (5.1)	<b>47.23</b> (4.2)
<i>N</i>	161	161	161	160	162	160
Adj <i>R</i> <sup>2</sup>	0.362	0.366	0.380	0.395	0.365	0.374
Left-right scale with 20-year average, <i>LR20</i>						
<i>x</i>	0.40 (0.3)	1.17 (0.7)	<b>-2.12</b> (-2.6)	<b>-4.40</b> (-2.4)	-2.28 (-1.4)	<b>-4.23</b> (-2.1)
<i>LR20</i>	<b>5.98</b> (1.9)	<b>5.53</b> (1.9)	<b>7.40</b> (2.6)	<b>7.70</b> (2.6)	<b>8.02</b> (2.7)	<b>8.62</b> (2.9)
<i>Africa</i>	<b>-13.45</b> (-2.4)	-9.44 (-1.2)	<b>-18.41</b> (-3.0)	<b>-22.79</b> (-3.1)	<b>-15.00</b> (-2.7)	<b>-19.89</b> (-3.1)
<i>Asia</i>	<b>-22.65</b> (-5.2)	<b>-19.56</b> (-3.8)	<b>-26.07</b> (-5.8)	<b>-28.19</b> (-6.1)	<b>-25.31</b> (-5.2)	<b>-27.53</b> (-5.7)
<i>LaAm</i>	<b>-31.06</b> (-6.4)	<b>-26.30</b> (-3.6)	<b>-36.87</b> (-8.0)	<b>-35.88</b> (-7.6)	<b>-32.98</b> (-7.2)	<b>-36.52</b> (-7.3)
<i>Mena</i>	<b>-28.04</b> (-5.4)	<b>-24.33</b> (-3.6)	<b>-32.93</b> (-6.4)	<b>-34.64</b> (-5.8)	-32.23 (-5.3)	<b>-34.25</b> (-5.8)
<i>PCom</i>	<b>-13.73</b> (-2.4)	-10.54 (-1.5)	<b>-21.59</b> (-3.6)	<b>-17.98</b> (-3.2)	<b>-17.82</b> (-3.0)	<b>-21.41</b> (-3.5)
<i>West</i>	<b>22.57</b> (2.7)	14.60 (0.9)	<b>44.81</b> (5.6)	<b>59.38</b> (4.0)	<b>40.82</b> (3.3)	<b>57.17</b> (3.6)
<i>N</i>	122	121	122	121	122	121
Adj <i>R</i> <sup>2</sup>	0.336	0.338	0.371	0.371	0.345	0.358

Note: See notes to Table 5. All regressions have Wald  $\chi^2(6)$  values above the 0.00 probability level. The standard deviations in the table are corrected for the panel structure by the Beck-Katz estimator

West is the best example of a *convergence club* of countries that have achieved much the same standard of living;<sup>31</sup> and globalization has historically been particularly strong within the Western group. This has caused the CS-scores to cluster as well—as is very visible on Fig. 3.

The four groups, Asia, LaAm, Mena and PCom, have much the same average income and also much the same CS-score. Two of the groups, Asia and PCom, are heterogeneous groups and have unstable coefficients. This is further confirmed by the set of experiments

with the low CS-scores found in many LDCs, and with the positive effect on the CS-score of legal quality discussed in Sect. 5.6 below.

<sup>31</sup>Using the measure of  $\sigma$ -convergence (defined as the standard deviation to ln GDP per capita), the coefficient of convergence has fallen from 0.5 to 0.2 in the period from 1950 to 2005 in the West, while the coefficient has remained well over 0.5 for the other clubs of countries by the authors' calculations based on the Maddison data set (Maddison home page 2010).

**Table 8** CS-scores explained by institutions, income and culture

Fraser index component $x$	(C1) Government size	(C2) Legal quality	(C3) Sound money	(C4) Free to trade	(C5) No regulation	(FI) Aggregate
$x$	0.94 (0.9)	<b>2.94</b> (2.4)	<b>-1.12</b> (-1.7)	<b>-4.48</b> (-3.4)	<b>-1.83</b> (-1.6)	-1.71 (-1.1)
<i>Income</i>	3.31 (1.4)	0.57 (0.2)	<b>5.07</b> (1.9)	<b>7.28</b> (3.0)	<b>5.17</b> (2.0)	<b>4.71</b> (1.7)
<i>Africa</i>	-10.19 (-1.3)	-6.52 (-0.8)	-8.39 (-1.1)	-8.94 (-1.2)	-6.28 (-0.8)	-9.01 (-1.1)
<i>Asia</i>	<b>-21.54</b> (-5.4)	<b>-16.88</b> (-4.5)	<b>-19.80</b> (-5.6)	<b>-20.83</b> (-5.9)	<b>-19.63</b> (-5.6)	<b>-20.29</b> (-5.7)
<i>LaAm</i>	<b>-27.93</b> (-5.7)	<b>-20.61</b> (-4.6)	<b>-27.44</b> (-6.6)	<b>-26.84</b> (-6.6)	<b>-25.39</b> (-6.1)	<b>-26.52</b> (-6.4)
<i>Mena</i>	<b>-26.01</b> (-4.5)	<b>-21.03</b> (-3.6)	<b>-24.87</b> (-4.6)	<b>-25.90</b> (-4.6)	<b>-24.88</b> (-4.4)	<b>-25.02</b> (-4.6)
<i>PCom</i>	<b>-15.67</b> (-3.4)	<b>-11.47</b> (-2.4)	<b>-17.19</b> (-3.7)	<b>-16.40</b> (-3.6)	<b>-16.23</b> (-3.5)	<b>-18.03</b> (-3.7)
<i>West</i>	-10.11 (-0.4)	-3.18 (-0.1)	-12.38 (-0.5)	-9.47 (-0.4)	-11.39 (-0.5)	-6.45 (-0.3)
$N$	174	174	178	173	177	173
Adj $R^2$	0.347	0.357	0.349	0.381	0.343	0.348

Note: See notes to Table 5. All regressions have Wald  $\chi^2(6)$  values above the 0.00 probability level. The standard deviations in the table are corrected for the panel structure by the Beck-Katz estimator

with divisions into subgroups reported in Bjørnskov and Paldam (2010). For the Asian group, it appears that the ATigers are already much like the countries in the West. The PCom countries, the countries that are closest in income and geography to the West, are already close to the West in CS-scores as well, while others scatter considerably.

The last two groups, LaAm and Mena, have consistently negative CS-scores—also when dubious members of the groups are deleted. In particular, it is amazing to see the change to socialism in Argentina and Peru, and the support for socialism in Chile that is the main showcase for capitalism in Latin America.

## 5.6 Interpretation: the effects of (F2) institutions

We now discuss the five  $x$ -rows in Tables 6 to 8 that provide estimates of the correlation between the CS-score and the components of the Fraser Index. The results are not independent as they are estimated on the same data with variants of the same model, so the five estimates of each coefficient provide a weak test of robustness. Even then only two of the six variables yield cross-estimate stability: It is C2 and C4.

*Legal quality* (C2) has positive signs, even though it is highly collinear with income: It even appears that legal quality is a slightly better predictor than income. However, due to the causality test in Sect. 4.4, we know that in the long run income probably dominates.

Consequently our interpretation is that legal quality rises strongly with income, and to the extent that the effect of the *legal quality* differs from *income*, the two variables reinforce each other. The better the legal system, the more people support capitalism. In other words, people seem in general to prefer capitalism without illegal excesses, recognizing that capitalism generates wealth but may include the possibility of sanctioned ‘plunder’ without a proper institutional basis.<sup>32</sup>

<sup>32</sup>Firms may act as roving or stationary bandits. The second possibility is a fine engine of wealth creation, while the first is not. The path of the CS-score in the PCom countries on Fig. 5 illustrates this argument.

**Table 9** CS-scores explained by alternative measures of globalization, income and population

Column	Globalization measure					
	Fraser (C4)		KOF globalization index (2010)		Trade share	
	(1)	(2)	(3)	(4)	(5)	(6)
Globalization	<b>-3.41</b> (2.1)	<b>-3.51</b> (2.1)	-0.19 (1.4)	-0.15 (1.2)	-0.03 (1.2)	-0.03 (1.2)
Population		<b>1.58</b> (2.8)		<b>1.43</b> (2.3)		<b>1.23</b> (2.2)
Income	<b>11.18</b> (4.7)	<b>11.08</b> (4.5)	<b>11.54</b> (4.4)	<b>10.92</b> (4.2)	<b>9.01</b> (5.2)	<b>9.12</b> (5.2)
<i>N</i>	173	170	160	160	174	174
<i>R</i> <sup>2</sup>	0.170	0.197	0.166	0.189	0.162	0.182

Note: See notes to Table 5

This leads us once again to the analysis of de Soto (2000). He argues that the very reason capitalism works better in the West is that the politically independent legal system is geared to legalize business—also small business—instead of generating rents and preventing competition. As such, one would expect that improving the judicial foundations of private ownership systems would spur on development. However, the relatively low CS-scores suggest that political support for such reform may be missing in many middle income countries.<sup>33</sup>

Component C4 is a measure of globalization which generates a negative coefficient, indicating that more globalization is associated with less support for capitalism. Trade theory predicts that globalization has two consequences: countries get richer, but have to make adjustments in the composition of firms and even sectors. Consequently, one may see the negative sign as an indication that people like the status quo, or that the visibility of transition costs makes them more critical of capitalism. This finding tallies well with the persistence of popular support for tariffs and other trade regulations in spite of all advice by economists (cf. Fernandez and Rodrik 1991).

However, it is difficult to compile a valid globalization index, and the various attempts to compile a measure of globalization have produced a range of indices. We note that the Fraser Institute globalization index has been found problematic by some researchers, e.g., Berggren and Jordahl (2005). Table 9 therefore checks the stability of the globalization finding by employing the two alternative measures (see Sect. 5.1): The KOF-index and the trade share of GDP. All three estimates are controlled for *population* as proposed by Alesina et al. (2005) to account for the fact that foreign trade matters less in countries with large domestic markets. This control is always significant, but has little effect on the size of the coefficients on globalization. The results reveal that the negative association of the Fraser Institute globalization measure (C4) cannot be replicated using two obvious alternatives. While coefficients are negative, they are always insignificant. The association between globalization and the CS-score is not as strong as suggested by the Fraser Index (2010). Thus, it appears that the effect of globalization on the CS-score needs more research.

The last two components (C1 and C3) and the aggregate index yield unstable coefficients, though the negative coefficient on C3, sound money, proves stable but of uncertain signif-

<sup>33</sup>Two of the countries analyzed in de Soto (2000) are Egypt and Peru. Here the average CS-scores are -31.4 and -15.6. Legislators in such countries may get more popular by enacting laws and regulation against business than by making it easier to start and run a business.

icance. Thus, it appears that the higher the rate of inflation, the more people will accept capitalism. This appears debatable in view of other available evidence.<sup>34</sup>

### 5.7 Interpretation: (F3) the relation to other aspects of ideology

The ownership preference is a key part of left-right ideology, as measured by the two variables LR5 and LR20. They are scaled so that a positive LR-variable indicates a right-wing orientation, which should correspond to a preference for capitalism. Consequently, the LR-variables and the CS-score should be positively correlated.

The popularity of governments and oppositions change for many reasons, but if a country has more left than rightwing governments in the longer run, it must mean that the median voter in the country is left-leaning, and likewise for rightwing governments. Hence, LR5 reflects short-run variation in the popularity of government for many reasons, of which one is fluctuations in the LR-orientation, while LR20 is closer to the long-run political ideology of the populations.

Tables 6 and 7 include  $24 = 2 \times 12$  estimates of the connection between the LR-variables and the CS-score. The causality behind these estimates is not discussed. 10 of 24 estimates are significant, and the coefficients have a pattern with three interesting properties:

(P1) The 24 coefficients on the two LR-variables are all positive, so by a binominal sign test the sign of the connection is highly significant and positive as predicted. However, only ten are significant, so the size of the effect is not well identified. The next two properties appear when the same regressions are compared: (P2) The coefficients on LR20 are twice as large as those on LR5. (P3) The estimates in Table 7 are consistently larger than the ones in Table 6. As a consequence of (P2) and (P3), the best results are found for LR20 in Table 7 where all six estimates are significant.

The association between government ideology and the CS-score is not only statistically significant, but also of political significance. If a hypothetical country moves from a purely left ideology (a score of  $-100$ ) to a fully right ideology ( $+100$ ), this would, according to the estimates, shift the CS-score upward by 12–26 points (*ceteris paribus*). That corresponds to the distance between the average country and the level of Germany.

It is possible to try a great many additional explanatory variables for the CS-score, but since the CS-score is a new measure, we have concentrated on trying out the most obvious. By and large our tests have confirmed that the CS-score does measures what it should.

## 6 Conclusions

This paper has developed the CS-score, which measures the mass support for capitalism (positive scores) and socialism (negative scores). The CS-score is calculated from a World Values Survey (2010) item that has been polled 200 times in 92 countries in the survey waves from 1990 to 2005. It is likely that the data has substantial measurement error, but they still have a pattern. The introduction proposed that to explain the pattern we should look at four broad factors (F1) to (F4):

<sup>34</sup>The instability of the coefficient is consistent with the idea that high inflation makes people reject the system they have. See Paldam (1987) for evidence on this connection. Under this interpretation the coefficient should vary by the existent system, and hence not be stable for the CS-score. The greatest inflations in our data occurred in the PCOM countries at the stage where the economic system was rapidly changing. Also, of course, the traditional communist model had fixed prices. It was the availability of goods that varied.



(F1) Development: About half the variation is associated with the cross-country pattern of income. This is a clear transition in ideology, so that when income goes up it causes the preferences for capitalism to increase.

(F2) Institutions: The CS-score is positively associated with legal quality, which permits a capitalist system to work in a civilized way. In addition the data from the post-communist countries exhibit a characteristic cyclical path, most likely generated by high post-transition expectations, followed by disappointment, and then by convergence to the typical score in the West.

(F3) Ideology: The Left/Right orientation of countries has a rather strong correlation to the CS-score.

(F4) When countries are sorted into the main cultural groups, most of the income effect is between groups, not within groups.

When capitalism triumphed in 1990, the average CS-score was well above zero, indicating that most people favored capitalism. Since then it has fallen by 16 pp (percentage points) to just above zero. When the WVS-data for 2010 become available, it seems intuitively likely that the crisis of 2009 in the world economy will drive the average CS-score closer to neutrality.

A notable feature of the cross-country pattern is that the West stands out as the most capitalist-minded area of the world, with a clustering of CS-scores around +25. This appears to be due to the fact that the West has been relatively successful for the last three centuries and has reached an income level that is a great deal higher than most other regions of the world.

The pattern in the score has many political implications. One such implication is that it points to countries that are most likely to be able to form stable unions. Obviously it is easier if countries have the same basic economic ideology. Thus, the clustering of the West may be one reason why the European Union has managed to survive so far.

We are fully aware that the paper has not exhausted the possibilities for analyzing the relations between the preferences for capitalism/socialism and the economy, but hopefully we have shown that the field, which has seen so much speculation, is susceptible to empirical research.

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## Appendix: Documenting variables and results

**Table A.1** A classification of 92 countries into six clubs

<i>Variable</i>	<i>N</i>	Countries included
<i>Africa</i>	11	Sub Sahara Africa: Burkina Faso, Ethiopia, Ghana, Mali, Nigeria, Rwanda, Tanzania, South Africa, Uganda, Zambia, Zimbabwe. South Africa is special
<i>Mena</i>	8	Middle East and North Africa: Algeria, Egypt, Iran, Iraq, Jordan, Morocco, Saudi Arabia Turkey. Iran and Turkey are non-Arab

**Table A.1** (Continued)

Variable	N	Countries included
<i>Asia</i>	14	Asia excluding <i>Mena</i> and <i>PCom</i> : Bangladesh, China, India, Indonesia, Japan, Malaysia, Pakistan, Philippines, Thailand, Vietnam and five developed countries <i>ATigers</i> , Asian Tigers: Hong Kong, Japan, Singapore, South Korea, Taiwan
<i>LaAm</i>	12	Latin America: Argentina, Brazil, Chile, Colombia, Dominican R., El Salvador, Mexico, Peru, Puerto Rico, Trinidad, Venezuela, Uruguay
<i>PCom</i>	23	Post Communist <sup>a</sup> : Albania, Armenia, Azerbaijan, Belarus, Bosnia, Bulgaria, Croatia, Czech R., Estonia, Georgia, Hungary, Kyrgistan, Latvia, Lithuania, Macedonia, Moldova, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Ukraine
<i>West</i>	24	20 <i>Old West</i> : Andorra, Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Netherlands, New Zealand, Norway, Sweden, Switzerland, UK, Ulster, USA and 4 <i>Convergers</i> Cyprus, Malta, Portugal, Spain that are catching up

Note: The names and abbreviations *in italic* are used in the text. Figure 5 only shows West and PCom, while the other four groups are added to *Others*. All regressions with *Africa* have been run with and without South Africa, and all regressions with *Mena* have been run with and without *Iran* and *Turkey*

<sup>a</sup>Mostly in Eastern Europe. The club includes some Asian countries that used to be parts of the USSR

**Table A.2** Definitions and sources of the DP-variables used in Table 4

Biological variables	
<i>animals</i>	Number of domesticable big mammals, weighing more than 45 kilos, which are believed to have been present in prehistory in various regions of the world. Source: Olsson and Hibbs (2005).
<i>bioavg</i>	Average of <i>plants</i> and <i>animals</i> , where each variable was first normalized by dividing by its maximum value. Source: Hibbs and Olsson (2004).
<i>biofpc</i>	The first principal component of <i>plants</i> and <i>animals</i> . Source: Olsson and Hibbs (2005).
<i>maleco</i>	Measure of malaria ecology; combines climatic factors and biological properties of the regionally dominant malaria vector into an index of the stability of malaria transmission; the index is measured on a highly disaggregated sub-national level and then averaged for the entire country and weighted by population. Source: Kiszewski et al. (2004).
<i>plants</i>	Number of annual perennial wild grasses known to have existed in various regions of the world in prehistory, with a mean kernel weight exceeding 10 milligrams. Source: Olsson and Hibbs (2005).
Geographical variables	
<i>axis</i>	Relative East-West orientation of a country, measured as east-west distance (longitudinal degrees) divided by north-south distance (latitudinal degrees). Source: Olsson and Hibbs (2005).
<i>climate</i>	A ranking of climates according to how favorable they are to agriculture, based on the Köppen classification. Source: Olsson and Hibbs (2005).
<i>coast</i>	Proportion of land area within 100 km of the sea coast. Source: McArthur and Sachs (2001).
<i>frost</i>	Proportion of a country's land receiving five or more frost days in that country's winter, defined as December through February in the Northern hemisphere and June through August in the Southern hemisphere. Source: Masters and McMillan (2001).
<i>geoavg</i>	Average of <i>climate</i> , <i>lat</i> , and <i>axis</i> , where each variable was first normalized by dividing by its maximum value. Source: Hibbs and Olsson (2004).
<i>geofpc</i>	The first principal component of <i>climate</i> , <i>lat</i> , <i>axis</i> and <i>size</i> . Source: Olsson and Hibbs (2005).
<i>lat</i>	Distance from the equator as measured by the absolute value of country-specific latitude in degrees divided by 90 to place it on a [0,1] scale. Source: Hall and Jones (1999).
<i>size</i>	The size of the landmass to which the country belongs, in millions of square kilometers (a country may belong to Eurasia or it may be a small island). Source: Olsson and Hibbs (2005).

**Table A.3** The 200 observations and the 92 countries

	1990	1995	2000	2005		1990	1995	2000	2005		
1	Albania	42.4	36.7		47	Latvia	30.3	2.7			
2	Algeria		9.9		48	Lithuania	17.5	12.5	16.1		
3	Andorra			13.7	49	Macedonia		30.7	38.7		
4	Argentina	35.3	9.4	-3.5	-32.1	50	Malaysia			-4.5	
5	Armenia		-14.9		51	Mali				-12.0	
6	Australia		37.6		13.8	52	Malta	25.4			
7	Austria	45.9		46.3		53	Mexico	18.7	16.2	-0.2	-2.8
8	Azerbaijan		-1.5			54	Moldova		-29.9	-23.2	-9.7
9	Bangladesh		20.7	46.3		55	Morocco			19.2	3.4
10	Belarus	-9.2	-14.2	5.7		56	Netherlands	25.3		25.2	
11	Belgium	32.6				57	New Zealand		25.7		30.0
12	Bosnia		20.2	19.3		58	Nigeria	-16.3	-1.0		
13	Brazil	9.3	6.5		1.9	59	Norway	26.5	23.2		
14	Bulgaria	26.8	5.9		-6.4	60	Pakistan			10.9	
15	Burkina				9.9	61	Peru		-2.5	-21.1	-23.2
16	Canada	47.0		35.8		62	Philippines		-5.0	-20.2	
17	Chile	-8.8	-9.0	-8.9	-18.9	63	Poland	-6.5	-11.8	-9.3	-27.7
18	China	-31.5	-21.2	-28.6	-25.1	64	Portugal	27.8		18.6	
19	Colombia		-23.5		-18.0	65	Puerto Rico		7.2	23.3	
20	Croatia		49.1	30.7		66	Romania	18.2	26.7	24.8	16.4
21	Cyprus				8.6	67	Russia	-3.1	-34.8	-15.9	
22	Czech Re	40.4	5.1	17.5		68	Rwanda				1.6
23	Denmark	39.8				69	Saudi Arabia			-0.2	
24	Dom Re		-18.6			70	Serbia		8.0	23.3	1.7
25	Egypt			-26.1	-36.7	71	Singapore			6.1	
26	El Salvador		-13.5			72	Slovakia	15.1	-20.4		
27	Estonia	30.8	-2.7	-4.6		73	Slovenia	32.9	21.3		15.6
28	Ethiopia				27.8	74	South Africa	39.9	21.4	14.5	1.3
29	Finland	41.0	29.9	28.8	18.2	75	Spain	7.8	3.8	-0.8	1.6
30	France	26.1		32.6		76	Sweden	27.9	23.9		16.0
31	Georgia		-3.9			77	Switzerland		47.0		17.3
32	Germany	45.6	20.6	24.5	9.3	78	Taiwan		8.3		5.6
33	Ghana				-19.1	79	Tanzania			7.9	
34	Hong Kong				24.9	80	Thailand				-17.4
35	Hungary	29.7	9.4			81	Trinidad				2.9
36	Iceland	36.1		40.6		82	Turkey	-7.3	12.8	10.7	-8.7
37	India	5.0	11.2	-12.0	4.5	83	Uganda			42.8	
38	Indonesia			-7.9	-14.0	84	UK	15.1	12.7	16.0	
39	Iran			-3.5	-1.8	85	Ukraine		-8.0	5.6	-27.8
40	Iraq			-31.8	-34.9	86	Ulster	18.5		22.7	
41	Ireland	31.6		28.7		87	Uruguay		0.1		
42	Italy	26.0		30.8	13.5	88	USA	51.1	51.6	43.7	42.1
43	Japan	8.0	16.0	19.1	22.5	89	Venezuela		12.8	-3.0	
44	Jordan			-6.8	3.9	90	Vietnam			2.5	11.1
45	Korea, South	15.7	15.9	14.8	-0.8	91	Zambia				-12.7
46	Kyrgyzstan			-5.5		92	Zimbabwe			27.3	

**Table A.4** Summary of Table A.3

	Countries	W1990	W1995	W2000	W2005	All	
Number	92	42	53	57	48	200	
Average	9.24	21.14	8.15	11.14	−0.31	9.70	
St. dev	18.87	18.63	19.57	20.26	17.91	20.52	
St. error	1.33	2.87	2.69	2.68	2.58	1.45	
Median	8.68	26.06	8.34	14.54	1.67	10.30	
	Group	Subgroup	Ownership item included				
Africa	11		2	2	4	7	15
South Africa		1	1	1	1	1	4
Mena	8		1	1	8	6	16
Asia	14		4	7	10	10	31
ATigers		5	2	3	3	4	12
LaAm	12		4	11	5	7	27
PCom	23		12	22	16	7	57
West	24		19	10	14	11	54
Old West		20	16	9	12	10	47
Convergers		4	3	1	2	1	7

Note: The ‘All’ column gives the average and confidence interval  $9.70 \pm 2 \times 1.45$ . Both W1990 and W2005 deviate. The subgroups are shaded and not included in the sums in the “number” line of table

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