

Trust, Deep Trust, Productivity and Well-being in 136 Countries

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Abstract

The article explores the role of generalized or social trust (trust between strangers) in explaining cross-country differences in the level of productivity (output per worker) and in self-reported well-being for 136 countries. Trust is measured directly from survey data. In addition, a second trust variable called deep trust is estimated as a function of ancient cultural, historical, geographic, and linguistic factors.

Both trust variables have significant bivariate relationships with each of productivity and well-being, each of which can also be modelled with fairly standard specifications: an augmented production function for productivity, and the multi-variate model of well-being developed in the annual World Happiness Reports. Yet when either trust variable is added to each of the standard models, neither contributes any additional explanatory power.

So where is the bivariate significance of trust coming from? We find that, in every case, one or both of trust and deep trust is significant for the standard determinants of productivity, with deep trust doing better at predicting human capital, physical capital and institution quality, and actual trust being stronger for the well-being determinants. That is, trust in the 21st century appears to not directly contribute to productivity or well-being, but has a substantial effect working through the proximate determinants.

As so often, Adam Smith (1723-1790) said it first and probably best:

In civilised society [man] stands at all times in need of the co-operation and assistance of great multitudes, while his whole life is scarce sufficient to gain the friendship of a few persons. (Smith, 1776:22 [1998])

Why are the multitudes needed? Because of the division of labour, which in this period just before the Industrial Revolution was the prime source of prosperity (along with still-uncrowded land). Smith carries on to his more famous passage:

It is not from the benevolence of the butcher, the brewer, or the baker, that we expect our

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dinner, but from their regard to their own interest. We address ourselves, not to their humanity but to their self-love, and never talk to them of our own necessities but of their advantages.

(Smith, 1776:22 [1998])

But Adam Smith — a moral philosopher by trade — was well aware of the importance of 'humanity' to civilized life, including civilized economic life. All those strangers upon whom each 'man' depends: with no ties of kinship or friendship — well, what is to stop them cheating, robbing, neglecting, even injuring or killing the lonely butcher, etc, in the pursuit of their self-love?

At the least, the investments of time and capital to gain and equip the specialized skills of the chosen trade can make their possessor vulnerable to what we now call 'hold-up problems' — *ex post* revisions of the terms of trade when the specialist's outside options have been run down.

But Smith saw the possibility of something different. He was a prophet in both senses of the word. He foretold a new future, and he helped it come to pass by uncovering the guiding principles of modernity. People needed to learn how to behave properly with each other — in particular, with strangers. And this not — or mostly not — because of what we would now call altruism, and Smith called 'sympa-

thy', which he noted is generally restricted to family and friends. Rather, what we now call bourgeois life requires something quite different from self-regarding altruism:² other-regarding adherence to a moral code: the voluntary tempering of self-love in action so as not to harm others, in the overall interest of society as a whole.

In Smith's setting of the division of labour, each new partition of tasks in the cause of specialization and productivity necessarily requires a new 'transaction' — an exchange of a good or service for money, and, in practice, the terms of such exchanges, which may be contingent on uncertain events, can seldom be pinned down unambiguously in advance. Therefore, as Kenneth Arrow put it, in his typically mild way:

Virtually every commercial transaction has within itself an element of trust, certainly any transaction conducted over a period of time. It can be plausibly argued that much of the economic backwardness in the world can be explained by the lack of mutual confidence...³

(Arrow, 1972:357)

These brief sentences by a great modern economist can be taken as the first sign of a revival of interest in the 'soft' technologies of specialization and exchange, ne-

2 At least to economists, altruism is seen as someone else's well-being entering an agent's utility function: the agent obtains some of their own utility out of giving utility to others, and does so solely for this reason.

3 These two sentences are actually something of a throwaway digression in a paper subtly reviewing the sociologist Richard Titmuss's famous analysis of gift exchange and its commercial alternative in the matter of obtaining supplies of blood for medical use.

glected for the century and a half through which economics was dominated by the industrial revolution and its 'hard' technologies of substitution of physical capital for labour, as embodied by the late 1960s in the neoclassical production function and the Solow-Swan growth model.

Arrow's words contain the two key propositions which now drive empirical research on what we call generalized trust (trusting and trustworthiness between strangers): the idea that such trust is essential to economic life, and the prediction that follows, to the effect that differences in economic success across nations might therefore, at least partially, be explained by different endowments of generalized trust at the national level. We will in this article seek and identify the role of trust in accounting for the level of economic development, or prosperity, of countries, as manifested or proxied by the level of labour productivity.

A quite recent research program has added a broader concern for the well-being or 'happiness' of citizens, of which economic prosperity turns out to be an important part, but far from the whole. The annual *World Happiness Report (WHR)* uses the results of international personal surveys carried out by the Gallup organization. The report develops an empirical model to explain cross-country differences in average self-reported well-being in terms of six core factors, only one of which is per capita incomes — so, a 'production function' for well-being.

This article explores the role of generalized trust in supporting higher levels of economic development as well as levels of well-being, for a panel of recent annual data on

a cross section of 136 countries. Two measures of trust are tested: actual trust as reported in Gallup-style personal surveys; and what I will call 'deep trust'; being the value of actual trust predicted by a set of plausibly exogenous cultural and social factors. The results, which are quite striking, can be summarized as follows:

First, simple bivariate regressions of, in turn, the level of productivity (GDP per employed person) and self-reported well-being, on trust deliver strongly significant coefficients for the trust variable, with deep trust performing somewhat better for productivity, and actual trust better for well-being. R^2 values are quite low — around 0.2.

Second, we can with these data easily replicate both the neoclassical GDP production function, usefully augmented by an index of institutional quality, and the *World Happiness Report* core well-being model, with quite high R^2 values.

Third, adding either trust variable to these standard models does not improve the fit.

So, where does the significance of trust in the bivariate models come from? We find that in all (nine) cases, the (three) regressors in the GDP function, and the (six) regressors in the *WHR* well-being model, have a strongly significant bivariate relationship with either trust variable. That is, social trust seems to be an input to the inputs. High trust levels do not in themselves make people happier or more productive. But high trust demonstrably encourages the long-term investments in physical and human capital, and in good institutions, that generate economic prosperity. And it somehow contributes to the various

cultural and institutional factors that feed into well-being.

This article contains five main sections. First, we describe and model trust, deploying a perhaps surprising set of deeply exogenous factors found in the literature. The next two sections examine the impact of trust on differences in productivity, and on self-reported well-being, across 136 countries, with a panel of annual data covering various years from 2005 through 2017. These data build on and extend the *World Happiness Report* database. Then there is a brief case study of an apparently anomalous First World country, New Zealand, comparing it with a very similar country — Australia — which has however enjoyed a markedly different productivity performance. A final section concludes.

Modelling Trust and Deep Trust

How to measure and model trusting and trustworthy behaviour? Since the 1980s, the standard data source has been randomized surveys asking versions of the 'trust question' to people in different countries: *Generally speaking, do you believe people can be trusted or not?*, with the answer usually recorded as Yes/No, though sometimes a scale from 1 to 5 is allowed. Although this question literally measures views on the trustworthiness of others, it has been found to predict actual trustworthiness — i.e. the trustworthiness of the respondent — quite well. It seems also understood that respondents are thinking not of their friends or family nor of foreigners, but rather the trustworthiness of strangers in their own country or society.

By combining information from two sources of answers to the trust question

— waves of the World Values Survey, and Gallup polls — as described in the Appendix, we are able to present trust data for 136 countries — far more than in any previous study of trust. Table 1 shows the descriptive statistics for trust and all other variables used in the article.

There is a rather large variation in the proportion of people in different countries who believe their fellow citizens to be trustworthy, with the distribution skewed towards the lower end of the range. Nearly three out of four Norwegians are trusting, but the sample average is only 23 per cent, and in the least trusting country — the Philippines — only one in thirty are foolish enough (as it would seem, in this case) to trust others. As some motivation for what follows, all rich countries — Western Europe and the New World — are in the top half of the trust distribution, with the least trusting — France — being at the median.

Can these cross-country variations in social trust be modelled empirically? Algan (2018) provides an up-to-date, insightful, extensive (more than 130 references) but not totally comprehensive review of the literature on the determinants and impacts of generalized trust, and its relationship to the concept of 'social capital'.

There is considerable evidence of systematic inter-regional differences in trust scores within countries, such as between regions within European nations and between the states of the American Union (Algan and Cahuc, 2014). It seems reasonable that such intra-national heterogeneity will generate statistical noise (but not bias) for analyses working with national average data, such that the calculated statistical stability of any coherent results achieved

Table 1: Descriptive Statistics

	TRUST	NOPRODROP	MONARCHY	MUSLIM	CATHOLIC	DIVERSITY
maximum	0.737 <i>Norway</i>	1.000	1.000	100	98	0.762 <i>Singapore</i>
minimum	0.032 <i>Philippines</i>	0.000	0.000	0	0	0.01 <i>Turkey, etc.</i>
average	0.231	0.222	0.134	22.50	30.13	0.365
standard deviation	0.141	0.416	0.340	33.92	34.17	0.214

	COLDEST	RGDPO/EMP	RNNA/EMP	HC	INSTITUTIONSAV	log(GDPPOP)
maximum	28 <i>Panama</i>	194314 <i>Ireland</i>	771062 <i>Italy</i>	4.36 <i>Uzbekistan</i>	10.85 <i>Finland</i>	11.465 <i>Luxembourg</i>
minimum	-21.6 <i>Mongolia</i>	1728 <i>Burundi</i>	3148 <i>Malawi</i>	1.13 <i>Burkina Faso</i>	-10.36 <i>Congo (Brazzaville)</i>	6.377 <i>Congo (Kinshasa)</i>
average	11.6	41782	201100	2.66	0.15	9.209
standard deviation	11.0	34108	200285	0.70	5.40	1.155

	LIFE_LADDER	SUPPORT	HLIFEEXP	FREEDOM	GENEROSITY	CORRUPT
maximum	8.02 <i>Denmark</i>	0.99 <i>New Zealand</i>	76.5 <i>Hong Kong</i>	0.985 <i>Uzbekistan</i>	0.678 <i>Myanmar</i>	0.983 <i>Hungary</i>
minimum	2.69 <i>Syria</i>	0.29 <i>Central African Republic</i>	37.8 <i>Sierra Leone</i>	0.258 <i>Bosnia and Herzegovina</i>	-0.323 <i>Greece</i>	0.035 <i>Singapore</i>
average	5.46	0.82	62.5	0.738	-0.001	0.752
standard deviation	1.12	0.12	8.0	0.141	0.167	0.187

with the latter will be underestimates of their true significance.

Bjornskov (2006, 2012 — not referenced in Algan (2018)) finds econometric evidence of some very long run determinants of current trust levels, indicating significant stability of trust over time. As collateral evidence, Bjornskov repeats from Zak and Knack (2001:295) a useful *aperçu* from Adam Smith — "the Dutch are most faithful to their word" — and notes that of the "European countries that Smith would likely have had business [with], the Netherlands is to this day the nation with the highest trust score" (2006:3, note 2).

Direct corroboration of inter-

generational transmission of trust is provided by Uslander (2008; cited by Bjornskov), who uncovers a strong tendency for descendants of immigrants to the United States to reveal levels of trust similar to those of the current inhabitants of: the country to which they trace ultimate descent.

Bjornskov (2006) also follows Zak and Knack (2001), and La Porta *et al.* (1997) in finding that variables for predominance of either Muslim or Catholic religions in a country are negative for trust. This is attributed to the hierarchical nature of those religions creating 'vertical bonds of obligation in society that divide rather than

4 Bjornskov (2006:6), following Putnam (1993) through La Porta *et al.* (1997), who also include Eastern (Christian) Orthodox in their list of hierarchical religions – this was not found to be significant here.

unite people socially'.⁴ Rather surprisingly, perhaps, constitutional monarchies are also moderately more likely to show higher trust levels, due to a perhaps under-appreciated role of impotent but venerable monarchies as national symbols of stability and cultural unity.⁵

Bjornskov (2006) also includes as regressors per capita GDP and income inequality, but these variables are both likely to be endogenous to trust, and are quietly omitted from the model of Bjornskov (2012). This model adds an even more surprising and authentically long-run exogenous factor: whether or not the predominant language of a country permits the dropping of personal pronouns. Linguists have apparently argued that forbidding the dropping of the pronoun is indicative of greater cultural respect for individual rights, and thence development of stronger trust norms (Lee, 2017).

In his earlier work, Bjornskov (2006) tried a measure of ethnic diversity (from Alesina *et al.*, 2003), which was not empirically very successful. In this article, a measure of religious diversity is constructed and included in the trust model.⁶ Diversity could be negative for trust not — or not just — because of prejudice against the presumed trustworthiness of people with different religious beliefs, but if it is harder to *predict* how different people will behave. In other words, diversity could undermine

shared norms that facilitate expectations of trusting and trustworthiness.

It is sometimes suggested that climate is an important determinant of cultural traits, and the average daily temperature in the coldest month of the year will be included here — perhaps in harsh climates people have to learn to look after each other more.

Table 1 gives average and extreme values for all the variables used in this article. The variables are defined as follows:

- TRUST: A variable derived from responses to the survey question “*Generally speaking, do you believe people can be trusted or not?*” Values for this variable represent the proportion of individuals in a given country who responded YES to the survey question.
- NOPRODROP: A dummy variable indicating whether or not the main language of a country forbids the dropping of personal pronouns, where 1 = YES, 0 = NO.
- MONARCHY: A dummy variable indicating whether or not a country is a constitutional monarchy. 1 = CONSTITUTIONAL MONARCHY, 0 = NOT A CONSTITUTIONAL MONARCHY.
- MUSLIM: The percentage of a country’s population that identifies as Muslim.

⁵ Chaney (2018:647) discusses the view that Western Europe recovered better than Eastern Europe from the devastating ‘Black Death’ pandemic of 1350, because of more robust peasant organizations in the West. This is possibly attributable to monarchies in Western Europe seeking to strengthen peasant communities in efforts to undermine their real enemies — the nobility.

⁶ Religious DIVERSITY is calculated as the sum of the squared ‘market shares’ of each of five religions (Muslim, Catholic, Other Christian, Hindu, Buddhist) with the shares scaled to add to one. That is, it is what in economics is called a Hirschman-Herfindahl index.

- CATHOLIC: The percentage of a country's population that identifies as Catholic.
- DIVERSITY: Represents religious diversity, which is calculated as one minus the sum of the squared 'market shares' of each of five religions (Muslim, Catholic, Other Christian, Hindu, Buddhist) with the shares scaled to add to one. Higher values for the variable represent greater levels of religious diversity.
- COLDEST: The average daily temperature of the coldest month of the year in a given country.
- RGDPO/EMP: The real GDP per employed person in a given country, measured in constant 2011 national prices and expressed in 2011 US dollars. This data is sourced from the Penn World Tables (PWT) database (Feenstra *et al.* 2015) annually in most cases from 2007 to 2017.
- RNNA/EMP: The real capital intensity, or real capital stock per employed person, in a given country, measured in constant 2011 national prices and expressed in 2011 US dollars. This data is sourced from the Penn World Tables (PWT) database (Feenstra *et al.* 2015) annually in most cases from 2007 to 2017.
- HC: An index of a country's human capital based on average years of schooling and returns to education. See footnote for the procedure used to infill values in the event of missing data.⁷
- INSTITUTIONSAV: An index of the average quality of a country's institutions. The variable is an average of six dimensions: voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption. In the original (Kaufman et al. 2010), the variable is scaled to mean = 0 and ranges from Finland with the best institutions, at least from this perspective, and Congo (Brazzaville) with the worst.

The following variables are taken from the 2018 World Happiness Report:⁸

- LIFE_LADDER: Evaluation, on a scale of 0 to 10, of the respondent's current satisfaction with their life so far, interpreted as subjective well-being (SWB). Values for this variable represent the average response of a given country.
- Log(GDPPOP): Natural log of a country's per capita GDP in 2011 purchasing power parity international dollars, from World Bank, *World Development Indicators*⁹

⁷ Fourteen of our countries have no PWT human capital data, but do have years-of-schooling data as compiled by Barro and Lee (2013). For countries with both data sources, we can estimate a linear relationship between PWT and Barro-Lee numbers which has an $R^2 = 0.933$. We use this to infill HC numbers for the 14 countries.

⁸ For more information, refer to 'Technical Box 1' in the 2018 *World Happiness Report*.

⁹ This variable is of course very similar to the PWT variable RGDPO/EMP. The latter can be used in the well-being modelling reported in this section, and it gives very similar (slightly better) econometric results.

- SUPPORT: A variable derived from responses to the question “*If you were in trouble, do you have relatives or friends you can count on...?*” where 1 = YES and 0 = NO. Values for this variable represent the proportion of individuals in a given country who responded YES to the survey question.
- HLIFEEXP: Healthy life expectancy at birth, from World Health Organization; country data.
- FREEDOM: A variable derived from responses to the question “Are you satisfied with your freedom to choose what you do with your life?” where 1 = YES and 0 = NO. Values for this variable represent the proportion of individuals in a given country who responded YES to the survey question.
- GENEROSITY: A variable derived from responses to the question “*Have you donated money to a charity in the past month?*” This is calculated as the residual of a regression of GDP per capita on responses to the charity question.
- CORRUPT: An average of the responses to the questions “*Is corruption widespread through the government?*” and “*Is corruption widespread within businesses?*” where 1 = YES and 0 = NO. Values presented for this variable are the average scores for individual countries.

The first row of variables in Table 1 are Bjornskov’s deep-rooted determinants of trust. Just 22 per cent of countries have a main language which forbids dropping the personal pronoun (NOPRODROP), with many but not all of these being European languages. Just 13 per cent (eighteen) of the countries are constitutional monarchies, with most of these being European or members of the British Commonwealth. The average proportion of countries’ populations that profess the Muslim religion is nearly 23 per cent, and 30 per cent for Catholics. However, I have calculated from the database that the percentage of all the people in the world who are either Catholic or Muslim is just 38 per cent — this total figure being in particular affected by the fact that the most populous country, China, has very few Muslims or Catholics.

Shares of both Muslims and Catholics in the population range from nearly 100 per cent to zero. Diversity, therefore, must have some zero value, but cannot be bounded upwards by 100 per cent, given that there are just five religions categorized. In fact, the most religiously diverse country is Singapore, in which all five religions are represented (even if the ethnic diversity of this country is much less – there are Christians and Buddhists of Chinese ethnicity).¹⁰ The warmest country in the coldest month of the year is Panama and the coldest Mongolia.

Table 2 shows a linear regression model of trust, incorporating all the above-named

¹⁰ Wiki reports that, of the 80 per cent of the population of Singapore who are ‘citizens or permanent residents,’ about 74 per cent are ethnically Chinese, 13 per cent Malay, and 9 per cent Indian. Apparently, the Singapore government does not release or record the ethnicity of the 20 per cent who are migrant or guest workers. I do not know if the latter group are surveyed for the well-being data.

Table 2: Modelling Trust

dependent variable	Constant	NOPRODROP	MONARCHY	MUSLIM	CATHOLIC	DIVERSITY	COLDEST DAY	R^2	n
TRUST	0.304	0.082	0.114	-0.000828	-0.001027	-0.03667	-0.00386	0.437	1376
<i>t</i> -statistic	8.14	3.31	3.63	-2.06	-2.89	-0.72	-4.28		

variables, and estimated — as will be all the econometric models in the article — with the EViews 10 OLS package with cluster-corrected standard errors: countries being the cluster.

All regressors apart from diversity have coefficients of the expected sign and are reaching statistical significance by the usual standards.¹¹ The overall goodness of fit of the model may or may not seem impressive, given ones priors as to the plausibility of those regressors. No doubt, adding regional dummies (Latin America, Western Europe, etc) would raise the R^2 , but it is more satisfying to look for fundamental determinants of social trust.

No doubt, also, there must be other factors — unknown or known — generating trust. Strong candidates are the direct (survey-based) measures of diversity or ‘polarization’ of views on politics, religion, honesty, and other factors, compiled by Beugelsdijk and Klasing (2016). They find a negative bivariate relationship between polarization and trust with an R^2 of 0.41, for a sample of 75 countries.

From an econometric point of view, the regressors used in the Table 2 model are attractive because, being so deep-seated in history and geography, they can very plausibly be taken as exogenous to mea-

asures of trust from contemporary surveys taken in our times. For this reason, I will call the values predicted by the model for each country ‘deep’ trust. These values will be given their chance to compete with currently surveyed trust in our subsequent analysis of international differences in productivity and well-being.

Trust and Productivity

For Adam Smith, productivity growth came primarily not from the accumulation of capital, both physical and human, but from the reorganization of existing resources through the division of labour. His work and life predated the large-scale application of science and technology to materials and mechanization that would fuel the 19th century Industrial Revolution and thus modern capitalism.

However, Smith did not himself discover or invent the idea of the division of labour. Indeed, his famous example in *The Wealth of Nations* of the productivity gains generated by splitting the manufacture of textile pins into 18 specialized steps was lifted directly and without acknowledgement from the *Encyclopédie* of the French philosopher Denis Diderot, twenty five years earlier.¹²

But what Smith may have been first to do was to examine the division of labour,

11 A referee has suggested assessing the economic significance of the trust regressors, by multiplying each variable’s coefficient from Table 2 by its sample standard deviation from Table 1. The resulting numbers are all in the range 0.3-0.4, or around 15 per cent of the sample average value of TRUST of 0.23.

12 See Katherine Sutherland’s ‘Explanatory Notes’ on Smith, 1776 (1998:467).

not as a production engineer, but as a social scientist. He realized the extraordinary demands that exploiting the division of labour would put on the coordinating capacity of the economy, by vastly increasing the number and extent of transactions needed in the new system. And he noted that this, inevitably, would take workers and capitalists beyond the safe confines of kith and kin: they would need to deal with strangers, and trust those strangers to behave reasonably honestly and predictably, as noted in the introduction. So can we test the importance of this, empirically, using the new survey data we now have aggregating responses to the standard 'trust question'?

Literature on trust, growth, and productivity

There is now a significant number of studies linking trust to economic growth — that is changes over time in incomes or productivity, rather than cross-sectional differences at a point in time — as surveyed by Bjornskov and Méon (2015) and Smith (2020). These studies seem to strain to achieve statistically significant results, and it is not surprising that this is so. In a cross section of nations there are huge differentials of levels of prosperity, and these differences do not change suddenly. Table 1 reports a more-than hundred-fold difference between real GDP per worker in Ireland compared with Burundi.

Differences in trust may be able to account for these differences in levels of pros-

perity, but not necessarily differences in year-to-year changes. And those differences are not strongly correlated decade to decade, as Hall and Jones (1999) note. For example, any database on economic growth covering the past thirty years will, or should, include Japan: a high-trust, high-income economy that has hardly grown at all since its great growth spurt in the post-war quarter century.

It *is* surprising, then, that there have been so few studies of trust — or more generally of the 'soft' institutions of social cohesion — linked — as Arrow predicted — to levels of economic development or productivity, not economic growth. Hall and Jones (1999) is pioneering, finding a strong effect on a cross section of output per worker data for 127 countries, of a measure of what they call quality of 'social infrastructure', this being the average of two indexes: one of the quality of protection of private property rights; the other of openness to international trade.¹³

Turning to studies focusing directly on trust as the soft-institution measure, Algan and Cahuc (2010) find a quite large effect of the inherited component of trust on per capita incomes, over time and across 24 countries. Bjornskov and Méon (2015) use total factor productivity (TFP) as their dependent variable, and are able to show a significant bivariate correlation, for 67 countries, between level of TFP and social trust, but this disappears when a measure of countries' legal quality is added to the model. Smith (2020), with a panel

¹³ Hall and Jones also successfully instrument their social infrastructure measure with two variables that in effect link it to Western Europe: distance from the equator, and prevalence in a country of a European language.

database on 32 mainly European countries, also finds a bivariate trust-TFP correlation, but does not explore the robustness of this to other possible explanatory factors, such as legal quality. Dearmon and Grier (2009), with data on 51 countries, report a linkage between trust and the level of per capita GDP, and also between trust and investment in physical capital — that is, in the change of the capital stock, not its level.

The present study will follow Hall and Jones (1999) in using output per worker, not incomes per capita, because our focus is on the supply side — productivity — rather than incomes, which can have other determinants.

Results

Along with the TRUST and DEEP TRUST variables as defined above, production function data are sourced from the Penn World Tables (PWT) database (Feenstra, Inklaar, and Timmer, 2015) annually in most cases from 2007 through 2017. We see from Table 1 that capital per worker varies internationally even more than output per worker (consistent with diminishing returns), and that the world's best educated citizenry live in Uzbekistan, a former republic of the Soviet Union.

We begin with the simplest 'Smithian' production function, regressing labour productivity (logged RGDP0 per person employed) on actual and predicted deep trust (Table 3). Though the overall fit of this model is not high, the trust variables show strong significance, with DEEP TRUST doing the better. That is, a variable created as a linear combination of various ancient cultural, religious and linguistic customs is by itself quite successful at account-

ing for the vast differences now in countries' material standards of living.

The third regression model shown on Table 3 switches to the standard neoclassical formulation that has output per worker dependent on physical and human capital per worker, with a non-neoclassical gloss in the form of the index of institutional quality.

Not surprisingly, the R^2 of this model is much higher, with both capital measures comfortably significant, and institutions less so. So, what happens if we combine the two models? Both trust variables now have negative coefficients!

So we dig down a level. Does a high level of trust encourage risky long-term investments in physical and human capital? Table 4 gives the answer: trust is indeed a strongly significant determinant of both types of capital, as well of the quality of a country's institutions. And deep trust is a more significant factor than current actual trust.

This last result is particularly interesting. Our model of deep trust is, as noted, subject to error, but the predicted value at least holds its own compared with directly measured trust. This suggests that deep trust is not an instrument for actual trust (at least, in the productivity setting), but, rather, the opposite: actual trust is really an instrument for deep trust. It is deep trust that matters.

That is, deep trust really is important for levels of economic development, but only indirectly, through its encouragement of productive investments. So, if two countries happen to have similar levels of the two types of capital, the more trusting of the two will not obtain an additional productivity boost from this. But in general,

Table 3: Modelling Real GDP per Person Employed

Independent Variable	(1)	(2)	(3)	(4)	(5)
Constant	9.437	8.950	3.250	3.298	3.388
<i>t</i> -statistic	67.36	50.44	7.82	7.85	7.89
TRUST	3.335			-0.274	
<i>t</i> -statistic	6.95			-1.39	
DEEP TRUST		5.481			-0.789
<i>t</i> -statistic		9.15			-2.66
log(RNNA/EMP)			0.542	0.541	0.537
<i>t</i> -statistic			13.17	13.22	12.88
HC			0.265	0.278	0.302
<i>t</i> -statistic			4.22	4.44	4.51
INSTITUTIONSAV			0.024	0.028	0.030
<i>t</i> -statistic			2.57	2.61	2.95
R^2	0.203	0.236	0.900	0.901	0.903
Observations	1385	1385	1385	1385	1385

Table 4: Modelling Production Function Inputs

Independent Variable	Dependent Variable					
	log(RNNA/EMP)		HC		INSTITUTIONSAV	
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	10.51	9.82	2.13	1.71	-4.78	-7.69
<i>t</i> -statistic	54.96	40.66	23.29	14.94	-7.31	-8.97
TRUST	4.41		2.29		21.32	
<i>t</i> -statistic	6.86		7.97		7.36	
DEEP TRUST		7.42		4.13		34.15
<i>t</i> -statistic		9.17		10.39		10.17
R^2	0.209	0.254	0.213	0.297	0.310	0.341

workers in high-trust societies are indeed more likely to have more capital to work with, either from their employer’s willingness to invest in physical capital or their own willingness to delay entering the paid labour force in order to invest in skills and education.

In particular, there is no systematic role for trust in determining what is called total factor productivity. Indeed, there is little variation in total factor productivity to be determined or explained. The R^2 (=0.9) of the third labour productivity regression in Table 3 — very high for what is basically a cross sectional model — leaves little to be

accounted for beyond the contributions of the two capitals and institutional quality.¹⁴

Adam Smith would probably be surprised by this – that a more trusting division of labour between strangers is not *ipso facto* productivity enhancing. In his pre-industrial revolution world, the accumulation of physical capital cannot get fully under way, because the new technologies in which capital would be embodied were still embryonic. As for human capital — Smith certainly recognized the skills developed by specialization. But he thought apprenticeships were made too long (for monopoly reasons). He was also definitely sceptical

¹⁴ A full-blown production function model, with log(RGDPO) dependent, and log(RNNA), log(EMP), HC, INSTITUTIONSAV as regressors, has $R^2 = 0.965$

— this fuelled by his own fairly useless experience as a student of Balliol College Oxford — about what now is assumed to be the standard method for increasing human capital: university education.

The productivity-enhancing division of labour on which Smith focused as the main determinant of prosperity in the late 18th century did not necessarily require much physical investment — just the willingness of strangers to cooperate to do the job. But Adam Smith also did not foresee the consequences of truly large scale production from the 19th century onward, with its (apparently) necessary innovation of bureaucratic organization and control systems. This may have reduced the importance of person-to-person trust in the workplace, by internalizing and codifying so many transactions.

How big is the trust effect, overall? From Table 1, the mean value of output per worker is about 42,000, for which the natural log is 10.6. Suppose a country with that value also has a sample-average value of deep trust, which is 0.23 (almost the same as the average of surveyed trust, as reported on Table 1). How much higher, *ceteris paribus*, would be the productivity of this country if it had deep trust at its highest predicted value, which is Norway's 0.50? The difference in deep trust is 0.27, and multiplying this by the deep trust coefficient from Table 3 (=5.5), we obtain a predicted change in the log of output per worker of +1.5, to 12.1, which corresponds to an actual value of output per worker of about US\$180,000 — that is, more than four times higher than mean productivity — higher, indeed, than actual productivity in the leading large industrial country

— the United States. The estimated deep trust-productivity effect is indeed substantial.

Trust and Well-being

Economists in recent years have looked beyond GDP as an index of economic performance to happiness itself, for which material prosperity may or may not be a significant contributor. Notable research programs include those of Rafael Di Tella and Robert MacCulloch (2008), and the annual (since 2012) *World Happiness Report* (*WHR*) issued by a group led by John Helliwell, Richard Layard and Jeffrey Sachs (2018). The latter uses surveys of samples of national populations whose respondents are asked (by the Gallup polling organization) to evaluate, on a scale of zero to ten, just how satisfied they are with their life so far (the 'Cantril Ladder').

For a panel of 157 countries surveyed (not all in all years) over the 2005 to 2017 period, Helliwell, Layard, and Sachs (2018, Table 2.1) estimate an econometric model with country average Cantril Ladder scores — called 'subjective well-being' or SWB — as the dependent variable. In this model, the natural log of per capita GDP is indeed a reasonably strong predictor, with a coefficient just above 0.3, and so too are several quality-of-life indicators surveyed along with SWB at the individual level: social support (friends in case of need), freedom to make life choices, generosity, and perceptions of corruption, along with healthy life expectancy, measured at the national level.

These are interesting results, and they establish the meaningfulness of individual survey responses to questions about

happiness and quality of life, as attested to by DiMaria, Peroni, and Sarracino (2021). These authors, and Sarracino and O'Connor (2021), take the sensible step of using the analogy with GDP production functions to carry out DEA (Data Envelope Analysis) of the 'productivity' at which a sample of countries convert the *WHR* regressors into well-being, relative to best-practice (frontier) countries.

Smith and Legge (2021) seek to unify the analysis of well-being and GDP production for 38 European countries by using physical and human capital as regressors in both models. Given that GDP is one of the six inputs to well-being in the *WHR* well-being model, we might expect the Smith and Legge procedure to show empirical success, and it does, but with the unexpected, and interesting, finding that human capital is relatively more important for well-being, and physical capital more important for GDP, such that, across these countries, there is no correlation between well-being and productivity.

So, what about trust? The *WHR* team have added the trust score variable to a SWB model, and find that it appears to have a quite strong direct effect on well-being. Comparing the coefficients on trust and on per capita incomes, they deduce, for example, that the increase in trust reported in Poland over the first decade of the new millennium was equivalent in its effect on life satisfaction with a 12 per cent increase in Polish per capita GDP (Helliwell, Huang, and Wang, 2016:11-12).¹⁵

These results are impressive, but they almost certainly underestimate the total effect of trust on well-being. They pick up the partial direct effect of trust on well-being, holding the other factors constant. But we know from Algan and Cahuc (2010), and the results of this article's second section, that at least one important other factor — per capita incomes or GDP — is in general not held constant when trust changes, and it may well be that some of the other well-being contributors, such as social support and life expectancy, are themselves affected by trust. That is, there may be multicollinearity amongst the regressors which will obscure their true effects on well-being.

The contribution here will be to tease out from the data the channels whereby differences in the long-term component of generalized trust work their way through to a net total impact on well-being.

Data

The basis for our database is the Excel spreadsheet "Table 2.1" supplied with the 2018 World Happiness Report. This has data on subjective well-being for 157 countries, collected by Gallup in its surveys for various years ranging from 2005 through 2017. These data are supplemented with data on the regressors in the *WHR* well-being model, each of these being available for most but not all countries, and for most but not all years. Variable definitions were given above. All variables from individuals' survey responses are averaged to the

¹⁵ However, this effect was derived from an econometric model not incorporating all the other well-being factors. When these are added, the coefficient on trust becomes smaller and less stable.

country level.

Table 1 revealed that there is certainly considerable cross-country variability in average subjective well-being to be explained, with Denmark in 2005 at the top of the Cantril Life Ladder with an average score of just over eight out of ten, and war-torn Syria below 3 in 2017.

Availability of support when troubled is generally high, and almost universal in New Zealand. Less happily, there are still countries where citizens cannot expect long healthy lives, though the mean value is much closer to the top than the bottom of the range. Professed freedom to make ones' life choices is apparently almost universal in Uzbekistan, but rather uncommon in Bosnia and Herzegovina — I know not why. However, the mean is well skewed towards the high end of the range. The fairly impoverished people of Myanmar are (relative to incomes) most likely to give to charity; the least generous are the Greeks, whose notorious unwillingness to pay their taxes apparently is not compensated for by a propensity towards charitable giving. It is very sad that almost all Hungarians believe their institutions are corrupt; pleasing but not surprising that citizens of the tightly administered city state of Singapore feel just the opposite.

Overall, it is strikingly clear from these data that income is not the only fact of life that is unevenly distributed around the world (as well as within countries), and the wide range of SWB outcomes may suggest that the differences in the other factors do

not cancel out. This in turn implies the existence of some underlying variable or variables which tend to have a similar effect (ie, in the same direction) for most or all of the happiness-determining factors identified in the *WHR*.

Estimation

We use the sample of 136 countries¹⁶ for which we have, or have constructed, data on social trust, and, as before cluster-correct standard errors of estimated coefficients. Table 5 shows the results.

First, we run the simplest trust-only models. As with the production function estimates, trust alone is a successful predictor of well-being, though now actual trust performs better than predicted or deep trust. However, just as with the production model, the direct trust effect does not survive inclusion of other regressors.

Replicating the *WHR* results, a quite large proportion of the cross-country variation in self-reported well-being is accounted for by incomes and the five non-economic variables, with all six showing statistical significance. The coefficient on log per capita GDP implies an elasticity of SWB with respect to incomes of around 0.3, which apparently is consistent with previous research. Having support in times of trouble is a particularly important factor for well-being.

Now, we repeat the exercise from the third section of the article: here looking for evidence that trust works indirectly through its influence on the direct deter-

¹⁶ Countries that appear in the *WHR* database but not here because trust data are not available include several very small countries (Maldives, Comoros, North Cyprus, Kosovo) and all the 'oil economies' of North Africa and the Middle East, except Iraq.

Table 5: Modelling Self-Reported Well-being

Independent Variable	(1)	(2)	(3)	(4)
Constant	4.580	4.278	-1.720	-1.695
<i>t-statistic</i>	<i>29.27</i>	<i>18.47</i>	<i>-3.26</i>	<i>-3.23</i>
TRUST	3.828		-0.192	
<i>t-statistic</i>	<i>6.82</i>		<i>-0.55</i>	
DEEP TRUST		5.169		-0.388
<i>t-statistic</i>		<i>5.78</i>		<i>-0.61</i>
LOGGDPPOP			0.352	0.359
<i>t-statistic</i>			<i>5.43</i>	<i>5.25</i>
SUPPORT			2.438	2.451
<i>t-statistic</i>			<i>5.74</i>	<i>5.98</i>
HLIFEEXP			0.028	0.027
<i>t-statistic</i>			<i>3.06</i>	<i>3.04</i>
FREEDOM			0.974	0.960
<i>t-statistic</i>			<i>3.00</i>	<i>2.98</i>
GENEROSITY			0.709	0.695
<i>t-statistic</i>			<i>2.42</i>	<i>2.32</i>
CORRUPT			-0.629	-0.635
<i>t-statistic</i>			<i>-2.02</i>	<i>-1.94</i>
R^2	0.232	0.182	0.730	0.731

minants of well-being. Table 6 shows that such is indeed the case. However, for the five non-economic factors, actual trust is stronger than predicted or deep trust as a determinant. Perhaps this is because well-being is more flexible than the level of a country’s economic development.

If we drop deep trust from the *WHR* model, multiply each of the six estimated coefficients by their coefficient in the DEEP TRUST bivariate models shown on Table 6, and then sum these products, we obtain the number 5.43, which is quite close to the coefficient, 5.17, on DEEP TRUST in the bivariate model of Table 5. This demonstrates that all (actually, somewhat more than all) of the overall impact of trust on happiness works indirectly through the regressors identified in the World Happiness Reports.¹⁷

The Kiwi Conundrum: Comparing Australia and New Zealand

We can apply the productivity and well-being models developed in this article to the case of two countries: Australia and New Zealand. These two countries are very open to each other and quite similar in many cultural respects, but are rather different in their economic policy regimes, and in the outcomes of these in terms of productivity.

The setting here is an enjoyable little scandal playing out about alleged improprieties involved with calculating the World Bank’s *Doing Business* 2018 ranking of 190 economies according to an Index aggregating scores on eleven areas of business regulation. The supposed wrong-doing concerns possible attempts by the then Managing Director of the Bank to improve the rating of China, at a time when that country’s support was sought for an increase in

¹⁷ Performing a similar exercise for productivity requires re-estimating the Table 3 and 4 bivariate models with DEEP TRUST logged, to match the Cobb-Douglas production function. Again, the sum of products is very close to the overall bivariate effect of (log) trust on productivity.

Table 6: Modelling Trust Determinants of Well-being

Independent Variable	Dependent Variable									
	SUPPORT		HLIFEEXP		FREEDOM		GENEROSITY		CORRUPT	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Constant	0.741	0.705	56.279	54.053	0.651	0.645	-0.086	-0.068	0.915	0.950
<i>t</i> -statistic	<i>49.55</i>	<i>31.71</i>	<i>48.99</i>	<i>33.75</i>	<i>36.28</i>	<i>0.40</i>	<i>-4.24</i>	<i>-2.05</i>	<i>38.85</i>	<i>25.10</i>
TRUST	0.324		27.083		0.377		0.369		-0.707	
<i>t</i> -statistic	<i>7.20</i>		<i>8.05</i>		<i>7.11</i>		<i>4.03</i>		<i>-6.05</i>	
DEEP TRUST		0.482		36.969		0.403		0.292		-0.859
<i>t</i> -statistic		<i>6.47</i>		<i>6.92</i>		<i>4.01</i>		<i>1.96</i>		<i>-4.84</i>
R^2	0.145	0.138	0.230	0.184	0.142	0.070	0.096	0.026	0.284	0.182

the Bank’s funding. The matter was assigned to an outside law firm to investigate (Machen et al., 2021), and the outcome of this was the demise of the published Index.

This furore was in the context of increasing general criticism of the Index itself, on the grounds that it is systematically biased towards favouring a right-wing — even, neoliberal — view of the appropriateness of certain ‘business-friendly’ policies; in particular, policies conducive to ‘flexibility’ in hiring and firing workers.¹⁸

Alarm bells might well have sounded at once on the publication, in 2019, of the 2018 rankings. Top of the list — first, supposedly, amongst 190 economies for the quality of its business regulations — is New Zealand. Yet this country in 2018 was just 22nd in the non-oil First World ranking of per capita GDP, in particular contrast to our nearest neighbour, Australia, which is 12th, with per capita GDP more than 30 percent higher than the smaller country’s (Table 7).

Now, these two countries have long been bound together by what may be the most extensive bilateral common market agree-

ment in the developed world, which in particular allows absolutely free mobility of labour, with the result that a rather high proportion of New Zealand (NZ) citizens — perhaps more than 10 per cent — have crossed the Tasman Sea to improve their fortunes in Australia.

This they do with absolutely no difficulty, being quickly employed in Australia at the much higher wages and salaries generated by the sizeable GDP gap. So it does not seem that the quality of human capital is at fault here. Then, could it be a policy/institutional problem? Well, the problem with *this* is that New Zealand has such good, business-friendly policies, as claimed by *Doing Business*, and also noted by Zheng, Duy, and Pacheco (2021) and others – better than Australia. For example, the institutional quality index used in this article, which has much overlap with the World Bank’s *Doing Business* methodology, places NZ at third best — just behind Finland and Sweden.

And, it could be noted that the decade in which the income gap widened the most was the 1990s, directly following New

18 On the topic, see Ghosh (2020), Stiglitz (2021), Krueger (2021) and Cárdenas (2021).

19 Named after the very determined Finance Minister, (Sir) Roger Douglas, who pushed through the reforms in the 1984-90 Labour government.

Table 7: Comparing New Zealand and Australia

		PREDICTED	ACTUAL
OUTPUT PER WORKER (RGDPO/emp)	NZ	65,550	70,294
	AU	93,090	100,216
CAPITAL PER WORKER (RNNA/emp)	NZ	441,730	241,543
	AU	349,400	438,047
INSTITUTIONAL QUALITY (INSTITUTIONSAV)	NZ	6.93	10.64
	AU	5.87	9.60
SELF-REPORTED WELLBEING (LIFE LADDER)	NZ	7.32	7.09
	AU	7.31	7.12
TRUST	NZ	0.428	0.548
	AU	0.397	0.503

Zealand’s swingeing Rogernomics neoliberal reforms.¹⁹ So, although the — rather moderate — significance of the INSTITUTIONSAV variable used in Table 3 production function is consistent with very bad institutions and policies being somewhat harmful to prosperity across the world, within the First World group it seems that the case is not at all clear.

Well, can the data and results of this study contribute at all to understanding the productivity gap between New Zealand and Australia?

The first line on Table 7 shows that our production function (the third regression model from Table 3) actually slightly underpredicts actual output per worker in both countries, and by a similar percentage amount. So we can rule out differences in total factor productivity — the two countries do seem to be on the same production function. The measures of human capital are very similar: 3.5 and 3.4, in 2017, consistent with New Zealand emigrants fitting easily into the Australian labour mar-

ket. The institution quality variable is, of course, higher in New Zealand, which increases the income disparity to be explained by our only other productive input, which is physical capital per worker.

Actual capital intensity is *much* higher in Australia: New Zealanders taking on jobs in Australia are, on average, provided with more productive capital to work with than was supplied by their erstwhile Kiwi employers. The discrepancy is the larger given that our Table 4 model predicts higher capital/labour ratios in New Zealand, due to higher generalised trust levels here.

This is as far as the data and results of this article can take us — not solving the puzzle, but somewhat narrowing it down.²⁰ I will note casually, however, that an obvious ‘smoking gun’ is the apparent unwillingness of Kiwi entrepreneurs and managers to build and operate large business corporations. The Australian economy overall is about five times larger than that of New Zealand, but the capitalization of its stock market is about thirteen times

²⁰ The difference in NZ and Australian capital/labour ratios is, of course, well known. Zheng, Duy, and Pacheco (2021) note this as a possible factor to account for their finding from micro data of labour productivity lower in New Zealand than in five small European economies, for firms on their country’s productivity frontier, and for firms within the frontier.

greater, including many big firms operating in New Zealand, such as the four major trading banks.

So, is there really a problem here? Perhaps New Zealanders just do not have a taste for running and working in the huge bureaucratic structures of the corporate sector. If the real bottom-line of a country's success is well-being, of which material GDP is an important, but not sole determinant, as the World Happiness Report consistently finds, then Table 7 shows little difference between the two countries, with our Table 5 model slightly over-predicting self-reported well-being in both countries. From an accounting perspective, Australia's higher incomes are just about balanced by higher informal support levels, and less corruption in New Zealand.²¹ In terms of the Data Envelope Analysis approach applied to European countries by Sarracino and O'Connor (2021), Australia and New Zealand are on the same iso-well-being frontier (just inside the 'efficient' frontier) but at different points of the curve.

Conclusion

When the University of Chicago macroeconomist Robert Lucas turned his attention to income disparities around the world, he was quite shocked. Clearly, capital/labour ratios are smaller in the developing world. But then, according to the neoclassical model, with just one freely available 'blueprint' for converting labour and capital into GDP, the marginal pro-

ductivity of capital will be higher in poor countries, and therefore international capital flows should be moving from rich to poor countries, to arbitrage the difference in marginal returns. But, Lucas noted, this was not happening, and, if anything, such surplus savings that the elites in poor countries were able to accumulate were siphoned out of the Third World into the capital markets of the West. Lucas was very worried about this:

The consequences for human welfare involved in questions like these are simply staggering: Once one starts to think about them, it is hard to think about anything else (1988:5).

But Kenneth Arrow had already thought about this question, and had suggested the answer to the puzzle, as quoted in Section 1, above. Physical and human capital may be indeed less productive in poor countries because of a shortage of an essential complementary input — 'social capital', as Smith and Legge (2021) put it — provided by social or generalized trust in strangers.

The evidence that has been gathered more recently, including in this article, surely bears out this proposition. In particular, we find that, with respect to trust and its effects, history casts a huge shadow on our lives today. The centuries-old cataclysms — as they usually were — that have shaped our religions, our languages, our governance, are now embodied in the

²¹ It is notable that the 'top ten' countries in each year's *WHR* well-being lists are without exception small or quite small First World economies, with Canada sometimes appearing, as the largest. Finland, Sweden, Norway, Iceland and Denmark are always in the top ten, with Finland at number one in recent years.

markers of our economic success and our personal well-being. Remarkably, it seems to be at least consistent with the data that all these ancient forces to an impressive extent work through just that one factor: the average level, across a country, of its citizens' trust in each other — in particular, our beliefs in the likelihood of strangers behaving well — trusting, trustworthy — in our country.

What are the policy implications of these findings? On the face of it, it might seem that policy is impossible: trust now is largely dependent on deep historical factors, and we cannot re-write history. The 'middle-income trap' that seems to have prevented any country from attaining first-world economic status over the past quarter century, may be, alas, secure.

But our current state of knowledge on the pathways leading to and from trust is surely not complete enough to justify lack of interest in trust-building policies — such as, for example, the very successful self-reported rating systems that have greatly facilitated the explosion of electronic commerce between strangers. Nor does it warrant lack of concern with what appears, from the analysis of changes in surveyed trust over recent periods by Beugelsdijk and Welzel (2018), to be a significant, though not universal, decline in trust scores across 67 countries.²²

What about the implications for economics; in particular for the principles of neoclassical economics, with its relentless

focus on scarcity and opportunity costs, and exponential growth in incomes — that is, the assumption that, at any point of time, we are constrained by the current production possibility frontier (PPF) such that any choice to have more of something good must be paid for by taking less of something else, whereas over the long term the PPF shifts out without limit?

Helliwell *et al.* (2018:49) write:

My gold cannot be your gold.
But happiness, unlike gold, can
be created for all, and can be
shared without being scarce for
those who give. It even grows as
it is shared.

That is, with the (quite important) exceptions of the parts of happiness that are income-dependent, happiness is a public not a private good — perhaps, even, contagious.

However, happiness surely cannot grow exponentially without limit (nor, of course can incomes, in a finite world). If everyone reports a perfect-ten on their Cantril Ladder score — well, that's as good as it can get, is it not? However, there is clearly still enough unhappiness in the world — even within Finland and other high-average happiness countries — to stave off satiation for some time yet. We get back to the belief — or hope — that policy still has — hopefully — its role to play, in particular in building or restoring trust, and the informal support

²² These authors also identify a plausibly related contemporary trend: an increase amongst young people of "more individualistic, more joyous" attitudes over a surveyed sample of 495,000 individuals across 110 countries. As noted above, Beugelsdijk and Klasing (2016) have documented a quite strong negative relationship between polarization of views within countries and social trust.

networks that seem entwined with trust.

But, in any case, the range of well-being across tolerably peaceful and competently managed countries is really not huge. In particular, the range is strikingly limited compared with the range in material prosperity. Even amongst developed countries, per capita incomes in Denmark and Norway are more than twice those in Portugal, and nearly twice Spain and New Zealand, countries are in turn at least twice as materially well off as the leading developing economies, such as Argentina, Brazil and Mexico.

Finally, should we break further from orthodoxy? The *WHR* researchers are themselves quite 'neoclassical' in their assumption of a unique production function for well-being, available on the same terms to all countries, just like a neoclassical GDP production function. For example, Hamilton, Helliwell, and Woolcock (2016) implicitly move around a common happiness production isoquant when they calculate that, for a given level of happiness, the difference between high-trust Sweden and low-trust Italy is worth about a 20 per cent difference in per capita GDP. But what if the Italians in some sense have chosen to live together as a low-trust society, and have developed various behavioural norms and procedures to deal with this in ways not available to Swedes?²³ There is more to be known about the development of widely shared norms, which may not be synonymous with trust.

References

- Alesina, A., A. Devleeschauwer, W. Easterly, S. Kurlat and R. Wacziarg (2003) "Fractionalization," *Journal of Economic Growth*, Vol. 8, No. 2, pp. 155-194.
- Algan, Y. (2018) "Trust and Social Capital," in *For Good Measure: Advancing Research on Well-being Metrics Beyond GDP*, OECD, pp. 283-320.
- Algan, Y. and P. Cahuc (2010) "Inherited Trust and Growth," *American Economic Review*, Vol. 100, No. 5, pp. 2060-2092.
- Algan, Y. and P. Cahuc (2014) "Trust, Growth and Well-being: New Evidence and Policy Implications," in Aghion, P. and S. Durlauf (eds.), *Handbook of Economic Growth*, Vol. 2, Elsevier, pp. 49-120.
- Arrow, K. J. (1972) "Gifts and Exchanges," *Philosophy and Public Affairs*, Vol. 1, No. 4, Summer, pp. 343-362.
- Barro, R. J. and J.-W. Lee (2013) "A New Data Set of Educational Attainment in the World, 1950-2010," *Journal of Development Economics*, Vol. 104, pp. 184-198.
- Beugelsdijk, S. and M. J. Klasing (2016) "Diversity and Trust: The Role of Shared Values," *Journal of Comparative Economics*, Vol. 44, No. 3, pp. 522-540.
- Beugelsdijk, S. and C. Welzel (2018) "Dimensions and Dynamics of National Culture: Synthesizing Hofstede with Inglehart," *Journal of Cross-Cultural Psychology*, Vol. 49, No. 10, pp. 1469-1505.
- Bjornskov, C. (2006) "Determinants of Generalized Trust: A Cross-country Comparison," *Public Choice*, Vol. 130, pp. 1-21.
- Bjornskov, C. (2012) "How Does Social Trust Affect Economic Growth?" *Southern Economic Journal*, Vol. 78, No. 40, pp. 1346-1368.
- Bjornskov, C. and P.-G. Méon (2015) "The Productivity of Trust," *World Development*, 70, pp. 317-331.
- Cárdenas, M. (2021) "After 'Doing Business'," Project Syndicate, October 8, 2021. <https://www.project-syndicate.org/commentary/world-bank-after-doing-business-four-criteria-by-mauricio-cardenas-2021-10>.
- Dearmon, J. and K. Grier (2009) "Trust and Development," *Journal of Economic Behavior & Organization*, Vol. 71, No. 2, pp. 210-220.

²³ A well-meaning upper class English settler in Tuscany was advised by her Italian friend: "Do not trust your neighbour. Your neighbour will not expect it."

- DiMaria, C.-H., C. Peroni, and F. Sarracino (2021) "From Productivity to Productive Well-Being," presented at Virtual Workshop on Productivity and Well-being: Measurement and Linkages - November 16th and 17th, 2021, International Association for Research in Income and Wealth.
- Di Tella, R. and R. MacCulloch (2008) "Gross National Happiness as an Answer to the Easterlin Paradox?" *Journal of Development Economics*, Vol. 86, No. 1, pp. 22-42, April.
- Feenstra, R. C., R. Inklaar, and M. P. Timmer (2015) "The Next Generation of the Penn World Table," *American Economic Review*, Vol. 105, No. 10, pp. 3150-3182, available for download at www.ggdc.net/pwt.
- Ghosh, J. (2020) "Stop Doing Business," Project Syndicate, September 10, 2020. <https://www.project-syndicate.org/commentary/world-bank-should-scrap-doing-business-index-by-jayati-ghosh-2020-09>.
- Goff, L., J. F. Helliwell, and G. Mayraz (2018) "Inequality of Subjective Well-Being as a Comprehensive Measure of Inequality," *Economic Inquiry*, Vol. 56, No. 4, October, pp. 2177-2194.
- Hall, R. E. and C. I. Jones (1999) "Why Do Some Countries Produce So Much More Output Per Worker Than Others?" *Quarterly Journal of Economics*, Vol. 114, No. 1, February, pp. 83-116.
- Hamilton, K., J. F. Helliwell, and M. Woolcock (2016) "Social Capital, Trust and Well-being in the Evaluation of Wealth," National Bureau of Economic Research Working Paper No. 22556, August.
- Helliwell, J. F., H. Huang and S. Wang (2016) "New Evidence on Trust and Well-being," National Bureau of Economic Research Working Paper No. 22450, July.
- Helliwell, J. F., R. Layard, and J. Sachs (2018) *World Happiness Report*, 2018.
- Kaufman, D., A. Kraay, and M. Mastruzzi (2010) "The Worldwide Governance Indicators: Methodology and Analytical Issues," Policy Research Paper 5430, The World Bank.
- Krueger, A. O. (2021) "The Bretton Woods Credibility Crisis," Project Syndicate, October 7, 2021. <https://www.project-syndicate.org/commentary/world-bank-doing-business-scandal-by-anne-o-krueger-2021-10>.
- La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny (1997) "Trust in Large Organizations," *American Economic Review*, Vol. 87, No. 2, pp. 333-338.
- Lee, S. (2017) "Rethinking the Relationship Between Pronoun-drop and Individualism with Bayesian Multilevel Models," *Journal of Language Evolution*, Vol. 2, No. 2, July, pp. 188-200.
- Lucas, R. E. (1988) "On the Mechanics of Economic Development," *Journal of Monetary Economics*, Vol. 22, No. 1, pp. 3-42.
- Machen C. R., M. T. Jones, G. P. Varghese, E. L. Stark (2021) "Investigation of Data Irregularities in Doing Business 2018 and Doing Business 2020: Investigation Findings and Report to the Board of Executive Directors," WilmerHale. <https://thedocs.worldbank.org/en/doc/84a922cc9273b7b120d49ad3b9e9d3f9-0090012021/original/DB-Investigation-Findings-and-Report-to-the-Board-of-Executive-Directors-September-15-2021.pdf>.
- Putnam, R. (1993) *Making Democracy Work*, Princeton University Press.
- Sarracino, F. and K. O'Connor (2021) "A Measure of Well-being Productivity Based on the World Happiness Report," presented at Virtual Workshop on Productivity and Well-being: Measurement and Linkages - November 16th and 17th, 2021, International Association for Research in Income and Wealth.
- Smith, A., (1776) *An Inquiry Into the Nature of and Causes of the Wealth of Nations*, republished as *An Inquiry Into the Nature of and Causes of the Wealth of Nations: A Selected Edition*, edited by Kathryn Sutherland, Oxford University Press, 1998.
- Smith, C. (2020) "Trust and Total Factor Productivity: What Do We Know About Effect Size and Causal Pathways?" *International Productivity Monitor*, No. 38, Spring, pp. 3-28. <http://www.csls.ca/ipm/38/Smith.pdf>
- Smith, C. and J. Legge (2021) "Wellbeing and Productivity," presented at Virtual Workshop on Productivity and Well-being: Measurement and Linkages - November 16th and 17th, 2021, International Association for Research in Income and Wealth.
- Stiglitz, J.E. (2021) "A Coup Attempt At the IMF," Project Syndicate, September 27, 2021. <https://www.project-syndicate.org/commentary/coup-attempt-against-imf-managing-director-georgieva-by-joseph-e-stiglitz-2021-09>.
- Uslaner, E. (2008) "Where You Stand Depends on Where Your Grandparents Sat: The Inheritability of Generalized Trust," *Public Opinion Quarterly*, Vol. 72, pp. 1-14.
- Zak, P. and S. Knack (2001) "Trust and Growth," *The Economic Journal*, Vol. 111, No. 470, pp. 295-321.
- Zheng, G., H. M. Duy, and G. Pacheco (2021) "Benchmarking the Productivity Performance of New Zealand's Frontier Firms," *International Productivity Monitor*, No. 40, Spring, pp. 27-55. http://www.csls.ca/ipm/40/IPM_40_Zheng.pdf

Appendix Table 1

Dependent Variable: TRUST				
Included observations: 124 after adjustments				
Variable	Coefficient	Std. Error	<i>t</i> -Statistic	Prob.
C	0.105171	0.021908	4.800701	0
TRUSTGALLUP	0.818429	0.070269	11.64702	0
CE_EUROPE	-0.03299	0.020015	-1.64852	0.1019
CIS	-0.08241	0.028324	-2.90968	0.0043
LA	-0.10454	0.021342	-4.89827	0
SUB_SAHARA	-0.18807	0.028374	-6.62828	0
<i>R</i> ²	0.678252	Mean dependent var		0.238996
Adjusted <i>R</i> ²	0.664619	S.D. dependent var		0.141404

Appendix: Infilling trust data

Ninety eight countries have World Values Survey (WVS) data on proportion of surveyed population agreeing that ‘most people can be trusted’ for at least one of the 1999-2004, 2005-2009 and 2010-2014 Rounds of the WVS (this means that in, say, one unnamed year of the five years in each Round, the trust question was asked in a country.)

There were 124 country/year rows containing both a WVS trust number and a number from a similar survey asked by

the Gallup polling organization. For those country/rows an OLS model was estimated (see Appendix Table 1).

That is, we can predict WVS scores quite well using the Gallup score (which tends to be higher) and a subset of regional dummies.

So, the highlighted estimated coefficients are used to infill WVS score estimates for the 39 countries in our set of 136 countries which have a Gallup trust score but no WVS score.