

Trust, Deep Trust, Productivity and Wellbeing in 137 Countries

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1. Introduction

Having disposed of Keynesian macroeconomics to his own satisfaction, the great University of Chicago economist Robert E. Lucas turned his mind in 1988 to even bigger things: the huge disparities in the wealth of nations.

Monetarist triumphalism proved premature, as, first, the Global Financial Crisis, and now Covid, have demonstrated both the fragility of the ‘Great Moderation’, and the enduring efficacy of mundane Keynesian demand management – so how have international income differences panned out since 1988?

Well, they are still there, though vastly reduced on a per capita rather than per country basis thanks to the remarkable growth of the largest country, China. Yet, more than one hundred economies are still poor or very poor, and a puzzling ‘middle-income trap’ has emerged: now not for a quarter century or more, has a country followed Taiwan and South Korea into the ranks of the prosperous First World.¹

So how did Robert Lucas view the situation? He saw how serious it was for the core neoclassical model based on a universally available technology for converting capital into output. Poor countries must have lower per capita incomes because their workers have less productive capital to work with. But this means that the marginal productivity of capital must be higher in poorer countries. And this, in the assumed efficient neoclassical world, should result in net flows of capital from rich to poor economies, seeking to arbitrage the differences in returns at the margin. But, Lucas noted, this just wasn’t happening, and -- if anything -- such

¹ The former Soviet satellite nations of Eastern Europe are by now at or close to first-world status, economically, but they were at this status before the imposition of communist regimes.

surplus savings that the elites in poor countries were able to get their hands on were siphoned out of the third world into the capital markets of the West.

Lucas was very worried about this. He wrote that:

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, p5).

But, it is, I believe, fair to say that the neoclassical production-with-arbitrage model that he and others were unwilling to challenge has not come up with a solution to the theoretical, empirical and policy challenges of underdevelopment.²

The present paper proposes to build on the insights of an even greater economist than Bob Lucas: the founder of our discipline, Adam Smith, and his pioneering recognition of the essentially *social* nature of human activity, including economic activity. A single variable: social or 'generalised' trust – willingness to trust strangers -- may hold the key to explaining why the marginal productivity of capital -- physical and human -- is indeed low in poor countries, and as such explain their lack of economic success. And trust also turns out to have considerable, if indirect, predictive power for explaining disparities across countries in measured wellbeing (self-reported happiness), which -- while not so striking perhaps as income differences -- also require insights to be found beyond the confines of the orthodox neoclassical system.

Section 2 describes and models trust, deploying a perhaps surprising set of deeply exogenous factors found in the literature. Sections 3 and 4 examine the impact of trust on differences in per capita GDP, and in self-reported wellbeing, across 137 countries, with annual data covering various years from 2005 through 2017. Section 5 is a brief case study of an apparently anomalous First World country, New Zealand. Section 6 concludes.

2. Modelling trust and deep trust

How to measure trusting and trustworthy behaviour? Since the 1980s, the standard empirical source has been randomised 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 -- ie, the trustworthiness of the respondent -- quite well. It seems

² Fairly unusually for a neoclassical economist, Lucas does give serious credence to the ideas of the great urban theorist Jane Jacobs, with her emphasis on agglomeration economies generated in big cities, which Lucas sees in terms of human capital externalities. This is not all that far from the trust model developed here.

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 137 countries -- more than in any previous study of trust. Table 1 shows the descriptive statistics for this and all other variables used in the paper.

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%, and in the two least trusting countries -- the Philippines and Trinidad & Tobago -- only one in thirty are foolish enough (as it would seem, in these cases) to trust others.³

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

I note at once that there is plenty of 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 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, he reports from Zak and Knack (2001) a useful *aperçu* from Adam Smith, who noted that 'the Dutch are most faithful to their word' -- 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'. Direct corroboration of inter-generational transmission of trust is provided by Uslaner (2008; cited by Bjornskov), who uncovers a strong tendency for descendants of immigrants to the US to reveal levels of trust similar to those of the current inhabitants of: the country to which they trace ultimate descent.

³ The people of Trinidad & Tobago are, however, somewhat above average in reporting that they can call on someone for support in times of trouble. Perhaps exclusionary kin- and friendship networks are particularly tight on these West Indian islands.

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 being attributed to the hierarchical nature of those religions creating ‘vertical bonds of obligation in society that divide rather than 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), which does however add 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 (2006), Bjornskov tried a measure of ethnic diversity (from Alesina *et al.* (2003)), which was not empirically very successful. In the present paper, a measure of religious diversity is constructed and included in the trust model. Diversity could be negative for trust – 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 – if diversity undermines 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 the main variables used. The first four are Bjornskov’s deep-rooted determinants of trust. Just 22% of countries have a main language which forbids dropping the personal pronoun, with many but not all of these being European languages. Just 13% (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%, and 30% for Catholics. Note, however, that we cannot deduce from these unweighted averages that more than one half of

⁴ Bjornskov (2006, p6), 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.

⁵ Chaney (2018, p647) 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, with this being possibly attributable to the greater strength, in general, of monarchies in Western Europe seeking to strengthen peasant communities in efforts to undermine their real enemies – the nobility.

the world's population is either Muslim or Catholic Christian, since, in particular, the two most populous countries in the world (India and China) have few Muslims or Catholics.

Shares of both Muslims and Catholics in the population range from nearly 100% to zero. Diversity, therefore, must have some zero value, but cannot be bounded upwards by 100%, given that there are just five religions categorised. 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).⁶ The warmest country is Panama and the coldest Mongolia.

Table 2 shows a 'kitchen sink' linear regression model of trust, incorporating all the above-named variables, and estimated -- as will be all the econometric models in the paper – 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 reaching statistical significance by the usual standards. 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 crank-up the R^2 , but it is more satisfying to look for fundamental determinants of social trust.

In any case, the values of what I will call 'deep trust' predicted by this model (PTRUST) will be given their chance to compete with actual TRUST in our subsequent analysis of international differences in incomes and well-being. Note from Table 1 that the variation across countries in trust predicted by our simple linear model is less than with actual trust, though in both cases Norway comes out on top.

3. Differences in per capita incomes and trust

For Adam Smith (1723-90), productivity growth came primarily not from the accumulation of capitals (physical, human), but from the reorganisation of existing resources through the division of labour. His work and life just predated the large-scale application of science and technology to materials and mechanisation that would fuel the 19th Century Industrial Revolution and thus modern 'capitalism'.

⁶ Wiki reports that, of the 80% of the population of Singapore who are 'citizens or permanent residents', about 74% are ethnically Chinese, 13% Malay, and 9% Indian. Apparently, the Singapore government does not release or record the ethnicity of the 20% who are migrant or guest workers. I do not know if the latter group are surveyed for the wellbeing, etc, data.

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 eighteen specialised steps was lifted directly and without acknowledgement from the *Encyclopédie* of the French philosopher Denis Diderot, twenty five years earlier.⁷

But what Smith may have been first to do was to examine the division of labour, not as a production engineer, but as an economist. He realised 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:

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.⁸

The danger of the situation comes from what we would now call ‘hold-up’ problems. Once the brewer, say, has committed himself to his specialism, what would stop the baker or the butcher forcing on him an *ex post* revision of the terms on which they trade, with the threat being starvation?

It was Adam Smith’s huge insight that the wealth of nations would depend foremost on being able to predict, and trust, the behaviour of strangers: the importance to prosperity of ‘generalised’ or ‘social’ trust. So can we test this, empirically?

Well, we are by now quite proficient at measuring the wealth of nations, through GDP and the National Accounts. And, as noted, we do have, since around the 1980s, surveyed answers to the ‘trust question’.

3.1 The literature on trust, growth and productivity

There is by now a quite large literature of studies linking trust to economic growth – that is year-to-year changes rather than cross sectional differences -- as surveyed by Bjornskov and Méon (2015), and Smith (2020). These studies seem often to strain to achieve robustly ‘significant’ results, and it is not surprising that this is so. In a cross section of nations there are always 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.

⁷ See Katherine Sutherland’s ‘Explanatory Notes’ on Smith 1776 [1998], page 467.

⁸ *Ibid*, page 22.

Differences in trust may be able to account for these differences in levels of prosperity, but not necessarily differences in year-to-year growth of GDP. 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 over those decades.

And the changes that do occur 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 over those decades.

It is surprising, then, that there have been so few studies of trust – or more generally of the ‘soft’ institutions of social cohesion – linked to *levels* of income or prosperity: to level 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.⁹

Turning to studies focussing 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 TFP and social trust, but this is wiped out when a measure of countries’ legal quality is added to the model. Smith (2020), with a panel database on 32 mainly European countries, also finds a bivariate trust-TFP correlation, and does not explore the robustness of this to other possible explanatory factors, such as legal quality.

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 sources. And I do not use TFP, because I expect that it will be the quantity of inputs, as well as or instead of the efficiency at which they are utilised, which is dependent on trust.

3.2 Results

Along with the TRUST and PTRUST variables as defined above, production function data are sourced from the Penn World Tables (PWT) database (*Feenstra et al., 2015* annually in most cases from 2007 through 2017.

⁹ 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.

RGDPO is real GDP and RNNA is real capital stock, both at constant 2011 national prices in 2011\$US; EMP is number of people in employment; HC is an index of 'human capital' based on average years of schooling and returns to education. 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.

An additional variable, INSTITUTIONSAV, is an index of average quality of a country's institutions, averaged over scores on six dimensions: 'voice and accountability', 'political stability and absence of violence', 'government effectiveness', 'regulatory quality', 'rule of law', 'control of corruption' (Kaufman *et al.*, 2010). This variable is scaled to mean = 0, and ranges from Finland with the best institutions, at least from this perspective, and one of the Congo republics with the worst.

We begin with the simplest 'Smithian' production function, regressing labour productivity (logged RGDPO per employee) on actual and predicted or 'deep' trust (Table 3). Though the overall fit of this model is not high, the trust variables show strong significance, with PTRUST doing the better. That is, a variable created as a linear combination of various ancient cultural, religious and linguistic customs is quite successful at resolving Robert Lucas's puzzlement over the vast differences now in countries' material standards of living. According to the model, a country with deep trust one standard deviation above the mean will have output per capita about three times higher than a country of which the predicted or deep trust is one deviation below the mean.

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 capitals, 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 almost certainly 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 capitals, then the more trusting of the two will not get an additional productivity boost from this, but, in general, 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 take time off paid work to invest in skills and education.

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 had yet to get fully under way, because the new technologies in which capital would be embodied were still embryonic. As for human capital – Smith certainly recognised the skills developed by specialisation, but he thought apprenticeships were made too long (for monopoly reasons), and he was definitely sceptical about what now is assumed to be the standard technology for increasing human capital in developed economies: university education.

The productivity-enhancing division of labour on which he focussed 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 get the job done. But Adam Smith also did not foresee the consequences of truly large scale production from the nineteenth century onwards, with its (apparently) necessary innovation of bureaucratic organisation and control systems, which may have reduced the importance of social trust in the workplace, by internalising so many transactions.

How big is the trust effect? From Table 1, the mean value of output per workers 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. 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 get 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 180,000 -- that is, more than four times higher than mean productivity – higher, indeed, than actual productivity in the leading industrial country -- the USA. The trust-productivity effect is indeed substantial.

4. Trust and wellbeing

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 (eg, 2008), and the annual (since 2012) *World Happiness Reports* issued by a group led by John F. Helliwell, Richard Layard and Jeffrey D. Sachs (eg. 2018). The latter use surveys of samples of national populations whose respondents are asked (by the Gallup polling organisation) 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 *et al.* (2018, Table 2.1) are able to estimate a successful 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 do fairly surely establish (as have other studies) the meaningfulness of individual survey responses to questions about happiness and quality of life. 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% increase in Polish per capita GDP (Helliwell *et al.* 2016, pp11-12).¹⁰

These results are impressive, but they almost certainly under-estimate 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) 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 all the channels whereby differences in the long-term component of generalised trust work their way through to a net total impact on well-being.

4.1 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 156 countries, collected by Gallup in its surveys for various years ranging from 2005 through 2017.

¹⁰ 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.

These data are supplemented in Table 2.1 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. Brief variable definitions are given below – for more information, refer to ‘Technical Box 1’ in the 2018 World Happiness Report. All variables from individuals’ survey responses are averaged to the country level.

Life Ladder: Evaluation, on a scale of 0 to 10, of the respondent’s current satisfaction with their life so far, interpreted as ‘subjective wellbeing’ (SWB).

LogGDPPPOP: natural log of per capita GDP in 2011 purchasing power parity international dollars, from World Bank, *World Development Indicators*¹¹

SUPPORT: “If you were in trouble, do you have relatives or friends you can count on...?” YES = 1; NO = 0

HLIFEEXP: Healthy life expectancy at birth, from World Health Organization; country data

FREEDOM: “Are you satisfied with your freedom to choose what you do with your life?” YES= 1; NO = 0

GENEROSITY: “Have you donated money to a charity in the past month?” This is presented as the residual of a regression of the answer to the question on GDP per capita.

CORRUPT: Average of binary answers to: “Is corruption widespread through the government?” and “Is corruption widespread within businesses?”

Table 1 reveals that there is certainly plenty of cross-country variability in average subjective wellbeing to 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.

The five non-economic factors used in the World Happiness Reports are all usefully spread out from the econometrician’s point of view. 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 & 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 private sector giving. It is very sad that

¹¹ This variable is of course very similar to the PWT variable $RGDPO/EMP$ used in Section 3 above. The latter can be used in the Wellbeing modelling reported next, and it gives very similar (slightly better) econometric results.

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.

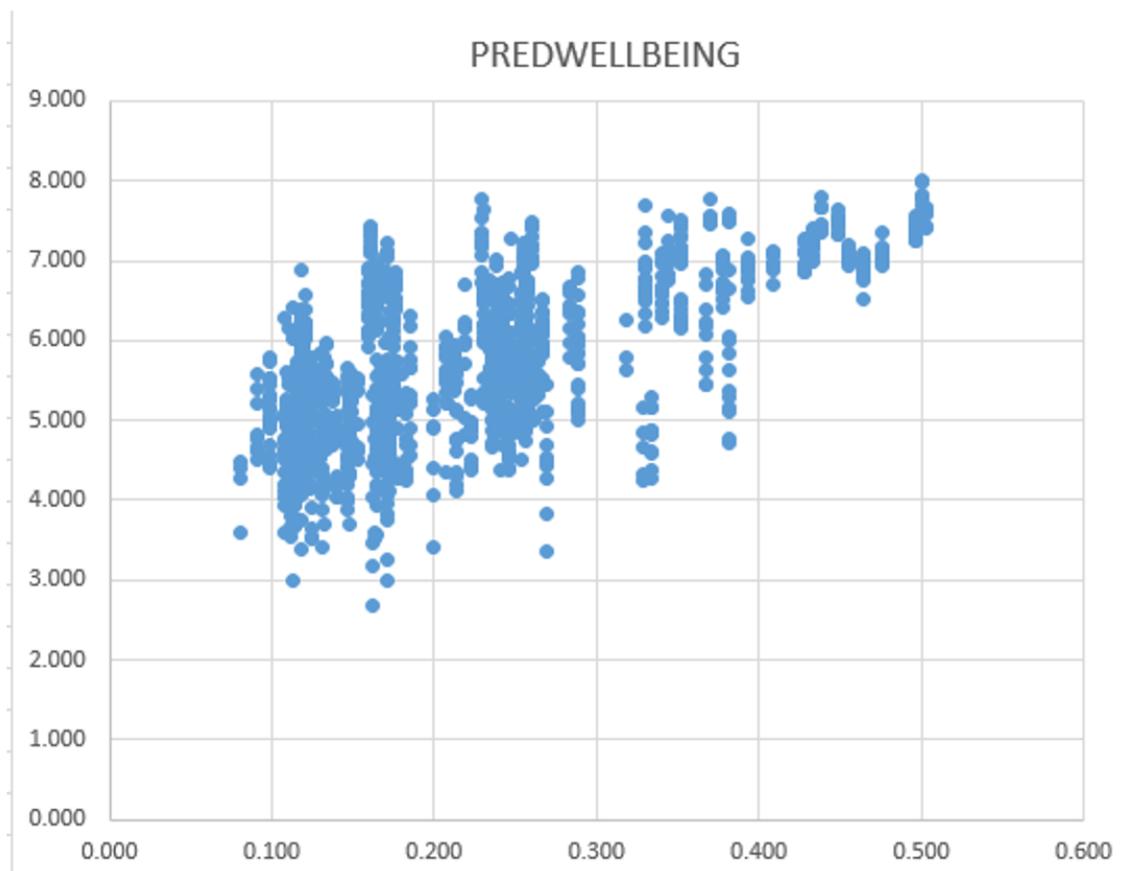
Overall, it is strikingly clear from these data that income is not the only fact of life that is unevenly distributed around the world (as well as within countries), and the wide range of SWB outcomes may suggest that the differences in the other factors do not cancel out, which in turn implies the existence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

4.2 Estimation

We use the sample of 137 countries 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 wellbeing, 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.

It is of interest to see what the simple model looks like: here is the scatter diagram for wellbeing plotted against predicted trust:



As in the WHR reports, a quite large proportion of the cross-country variation in self-reported wellbeing 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 wellbeing.

Now, we repeat the exercise of Section 3: looking for evidence that trust works indirectly through its influence on the direct determinants of wellbeing. Table 6 shows that such is indeed the case. We already know from Tables 3 and 4 that the income effect is itself indirect, via the provision of production inputs, and a similar situation is revealed for the five non-economic wellbeing factors, with, in every case, actual reported trust performing better than deep trust. Wellbeing appears to be more flexible in this sense than the level of a country's economic development.

5. The Kiwi conundrum: comparing Australia and New Zealand

There has been 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 the Bank's funding. The matter was assigned to an outside law firm to investigate, and the outcome of this remains controversial.

This furore is in the context of increasing 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.¹²

In this context, alarm bells could 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 free trade, etc, agreement in the developed world, which in particular allows absolutely free mobility of labour, with the result that a rather high proportion of NZ citizens -- perhaps more than 10 percent -- have crossed the Tasman Sea to improve their fortunes in 'OZ' -- as we often call Australia.

This they do with absolutely no difficulty, being quickly employed in OZ 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 noted by Zheng *et al.* (2021) and others -- 'better' than Australia. The INSTITUTIONSAV index used in this paper, which has much overlap with the World Bank's 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 Zealand's swingeing 'rogeromics' neoliberal

¹² <https://www.project-syndicate.org/commentary/world-bank-should-scrap-doing-business-index-by-jayati-ghosh-2020-09> <https://www.project-syndicate.org/commentary/world-bank-after-doing-business-four-criteria-by-mauricio-cardenas-2021-10> <https://www.project-syndicate.org/commentary/world-bank-doing-business-scandal-by-anne-o-krueger-2021-10> <https://www.project-syndicate.org/commentary/coup-attempt-against-imf-managing-director-georgieva-by-joseph-e-stiglitz-2021-09>

‘reforms’.¹³ So, although the -- rather moderate -- significance of the INSTITUTIONSAV variable used in our 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 paper contribute at all to understanding the NZ/OZ productivity gap?

| TABLE 7: COMPARING NEW ZEALAND & AUSTRALIA | | | |
|--|----|-----------|---------|
| | | PREDICTED | ACTUAL |
| OUTPUT PER WORKER (rgdpo/emp) | NZ | 65,550 | 70,294 |
| | OZ | 93,090 | 100,216 |
| CAPITAL PER WORKER (rnna/emp) | NZ | 441,730 | 241,543 |
| | OZ | 349,400 | 438,047 |
| INSTITUTIONAL QUALITY (INSTITUTIONSAV) | NZ | 6.93 | 10.64 |
| | OZ | 5.87 | 9.60 |
| SELF-REPORTED WELLBEING (LIFE LADDER) | NZ | 7.32 | 7.09 |
| | OZ | 7.31 | 7.12 |
| TRUST | NZ | 0.428 | 0.548 |
| | OZ | 0.397 | 0.503 |

The first box on Table 7 shows that our production function (the fourth regression model from Table 3) actually slightly underpredicts actual output per work 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 HC 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 market. The institution quality variable is, of course, higher in NZ, 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

¹³ Named after the very determined Finance Minister, (Sir) Roger Douglas, who pushed through the reforms in the 1984-90 Labour government.

that our Table 4 model predicts higher capital/labour ratios in NZ, due to higher generalised trust levels here.

This is as far as the data and results of the present paper can take us – not solving the puzzle, but somewhat narrowing it down.¹⁴ 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 New Zealand’s, but the capitalisation of its stock market is about thirteen times greater, including many big firms operating in New Zealand, such as the four major trading banks.

So, is there really a problem here? Perhaps we just don’t have a taste for running and working in the huge bureaucratic structures of the corporate sector. The real bottom-line of a country’s success is surely wellbeing, of which material GDP is an important, but not sole determinant, as the World Happiness Report consistently finds. Table 7 shows that the Table 5 model slightly over-predicts self-reported wellbeing in both our countries, with little difference between them. From an accounting perspective, here Australia’s higher incomes are just about balanced by higher informal support levels, and less corruption in New Zealand.¹⁵

6. Conclusion

The great modern economist, Kenneth Arrow, almost casually kick-started the contemporary interest in trust with this remark:

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...¹⁶

The evidence that has been gathered since then, including in this paper, 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 markers of our economic success and our personal wellbeing. Remarkably, it seems to be at least consistent with the data that all these

¹⁴ The difference in NZ and Australian capital/labour ratios is, of course, well known. Zheng *et al* (2021) note this as a possible factor to account for their finding from micro data of labour productivity lower in NZ than in five small European economies, for firms on their country’s productivity frontier, and for firms within the frontier.

¹⁵ It is notable that the ‘top ten’ countries in each year’s WHR wellbeing lists are without exception small or quite small First World economies, with Canada sometimes appearing, as the largest. The four Scandinavian countries are always in the top ten, with Finland at number one in recent years.

¹⁶ Arrow, 1972, p357. 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.

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 trust in strangers in our country.

Deep trust between strangers is an extremely important determinant of differences in the wealth of nations, through its influence on the willingness of workers and entrepreneurs to take the risks of investing in physical and human capital. Deep trust is also important for the quality of a country's institutions, which will be important to the well-being of the citizenry, but which apparently is not itself a determinant of economic productivity.

Thus trust is 'deep' in two senses: because of its ancient historical/geographical roots, and through the result that its effects on, in particular, well-being largely operate indirectly through well-being's immediate causal factors – incomes, social support, personal autonomy, (lack of) corruption, and so on.

So how does all this measure up against 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, p.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, but that is another story). If everyone reports a perfect-ten on their Cantril Ladder score – well, that's as good as it can get, isn't it? 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. Policy still has – hopefully – its role to play, in particular in building or restoring trust, and the informal support 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 1st World countries, per capita incomes in Denmark and Norway are more than twice those in Portugal, and nearly twice Spain and New Zealand, which countries are in turn at least twice as materially well off as the leading 2nd world economies, such as Argentina, Brazil and

Mexico. If these differences are largely dependent on deep trust, which in turn was basically preordained by events centuries ago, then the ‘middle-income trap’ may continue to be difficult to escape.

Finally, should we break further from orthodoxy? The WHR researchers are themselves quite ‘neoclassical’ in their assumption of a unique production function for wellbeing, available on the same terms to all countries, just like a neoclassical GDP production function. For example, Hamilton *et al.* (2016, pp9-10) 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% 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?¹⁷ There is more to be known about the development of widely shared norms, which may not be isomorphic to trust.

¹⁷ 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”.

| | TRUST | NOPRODROP | MONARCHY | MUSLIM | CATHOLIC | DIVERSITY | COLDEST |
|--------------------|--------------------|---------------------------------|---------------------|-------------------------------|----------------|--------------------|-----------------|
| maximum | 0.737 | 1.000 | 1.000 | 1.00 | 98.00 | 0.762 | 28 |
| | <i>Norway</i> | | | | | <i>Singapore</i> | <i>Panama</i> |
| minimum | 0.032 | 0.000 | 0.000 | 0.00 | 0.00 | 0.01 | -21.6 |
| | <i>Philippines</i> | | | | | <i>Turkey, etc</i> | <i>Mongolia</i> |
| average | 0.231 | 0.222 | 0.134 | 22.504 | 30.13 | 0.365 | 11.6 |
| standard deviation | 0.141 | 0.416 | 0.340 | 33.92 | 34.17 | 0.214 | 11.0 |
| | rgdpo/emp | rnna/emp | hc | insitutionsav | PTRUST | | |
| maximum | 194314 | 771062 | 4.36 | 10.85 | 0.502 | | |
| | <i>Ireland</i> | <i>Italy</i> | <i>Uzbekistan</i> | <i>Finland</i> | <i>Norway</i> | | |
| minimum | 1728 | 3148 | 1.13 | -10.36 | 0.099 | | |
| | <i>Burundi</i> | <i>Malawi</i> | <i>Burkina Faso</i> | <i>Congo (Brazza)</i> | <i>Panama</i> | | |
| average | 41782 | 201100 | 2.66 | 0.15 | 0.230 | | |
| standard deviation | 34108 | 200285 | 0.70 | 5.40 | 0.092 | | |
| | LIFE_LADDER | SUPPORT | HLIFEEXP | FREEDOM | GENEROUS | CORRUPT | |
| maximum | 8.02 | 0.99 | 76.5 | 0.985 | 0.678 | 0.983 | |
| | <i>Denmark</i> | <i>New Zealand</i> | <i>Hong Kong</i> | <i>Uzbekistan</i> | <i>Myanmar</i> | <i>Hungary</i> | |
| minimum | 2.69 | 0.29 | 37.8 | 0.258 | -0.323 | 0.035 | |
| | <i>Syria</i> | <i>Central African Republic</i> | <i>Sierra Leone</i> | <i>Bosnia and Herzegovina</i> | <i>Greece</i> | <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 | |

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

| dependent variable | C | TRUST | PTRUST | log(RNNA/EMP) | HC | INSTITUTIONS AV | R-squared | observations |
|--------------------|-------|--------|--------|---------------|-------|-----------------|-----------|--------------|
| log(RGDPO/EMP) | 9.437 | 3.335 | | | | | 0.203 | 1385 |
| <i>t-statistic</i> | 67.36 | 6.95 | | | | | | |
| | 8.950 | | 5.481 | | | | 0.236 | 1385 |
| <i>t-statistic</i> | 50.44 | | 9.15 | | | | | |
| | 3.250 | | | 0.542 | 0.265 | 0.024 | 0.900 | 1385 |
| <i>t-statistic</i> | 7.82 | | | 13.17 | 4.22 | 2.57 | | |
| | 3.298 | -0.274 | | 0.541 | 0.278 | 0.028 | 0.901 | 1385 |
| <i>t-statistic</i> | 7.85 | -1.39 | | 13.22 | 4.44 | 2.61 | | |
| | 3.388 | | -0.789 | 0.537 | 0.302 | 0.030 | 0.903 | 1385 |
| <i>t-statistic</i> | 7.89 | | -2.66 | 12.88 | 4.51 | 2.95 | | |

| TABLE 4: MODELLING PRODUCTION FUNCTION INPUTS | | | | |
|---|-------|-------|--------|-----------|
| dependent variable | C | TRUST | PTRUST | R-squared |
| log(RNNA/EMP) | 10.51 | 4.41 | | 0.209 |
| <i>t-statistic</i> | 54.96 | 6.86 | | |
| log(RNNA/EMP) | 9.82 | | 7.42 | 0.254 |
| <i>t-statistic</i> | 40.66 | | 9.17 | |
| HC | 2.13 | 2.29 | | 0.213 |
| <i>t-statistic</i> | 23.29 | 7.97 | | |
| HC | 1.71 | | 4.13 | 0.297 |
| <i>t-statistic</i> | 14.94 | | 10.39 | |
| INSTITUTIONSAV | -4.78 | 21.32 | | 0.310 |
| <i>t-statistic</i> | -7.31 | 7.36 | | |
| INSTITUTIONSAV | -7.69 | | 34.15 | 0.341 |
| <i>t-statistic</i> | -8.97 | | 10.17 | |

| TABLE 5: MODELLING SELF-REPORTED WELLBEING | | | | | | | | | | |
|--|--------|--------|--------|------------|---------|----------|---------|----------|---------|-----------|
| dependent variable | C | TRUST | PTRUST | LOGGDPPPOP | SUPPORT | HLIFEEXP | FREEDOM | GENEROUS | CORRUPT | R-squared |
| LIFE_LADDER | 4.580 | 3.828 | | | | | | | | 0.232 |
| <i>t-statistic</i> | 29.27 | 6.82 | | | | | | | | |
| LIFE_LADDER | 4.278 | | 5.169 | | | | | | | 0.182 |
| <i>t-statistic</i> | 18.47 | | 5.78 | | | | | | | |
| LIFE_LADDER | -1.720 | -0.192 | | 0.352 | 2.438 | 0.028 | 0.974 | 0.709 | -0.629 | 0.730 |
| <i>t-statistic</i> | -3.26 | -0.55 | | 5.43 | 5.74 | 3.06 | 3.00 | 2.42 | -2.02 | |
| LIFE_LADDER | -1.695 | | -0.388 | 0.359 | 2.451 | 0.027 | 0.960 | 0.695 | -0.635 | 0.731 |
| <i>t-statistic</i> | -3.23 | | -0.61 | 5.25 | 5.98 | 3.04 | 2.98 | 2.32 | -1.94 | |

| TABLE 6: MODELLING TRUST DETERMINANTS OF WELLBEING | | | | |
|--|--------|--------|--------|-----------|
| dependent variable | C | TRUST | PTRUST | R-squared |
| SUPPORT | 0.741 | 0.324 | | 0.145 |
| <i>t-statistic</i> | 49.55 | 7.20 | | |
| SUPPORT | 0.705 | | 0.482 | 0.138 |
| <i>t-statistic</i> | 31.71 | | 6.47 | |
| HLIFEEXP | 56.279 | 27.083 | | 0.23 |
| <i>t-statistic</i> | 48.99 | 8.05 | | |
| HLIFEEXP | 54.053 | | 36.969 | 0.184 |
| <i>t-statistic</i> | 33.75 | | 6.92 | |
| FREEDOM | 0.651 | 0.377 | | 0.142 |
| <i>t-statistic</i> | 36.28 | 7.11 | | |
| FREEDOM | 0.645 | | 25.631 | 0.070 |
| <i>t-statistic</i> | 0.40 | | 4.01 | |
| GENEROUS | -0.086 | 0.369 | | 0.096 |
| <i>t-statistic</i> | -4.24 | 4.03 | | |
| GENEROUS | -0.068 | | 0.292 | 0.026 |
| <i>t-statistic</i> | -2.05 | | 1.96 | |
| CORRUPT | 0.915 | -0.707 | | 0.284 |
| <i>t-statistic</i> | 38.85 | -6.05 | | |
| CORRUPT | 0.950 | | -0.859 | 0.182 |
| <i>t-statistic</i> | 25.10 | | -4.84 | |

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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 the following OLS model was estimated:

Dependent Variable: TRUST

Included observations: 124 after adjustments

| Variable | Coefficient | Std. Error | t-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 |
| R-squared | 0.678252 | Mean dependent var | | 0.238996 |
| Adjusted R-squared | 0.664619 | S.D. dependent var | | 0.141404 |

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 137 countries which have a Gallup trust score but no WVS score.