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SOCIAL CAPITAL, TRUST AND WELL-BEING IN THE EVALUATION OF WEALTH

Kirk Hamilton
John F. Helliwell
Michael Woolcock

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1050 Massachusetts Avenue
Cambridge, MA 02138
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ABSTRACT

We combine theory with data from different domains to provide an empirical analysis of the scale and variability of social capital as wealth. This is used to argue, given what we have learned in the literature on social capital, that the welfare returns to investing in trust could be substantial. Using social trust data from 132 nations covered by the Gallup World Poll, we present a range of estimates of social trust's wealth-equivalent values. The estimates of the wealth embodied in social capital are very large, and with a structure and distribution quite different from those for physical capital. These estimates reflect values above and beyond what social trust contributes to supporting incomes and health. Although social trust is an important component of total wealth in all regions and country groupings, there are nonetheless big variations within and among regions, ranging from as low as 12% of total wealth in Latin America to 28% in the OECD.

Kirk Hamilton
Visiting Professor
Grantham Research Institute on
Climate Change and Environment
London School of Economics
and Political Science
Houghton St
London WC2A 2AE
hamilton.kirke@gmail.com

John F. Helliwell
Vancouver School of Economics
University of British Columbia
6000 Iona Drive
Vancouver, BC V6T 1L4
CANADA
and NBER
john.helliwell@ubc.ca

Michael Woolcock
Development Research Group
World Bank
Mailstop MC3-306 1818 H Street NW
Washington, DC 20433
mwoolcock@worldbank.org

1. Introduction

This paper has a dual purpose. This first is to propose a broader framework for evaluating wealth, one that uses subjective well-being as an overarching measure of human wealth and welfare, and to show how this can provide a way to evaluate aspects of wealth that otherwise seem hard to measure and compare. The second is to illustrate the utility of this approach by using well-being analysis to evaluate social capital comparably with other forms of wealth. To achieve these dual purposes, we begin by making the case for using subjective well-being research to compute wealth-equivalent values for variables important to human welfare, values not normally included in national and global accounts of income and wealth. Next, we outline the analytical framework to be used to treat social trust as a part of national and global wealth estimates. We then consider various aspects of social capital, and how they might be expected to have a continuing value to society, focusing on social trust. Using data from nations covered by the Gallup World Poll we present a range of estimates of social trust's wealth-equivalent values. Finally, in the light of the estimated importance of social trust as a component of wealth and welfare, we consider some policy options for how it might be better built and sustained.

2. Using subjective well-being to broaden the scope of wealth estimates

Following the lead of Adam Smith (1796), labor economists have long used the notion of 'compensating differentials' to establish a monetary value for non-wage job characteristics by comparing the wage rates paid for jobs with different characteristics (for an early survey see Smith 1979). The problem with this approach is that unmeasured differences in ability permit those with higher ability to have jobs with higher pay and better working conditions, making it hard to use pay differentials as a straight-forward measure of the value of job characteristics. But if there is a suitable direct measure of utility, then it becomes possible to value income and job characteristics separately, and then to use the ratio of the two estimates as a measure of the income-equivalent value of job characteristics, or indeed of any other aspect of life.

Constructing direct measures of utility is not intractable, and in recent decades there has been growing use of measures of subjective well-being, and in particular of life evaluations, for exactly this purpose. For example, van Praag and Baarsma (2005) used data from happiness

surveys to attach a value to aircraft noise. Closer to the workplace, and to the well-being value of trust, Helliwell and Huang (2010, Table 4) used several different surveys to estimate income-equivalent values for different measures of workplace trust. These estimated compensating differentials were vary large; for example, averaging across the results from several different surveys, comparing a workplace at the 75th percentile in the trust distribution with one at the top of the distribution had an income-equivalent value roughly equal to a doubling of household income. More generally, it has been argued that life evaluations provide the capacity to extend the scope and methods of benefit/cost analysis profoundly (see Layard and O'Donnell 2015). Using these estimated well-being values for intangibles permits analysts to attach monetary values to features of life that were long known to be important but were relegated to the footnotes by the lack of any explicit way to bring them into the analysis.

We propose to use precisely the same method to develop wealth-equivalent measures of the value of social capital. We shall use social trust as our primary example, for reasons to be explained in more detail below: it is widely measured in surveys, has claims to be the longest-standing and broadest measure of trust, has a consistently strong relation to subjective well-being, and plays a central role in research on social capital and trust.

The next section outlines our analytic framework. On this basis we shall situate social trust in the context of debates surrounding the theory and measurement of social capital, and use this to develop our estimates for the wealth value of social trust.

3. Analytical framework

The aim of this section is to derive a measure of wealth for an economy where social capital is both an input to production and a direct contributor to well-being.

Wealth can be conceived as the present value of the stream of monetary benefits derived from a portfolio of assets. Indeed, under constant returns to scale the sum of asset values in an economy will just equal the present value of aggregate consumption as measured in the System of National Accounts (SNA). We show how the inclusion of social capital (using trust as an example) in the utility function leads to a more general value of wealth – it equals the present value of not just aggregate consumption of goods and services but also the level of trust enjoyed, valued at its marginal wealth-equivalent value.

Assume a simple closed economy where a composite produced good can be consumed, invested in 'social capital institutions', or invested in produced capital. The market equilibrium condition is

$$F(K,S) = C + I + \dot{K} \quad (1)$$

Here K is the stock of produced capital, S the stock of social capital, C is consumption and I investment in social capital. F is the production function for the composite good, and social capital is an input to production. Social capital is also a source of well-being, with utility given by $U = U(C,S)$ for $U_C > 0$, $U_S > 0$. We therefore treat social capital as non-rival. All variables are assumed to be functions of time unless otherwise stated. Population is constant and the pure rate of time preference is fixed at δ. Social capital accumulates according to

$$\dot{S} = f(I) \qquad (2)$$

Here investment function f is increasing in investment, $f' > 0$. We are assuming that increasing social capital will require investment of resources – an example would be building institutions that foster trust, as discussed in Section 6 below.

The optimal economy maximizes the present value of well-being over an infinite horizon, and has a Hamiltonian function,

$$\mathcal{H} = U(C,S) + p^K(F(K,S) - C - I) + p^S f(I)$$

Setting $\frac{\partial \mathcal{H}}{\partial C} = 0$ yields the shadow price of produced capital as $p^K = U_C$. Defining the marginal value of investment in social capital to be $q \equiv \frac{1}{f'}$, the shadow price of social capital p^S measured in utils is derived by setting $\frac{\partial \mathcal{H}}{\partial I} = 0$. This yields $p^S = U_C q$.

The dynamic conditions for optimization are derived as follows.

$$\dot{p}^K = \delta p^K - \frac{\partial \mathcal{H}}{\partial K} = \delta p^K - p^K F_K$$

This leads to the standard Ramsey rule for interest rate F_K:

$$\frac{\dot{U}_C}{U_C} = \delta - F_K \quad (3)$$

Turning to social capital we have

$$\dot{p}^S = \delta p^S - \frac{\partial \mathcal{H}}{\partial S} = \delta p^S - U_S - U_C F_S$$

Substituting $p^S = U_C q$ implies that

$$\frac{\dot{U}_C}{U_C} + \frac{\dot{q}}{q} = \delta - \frac{U_S}{U_C} \cdot \frac{1}{q} - \frac{F_S}{q}$$

Substituting for the Ramsey rule (3) therefore yields,

$$\dot{q} = -\left(\frac{U_S}{U_C} + F_S\right) + F_K q \qquad (4)$$

This differential equation has the particular solution

$$q = \int_t^{\infty} \left(\frac{U_S}{U_C}(z) + F_S(z)\right) \cdot e^{-\int_t^z F_K(\tau) d\tau} dz \qquad (5)$$

The shadow price of social capital measured in dollars is equal to the present value of the sum of the relative price of social capital versus consumption $(\frac{U_S}{U_C})$ and the marginal product of social capital (F_S). This expression captures the dual contribution that social capital makes to the economy.

Total wealth for this economy is given by

$$W = K + qS \quad (6)$$

The instantaneous change in total wealth $\dot{W}$ is derived by assuming constant returns to scale in both production and investment, so that

$$F(K, S) = F_K K + F_S S \text{ and } q \cdot f(I) = I$$

Using expressions (1), (2) and (4) we derive,

$$\begin{aligned} \dot{W} &= \dot{K} + \dot{q}S + q\dot{S} \\ &= F_K K + F_S S - C - I - \left(\frac{U_S}{U_C} + F_S\right) S + F_K q S + qf \\ &= F_K W - \left(C + \frac{U_S}{U_C} S\right) \end{aligned}$$

This differential equation has particular solution

$$W = \int_t^{\infty} (C(z) + \frac{U_S}{U_C}(z)S(z)) \cdot e^{-\int_t^z F_K(\tau)d\tau} dz \qquad (7)$$

Total wealth is therefore equal to the present value of the sum of consumption and social capital valued at its marginal contribution to dollar-valued well-being. Note that this result will hold in any economy where there are constant returns to scale and efficient pricing of social capital (expression 4). Optimality is not a necessary condition for expression (7) to hold. What should be clear from expression (7) is that if utility is a function of consumption only, $U = U(C)$, then total wealth will just equal the present value of consumption. Other things being equal, adding social capital as a contributor to well-being will increase the value of total wealth.

The latter point relates directly to the calculation of total wealth in World Bank (2006, 2011). In these publications, produced capital and natural resources appear as inputs to production but not as a direct source of well-being. Taking consumption C from published SNA values, total wealth is measured as the present value of consumption subject to assumptions that determine future consumption. If particular natural resources such as natural areas or green space in cities were accounted as a source of amenity, then an expression for total wealth very similar to expression (7) would result – total wealth would increase to include the well-being derived from environmental amenities.

Note that the shadow price q partitions neatly into the shadow price of the production value of social capital q^F and the well-being value, q^U. Expression (5) becomes,

$$q = q^F + q^U \quad (8)$$

From expressions (7) and (8) we derive,

$$K + q^F S + \int_t^{\infty} (\frac{U_S}{U_C}(z)(S(t) - S(z)) \cdot e^{-\int_t^z F_K(\tau)d\tau} dz = \int_t^{\infty} C(z) \cdot e^{-\int_t^z F_K(\tau)d\tau} dz \quad (9)$$

If social capital is constant or changes only slowly or in any event without predictable trends, we conclude that the present value of consumption is (roughly) equal to the sum of produced capital and the production value of social capital. This will be true even if no explicit values of F_S and q^F can be derived empirically. The 'missing' value of the production value of social capital would become part of an intangible wealth residual in comprehensive wealth accounts.

The well-being value of social capital, the present value of $\frac{U_S}{U_C}S$ in expression (7), should be interpreted as a 'wealth equivalent' value. This asset is clearly different from produced,

natural and human capital, in the sense that we can actually buy (or at least rent) the latter assets, given their contribution to the production of ordinary goods and services.

One motivation for measuring wealth equivalents of well-being is to compare the magnitudes of social contributors to wealth to other more familiar figures such as the value of natural, produced or human capital. This gives us a deeper insight into the question of 'where is the wealth of nations?' (a question that has occupied both Adam Smith and the World Bank) and can be useful for policy to the extent that we have effective policy levers that increase trust. By dealing with wealth magnitudes our results also contribute to a broader argument that the primary task of governments is to increase social welfare (the present value of well-being), rather than narrowly focusing on boosting *current* consumption, or production in terms of GDP growth.

The inclusion of social capital based on its well-being value also helps to avoid some oft-mentioned difficulties created when defensive expenditures (e.g., on police and prisons) are valued at what is spent on them, while the appropriate values should depend on the overall quality of the environment in which these expenditures are made. These problems have long inspired suggestions to revise income accounts to make them better 'measures of economic welfare' (Nordhaus and Tobin 1972), and continue to do so to this day (see Stiglitz, Sen and Fitousi 2009). A particular example may help to illustrate the issue, and to show how treating social trust as wealth might help to make the wealth estimates a better measure of welfare. France spends much more per capita on traffic policing than does Norway, while their rate of traffic fatalities is twice as high. OECD-wide research linking traffic fatalities and social trust (Helliwell and Wang 2011) suggests that the average social trust differences between France and Norway are sufficient to account for the much higher rate of traffic fatalities in France.

4. Aspects of social capital, and ways in which they might influence well-being

Our conceptualisation of social capital, consistent with those of Woolcock (1998) and Putnam (1993, 2001), is based on the OECD's definition (2001, p.41) as "networks together with shared norms, values and understandings that facilitate co-operation within or among groups". There is wide agreement that social norms and networks yield streams of benefits. These benefits can be narrowly economic (production values) or more broadly conceived as human well-being. Since we aim to develop a wealth measure for social capital that lies above and beyond its contributions to high incomes, we shall concentrate on the benefits of social capital that lie above

and beyond their contributions to income and material wealth. This is implicit in our calculation procedures, which will be set up so as to estimate the amount that social trust contributes to subjective well-being within a framework in which the contributions from income, including the extent to which it is supported by social trust, are already taken into account.

There is no guarantee that any particular measure of social capital will improve well-being, whether via economic or other channels, any more than there is for any piece of human or physical capital. (Human capital in the form of knowledge of chemistry, for example, can be deployed to make life-saving medicines or life-destroying bombs.) In the social capital space, these so-called 'downsides' (Portes 2014) reside in social norms that favor narrow in-group interests over those of outsiders (or the collective good more generally). Empirically, Knack (2003) has sought to show that societies characterized by a prevalence of narrow, 'Olson (1982) groups' are associated with lower economic growth than those with broader, 'Putnam (1993) groups'.[1] Similarly, within the United States there is evidence that membership in Putnam groups is more supportive of happiness than is membership in Olson groups (Bartolini et al 2013).

Given the variety of sources and uses of social capital, there are obvious possibilities for outcomes ranging from malign to benign to collectively beneficial. Co-operation within and among groups may sometimes be such as to facilitate outcomes – such as crime, warfare, terrorism, oppression or environmental destruction – that have negative consequences for the world as a whole, and for average life satisfaction. If, however, we find that certain measures of social capital seem to be associated with higher average levels of subjective well-being, the appropriate inference is that on average the social capital is being put to uses that support rather than destroy subjective well-being. Such a finding matters because trust is sometimes seen as an element of social capital, and sometimes as a consequence of it. If trust is or reflects a social norm, then it is an element. Yet it is in any event also a consequence of other forms of social capital, because research on the accumulation of trust, even in experimental contexts, shows trust to be higher in face-to-face contexts reflected by the various sorts of groups, and the time spent

[1] See also Zak and Knack (2001), who argue that trust enhances growth by creating an environment more conducive to investment. More recent evidence on trust and economic growth is provided by Algan & Cahuc (2013).

in shared activities, of the sorts often considered as elements of social capital (see Woolcock and Radin 2008).

We have seen that broader forms of trust are less likely to have their gains at the expense of outsiders, and hence are more likely to have positive externalities. For use as a component of national wealth, we would prefer to make use of a measure for which the individual gains are supplemented by positive externalities. In that way we can have more assurance that averaging the individual-level gains will provide a lower-bound estimate of the aggregate gains.

Such a measure could potentially be found in the oft-employed social trust question, which has several versions, typically of the form: "Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?" Given its form, it has generally been assumed to have a wide ambit, and to be a broad-radius measure of trust, and hence a good candidate to have positive externalities. But its ambit is clearly not completely global in scope, because there are large international differences in average answers. Individual and national average answers have been found to depend on community-level and national-level determinants, perhaps with different weights in different cultures (Delhey et al 2011). Furthermore, answers to the social trust question have themselves been argued to reflect underlying social norms (Helliwell, Wang & Xu 2014), as they adapt on migration from one country to another, but slowly enough so as to leave a significant footprint, sometimes into subsequent generations (Rice & Feldman 1997, Uslaner 2008).

Where well-being analysis is based on several types of trust, it is common to find independent positive contributions from several different sorts of trust. Inclusion of more measures in the analysis sometimes reduces the estimated effects of the central measure of social trust, but always increases the total effects of a high-trust environment. Thus if our analysis makes use of just the effects that flow through social trust, they are likely to reflect an underestimate of the well-being effects of trust, and even more so for social capital as a whole.

For all of these reasons, social trust seems to us an ideal candidate to provide a lower-bound estimate of the wealth-equivalent value of social capital at the national level. It is the broadest measure, and hence most likely to have positive externalities. It has national average values that differ significantly across countries, while being responsive to the levels and changes in national-level determinants. Finally, it is the longest-standing and most broadly available indicator with credible claims to represent the national quality of social capital.

5. Estimating the global wealth value of social trust

In this section we use social trust to illustrate how well-being analysis can be used to make social capital comparable with other forms of wealth. Total wealth is made up of a variety of assets. An asset is any object – building, machine, structure, plot of land, natural resource, idea, institution – that provides a stream of benefits into the future. Trust, as a key aspect of social capital, clearly fits this definition. In this section we apply the analytical framework of section 3 to the valuation of trust as an asset.

A related paper (Helliwell, Huang & Wang 2016) has developed new estimates of the key parameters required to calculate the wealth-equivalent value of social trust. The main sources are three large international surveys that have in some or all of their survey rounds asked the social trust question. These include the Gallup World Poll (in which the social trust question was only asked in most countries for only a single year, usually 2009), six waves of the biennial European Social Survey (2002 through 2012), and six waves of the World Values Survey (covering1981-2014).

In order to calculate wealth-equivalent values for social trust, we must first estimate the effects of both social trust and income on subjective well-being. We then take the ratio of these two effects to represent the income-equivalent value of any given level of social trust. The coefficient on social trust shows by how much life evaluations increase, in terms of points on the 10-point scale, if the value of social trust moves from 0 to 1. We measure income, at either the household or the national level, in logarithmic form, and the estimated coefficient on income thus shows the size of the life evaluation increase that would follow from an increase of 1.0 in the log of income. Thus the ratio of the two effects shows the income-equivalent value, measured as a log change in income, of increasing social trust from 0 to 1. To illustrate the procedure more specifically, we can calculate the amount of income equivalent to the well-being value of the difference in social trust between two countries. The average of binary responses to the social trust question in 2009 was .564 in Sweden and .207 in Italy. The difference is about .354, favoring Sweden. Using 0.5 as an illustrative value for the compensating differential (it is actually the value we will suggest as a conservative lower bound estimate) then the social trust difference of .357 between Sweden and Italy has an income equivalent value, in log terms, of

.178 (=.5*.357). Thus the additional social trust in Sweden, relative to that in Italy, has a well-being benefit equivalent to a 20% difference in GDP per capita (exp(.178)=1.198).

Our calculations thus depend on the relative sizes of the well-being effects of two key variables – social trust and log income. There are two main ways of estimating these effects, through the use of either individual-level or national-level data. Helliwell, Huang and Wang (2016) have used both ways to calculate social trust and income effects in each of three large international surveys that have asked the social trust question. All of the results used below are reported in detail in that paper, and its supporting statistical appendix.

For the individual-level analysis, the sample sizes are large, ranging from 144,000 in the Gallup World Poll (GWP) to 278,000 in the European Social Survey (ESS) and 356,000 in the World Values Survey (WVS). The GWP and the WVS ask the social trust question on a binary basis, with each answer being either 0 or 1, while the ESS collects answers on a more informative scale running from 0 to 10. For greater comparability across the surveys, we convert the ESS answers to a binary form, using 1.0 for all those answering 7 or above on the 10-point scale. This gives roughly the same average national trust scores as are obtained from the answers to the binary question. Household incomes are available in log form in the GWP, but only by decile groups for the other two surveys. We can however convert the decile response data to log-equivalent form using data on the average incomes in each decile.

There is also a related issue of whether it is appropriate to assume that the same coefficients apply in all countries and global regions. Some previous evidence has suggested that trust effects might be lower, and possibly income effects higher, in less industrialized countries. To get some idea of these differences, we split the large WVS sample between respondents in OECD and non-OECD countries. We found, as expected, that the social trust coefficients averaged .36 for the OECD sample compared to .27 for the non-OECD sample. However, since in both cases the values are higher than the .25 we are proposing to use as our conservative lower bound for the estimate of the trust effect, we have decided for simplicity to continue to use a single global estimate, recognizing that it is likely to undervalue social trust for all countries, but especially so for the industrial countries[2].

[2] There are also possibilities for trust valuations to differ among sub-groups within a country, as argued by Decancq et al (2015), who suggest a method for estimating income-equivalent values of non-income sources of well-being that differ among demographic groups within the national

Our individual-level results for the social trust effect in the three surveys range from .25 to .45, while the income effects range from about .3 to .5. The estimated compensating differentials range from about .6 to .9.

The estimates based on national-level data are harder to make comparable across surveys, as the Gallup World Poll has trust data typically only for a single year, and the WVS has a very uneven set of countries in its widely spaced survey rounds, while the ESS has a fairly well-balanced set of 6 surveys for its 32 countries.[3] The number of observations is of course much smaller, and there are many variables with claims to underlie the very large international differences in life evaluation. Both of these facts reduce the precision of our estimates. One offsetting advantage of the national estimates is that they include any spillover or external effects that may apply to either social trust or incomes. If these external effects are more likely to be positive for social trust than for incomes, then we might expect the estimated compensating differentials to be higher when national average data are used. This turns out to be the case. For each of the three surveys, the estimated social trust effect was substantially larger than for the individual-level data. The estimated income effects were roughly unchanged for the GWP and the WVS, but larger for the ESS. However the ESS social trust effects were much larger still so that for all three surveys the national-level estimates for the compensating differentials were higher, in all cases double or more then those coming from the individual-level analysis. They are, however, much less precise, making the exact size of the increases difficult to pin down.

Thus both estimation methods and all three surveys deliver compensating differentials for social trust that are greater than 0.5. Our calculated wealth estimates, which make use of .25 as the social trust effect and .5 as the effect of log income, which also gives 0.5 for the compensating differential, since .25/.5=.5, are therefore likely to err on the low side.

There is another reason for thinking that our calculations are likely to understate the overall value of a trustworthy environment. The European Social Survey, with its larger range of trust variables, and its information-rich answer scales, permits the effects of social trust to be

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population. For our purposes, the average national valuations are what we wish to establish, so we are prepared to estimate them using coefficients based on the average effects of social trust on life evaluations.

[3] Corresponding to these differences, we use slightly different estimation strategies in the three cases: a cross-section for the GWP data, a panel with year effects for the WVS, and a panel with both country and year effects for the ESS. The estimation details and results are shown in the on-line statistical appendix to Helliwell, Huang and Wang (2016).

jointly estimated with those of other forms of trust. Helliwell, Huang and Wang (2016) show that adding four additional trust variables – trust in police, judiciary, parliament and politicians – significantly increases the total effects of trust. The estimated effect of social trust drops by about a quarter, since social trust no longer has to play a proxy role for so many other types of trust. It remains, however, along with trust in police, as the most important trust contributor to well-being. Overall, and omitting the likely large impacts from workplace trust, our estimate of the well-being effects of having trust in all the five dimensions covered in our ESS analysis is double that estimated to flow from social trust alone.

We now use these estimates to estimate the asset value of social trust for each country. As we have shown above, the starting point in the calculation is the compensating differential for trust – the amount of income, measured as GDP, yielding the same marginal amount of subjective well-being as a unit of trust, measured on a scale from 0 to 1. In the analytical framework this is denoted as $\frac{U_S}{U_C}$. As argued above, we choose values of U_S and U_C that represent conservative values for the average marginal benefits (measured as units of subjective well-being on a scale of 0 to 10) of trust or income across countries, yielding $U_S = 0.25$ and $U_C = 0.50$. Income is measured in units of ln(GDP). For any given country i the dollar value of the benefit of a unit of trust (a flow) is therefore given by $\frac{U_S}{U_C} S_i$. The flows of benefits provided by trust are converted into asset values by taking present values. In order to ensure consistency of these asset values with the total wealth estimates of the World Bank, the present values are taken over 25 years (roughly a generation in length) with a discount rate of 1.5% in all countries.[4]

An example can aid in understanding the calculations. In the case of India, its trust score on a scale of 0 to 1 for 2010 is 0.207, which is slightly below the average for east and south Asia of 0.212. The value of this level of trust as an annual flow is equal to 0.106 times ln(GDP), or 10.9% of GDP, which equals $151 per capita. Taking the present value of this flow over 25 years using the World Bank assumptions therefore yields a wealth value of $3,136 per capita, or 18.9% of total wealth per capita as measured by the Bank – again, this is just below the regional average

[4] Note that the analytical framework measures the marginal utility of consumption U_C. The marginal benefit of income from the subjective well-being data is a good proxy for this value. For details of the total wealth calculation see World Bank (2011), Annex 1, or the introduction to Hamilton and Liu (2014).

of 20.0%. The value of trust as an asset is comparable to the value of produced capital per person in India, $3,496.

Table 1 provides, region by region, a summary of the calculated asset values of trust by country in proportion to total wealth in 2010. The trust data are national averages of Gallup World Poll individual responses to the binary social trust question for each of the 132 countries in which the question was asked.[5] Most countries were asked in 2009, with roughly 1,000 respondents per survey year. The total wealth data are from World Bank estimates.[6] Looking across regions, three points stand out. First, mean trust scores and asset values of trust vary widely across regions, with Eastern Europe and Central Asia and the OECD countries at the high end and Latin America and the Caribbean and the Middle East and North Africa at the low end. Second, unsurprisingly, there is considerable total variation within regions.[7] Finally, the asset values of trust are generally large, on the order of 20% in proportion to total wealth as measured by the World Bank.

Table 1. Trust scores and asset value of trust in proportion to total wealth

Two highest and lowest shares of wealth by region, 2010

Asia (East and South)	**Trust score (0-1)**	**Asset value % of total wealth**
Cambodia	0.105	7.0%
Bangladesh	0.115	8.4%
Average	0.212	20.0%
Thailand	0.236	22.1%
China	0.585	85.5%
Africa (sub-Saharan)		
Kenya	0.096	6.4%

[5] The individual country trust data are reported in Appendix Table 9 of Helliwell, Wang & Xu (2014).

[6] The 2010 wealth estimates used here will be published at the same time as the forthcoming World Bank publication *The Changing Wealth of Nations 2016*, slated for early 2017. The 2010 wealth estimates use methods entirely consistent with the figures for 1995, 2000 and 2005 published at http://databank.worldbank.org

[7] There are also large differences within countries, as documented by Putnam (1993) for Italy, and by Algan & Cahuc (2013) for sub-national regions in Europe and states in the United States. Since our wealth estimates are at the national level, we do not make use of any sub-national data, which are only available in any event for selected countries.

Zimbabwe	0.148	7.9%
Average	0.248	19.1%
Congo, Dem. Rep.	0.390	34.4%
Mali	0.448	34.7%
Latin America and Caribbean		
Nicaragua	0.113	6.6%
Honduras	0.128	7.5%
Average	0.169	12.2%
Panama	0.213	21.0%
Uruguay	0.278	21.4%
Middle East and North Africa		
Lebanon	0.067	4.5%
Jordan	0.096	5.5%
Average	0.158	16.6%
Iraq	0.160	18.5%
Saudi Arabia	0.371	49.1%
Eastern Europe and Central Asia		
Moldova	0.126	6.3%
Macedonia, FYR	0.106	6.4%
Average	0.223	22.0%
Kazakhstan	0.344	50.3%
Turkmenistan	0.275	89.4%
OECD		
Turkey	0.084	5.4%
Hungary	0.133	9.4%
Average	0.311	28.4%
Sweden	0.563	51.1%
Denmark	0.630	54.3%

Source: Authors' calculations

In South and East Asia and the Middle East and North Africa there is a big gap in trust levels between the highest and second-highest countries, with China and Saudi Arabia standing out. The Nordic countries are significant outliers as well, as the figures for Sweden and Denmark indicate. The World Bank total wealth estimates for China are probably anomalous, however. In China roughly 50% of GDP is saved, compared with about 20% in high income countries. This leads to an arguably under-estimated total wealth for China, with the culprit being the uniform discount rate used across all countries in the wealth estimation methodology. The result is an over-statement of the asset value of trust as a percent of total wealth. Similar results would hold for other high savers such as Singapore.

Table 2 and Figure 1 detail the composition of national wealth, including both human and social capital. Note that the value of total wealth from the World Bank estimates is the sum of the first five columns, with the 'Residual' column being the difference between World Bank figures on intangible capital and human capital as estimated by Hamilton and Liu (2014).[8]

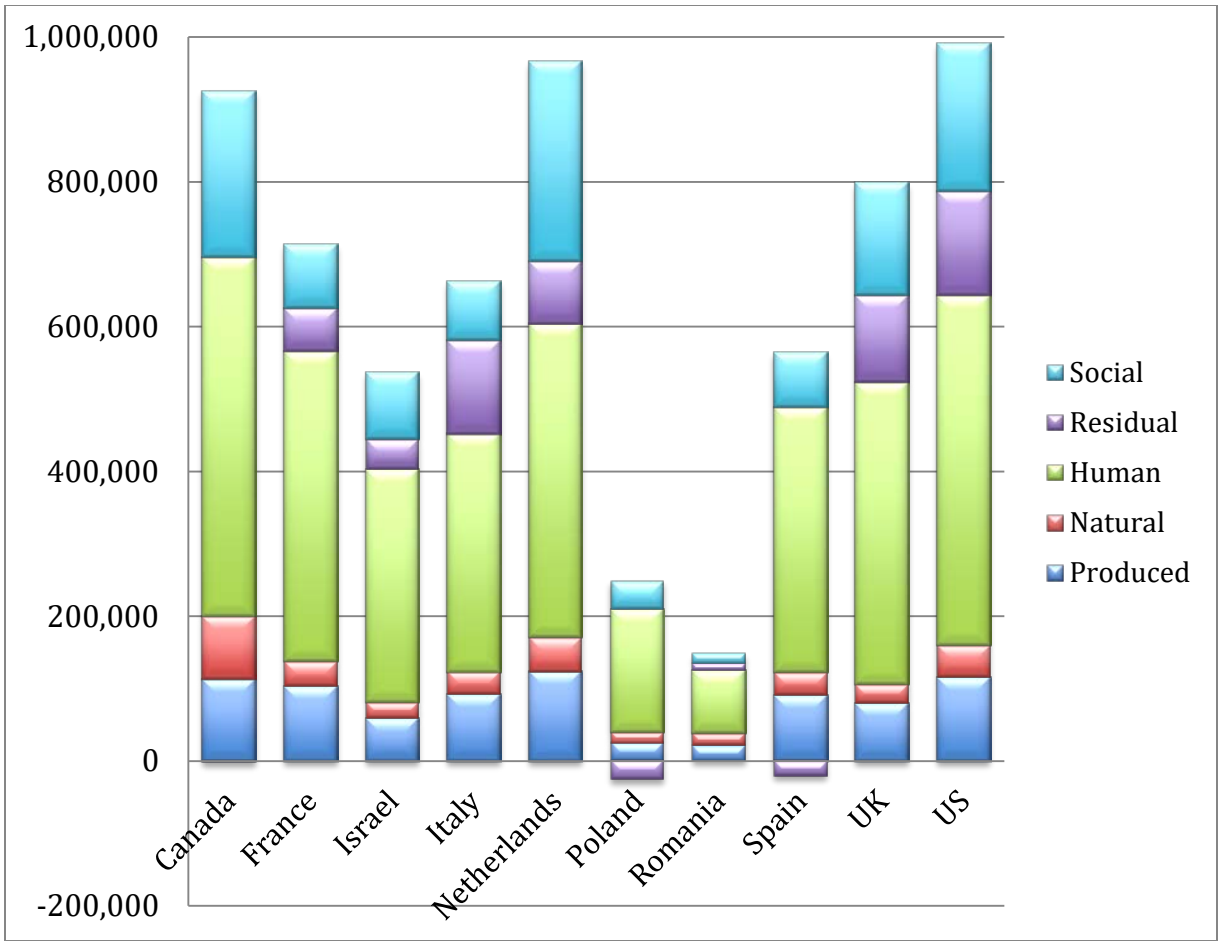
Table 2. Composition of wealth by type of capital, selected countries, $ per capita, 2010

	Produced	Natural	Human	Residual	Social	Sum
Canada	112,845	87,218	496,141	-1,744	229,120	923,580
France	103,212	33,757	428,837	59,555	88,073	713,434
Israel	59,400	22,084	320,865	42,263	92,130	536,741
Italy	92,032	31,134	328,570	129,156	81,110	662,003
Netherlands	123,444	47,612	432,868	86,454	275,867	966,245
Poland	25,361	14,674	170,057	-25,376	38,764	223,481
Romania	21,412	16,746	86,878	9,596	13,815	148,448
Spain	90,459	31,553	366,431	-20,600	75,620	543,463
UK	79,985	26,587	417,479	118,608	155,486	798,145
US	115,535	44,753	482,374	144,151	204,134	990,947

Source: Authors' calculations, based on World Bank wealth estimates and Hamilton and Liu (2014).

Figure 1. Composition of wealth by type of capital, selected countries, $ per capita, 2010

[8] Hamilton and Liu (2014) estimate human capital in 2005 for selected countries. This is updated to 2010 using the growth in nominal GDP – since salaries paid and proprietor income generally amount to over 60% of GDP, the 2010 estimates are crude but reasonably accurate.



Source: Authors' calculations

For the selected countries in 2010 the value of human capital is the dominant asset at over 60% of total wealth. Generally speaking, however, the value of social capital ranks second as a share of total wealth, with particularly large shares in Canada, the Netherlands and the US, and small shares in France, Italy and Spain.

In assessing these numbers, recall that what is labeled 'social capital' is the wealth equivalent of well-being derived from social trust. The contribution of social capital to production is not measured explicitly and so, by construction, must be part of the wealth residual (under the assumption made in section 3 that levels of trust change only slowly, or without predictable trend, over time). Other constituents of the wealth residual include the value of institutional quality, also not measured explicitly.

6. Policy implications

The analytical framework presented in section 3 shows that, from the point of view of economic theory, the most general measure of wealth in an economy where social trust is both a productive input and a direct source of well-being is equal to the present value of both consumption and the dollar-valued flow of well-being derived from trust. We interpret the theory carefully, however, making a distinction between assets that have exchange value, and social capital as an example of an asset where there is no obvious exchange value. We term the latter a 'wealth equivalent.' This appears to us to be a useful distinction to make.

Even so, a key message from our analysis is that economists have tools that permit us to value trust as an asset, and the evidence we present suggests that social capital as a source of well-being is a major contributor to social welfare – indeed, as large as or larger than produced capital in many economies. The value of social capital as an asset also varies markedly across (and doubtless within) countries. From a policy perspective these factors may make social capital an attractive target for investment. This begs the question, of course, of how to invest in social trust.

Two initial considerations present themselves. First, the nature of policy evaluation should be extended even more broadly, in both scope and horizon, than is already implied by broadening the focus of development research from income to sustainable wealth. Both the levels and the distribution of subjective well-being need to be measured regularly, and in much finer geographic and demographic detail, along with corresponding data reflecting the quality of the social context in which lives are being lived. Only thus can estimates of the wealth value of social capital be matched more precisely to other components of wealth, and the wealth analysis itself be expanded to provide a better measure of human welfare. Second, putting more emphasis on the importance of well-being as an overarching objective entails greater efforts devoted not just to the collection of data, but to a better understanding of how social capital contributes to better lives. Research already in hand shows that there are immediate implications not just for what policies are useful, but how they ought to be designed and delivered. Evidence from the World Happiness Reports and elsewhere suggests that those who are working together to design and deliver better futures for themselves and others are not only made happier by this process, but also do so more effectively.

Given the substantial contribution that social capital (even just that part flowing through social trust) makes to generalized wealth, how can policies support these elements of the social fabric? Research has shown that higher levels of social trust are correlated with higher levels of well-being. We have also found that higher levels of social trust achieve their impacts on average well-being in part by reducing the well-being impact of ill-health, unemployment and discrimination.[9] Since these three adversities are far more prevalent among those at the bottom of the distribution of well-being, these channels of influence not only raise the average level of well-being directly, but also reduce the inequality of well-being, which in turn increases again the total advantages flowing from higher social trust. A policy emphasis that is especially directed towards building social trust among the disadvantaged therefore has a supercharged effect on average well-being, since the well-being improvements are greater when the trust increases happen among the disadvantaged. Realizing this outcome, however, will entail not merely articulating 'policies' supporting the disadvantaged but sustained political commitments to actually providing the necessary resources and services, and to actively defending them in the face of resistance. Moreover, it will require building the capability of implementing systems that can deliver what are often deeply complex administrative tasks (e.g., accommodating the specific concerns of groups ranging from refugees and disabled military veterans to minority groups, juvenile offenders and the chronically unemployed). In this sense, policies to build social trust certainly require adequate resource provision, but their full realization entails building credible partnerships across societal fault lines, an encompassing social contract that is (and is perceived to be) legitimate by broad constituencies.

How can well-being analysis be used more generally to value the material and other supports for sustainable human progress? We have already noted that benefit/costs assessments in general, and estimates of the consequences of social capital in particular, can be done more accurately by using analysis of the determinants of subjective well-being to attach comparable values to important aspects of life. Otherwise these aspects are likely to be left out of the quantitative analysis entirely, and left to languish in the footnotes.

[9] The results in section 5 of Helliwell, Huang & Wang (2016) show that the adverse well-being effects for these three types of adversity average almost 30% less for high-trust respondents.

7. Conclusion

There are two main conclusions from this paper. The first is that subjective well-being data provide a credible way to broaden the range of variables that can be taken into account in the construction of measures of wealth. The second is that the resulting estimates of the wealth embodied in only a part of the measurable stock of social capital are very large, and with a structure and distribution quite different from those for physical capital. Our estimates of the wealth-equivalent values of social trust are above and beyond what social trust contributes to supporting incomes and health. We found large differences among countries and regions in the asset value of social trust. Although social trust was an important component of total wealth in all regions and country groupings, there were nonetheless big variations, ranging from as low as 12% of total wealth in Latin America to 28% in the OECD.

Application of these methods in the case of social trust has enabled us to construct estimates of the wealth value of at least one aspect of social capital, thereby enabling a broader focus for future public policy. This should permit policymakers to use these broader estimates of total wealth as measures of human progress, and to seek better ways of increasing the advantages that such wealth can provide for current and future generations.

References

Algan, Y., & Cahuc, P. (2013). Trust, growth and well-being: New evidence and policy implications.

Bartolini, S., Bilancini, E., & Pugno, M. (2013). Did the decline in social connections depress Americans' happiness? *Social Indicators Research*, *110*(3), 1033-1059.

Decancq, K., Fleurbaey, M., & Schokkaert, E. (2015). Happiness, equivalent incomes and respect for individual preferences. *Economica*, *82*(s1), 1082-1106.

Delhey, J., Newton, K., & Welzel, C. (2011). How general is trust in "most people"? Solving the radius of trust problem. *American Sociological Review*, *76*(5), 786-807.

Hamilton, K. & Liu, G. (2014). Human capital, tangible wealth, and the intangible capital residual. *Oxford Review of Economic Policy*, *30*(1), 70-91.

Helliwell, J. F., & Huang, H. (2010). How's the job? Well-being and social capital in the workplace. *Industrial & Labor Relations Review*, *63*(2), 205-227.

Helliwell, J. F., Huang, H., & Wang, S. (2016). New evidence on trust and well-being. Forthcoming in Uslaner, R. ed. *Handbook on Social and Political Trust*, New York: Oxford University Press. (also available as NBER Working Paper 22450, with online statistical appendix)

Helliwell, J. F., & Wang, S. (2011). Trust and wellbeing. *International Journal of Wellbeing*, *1*(1), 42-78.

Helliwell, J. F., Wang, S., & Xu, J. (2014). How durable are social norms? Immigrant trust and generosity in 132 Countries. *Social Indicators Research*, 1-19.

Knack, S. (2003). Groups, growth and trust: Cross-country evidence on the Olson and Putnam hypotheses. *Public Choice*, *117*(3-4), 341-355.

Layard, R. & O'Donnell, G. (2015). How to make policy when happiness is the goal. Chapter 4 in Helliwell, J.F., Layard, R. and Sachs, J., *World Happiness Report 2015*. New York: Sustainable Development Research Institute, pp. 76-87.

Nordhaus, W. D., & Tobin, J. (1972). Is growth obsolete? In *Economic Research: Retrospect and Prospect, Volume 5, Economic Growth*. National Bureau of Economic Research, pp. 1-80.

OECD (2001). *The Well-Being of Nations: The Role of Human and Social Capital, Education and Skills*. Organisation for Economic Cooperation and Development, 2 rue Andre Pascal, F-75775 Paris Cedex 16, France.

Olson, M. (1982). *The Rise and Decline of Nations: Economic Growth, Stagflation, and Social Rigidities*. New Haven: Yale University Press.

Portes, A. (2014). Downsides of social capital. *Proceedings of the National Academy of Sciences*, *111*(52), 18407-18408.

Putnam, R. D., with Leonardi, R., & Nanetti, R. Y. (1993). *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton: Princeton University Press.

Putnam, R. D. (2001). *Bowling Alone: The Collapse and Revival of American Community*. New York: Simon and Schuster.

Rice, T. W., & Feldman, J. L. (1997). Civic culture and democracy from Europe to America. *The Journal of Politics*, *59*(04), 1143-1172.

Smith, A. (1786). *An Inquiry into the Nature and Causes of the Wealth of Nations,* First edition 1786, 4th ed. (edited by John R. McCulloch). Edinburgh: Adam & Charles Black, 1850.

Smith, R. S. (1979). Compensating wage differentials and public policy: a review. *Industrial and Labor Relations Review*, *32*(3), 339-352.

Stiglitz, J. E., Sen, A., & Fitoussi, J. P. (2009). Report by the Commission on the Measurement of Economic Performance and Social Progress.

Uslaner, E. M. (2008). Where you stand depends upon where your grandparents sat: the inheritability of generalized trust. *Public Opinion Quarterly*, *72*(4), 725-740.

Van Praag, B., & Baarsma, B. E. (2005). Using happiness surveys to value intangibles: The case of airport noise. *The Economic Journal*, *115*(500), 224-246.

Woolcock, M. (1998). Social capital and economic development: Toward a theoretical synthesis and policy framework. *Theory and Society*, *27*(2), 151-208.

Woolcock, M. & Radin, E. (2008). A relational approach to the theory and practices of economic development. In Dario Castiglione, Jan van Deth and Guglielmo Wolleb (eds.) *Handbook of Social Capital*. New York: Oxford University Press, pp. 411-438.

World Bank (2006). *Where is the Wealth of Nations?* Washington DC: The World Bank.

World Bank (2011). *The Changing Wealth of Nations.* Washington DC: The World Bank.

Zak, P.J. & Knack, S. (2001). Trust and growth. *The Economic Journal*, *111*(470), 295-321.