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Research Paper No. 2007/77

Estimating the Level and Distribution of Global Household Wealth

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Anthony Shorrocks,² and Edward N. Wolff³

November 2007

Abstract

We provide the first estimate of the level and distribution of global household wealth. Mean assets and debts within countries are measured, partly or wholly, for 38 countries using household balance sheet and survey data centred on the year 2000. Determinants of mean financial assets, non-financial assets, and liabilities are studied empirically, and the results are used to impute values to countries lacking wealth data. Household wealth per adult is US\$43,494 in PPP terms, and ranges regionally from US\$11,655 in Africa to US\$193,147 in North America. Data on the shape of the household distribution of wealth for 20 countries, accounting for 59 per cent of the world's population and, we estimate, 84 per cent of its wealth are used to establish patterns of wealth inequality within countries. Imputations are again performed for countries lacking wealth data, on the basis of the observed relation between wealth and income distribution for the 20 countries with data. The Gini coefficient for the global distribution of wealth is 0.804, and the share of the top 10 per cent is 71 per cent. Wealth of US\$8,325 is needed to be in the top half of the distribution, and US\$517,601 is needed to be in the top one per cent. Between-country differences in wealth are two-thirds of global inequality according to the Gini coefficient, indicating a larger role for within-country inequality than in the case of income according to recent estimates.

Keywords: wealth, net worth, personal assets, inequality, households, balance sheets, portfolios

JEL classification: D31, E01, E21, O10

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1 Introduction

Much attention has recently been given to estimates of the world distribution of income (Bourguignon and Morrison 2002; Milanovic 2002, 2005). The results show that global income distribution is very unequal and that inequality has not been falling over time. Indeed, in some regions both poverty and income inequality have risen. Interest naturally turns to global inequalities in other dimensions of economic status, resources or wellbeing, of which one of the most important is household wealth.

In everyday conversation the term ‘wealth’ often signifies little more than ‘money income’. On other occasions economists interpret the term broadly and define wealth to be the value of all household resources, both human and non-human. Here, the term is used in its long-established sense of net worth: the value of physical and financial assets less liabilities.¹ Wealth in this respect represents the ownership of capital. While only one part of personal resources, capital is widely believed to have a disproportionate impact on household wellbeing and economic success, and more broadly on economic development and growth.

Wealth has been studied carefully at the national level since the late nineteenth or early twentieth century in a small number of countries, for example Sweden, the UK and the USA. In some other countries, for example Canada, it has been studied systematically since the 1950s. And in recent years the number of countries with wealth data has risen fairly quickly. The largest and most prosperous OECD countries all have wealth data based on household surveys, tax records, or national balance sheets. Repeated wealth surveys have been conducted for the two largest developing countries, China and India, and one survey covering wealth is also available for Indonesia. At the top end of the wealth scale, Forbes magazine publishes details of the holdings of the world’s dollar billionaires, and Merrill-Lynch estimate the number and net worth of dollar millionaires around the world. More detailed lists are provided regionally by other publications. National wealth has been estimated for a large number of countries by the World Bank.² In short, there is now a substantial amount of information on wealth holdings which, despite the gaps, encourages us to try to estimate the world distribution of household wealth.³

This paper establishes, first, that there are very large inter-country differences in the level of household wealth. The USA is the richest country in aggregate terms, with mean wealth estimated at \$143,727 per person in purchasing power parity (PPP) dollars

¹ Some studies include ‘social security wealth’; i.e., the present value of expected net benefits from public pension plans in household wealth. Social security wealth is excluded here, because estimates are available for very few countries.

² See World Bank (2005). National wealth differs from household wealth in including the wealth of all other sectors, of which corporations, government and the rest-of-the-world are important examples.

³ One sign of the growing maturity of household wealth data is the launching of the Luxembourg Wealth Study (LWS) parallel to the long-running Luxembourg Income Study (LIS). See www.lisproject.org/lws.htm. In its first phase the LWS aims to provide comparable wealth data for ten OECD countries, with the cooperation of national statistical agencies or central banks. The LWS initiative differs from ours in that its aim is not to estimate the world distribution of wealth, but to assemble fully comparable wealth data across an important subset of the world’s countries. For some preliminary results, see Sierminska et al. (2006).

in the year 2000.⁴ At the opposite extreme among countries with wealth data, India has per capita wealth of PPP\$6,513. Other countries show a wide range of values. Even among high income OECD countries the figures range from \$53,154 for Finland, and \$55,823 for New Zealand, to \$128,959 for the UK (again in PPP terms).

International differences in the *composition* of wealth are also examined. Some regularities are evident, but also country-specific differences—such as the strong preference for liquid savings in Japan and a few other countries. Real assets, particularly land and farm assets, are more important in less developed countries. This reflects not only the greater importance of agriculture, but also an immature financial sector (that is currently being addressed in some of the rapidly growing developing countries) and other factors such as inflation risk. Among rich nations, financial assets and share-holding are more prominent in countries with greater reliance on private pensions and more highly developed financial markets, such as the UK and USA.

Concentration of wealth within countries is high. Gini coefficients for wealth typically lie in the range of about 0.6–0.8. In contrast, most Ginis for disposable income fall in the range 0.3–0.5. The mid value for the share of the top 10 per cent of wealth-holders in our input data is 51 per cent, again much higher than common for income.

While inter-country differences are interesting, our principal objective is to estimate the distribution of wealth for the world as a whole. This requires estimates of the levels and distribution of wealth in countries where data on wealth are not available. Fortunately, the countries which have wealth data cover 56 per cent of the world's population and more than 80 per cent of household wealth. Careful analysis of the determinants of wealth levels and distribution in these countries allow imputations to be made for countries without direct wealth data.

The remainder of the paper is organized as follows. The next section describes what can be learned about household wealth levels and composition across countries using household balance sheet and survey data. Section 3 presents our results on the determinants of wealth levels, and assigns household wealth totals to the 'missing countries'. Section 4 reviews the available evidence on the pattern of wealth distribution, and then performs imputations for other countries. In Section 5 information on levels and distributions are combined to construct the global distribution of household wealth. Conclusions are drawn in Section 6.

⁴ All our wealth estimates are for the year 2000. Wealth data typically become available with a significant lag, and wealth surveys are conducted at intervals of three or more years. The year 2000 provides us with a reasonably recent date and good data availability.

2 Wealth levels

This section assembles data on wealth levels for as many countries as possible. These data are of independent interest, but are also used in the next section to impute per capita wealth to countries which lack wealth data. The exercise begins by taking inventories of household balance sheet (HBS) and sample survey estimates of household wealth levels and composition.⁵

2.1 Household balance sheet (HBS) data

As indicated in Table 1, ‘complete’ financial and non-financial balance sheet data are available for 19 countries. These are all high-income countries, except for the Czech Republic, Poland, and South Africa, which are classed as upper middle-income by the World Bank.⁶ The data are regarded as ‘complete’ if there is full, or almost full, coverage of financial assets, and inclusion of owner-occupied housing at least on the non-financial side. Sixteen other countries have comparable financial balance sheets, but no information on real assets. This group is less biased towards the rich world since it contains six upper middle income countries and three lower middle income countries.

Regional coverage in HBS data is not representative of the world as a whole. Such data tend to be produced at a relatively late stage of development. Europe and North America, and the OECD in general, are well covered, but low-income and transition countries are not.⁷ In geographic terms this means that coverage is sparse in Africa, Asia, Latin America, and the Caribbean. Fortunately for this study, these gaps in HBS data are offset to an important extent by the availability of survey evidence for the largest developing countries, China, India and Indonesia. Also note that while there are no HBS data for Russia, complete HBS data are available for two European transition countries and financial data for eight others.

As discussed in Appendix I, sources and methods differ across countries, particularly in respect of non-financial assets.⁸ HBS numbers may be obtained by direct or indirect means. The direct approach involves, for example, estimating the value of owner-

⁵ The sources and methods for balance sheet and survey data are described in Appendices I and II.

⁶ The World Bank classification is used throughout the paper except that Brazil, Russia, and South Africa were moved from the lower middle-income category to higher middle-income, and Equatorial Guinea from low to lower middle-income. These changes were prompted by the fact that the WB classifications seems anomalous compared to the Penn World Table GDP data that was used for the year 2000.

⁷ Interestingly, Goldsmith (1985) prepared ‘planetary’ balance sheets for 1950 and 1978 and found similar difficulties in obtaining representative coverage. He was able to include 15 developed market economies, two developing countries (India and Mexico), and the Soviet Union. This produces a total of 18 countries, one less than the number of countries for which we have complete HBS data for the year 2000.

⁸ Appendix IIB summarizes key definitional and coverage characteristics of the household balance sheet data by country.

Table 1 Coverage of wealth levels data, year 2000

	High income			Upper middle income	Lower middle income	Low income	Cumulative % of world population
Complete financial and non-financial data							
Household Balance Sheets	North America Canada USA	Europe Denmark Finland France Germany Italy Netherlands Portugal Spain UK	Asia-Pacific Australia Taiwan Japan New Zealand Singapore	Czech Republic Poland South Africa			15.3
Survey data					China	India Indonesia	56.0
Incomplete data							
Financial Balance Sheets		Austria Belgium Greece Slovenia Sweden Switzerland	Korea	Croatia Estonia Hungary Latvia Lithuania Slovakia	Bulgaria Romania Turkey		59.5
Survey data: non-financial assets				Mexico			61.1
Number of countries with wealth partly or fully estimated by regression method			18	28	36	46	95.2
Number of countries with wealth imputed by mean value of group			33	16	22	8	100.0

Source: see Appendix II.

occupied housing, or business equity, from survey data. The indirect method may require residual estimation of household assets in which the holdings of other sectors are deducted from national totals obtained from institutional sources. HBS estimates therefore inherit both the errors in data from direct sources, as well as the (possibly large) errors caused by the method of residual estimation.

Often, household balance sheets are compiled in conjunction with the National Accounts or Flow of Funds data, but there are several exceptions. For countries such as New Zealand, Portugal and Spain, data are reported by central banks and include estimates based on Financial Accounts augmented with data on housing assets. The German and Italian data are to a large extent also based on central bank data, but are more complete. The German figures are based on financial accounts data from Deutsche Bundesbank, and non-financial asset information including housing, other real assets and durables. Italian data are based on the financial accounts of the Bank of Italy supplemented by estimates of the stock of dwellings by the Italian statistical office (ISTAT) and of durable goods based on Brandolini *et al.* (2004). Even if household balance sheets use data from national statistical organizations, they do not necessarily have a broad coverage of non-financial assets. For example, data for the Netherlands are a mix of figures from Statistics Netherlands and the central bank, and the financial balance sheets are only augmented with data on owner-occupied housing. Non-financial data from the Singapore Department of Statistics also cover only housing assets. For Denmark we combined financial balance sheet data with fixed capital stock accounts reported by Statistics Denmark, and for Finland we combined financial balance sheets with estimates of housing assets provided to us by Statistics Finland.

In summary, each of the 19 countries classed as having complete balance sheets report good financial data plus data on owner-occupied housing. Finland, Poland, Singapore, and the Netherlands are at this minimum level. Fifteen countries also report data on some other real property, including land and/or investment real estate in most cases, and six of these countries have estimates for consumer durables.

We considered whether the non-financial coverage in these ‘complete’ balance sheets could be made more uniform by imputing missing items. It is very difficult to devise a satisfactory estimation procedure for land or investment real estate,⁹ so these items have not been imputed. Since only four countries lack these items entirely, and eight countries, including the USA, have complete data, the impact would not be substantial, although the omissions will have some effect on our results. In contrast, it is reasonably easy to construct estimates of consumer durables, and since this improves the non-financial asset coverage for thirteen countries, these imputations were included.¹⁰

⁹ While balance sheet figures for dwellings also capture the value of land on which they stand, other land is missing for Denmark, Germany, Italy, the Netherlands, and Singapore. Investment or commercial real estate is missing for the Netherlands, New Zealand, Portugal and Singapore, and for Italy (which covers all housing, whether owner occupied or not, but not other real estate). To the best of our knowledge, all real estate and land owned by households is included in the data in all other cases.

¹⁰ Durables figures are available for Canada, the USA, Germany, Italy and South Africa. The mean ratio of durables to GDP in Canada and the USA was used to impute durables to Australia, New Zealand, and the UK. For European countries other than the UK, the mean ratio for Germany and Italy was used. Finally, the mean ratio for Canada, the USA, Germany, and Italy was used for imputations for Japan and Singapore.

Appendix IIB also reveals differences in sectoral definition across countries. We aimed for a household sector which covered the assets and debts of households and unincorporated business. However, non-profit organizations (NPOs) are sometimes grouped with households. Data for the UK and USA allowed us to exclude NPOs. This correction is especially important for the USA where NPOs account for about 6 per cent of the financial assets of the household sector (Board of Governors of the Federal Reserve System 2003).

Table 2 reports the asset composition of household balance sheets. The asset composition reflects different influences on household behaviour such as market structure, regulation and cultural preferences (IMF 2005). However, these data need to be analyzed with care, since the comparison may be affected by differences in sectoral definition, asset coverage and estimation methods. For most countries, non-financial assets account for between 40 and 60 per cent of total assets, with higher shares in the Czech Republic, New Zealand, Poland, and Spain. Housing assets constitute a considerable share of non-financial assets. In a number of countries, for example Italy, Spain and the UK, the large increase in real estate prices in the late 1990s helps to explain the high share of housing. The high share of financial assets makes South Africa stand out. One would expect real assets to be important in a developing country, but the well developed financial markets in South Africa, combined with negative rates of return on investment in fixed property and high mortgage interest rates, have resulted in an unusually low share of non-financial assets (see Aron *et al.* 2006). The USA is also an outlier in the share of financial assets, which is clearly related to the strength of its markets, but may also be partly due to relatively cheap housing and extensive reliance on private pension plans.

The composition of financial assets can be examined not only for the 19 countries with complete balance sheets but also the 16 countries with only financial balance sheets. Striking differences across countries are evident when financial assets are disaggregated into liquid assets, shares and equities, and other assets. Liquid assets are a large part of the total in Japan and in most of the European transition countries. The preference for liquidity in Japan has a long history, but also reflects lack of confidence in real estate and shares after their poor performance in the 1990s (Babeau and Sbrano 2003). The share of other financial assets is particularly high in some countries, such as Australia, Austria, the Netherlands, South Africa, and the UK, which may be partly due to the importance of pension fund claims in these countries. Italy stands out as having a particularly low share of liabilities, something that is confirmed by survey data (see below). Poland and the Czech Republic also have low debt ratios, reflecting the under-development of mortgage and consumer credit in European transition countries.

Table 2: Percentage composition of household wealth in household balance sheets, year 2000

	Share of total gross assets				Share of financial assets		
	financial assets	non-financial assets	housing	liabilities	liquid assets	equities	other financial assets ^a
Household balance sheets							
Australia	41	59	20	17	22	20	58
Canada	57	43	20	18	25	32	43
Taiwan	59	41	20	10	39	32	29
Czech Republic	34	66	na	9	60	24	16
Denmark	55	45	24	30	21	31	48
Finland	41	59	48	13	33	45	22
France	40	60	29	11	33	32	35
Germany	40	60	42	16	34	37	29
Italy	42	58	50	3	23	55	21
Japan	50	50	Na	14	53	16	31
Netherlands	54	46	38	16	19	24	57
New Zealand	32	68	59	20	35	40	25
Poland	20	80	62	3	59	25	17
Portugal	49	51	39	19	47	38	15
Singapore	45	55	47	18	44	21	35
South Africa	65	35	16	15	21	19	60
Spain	31	69	60	10	40	43	17
UK	53	47	35	13	20	24	55
USA	67	33	26	15	13	51	36

Financial balance sheets			
Austria	55	26	19
Belgium	25	59	16
Bulgaria ^b	88	5	7
Croatia ^b	85	6	9
Estonia	26	54	20
Greece	44	51	4
Hungary	43	43	14
South Korea	61	18	21
Latvia	53	44	3
Lithuania	33	40	27
Romania ^b	76	21	3
Slovakia ^b	74	12	14
Slovenia	52	31	17
Sweden	14	45	40
Switzerland	21	38	41
Turkey ^b	62	32	6

Note: ^aOther financial assets include insurance and pension reserves and other accounts receivable. ^bComposition from year 2004.

Source: see Appendix II.

Table 3: Percentage composition of household wealth in survey data, year 2000

	Share of total assets				Share of financial assets		
	financial assets	non-financial assets	housing	liabilities	liquid assets	equities	other financial assets ^a
Australia	32	68	54	14	14	21	64
Canada	29	71	38	16	19	23	58
China ^b	22	78	57	1	0	na	Na
Finland	17	83	75	12	51	36	14
Germany	24	76	Na	15	46	24	30
India	5	95	28	3	92	5	3
Indonesia	3	97	46	2	na	na	na
Italy	18	78	69	2	40	39	na
Japan	30	70	54	10	59	34	29
Netherlands	21	80	70	27	37	43	20
New Zealand	28	72	37	16	21	21	58
Spain	13	87	58	9	40	38	22
USA	42	58	32	12	15	39	46

Note: ^aOther financial assets include insurance and pension plans and other accounts receivable. ^bHousing assets are net of associated debts; liabilities exclude housing debt. Source: see Appendix II.

2.2 Survey data

In order to check our HBS data and to expand our sample, especially to non-OECD countries, household wealth survey data were also consulted.¹¹ Country coverage is broader than in HBS data (see Table 3). Most importantly, wealth surveys are available for the three most populous developing (and emerging market) countries: China, India and Indonesia. These three countries, together with Mexico in the case of non-financial assets, are used in regressions in Section 3 that provide the basis for wealth level imputations for our ‘missing countries’.

Like all household surveys, those of wealth are affected by sampling and non-sampling errors. However, these errors are likely to be particularly serious for asset and debts. The high skewness of wealth distributions makes sampling error more severe. Non-sampling error is also a greater problem since differential response (wealthier households are less likely to respond) and misreporting are generally more important than for other variables of interest, such as income. Both sampling and non-sampling error lead to special difficulties in obtaining an accurate picture of the upper tail, which is of course one of the most interesting parts of the wealth distribution (see Davies and Shorrocks 2000: 605-76, 2005).

In order to offset the effects of sampling error in the upper tail, well-designed wealth surveys over-sample wealthier households. This is the practice in the US Survey of Consumer Finances and the Canadian Survey of Financial Security.¹² Unfortunately, none of the three countries whose survey data are used in the regressions for financial assets and liabilities reported in the next section over-samples rich households. Sampling error may therefore be of some concern in the Chinese CASS survey, the Indian AIDIS survey (part of the Indian National Sample Survey round 59) and the Indonesian Family Life Survey, despite the high reported response rate (in excess of 90 per cent) in both China and India.

In the case of the Chinese survey, there are additional difficulties regarding the representativeness of the wealth survey sub-sample, which covers only a part of the provinces included in the sample of the State Statistical Bureau (SSB) Household Income Survey. The SSB sample itself also suffers from some degree of geographical under-coverage (Bramall 2001). The Indonesia Family Life Survey has a similar limitation; it samples only 13 of the nation’s 27 provinces, although these include 83 per cent of the country’s population.

¹¹ We use HBS data in preference to survey data wherever the former is available. While HBS data are of course also subject to error, a country’s wealth survey results can be, and normally are, used as an input in creating HBS estimates. Since the HBS estimates benefit from *additional* inputs of information and data from other sources, they should, in principle, dominate wealth survey estimates. The US Survey of Consumer Finance (SCF) is of such high quality, however, that it is not clear whether US HBS or survey data should be preferred (see, for example, Bertaut and Starr-McCluer 2002: 181-218). Fortunately for our purposes, HBS and SCF estimates of total household wealth in the USA in 2000 are very similar (see below). Our results would differ little if the SCF had been used to establish the USA wealth level.

¹² The SCF design explicitly excludes people in the Forbes 400 list of the wealthiest Americans, which again helps to reduce the effects of sampling error; see Kennickell (2006: 19-88).

Aside from the USA—whose sophisticated Survey of Consumer Finance succeeds in capturing most household wealth—surveys usually yield lower totals for most financial assets compared with HBS data, principally due to the lower response rate of wealthy households and under-reporting by those who do respond.¹³ In contrast, non-financial assets, especially housing, are sometimes better covered in survey data. The relative importance of different types of assets at different stages of development is reflected in the survey coverage. The Finnish survey, for example, focuses on financial assets, housing and vehicles. The surveys from the three developing countries pay relatively little attention to financial wealth, since it is of less importance, and concentrate instead on housing, agricultural assets, land and consumer durables.

Table 3 reports asset composition in the survey data. It is clear that non-financial assets bulk larger in surveys than in HBS data, reflecting both the relative accuracy of housing values in survey data and the importance of non-response and under-reporting by rich households, who own a disproportionate share of financial assets. The table also highlights the relative importance of financial and non-financial assets in developed and developing countries. The two low-income countries in our sample, India and Indonesia, stand out as having particularly high shares of non-financial wealth.¹⁴ This is no surprise since assets such as housing, land, agricultural assets and consumer durables are particularly important in developing countries. In addition, financial markets are often primitive. In India, the only low or middle income country for which the composition of financial assets is reported in Table 3, most of the financial assets owned by households are liquid. Renwei and Sing (2005) report more detailed data for urban areas of China, showing that about 64 per cent of household financial assets are liquid.

In Table 3, China does not stand out as having a high share of non-financial assets. One reason is that the value of housing is reported net of mortgage debt in China. Another is that there is no private ownership of urban land. And of course there has been rapid accumulation of financial assets by Chinese households in recent years. The ratio of liabilities to total assets is particularly low in India and Indonesia (for China only non-housing liabilities are reported). Again poorly developed financial markets help to explain this phenomenon. But, in addition, underreporting of debt appears to be more severe than underreporting of assets. Subramanian and Jayaraj (2006) estimate that debts are, on average, underrepresented in the AIDIS by a factor of almost three. Italy also stands out as having a very low share of liabilities. This low share echoes the finding in HBS data, and likely reflects the relative lack of mortgage loans in Italy compared to other high income OECD countries.

¹³ Statistical organizations fight these forms of non-sampling error through their survey technique and questionnaire design. Once the results are in, it is also possible to try to correct for these errors. Ambitious efforts have been made in the Italian SHEW survey. Brandolini (2004) uses records of the number of contacts needed to win a response to estimate the differential response relationship, which allows reweighting of the sample. He also uses results of a validation study comparing survey responses and institutional records to correct for misreporting of selected financial assets. Finally, this study also imputes non-reported dwellings owned by respondents (aside from their principal dwelling).

¹⁴ This echoes the findings of Goldsmith (1985) who reported that India and Mexico had an average of 65 per cent of national assets in tangible form in 1978, compared to 51 per cent for fourteen developed market economies.

Combining the balance sheet and survey data, it is evident that there are major international differences in asset composition. Real property, particularly land and farm assets, are more important in less developed countries, while financial assets are more important in rich countries. There are also major international differences in the types of financial assets owned. Savings accounts are favoured in transition economies and some rich Asian countries, while share-holdings and other types of financial assets are more evident in rich western countries. Debt is also less important in developing and transition countries than in the more developed countries (with the notable exception of Italy).

2.3 Wealth levels from household balance sheet and survey data

When wealth levels are compared across countries, one of the first issues to be confronted is the appropriate rate of exchange between currencies. In comparisons of consumption or income there is widespread agreement that international price differences should be taken into account via the use of PPP exchange rates.¹⁵ This procedure seems appropriate for wealth holdings also if the focus of attention is, say, the bottom 95 per cent of wealth-holders, for whom domestic prices are the main determinant of the real value of their assets. However, a large share of wealth is held by households in the top few percentiles of the distribution. People in this category, and their financial assets, tend to be internationally mobile, making exchange rates more relevant for international wealth comparisons among the rich and super-rich.

This paper follows the convention of using PPP exchange rates to compare countries; unless otherwise stated, all wealth figures are expressed in PPP US dollars for the year 2000. Selected comparable figures on an exchange rate basis are presented in footnotes and appendices. They are also discussed in detail in Davies *et al.* (2007) which places more emphasis on the upper tail of the distribution.

Table 4 summarizes information on the per capita wealth and income of countries with complete household balance sheet or wealth survey data (data for individual countries are given in Appendix III). Of the 19 countries that have complete HBS data, the USA ranks first with per capita wealth of \$143,727 in 2000, followed by the UK at \$128,959, Japan at \$124,858, the Netherlands at \$121,165, Italy at \$120,897, and then Singapore at \$113,631. South Africa is in last place, at \$16,266, preceded by Poland at \$24,654, and the Czech Republic at \$32,431. The overall range is rather large, with per capita wealth in the USA 8.8 times as great as that of South Africa. The (unweighted) coefficient of variation (CV) among the 19 countries is 0.440.

¹⁵ There is, however, some disagreement about the *type* of PPP exchange rates that should be used. We follow common practice and use the Penn World Table PPP rates, which are based on the 'Geary' method. This method has many practical advantages, including desirable adding-up properties but has been criticized in the past for its lack of a rigorous theoretical basis. The leading competitor is the 'EKS' method, which has a stronger theoretical foundation. The EKS method has been used by the OECD and Eurostat to compare income across their member countries. Recently, Neary (2004) has clarified the theoretical basis for the Geary method.

Table 4: Wealth per capita from household balance sheet and survey data, year 2000

	US\$ per capita at PPP exchange rates				US\$ per capita at official exchange rates			
	Wealth ^a	Real GDP ^b	Personal disposable income ^c	Real Consumption ^b	Wealth ^a	GDP ^b	Personal disposable income ^c	Consumption ^b
Household balance sheet data								
Mean	84955	22519	13482	14240	74890	19434	11530	12239
Median	90906	23917	12798	15197	70916	21425	11915	12708
Coefficient of variation	0.440	0.301	0.331	0.319	0.612	0.527	0.524	0.521
Highest wealth: USA	143727	35619	25480	24313	143727	35619	25480	24313
Lowest wealth: South Africa	16266	8017	4691	5210	5977	2946	1724	1914
Survey data								
Mean	59349	20311	12338	13072	53251	17983	10911	11588
Median	61218	23917	12798	15197	45176	20338	11557	12708
Coefficient of variation	0.667	0.512	0.551	0.530	0.836	0.669	0.707	0.671
Highest wealth: USA	143857	35619	25480	24313	143857	35619	25480	24313
Lowest wealth: India	6513	2684	1916	1406	1112	458	327	240
Ratio high/low - HBS	8.8	4.4	5.4	4.7	24.1	12.1	14.8	12.7
Ratio high/low - survey data	22.1	13.3	13.3	17.3	129.4	77.8	77.9	101.4
China/USA - survey data	12.8	9.3	13.2	13.0	55.1	40.0	56.8	56.1

Note: ^aSee Appendix II for sources of HBS and survey data. Figures have been adjusted to year 2000 values using the real growth rate per capita. ^bSource: Penn World Table 6.1. ^cSource: The Economist Intelligence Unit.

The next column shows GDP per capita. In the group of 19 countries with HBS data, the USA again ranks first, at \$35,619, and South Africa last, at \$8,017. However, the range is much smaller than for net worth per capita. The ratio of highest to lowest GDP per capita is only 4.4, and the coefficient of variation (again among the 19 countries) is 0.301, compared to 0.440 for net worth per capita. These results are a first illustration of the fact that, globally, wealth is more unequally distributed than income. The comparison here is only *between* countries. The full results we present later in the paper include inequality within countries, which further increases the gap between income and wealth inequality.

Column four shows personal disposable income per capita for the same group of countries. The USA again ranks first, at \$25,480, South Africa is again last, at \$4,691, and the ratio of highest to lowest is 5.4, slightly higher than for GDP per capita. The coefficient of variation is 0.333, again slightly higher than that of GDP per capita. The fifth column shows real consumption per capita, whose dispersion is intermediate between that of GDP and disposable income. All in all, the per capita variation of net worth is much greater than that of GDP, disposable income or consumption.

Differences across countries are even more pronounced in survey data due to the inclusion of China, India, and Indonesia. Of the 13 countries with the pertinent data, the USA again ranks first in net worth per capita, at \$143,857, followed by Australia at \$101,597, and Japan at \$91,856. In this group, India and Indonesia occupy the bottom two positions, at \$6,513 and \$7,973, respectively. China appears to be about twice as wealthy as India, having per capita net worth of \$11,267. Note that the PPP adjustment has a proportionately greater impact on the figures for developing countries. Using official exchange rates, all three countries have much lower per capita wealth: India at \$1,112, Indonesia at \$1,440, and China at \$2,613. Hence inequality in wealth between countries is greater using official exchange rates, as reflected in the CV of 0.612 shown in the table versus 0.440 on a PPP basis. In the survey data, as in the HBS data, the range in per capita wealth is much larger than that of per capita GDP, disposable income, or consumption. The ratio of highest to lowest is 22 for wealth per capita, 13 for both GDP and disposable income, and 17 for consumption. The coefficients of variation for the income and consumption variables are again smaller than for wealth, and higher using official exchange rates than PPP rates.

As would be expected, wealth is fairly highly correlated with both income and consumption. The correlation between net worth and GDP is 0.77 in the HBS data and is higher again in the survey data at 0.87. Correlations of wealth and disposable income are higher from both HBS and survey sources—rising to 0.94 in the survey data—while correlations of wealth with consumption are a little lower: 0.71 from balance sheet data and 0.89 from survey data. The highest correlations are found between the logarithms of net worth per capita and disposable income per capita: 0.91 from the balance sheet data and 0.97 from the survey data. The correlations of log wealth per capita and log consumption per capita are slightly lower.¹⁶

¹⁶ See Appendix IV. When official exchange rates are employed, the correlations are uniformly higher, but the pattern is similar.

3 Imputing wealth levels to other countries

The next step is to generate per capita wealth values for the remaining countries of the world. As explained below, regressions run on the 38 countries with HBS or survey data enable part or all of wealth to be estimated for many countries. This yields a total of 150 countries with observed or estimated wealth, covering 95.2 per cent of the world's population in 2000. It is tempting to regard the results as representative of the global picture. However this would implicitly assume that the 79 excluded countries are neither disproportionately rich nor poor, an untenable assumption. While the omitted countries include several small rich nations (for example, Liechtenstein, the Channel Islands, Kuwait, Bermuda), the most populous countries in the group (Afghanistan, Angola, Cuba, Iraq, North Korea, Myanmar, Nepal, Serbia, Sudan, and Uzbekistan, each have more than 10 million population) are all classified as low income or lower middle income. To try to compensate for this bias towards poorer nations, each of the excluded countries was assigned the mean per capita wealth of the appropriate continental region (6 categories) and income class (4 categories)¹⁷. This imputation is admittedly crude, but nevertheless an improvement over the default of simply disregarding the excluded countries. It allows us, in the end, to assign wealth levels to 229 countries.

The regressions reported below are designed to predict wealth in countries where wealth data are missing. The goal is not to estimate a structural model of wealth-holding, but to find equations that fit well in-sample and that will also allow us to predict out-of-sample. The nature of this exercise limits the range of models that can be applied. Perhaps most importantly, it limits the choice of explanatory variables to those that are available not only for the countries with wealth data but also for a large number of countries *without* wealth data.

3.1 Wealth regressions

The first experiment considered OLS regressions for those countries with complete wealth data, excluding the 17 countries with incomplete data shown in Table 1. Initially the dependent variable was per capita wealth and the principal independent variable was per capita income or consumption. As Figures 1 and 2 indicate, there is a strong relationship between wealth and income, so these equations fit fairly well.¹⁸ However, there are significant gains from the greater flexibility offered by running separate regressions for (i) non-financial assets, (ii) financial assets, and (iii) liabilities. The improvement is due in part to the fact that certain variables help explain one or two of the components, but not all three. In addition, the relative impact of common variables varies across the equations.

¹⁷ Our regional calculations treat China and India separately due to the size of their populations. In the regional breakdowns it was also convenient to distinguish the high income subset of countries in the Asia-Pacific region (a list which includes Japan, Taiwan, South Korea, Australia, New Zealand, and several middle eastern states) from the remaining (mainly low-income) nations.

¹⁸ Figure 1 uses wealth from the HBS data while Figure 2 uses wealth from survey data. The slope of the simple regression line in Figure 2 is lower than that in Figure 1, reflecting the fact that survey data generally provide lower estimates of wealth than do national balance sheets.

Running separate regressions for the three components enables data to be used from countries lacking complete wealth data. Observations for both financial assets and liabilities are available for the 16 countries shown in Table 1 with financial balance sheets, but no data on real assets. In addition, Mexico provides an observation of non-financial assets. Adding these observations not only increases the sample size, but also brings in more developing and transition countries, thus improving the ability of the regressions to predict the wealth of the ‘missing’ countries.

The dependent variable is calculated from household balance sheet data for 35 countries and survey data for four countries that lack HBS data (China, India, Indonesia, and Mexico). The income variable is very important in each regression. Although the best fit is obtained using disposable income per capita (see the results in Appendix V), real consumption per capita reduces goodness of fit only slightly and is preferred for our purposes since it is available for about twice as many countries.

Because errors in our three equations are likely to be correlated, we explored application of the seemingly unrelated regressions (SUR) technique due to Zellner (1962) (see Greene 1993: 486-99). This involves stacking equations and estimating via generalized least squares. While OLS estimates are consistent, SUR provides greater efficiency, with the gain in efficiency increasing with the correlation of the errors across the equations, and decreasing with the correlation of the regressors used in the different equations. For equations with an unequal number of observations it is not straightforward to apply SUR. Since we have an equal number of observations for financial assets and liabilities, but fewer observations for non-financial assets, and since we believe errors are more likely to be correlated between financial assets and liabilities than between the latter variables and non-financial assets, we have applied SUR here only for financial assets and liabilities.¹⁹

¹⁹ While it is theoretically possible to apply SUR with an unequal number of observations in the equations estimated, this is very difficult to do in STATA or in other standard packages. Errors in the financial assets and liabilities equations are likely to be correlated, but error-correlation between either of those variables and non-financial assets is likely to be smaller, since estimates of the latter generally come from different sources and are prepared using different techniques. Thus correlations in measurement error, at least, should be small.

Figure 1: Wealth from household balance sheet versus disposable income, PPP\$

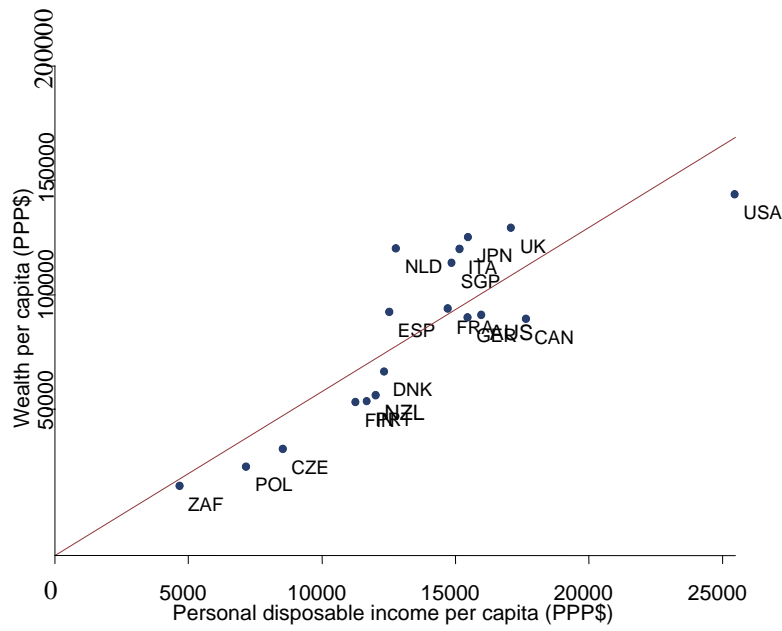


Figure 2: Wealth from surveys versus disposable income, PPP\$

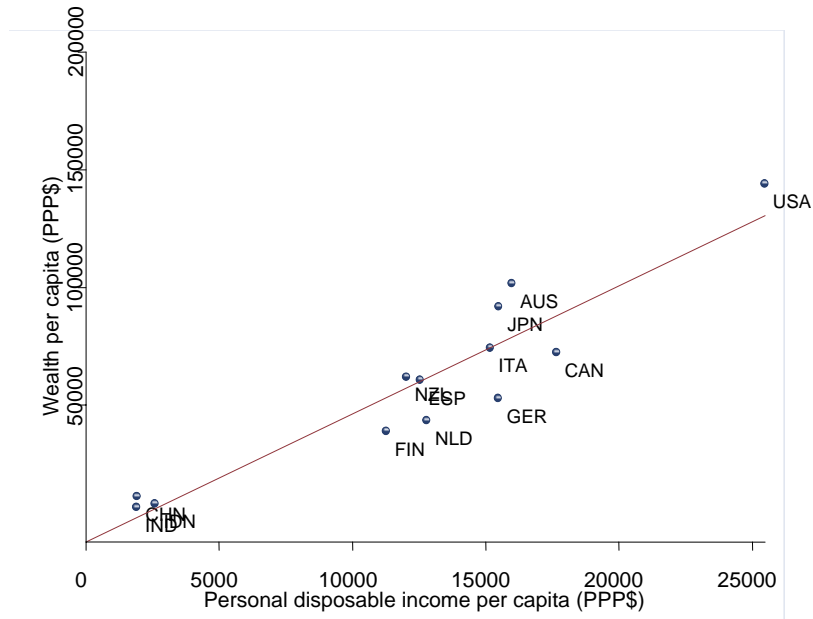


Table 5: Regressions of wealth components

Independent variables	Dependent variables					
	Log non-financial wealth		Log financial wealth		Log liabilities	
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
Constant	0.03 (0.973)	0.435 (0.528)	4.768*** (1.183)	3.908*** (0.868)	8.716*** (1.136)	8.704*** (0.731)
Log real consumption per capita	1.101*** (0.090)	1.028*** (0.053)	1.530*** (0.135)	1.354*** (0.126)	1.477*** (0.207)	1.510*** (0.114)
Log population density	.117** (0.042)	.121*** (0.041)				
Log market capitalization rate			0.231** (0.105)	0.390*** (0.098)		
Log public pensions as percentage of GDP			-0.079 (0.121)			
Log domestic credits available to private sector					0.903*** (0.230)	0.830*** (0.163)
Income Gini	-0.008 (0.009)		0.002 (0.015)			
Survey dummy	0.391 (0.305)		-0.908* (0.514)	-0.733* (0.437)	-1.421 (0.910)	
R ²	0.955	0.949				
'R ² '			0.954	0.950	0.936	0.933
RMSE	0.324	0.325	0.380	0.470	0.581	0.622
Sample size	23	23	34	38	34	38

Note: The non-financial regressions use Ordinary Least Squares and a sample consisting of 19 countries with HBS data and 4 with survey data. The financial assets and liabilities regressions use the Seemingly Unrelated Regression (SUR) method and a sample consisting of 35 countries with HBS or financial balance sheet data and 3 with survey data. Lack of data on public pensions reduces the sample size by 4 in specifications (2a) and (3a). Standard errors are given in parentheses. Significance: * 10% level; ** 5% level; *** 1% level.

Sources: (a) Market capitalization rate, public spending on pensions as a percentage of GDP, and availability of domestic credit are from World Development Indicators 2005. (b) Real consumption and GDP per capita are from PWT 6.1. See Alan Heston, Robert Summers and Bettina Aten, Penn World Table Version 6.1, Center for International Comparisons at the University of Pennsylvania (CICUP), October 2002. For countries not available in PWT 6.1, GDP per capita is taken from the United Nations Common Database (2006). (c) Income Gini is from WIIDA2a. See UNU-WIDER World Income Inequality Database, Version 2.0a, June 2005. (d) Personal disposable income is from the EIU. See The Economist Intelligence Unit (2005), WorldData.(e) Population is taken from the United Nations Common Database (2006).

Table 5 shows the results with two different versions of the consumption specification, labelled *a* and *b*. The preferred specification is *b* in all three cases. Both the dependent variables and most of the independent variables are entered in log form. Note first that the logarithm of real consumption per capita appears significant at the 1 per cent level in all of the runs. The estimated elasticities of non-financial and financial wealth with respect to consumption are 1.028 and 1.354 respectively in the preferred runs. The slightly greater elasticity for financial wealth seems plausible, since higher income countries tend to have better developed financial markets. There is an even larger difference for liabilities, which have an estimated elasticity of 1.510. These differences in consumption elasticities imply that, for the many low income countries with assigned wealth values, imputed financial assets and (especially) liabilities will tend to be relatively less important than non-financial assets.

A dummy variable for the data source (HBS or survey data) was tried in all three regressions, but found to be insignificant in the equation for non-financial assets, not unexpectedly since survey data typically cover non-financial assets quite well. While insignificant in the first liabilities specification, and therefore dropped from run *b* for liabilities, the survey dummy is significant at the 10 per cent level in both runs for financial wealth. With a value of -0.733 in the *b* run, this dummy reflects the well-known fact that financial assets are under-reported and under-represented in survey data. Five other independent variables were also considered:²⁰

Population density: The value of non-financial assets, particularly housing, should be positively related to the degree of population density (greater density indicating a relative scarcity of land). This variable is statistically significant in the non-financial asset equation.

Market capitalization rate: The value of household financial assets should be positively correlated with this measure of the size of the stock market. It is positive and significant in both regressions for financial wealth. This is a useful result in terms of prediction and imputations, since the variable is available for a large number of countries that do not have full wealth data.

Public spending on pensions as a percentage of GDP: This was expected to be negatively related to financial assets per capita, since public pensions may substitute for private saving. However, the variable was not statistically significant and was dropped in the *b* specification.

Income Gini: Some theoretical models suggest that income inequality and per capita wealth are positively related. However, the variable turned out to be insignificant.

Domestic credits available to the private sector: This variable is highly significant in the liabilities regression, which is fortunate from the imputation perspective since, as in the

²⁰ The log form was used for most of the variables. The lowest positive value in the sample was imputed when the values were negative or zero.

case of market capitalization, the variable is available for many of our ‘missing countries’. The R^2 or ‘ R^2 ’ for each equation indicates that the model fits fairly well.²¹

3.2 Estimated wealth levels

Table 6 summarizes the wealth levels obtained for the world and its regions. HBS data are used where available (see Table 1); survey data are used for China, India and Indonesia. Financial assets and liabilities are imputed for 112 countries, and financial assets for 127 countries, using the regressions described in the previous section. As explained earlier, the 79 ‘excluded’ countries that do not have the required data for the regression-based estimation were assigned the mean per capita wealth level of their respective region and income class.

Table 6 provides both per capita and per adult numbers.²² For the world as whole in 2000, net worth was \$26,416 per capita and \$43,494 per adult. North America accounted for 27 per cent of world household wealth, much more than its 5 per cent share of world population and greater than its 24 per cent share of world GDP. The ‘rich Asia-Pacific’ group and Europe show a similar pattern, with wealth shares much greater than their population shares and larger than their shares of world GDP.²³ Given these results, it is not surprising to see that between-country inequality, as shown by the Gini coefficient, is higher for wealth than GDP (0.619 vs. 0.534 respectively on a per capita basis). Note also that between-country wealth inequality is lower using the per adult basis (which gives a Gini of 0.573), reflecting the fact that the difference between wealth per capita and per adult is greater in poor countries, which have a higher proportion of children in their populations.

The rich Asia-Pacific group includes Hong Kong, which has the highest mean wealth in the world on either a per capita or a per adult basis according to our estimates—\$188,699 per capita and \$246,307 per adult, or 5.7 times the world average per adult (see Appendix VI as well as Table 6). This group also includes Japan and Singapore, both at 3.6 times the world average per adult. Europe contains both very high wealth countries, such as Luxembourg (the second place country, very slightly behind Hong Kong and also with wealth 5.7 times the world average), the UK (4.0 times the world average), and the Netherlands and Italy (3.7 and 3.4 times the world average respectively), as well as low wealth countries such as Moldova (27 per cent of the world average), the Ukraine (30 per cent), and Albania (41 per cent).

²¹ R^2 is not a well-defined concept in generalized least squares, so as is customary the fraction of the variance in the dependent variable that is ‘explained’ in each regression is referred to as ‘ R^2 ’ here.

²² While per capita magnitudes are more familiar, we argue in the next section that it is best to analyze the world wealth distribution among adults rather than all individuals. It is therefore helpful to begin looking at per adult, as well as per capita, figures at this point.

²³ Note that the disproportion between wealth and population shares, although large, is less for Europe than the other high wealth regions. This reflects in part the inclusion of the lower wealth countries of Eastern Europe.

Table 6: Average wealth by region, year 2000

Region (number of countries)	Share of world			Share of world		GDP per	Share of world
	population	Wealth per capita	Wealth per adult	wealth	GDP per capita	adult	GDP
	(%)	(PPP\$)	(PPP\$)	(%)	(PPP\$)	(PPP\$)	(%)
North America (5)	5.2	138417	193147	27.1	34947	48765	23.6
Latin America and Caribbean (46)	8.6	19781	34149	6.4	7683	13262	8.6
Europe (48)	12.0	62024	82151	28.1	16444	21780	25.7
Africa (56)	13.4	5225	11262	2.6	2242	4842	3.9
China	20.6	11267	16749	8.8	3844	5713	10.3
India	16.8	6513	11655	4.1	2684	4802	5.9
Rich Asia-Pacific (17)	4.0	102846	137020	15.6	23247	30912	12.1
Other Asia-Pacific (55)	19.5	9684	17870	7.2	3911	7206	10.0
World (229)	100	26416	43494	100	7675	12633	100
World between-country Gini		0.619	0.573		0.534	0.481	

Note: The world between-country Gini refers to the Gini inequality value computed using the per capita (or adult) wealth (or income) figures for 229 countries weighted by population size.

Source: Authors' calculations.

Lower down the scale, China and India collectively accounted for 37 per cent of world population in the year 2000, but only 16 per cent of world GDP and 13 per cent of the global wealth. China's net worth per adult was \$16,749 (39 per cent of the world average) and India's was \$11,655 (27 per cent). Latin American and the Caribbean had 9 per cent of the world's population and GDP, but 7 per cent of world wealth. Among this group, the wealthiest countries were Barbados (3.3 times the world average per adult), Puerto Rico (2.6 times), and Trinidad and Tobago (1.9 times). The less affluent countries in this group include Peru (48 per cent of the world average), Colombia (56 per cent) and Venezuela (60 per cent).

Africa and 'other Asia-Pacific' countries together accounted for 33 per cent of the world population but only 14 per cent of world GDP and 10 per cent of global wealth. All countries in the other Asia-Pacific group have net worth per adult below the world average, ranging from Turkey (88 per cent of the world average) and Saudi Arabia (99 per cent) at the high end of the scale to Yemen (8 per cent), Cambodia (25 per cent), Vietnam (23 per cent), and Pakistan (29 per cent) at the other end. With the notable exception of Mauritius and the Seychelles (2.1 and 1.1 times the world average per adult), the African nations are all below average in per capita wealth and include South Africa (67 per cent of the world average), Zimbabwe (32 per cent), Kenya (18 per cent), Uganda (17 per cent), Tanzania (6 per cent), and Nigeria (5 per cent).

4 Wealth distribution within countries

As indicated in Table 7, information on the distribution of wealth across households or individuals can be assembled for 20 countries. One set of figures was selected for each nation, with a preference for the year 2000, *ceteris paribus*. To assist comparability across countries, a common distribution template was adopted, consisting of the decile shares reported in the form of cumulated quantile shares (i.e. Lorenz curve ordinates) plus the shares of the top 10 per cent, 5 per cent, 2 per cent, 1 per cent, 0.5 per cent and 0.1 per cent.

The data differ in many significant respects. The economic unit of analysis is most often a household or family, but sometimes individuals or, in the case of the UK, adult persons. Distribution information is usually reported for the share of wealth owned by each decile, together with the share of the top 5 per cent and the top 1 per cent of wealth-holders. But this pattern is far from universal. In some instances information on quantile shares is very sparse. On other occasions, wealth shares are reported for the top 0.5 per cent or even the top 0.1 per cent in the cases of Denmark, France, Spain, and Switzerland.

Table 7: Wealth shares for countries with wealth distribution data

Country	Year	Unit	Share of lowest											Share of top						
			10%	20%	25%	30%	40%	50%	60%	70%	75%	80%	90%	10%	5%	2%	1%	0.5%	0.1%	
Australia	2002	household	0.0	0.0		1.0	4.0	9.0	16.0	25.0		38.0	56.0	45.0	32.0					
Canada	1999	family				1.0	3.0	6.0	11.0	19.0		30.0	47.0	53.0						
China	2002	person	0.7	2.8		5.8	9.6	14.4	20.6	29.0		40.7	58.6	41.4						
Denmark	1996	family	-14.4	-17.3		-18.1	-18.1	-17.6	-15.8	-10.5		1.3	23.6	76.4	56.0		28.8	22.2	11.6	
Finland	1998	household	-0.9	-0.9		-0.3	2.2	7.4	15.0	25.0		38.6	57.7	42.3						
France	1994	adult										39.0	61.0			21.3			6.3	
Germany	1998	household	-0.3	-0.2		0.3	1.5	3.9	9.0	18.9		34.0	55.7	44.4						
India	2002-03	household	0.2	1.0		2.5	4.8	8.1	12.9	19.8		30.1	47.1	52.9	38.3		15.7			
Indonesia	1997	household	0.0	0.4		1.3	2.8	5.1	8.5	13.5		21.1	34.6	65.4	56.0		28.7			
Ireland	1987	household	0.0	0.2		2.5	6.6	12.2	18.9	28.5		40.4	57.7	42.3	28.7		10.4			
Italy	2000	household					7.0					36.2	51.5	48.5	36.4		17.2			
Japan	1999	household	0.5	2.1		4.8	8.7	13.9	20.7	29.8		42.3	60.7	39.3						
South Korea	1988	household	0.5	1.8		4.0	7.4	12.3	18.9	27.9		39.9	56.9	43.1	31.0		14.0			
New Zealand	2001	tax unit										48.3	51.7							
Norway	2000	household	0.1	0.7		2.6	5.8	10.4	16.4	24.2		34.6	49.6	50.5						
Spain	2002	household			2.1			13.2			34.7		58.1	41.9			18.3	13.1	5.6	
Sweden	2002	household	-5.7	-6.8		-6.9	-6.6	-4.8	-0.6	7.1		19.9	41.4	58.6						
Switzerland	1997	family										28.7	71.3	58.0		34.8	27.6	16.0		
UK	2000	adult						5.0			25.0		44.0	56.0	44.0	31.0	23.0			
USA	2001	family						2.8					30.2	69.8	57.7		32.7			

Source: See Appendix IIC.

The most important respect in which the data vary across countries is the manner by which the information is collected. Household sample surveys are employed in 15 of the 20 countries.²⁴ Survey results are affected by sampling and non-sampling error, as discussed earlier. Non-sampling error tends to reduce estimates of inequality and the shares of the top groups because wealthy households are less likely to respond, and because under-reporting is particularly severe for the kinds of financial assets that are especially important for the wealthy—for example, equities and bonds.

Other wealth distribution estimates derive from tax records. The French and UK data are based on estate tax returns, while the data for Denmark, Norway, and Switzerland originate from wealth tax records. These data sources have the advantage that ‘response’ is involuntary, and under-reporting is illegal. However, under-reporting may occur nonetheless, and there are valuation problems that produce analogous results.

Wealth tax regulations may assign to some assets a fraction of their market value, and omit other assets altogether. There are also evident differences in the way that debts are investigated and recorded. For most countries the bottom decile of wealth-holders is reported as having positive net wealth, but in Sweden the bottom three deciles each have negative net worth and in Denmark this is true for the bottom four deciles.²⁵

Table 7 shows that estimated wealth concentration varies significantly across countries and is generally very high. Comparisons of wealth inequality often focus attention on the share of the top 1 per cent. That statistic is reported for 11 countries, a list that excludes China, Germany, and the Nordic countries apart from Denmark. Estimated shares of the top 1 per cent range from 10.4 per cent in Ireland to 34.8 per cent in Switzerland, with the USA towards the top end of this range at 32.7 per cent.²⁶ The share of the top 10 per cent, which is available for all 20 countries, ranges from 39.3 per cent in Japan to 76.4 per cent in Denmark.

The differences in wealth concentration across countries in Table 7 are probably attributable in part to differences in data quality. If survey data do not oversample the upper tail, the shares of the richest groups can be depressed very significantly (see, for example, Davies 1993): in the absence of corrections for non-sampling error, a reasonable guess is that the share of the top 1 per cent may be under-estimated by about

²⁴ The list of countries differs a little from that used in Sections 2 and 3. Here the desire is to exploit distributional information for as many countries as possible, so countries with data considerably earlier than 2000 were added: Ireland (for 1987) and Korea (for 1988). It is hoped that the shape of wealth distribution in these countries was reasonably stable from the late 1980s to the year 2000, even if it is unsafe to use the 1980s values for wealth *levels*. Sweden was also added since its distributional detail is of interest, although the mean from this source was not judged sufficiently reliable to be used in our estimates of wealth levels. The Netherlands was dropped due to insufficient distributional detail.

²⁵ Klevmarcken (2006: 276-94) identifies a number of factors that helped to account for negative wealth shares of Swedish households in the tax register data in the 1990s, and may still have been operative in 2002. These include student loan debt, the inclusion of debt incurred to buy assets that are not covered in the data (mainly consumer durables) and a household definition in which young adults living at home with their parents, as well as unmarried cohabiting adults, were counted as separate households.

²⁶ The sampling frame for the USA survey excludes the Forbes 400 richest families; adding them would raise the share of the top 1 per cent by about two percentage points; see Kennickell (2006: 20).

5–10 percentage points. The surprisingly low top shares seen here in Australia, Ireland, and Japan may well reflect this phenomenon. One way to attack this problem is to replace, where possible, the survey estimate of the upper tail with figures derived from lists of the very rich (and their wealth) compiled by journalists and others (see Atkinson (2006) for discussion of this form of evidence). While estimates have been prepared on this basis in a few countries, the approach has not been widely adopted and is beyond the scope of this paper.

As evident from Table 7, the available sources provide a patchwork of quantile shares. In order to move towards an estimate of the world distribution of wealth, more complete and comparable information is needed on the distribution in each country. To achieve this, missing cell values were imputed using a programme developed at UNU-WIDER which constructs a synthetic sample of 1000 observations that conforms exactly with any valid set of quantile shares derived from a distribution of positive values (e.g., incomes) (see Shorrocks and Wan 2007.) To apply this ‘ungrouping’ programme, the negative wealth shares reported for Denmark, Finland, Germany, and Sweden were discarded, together with the zero shares reported elsewhere, thus treating the cell values as missing observations.

The 20 countries for which wealth distribution data are available include China and India, and hence cover a good proportion of the world population. They also include most of the large rich countries, and hence cover much of global wealth. However, the fact that the list is dominated by OECD members cautions against extrapolating immediately to the rest of the world.

For most countries lacking direct wealth distribution data, the pattern of wealth distribution was estimated using income distribution data recorded in the WIID dataset, on the grounds that wealth inequality is likely to be correlated—possibly highly correlated—with income inequality across countries. The WIID dataset covers 144 countries and has multiple observations for most of them. Where possible, data was chosen for *household income per capita* across *individuals* for a year close to 2000, with first priority given to figures on disposable income, then consumption or expenditure. Eighty-five per cent of the income distributions conform to these criteria. Figures for gross incomes added a further seven per cent, leaving a residual eight per cent of countries for which the choices were very limited. The ‘ungrouping’ programme was then used to generate quantile shares for income (reported in Lorenz curve form) according to the same template employed for wealth distribution.

The common template applied to the wealth and income distributions allows Lorenz curve comparisons for each of the 20 reference countries listed in Table 7. In every instance, wealth shares are lower than income shares at each point of the Lorenz curve: in other words, wealth is unambiguously more unequally distributed than income. Furthermore, the ratios of wealth shares to income shares at various percentile points appear to be fairly stable across countries, supporting the view that income inequality is a good proxy for wealth inequality when wealth distribution data are not available. Thus, as a first approximation, it seems reasonable to assume that the ratio of the Lorenz ordinates for wealth compared to income are constant across countries, and that these constant ratios (14 in total) correspond to the average value recorded for the 20

reference countries.²⁷ This generates estimates of wealth distribution for 124 countries to add to the 20 original countries which have direct evidence of wealth inequality.

The group of 144 countries with actual or estimated wealth distribution data differs slightly from the group of 150 nations which have figures for mean wealth derived from actual data or the regressions of Section 3. Distributional evidence is more common for populous countries, so the group of 144 now includes Cuba, Iraq, Myanmar, Nepal, Serbia, Sudan, and Uzbekistan, and covers 96.6 per cent of the global population. For the rest of the world not covered by WIID data, the default of disregarding the remaining countries was again eschewed in favour of imputing a wealth distribution pattern equal to the (population weighted) average for the corresponding region and income class.

5 World distribution

The final step in the construction of the global distribution of wealth combines the national wealth levels derived in Section 3 with the wealth distribution data derived in Section 4. Specifically, the ungrouping programme was applied to each country to generate a sample of 1,000 synthetic individual observations consistent with the (actual, estimated or imputed) wealth distribution. These were scaled up by mean wealth, weighted by the adult population size of the respective country, and merged into a single dataset comprising over 200,000 observations.²⁸ The complete sample was then processed to obtain the minimum wealth and the wealth share of each percentile in the global distribution of wealth. The procedure also provides estimates of the composition by country of each wealth percentile, although these are rough estimates given that the population of each country is condensed into a sample of 1,000, so that a single sample observation for China or India represents more than half a million adults.

The interpretation of data on personal wealth distribution hinges a great deal on the underlying population deemed to be relevant. Are we interested in the distribution of wealth across all individuals, adult persons, or households or families?²⁹ When examining the analogous issue of global income distribution, it is common practice to assume (as a first approximation) that the benefits of household expenditure are shared equally among household members, and that each person should be weighted equally in the overall distribution. However, the situation with wealth is rather different. Personal assets and debts are typically owned by named individuals, and may well be retained by those individuals if they leave the family. Furthermore, while some household assets, especially housing, provide a stream of communal benefits, it is highly unlikely that control of assets is shared equally by household members or that household members will share equally in the proceeds if the asset is sold. Membership of households can be quite fluid (for example, with respect to children living away from home) and the pattern of household structure varies markedly across countries. For these and other

²⁷ To circumvent aggregation problems, the adjustment ratio was applied to the *cumulated* income shares (i.e. Lorenz values) rather than separate quantile income shares.

²⁸ There are 229 countries in total, but a number of small countries with identical imputed wealth levels and distributions were merged at this point.

²⁹ Note that each of these bases was used by at least one country listed in Table 6.

reasons, the total number of households is not a readily available statistic for many countries. Thus, despite the fact that most of the datasets listed in Table 7 are constructed on a family or household basis, the distribution of global wealth is probably best interpreted in terms of the distribution across adults, on the grounds that those under 20 years of age have little formal or actual wealth ownership, and may therefore be neglected in global terms.³⁰

Tables 8 and 9 summarize our estimates of the distribution of wealth across the global population of 3.7 billion adults. Only \$8,325 was needed in order to belong to the top half of the world wealth distribution in the year 2000; but to be a member of the top 10 per cent required at least \$87,876 and membership of the top 1 per cent required more than \$517,601 per adult. This latter figure is surprisingly high, given that the top 1 per cent group contains 37 million adults and is therefore far from an exclusive club. The entrance fee has no doubt grown higher still in the period since the year 2000. The figures for wealth shares show that the top 10 per cent of adults owned 71.2 per cent of global household wealth, so that the typical member of this group had 7.1 times the average global holding. The corresponding figures for the top 5 per cent and top 1 per cent are 57.1 per cent (11.4 times the average) and 31.9 per cent (31.9 times the average), respectively. This contrasts with the bottom 30 per cent of the distribution, which collectively owned just one per cent of global wealth. Thus the top one per cent owned about 32 times as much as the bottom three deciles.

Table 9 gives wealth Gini coefficients for individual countries and for the world as a whole. As mentioned earlier, wealth distribution is unambiguously more unequal than income distribution in all countries which allow comparison. Our wealth Gini estimates for individual countries range from a low of 0.547 for Japan to the high values reported for Brazil (0.784) and the USA (0.801). The global wealth Gini is 0.804. As is true within countries, this figure is considerably higher than the Ginis computed for the global income distribution. Milanovic (2005: 108) reports a Gini of 0.642, for example, for the world distribution of income in 1998 on a PPP basis.

Table 8 provides the regional representation in the various wealth quantiles. The top end of the global wealth distribution is dominated by North America, Europe and the rich Asia-Pacific countries, with Europe having 35 per cent of the members of the top decile, and North America and rich Asia-Pacific each contributing 22 per cent. The North American share rises rapidly in the upper tail, to 39 per cent in the top percentile, overtaking Europe whose share declines to 31 per cent.

³⁰ The original country-level data are generally based on households. Our results implicitly assume that the shape of the distribution of wealth among adults is the same as that among households, an assumption which would be true if all households contained two adults, if children had zero wealth, and if wealth was equally divided between the adult members.

Table 8: Global wealth distribution in 2000, regional details based on PPP exchange rates

	Decile1	Decile2	Decile3	Decile4	Decile5	Decile6	Decile7	Decile8	Decile9	Top10%	Top5%	Top1%	Adult population (million)	Adult population share (%)
World wealth shares (%)	0.1	0.3	0.6	1.1	1.6	2.4	3.7	6.2	12.9	71.2	57.1	31.9		
Minimum wealth (PPP\$)	0.5	767	1880	3651	5633	8325	12585	20167	35699	87876	170469	517601		
Adult population proportions by region (%)														
North America	1.6	2.9	3.8	3.3	3.8	3.8	4.7	6.0	9.2	21.9	25.8	39.1	225.7	6.1
Latin America and Caribbean	10.8	9.1	8.3	6.6	6.7	7.1	8.3	9.0	9.4	6.7	6.1	5.8	302.9	8.2
Europe	9.7	9.1	9.6	9.2	9.6	11.7	14.1	17.8	22.9	35.2	36.3	30.6	550.6	14.9
Africa	28.5	17.9	14.6	9.1	7.4	6.4	6.0	5.3	4.5	2.1	1.5	1.2	376.3	10.2
China	6.4	14.1	13.9	34.2	36.7	35.3	32.3	29.8	21.0	4.1	1.4	0.0	842.1	22.8
India	19.9	22.2	24.7	18.5	16.7	15.9	14.4	11.6	8.2	2.3	1.2	0.0	570.6	15.4
Rich Asia-Pacific	0.2	0.6	1.2	1.3	1.8	2.1	2.6	5.2	13.0	21.6	23.1	19.3	183.3	5.0
Other Asia-Pacific	23.0	24.1	24.0	17.9	17.3	17.6	17.5	15.4	11.9	6.1	4.6	3.9	646.1	17.5
World	100	100	100	100	100	100	100	100	100	100	100	100	3697.5	100

Source: Authors' calculations.

Table 9: Global wealth distribution in 2000: country details based on PPP exchange rates

	Quintiles					Top			Adult population (million)	Population share (%)	Mean wealth per adult (PPP\$)	Wealth share (%)	Median wealth per adult (PPP\$)	Gini
	Q1	Q2	Q3	Q4	Q5	10%	5%	1%						
USA	1.9	3.2	3.5	4.9	13.9	19.6	23.5	36.8	202.9	5.5	201319	25.4	41682	0.801
Japan	0.0	0.4	0.7	1.7	10.8	14.2	15.9	12.3	100.9	2.7	157146	9.9	93152	0.547
Germany	1.7	0.5	0.8	1.3	4.5	7.0	9.0	3.9	64.8	1.8	115325	4.6	39709	0.667
UK	0.2	0.6	0.8	1.0	3.4	5.9	6.0	6.4	43.9	1.2	172461	4.7	77439	0.697
Italy	0.0	0.1	0.4	1.3	4.5	5.9	5.5	5.4	46.4	1.3	150327	4.3	80043	0.609
China	10.2	24.0	36.0	31.1	12.5	4.1	1.4		842.1	22.8	16749	8.8	9151	0.550
Spain	0.0	0.3	0.4	0.5	3.1	3.7	3.5	1.4	32.2	0.9	117837	2.4	72483	0.570
France	0.2	0.5	0.8	1.5	3.1	3.5	4.0	5.9	44.4	1.2	126360	3.5	36975	0.730
Canada	0.3	0.3	0.3	0.5	1.7	2.3	2.3	2.3	22.8	0.6	120326	1.7	45850	0.688
India	21.0	21.6	16.3	13.0	5.3	2.3	1.2		570.6	15.4	11655	4.1	4663	0.669
Brazil	3.7	2.6	2.4	2.8	2.6	2.2	2.1	2.0	104.2	2.8	32825	2.1	7201	0.784
South Korea	0.1	0.4	0.6	1.2	2.3	1.8	1.1	0.9	33.2	0.9	63716	1.3	36098	0.579
Taiwan	0.0	0.1	0.2	0.4	1.4	1.7	1.8	1.9	15.5	0.4	143405	1.4	62867	0.655
Australia	0.2	0.1	0.2	0.1	1.2	1.7	1.7	1.3	13.7	0.4	126635	1.1	75027	0.622
Mexico	1.4	1.2	1.3	1.8	1.9	1.6	1.4	1.4	56.1	1.5	41881	1.5	11685	0.749
Netherlands	0.0	0.1	0.1	0.3	1.1	1.5	1.7	1.6	12.0	0.3	159910	1.2	71441	0.650
Russia	3.1	2.8	2.8	3.7	2.1	1.3	0.9	0.6	107.5	2.9	22604	1.5	8405	0.699
Turkey	0.9	0.9	0.9	1.4	1.3	1.0	0.8	0.8	40.4	1.1	37806	1.0	12439	0.718
Argentina	0.5	0.4	0.5	0.7	1.1	1.0	0.9	0.9	23.3	0.6	58161	0.8	16573	0.740
Indonesia	5.7	4.5	3.2	2.6	0.8	0.9	0.7	0.7	124.4	3.4	13401	1.0	3770	0.764
Thailand	1.3	1.2	1.0	1.2	0.8	0.5	0.3	0.2	40.2	1.1	21295	0.5	7088	0.710
Pakistan	2.5	2.5	2.2	1.3	0.6	0.4	0.3	0.2	68.0	1.8	12566	0.5	4709	0.698
Bangladesh	2.3	2.3	2.1	1.7	0.6	0.3	0.2	0.2	66.5	1.8	12226	0.5	5223	0.660
Viet Nam	1.9	1.7	1.2	0.9	0.3	0.1	0.1	0.1	44.0	1.2	10045	0.3	3907	0.682
Nigeria	5.3	1.1	0.3	0.2	0.0				51.4	1.4	2070	0.1	632	0.736
World	100	100	100	100	100	100	100	100	3697.5	100	43494	100	8325	0.804

Note: Countries are listed according to the number of members of the global top wealth decile. Source: Authors' calculations.

Table 10: Global wealth distribution under alternative assumptions

	Number of countries	Adult population (million)	Share of adult population (%)	Wealth per adult (\$)	Share of wealth (%)	World wealth shares									Gini
						Quintile					Top				
						Q1	Q2	Q3	Q4	Q5	10%	5%	1%		
(1) All countries, PPP valuations	229	3697.5	100	43494	100	0.4	1.7	4.0	9.9	84.1	71.2	57.1	31.9	0.804	
(2) All countries, official exchange rates	229	3697.5	100	33875	100	0.1	0.5	1.3	4.1	93.9	85.2	70.7	40.1	0.892	
Excluding regional average imputations for:															
(3) — average wealth level	150	3540.8	95.8	44503	98.0	0.4	1.7	4.0	9.9	84.1	71.1	57	31.9	0.804	
(4) — wealth distribution	144	3596.8	97.3	44020	98.5	0.4	1.7	4.0	9.9	84.1	71.1	57	31.9	0.803	
(5) — average wealth level and distribution	129	3491.1	94.4	44885	97.4	0.4	1.7	4.0	9.9	84.1	71.1	56.9	31.8	0.803	
Countries with wealth distribution data															
(6) — using reported wealth distributions	20	2171.1	58.7	55435	74.8	0.5	1.8	3.7	9.6	84.5	70.9	56.6	32.2	0.803	
(7) — imputing from income distributions	20	2171.1	58.7	55435	74.8	0.3	1.3	3.6	10.2	84.7	70.2	54.7	27.7	0.807	

Source: Authors' calculations

The middle half of the distribution is the domain of China, which supplies a third of the membership of deciles 4-8. In contrast, India is concentrated at the lower end of the global wealth distribution; the membership share is almost a quarter (22.3 per cent, in fact) for the bottom three deciles, and then declines monotonically with wealth right up to the top tail. The membership pattern of India is roughly similar to that of Africa.

Residents of Latin America and the Caribbean are spread across the entire global distribution, reflecting the great inequality of wealth-holding in that region. Taken as a whole, Asia-Pacific countries apart from China and India are also quite evenly spread, although there is high polarization, with rich Asia-Pacific countries occupying the top end and the lower income countries (especially, Indonesia, Bangladesh, Pakistan, and Vietnam) being found in the lower tail.

Table 9 provides more details for those countries that have either high wealth (more than one per cent of global wealth or more than one per cent of members of the world top wealth decile) or else adult populations exceeding 45 million. A country's ranking in the global top wealth decile depends on a combination of three factors: population size, mean wealth, and wealth inequality. The USA heads the list, with 19.6 per cent of the world's top decile and 36.8 per cent of the top percentile. Large population, high mean wealth, and high wealth inequality all reinforce each other in the USA case to produce this result. Japan comes a strong second to the USA, with 14.2 per cent of the top decile and 12.3 per cent of the top percentile. This strong performance reflects not only Japan's population size, but also its high personal saving rate and resulting high household asset levels. Germany, the UK, and Italy follow Japan with 7.0, 5.9 and 5.9 per cent of the top decile respectively, accounting for more than half of the 35.2 per cent population share of Europe in the top global decile. Note also that Italy, like Japan, has very low representation in the bottom half of the world distribution, and in particular relatively fewer members than the USA, Germany or the UK. This reflects, in part, the remarkably low level of household debt in Italy.

Table 9 also reports figures for median wealth across countries, which reflect variations in both mean wealth and inequality. One interesting observation is that median wealth rarely exceeds 50 per cent of mean wealth. In addition, the rank order of countries changes significantly when medians are used instead of mean values. Of the countries listed in the table, the USA ranked first in mean wealth per adult, followed by the UK, Japan, and then Italy. However, of this group, Japan ranks first in terms of median wealth per adult, followed by Italy, the UK, and then the USA. Indeed, Japan's median wealth was more than double the figure for the USA although its mean wealth was 22 per cent lower.

A number of checks were conducted to test the sensitivity of our results to the assumptions made at various stages. Table 10 begins by summarizing the figures recorded earlier for the total world adult population with wealth valued according to PPP (row 1) and official exchange rates (row 2). By lowering the wealth levels of poorer countries, the shift from PPP to official exchange rates leads to a significant rise in measured inequality. The share of the top decile increases from 71.2 to 85.2 per cent, and the share of the top percentile from 31.9 to 40.1 per cent. The world Gini value jumps from 0.804 to 0.892, now far exceeding the

figure recorded for any individual country.³¹ The use of official exchange rates may thus be viewed as magnifying wealth level differences across countries and ensuring that inter-country variations make a greater contribution to global wealth inequality.³²

In contrast, Table 10 shows that the assumptions used during the course of our analysis have very little impact on global wealth distribution. Rows 3–5 report the PPP figures corresponding to row 1 after omitting countries for which data has been imputed from region-income group averages. Row 3 discards those with imputed wealth levels; row 4 those without income distribution data (and hence no way of estimating wealth inequality); and row 5 those with either form of imputation. The results show that the regional-income group imputations affect less than 6 per cent of the global adult population and less than 3 per cent of global wealth, so it is perhaps not surprising to discover no discernible impact on the global wealth distribution.

The last two rows take an even more extreme position, excluding all countries except the 20 nations listed in Table 6 which have wealth distribution data. Restricting attention to these 20 countries loses 25 per cent of the world's wealth and 41 per cent of the world's adults. Nevertheless, the figures in row 6 are little different from the row 1 benchmark, with a top 1 per cent share of 32.2 per cent compared to 31.9 per cent, for example, and a Gini value of 0.803 compared to 0.804.

The final row 7 keeps the same 20 countries but discards the 'true' wealth distribution figures, replacing them instead with the estimate derived from income distribution data that was applied to most countries. Comparing rows 6 and 7 suggests that the estimation procedure reduces wealth inequality at the very top of the distribution, with the share of the top 1 per cent falling from 32.2 per cent to 27.7 per cent. However, the share of the top two quintiles rises and the share of the bottom three quintiles falls, suggesting a shift towards greater inequality. The combined impact is evidently small, with the world Gini value changing from 0.803 to 0.807. Overall, it seems that our method of estimating wealth distributions from income distributions, and the other estimation and imputation procedures used during the course of our study, have little impact on the global wealth inequality figures. The impact is certainly less than the change induced by switching from PPP figures to official exchange rate valuations, which is a conceptual distinction rather than an assumption adopted for computational convenience.

Other respects also lead us to believe that our estimates of the top wealth shares are reasonable. The survey data on which most of our estimates are based under-represent the rich and do not reflect the holdings of the super-rich. This suggests that our estimated shares of the top percentile and top decile, for example, may err on the low side. A rough idea of the possible size of the error is given by the total wealth of the world's billionaires reported by

³¹ This parallels the result in Milanovic (2005) for the global income distribution. Milanovic has a world income Gini in 1998 of 0.642 on a PPP basis but 0.795 using official exchange rates.

³² The particular approach to estimating PPPs used in the Penn World Tables, the Geary-Khamis method, may also have an effect on our results. While it is widely used in the study of international differences in income this method produces smaller estimated differences in living standards between rich and poor countries than some other popular methods, for example the 'EKS' method used by the World Bank (see, for example, United Nations 2007.) Using PPPs based on the Geary-Khamis method likely leads to lower estimates of world wealth inequality than would be obtained using the EKS method.

Forbes magazine for the year 2000, which was \$2.16 trillion. This represents 1.7 per cent of our figure of \$125.3 trillion (at official exchange rates) for total world household wealth. Thus if our estimates erred so badly as to exclude all the world's billionaires, the shares of the top percentile and top decile would be depressed by less than two percentage points.

As discussed in Davies *et al.* (2007), a further check was accomplished by fitting a Pareto distribution to the upper tail of our estimated global wealth distribution (based on official exchange rates). The Pareto distribution well approximates the upper tail of both income and wealth distribution data at the national level, and is a remarkably close fit to our global distribution in the range from \$250,000 to \$5 million. While the fit deteriorates beyond this point, it gives us added confidence in the quality of our estimated distribution up to about \$10 million, which covers all but a very small percentage of the world's population.

6 Conclusion

This paper has shown that the global distribution of household wealth is highly concentrated. Using PPP valuations, we estimate that the top 10 per cent of adults in the world owned 71 per cent of household wealth in the year 2000 and that the Gini coefficient for global wealth holdings was 0.804. Measured wealth inequality is higher still if international comparisons are based on official exchange rates, which is appropriate if attention is focused on the rich and super rich: the share of the top decile rises to 85 per cent and the Gini becomes 0.893. These statistics indicate that the world's wealth distribution is considerably more unequal than its income distribution, for which Milanovic (2005) reports Gini coefficients of 0.642 and 0.795 on PPP and exchange rate bases, respectively, for his full 1998 sample.

This study began by assembling information on mean household wealth levels, and portfolio composition, for as many countries as possible. Wealth composition was seen to vary, not only with the stage of development, but across countries at similar income levels. These variations may be explained in terms of institutional and traditional differences, varying importance of public pensions, and other factors. The importance of both financial assets and borrowing rises sharply with per capita income and with financial market development. Conversely, household balance sheets in poor countries remain dominated by land and other tangible assets.

Using regression analysis and other imputation methods, mean wealth levels were assigned to countries lacking adequate wealth data. This generates estimated wealth levels for 229 countries and a snapshot of what Milanovic (2005) and others refer to as 'international inequality', that is inequality *between* countries. On a PPP basis, wealth per adult for most countries fell between the figure of \$11,655 for India and \$201,319 for the United States in the year 2000. The between-country Gini coefficient for wealth per adult was 0.573 compared to 0.481 for GDP per adult.

Having obtained estimates of wealth level by country, details of the shape of the wealth distribution were assembled for as many countries as possible. The data covered 20 countries, which together account for 59 per cent of the world population in 2000 and, we estimate, 84 per cent of global wealth. The group includes all the populous rich countries along with the largest developing nations, China, India and Indonesia. It allows us to study the relation between wealth distribution and income distribution, and to generate rough estimates of wealth inequality for 124 countries that have income distribution data but no wealth distribution data. Simple imputations of wealth inequality were applied to the remaining

countries, which comprised less than four per cent of the world population. Combining the wealth distribution estimates with the wealth level numbers, and weighting by population, then yielded our estimates of the world distribution of wealth.

Our estimate of 0.804 for the world wealth Gini is high, both compared to the Ginis for many countries, and compared to Ginis that have been estimated for the world distribution of income. However, it is interesting to note that several important countries have fairly similar values of wealth Ginis, including Brazil at 0.784 and the USA at 0.801. According to the Gini coefficient, therefore, such countries contain within their borders about the same level of wealth inequality as is seen in the world as a whole.

Our results also allow us to comment on the relative importance of between-country wealth inequality compared to within-country wealth inequality. As reported earlier, between-country differences in wealth per adult yield a Gini value of 0.573 on a PPP basis. Adding within-country differences pushes the Gini to 0.804, suggesting that within-country differences are a very important component of world wealth inequality. This impression is confirmed by comparison with the world income distribution results of Milanovic (2005), which show a between-country Gini of 0.531 and a full Gini of 0.641 in 1998 (for a common sample of countries over the years 1988-98). The Milanovic results thus show between-country income inequality equal to 83 per cent of total inequality, which is much greater than the 71 per cent obtained here for wealth.

While this paper makes a start in estimating the world distribution of wealth, it is clear that there are gaps in the data and significant concerns about data quality in some countries. Globally, there is huge room for improvement in the study of household wealth. Household balance sheets and wealth surveys need to be generated in many more countries. These are completely lacking in Latin America, and almost totally absent in Africa and most of Asia as well. The development of financial institutions and property rights are key aspects of economic growth and human development. Without the relevant data it is impossible to see what progress is being made. Improvements in data quality, particularly in survey data, must also occur. The task is far from hopeless, however, and great strides have been taken in several countries. The fact that regular wealth surveys are conducted in the two largest developing countries, China and India, is encouraging. As balance sheet studies spread, and as more and better surveys are conducted, a much better picture will emerge of the level, composition and distribution of household wealth around the globe.

Appendix I: Household balance sheet (HBS) data: methods

There is considerable variation between countries in how household balance sheets are constructed, who puts them together, sectoral definition, and asset coverage. In some countries, for example Australia, the UK, and France the balance sheets, or at least their major elements, are compiled as part of the system of national accounts (SNA). Elsewhere, for example the USA, Canada, and Japan, they are assembled together with flow of funds (FOF) data. In other cases central banks or national statistical agencies issue HBS data independent of the SNA or FOF. The OECD publishes the financial balance sheet of the household sector for its member countries (OECD 2005).ⁱ As discussed below, however, fully comparable household balance sheets including non-financial assets are available for only a subset of OECD countries.

What is important is not who delivers the HBS data, but who and what are covered, and how the data are constructed. The objective is to estimate the balance sheet of the household sector as of a certain date—often but not always the year-end. This can be done by trying to measure the relevant stocks, or by updating previous stock figures by adding estimates of subsequent flows. Both stocks and flows can be measured by direct or indirect means (Aron *et al.* 2006). In the direct approach data are collected from household members through sample surveys, censuses or administrative records. In the indirect approach the values for the household sector by asset type are calculated as residuals from independent totals by deducting the estimated holdings of other sectors. Often the independent totals are counterpart data, for example the liabilities of the banking sector in the form of deposits. In most countries a mix of direct and indirect approaches is used.

In the USA, for example, most categories of financial assets and liabilities are calculated using the indirect approach (Board of Governors of the Federal Reserve System 2003). That is, amounts held or owed by the other sectors are subtracted from known totals and the remainders are assumed to be the amounts held by the household sector. For consumer credit no deductions are necessary. When micro-data are available, assets and liability totals for the household sector are reviewed in light of that data and sometimes adjusted accordingly. The Survey of Consumer Finances (SCF), which is conducted every three years by the Federal Reserve Board, is used for this purpose. House values and equity in unincorporated business are estimated using the perpetual inventory method. Land values are updated based on an index of land prices.

In the UK, financial assets are measured mostly using the residual approach based on data from banks and other financial intermediaries. Ordinary shares are estimated with the help of a sample survey, the Share Registers Survey, whereas unlisted company shares are estimated using the estate multiplier method. Data on life assurance and pensions funds are obtained from returns made by insurance companies and pension funds. The value of fixed assets is derived using a number of sources. Some of the net capital stock estimates included in non-financial assets are calculated using the perpetual inventory method (Aron *et al.* 2006). Residential housing stock estimates are compiled using property tax records of local

ⁱ Financial balance sheets for the household sector have also been published for eight countries in ‘New Europe’ by a financial group based in Italy. See UniCredit Group (2005). The countries covered are Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Slovakia, and Turkey. We were only able to obtain non-financial data for the Czech Republic, and so it is the only one of these countries whose balance sheet numbers are reported here.

authorities, and farm land and buildings are estimated from data on farm sizes and prices from the Ministry of Agriculture, Fisheries and Food.

Also in Italy, financial assets are measured using the residual approach and are based on data from banks, credit institutions, insurance companies etc. (Brandolini *et al.* 2004). Debts comprise all short and long term liabilities and are estimated using the same approach. The stock of dwellings is based on a series provided by the Italian Statistics Office given at constant rather than market prices. The series is corrected to be expressed in market prices using a housing price series based on information assembled in a semi-annual survey of real estate agents. Benchmark values of the stock of dwellings and the share owned by households are obtained using census data. Apart from housing assets, only durables are included in fixed assets. The stock of durables is computed using the perpetual inventory method.

Sectoral definitions unfortunately are not the same across all countries. Sometimes the household sector only includes households. However, in many cases, as we see below, unincorporated business is included in the household sector; it is also common to include non-profit organizations (NPOs) that serve the household sector. Households are the owners of unincorporated business. In principle this means that whether unincorporated business is included with households or not should not affect estimates of the total wealth of households.ⁱⁱ However, where these sectors are separated, unincorporated businesses are in practice treated as having some net worth of their own. Hence households will tend to appear wealthier where the sectors are combined. Apparent composition of household wealth will also be affected. Where the sectors are combined, business assets and debts are separated into the various relevant categories. But where unincorporated business is treated as a separate sector, we will just see a single entry, business equity, in the household balance sheet.

ⁱⁱ If unincorporated business is treated as a separate sector, household wealth will include equity in unincorporated business.

Appendix IIA: Household balance sheet and financial balance sheet sources

Country	Financial data	Non-financial data	Data combined by	Link to data
Australia	Australian Bureau of Statistics (2005). 5204.0 Australian System of National Accounts Table 51	Same as for financial data		www.abs.gov.au/
Austria	OECD (2005)			
Belgium	OECD (2005)			
Bulgaria	UniCredit Group (2005).			
Canada	Statistics Canada, National Balance Sheet Accounts 2000; CanSim Matrix 0751	Same as for financial data		
Taiwan	National Wealth Statistics. Statistical Tables. Table 7 (quoted from Central Bank Flow of Funds Statistics)	National Wealth Statistics. Statistical Tables. Table 7	National Statistical Office	http://eng.stat.gov.tw/
Croatia	UniCredit Group (2005).			
Czech Republic	Czech Statistical Office. Sector Accounts Times Series. Table ST01415, 2006	Same as for financial data		http://dw.czso.cz/
Denmark	Statistics Denmark. National Accounts and Balance of Payments, Annual National Accounts ESA95, Balance Sheets for Financial Assets and Liabilities Table NAT10	Statistics Denmark. National Accounts and Balance of Payments, Annual National Accounts ESA95, Fixed Capital Table Nat14	Authors	www.statbank.dk/
Estonia	Eurostat Financial Balance Sheets			http://epp.eurostat.cec.eu.int/
Finland	Statistics Finland. Financial Assets, Balance Sheets. Financial Liabilities, Balance Sheets	Housing stock from financial accounts provided by Statistics Finland.	Authors	www.stat.fi
France	INSEE. Comptes Nationaux Annuels - Base 2000. Table 4515	Same as for financial data		www.insee.fr/
Germany	Deutsches Bundesbank (2004). Financial Accounts for Germany 1991 to 2003. Special Statistical Publication. Table XI p. 86	Real assets data provided by Deutsches Bundesbank.	Authors	
Greece	Eurostat Financial Balance Sheets			http://epp.eurostat.cec.eu.int/
Hungary	OECD (2005).			

Italy	Financial Accounts by the Bank of Italy.	Adjusted Italian Statistical Office data.	Brandolini <i>et al.</i> (2004), Table 2, p.18.	
Japan	Economic Planning Agency, Government of Japan. Annual Report on National Accounts. Table 4	Same as for financial data		
Korea	OECD (2005).			
Latvia	Eurostat Financial Balance Sheets			http://epp.eurostat.cec.eu.int/
Lithuania	Eurostat Financial Balance Sheets			http://epp.eurostat.cec.eu.int/
Netherlands	van Els <i>et al.</i> (2005: Table 1 p.23)	Statistics Netherlands. Sector Accounts: Financial Balance Sheets Table 4b.	Authors	www.cbs.nl/
New Zealand	Reserve Bank of New Zealand. Household Financial Assets and Liabilities.	Same as for financial data		www.rbnz.govt.nz/
Poland	OECD (2005).	Yemtsov (2007).	Authors	
Portugal	Financial Accounts by the Bank of Portugal.	Housing stock estimates calculated based on data from the Central Statistical Office and the Bank of Portugal.	Cardoso and da Cunha (2005: Table A1.1 p.41)	
Romania	UniCredit Group (2005).			
Singapore	Singapore Department of Statistics (2003).	Same as for financial data		
Slovakia	UniCredit Group (2005).			
Slovenia	Eurostat Financial Balance Sheets			
South Africa	Aron and Muellbauer (2004: Table 2 p.50)	Same as for financial data		
Spain	Banco de Espana (2005). Financial Accounts of the Spanish Economy. Table II.5.e.	Banco de Espana. Summary indicators: Household market indicators.	Authors	www.bde.es/
Sweden	OECD (2005).			
Switzerland	Swiss National Bank. Swiss Financial Accounts. Table T11.			www.snb.ch

Turkey	UniCredit Group (2005).			
UK	National Statistics Online. Financial Statistics Time Series Data Table 12.1N.	United Kingdom National Accounts. Blue Book Time Series Data Table 10.10.	Authors	www.statistics.gov.uk/
USA	Federal Reserve Statistical Release. Flow of Funds Accounts of the United States. Release Z. I, June 9, 2005. Table B.100.	Same as for financial data		www.federalreserve.gov/

Appendix IIB: Comparison of full household balance sheets

Country	Sector definition	Non-housing real assets	Consumer durables
Australia	households	yes	imputed
Canada	households + NPOs	yes	yes
Taiwan	households	yes	yes
Czech Republic	households	yes	imputed
Denmark	households + NPOs	yes	imputed
Finland	households	no	imputed
France	households + NPOs	yes	imputed
Germany	households	yes	yes
Italy	households	yes (only durables)	yes
Japan	households	yes	imputed
Netherlands	households + NPOs	no	imputed
New Zealand	households	yes (only land)	imputed
Poland	households	no	imputed
Portugal	households + NPOs	yes (only land)	imputed
Singapore	households	no	imputed
South Africa	households + NPOs	yes	yes
Spain	households + NPOs	yes (only real estate)	imputed
UK	households (corrected for NPOs)	yes	imputed
USA	households (corrected for NPOs)	yes	yes

Note: NPOs are non-profit institutions serving households.

Appendix IIC: Survey sources

Australia	2002	Household Income, and Labour Dynamics; See Headey, et al (2005).
Canada	1999	Survey of Financial Security; see Statistics Canada (2001).
China	2002	China Academy of Social Science Survey; see Renwei and Sing (2005).
Denmark	1996	Wealth tax records; see Statistics Denmark (1998) and Ohlson <i>et al.</i> (2006). Supplemented with private communication with Statistics Denmark in 2007.
Finland	1998	Household Wealth Survey; see Statistics Finland (2000).
France	1994	Estate tax returns; see Piketty et al (2004).
Germany	1998	Einkommens und verbrauchstichprobe; see Ammermüller <i>et al.</i> (2005).
India	2002	All-India Debt and Investment Survey (NSS 59th round); see National Sample Survey Organization (2005).
Indonesia	1997	Indonesia Family Life Survey (own calculations); www.rand.org/labor/FLS/IFLS/
Ireland	1987	The survey of Income Distribution, Poverty and Usage of State Services; see Nolan (1991).
Italy	2000	Survey of Household Income and Wealth; see Brandolini <i>et al.</i> (2004).
Japan	1999	National Survey of Family Income and Expenditure; see Japan Statistics Bureau (2005).
Korea	1988	Korea Development Institute Survey; see Leipziger <i>et al.</i> (1992).
Mexico	2002	Encuesta Nacional sobre Niveles de Vida de los Hogares; see Jäntti and Sierminska (2007).
New Zealand	2001	Household Saving Survey; see Statistics New Zealand (2002).
Norway	2000	Income and Property Distribution Survey; see Statistics Norway (2005).
Spain	2002	Survey of Household Finances; see Banco de Espana (2005) and Alvaredo and Saez (2006).
Sweden	2002	Wealth statistics based on registers of total population; see Statistics Sweden (2004).
Switzerland	1997	Survey based on county wealth tax statistics; see Dell <i>et al.</i> (2005).
UK	2000	Inland Revenue Statistics; see Inland Revenue Statistics (2005).
USA	2001	Survey of Consumer Finances 2001; see Kennickel (2006).

Appendix III: Wealth per capita from household balance sheet and survey data, 2000

Country	Wealth, ^a HBS	Wealth, ^a survey data	GDP ^b	Personal disposable income ^c	consumption
US\$ per capita at PPP exchange rates					
Australia	90906	101597	27193	15983	18913
Canada	89252	72384	28731	17661	15994
China		11267	3844	1934	1870
Czech Republic	32431		14844	8205	10008
Denmark	66191		28539	12348	17951
Finland	53154	38754	24416	11285	15197
France	94557		23614	14732	15672
Germany	90768	55431	23917	15486	16603
India		6513	2684	1916	1406
Indonesia		7973	4035	2603	2614
Italy	120897	74956	22876	15169	14195
Japan	124858	91856	25924	15496	15975
Netherlands	121165	43866	25759	12798	16159
New Zealand	55823	61872	20008	12034	13534
Poland	24654		9661	7083	6493
Portugal	53811		17089	11700	10380
Singapore	113631		28644	14885	9965
South Africa	16266		8017	4691	5210
Spain	93086	61218	19037	12544	13160
Taiwan	100009		19714	11471	12603
UK	128959		24252	17102	18238
USA	143727	143857	35619	25480	24313
US\$ per capita at official exchange rates					
Australia	67990	75986	20338	11954	14145
Canada	70916	57513	22828	14032	12708
China		2613	891	448	434
Czech Republic	10797		4942	2732	3332
Denmark	70751		30505	13198	19188
Finland	50984	37171	23419	10824	14576
France	85794		21425	13367	14220
Germany	86369	52744	22758	14735	15799
India		1112	458	327	240
Indonesia		1440	729	470	472
Italy	98317	60957	18604	12336	11544
Japan	180837	133038	37547	22443	23137
Netherlands	109418	39613	23261	11557	14592
New Zealand	37026	41038	13271	7982	8976
Poland	10438		4090	2999	2749
Portugal	33421		10614	7267	6447
Singapore	90960		22929	11915	7977
South Africa	5977		2946	1724	1914
Spain	68693	45176	14048	9257	9711
Taiwan	73654		14519	8448	9282
UK	126832		23852	16820	17937
USA	143727	143857	35619	25480	24313

Notes and source: ^aSource for HBS data: flow of funds data, national balance sheets and financial balance sheets augmented with estimates of housing assets. The original survey data are close to year 2000. Figures have been adjusted to year 2000 values using the real growth rate per capita. ^bSource: Penn World Table 6.1. ^cSource: The Economist Intelligence Unit.

Appendix IV: Correlations of wealth and income across countries 2000

	GDP	Personal disposable income	Real consumption	Ln (Personal disposable income)	Ln (Real consumption)
<hr/> Household balance sheet data <hr/>					
Correlation with wealth					
PPP	0.774	0.831	0.710		
Official exchange rates	0.879	0.921	0.860		
Correlation with Ln (wealth)					
PPP				0.911	0.816
Official exchange rates				0.970	0.936
<hr/> Survey data <hr/>					
Correlation with wealth					
PPP	0.867	0.938	0.891		
Official exchange rates	0.908	0.958	0.920		
Correlation with Ln (Wealth)					
PPP				0.970	0.954
Official exchange rates				0.989	0.984

Note: See Appendix III for data sources. All variables are measured in year 2000 US\$ per capita.

Appendix V: Regressions of wealth components

Independent variables	Dependent variables						
	Log non-financial wealth			Log financial wealth		Log liabilities	
	(1a)	(1b)	(1c)	(2a)	(2b)	(3a)	(3b)
Constant	0.156 (0.790)	.0918 (0.650)	0.215 (0.478)	-5.437*** (0.942)	-4.347*** (0.920)	-10.150*** (1.089)	-9.73*** (0.693)
Log disposable income per capita	1.138*** (0.076)	1.047*** (0.051)	1.076*** (0.049)	1.659*** (0.113)	1.403*** (0.130)	1.587*** (0.199)	1.515*** (0.104)
Log population density	.0740** (0.034)	.0763** (0.036)	.085** (0.036)				
Log market capitalization rate				.188** (0.085)	.393*** (0.099)		
Log pensions as percentage of GDP				-0.065 (0.095)			
Log domestic credits available to private sector						.991*** (0.227)	1.047*** (0.159)
Income Gini	-.014* (0.008)	-0.012 (0.008)		-0.009 (0.012)			
Survey dummy	0.398 (0.251)			1.385*** (0.418)	-.753* (0.430)	-1.122 (0.827)	
R ²	0.969	0.964	0.960				
'R ² '				0.975	0.958	0.957	0.952
RMSE	0.270	0.280	0.290	0.277	0.446	0.483	0.544
Sample size	23	23	23	29	33	29	33

Note: The non-financial regressions use Ordinary Least Squares and a sample consisting of 19 countries with HBS data and 4 with survey data. The financial assets and liabilities regressions use the Seemingly Unrelated Regression (SUR) method and a sample consisting of 30 countries with HBS or financial balance sheet data and 3 with survey data. Lack of data on public pensions reduces the sample size by 4 in specifications (2a) and (3a). Standard errors are given in parentheses. Significance: * 10% level; ** 5% level; *** 1% level.

Appendix VI: Population, wealth and GDP by country, 2000

	population		Share of world population (%)	Share of adult population (%)	PPP\$					US\$ at official exchange rates					
					Wealth per capita	Wealth per adult	Share of world wealth (%)	GDP per capita	Share of world GDP (%)	Wealth per capita	Wealth per adult	Share of world wealth (%)	GDP per capita	Share of world GDP (%)	Wealth Gini
	(000s)	adults (000s)	(%)	(%)	per capita	per adult	(%)	capita	(%)	capita	per adult	(%)	capita	(%)	
North America															
Canada	30689	22763809	0.50	0.62	89252	120326	1.70	28731	1.89	70916	95606	1.74	22828	2.18	0.688
USA	284154	202865141	4.67	5.49	143727	201319	25.40	35619	21.67	143727	201319	32.62	35619	31.47	0.801
Europe															
Albania	3062	1850530	0.05	0.05	10574	17497	0.02	3658	0.02	3176	5255	0.01	1099	0.01	0.642
Austria	8096	6271048	0.13	0.17	73047	94305	0.37	24836	0.43	68423	88336	0.44	23264	0.59	0.646
Belarus	10029	7334662	0.17	0.20	14659	20043	0.09	8738	0.19	1706	2333	0.01	1017	0.03	0.628
Belgium	10304	7896153	0.17	0.21	86205	112492	0.55	25008	0.55	76922	100379	0.63	22315	0.72	0.662
Bulgaria	7997	6192210	0.13	0.17	15120	19527	0.08	6356	0.11	3489	4506	0.02	1467	0.04	0.652
Croatia	4505	3429614	0.07	0.09	22021	28925	0.06	9547	0.09	10030	13176	0.04	4349	0.06	0.654
Czech Rep.	10267	7889378	0.17	0.21	32431	42205	0.21	14844	0.33	10797	14051	0.09	4942	0.16	0.626
Denmark	5340	4071796	0.09	0.11	66191	86807	0.22	28539	0.33	70751	92787	0.30	30505	0.51	0.808
Estonia	1367	1016498	0.02	0.03	24556	33023	0.02	10873	0.03	7843	10548	0.01	3473	0.02	0.675
Finland	5177	3905409	0.09	0.11	53154	70461	0.17	24416	0.27	50984	67584	0.21	23419	0.38	0.615
France	59278	44358337	0.97	1.20	94557	126360	3.49	23614	3.00	85794	114650	4.06	21425	3.95	0.730
Germany	82344	64810316	1.35	1.75	90768	115325	4.65	23917	4.22	86369	109735	5.68	22758	5.83	0.667
Greece	10975	8568181	0.18	0.23	69855	89477	0.48	15558	0.37	48191	61728	0.42	10733	0.37	0.654
Hungary	10226	7834119	0.17	0.21	31452	41055	0.20	11063	0.24	13142	17155	0.11	4623	0.15	0.651
Iceland	281	194418	0.01	0.01	81945	118439	0.01	26929	0.02	92696	133977	0.02	30461	0.03	0.664

Ireland	3801	2645529	0.06	0.07	91432	131367	0.22	27197	0.22	84501	121408	0.26	25135	0.30	0.581
Italy	57715	46416152	0.95	1.26	120897	150327	4.34	22876	2.83	98317	122250	4.53	18604	3.34	0.609
Latvia	2373	1769603	0.04	0.05	18958	25422	0.03	8305	0.04	6877	9221	0.01	3013	0.02	0.670
Lithuania	3500	2547789	0.06	0.07	21566	29626	0.05	8397	0.06	7871	10813	0.02	3065	0.03	0.666
Luxembourg	435	328238	0.01	0.01	185231	245479	0.05	48968	0.05	162366	215176	0.06	42923	0.06	0.650
Macedonia	2010	1398385	0.03	0.04	14759	21214	0.02	5506	0.02	4701	6757	0.01	1754	0.01	0.661
Malta	392	283904	0.01	0.01	74246	102515	0.02	18256	0.02	39697	54812	0.01	9761	0.01	0.664
Moldova	4275	2893942	0.07	0.08	7790	11508	0.02	2212	0.02	1059	1564	0.00	301	0.00	0.691
Netherlands	15898	12046107	0.26	0.33	121165	159910	1.20	25759	0.88	109418	144406	1.39	23261	1.15	0.650
Norway	4502	3337138	0.07	0.09	79292	106970	0.22	32057	0.31	89096	120195	0.32	36021	0.50	0.633
Poland	38649	27857771	0.64	0.75	24654	34204	0.59	9661	0.80	10438	14481	0.32	4090	0.49	0.657
Portugal	10225	7878277	0.17	0.21	53811	69840	0.34	17089	0.37	33421	43377	0.27	10614	0.34	0.667
Romania	22117	16431262	0.36	0.44	14806	19930	0.20	5024	0.24	4815	6481	0.09	1634	0.11	0.651
Russia	146560	107493120	2.41	2.91	16579	22604	1.51	9996	3.14	2858	3897	0.34	1723	0.79	0.699
Slovakia	5400	3900087	0.09	0.11	24049	33297	0.08	12619	0.15	6802	9417	0.03	3569	0.06	0.629
Slovenia	1967	1521256	0.03	0.04	37019	47867	0.05	16983	0.07	19900	25731	0.03	9130	0.06	0.626
Spain	40717	32164621	0.67	0.87	93086	117837	2.36	19037	1.66	68693	86958	2.23	14048	1.78	0.570
Sweden	8877	6735471	0.15	0.18	78148	102996	0.43	24628	0.47	81883	107917	0.58	25805	0.71	0.742
Switzerland	7167	5496752	0.12	0.15	137549	179345	0.61	28209	0.43	162896	212394	0.93	33407	0.74	0.803
Ukraine	49116	36573036	0.81	0.99	9547	12821	0.29	5147	0.54	1193	1603	0.05	643	0.10	0.667
UK	58670	43870847	0.96	1.19	128959	172461	4.71	24252	3.05	126832	169617	5.94	23852	4.35	0.697
Rich Asia Pacific															
Australia	19071	13690328	0.31	0.37	90906	126635	1.08	27193	1.11	67990	94712	1.04	20338	1.21	0.622
Hong Kong	6637	5084696	0.11	0.14	188699	246307	0.78	27893	0.40	161787	211179	0.86	23915	0.49	0.740
Israel	6084	3835919	0.10	0.10	64633	102511	0.25	19148	0.25	59761	94784	0.29	17705	0.34	0.677
Japan	127034	100933388	2.09	2.73	124858	157146	9.86	25924	7.05	180837	227600	18.35	37547	14.83	0.547
Korea	46779	33241887	0.77	0.90	45278	63716	1.32	14937	1.50	29317	41256	1.10	9671	1.41	0.579
Macao	444	309641	0.01	0.01	71660	102755	0.02	23118	0.02	43929	62990	0.02	14172	0.02	0.580

New Zealand	3818	2678076	0.06	0.07	55823	79585	0.13	20008	0.16	37026	52786	0.11	13271	0.16	0.651
Singapore	4017	2890043	0.07	0.08	113632	157942	0.28	28644	0.25	90960	126429	0.29	22929	0.29	0.689
Taiwan	22191	15475856	0.37	0.42	100009	143405	1.38	19714	0.94	73654	105613	1.31	14519	1.00	0.655
China and India															
China	1251788	842062525	20.57	22.77	11267	16749	8.77	3844	10.30	2613	3885	2.61	891	3.47	0.550
India	1021084	570594599	16.78	15.43	6513	11655	4.14	2684	5.87	1112	1989	0.91	458	1.45	0.669
Other Asia Pacific															
Armenia	3082	1986062	0.05	0.05	9480	14711	0.02	3068	0.02	1537	2386	0.00	498	0.01	0.684
Azerbaijan	8143	4816122	0.13	0.13	6737	11391	0.03	3555	0.06	1240	2097	0.01	654	0.02	0.678
Bangladesh	128916	66483343	2.12	1.80	6305	12226	0.51	1772	0.49	1233	2392	0.13	347	0.14	0.660
Cambodia	12744	5847485	0.21	0.16	4890	10658	0.04	1859	0.05	755	1645	0.01	287	0.01	0.714
Fiji	811	453249	0.01	0.01	9928	17764	0.01	4950	0.01	4089	7316	0.00	2039	0.01	0.709
Georgia	4720	3326218	0.08	0.09	12358	17537	0.04	5315	0.05	1376	1952	0.01	592	0.01	0.725
Indonesia	209174	124446357	3.44	3.37	7973	13401	1.04	4035	1.81	1440	2421	0.24	729	0.47	0.764
Iran	66365	34052897	1.09	0.92	16673	32494	0.69	7202	1.02	11028	21492	0.59	4764	0.98	0.707
Jordan	4972	2474147	0.08	0.07	10792	21687	0.03	4282	0.05	4262	8565	0.02	1691	0.03	0.678
Kazakhstan	15033	9507099	0.25	0.26	13723	21699	0.13	8331	0.27	2036	3220	0.02	1236	0.06	0.655
Kyrgyzstan	4952	2705768	0.08	0.07	5174	9469	0.02	3205	0.03	433	792	0.00	268	0.00	0.680
Lebanon	3398	2023735	0.06	0.06	20560	34522	0.04	6089	0.04	12850	21576	0.04	3806	0.04	0.762
Malaysia	22997	12943607	0.38	0.35	12458	22135	0.18	9422	0.46	5082	9029	0.09	3843	0.28	0.733
Pakistan	142648	67968129	2.34	1.84	5987	12566	0.53	2158	0.66	1193	2504	0.14	430	0.19	0.698
Papua N. Guinea	5299	2544334	0.09	0.07	3629	7559	0.01	2326	0.03	1007	2098	0.00	645	0.01	0.738
Philippines	75766	39205780	1.25	1.06	12453	24066	0.59	4065	0.66	3103	5996	0.19	1013	0.24	0.717
Saudi Arabia	21484	10992367	0.35	0.30	22025	43046	0.29	12374	0.57	15612	30512	0.27	8771	0.59	0.737
Sri Lanka	19848	12689397	0.33	0.34	10337	16168	0.13	3841	0.16	2267	3546	0.04	842	0.05	0.665
Syria	16813	7920092	0.28	0.21	8917	18929	0.09	4338	0.16	10192	21636	0.14	4958	0.26	0.704
Tajikistan	6159	2866286	0.10	0.08	2940	6318	0.01	1380	0.02	297	639	0.00	140	0.00	0.664
Thailand	61438	40159804	1.01	1.09	13920	21295	0.53	6715	0.88	4123	6307	0.20	1989	0.38	0.710

Turkey	68234	40391372	1.12	1.09	22379	37806	0.95	7414	1.08	9028	15252	0.49	2991	0.64	0.718
Viet Nam	78671	44024523	1.29	1.19	5621	10045	0.28	2012	0.34	1109	1982	0.07	397	0.10	0.682
Yemen	17937	7208854	0.30	0.20	1426	3548	0.02	1293	0.05	537	1337	0.01	487	0.03	0.613
Latin America and Caribbean															
Antigua and Barbuda	77	52165	0.00	0.00	20944	30915	0.00	18007	0.00	11791	17404	0.00	10137	0.00	0.747
Argentina	36896	23307144	0.61	0.63	36740	58161	0.84	11729	0.93	24261	38406	0.72	7745	0.89	0.740
Barbados	266	189642	0.00	0.01	102932	144376	0.02	17526	0.01	57642	80851	0.01	9815	0.01	0.706
Belize	242	119358	0.00	0.00	12550	25444	0.00	7170	0.00	5961	12086	0.00	3406	0.00	0.763
Bolivia	8317	4171017	0.14	0.11	6654	13269	0.03	2934	0.05	2260	4506	0.02	996	0.03	0.762
Brazil	173858	104212978	2.86	2.82	19676	32825	2.13	7745	2.88	8923	14887	1.24	3512	1.90	0.784
Chile	15412	9808899	0.25	0.27	27536	43265	0.26	10389	0.34	12284	19301	0.15	4635	0.22	0.777
Colombia	42120	24196525	0.69	0.65	13826	24067	0.36	5796	0.52	4576	7965	0.15	1918	0.25	0.765
Costa Rica	3929	2283843	0.07	0.06	14718	25319	0.04	5873	0.05	10434	17950	0.03	4164	0.05	0.732
Dominica	78	46137	0.00	0.00	12717	21500	0.00	8284	0.00	5699	9635	0.00	3712	0.00	0.763
Dominican Rep.	8265	4462343	0.14	0.12	13873	25696	0.07	5654	0.10	5772	10692	0.04	2352	0.06	0.723
Ecuador	12306	6769686	0.20	0.18	6758	12285	0.05	3720	0.10	1951	3547	0.02	1074	0.04	0.760
El Salvador	6280	3388522	0.10	0.09	18408	34115	0.07	4622	0.06	8410	15587	0.04	2112	0.04	0.746
Grenada	102	60332	0.00	0.00	15250	25782	0.00	6410	0.00	9941	16806	0.00	4178	0.00	0.763
Guatemala	11166	4985807	0.18	0.14	12858	28796	0.09	4335	0.10	4969	11128	0.04	1675	0.06	0.779
Guyana	744	432951	0.01	0.01	5697	9790	0.00	4072	0.01	1340	2303	0.00	958	0.00	0.707
Haiti	7939	3744530	0.13	0.10	6244	13238	0.03	1798	0.03	1617	3427	0.01	466	0.01	0.755
Honduras	6424	3024908	0.11	0.08	5318	11293	0.02	2164	0.03	2268	4817	0.01	923	0.02	0.743
Jamaica	2585	1478456	0.04	0.04	9601	16787	0.02	3464	0.02	7892	13798	0.02	2848	0.02	0.686
Mexico	100088	56131898	1.65	1.52	23488	41881	1.46	9711	2.08	14283	25468	1.14	5905	1.84	0.749
Nicaragua	4959	2279219	0.08	0.06	5161	11228	0.02	1947	0.02	1253	2726	0.01	473	0.01	0.755
Panama	2950	1730749	0.05	0.05	15003	25571	0.03	6650	0.04	7801	13297	0.02	3458	0.03	0.766
Paraguay	5470	2702916	0.09	0.07	10879	22016	0.04	4801	0.06	3099	6272	0.01	1368	0.02	0.766
Peru	25952	14348426	0.43	0.39	11577	20939	0.19	4799	0.27	5042	9119	0.11	2090	0.17	0.738

Puerto Rico	3835	2608915	0.06	0.07	77876	114475	0.19	22242	0.18	56012	82335	0.17	15998	0.19	0.753
St Kitts and Nevis	40	23660	0.00	0.00	22339	37767	0.00	14627	0.00	11666	19723	0.00	7639	0.00	0.763
St Lucia	154	89115	0.00	0.00	18013	31128	0.00	6823	0.00	11942	20637	0.00	4523	0.00	0.763
St Vincent-Grenadines	116	64403	0.00	0.00	13287	23932	0.00	7847	0.00	4921	8864	0.00	2906	0.00	0.741
Trinidad and Tobago	1285	817040	0.02	0.02	51101	80369	0.04	13721	0.04	22388	35210	0.02	6011	0.02	0.689
Uruguay	3342	2259044	0.06	0.06	20926	30957	0.04	10285	0.07	12227	18089	0.03	6009	0.06	0.708
Venezuela	24418	13706925	0.40	0.37	14711	26206	0.22	7232	0.38	10157	18094	0.20	4994	0.38	0.712
Africa															
Algeria	30463	16353459	0.50	0.44	7320	13635	0.14	6107	0.40	2102	3915	0.05	1754	0.17	0.670
Benin	7197	3111872	0.12	0.08	3378	7812	0.02	1225	0.02	952	2201	0.01	345	0.01	0.713
Botswana	1754	850916	0.03	0.02	15719	32401	0.02	7703	0.03	6109	12593	0.01	2994	0.02	0.751
Burkina Faso	11292	4591304	0.19	0.12	2123	5222	0.02	986	0.02	419	1031	0.00	195	0.01	0.728
Burundi	6486	2607095	0.11	0.07	1876	4668	0.01	619	0.01	328	815	0.00	108	0.00	0.699
Cameroon	14856	6819341	0.24	0.18	5290	11525	0.05	2301	0.07	1266	2758	0.02	551	0.03	0.711
Cape Verde	451	201769	0.01	0.01	10801	24144	0.00	4299	0.00	3180	7109	0.00	1266	0.00	0.688
Central African Rep.	3777	1737874	0.06	0.05	1949	4235	0.01	1148	0.01	428	931	0.00	252	0.00	0.782
Chad	8216	3500675	0.14	0.10	1726	4051	0.01	959	0.02	329	772	0.00	183	0.01	0.681
Comoros	699	315249	0.01	0.01	5182	11490	0.00	1823	0.00	1028	2280	0.00	362	0.00	0.711
Congo Dem. Rep.	50052	21050151	0.82	0.57	1400	3328	0.04	669	0.07	180	428	0.01	86	0.01	0.711
Congo Rep.	3438	1467504	0.06	0.04	2806	6573	0.01	2533	0.02	1132	2651	0.00	1022	0.01	0.711
Côte d'Ivoire	16735	7528849	0.28	0.20	5212	11584	0.05	2028	0.07	1505	3346	0.02	586	0.03	0.712
Egypt	67285	35550065	1.11	0.96	15541	29415	0.65	4406	0.64	5371	10166	0.29	1523	0.32	0.689
Equatorial Guinea	449	206368	0.01	0.01	7404	16110	0.00	10302	0.01	2111	4594	0.00	2938	0.00	0.688
Ethiopia	68525	30019629	1.13	0.81	1412	3224	0.06	720	0.11	193	439	0.01	98	0.02	0.652
Gabon	1272	603199	0.02	0.02	14833	31279	0.01	7780	0.02	7642	16115	0.01	4008	0.02	0.784
Gambia	1316	643350	0.02	0.02	3894	7964	0.00	1329	0.00	947	1937	0.00	323	0.00	0.723
Ghana	19867	9417943	0.33	0.26	3903	8234	0.05	1376	0.06	733	1546	0.01	258	0.02	0.692
Guinea	8434	3875822	0.14	0.11	7756	16877	0.04	2961	0.05	1065	2318	0.01	407	0.01	0.693

Guinea-Bissau	1366	588472	0.02	0.02	1673	3884	0.00	738	0.00	409	950	0.00	180	0.00	0.710
Kenya	30689	13409338	0.50	0.36	3442	7878	0.07	1316	0.09	906	2074	0.02	346	0.03	0.699
Lesotho	1788	824710	0.03	0.02	2876	6236	0.00	1492	0.01	850	1842	0.00	441	0.00	0.767
Madagascar	16195	7260060	0.27	0.20	2226	4965	0.02	877	0.03	633	1413	0.01	249	0.01	0.722
Malawi	11512	4970200	0.19	0.13	2559	5927	0.02	808	0.02	521	1207	0.01	165	0.01	0.736
Mali	11647	4691432	0.19	0.13	1798	4464	0.01	996	0.03	383	950	0.00	212	0.01	0.750
Mauritania	2645	1224561	0.04	0.03	3966	8566	0.01	1729	0.01	937	2025	0.00	409	0.00	0.686
Mauritius	1186	778997	0.02	0.02	60398	91954	0.05	14406	0.04	15485	23576	0.02	3693	0.01	0.661
Morocco	29231	16167459	0.48	0.44	12440	22491	0.23	4299	0.27	3372	6096	0.08	1165	0.11	0.690
Mozambique	17911	8088291	0.29	0.22	2820	6245	0.03	1113	0.04	545	1207	0.01	215	0.01	0.689
Namibia	1894	874182	0.03	0.02	8843	19159	0.01	6058	0.03	2630	5699	0.00	1802	0.01	0.847
Niger	11782	4758426	0.19	0.13	1755	4344	0.01	902	0.02	329	814	0.00	169	0.01	0.729
Nigeria	117608	51431246	1.93	1.39	905	2070	0.07	826	0.21	356	813	0.03	325	0.12	0.736
Rwanda	8025	3250124	0.13	0.09	2955	7296	0.02	976	0.02	638	1576	0.00	211	0.01	0.714
Sao Tome and Principe	140	62459	0.00	0.00	3235	7251	0.00	1317	0.00	774	1735	0.00	315	0.00	0.711
Senegal	10343	4546750	0.17	0.12	4309	9802	0.03	1681	0.04	1176	2675	0.01	459	0.02	0.697
Seychelles	77	42779	0.00	0.00	26486	47673	0.00	11644	0.00	17197	30954	0.00	7561	0.00	0.760
Sierra Leone	4509	2136473	0.07	0.06	2043	4311	0.01	734	0.01	353	745	0.00	127	0.00	0.687
South Africa	45610	25479859	0.75	0.69	16266	29118	0.46	8017	0.78	5977	10699	0.22	2946	0.42	0.763
Swaziland	1023	444192	0.02	0.01	12773	29417	0.01	5047	0.01	3258	7503	0.00	1287	0.00	0.780
Tanzania	34763	15568986	0.57	0.42	1216	2716	0.03	490	0.04	665	1484	0.02	268	0.03	0.676
Togo	5364	2378967	0.09	0.06	2217	4999	0.01	926	0.01	645	1455	0.00	270	0.00	0.711
Tunisia	9563	5637588	0.16	0.15	20534	34833	0.12	7130	0.15	5843	9911	0.05	2029	0.06	0.693
Uganda	24309	9370236	0.40	0.25	2889	7495	0.04	1030	0.05	721	1870	0.01	257	0.02	0.723
Zambia	10702	4516719	0.18	0.12	2010	4762	0.01	841	0.02	748	1772	0.01	313	0.01	0.766
Zimbabwe	12595	5630670	0.21	0.15	6104	13654	0.05	2607	0.07	1303	2914	0.01	556	0.02	0.845
Other countries	293912	156752858	4.84	4.24			1.98		2.08			1.41		1.47	
World	6085576	3697510912	100.00	100.00	26416	43494	100.00	7675	100.00	20574	33861	100.00	5285	100.00	0.804

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