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The World Distribution of Household Wealth

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1. Introduction

Research on economic inequality – both within countries and between countries – is usually framed in terms of differences in income or consumption. In recent years a number of studies have extended this line of work to the global stage, by attempting to estimate the world distribution of income: see, for example Bourguignon and Morrison (2002), and Milanovic (2002, 2005). The findings document the very high disparity of living standards amongst the world’s citizens, but indicate that the rising inequality seen within many countries in recent decades has not led to a clear upward trend in global income inequality. The lack of trend is due to the rapid increase of incomes in certain developing countries, of which China is by far the most important.

Alongside this work there has been growing recognition of the importance of other contributions to individual well-being, most especially health status, but also education, environment, personal security, and vulnerability to natural disasters. This paper focuses on another dimension of human well-being — household wealth — by which we mean net worth or, more precisely, the value of physical and financial assets less liabilities.¹

Household wealth is important for a number of reasons. First, it provides a means of raising long term consumption, either directly by dissaving, or indirectly via the income stream of investment returns to assets. Second, by enabling consumption smoothing, ownership of wealth helps to insulate households against adverse events, especially those that lead to a reduction in income, such as ill health, unemployment, or simply growing old. Thirdly, household wealth provides a source of finance for informal sector and entrepreneurial activities, either directly or by use as collateral for business loans. These motives are less compelling in countries that have good state pension arrangements, adequate social safety nets and well developed source of business finance. By the same token, private wealth has more significance in countries which lack these facilities, which is the case in much of the developing world. Thus, as our results will make evident, household wealth tends to be lower in precisely those countries where it is needed most.

Despite these reasons for interest in wealth, and other evidence that asset holdings have a disproportionate impact on household wellbeing and economic success, and more broadly on economic development and growth, data limitations have severely handicapped research on the topic. However, the situation has rapidly improved in recent years. Many OECD countries

¹ No attempt is made to include the present value of public pension schemes, because estimates are available for very few countries.

now have wealth data derived from household surveys, tax records or national balance sheets. Household wealth surveys have also been conducted in the two largest developing countries, China and India, and one survey with wealth results is available for Indonesia. Lists of the holdings of the super rich are reported at regular intervals by Forbes magazine and other media outlets. Other sources add insights into the level and spread of personal wealth. We therefore believe that there is sufficient data to support preliminary estimates of the distribution of household wealth across the world, which we attempt to do for the year 2000.

The remainder of the paper is organized as follows. The next section summarises the sources and methods used in our study. (These are described in more detail in Davies et al., 2007.) Section 3 discusses results for the estimated world distribution of wealth. Likely future trends in wealth-holding and wealth distribution are discussed in Section 4. Conclusions are drawn in Section 5.

2. Sources and methods

Wealth Levels

The estimation of wealth levels is based on the information that can be assembled from household balance sheets and sample surveys. Household balance sheets are often compiled in conjunction with the National Accounts or Flow of Funds data while sample surveys derive from household interviews. Available household balance sheet information enables us to construct ‘complete’ financial and non-financial data for 19 countries and financial data for 15 countries, where ‘complete’ is interpreted as full or almost full coverage of financial assets, and inclusion of at least owner-occupied housing on the non-financial side.

The country coverage of household balance sheets is not representative for the world as a whole.² While Europe and North America, and the OECD in general, are well covered, low and middle income countries are under-represented. In geographic terms this means that coverage is sparse in Africa, Asia, Latin America and the Caribbean. Fortunately for this study, these gaps were offset to an important extent by the availability of survey evidence for the largest developing countries, China, India and Indonesia.

² See Appendix in Davies et al (2007)

Altogether we made use of full or partial data on wealth levels for 38 countries. These countries accounted for 56 per cent of world population in the year 2000 and, we estimate, more than 80 per cent of global household wealth. Regressions run on these 38 countries allowed wealth levels to be estimated for other countries. The best predictions were achieved when separate regressions were run on three subcomponents of wealth: non-financial assets, financial assets and liabilities. (See Appendix Table A1.) Each of the regressions uses real consumption per capita as one of the explanatory variables.³ Population density also appears in the regression equation for non-financial assets, market capitalization ratio (a measure of the size of the stock market) in the equation for financial assets, and private sector domestic credits in the equation for liabilities. To control for the mixture of HBS and survey data sources, a survey dummy was included, although this was only significant for financial assets, reflecting the well-known fact that financial assets are under-reported in survey data.

In the year 2000, the world comprised 229 countries. The regressions yielded 150 countries with observed or estimated average wealth, covering 95 per cent of world population. The remaining 79 countries are mostly small or insignificant in wealth terms. Omitting these countries implicitly suggests that they are representative of the world as a whole, which is patently untrue. We therefore assigned each country the average per capita wealth of the corresponding continental region (6 categories) and income class (4 categories), an admittedly crude procedure, but one that is preferable to the alternative default option.

Shape of Wealth Distributions

A complete picture of wealth holdings within a country requires information on the shape of the distribution as well as the average level. A total of 20 countries have reasonably reliable estimates of wealth distribution at the national level. These are listed in Table 1 along with the quantile share data assembled for them. The list includes the largest rich countries and the largest poor countries — the United States, Japan, Germany, Britain, France and Italy on one hand, and China, India and Indonesia on the other. Scandinavia and the smaller English-speaking countries (Australia, Canada, and New Zealand) are also well represented. Inclusion of both the large rich countries of the West on the one hand, and China and India on the other, may be quite significant. Milanovic (2005) demonstrates that this relatively small number of countries is responsible for most of the recent changes in world income inequality.⁴ It seems

³ Real consumption per capita was used because consumption figures are available for about twice as many countries as income data, and hence allow imputations to be made for many more countries..

⁴ See Milanovic (2005), p. 115.

likely that these key countries are also crucial for understanding and appreciating the global distribution of wealth.

One set of distributional figures was selected for each country, with a preference for the year 2000, *ceteris paribus*. The data differ in many important respects across countries and have many well known deficiencies. For 15 of the 20 countries, the data originate from household surveys which tend to underestimate the share of the top wealth groups due to lower response rates and under-reporting of asset values, particularly financial assets.⁵ Tax records are the source of wealth distribution data for the remaining five countries: estate tax returns in the case of France and the UK; wealth tax records for Denmark, Norway, Switzerland and Sweden. Although these sources have the advantage that ‘response’ is involuntary and under-reporting is illegal, under-reporting may still occur and other valuation problems affect both the accuracy of the figures and the degree of comparability across countries.

Table 1 shows that the wealth distribution data most often refers to households or families, but can also refer to individuals or adults. The distributional information usually include the decile wealth shares, plus the share of the top 5 per cent and the top 1 per cent of wealth holders. But there are many gaps in the coverage. The share of the top 10 per cent is reported for all 20 countries, and ranges from 39.3 per cent in Japan to 71.3 per cent in Switzerland.⁶ The very high level of wealth concentration is even more evident in the share of the top 1 per cent. Amongst the 11 countries reporting that statistic (a group that excludes China, Germany, and the Nordic countries apart from Denmark), the share of the top 1 per cent ranges from 10.4 per cent in Ireland to 34.8 per cent in Switzerland.⁷

To proceed towards an estimate of the world distribution of wealth, a utility program developed at UNU-WIDER was used to create a synthetic, equal weighted sample of 1000 observations corresponding to each of the 20 distributions recorded in Table 1. This

⁵ Oversampling of high income/wealth groups, as is done in Canada, Finland, Spain, and the United States can mitigate the differential response rates. Undervaluation of assets can also be addressed in principle by scaling up the reported figures.

⁶ The Danish figure of 76.4 per cent is higher still, but probably unreliable given the large negative asset holdings reported for half the Danish population.

⁷ The sampling frame for the US 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, 2003, p. 3. Other differences in data sources and units of analysis mean that cross country variations should be interpreted with considerable caution. For example, the relatively low shares of top wealth groups in Australia, Ireland, and Japan are probably due in part to the fact that the surveys in these countries do not compensate for differential response by oversampling the upper tail, and we believe are consequently likely to underestimate the share of the top 1 per cent by about 5–10 percentage points.

‘ungrouping’ program can be applied to any set of quantile shares (in the form of Lorenz values) derived from a distribution of positive values (e.g. incomes). It begins by generating a sample of 1000 observations which roughly matches the reported distribution, then adjusts the values until the sample properties exactly match the target characteristics.⁸ To apply this program to the distributions in Table 1, the non positive values were discarded, thus treating these cells as missing observations.

Estimating the shape of the wealth distribution for the countries not listed in Table 1 requires more heroic assumptions. We took the view that income inequality is likely to be highly correlated with wealth inequality across countries, and hence drew on income distribution data for 144 countries contained in the World Income Inequality Database (WIID).⁹ Comparison of the Lorenz curves for wealth and income distributions for the 20 reference countries in Table 1 reveals that the cumulative wealth shares are always lower than the corresponding income shares, and suggests that the ratio of the Lorenz ordinates for wealth and income is reasonably stable across countries. Consequently, the average ratio for the 20 reference countries was applied to the other 124 countries in order to estimate the (unknown) wealth distribution data from the available income distribution information. Wealth distribution figures for the remaining countries (which collectively account for less than 4 per cent of the world population) were again imputed using the average values for the corresponding region and income class.

Computing the world distribution

The final step in the construction of the world distribution of wealth combines information on the level and shape of wealth holdings. For each country, the ungrouping utility program generated a sample of 1000 observations consistent with the actual, estimated or imputed wealth distribution. These observations were then scaled to match the mean wealth, and weighted by the population size. Merging the countries into a single dataset produced a weighted sample of more than 200,000 observations¹⁰ from which the minimum wealth and

⁸ See Shorrocks and Wan (2007) for further details.

⁹ The 144 countries covered by WIID are not a subset of the 150 nations for which mean wealth was obtained (from actual data or via the regressions) in Section 2. In particular, populous countries are more likely to report income distribution data, so the list of 144 now includes Cuba, Iraq, Myanmar, Nepal, Serbia, Sudan and Uzbekistan.

¹⁰ There are 229 countries in all, but some small countries with identical imputed wealth levels and distributions were merged at this stage.

the share of each percentile in the global distribution of wealth was estimated, along with the membership of each wealth percentile by country of residence.

Two additional issues must be confronted before the global wealth distribution figures can be interpreted. First, what is the relevant population to which the figures refer: all households in the world, all individuals, or all adults? Studies of global income inequality typically assume that the benefits of household expenditure are shared equally among household members and that each person counts equally in determining overall inequality. Household assets like housing also provide communal benefits, but ownership and control of household assets does not usually extend to non-adult members, nor are the proceeds shared equally in the event that the assets are sold. We therefore took the view that it is best to disregard ownership of wealth by minors (specifically, those aged below 20 years) and to interpret the wealth distribution figures in terms of the distribution across adults.¹¹

The second question concerns the appropriate conversion rate for currencies in different countries. Studies of the global distribution of income or consumption usually use PPP (purchasing power parity) exchange rates to compensate for price variations across countries. Here, we focus on global wealth estimates based on official exchange rates on the grounds that wealth is heavily concentrated in the hands of the rich, whose expenditure for both consumption and investment purposes will often be at world prices rather than at the prices prevailing in their home country.¹²

¹¹ Although the three options considered here — households, individuals and adults — are all present in the data reported in Table 1, most country data refers to households. The relationship between the distribution of wealth across households and the pattern among adults is not known. However the two distributions are identical if all households contain two adults, if children have zero wealth, and if wealth is equally divided between the adult members.

¹² Some alternative estimates using PPP rates are discussed in Section 3 below. Further details are reported in Davies et al (2007).

3. The Global Distribution of Wealth

Wealth Inequality

Table 2 summarises our results on the distribution of household wealth across the world population of 3.7 billion adults, based on official exchange rates and figures for the year 2000. According to our estimates, adults required just \$2129 in order to be among the wealthiest half of the world. But more than \$61,000 was needed to belong to the top 10 per cent and more than \$510,000 per adult was required for membership of the top 1 per cent. The entrance fee for the top 1 per cent seems surprisingly high, given that the group has 37 million adult members. Furthermore, the figure refers to the year 2000 and is now likely to be considerably higher, especially when measured in US dollars.

The wealth share estimates reveal that the richest 2 per cent of adult individuals own more than half of all global wealth, with the richest 1 per cent alone accounting for 40 per cent of global assets. The corresponding figures for the top 5 per cent and the top 10 per cent are 71 per cent and 85 per cent, respectively. In contrast, the bottom half of wealth holders together hold barely 1 per cent of global wealth. Members of the top decile are almost 400 times richer, on average, than the bottom 50 per cent, and members of the top percentile are almost 2000 times richer.

Additional information on wealth inequality is provided in Table 3 which reports the value of the Gini coefficient for the world as well as the values for individual countries. As mentioned earlier, in all countries which have the requisite data, wealth distribution is more unequal than income. The final column of Table 3 records wealth Gini estimates ranging from 0.547 for Japan to 0.801 for the USA and 0.803 for Switzerland. The global wealth Gini is estimated to be even greater at 0.893. This is equivalent to the Gini value that would be registered for a 100-person population in which one person receives \$900 and the remaining 99 people each receive \$1.

By way of comparison, Milanovic (2005, p. 108) estimates the Gini for the world distribution of income to be 0.795 in 1998 using official exchange rates. Note that, while wealth inequality exceeds income inequality in global terms, the gap between the Gini coefficients for world wealth and income inequality — about 10 percentage points — is less than the gap at the country level, which averages about 30 percentage points. This is to be expected given the limited possibilities for higher Gini values arising from an income Gini of 0.795 and a Gini upper bound of 1. It is also worth pointing out that the relative insensitivity of the Gini coefficient to the tails of the distribution implies that our likely slight underestimation of the

top wealth shares will have little impact on the estimated Gini. Furthermore, concentration in the upper tail of the income distribution is also probably underestimated (although to a lesser extent than for wealth), so that the estimated *gap* between wealth and income inequality is unlikely to be heavily biased.

Geographic Distribution of Wealth

The world map in Figure 1 shows the per capita wealth of different countries. Western Europe, North America¹³, and rich Asian-Pacific nations (principally Japan, South Korea, Taiwan, Australia and New Zealand) stand out as the richest areas, with per capita wealth exceeding \$50,000 in the year 2000. Next come some prosperous developing and transition countries — for example Mexico, Chile, Argentina, Poland, the Czech Republic and the Ukraine — in the \$10,000 to \$50,000 band. The large transition countries, Russia and China, fall in the \$2,000 to \$10,000 range along with Turkey, Brazil, Egypt, Thailand, and South Africa. Finally, in the category below \$2,000 are found India, Pakistan, Indonesia, and most of Central and West Africa.

Regional wealth shares are interesting (see the last column of Table 2). North America owns about a third (34 per cent) of the world's wealth. Europe has a fraction less (30 per cent) and Rich Asia-Pacific is close behind at 24 per cent. The rest of the world shares the remaining 12 per cent. Figure 2 shows how these wealth shares compare to population shares. North America has the largest excess of wealth over its "fair share" according to population, which is a mere 5 per cent. Europe has more than double the population of Northern America, so that its large wealth share is more aligned with its population. The case of rich Asia-Pacific is intermediate between Europe and North America.

Figure 3 compares the asset composition of wealth across a selection of countries. In the USA, according to our estimates, 42 per cent of gross household assets are in financial form. Among the countries for which we have data, this high ratio is approached only by the UK. As illustrated, Japan, Canada and Germany have a considerably lower share of financial assets — averaging just 28 per cent. Interestingly, estimated financial assets are 22 per cent of the total in China, but just 5 per cent and 3 per cent in India and Indonesia respectively. Like Japan and several other East Asian countries before it, China has been experiencing a period of explosive growth and very high saving rates which has produced a strikingly different wealth composition than that found in low income developing countries. Household assets in

¹³ For our purposes "North America" includes only Canada and the United States. Mexico and the Central American countries are included in Latin America.

the latter are heavily weighted towards land, livestock, and other agricultural assets. Financial development also lags, with the result that non-financial assets dominate the balance sheet.

Figure 3 also suggests that debt is higher in the developed world, at least according to official data. However, it is possible that debts are especially under-reported in LDC sample surveys. Subramanian and Jayaraj (2006), for example, estimate that the true indebtedness of Indian households is about three times greater than that reported in the survey data. If so, total debt in India would be about 10 per cent of gross assets, similar to the level reported in the USA and Japan.

Turning now to the membership of the wealth quantiles, Figure 4 charts the regional composition of the various global deciles. The corresponding numerical data is recorded in Table 2. ‘Thirds’ feature prominently in describing the overall pattern of results. India dominates the bottom third of the global wealth distribution, contributing a little under a third (27 per cent to be precise) of the bottom three deciles. The middle third of the distribution is the domain of China which supplies more than a third of those in deciles 4-8. North America, Europe and Rich Asia-Pacific monopolise the top decile, each regional group accounting for around one third of the richest wealth holders, although the composition changes a little in the upper tail, with the North American share rising while European membership declines. Another notable feature is the relatively constant membership share of Asian countries other than China and India. However, as the figures indicate, this group is highly polarised, with the high-income subgroup populating the top end of the global wealth distribution and the lower income countries (especially, Indonesia, Bangladesh, Pakistan and Vietnam) occupying the lower tail. The population of Latin America is also fairly even spread across the global distribution but Africa, as expected, is heavily concentrated at the bottom end.

Table 3 provides more details for a selection of countries. The list of countries includes all those which account for more than 1 per cent of global wealth or more than 1 per cent of those in the top decile, plus those additional countries with adult populations exceeding 45 million. They have been arranged in order of the number of persons in the top global wealth decile.

The number of members of the top decile depends on three factors: the size of the population, average wealth, and wealth inequality within the country. Unsurprisingly, the US appears in first position, with 25 per cent of the global top decile (see Figure 5) and 37 per cent of the global top percentile. All three factors reinforce each other in this instance: a large population combining with very high wealth per capita and relatively unequal distribution. Japan features strongly in second place — more strongly than anticipated, perhaps — with 21 per cent of the global top decile and 27 per cent of the global top percentile. The high wealth per adult and

relatively equal distribution accounts for the fact that the number of Japanese in the bottom half of the global wealth distribution is insignificant according to our figures. Italy, too, has a stronger showing than expected, for much the same reasons as Japan.

Further down the list, China and India both owe their position to the size of their population. Neither country has enough people in the global top 5 per cent in 2000 to be recorded in Table 3. While the two countries are expected to be under-represented in the upper tail because of their relatively low mean wealth, their absence here from the top 5 per cent seems anomalous. It may well reflect unreliable wealth data drawn from surveys that do not over-sample the upper tail, data which could be improved by making corrections for differential response and under-reporting.¹⁴ The representation of both China and India has been rising in the annual Forbes list of billionaires, so it is likely that more recent estimates of the membership of the top 5 per cent or top 1 per cent would not only record greater representation from these two countries, but also register an increasing trend over time.¹⁵

Adjusting for local prices

As discussed earlier, it is natural to using official exchange rates to compare the wealth of the world's super rich in different countries. Lower down the scale, however, the benefits (and valuations) of asset holdings may depend heavily on the local prices of goods and services, so it may be more appropriate to evaluate wealth in terms of what it would buy if liquidated and spent on consumption locally. To address this point, alternative estimates of the world distribution of wealth have been constructed on a PPP basis.¹⁶

¹⁴ The estimated membership figures for large countries may be especially unreliable, given that our procedures condense the population of each country into a sample of 1000, so a single sample point for China or India represents more than half a million adults.

¹⁵ Ten years ago the Forbes list contained no billionaires from China. In 2007 there were 16. As late as 2004, only 9 billionaires were reported in India. This number had risen to 36 by 2007.

¹⁶ More detailed results are discussed in Davies et al, 2007.) We use the PPP exchange rates from the Penn World Tables, which are based on the Geary-Khamis method. 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 methods, for example the "EKS" method used by the World Bank. (See e.g. United Nations, 2007.) It could therefore be argued that our PPP results may underestimate the true degree of world wealth inequality. Fortunately, it is found that all the alternative PPP methods "produce results much closer to one another than to the nominal results obtained by converting by exchange rates" (United Nations, 2007, para. 232), so the sensitivity of our results to the particular choice of PPP method may not be too great.

Applying the PPP adjustment increases average wealth in most countries, and hence the global average, which rises from \$33,793 per adult to \$43,326 per adult. The admission fee for membership of the top wealth groups also increases. The price for entry to the top 10 per cent rises from \$61,288 to \$87,589, but entry to the top 1 per cent increases more modestly, from \$511,143 to \$516,365, reflecting the small impact of PPP adjustments within the richest nations.

Because the PPP adjustment tends to be greater for poorer countries, switching to PPP valuations compresses the variation in average wealth levels across countries and hence provides a more conservative assessment of the degree of world wealth inequality. For example, the estimated wealth share of the richest individuals falls, from 85.2 per cent to 71.2 per cent for the top 10 per cent of wealth holders, and from 40.2 per cent to 31.9 per cent for the top 1 per cent. The global Gini value also declines, from 0.893 to 0.804 (although the Gini coefficients for individual countries are unaffected).

The overall picture suggested by the PPP results is much the same as the pattern observed earlier with official exchange rates. India moves a little more into the middle deciles of the global wealth distribution, and both India and China are now recorded in the global top 5 per cent, although not in the top 1 per cent. Membership of the top 10 per cent is a little more evenly spread regionally, principally due to a decline in the share of Japan, whose membership of the top 10 per cent falls from 21 per cent to 14 per cent as a result of the decline in Japan's wealth per adult from \$227,600 to \$157,146 when measured in PPP terms.

As regards the rankings of individual countries, Brazil, India, Russia, Turkey and Argentina are all promoted to the exclusive group of countries with more than 1 per cent of the members of the global top wealth decile. The most dramatic rise, however, is that of China which leapfrogs into sixth position with 4.3 per cent of the members. Even without an increase in wealth inequality, a relatively modest rise in average wealth in China in future years will move it up to third position in the global top decile (measured in PPP dollars), and overtaking Japan is not a remote prospect.

In summary, it is clear that household wealth is much more concentrated, both in size distribution and geography, when official exchange rates rather than PPP valuations are employed. Thus a somewhat different perspective emerges depending on whether one is interested in the power that wealth conveys in terms of local consumption options or the power to act and have influence on the world financial stage.

Reliability of Results

It was noted earlier that the countries for which wealth data are available include those most crucial to the overall world picture — the richest and poorest large nations. Nevertheless, we have had to rely on various estimation and imputation techniques in order to fill the many gaps in data coverage. So it is important to try to assess the robustness of our results to the assumptions and imputations made during the course of the study.

For a large number of (mainly small) countries, missing observations on wealth level or distributional shape were imputed using the average value of the corresponding region and income class. As reported in Davies et al (2007), omitting these countries has little effect on the global figures for wealth levels or inequality. Going further and restricting attention to the 20 countries for which direct data exist on both wealth levels and distributional shape leads to a modest reduction in the Gini coefficient from .893 to .887, again suggesting that the results are robust. Focussing on the same 20 countries, the use of income inequality as a proxy for wealth inequality was investigated by replacing the ‘true’ wealth distribution figures with the income distribution derived estimate obtained as for other countries. This reduces the share of the top 1 per cent from 37.4 per cent to 32.8 per cent, and the global Gini value from 0.887 to 0.879, which suggests that the income inequality proxy may lead to an underestimate of global wealth inequality, although the overall impact may be modest given that the countries involved hold less than 20 per cent of global wealth.

Another way of checking our results is to consider countries which have some information on wealth inequality, although not complete data. Our imputed wealth distributions appear consistent with that partial information, adding to our confidence in the results. For example, Rogg (2007) reports a Gini coefficient of 0.59 for rural Ethiopia (which has 84 per cent of the country’s population according to the WDI) in 1997, a moderate figure that does not conflict with our imputed figure of .652 for Ethiopia as a whole.¹⁷ Pinto (2006) estimates the distribution of wealth in Campinas, Brazil, a city with a population of about a million people using the estate-multiplier method. He obtains a Gini coefficient of 0.920 for 1996, which suggests that our figure of 0.783 for the country as a whole is not extreme.¹⁸ Torche and

¹⁷ Per capita wealth is significantly higher in urban than in rural areas in developing countries. Even if inequality in urban areas was no greater than in rural areas, one would therefore expect the national wealth Gini to exceed that for rural areas.

¹⁸ Interestingly, Noyola (2000) obtains a much lower Gini coefficient for wealth in the city of Monterrey, Mexico in 1998 - - just 0.54. (This compares to our figure of 0.749 for Mexico as a whole.) Noyola’s estimate is based, however, on a sample survey of about 1,000 families that did not over-sample the upper tail. The difference between the Pinto and Noyola results illustrates the importance of getting information on the truly rich for obtaining an accurate picture of overall wealth distribution.

Spilerman (2006) report a Gini for land-holding of 0.85 for Brazil — slightly above the median figure of 0.84 for 15 Latin American countries and well above the US figure of 0.72. Our estimates show above-average wealth inequality for Latin America, consistent with this evidence on land inequality and with data on the distribution of some other important wealth components.¹⁹

Other considerations also lead us to believe that our estimates of the top wealth shares are conservative. The survey data on which most of our estimates are based underrepresent the rich and do not reflect the holdings of the super-rich. Although the SCF survey in the USA does an excellent job in the upper tail, its sampling frame explicitly omits the ‘Forbes 400’ families. Surveys in other countries do not formally exclude the very rich, but it is rare for them to be captured. This means that our estimated shares of the top 1 per cent and 10 per cent are likely to err on the low side. A rough idea of the possible size of the error can be gained by noting that the total wealth of the world’s billionaires reported by Forbes for the year 2000, \$2.16 trillion, was 1.7 per cent of our estimate of \$125.3 trillion for total world household wealth.

The top tail of wealth distributions is often well approximated by the Pareto distribution which plots the logarithm of the number of persons above wealth level w against the logarithm of w . The outcome, depicted in Figure 6, shows a remarkable correspondence in the range from \$250,000 to \$5 million. Above \$5 million the relationship breaks down, as expected given the limitations of the data sources and the lumpiness caused by using a single sample observation to represent many tens of thousands of adults. However, it seems reasonable to use a fitted Pareto curve to estimate the number of individuals in the highest echelons of the wealth distribution. This leads us to predict that more than 16000 adults owned at least 100 million dollars in the year 2000, and that 558 persons were dollar billionaires (see Table 4). The latter figure is very close to the Forbes estimate of 492 billionaires for the year 2000. Furthermore, Forbes magazine classifies 41 per cent of the billionaires as US citizens, a proportion consistent with the figures in Table 3 which record a US share of 37 per cent of the top 1 per cent, and suggests that the share is higher at higher wealth ranges.

¹⁹ Torche and Spilerman (2006) report the Gini for housing wealth for nine Latin American countries. The range is from 0.56 in Uruguay to 0.85 in Bolivia. (In these data non-owners are included in the calculation of the Gini, with zero wealth. In contrast, the Gini for landholding mentioned in our text above is just for landowners.) Torche and Spilerman also compare data on the quintile shares for various forms of capital income. For income from capital, rents and profits in 16 countries they indicate a share of the top quintile ranging from 64 per cent in the Dominican Republic to 96 per cent in Guatemala. The median is 80 per cent.

This degree of similarity may be a little misleading, since the Forbes list tends to refer to billionaire *families* rather than *individuals*. Nevertheless, our projections for the number of super rich adults add to our confidence that our global wealth distribution estimates are plausible.

4. Trends over Time

This is the first comprehensive study of the world distribution of household wealth ever undertaken. Since our estimates are a snapshot for a single year, no time series exist on global wealth inequality. However, estimates of wealth inequality over time are available for several individual countries, and some comments can be made concerning changes over time in the size of international differences in wealth levels. It is interesting to look at the trends displayed by these pieces of the puzzle, although hazardous to draw conclusions about the trend in global wealth inequality on the basis of the limited evidence.

Long time series of wealth inequality estimates are available for Denmark, France, Norway, Sweden, Switzerland, the US and the UK (see Ohlsson et al., 2006). From the early years of the 20th century up to the mid 1970s wealth inequality declined dramatically in all of these countries with the exception of Switzerland. This parallels the decline of income inequality observed over the same period. In contrast, wealth and income inequality have behaved somewhat differently during the last three decades wealth inequality in developed countries. Increases in income inequality have been strong in the US and UK, and have been observed in most OECD countries over this period. While the wealth share of the top 1% also increased in most countries during this period (Ohlsson et al., 2006, pp. 23-24), the increase in wealth inequality appears to have been generally weaker than that of income inequality. For example, in the US while there was a mild increase in wealth concentration between the mid 1970s and the mid 1980s, and a further increase in the late 1990s, inequality then fell and the share of the top 1 per cent in 2001, at 33.4 per cent according to the Survey of Consumer Finance, did not differ much from the share of 33.8 per cent in 1983.

One part of the explanation for the weaker increase of wealth inequality than of income inequality at the country level is suggested by the findings of Piketty and Saez (2003) who show that the rise in top income shares in the US in recent decades is due mostly to increased earnings dispersion rather than to increased capital income at the top end. In other words, increased executive compensation and the like, rather than higher returns to rentiers, is driving higher income inequality among the rich and super rich. This is consistent with the observation of flat or slowly rising wealth inequality during a time of strongly increasing

income inequality. A further element in the explanation likely lies in the large increases in house prices in the UK, US and a number of other countries in the last 10 – 15 years. Housing is a “popular” asset. It is relatively more important for the middle class than for the poor or the rich. Thus, increases in house prices tend to reduce top wealth shares and other measures of wealth inequality, thus opposing the trend towards higher wealth inequality coming from such sources as higher share prices.

There is also some evidence on between-country trends for the seven major OECD economies: Canada, France, Germany, Italy, Japan, the UK, and the US. In 1994 the ratio of wealth to disposable income ranged from 4.72 for Canada to 7.47 for Japan. From 1994 to 1997 the unweighted dispersion fell for these countries, as the wealth-income ratio declined somewhat for Japan but rose for the other countries. After 1997 though, dispersion rose due to strong increases in wealth in France, Italy, and the UK, mostly associated with rising real estate prices. As a result, this group of countries showed about the same dispersion in the wealth-income ratio in 2004 as they did in 1994.²⁰

Among developing countries, only China and India offer the prospect of comparisons over time. There is no apparent upward or downward trend in wealth inequality in India, where results from a large asset and debt survey are available at decennial intervals since 1981-82. (See Subramanian and Jayaraj, 2006.) On the other hand, wealth inequality has been rising at a strong pace in China, paralleling the rise of income inequality in that country. Between 1995 and 2002 the wealth Gini rose from 0.40 to 0.55 according to survey evidence. As noted earlier, the number of Chinese billionaires on the Forbes list has also been rising significantly in the last few years. The disequalizing effect on world wealth distribution is offset, however, by the rise in mean wealth in China, which reduces between-country wealth inequality. Hence the net impact of wealth trends in China on global wealth inequality is unclear.

Russia and the European transition countries also provide evidence of the link between rising wealth inequality and the shift from limited personal property under socialism to a market system (see Guriev and Rachinsky, 2006, and Yemtsov, 2006). However, the increase in wealth inequality in Central and Eastern Europe has been much less extreme than in Russia. Since the former countries have, on average, been experiencing reasonable economic growth in recent years, their mean wealth, which started from a low level, may have been rising fast enough to offset much of the impact of their higher wealth dispersion on global inequality. This cancellation has almost certainly not taken place for Russia, however, since its increase

²⁰ The unweighted coefficient of variation in 2004 was 0.207, compared with .203 in 1994.

in wealth inequality has been extreme (see Guriev and Rachinsky, 2006) and its growth performance has been relatively poor.

While it is difficult to predict future trends in global wealth inequality, a few observations may be offered. First, as in the past, growth in GDP is likely to remain a major determinant of both the overall level of global wealth and the distribution across regions and countries. However, growth in wealth levels may not exactly match income growth rates. Aggregate wealth levels depend heavily on asset prices, especially real estate and equity values, and are also sensitive to institutional changes affecting property rights, such as moves towards privatisation and property registration schemes. On the whole, it seems likely that wealth will grow faster than income in the medium and long run.

A second important factor concerns changes in exchange rates. Exchange rate movements have little impact on global income inequality measured in PPP dollars, since the PPP currency conversions sterilise most of the change. But if estimates of global wealth distribution employ official exchange rates, for the reasons discussed earlier, the impact could be significant, especially on the rankings of individual countries. Our estimates for the year 2000 are already likely to be out of date given the subsequent relative decline in the US dollar. *Ceteris paribus*, figures for more recent years should reduce somewhat the dominance of the USA in the global wealth picture.

Whether wealth inequality will increase or subside in global terms also depends on wealth inequality trends in individual countries, on the level of wealth inequality in the faster growing countries, and on the population weight of the respective countries. Assembling these pieces of the puzzle suggests a crucial role for China during the next 20 years. Strong economic growth coupled with an expansion in private property opportunities provide the foundation for a significant rise in the average level of wealth which in global terms is reinforced by the population size, but constrained by the managed currency peg to the US dollar. As Figure 4 makes clear, China is poised to make big inroads into the echelons of top wealth holders. The relative equality of wealth holdings in China mean that even a modest rise in the average level of wealth relative to the rest of the world will promote many into the top global wealth decile, and, given time, into the top global percentile. Indeed, more up-to-date data may reveal that this movement has already begun in earnest.

Although India has a similar sized population, it is unlikely that Indian nationals will rapidly occupy many of the global top wealth slots for two reasons. First, the recent growth experience has not matched that of China. Secondly, wealth inequality is much greater, so there are significantly fewer wealth holders who can expect to be promoted into the global top

wealth decile. The contrast is captured by the thin right tail of India in Figure 4 compared with the fat pattern of China above the global median wealth.

Russia is another country whose super rich have made headlines in recent years. However, it is unlikely that many Russians will be in evidence among the wealth elite of the world in, say 20 years time, at least compared to Chinese. The much smaller (and shrinking) population and the higher concentration of wealth are the two principal factors limiting the expansion of Russian membership of the global top wealth decile.

5. Conclusions

This paper has provided a first estimate of the world distribution of household wealth. It is evident that the distribution is highly concentrated — in fact much more concentrated than the world distribution of income, or the distribution of wealth within all but a few of the world's countries. While the share of the top 10 per cent of wealth-holders within a country is typically about 50 per cent, and the median Gini value around 0.7, our figures for the year 2000 using official exchange rates suggest that for the world as a whole the share of the top 10 per cent was 85 per cent and the Gini equalled 0.893. By comparison, Milanovic (2005) estimates that the world income Gini was 0.795 in 1998. While wealth (and income) concentration is somewhat less when the estimates are done on a PPP basis, converting at official exchange rates is preferable for many purposes when studying wealth given the large share of wealth owned by people who can readily travel and invest globally.

Much of the data used in this study derive from household surveys. This is not a big problem for the US, which supplies 25 per cent of the world's top 10 per cent of wealth-holders: sophisticated techniques have been used by the Federal Reserve Board to ensure the reliability of its triennial Survey of Consumer Finance. Less striking, but still effective, steps have been adopted in some of the other wealthiest countries. While the super rich are not represented in these data, this does not significantly compromise measures of the overall degree of inequality. On the other hand, surveys in the major developing countries appear to have difficulties capturing the upper tail. Thus, while we have reasonable confidence in our estimates, a non-negligible error bound is attributable to the limitations of household surveys.

The quality of our results also depends on other sources of data and on the procedures employed to estimate wealth levels and wealth inequality at country level. Household sector financial balance sheet data exist for 38 countries, covering 56 per cent of the world's population and all the major OECD economies. Estimates of non-financial assets also exist

for 22 of these countries, and are often constructed in conjunction with Flow of Funds data or the National Accounts, suggesting a solid foundation of reliable numbers from financial institutions and government statistical agencies. This generates some confidence in the basic sources.

One of the most fascinating aspects of our results is the light they throw on the geographic distribution of world wealth and of the membership of the top wealth groups. About 34 per cent of the world's wealth was held in the US and Canada in the year 2000, 30 per cent was held in Europe, and 24 per cent was in the "rich Asia-Pacific" group of countries. Africa, Central and South America, China, India and other Asia-Pacific countries shared the remaining 12 per cent. The location of top wealth-holders is even more concentrated, with North America hosting 39 per cent of the top global 1 per cent of wealth-holders, and Europe and rich Asia-Pacific having 26 per cent and 32 per cent respectively. The high share of top wealth-holders in North America is particularly disproportionate, as this region contains just 6 per cent of the world population.

Looking lower down in the global wealth distribution, India supplies about one third of the bottom three deciles, while China contributes about a third of the people in the fourth to seventh deciles. Latin America is fairly evenly spread across all deciles, reflecting the fact that wealth inequality in the region mimics that in the world as a whole, according to our estimates. Africa and low-income Asia-Pacific are heavily present at the bottom. While North America and rich Asia-Pacific have little representation in the bottom deciles, this is not true for Europe which comprises about 8 per cent of the world's population in the bottom three deciles.

Information on the geographic distribution of wealth holders produces some straightforward but revealing observations about possible future global trends. For example, if the rapid growth observed in China and India continues it will likely have different consequences for the two countries' representation in different parts of the global distribution. With its large current representation in the middle wealth deciles, China is poised to contribute a greatly increased number of people to the top deciles if its mean wealth continues to rise quickly. On the other hand, India has a relatively small number of people in the middle deciles compared with China, so the consequence of continued growth may be that Indians supplant the Chinese as the largest group in the middle wealth range.

If current trends continue, the bottom deciles in the world wealth distribution may come to be increasingly dominated by Africa, Latin America, and low-income Asia-Pacific countries. While European transition countries are currently found among the bottom deciles, their

increasing integration into Europe and fast growth in recent years suggest the likelihood of an upward movement of large number of people from this region. The success of so many people in rapidly growing Asian countries is very positive in terms of global welfare, but continued low wealth in Africa, Latin America, and low-income Asian-Pacific countries is a real concern. From a global perspective, the level of wealth in these areas is relatively lower than income. This points to a serious problem, since these are precisely the countries where having sufficient household wealth is the most crucial, due to the shocks and uncertainty people experience, the lack of social safety nets, and the lack of opportunities to borrow or insure on reasonable terms. Hopefully, one consequence of our study will be to focus attention on developing and improving the institutions and policies needed in these regions to help ordinary people acquire adequate personal assets.

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Table 1: 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 unit				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 unit	-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	person											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						
Korea, South	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	
United Kingdom	2000	adult						5.0			25.0		44.0	56.0	44.0	31.0	23.0			
United States	2001	family					2.8						30.2	69.8	57.7		32.7			

Table 2. Global wealth distribution in 2000: regional details based on official exchange rates.

	percentage of adults in global wealth quantiles												Adult population (million)	Population Share (%)	Wealth per adult (US\$)	Wealth share (%)
	Decile1	Decile2	Decile3	Decile4	Decile5	Decile6	Decile7	Decile8	Decile9	Top10	Top5	Top1				
World wealth shares (%)	0.0	0.1	0.2	0.3	0.5	0.8	1.4	2.7	8.7	85.2	70.7	40.2				
Minimum wealth (US\$)	0.1	178	445	872	1380	2129	3456	6193	13876	61288	149886	511143				
Adult population proportions by region (%)																
North America	0.2	0.6	1.1	1.4	1.9	2.8	4.6	7.5	13.6	27.3	28.7	38.9	225.7	6.1	190653	34.4
Latin America and Caribbean	5.8	7.0	7.0	5.4	6.2	7.6	9.9	13.1	15	4.9	3.1	2.3	302.9	8.2	17939	4.3
Europe	9.4	8.4	9.3	7.8	8.2	9.8	12.9	17.1	29.8	36.3	35.8	25.9	550.6	14.9	67301	29.7
Africa	27.1	17.7	14.4	9.2	7.8	7.4	6.9	6.4	4.3	0.7	0.3	0.2	376.3	10.2	3425	1.0
China	6.4	14.6	15.5	36.9	40.8	39.2	35.1	29.8	9.3	0.2	0.0	0.0	842.1	22.8	3885	2.6
India	26.4	27	27.6	19.8	16.8	14.8	11.7	7.4	2.6	0.2	0.0	0.0	570.6	15.4	1989	0.9
Rich Asia-Pacific	0.0	0.1	0.3	0.3	0.6	0.9	1.9	4.1	13.2	28.2	31.1	32.2	183.3	5.0	164133	24.1
Other Asia-Pacific	24.8	24.7	24.8	19.2	17.7	17.6	17.1	14.6	12.1	2.3	1.1	0.5	646.1	17.5	5654	2.9
World	100	100	100	100	100	100	100	100	100	100	100	100	3697.5	100	33793	100

Table 3. Global wealth distribution in 2000: country details based on official exchange rates.

	percentage of adults in global wealth quantiles												Adult population (million)	Population Share (%)	Wealth per adult (US\$)	Wealth share (%)	Gini
	Decile1	Decile2	Decile3	Decile4	Decile5	Decile6	Decile7	Decile8	Decile9	Top10	Top5	Top1					
USA	0.2	0.5	0.9	1.2	1.6	2.5	4.2	7.2	11.8	24.8	26.7	37.3	202.9	5.5	201319	32.7	0.801
Japan						0.1	0.4	1.3	5.0	20.5	25.1	27.3	100.9	2.7	227600	18.4	0.547
Germany	1.1	0.6	1.0	0.4	0.4	0.2	1.0	1.7	3.6	7.6	9.7	3.5	64.8	1.8	109735	5.7	0.667
Italy						0.1	0.3	1.1	4.4	6.6	5.0	4.0	46.4	1.3	122250	4.5	0.609
UK			0.1	0.1	0.2	0.4	0.8	1.7	2.6	5.9	7.8	6.4	43.9	1.2	169617	6.0	0.697
France			0.1	0.1	0.2	0.4	0.8	1.8	4.4	4.2	4.1	5.2	44.4	1.2	114650	4.1	0.730
Spain				0.1	0.1	0.3	0.5	0.7	3.0	3.9	2.4	1.0	32.2	0.9	86958	2.2	0.570
Canada		0.1	0.2	0.2	0.4	0.3	0.3	0.3	1.8	2.5	2.0	1.6	22.8	0.6	95606	1.7	0.688
Taiwan						0.1	0.3	0.5	1.4	1.8	1.5	1.2	15.5	0.4	105613	1.3	0.655
Australia		0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.8	1.8	1.3	0.7	13.7	0.4	94712	1.0	0.622
Netherlands						0.1	0.1	0.3	1.0	1.7	1.7	1.4	12.0	0.3	144406	1.4	0.650
South Korea			0.1	0.1	0.3	0.4	0.7	1.5	4.2	1.7	0.6	0.4	33.2	0.9	41256	1.1	0.579
Brazil	2.2	2.8	2.4	1.9	2.3	2.8	3.4	4.5	4.5	1.4	0.8	0.6	104.2	2.8	14887	1.2	0.784
Mexico	0.4	0.8	1.2	0.8	1.0	1.2	1.9	2.7	4.0	1.3	0.9	0.6	56.1	1.5	25468	1.1	0.749
Argentina	0.1	0.3	0.3	0.4	0.3	0.5	0.6	1.0	1.9	0.9	0.6	0.5	23.3	0.6	38406	0.7	0.740
Switzerland							0.1	0.3	0.5	0.6	0.7	1.2	5.5	0.1	212394	0.9	0.803
Turkey	0.3	0.7	1.0	0.7	0.8	1.1	1.4	2.2	2.2	0.5	0.2	0.1	40.4	1.1	15252	0.5	0.718
China	6.4	14.6	15.5	36.9	40.8	39.2	35.1	29.8	9.3	0.2			842.1	22.8	3885	2.6	0.550
India	26.4	27.0	27.6	19.8	16.8	14.8	11.7	7.4	2.6	0.2			570.6	15.4	1989	0.9	0.669
Russia	4.1	3.5	3.5	3.1	3.1	3.7	3.8	2.8	1.3	0.1	0.1		107.5	2.9	3897	0.3	0.699
Indonesia	7.5	6.0	5.5	4.2	3.2	2.7	2.9	0.6	1.0	0.1	0.1		124.4	3.4	2421	0.2	0.764
Thailand	0.8	1.4	1.2	1.1	1.1	1.2	1.5	1.6	1.0	0.1			40.2	1.1	6307	0.2	0.710
Pakistan	2.8	2.8	3.3	2.4	2.4	2.2	1.0	0.9	0.5				68.0	1.8	2504	0.1	0.698
Viet Nam	2.3	2.0	2.0	1.5	1.3	1.2	0.9	0.5	0.2				44.0	1.2	1982	0.1	0.682
Bangladesh	2.5	2.8	3.0	2.2	2.3	2.2	1.7	1.0	0.4				66.5	1.8	2392	0.1	0.660
Nigeria	5.9	2.9	2.2	1.1	0.6	0.5	0.3	0.2	0.1				51.4	1.4	813	0.0	0.736
World	100	100	100	100	100	100	100	100	100	100	100	100	3697.5	100	33793	100	0.893

Table 3: Estimated global numbers of US\$ millionaires and billionaires, 2000, official exchange rate basis

Wealth (\$)	Number above
1 million	13 622 833
10 million	416 730
100 million	16 196
1 billion	558

Table A1: Regressions of Wealth Components

Independent variables	Dependent variables					
	Log of non-financial wealth		Log of financial wealth		Log of liabilities	
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
Constant	.030 (0.973)	.435 (.528)	-4.768*** (1.183)	-3.908*** (.868)	-8.716*** (1.136)	-8.704*** (.731)
Log real cons per capita	1.101*** (.090)	1.028*** (.053)	1.530*** (.135)	1.354*** (.126)	1.477*** (.207)	1.510*** (.114)
Log population density	.117** (.042)	.121*** (.041)				
Log market cap. rate			.231** (.105)	.390*** (.098)		
Log public pensions as % of GDP			-0.079 (.121)			
Log domestic credits available to private sector					.903*** (.230)	.830*** (.163)
Income Gini	-0.008 (.009)		.002 (.015)			
Survey dummy	.391 (.305)		-.908* (.514)	-.733* (.437)	-1.421 (.910)	
R ²	.9546	.9493				
"R ² "			.9537	.9499	.9356	.9331
RMSE	.324	.325	.380	.470	.581	.622
Sample Size	23	23	34	38	34	38

Note: The sample for the non-financial regressions consists of 18 countries with HBS data and 5 with survey data. The sample for the financial and liabilities regressions consist of 34 countries with HBS or financial balance sheet data and 4 with survey data. In the non-financial assets regression, Ordinary Least Squares are used. In the financial assets and liabilities regressions, the Seemingly Unrelated Regressions (SUR) estimation method is used.

Standard errors in parenthesis.

Significance levels: * - 10% level; ** - 5% level; *** - 1% level.

Figure 1

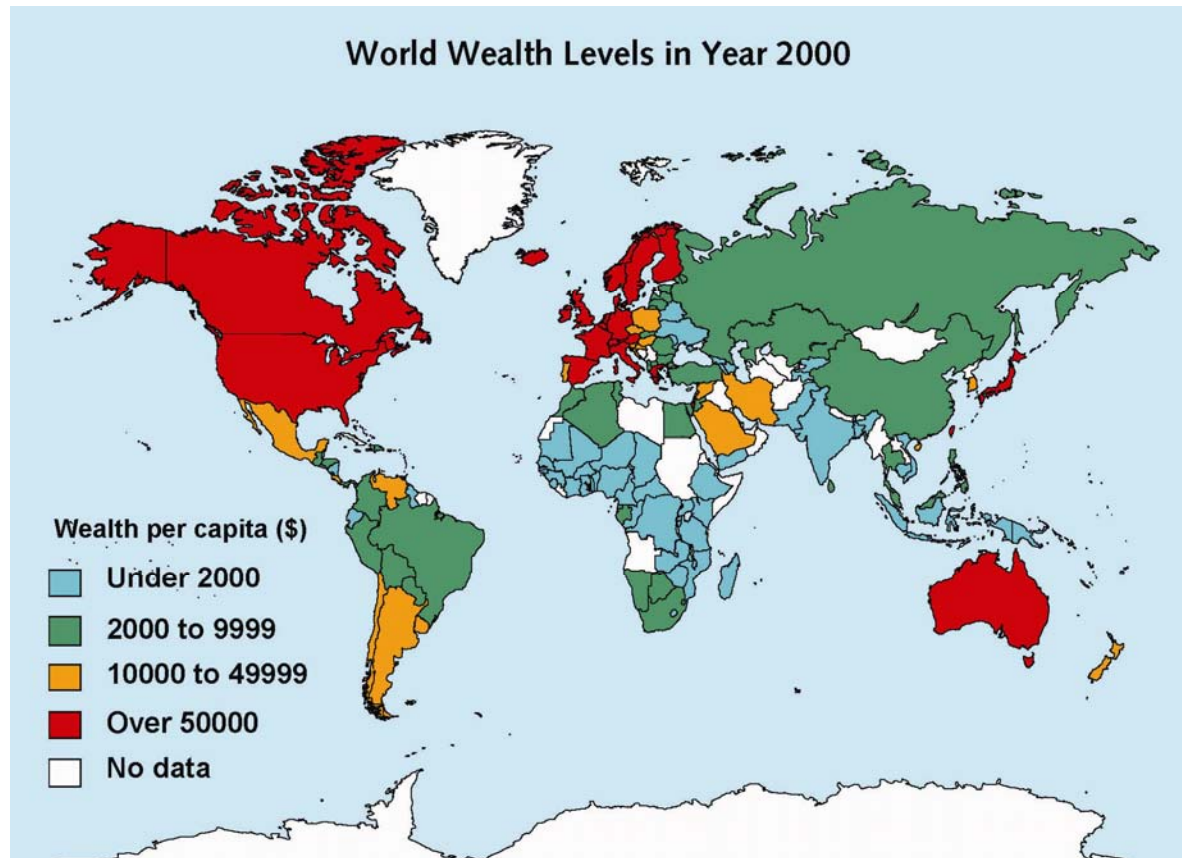


Figure 2

Population and Wealth Shares by Region

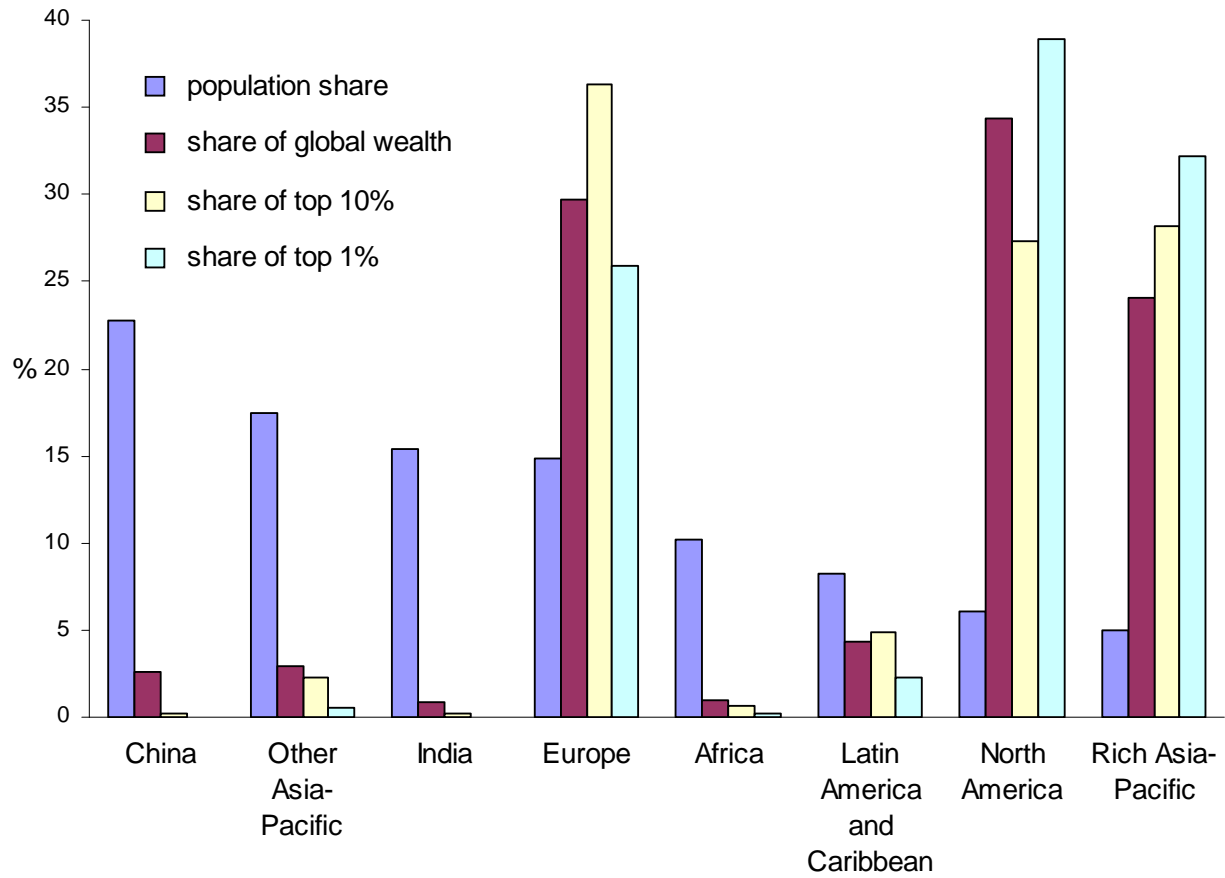


Figure 3

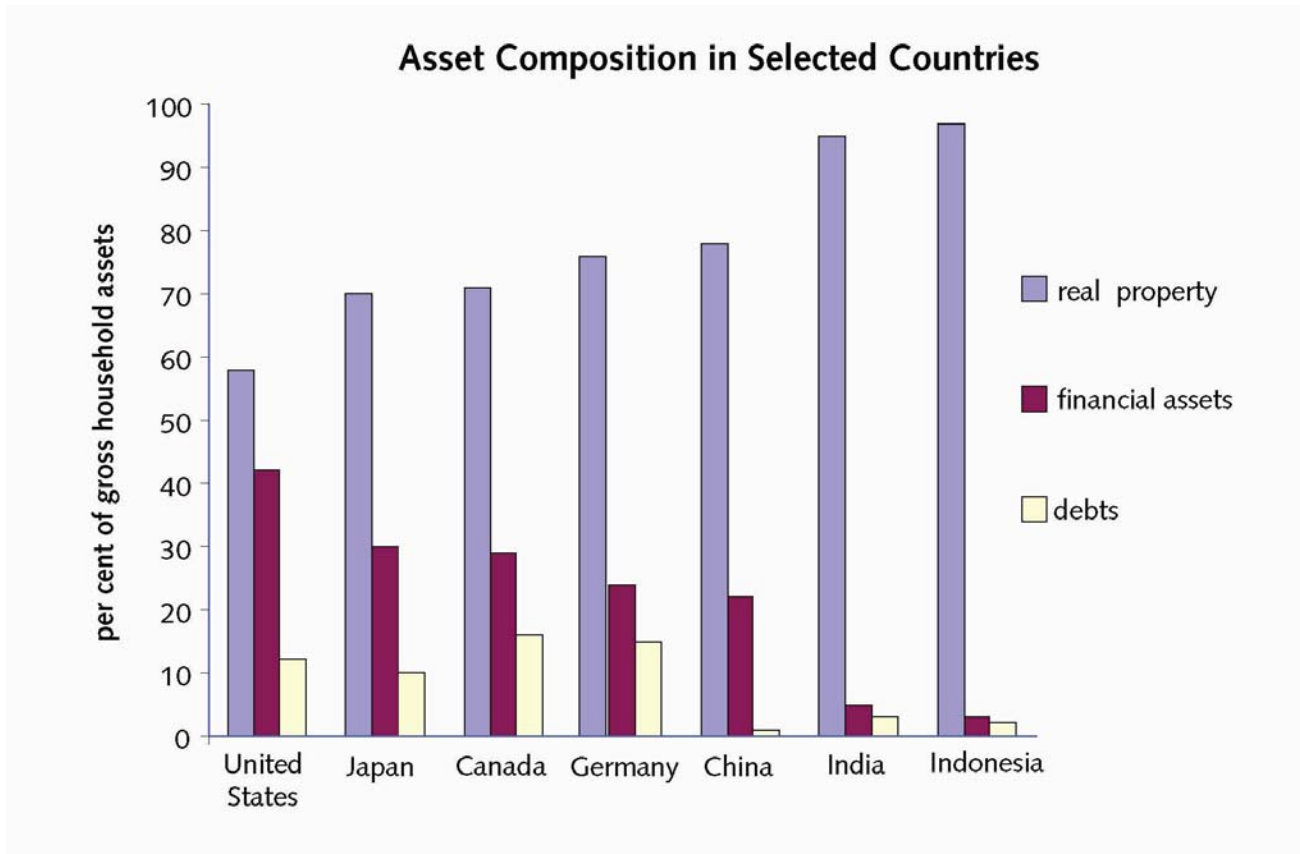


Figure 4

Regional Composition of Global Wealth Distribution

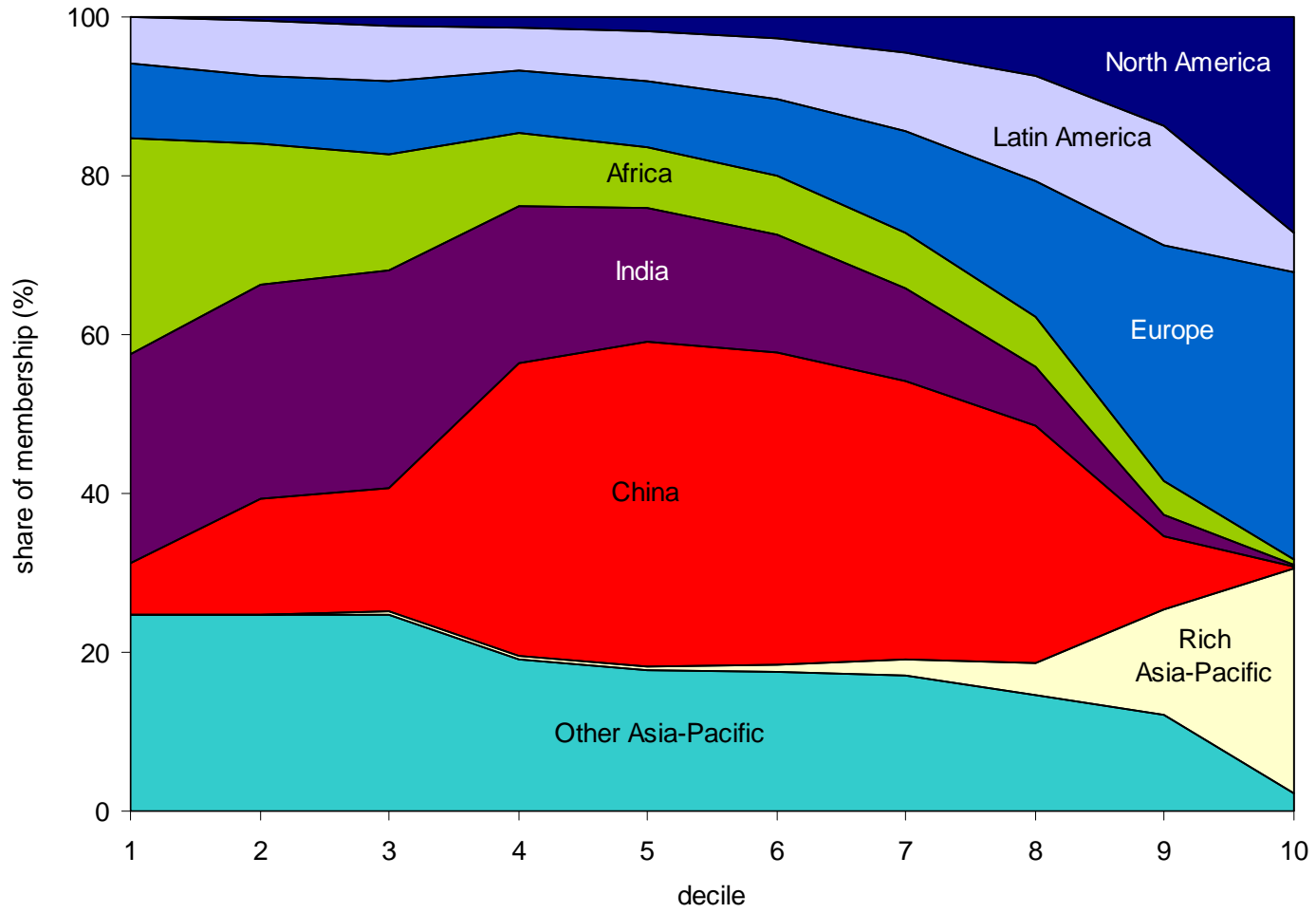


Figure 5

Percentage Membership of Wealthiest 10%

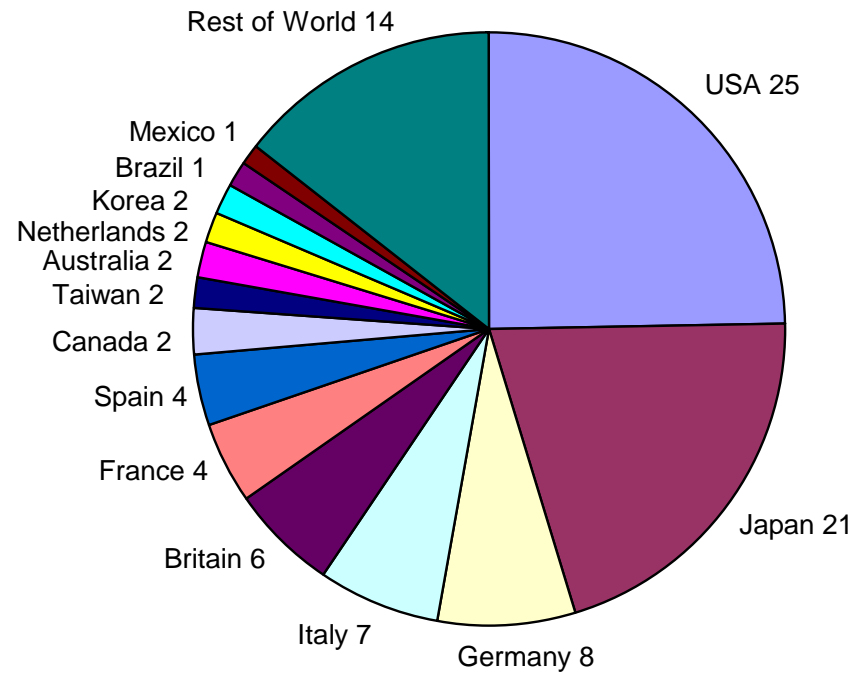


Figure 6

Fitted Pareto Distribution

