

# 2012 Canazei Winter Workshop on Inequality

## **Measuring the Global Distribution of Wealth**

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# Collaborators

Susanna Sandström, Tony Shorrocks, Ed Wolff

- “The world distribution of household wealth” in J.B. Davies (ed.) *Personal Wealth from a Global Perspective* (OUP, 2008)
- “The level and distribution of global household wealth”, *Economic Journal*, March 2011

Tony Shorrocks, Rodrigo Lluberas, Michael O’Sullivan, Giles Keating

- Credit Suisse Global Wealth Report 2010, 2011
- Credit Suisse Global Wealth Databook 2010, 2011

OXFORD

# PERSONAL WEALTH

## FROM A GLOBAL PERSPECTIVE



*Edited by*  
*James B. Davies*

UNU-WIDER STUDIES IN DEVELOPMENT ECONOMICS

# Objective

To measure the world distribution of *household wealth* across individuals, countries and regions

- wealth = **real assets + financial assets – debts**
- wealth level results for years **2000 – 2011**
- global distribution pattern for **2000, 2010 and 2011**
- compared across countries using **official exchange rates**
- comparisons for **adult** population

# Household Wealth - Coverage

- Asset coverage follows UN system of national accounts; residence basis
- Some assets that *are* included:
  - Equity of personal sector in insurance and pension funds; trust funds
- Some wealth not included:
  - Social security wealth
  - Net worth of government, corporations, ROW

## Some Related Literature

Goldsmith, Raymond W. (1985): *Comparative National Balance Sheets, A Study of Twenty Countries, 1688-1978*, University of Chicago Press.

Milanovic, Branko (2005): *Worlds Apart: Measuring International and Global Inequality*, Princeton University Press.

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

# Structure of talk

- Evidence on wealth levels and composition
- Estimating levels for countries without direct data
- Evidence on wealth distribution
- Estimating distributions for countries without wealth distribution data
- Adjusting top tail to match information in "rich lists"
- World distribution of wealth
- Long-term trends in wealth-holding

# Some details regarding methods

## (1) **adult population**

## (2) **average wealth level:** based on

- household balance sheets and wealth survey data (covering 49 countries, 63% of world population, 93% of world wealth)
- extended by regression methods to most other countries
- region-income class averages imputed to remaining countries

## (3) **distribution of wealth:** based on

- distribution data for 22 countries
- wealth dist estimated from income distribution for most other countries
- region-income class averages imputed to remaining countries



# Estimating Wealth Levels

- Household Balance Sheet Data - - 45 countries
  - Our preferred source
  - Est'd by national statistical organizations, central banks, ministries of finance, using multiple sources
    - Counterparty data for most financial assets
    - Surveys, perpetual inventories for non-financial
  - Part of UN system of national accounts
  - Financial assets collated by OECD, Eurostat
  - Non-financial assets: obtain directly from official country sources

## Estimating wealth levels (cont'd.)

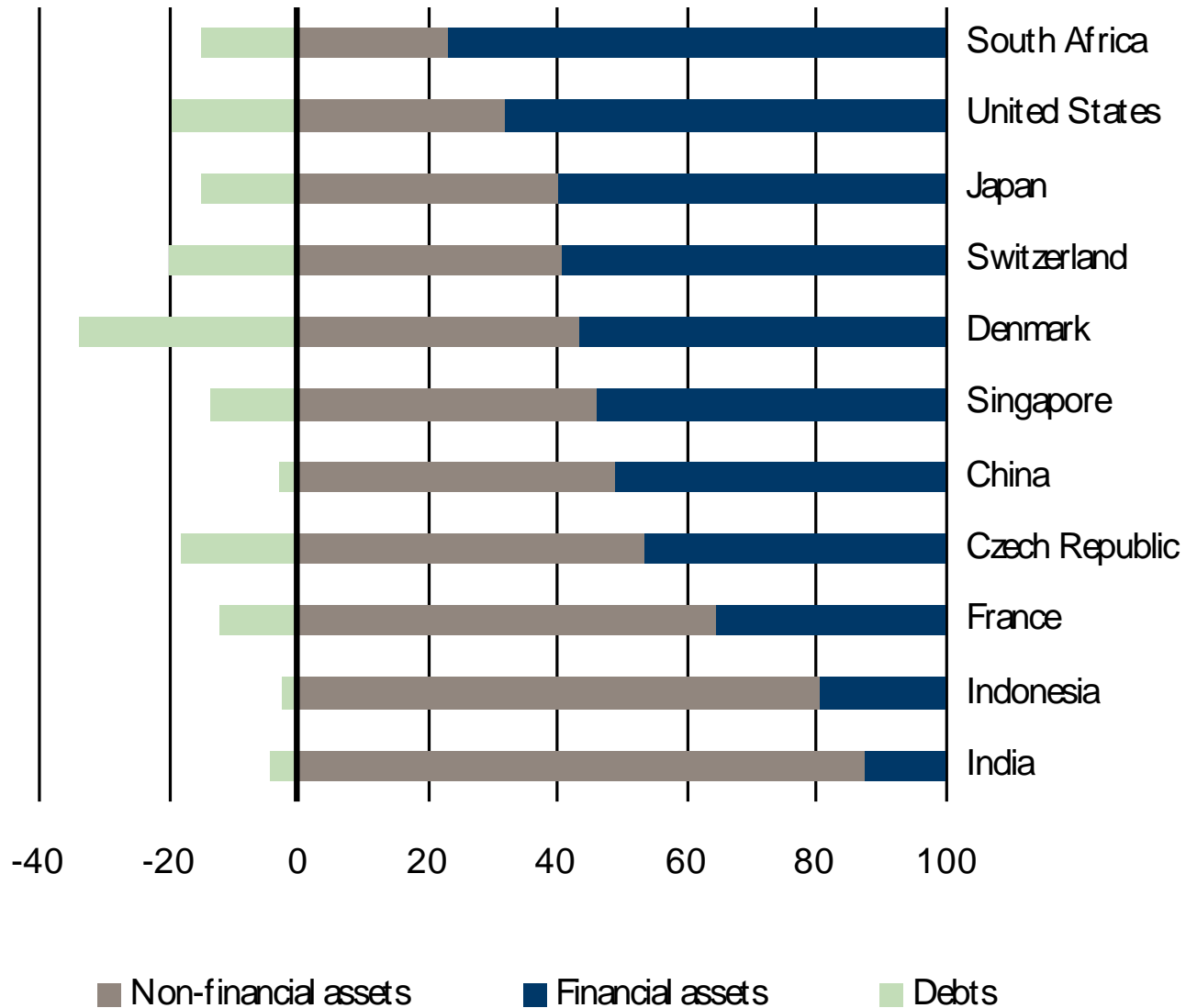
- Household Survey Data - - 4 countries
  - Financial assets under-estimated
  - Value of housing relatively accurate
  - Liabilities somewhat under-estimated
  - Used here when HBS data unavailable
    - correction to Financial Assets based on regression results

Table 1-1: Coverage of wealth levels data

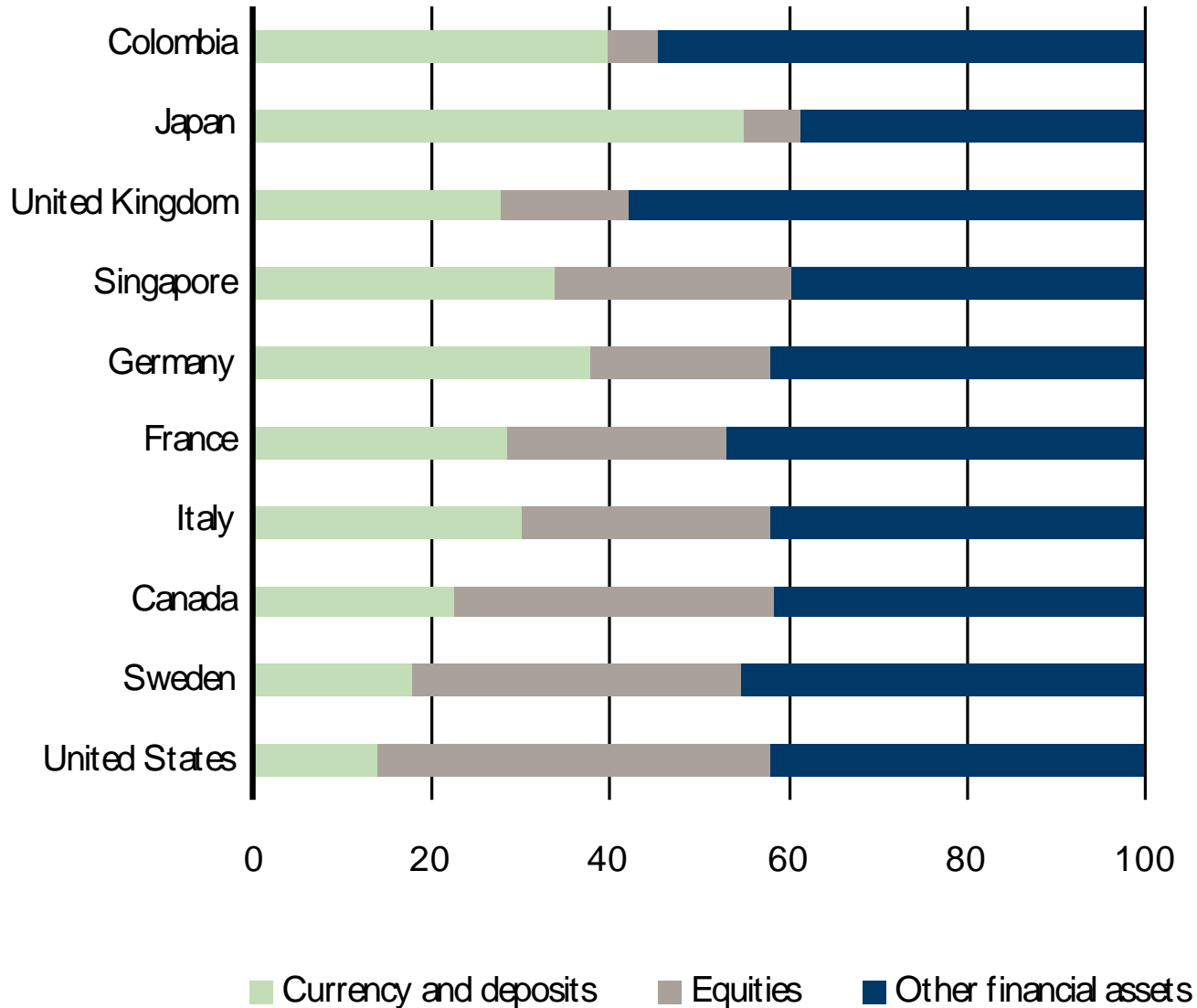
	High income		Upper middle income	Lower middle income	Low income	Cumulative % of world population	Cumulative % of world wealth
Complete financial and non-financial data in at least 1 year							
	North America	Europe	Asia-Pacific				
Household balance sheets	Canada USA	Denmark France Germany Italy Netherlands Switzerland UK	Australia Taiwan Israel Japan New Zealand Singapore	Czech Republic South Africa		12.9	70.5
Survey data				Chile	China	India Indonesia	53.3 82.0
Incomplete data							
	North America	Europe	Asia-Pacific				
Financial balance sheets		Austria Belgium Cyprus Finland Greece Ireland Luxembourg Norway Portugal Slovenia Spain Sweden	Korea, Rep.	Croatia Estonia Hungary Latvia Lithuania Mexico Poland Russian Fed. Slovakia	Bulgaria Colombia Romania Thailand Turkey Kazakhstan	63.3	93.3
Number of countries with wealth partly or fully estimated by regression method		26		32	43	51	93.9 99.4
Number of countries with wealth imputed by mean value of group		21		5	12	12	100.0 100.0

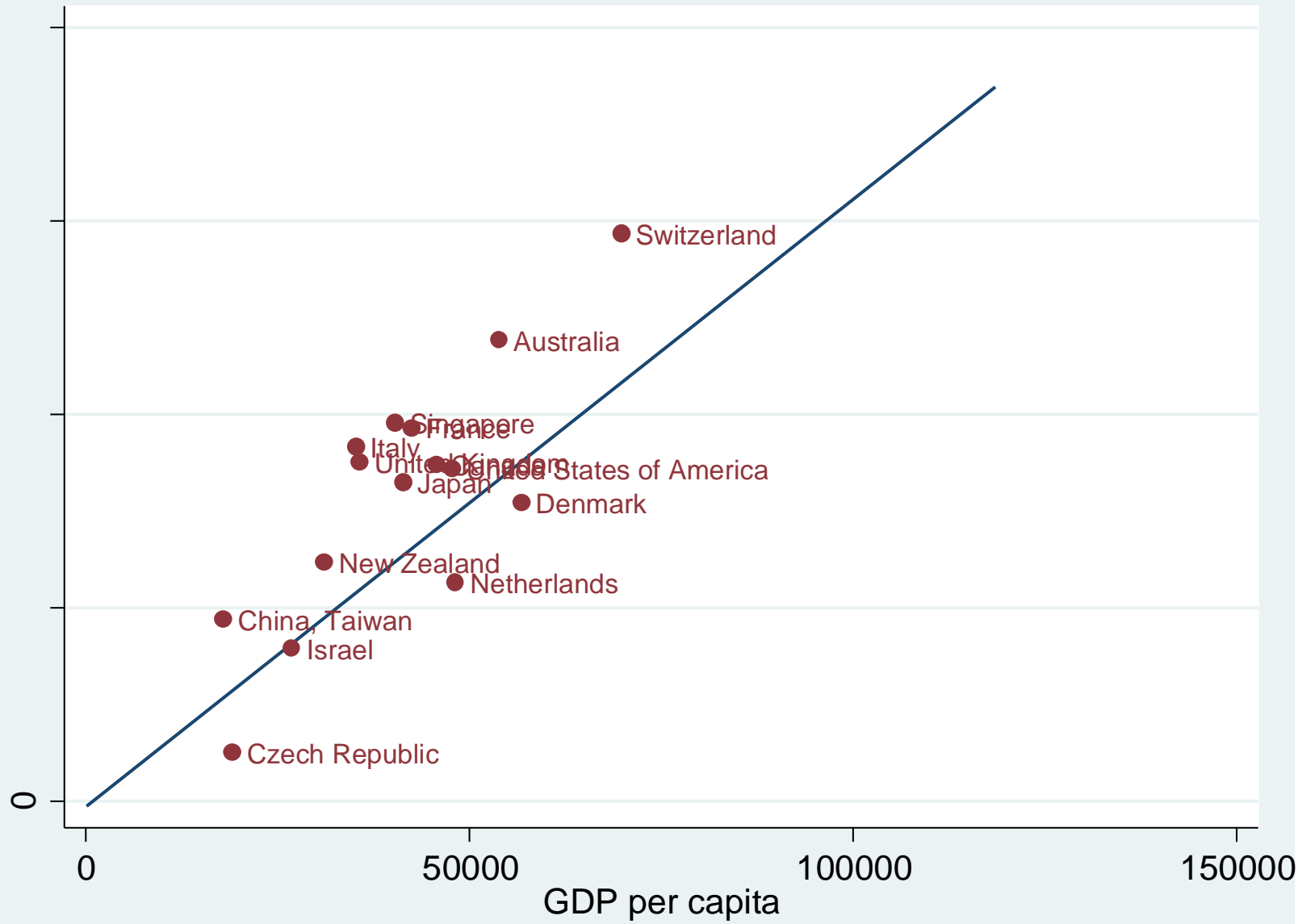
- Wealth dominated by Real Assets in low income countries
- Financial Assets more important in high income countries
- "Financial Interrelations Ratio" rises with development (Goldsmith, 1985).
  - Ratio = Financial Assets/Non-Financial Assets
  - Averages about 0.5 in LDCs
  - Approx 1.0 in Developed Countries
- Large differences in wealth composition for countries at similar income

# Asset composition, 2011



# Composition of financial assets, 2011





# Log Financial Assets Per Capita regression (SUR) with year and region dummies, 2000-2008

Variable	Coefficient	Standard Error
Log Consumption per capita	1.2157	.0861
GDP per capita growth rate	-0.0122	.0031
Log Market Capitalization Rate	0.1168	.0357
% Urban Population	.0088	.0023
Survey Dummy	-2.6763	.3581
“R2” = .9369 329 Observations		



# Log Liabilities Per Capita regression (SUR) with year and region dummies, 2000-2008

Variable	Coefficient	Standard Error
Log Consumption per capita	1.3313	.0774
Log Domestic Credit per capita	0.8158	.0485
% Urban Population	.0068	.0020
“R2” = .9572 329 Observations		

# Log Non-Financial Assets Per Capita regression with year and region dummies, 2000-2008

Variable	Coefficient	Standard Error
Log Consumption per capita	1.0656	.1333
Life Expectancy	4.5459	2.1360
Log Population Density	-0.0661	.0194
% Urban Population	.0068	.0020
R2 = .9105 132 Observations		

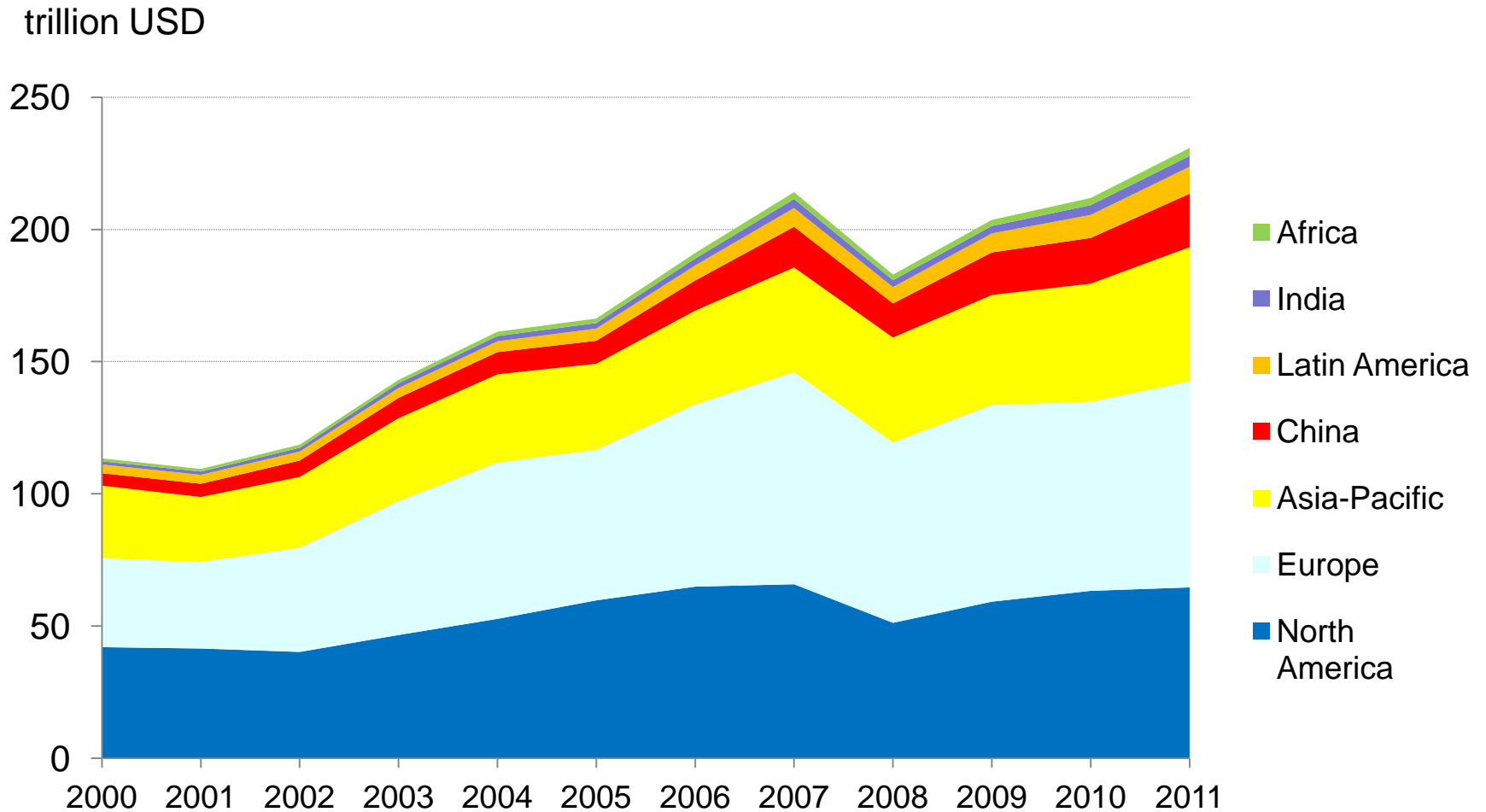
# Estimating & imputing wealth levels 2000 – 2011 for all countries

- Complete HBS data: 17 countries
- Financial HBS Data: 28 countries
  - Non-financial assets imputed from regression
- Survey Data: 4 (includes China & India)
  - Financial assets corrected using survey dummy
- Entirely imputed from regressions: 152
- Mean of region/income group: 50

# Estimating wealth levels for interrupted HBS & Survey series

- Complete annual data 2000-2011 (2<sup>nd</sup> Q) rare....  
US and a few other countries
- Regression-based estimates for missing years
- 2009 – 2011: imputations based on separate regressions done on key variables

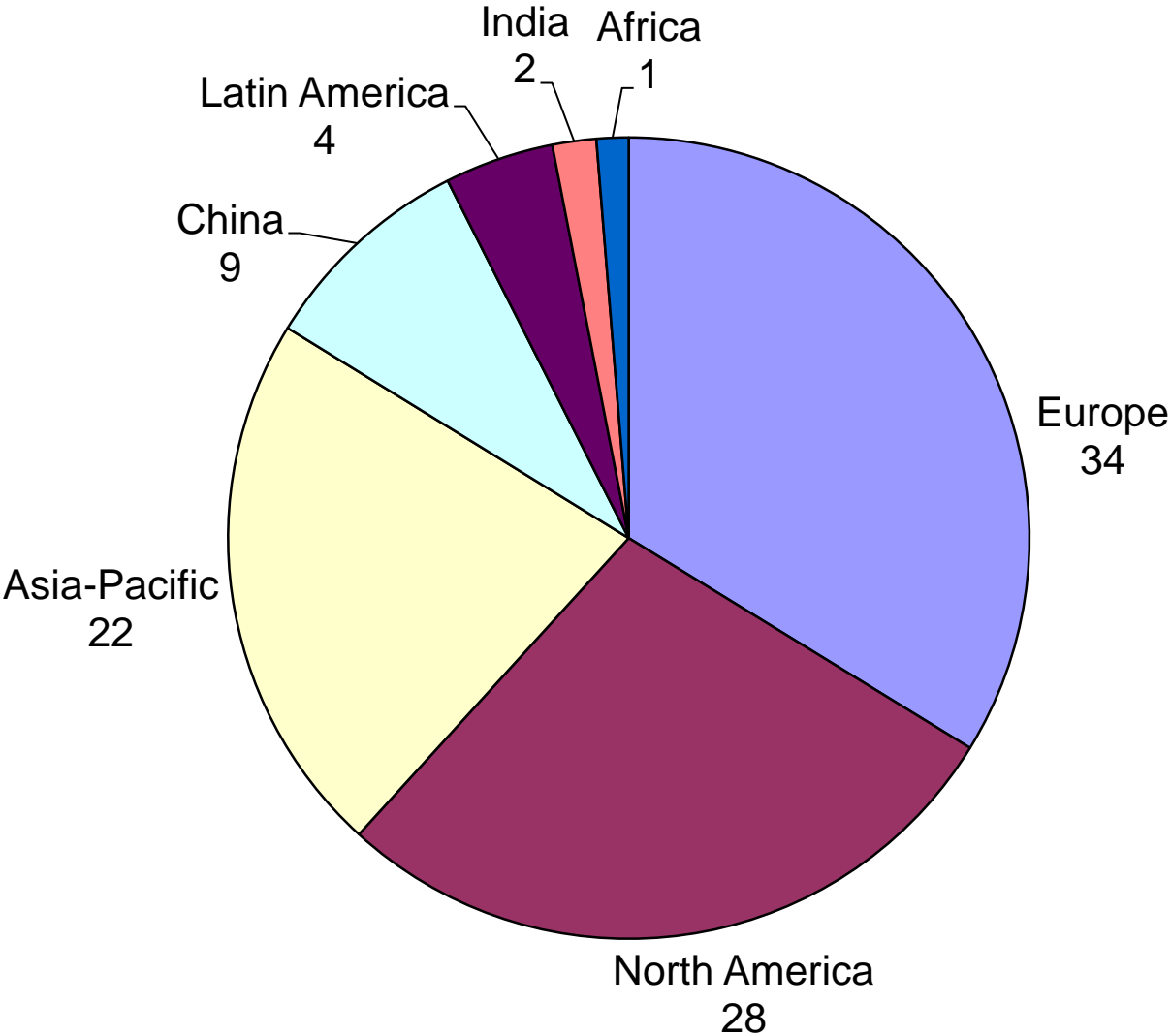
# Aggregate Global Wealth, 2000 - 2011



# Sources of changes in wealth levels 2000-2011

- real growth and private saving
- asset price changes (e.g. shares, housing)
- exchange rate movements (especially \$ - euro)
- population shifts and ageing

# Wealth shares by region 2011 (%)



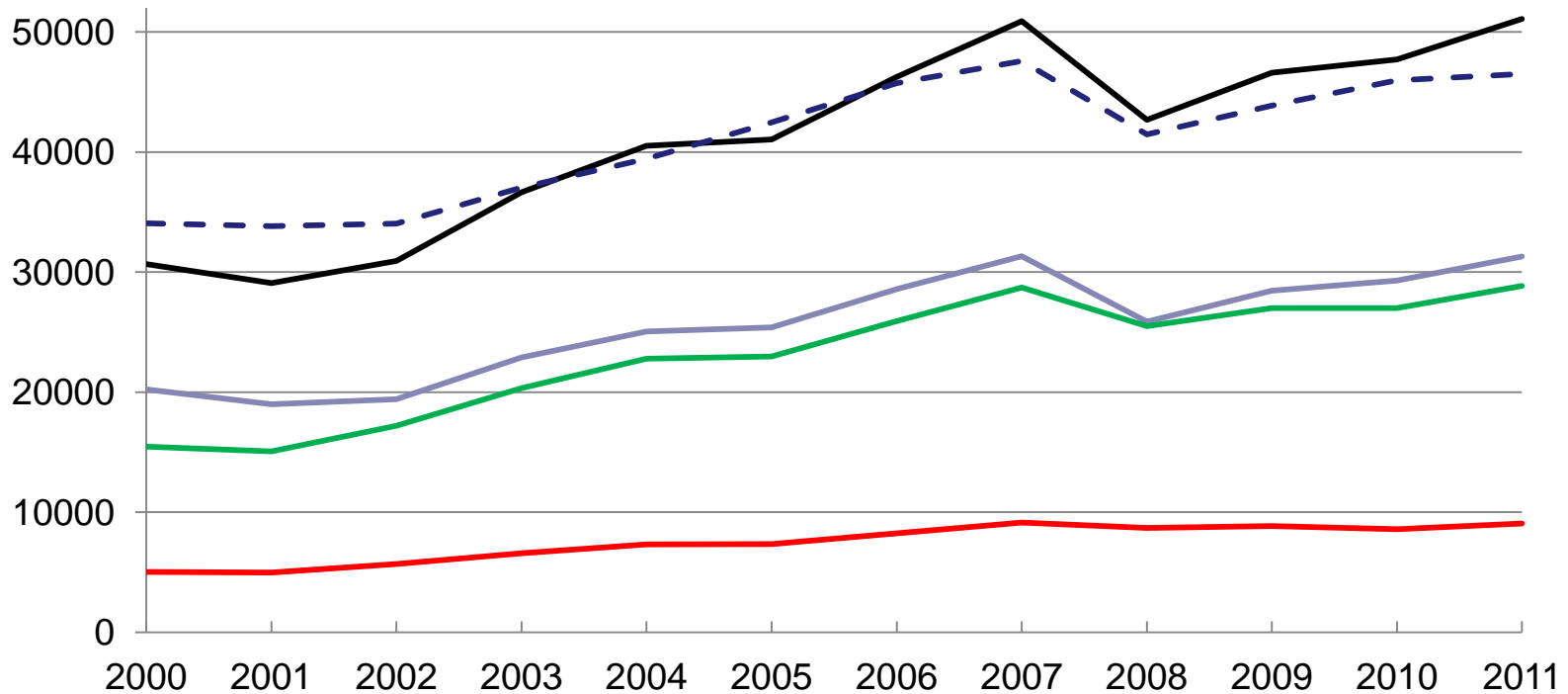
# Geographical spread of wealth

- wealth is heavily concentrated in North America, Europe, and high income Asia-Pacific countries
  - collectively have 80% of world wealth
- North America has 6% of the world adult population, 28% of household wealth
- Europe and high income Asia-Pacific countries also have disproportionate amounts of wealth
- For Africa, China, India, and lower income Asian countries, share of wealth is considerably less than population share, sometimes by a factor of more than 10



# Global trends in wealth per adult, 2000-2011

USD per adult



— net worth

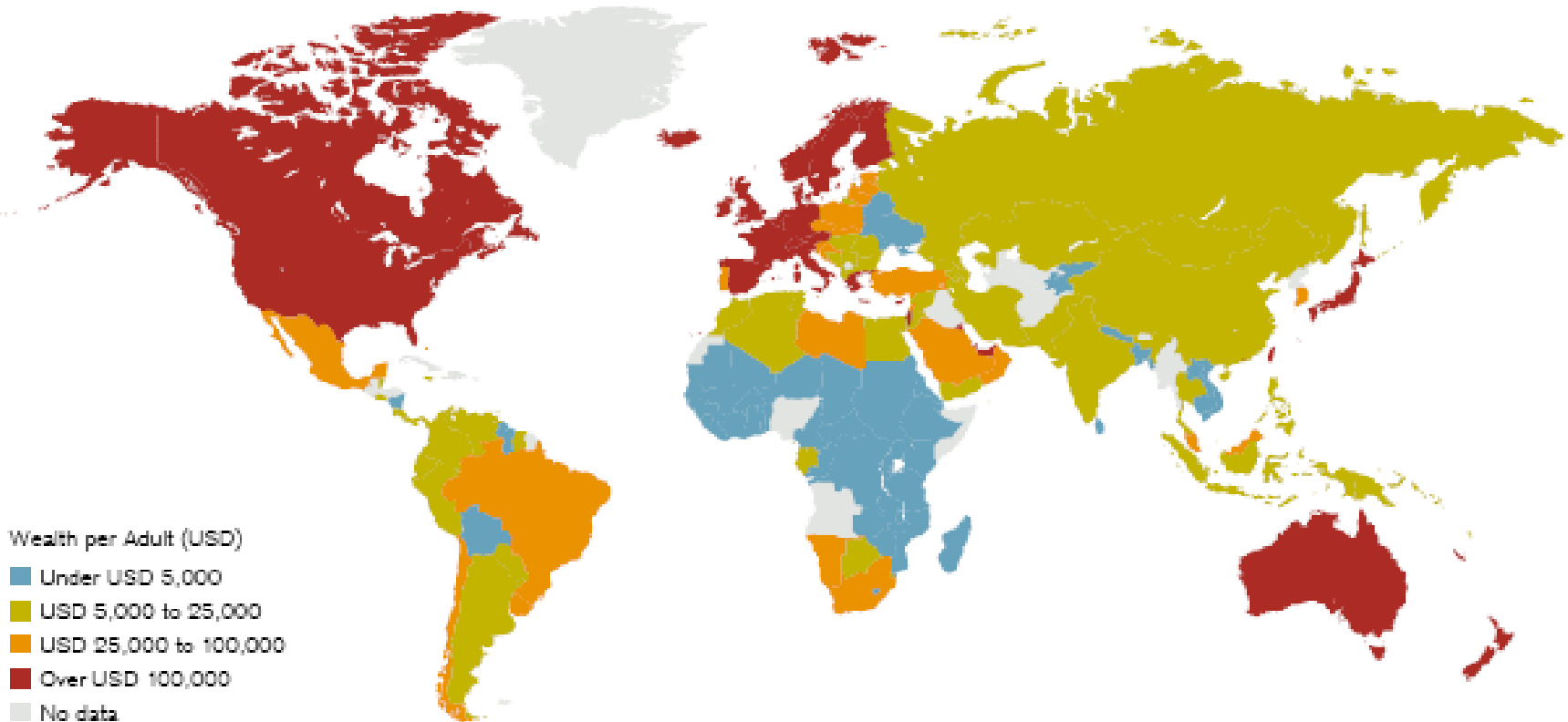
— financial wealth

— debt

- - net worth at constant exchange rates

— non-financial wealth

# World Wealth Levels, 2011



# Wealth levels across Countries

## Global household wealth using official exchange rates

2000	\$ 30,672
2010	\$ 47,720
2011	\$ 51,078

Average wealth per adult	end 2010	mid 2011
Switzerland	\$ 420,000	\$ 540,000
USA	\$ 247,000	\$ 248,000
Japan	\$ 215,000	\$ 249,000
China	\$ 18,000	\$ 21,000
Indonesia	\$ 11,000	\$12,000
India	\$ 5,100	\$ 5,500

<b>GDP per cap upper lim \$)</b>	<b>Example countries</b>	<b>Wealth/GDP</b>	<b>Financial/Non-Financial Assets</b>
593	Congo, Afghanistan	1.34	.902
1,031	Bangladesh, Zimbabwe	2.44	.639
1,824	India, Ghana	2.06	.198
3,391	Philippines, Bolivia	1.92	.416
5,245	China, Ecuador	2.82	.906
7,914	S. Africa, Jamaica	1.66	.747
12,423	Brazil, Mexico, Turkey	1.72	.599
22,353	Chile, Poland, Portugal	1.69	.970
46,970	France, Germany, Italy	4.39	.920
120,060	Luxbg, Sweden, U.S.	3.68	1.61

# Differences in wealth and financial development

- Bottom 80% of countries by GDP:
  - Wealth/GDP: 1.95
  - Financial/Non-Financial Assets: 0.67
    - Emerging market countries generally still have relatively low financial interrelations ratio
- Top 20% of countries:
  - Wealth/GDP: 4.04
  - Financial/Non-Financial Assets: 1.27

# Wealth distribution data

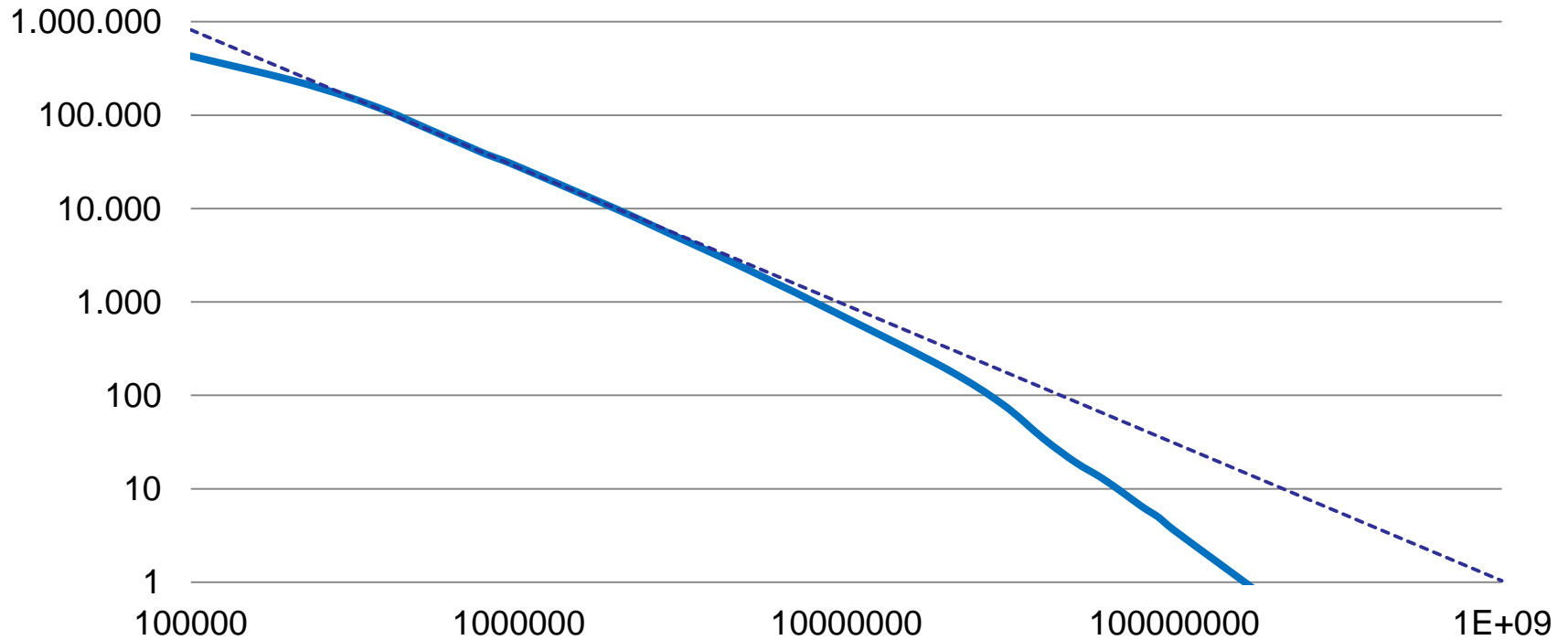
Country	Year Unit	Share of top							
		25%	20%	10%	5%	2%	1%	0.50%	0.10%
Australia	2006 household		61.2						
Canada	2005 family		69	50.4	35.8		15.5		
Chile	2007 household		65.5	44					
China	2002 person		59.3	41.4					
Denmark	1996 family		98.7	76.4	56		28.8	22.3	11.7
France	2010 adult			62			24		
Germany	2003 household		67.4	46.7					
India	2002-3 household		69.9	52.9	38.3		15.7		
Indonesia	1997 household		78.9	65.4	56		28.7		
Italy	2008 household		59.4	42.3	29.6		12.2		
Japan	1999 household		57.7	39.3					
Korea,	1988 household		60.1	43.1	31		14		
Netherlands	2008 household		78.5	62.7					
New Zealand	2001 tax unit		67	48					
Norway	2004 household		80.1	65.3					
Spain	2005 household	64.2		41.6					
Sweden	2007 adult			72	55		29		
Switzerland	1997 family			71.3	58		34.8	27.6	16
Thailand	2006 household		69.5						
UK	2005 household		62.8	44.3	30.5		12.5		
USA	2007 family		83.4	71.5	60.4		33.8		

# Strategy for global wealth distribution

- published wealth (and income) dist data for 22 countries
- impute missing quantile shares using “ungrouping” program
- compare wealth to income shares
- estimate wealth dist from income dist data for 141 countries
- generate synthetic wealth samples for each country
  - 1 observation per 10,000 adults bottom 90%
  - 1 observation per 1,000 adults top 10%
  - 1 observation per 100 adults top 1%
- scale up wealth values to match average wealth
- adjust top tail to match number of billionaires by country in Forbes list, rescale to match average wealth, repeat process until convergence
- process world wealth sample 1.27 million weighted observations

# Pareto Top Tail

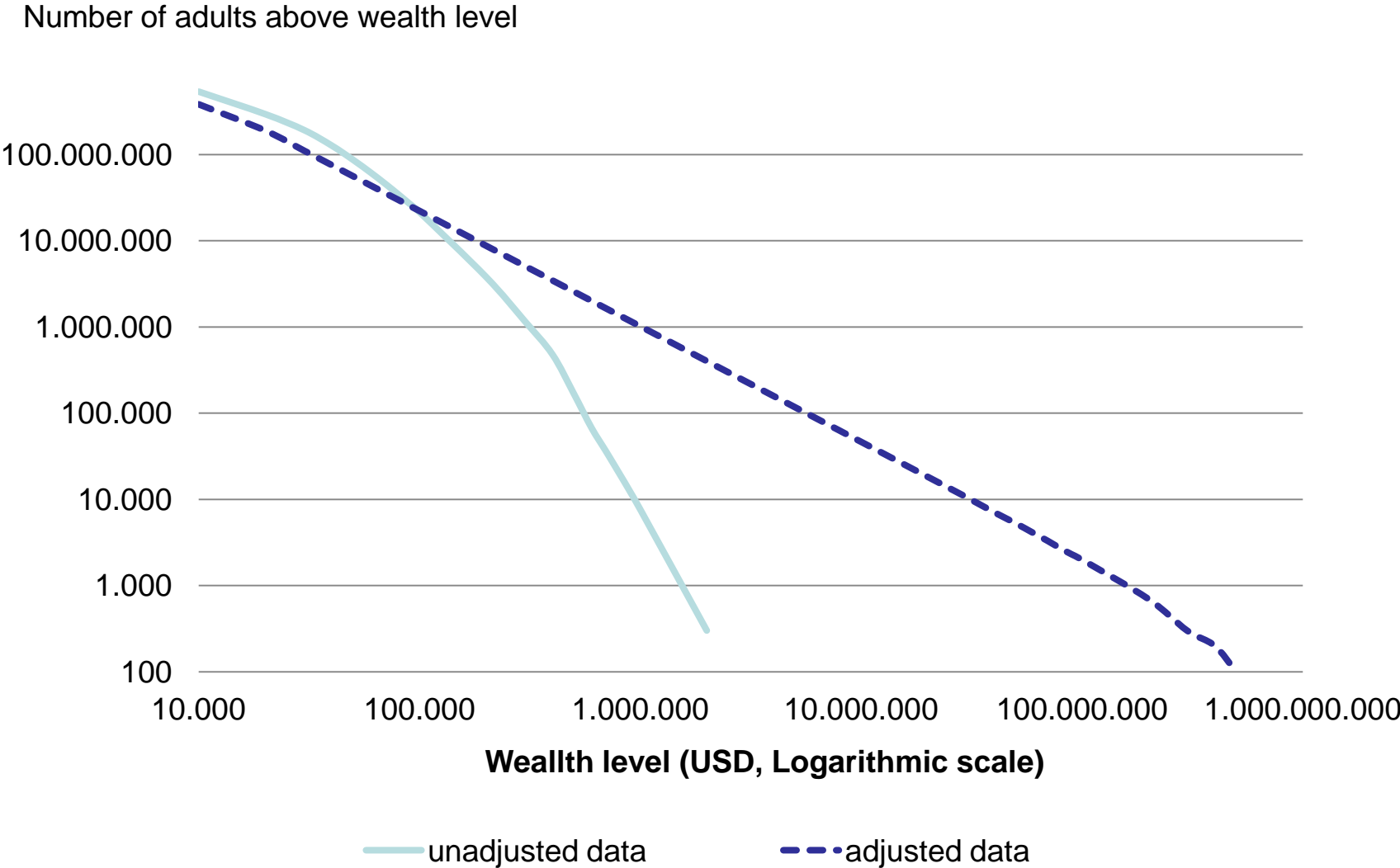
Thousands of adults above wealth level  
(logarithmic scale)



— Unadjusted wealth estimates      - - - Fitted Pareto



# Unadjusted and adjusted wealth values for China



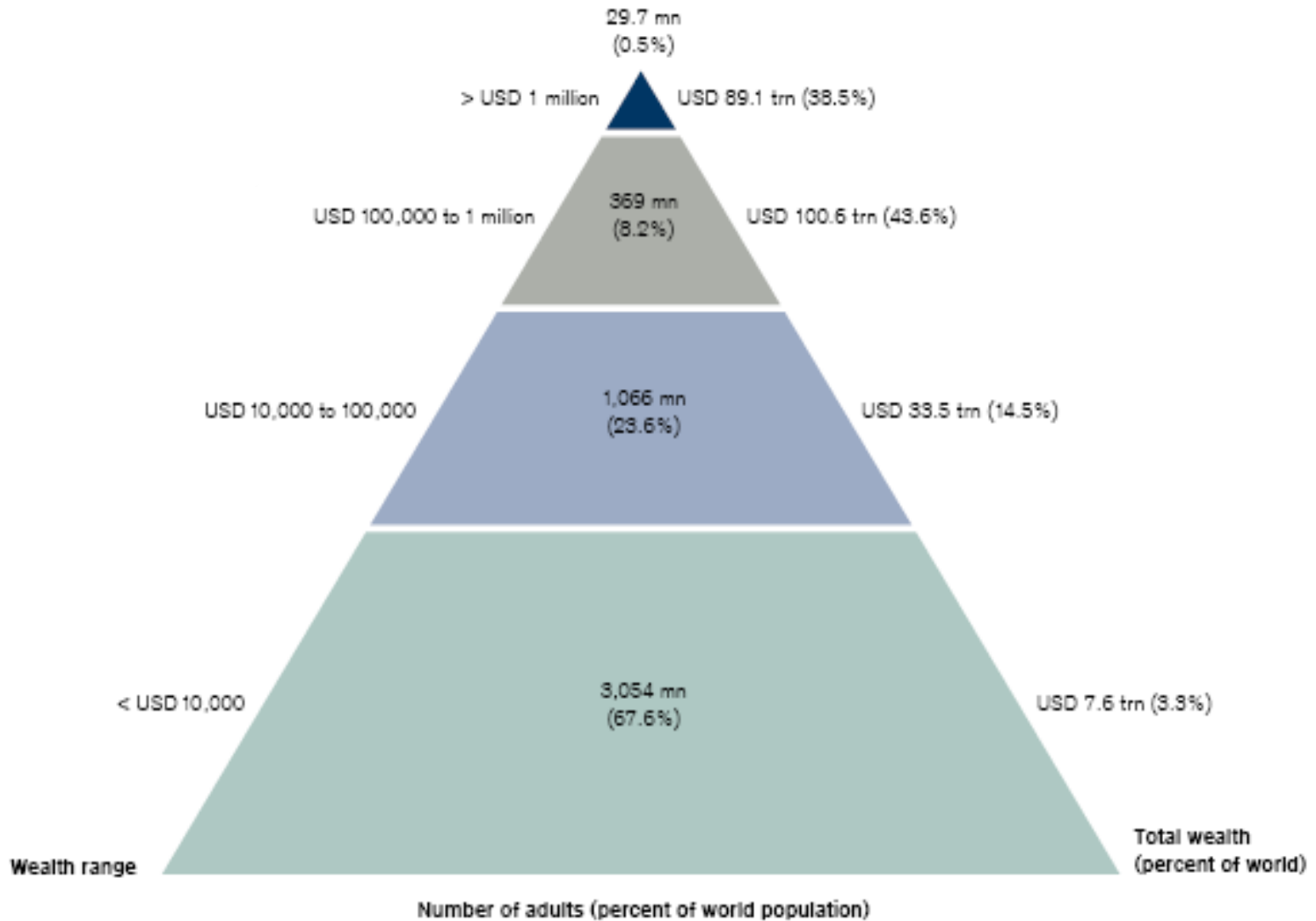
# Wealth inequality is very high

- share of the top 10% around
  - 60% in China, 71% in US, higher in some other countries
- even higher for world as a whole
  - richest 2% of adults own more than half global wealth
  - global wealth Gini for adults is 0.893
  - most global inequality is *between country* inequality
- wealth more unequally distributed than income *across countries*
  - high income countries have bigger share of wealth than GDP
  - reverse is true of middle- and low-income nations
  - some exceptions in Nordic and Eastern Europe transition countries

# Global wealth distribution, adults

<b>Decile</b>	<b>Share (%)</b>	<b>Decile</b>	<b>Share (%)</b>
1	-0.2	8	3.2
2	0.1	9	8.7
3	0.2	10	84.3
4	0.4	Top 5%	71.6
5	0.6	Top 1%	44.2
6	1.0	Gini	0.893
7	1.7	Mean	\$51,078

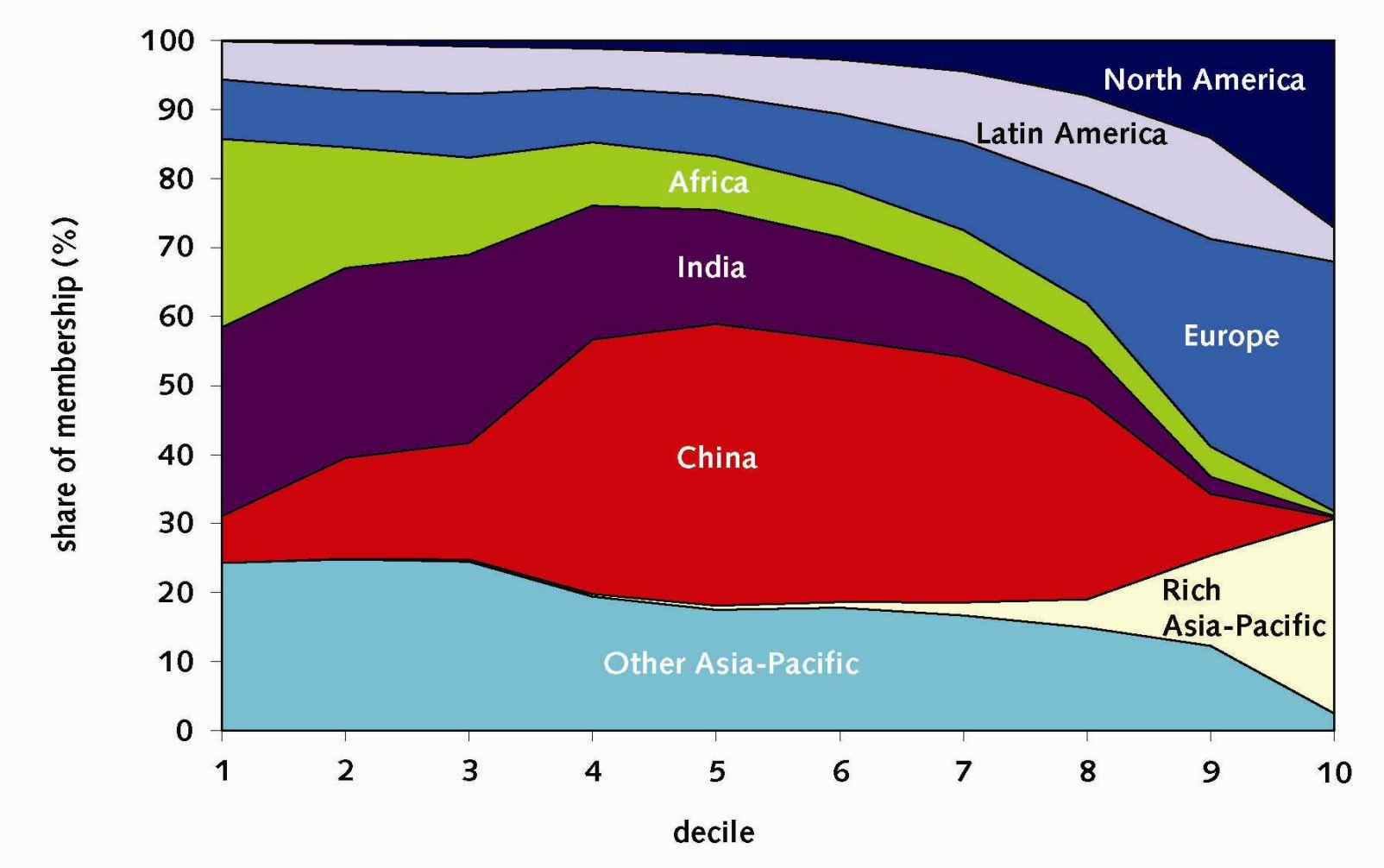
# The global wealth pyramid



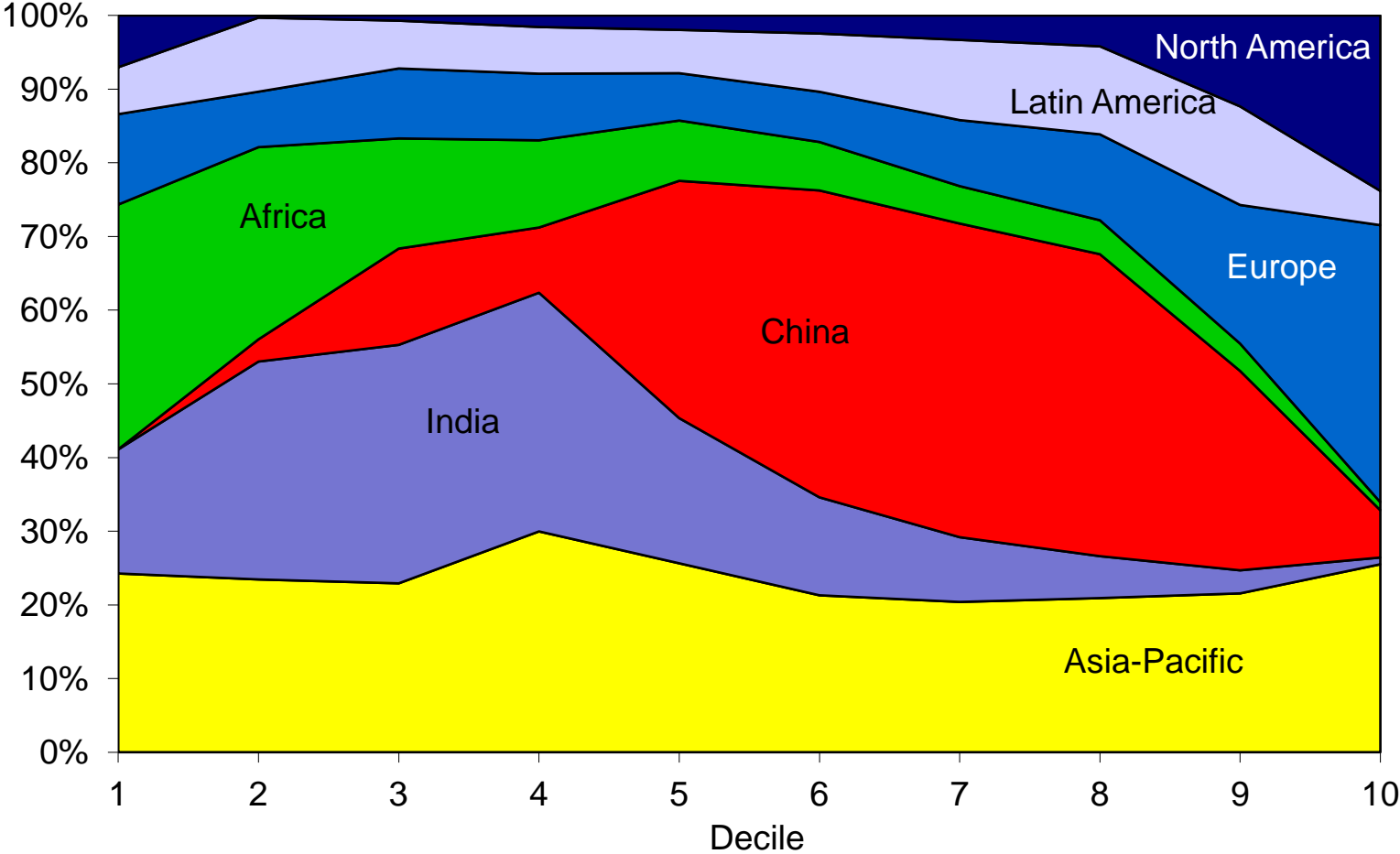
# The global rich 2011 (official exchange rates)

- \$ 4,200 per adult to be in top half of world wealth ranking
- \$ 82,000 to be in richest 10% of adults
- \$ 712,000 to be in richest 1% of adults (group with 45 million members worldwide)
  
- richest 1% of adults owned 44% of global assets
- richest 5% owned 72%
- richest 10% owned 84%
- bottom half owned under 2%

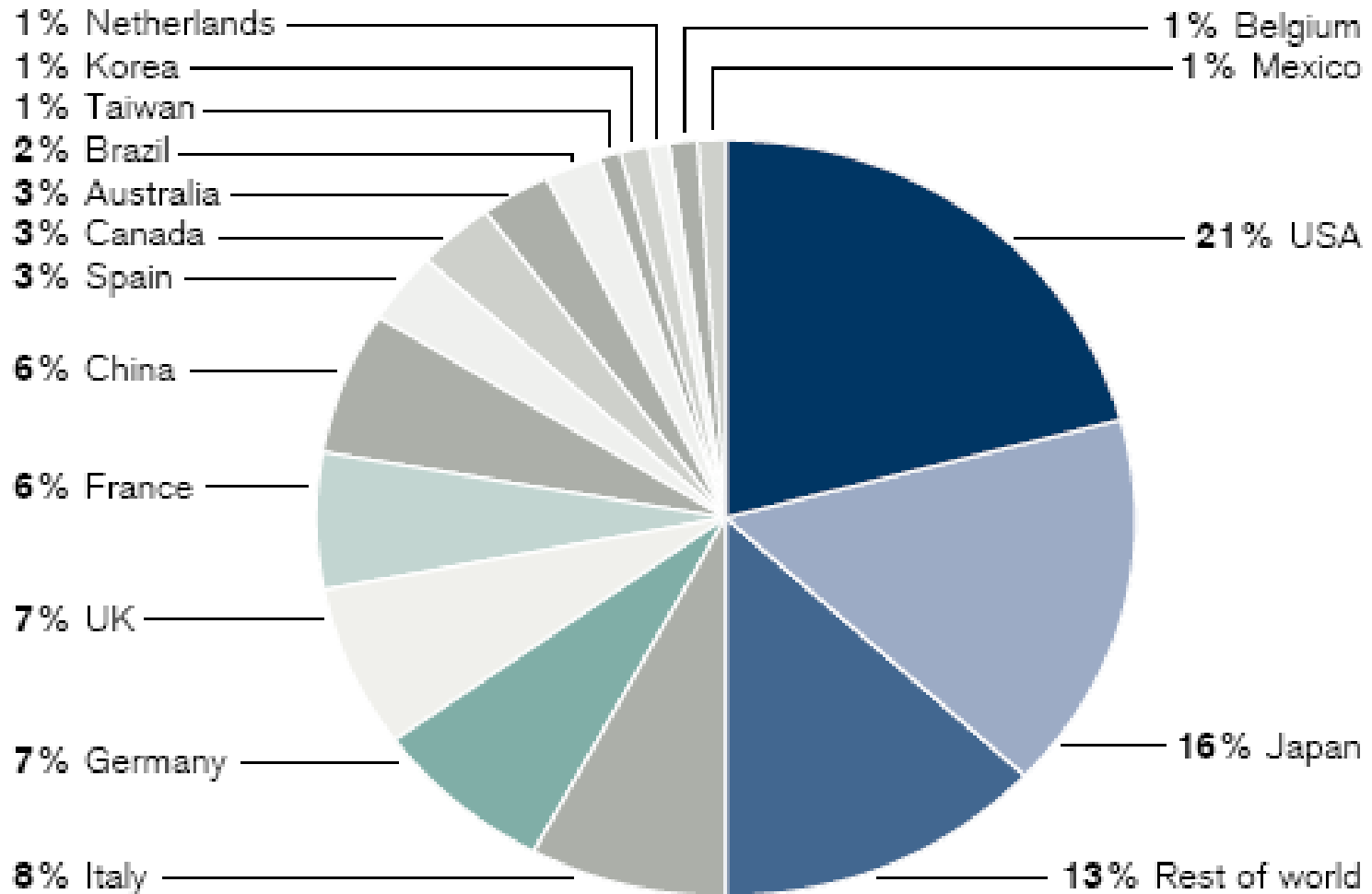
# Regional Composition of Global Wealth Distribution, 2000



# Regional Composition of Global Wealth Distribution, 2011

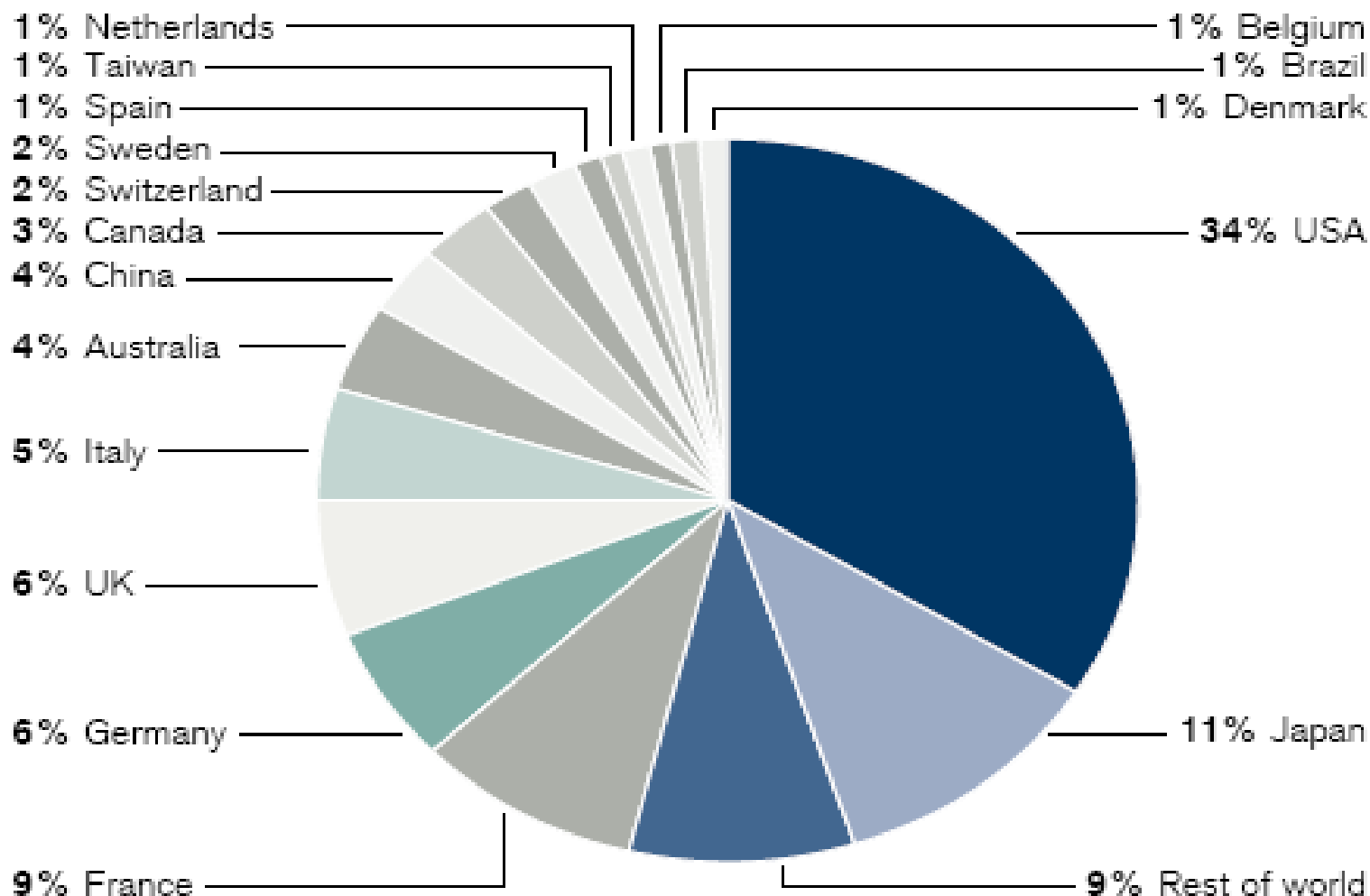


# Owners of wealth above USD 100,000 by country





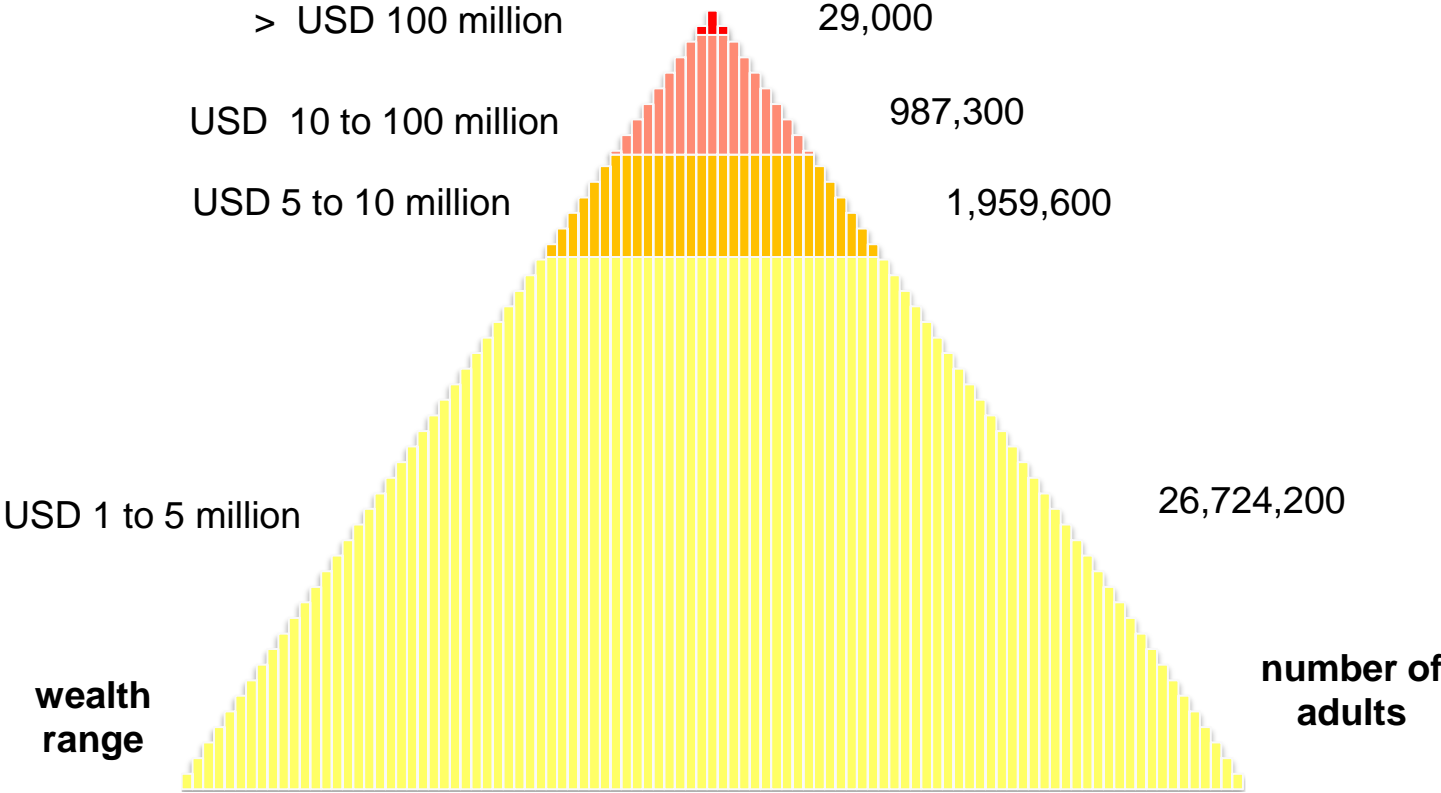
# Dollar millionaires by country of residence



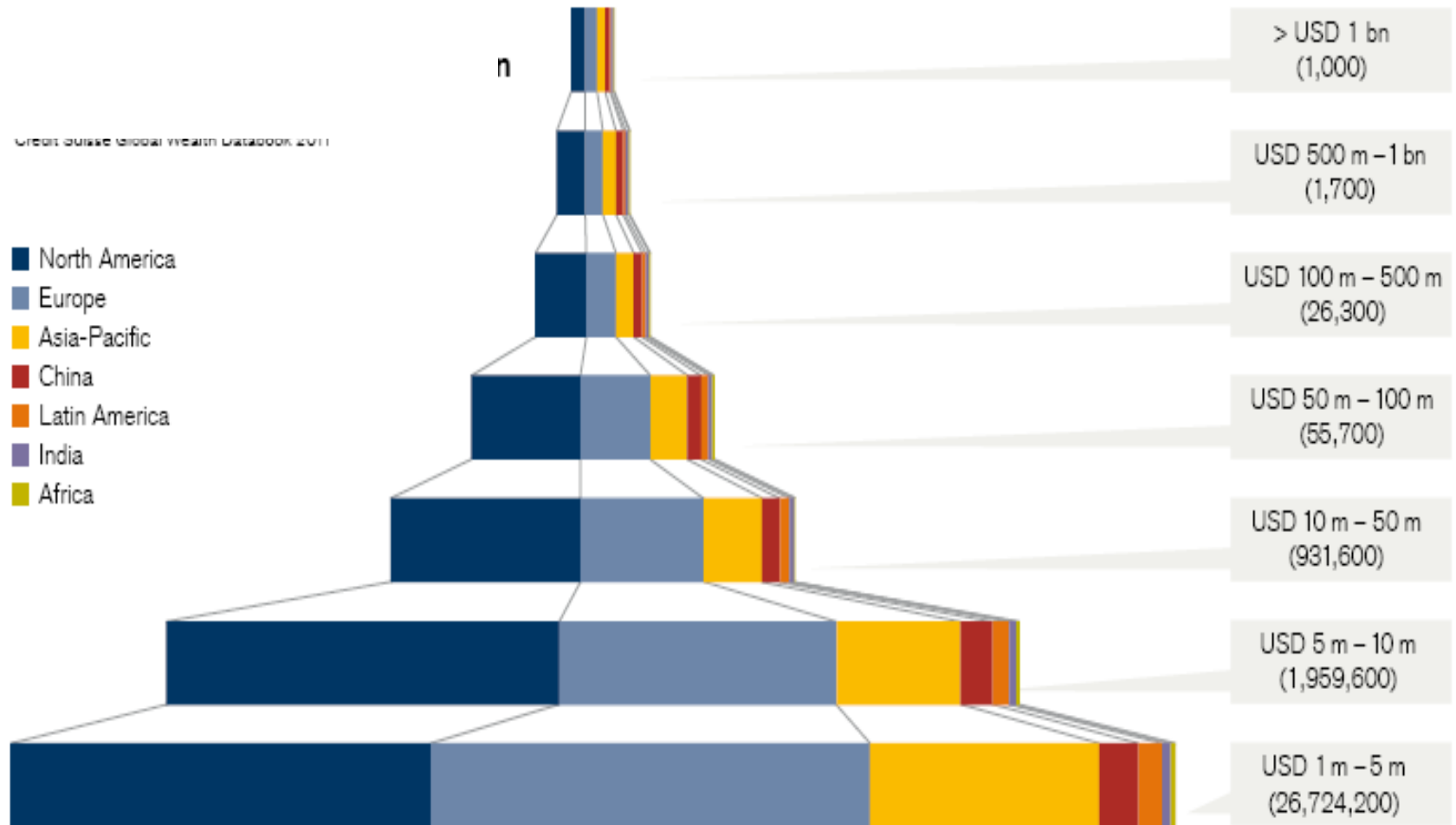
# Where do the richest 1% live?

- Richest 1% more concentrated geographically than top decile
- US even more dominant (but share has been falling)
- 28% reside in the US, 12% in Japan
- China and India membership was almost insignificant in year 2000, now China accounts for 3.5%

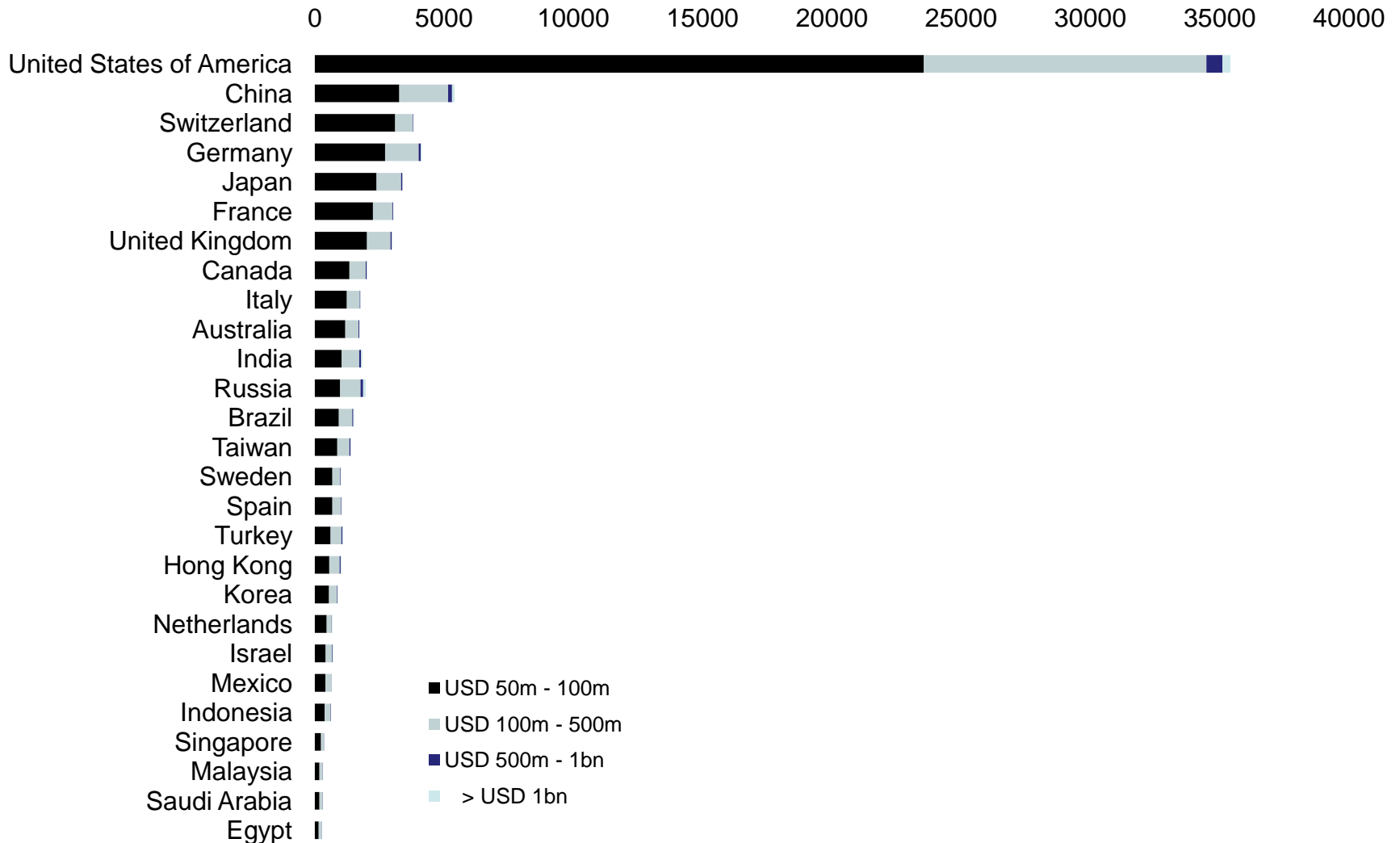
# Apex of the Pyramid



# Rich and Super Rich Individuals by Region



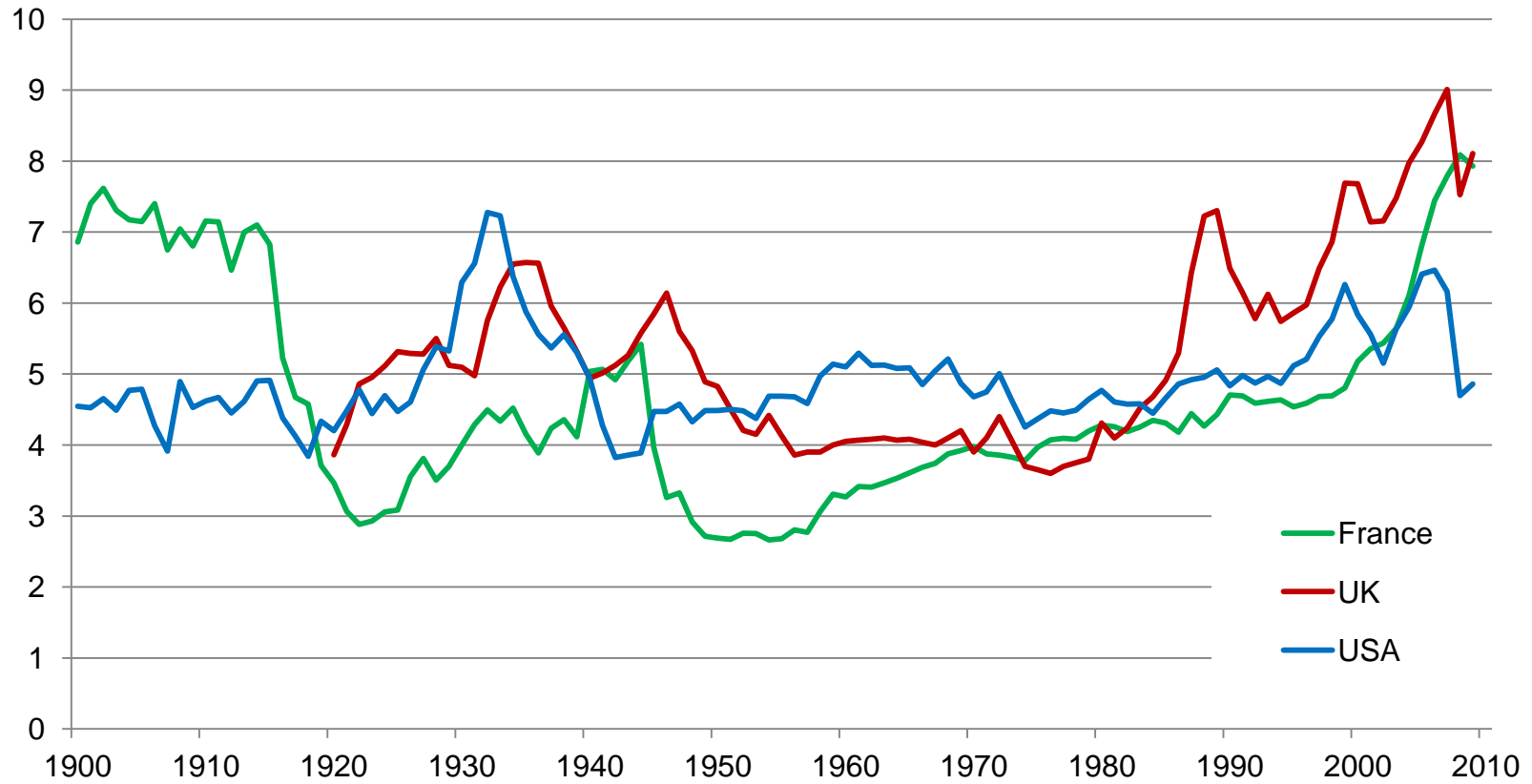
# Super Rich (> \$50m) 2011: selected countries



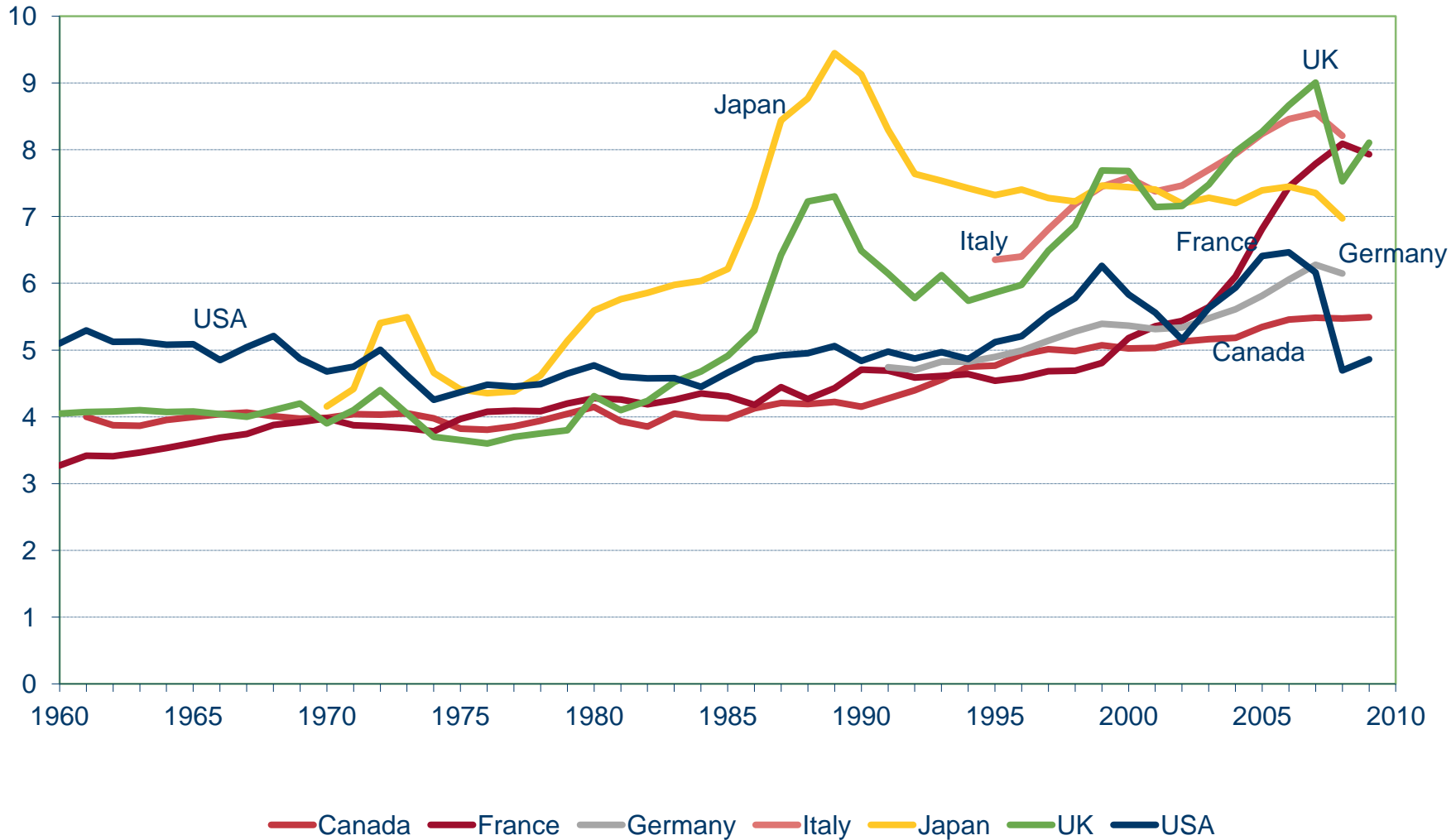
## Long-term trends in wealth-holding

- Wealth-disposable income ratios for France, UK, US since early 1900s
- OECD wealth-disposable income ratios for G7 countries since 1960
- Major wealth components for G7 countries since 1960

# Wealth-income ratios for France, UK and USA since 1900

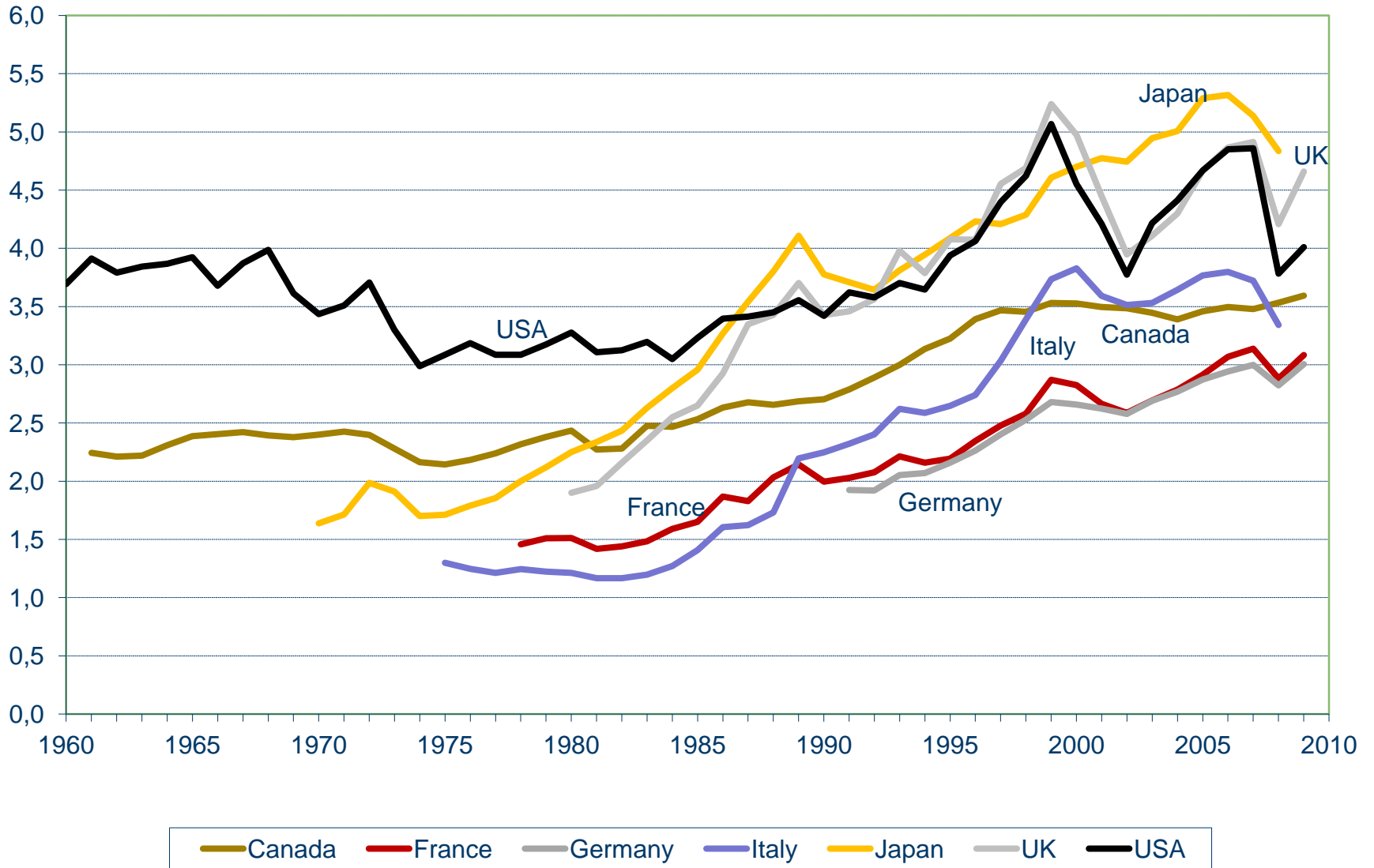


# Household wealth-income ratio in G7 countries

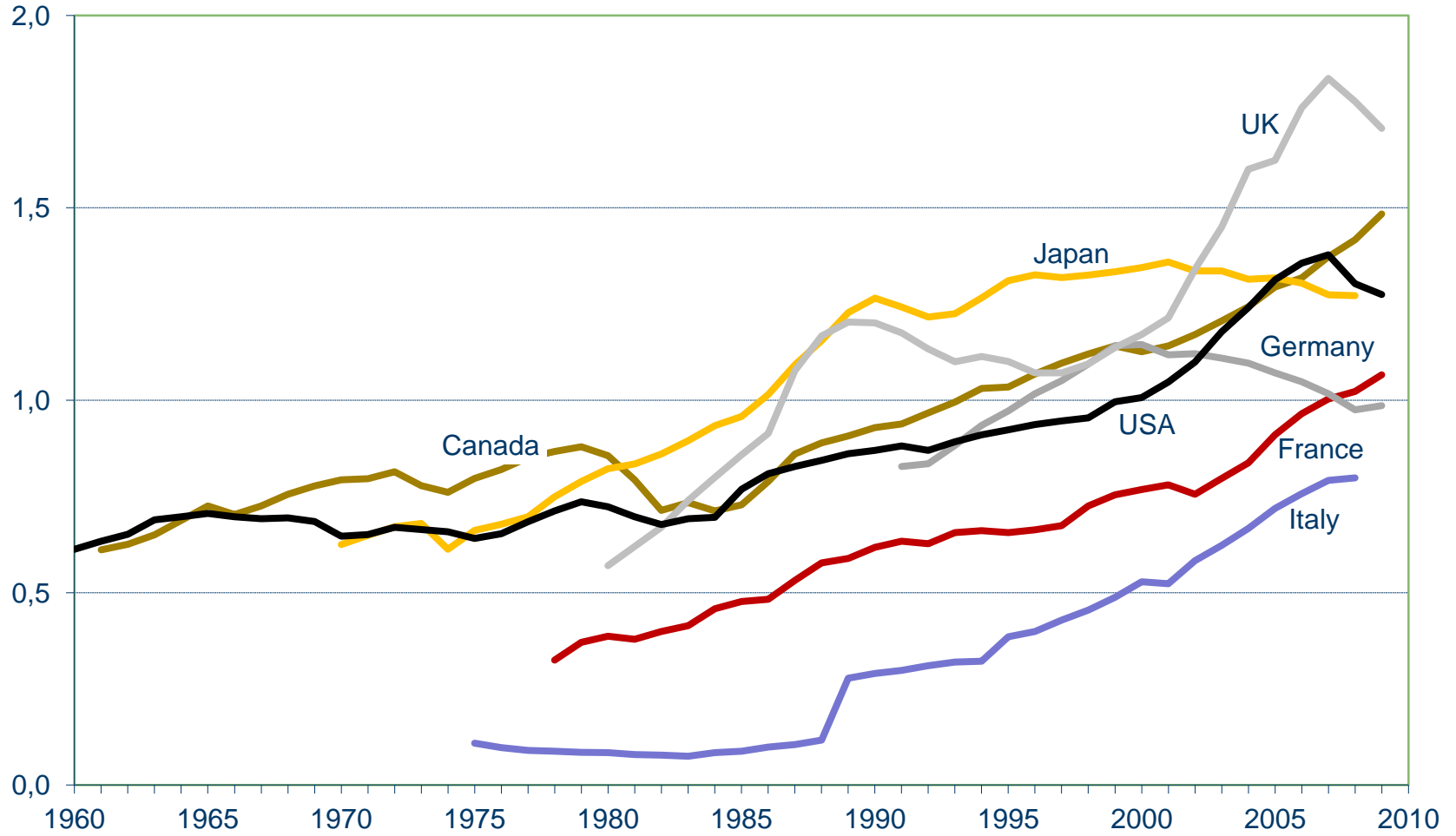




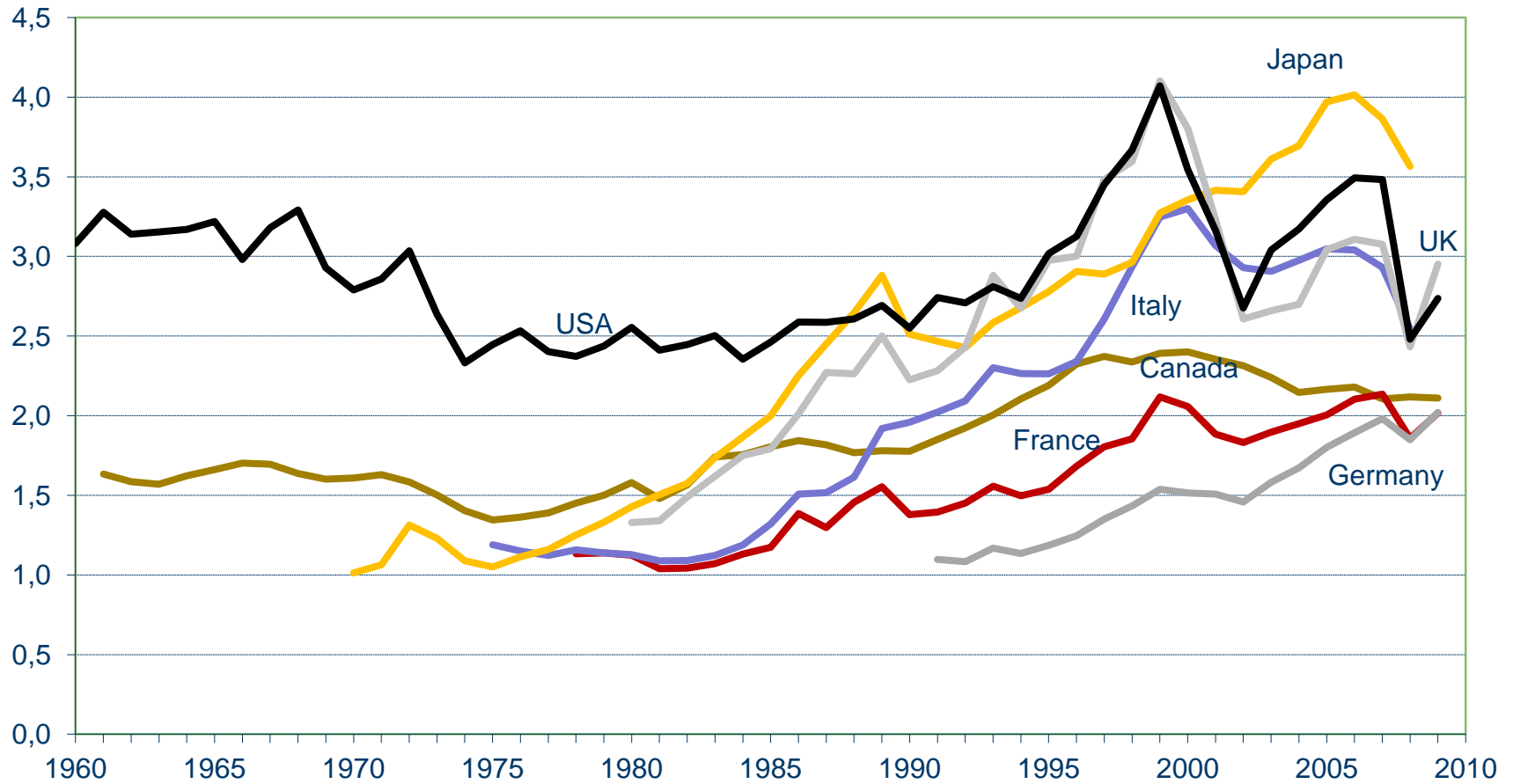
# Gross financial assets - income ratio



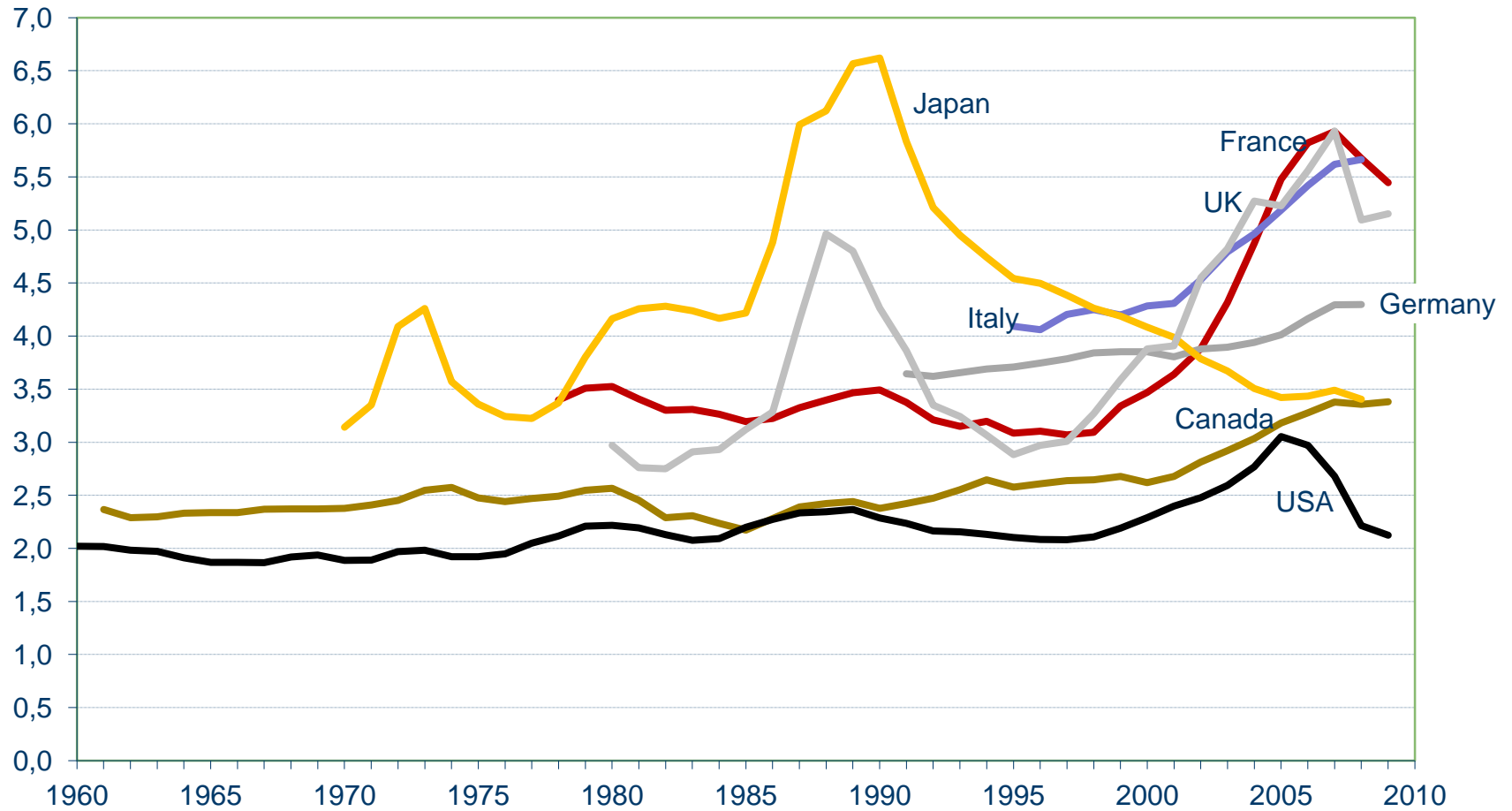
# Household debt-income ratio in G7 countries



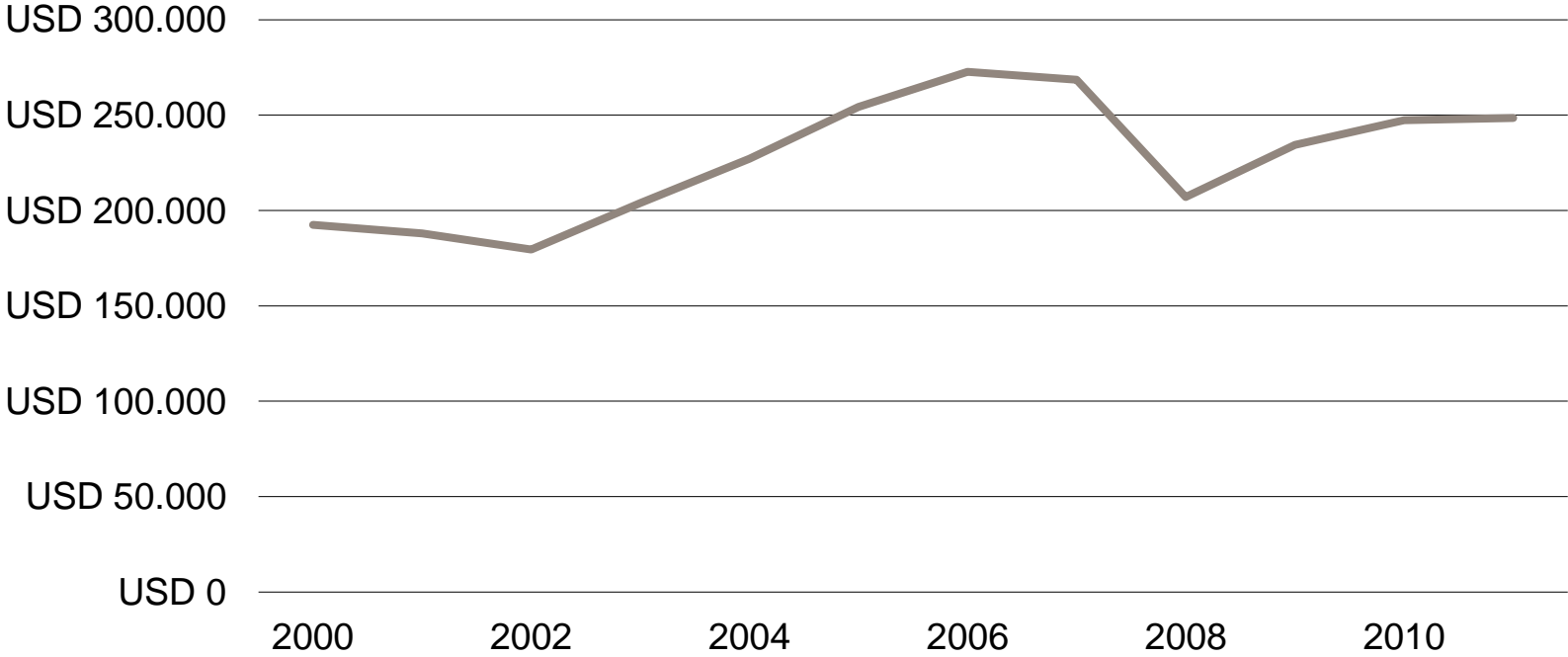
# Household net financial wealth - income ratio



# Real assets-income ratio in G7 countries



# Wealth per adult – USA



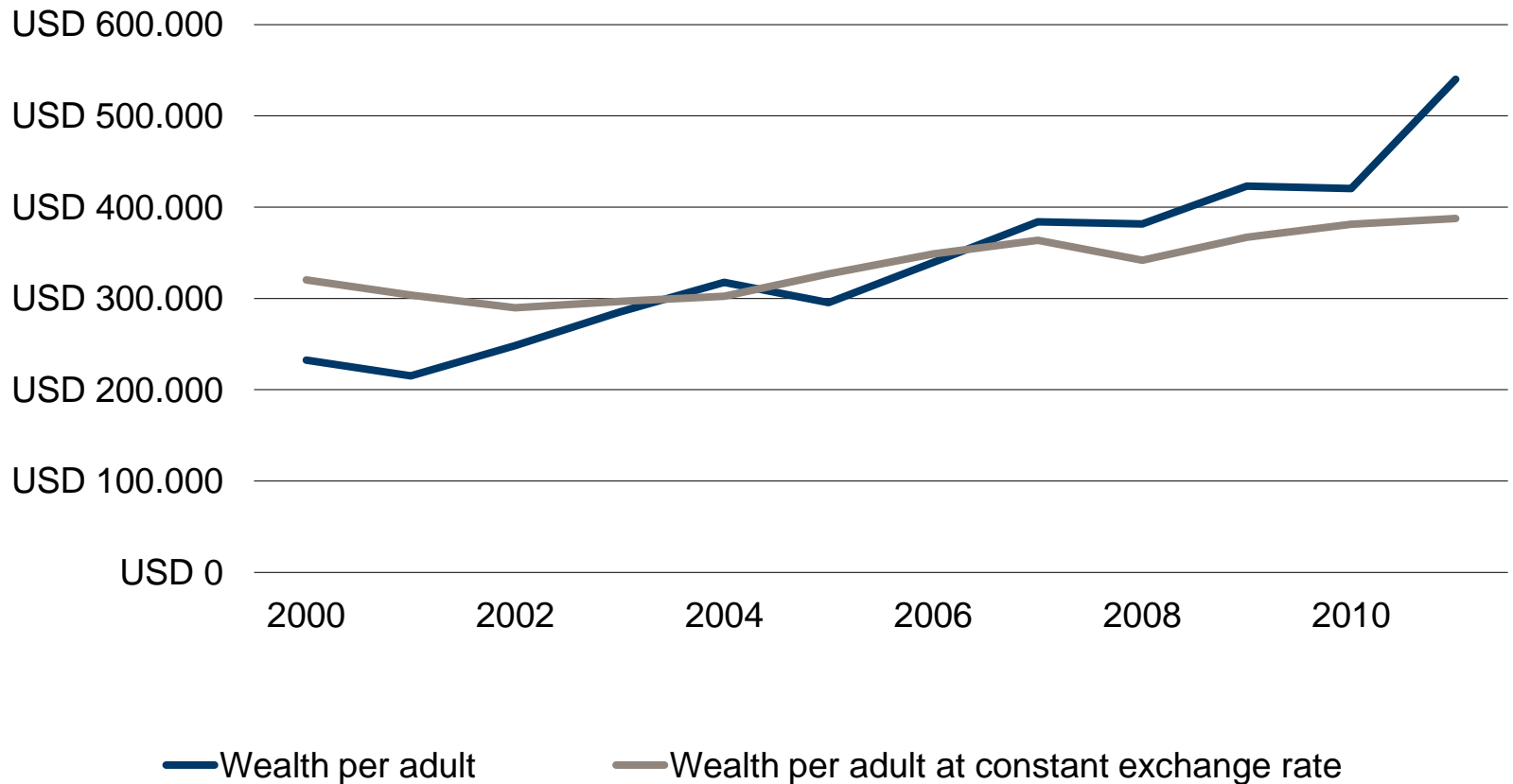
# Wealth per adult – Japan



# Wealth per adult – China

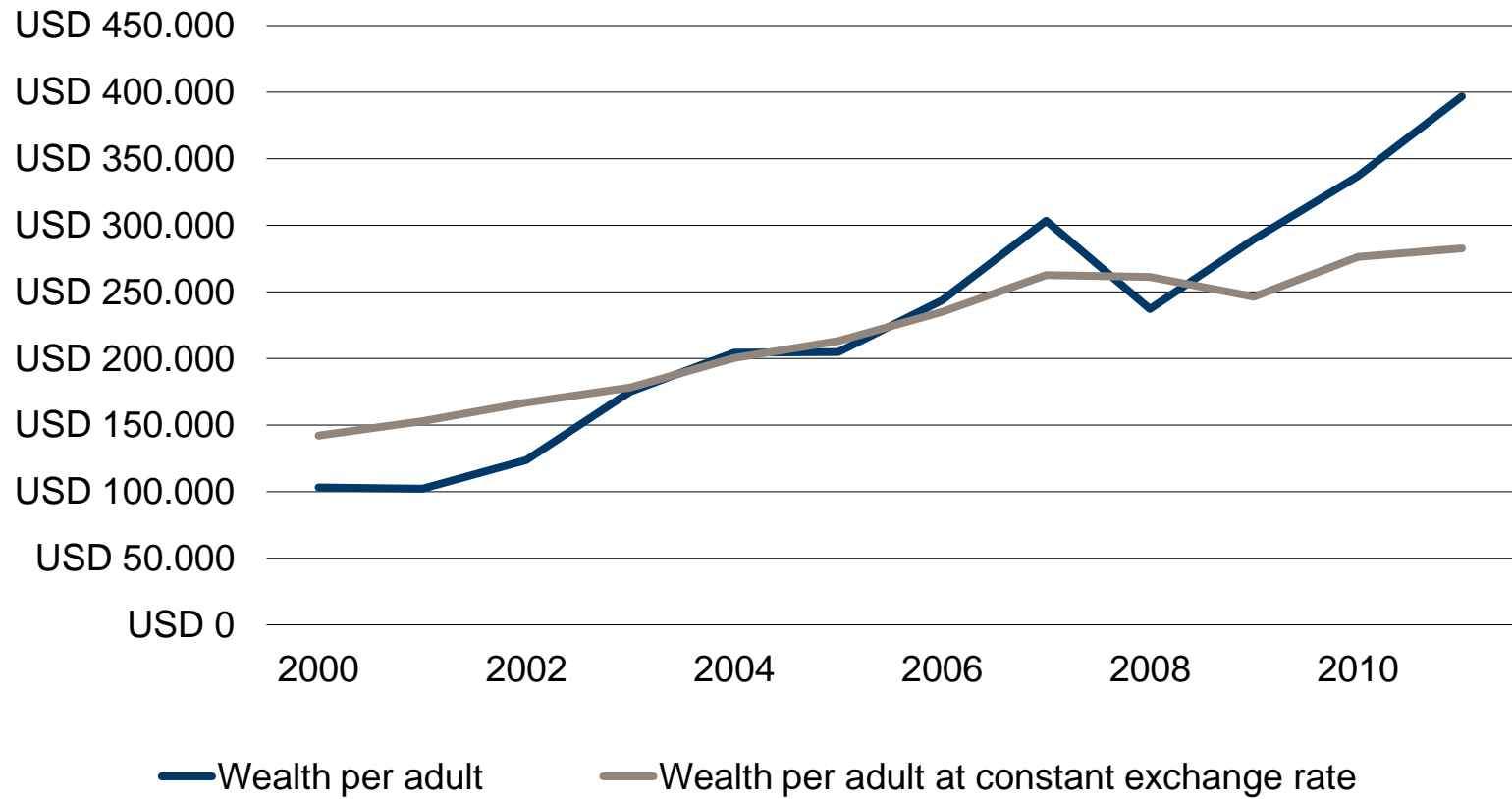


# Wealth per adult – Switzerland

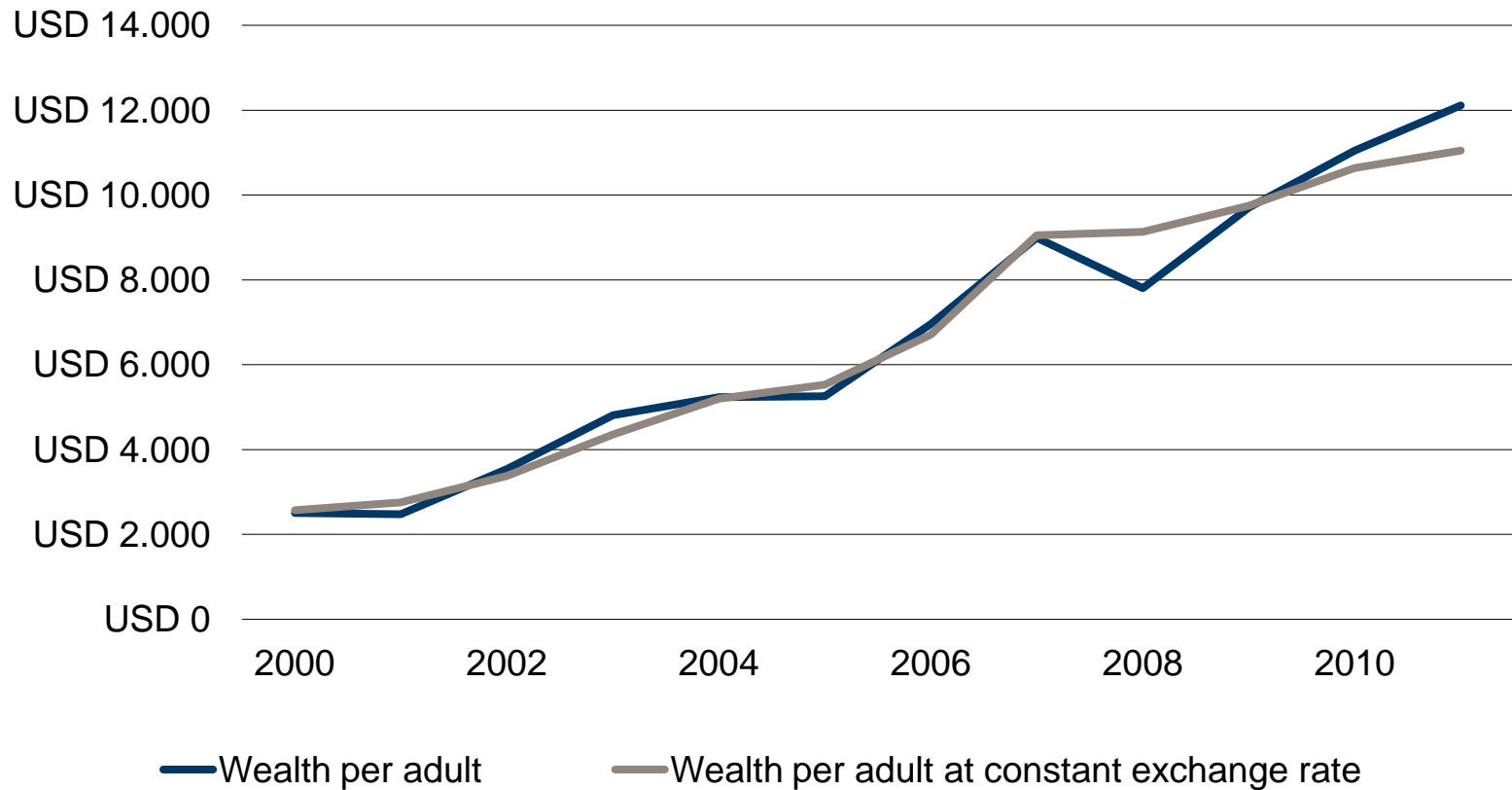




# Wealth per adult – Australia



# Wealth per adult – Indonesia



# Conclusions: Regions

- Wealth geographically concentrated
  - North America, Europe, Rich Asia-Pacific
- China: wealth rising rapidly, population moving into higher global deciles
- India: wealth rising but highly polarized, move into higher global deciles weaker than China's
- Latin America: microcosm of world as a whole?
- Africa: low wealth/income in many countries

# Conclusions: wealth structure and inequality

- Financial/Non-Financial Assets Ratio
  - 0.67 for bottom 80% of countries
  - 1.27 for top 20%
  - Still relatively low in emerging market countries
- World wealth highly unequal
  - Shares of top 1, 5, 10%: 44.2, 71.6, 84.3%
  - Gini coefficient = 0.893

# Conclusions: Long-run trends

- Wealth/disposable income ratio:
  - US: in range (4,5) for most of last 100 years, brief departures
  - France, UK: now  $\approx 8$ , up from 3 in 1950 (FR), 4 in 1980 (UK)
  - Upward trend across G7 since 1985, large fluctuations except in Canada, Germany
- Financial Assets/Income:  $\uparrow$  1980-2000, little trend since 2000
- Debt/Income:  $\uparrow$  1980-2007, except  $\downarrow$  since 2000 in Japan Germany