Works Cited

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> Explanations of labor, income, and wealth inequality, and deeper mathematical analysis of the second law of capitalism (Solow growth) and Pareto inequality with power functions, as well as the relevant parameters that affect the latter.

Introduction

"Democracy can regain control over capitalism and ensure that the general interest takes precedence over private interests, while preserving economic openness and avoiding protectionist and nationalist reactions" (1).

Malthus, Young, and the French Revolution:

Malthus predicts an apocalypse where everyone succumbs to chaos and misery and starvation because of overpopulation. End all welfare to the poor and discourage them from reproducing.

This does not take into account the effect of technology, but has a great legacy or at least similar views today. Today we also consider the actual quality of life e.g. Americans' high energy usage.

Ricardo: The Principle of Scarcity

When population and output grow, so does the price of land. Landlords hoard more and more wealth, thus upsetting society.

Marx: The Principle of Infinite Accumulation

When the growth of capital exceeds output and labor, capitalists begin to hoard wealth and progress society further towards violent conflict: either by capitalists fighting over limited wealth, or workers united against capitalists in a runaway inegalitarian society.

Kuznets: "Fairy Tale"

Kuznets observes inequality of industrial society over time and finds that it rises in the beginning with the advent of machinery and factories, and then drops because everyone reaps the fruits of industry.

However, this was mostly based on the rise in inequality which stabilized in 1870-1900, and then began to drop as a result of the World Wars, not because of true economic forces.

Combined with Solow's balanced growth model which advocates that societies tend towards a stable rate of economic growth, this presents a limited, optimistic view of the world economy.

Major Results

"The history of the distribution of wealth has always been deeply political, and it cannot be reduced to purely economic mechanisms" (20).

"Powerful mechanisms pushing alternately toward convergence and divergence...there is no force to prevent destabilizing, inegalitarian forces from prevailing permanently" (21).

The "rising human capital hypothesis": technology over time leads to greater value in human capital and hence, the triumph of meritocracy.

Forces of Divergence

Top earners, like managers of large firms, can often set their own remuneration and separate themselves from others by accumulating large amounts of capital.

Income inequality has risen greatly starting in the 70s, which in The Intelligent Investor, was attributed to inflation and great investment in stocks and mutual funds. Piketty mentions a steady, stable rate of growth. Private capital/national income ratio rose greatly in this period too.

The inequality: $r > g$, where r represents return on capital, profits, dividends, other income from capital, etc., and g represents the rate of growth of the economy.

Inherited wealth can easily outgrow the rate of growth of the economy, because people can save more and earn more with more capital, which drives society to great inequality.

Income and Output

A large problem in economics is the distribution of profit between workers and owners.
Inequality of wealth and return on capital always outpaces inequality of income.

In the grand scheme of 20th century history, economic policies were liberal after the destruction of WW2, where capital's share of income was low, which was reversed by the conservative revolution of Thatcher and Reagan. Globalization and deregulation followed.

National Income

National income is the sum of all income available to residents of a country.
GDP is the sum of all products and goods transactions in a country.

NI = GDP - depreciation (wear and tear on buildings, machinery, etc) + net income from abroad
GDP - depreciation = net domestic product or domestic output.
Global income = global output

National income = capital income + labor income

Capital is all nonhuman assets that can be exchanged on a market, which includes money, property, machinery, etc.

Private and public (government) capital. Also “moral” persons are organizations such as foundations and churches.

National wealth/capital is the total market value of everything owned by people and the government, so all nonfinancial assets (land, inventory, buildings, etc), financial assets (bank accounts, stocks, bonds, options, insurance policies, etc), minus debts and liabilities.

National wealth = private wealth + public wealth = domestic capital + net foreign capital
Domestic capital is held within a nation, while net foreign capital/net foreign assets are the difference of citizens’ capital living abroad and foreign citizens living in the country.

β = capital / income, a ratio. It can be as high as 5-6 in highly unequal countries or slightly negative in poorer ones.

The First Fundamental Law of Capitalism

$\alpha = r * \beta$,
Where α = share of income from capital in national income,
And r is the rate of return on capital.

The Global Distribution of Output

The Industrial Revolution saw GDP per capita in Europe and America rise from 150% world average in 1700 all the way to 250% in 1990, and then falls off with the diffusion of industrial techniques/technology. It is lowering in 2010.

Europe and Americas can be broken down into a hyperdeveloped core and a less developed periphery.

Purchasing power parity is a better measure of comparing wealth between countries. It takes book exchange rates and factors in market values, price levels, etc. Certain types of goods can have different PPP (greater energy purchasing power in US, healthcare power greater in Europe).

Furthermore, GDP increases under PPP measure. For example, in Africa and Asia, prices are halved, so PPP doubles, since the same amount of money buys more products.

The Global Distribution of Income Is More Unequal Than the Distribution of Output

On a national or global level, countries with the highest per capita output are more likely own capital of other countries, and receive a positive flow of income from capital in poorer countries. They produce more at home and invest more abroad.

Most continents are in equilibrium, except Africa, where foreigners own 20% of African capital, and derive income from capital from abroad, hence Africa has a net negative foreign capital/cash flow.

What Forces Favor Convergence?

One conjecture of foreign investment: it becomes more difficult to gain more income indefinitely (the marginal productivity of capital, the stage at which additional output due to adding more capital begins to drop), so wealthy countries should invest in foreign ones. Wealth countries gain more return on capital, while poorer ones will increase productivity, thus “closing the gap”.

This can only ensure equilibrium of output, which does not translate to a higher quality of life (income per head). Poor countries have much more benefitted from free trade of goods, not free flow of capital.

Furthermore, large foreign ownership triggers a cycle of revolutionary, corrupt coups, and property protecting governments.

Growth: Illusions and Realities

Total growth i.e. global output can always be decomposed into population growth and per capita output growth. Real economic growth does not always translate to an increase in quality of life.

The Law of Cumulative Growth: Much as how an annual saving rate compounded over time results in a great increase of wealth, a stable annual growth rate of output creates considerable progress.

Extended to this thesis, a small gap between return on capital and the rate of growth results in great inequality.

Demographic Transition Review: Societies increase in birth rates and lower mortality, resulting in population booms, then birth rates drop due to education and the lack of need to replace people, with the increase in life expectancy no longer compensating enough for falling birth rates, resulting in lower population growth. We are currently at the end of this transition with future growth rates expected to stagnate, which can be influenced by culture and education.

Population growth can increase equality. Strong demographic growth leads to higher output per head, thus it is better to rely on one’s own labors rather than inherited money. Economic stagnation and low growth leads to the opposite — reliance on inherited wealth.

The Stages of Economic Growth

Increase in purchasing power does not always correlate to the same increase in exact value. The gain in PPP in Europe was a result of people replacing food purchases with a diverse set of purchases. In the long run, prices may change drastically and not reflect real purchasing power.

Industrial production has always increased faster than the economy as a whole, so prices of these goods have fallen. Food production has evolved at roughly the same rate, but lesser people are employed in agriculture. Productivity growth in service is low, so these prices have increased.

Example: a computer has decreased half in price for a fivefold performance multiplier, hence its PPP increase is tenfold.

People move away from agriculture and manufacturing to services. Public services are counted as cost to the taxpayer.

An Annual Growth of 1 Percent Implies Major Social Change

This same 1% rate was achieved in Europe, North America, and Japan from 1980-2010. In this period, many technological changes like cell phones and the Internet dramatically changed the quality of life in these areas, as well as medical advances, communication, transportation, health, and education.

People became used to the rapid economic growth in the Trente Glorieuses, the period from 1945 to 1975, where the average per capita output growth rate was 5%. This is unsustainable in modern society and led to great consumerism and environmental ruin. This slowdown combined with the rise of German and Japanese industry fueled the “conservative revolution”, which influences policy today. Piketty argues however, that neither post-war state intervention or economic liberalization affected the actual rate of growth.

Piketty predicts that we are at the end of the growth bell curve, where most growth in the future will be in developing countries and the distribution of output will be equal.

The Dynamics of the Capital/Income Ratio

In Britain, value of national capital shifted from primarily agriculture to housing and other domestic capital, such as business and financial capital. Net foreign capital went down due to decolonization. The capital/income ratio as a whole stayed at 700%, went down dramatically during WWI, and continued to steadily rise after WWII.

National capital = farmland + housing + other domestic capital (capital of firms & government) + net foreign capital

Farm land -> housing & industrial and financial assets

Large net positions in foreign capital/assets allowed colonial powers like Britain and France to run trade deficits, where goods were shipped into these powers.

Net public wealth (includes minus public debt) is very small compared to net private wealth. Britain and France racked up great public debt due to spending on wars. Investing in public debt is good for business for wealthy people and their heirs. Britain eventually paid off the debt with a century of budget surpluses. Inflation is low when governments borrow instead of print.

In France, debt was paid off by inflation, since “debt was drowned by inflation and repaid with money of decreasing value” (132).

Keynes and others argue that inflation can be used a simple, possibly unjust method to reduce debt and the influence of private, accumulated wealth.

Inequality is an important issue in the public/private wealth balance. Also, “Ricardian equivalence” is a conjecture that public debt does not influence private capital accumulation, which is wrong since a small minority of people hold government debt and gain returns on it.

Over the course of history, the state has expanded economically into fields that require large initial investments for the public good, like health, education, and transportation. After WWII, public investment grew in the period 1950-1980, until waves of privatization.

The Great Depression deeply shook faith in laissez-faire style economies in favor of various types of government intervention: all the way from strong regulation to a mixed public-private economy to economic statism/socialism.

After the Trente Glorieuses, the memory of the Great Depression faded, and stagflation, low economic growth combined with high inflation and unemployment, questioned the postwar Keynesian consensus, the idea that government needs to intervene its economy.

In Germany, the overall trajectory is similar to Britain and France, with the same shift in capital a well as the state ownership in 1950-1980, which continues today, among a wave of privatization.

“Rhenish capitalism” or “the stakeholder model” is the idea that firms can be owned by both shareholders and other interested parties called “stakeholders”, which may be organizations like representatives of labor.

The drop in national capital during 1913-1950 can be explained not just by war but also by budgetary and political shocks, regulation, and low asset prices for rebuilding after wars. Furthermore, national saving combined with high inflation reduced the power of large, accumulated capital.

America's Capital and Income

America's capital to income ratio was much more stable in the same time period, mostly due to its lack of involvement in the world wars; however, it still accumulated great public debt. It also had a small, balanced or slightly negative net foreign capital account, which rose to a limited amount during the World Wars since Americans financed the belligerents.

Furthermore, America was much more equal since most immigrants did not bring their nonfinancial over, and housing and farmland were much cheaper.

During WWII, Europe suffered greatly and capitalistic systems were broken down or regulated. Eventually, capital became great and influential again, owing to the demographic shift such that inherited wealth and return on capital was comparable to the economy's growth rate.

As stated before, Europeans relied on colonial empires (a net positive foreign account) to finance net negative trade deficits, where goods were shipped into Europe, improving its quality of life. "US investments abroad continued to yield a far better return than the nation paid on its foreign-held debt — such is the privilege due to confidence in the dollar. This made it possible to limit the degradation of the negative US position" (156), which amounted to 10-20%, starting to rise in the 1990s.

The Canadian position was a much different trajectory owing to large foreign investment and ownership abroad and good relations with the UK. Largely political reasons, not just economic ones, contributed to this.

The importance of slavery: in the US, 40% of the population in the South were slaves, and as a result, the South had a capital to income of 700%, and slaves accounted for 1.5 years of national income, out of 500% (5 years).

The United States was composed of "two diametrically opposed realities" (161): the egalitarian North, which land and housing were cheap, and immigrants create their own capital instead of inheriting it; whereas the South crowned slave capital king, and enforced a harsh, brutal economic system and society onto half of the population. The latter affected the development (as Piketty quips, "nondevelopment") of the US welfare state.

The Dynamics of the Capital/Income Ratio

The Second Fundamental Law of Capital:

$\beta = s / g$

Where s is the savings rate,
And g is the growth rate.
This law is only achieved in long-term equilibrium, and focuses on forms of capital that humans can accumulate i.e. not natural resources.

Alternatively, in the well-known Solow growth model, this is equivalent to
$\beta = s' / (n' + g' + d')$
where $g = n' + g'$ (total growth)
and $s = s' - d' * K / Y$ (the "investment rate net of depreciation")

Review:
Overall growth rate = per capita growth rate + demographic growth rate

Corollary of this law: a country that saves a lot and grows slowly will accumulate great amounts of capital. The later stages of demographic growth contributed to lower overall growth and hence a disproportionate importance of capital and inherited wealth.

Equilibrium corollary: a savings rate will cause capital stock to grow at a rate faster or slower than income, which means capital stock tends to a ratio compared to income.

Capital/income ratio has been rising in all developed countries. While short-term economic issues like stock prices, real estate prices, bubbles and meltdowns affect capital greatly in the short term, the general pattern of capital/income heading higher and higher continues long-term because of a low growth rate (and low demographic growth rate).

Private saving directly involves either individuals saving their own disposable income, or firms saving their own capital (and possibly reinvesting it, which is retained capital).

The income in capital/income can be national or disposable. The gap is mostly services, "transfers in kind", like health and education financed by taxes, which would otherwise be funded privately.

Along with the second law of capitalism, privatization of wealth and the "catch-up" of asset prices in the long-term.

Privatization of Wealth

The proportion of public capital in national capital dropped greatly, as waves of privatization swept all of the major industrial powers in the 1970s and 1980s, and even greater and more extreme in the former Soviet bloc.

In Italy, one great example, governments shifted from using tax to pay public deficits to using government bonds, which enrich private capital but not national wealth.

Rebound of Asset Prices

Asset prices for real estate, stocks, etc. fell greatly because of WWII, and rebounded in the next decades, as rent control, regulation, and political climate changed to favor business.

The accounting value of a firm, also called book value, net assets, or own capital, is the value of all assets included in a firm's balance sheet, minus debt.

Tobin's Q, the ratio between market and book value of corporations, has risen in rich countries since the 1970s-1980s. This varies greatly per country and stock since the difference is generated when financial analysts speculate over the true value of a stock, as well as cyclical economic movements. It is also in part influenced by politics, such that US-UK firms may under represent a portion of their assets, while in Germany and Japan, stakeholders, such as workers' unions, government representatives, consumer advocates, etc., may negotiate for concessions that undermine the market value of a company.

The logic of the second law of capitalism can give rise to great inequality and capital imbalances, such as in Japan around 1990, which can lead to massive, disruptive societal and political change.

Financialization of the economy is the shift of capital such that assets and liabilities in all "sectors" (households, corporations, government agencies) increased more rapidly than net wealth.

Piketty predicts in the 21st century that the capital/income ratio will continue to rise and approach equilibrium at a very high, socially disruptive level, due to the factors described previously, mainly the dynamics of the $\beta = s / g$ law.

The Capital-Labor Split in the Twenty-First Century

The capital labor ratio is the portion of total income created from investing capital over the total, including the money spent on labor and the income that workers derive.

The pure rate of return represents a long-term societal average of how much people create from their capital.

The limited liability corporation (LLC) was a great boon for business and economic records since people could separate themselves from their companies. Data for the rate of return on partnerships and sole proprietorships is approximated with the average r.

Furthermore, the current rate of return measure used is lower because of the idea of financial management being counted as labor, and is pre-tax real rates of return.

Real assets, such as real estate and stocks, rise appropriately with consumer prices. Nominal assets, however, are subject to misrepresentation and inflation devaluation. As discussed before, inflation can be an arbitrary force for good and bad, and the distribution of wealth.

Capital growth rate is determined by the level of technology and productivity, as well as the capital stock. Review: the marginal productivity of capital is the amount of additional output for every unit of capital added at the end.

Financial intermediation is the process by which banks and firms find the best use for capital, which can fluctuate and be speculative and wrong.

Diminishing returns is the idea that capital becomes less and less productive per unit as more units are added.

A production function or curve represents the technological and economic productivity of an economy, where the elasticity of capital and labor is a unit that represents the ability of a society to substitute capital and labor with each other for a certain amount of output.

Corollaries: an elasticity of zero implies no gain whatsoever from adding capital or labor to a production; an infinite elasticity implies an infinite availability of opportunity to add new capital to achieve the same return.

Revisiting the first law of capitalism, based on historical data, alpha and beta followed the same U-shape pattern, suggesting that when beta increases, r decreases as a slower rate proportionately (an elasticity of 1?).

Piketty argues that the Cobb-Douglas production function is flawed because it relies on a model of constant capital/labor split.

The elasticity of substitution of capital and labor rises in the future along with alpha and beta. This reflects a greater return from capital which has more uses in a functioning, stable, ever richer and technologically advanced society.

There are lots of short-term and medium-term changes in the capital/income ratio as exemplified by the variations in French profit share in value added, and housing rent in national income percentage, which experienced great shocks in the World Wars, the Great Depression, and around 1975.

“There is no natural force that inevitably reduces the importance of capital and of income flowing from ownership of capital over the course of history” (234). This ties into the limited significance of human capital being touted as a benevolent force for egalitarian meritocracy.

Inequality and Concentration: Preliminary Bearings

Inequality is measured by the addition of inequality of income from labor and inequality of income from capital. Furthermore, the link between these two factors is measured as a correlation: how does the first income affect the second? Inequality of income from capital can actually be greater than inequality of income itself. These are differentiated between since they can have different causes and moral implications.

The inequality of capital is always greater than the inequality of labor. The top decile owns 25-30% of labor income but 50% of total capital, whereas the bottom half of laborers own almost no wealth, around 5%.

Piketty creates the three classes: upper class (top decile), middle class (middle 40%), and lower class (bottom 50%). See Table 7.1 (247) for a breakdown of the relative magnitudes. For example, in present-day America, the top 10% own 35% of labor income, and the 1% own 12%; this implies the top decile earned 3.5 times the average wage, while the top centile earned 12 times more. These same two groups owned 70% and 35% of total capital, which implies they own 7 and 35 times the average net worth per person, respectively. The Gini index, a "synthetic" country-wide index, valued between 0 and 1 where larger values represent more inequality in general, was 0.36 for labor and 0.73 for capital.

The Gini coefficient is flawed because it attempts to summarize a whole multivariable distribution with a single, abstract number. Piketty uses shares of income or multipliers of average income to show how the equality of certain societies.

Social tables were used in the past, similar to distribution tables, to compare various different social groups' incomes and wealth, which can be more socially and politically charged.

A Simple Case: The Reduction of Inequality in France in the 20th Century

Inequality of labor and capital has fallen greatly since pre-1945 due to the "fall of the rentier" and the collapse of very high income/capital of the top decile from 45%-50% to 30%-35%, while wage inequality has remained the same, with the top decile of wages earning a near constant 25%. The top percentile has followed the same trend, from 20% to 10%.

Furthermore, no economically determinist policy alone can explain this drop i.e. the Kuznets curve — the history of inequality is fundamentally chaotic and political, with wide variations due to war, social upheaval, regime change, etc.

The composition of top incomes in France suggest that for the P90-95 range, labor income is the majority, while heading towards the P99.5 range, the share of capital income rises dramatically; this shifted towards labor such that even split between labor and capital income moved towards P99.9. These labor-capital income splits can be underestimated in favor of labor because of tax havens, tax evasion, underreporting, etc.

Rentiers are a class of people who can afford live off of income from capital such capital gains and dividends. Managers are people who are in the top decile and earn the vast majority of their income from management labor; these managers are relatively spread out by profession. Professional workers make up some of this well-to-do class.

“In wartime, economic activity decreases, inflation increases, and real wages and purchasing power begin to fall” (287). The World Wars were great force for equality as income from capital collapsed and wage inequality was compressed, which was greatly corrected by post-War reconstruction and investment.

The capital-labor split tends to move in the same direction as inequality in income from labor.

In France, reconstruction led to the rise of inequality and sharp rises in capital’s share of income and wage inequality. Charles de Gaulle signed the Grenelle Accord, increasing minimum wage, which was indexed to the mean wage. This was dropped by the Socialist government in the early 1980s, which led to a freezing of wages, a great rise in the share of profits in national income, and obviously greater wage inequality.

Similarly in America, wage inequality and a rise in capital’s share of income was due to stock market bubbles and large capital gains.

Piketty argues that this concentration of wealth and wage inequality caused the financial recession. The lower classes’ wages stagnated and the real wages grew slowly, at the rate of a mere 0.5% annually. This led to a poor, often indebted lower class which led to households taking on risky debt, with investor offering even riskier credit.

The supercompression during WWII caused the top decile’s income to dramatically decrease, however, this rebounded with the advent of managers and supersalaries, which are often decided by themselves at the mercy of a firm and its wage workers.

Inequality of Labor Income

Most of this inequality can be explained due to the “race” between education and technology. Greater technological progress and diffusion allow workers to be more productive, provided they are educated with the skills needed. This creates a supply and demand for various skills in the macroeconomic sense, with smaller, in-group differences attributed to education diffusion and social grouping. The wage gap widened while the increase in college graduates slowed in the US during the 1980s.

“The best way to reduce inequalities with respect to labor as well as to increase the average productivity of the labor force and the overall growth of the economy is surely to invest in education” (306-307). Furthermore, Piketty argues that greater access to skill set and professional training, and advanced educational opportunities would increase wages for the lower and middle classes. A fivefold and tenfold increase in wages cannot be enforced by minimum wage but only by education and technology.

The theoretical model such that a worker's wages is equal to their utilitarian marginal production to society is flawed and does not factor in in-group variations as well as the general societal benefit (income dedicated to health, culture, and education) resulting from one's labor.

Minimum wage is a key factor in current inequality, because it tends to follow inequality, specifically, the gap between lower class wages and the average wage. The actual purchasing power of the US minimum wage has gone down from $10 in 1970 (2013 dollars) to $7.25. In France, it rose greatly in the 70s, and was frozen in the 1980s, but continued to follow inflation indices.

Piketty argues that the minimum wage, other than being a factor in countries' income inequality, incentives workers to commit to job and organizational training with the reward of a livable, stable, and monthly wage. Furthermore, an employer that has a competitive advantage in hiring in a certain area (such a monopoly of sorts is called a "monopsony") will be forced to pay workers decent wages.

In conclusion, wage increases need to follow productivity. It is not viable to increase wages faster than the growth of production, but it is highly inegalitarian to keep wages stagnant.

Piketty notices a pattern in the rise of income inequality: in Anglo-Saxon countries, namely the US, UK, Canada, and Australia, wages for top supermanagers skyrocketed, resulting in an increase in the top percentile's share of income as well as income inequality in general, while noting this phenomenon did not take place in similarly rich, developed, and technologically advanced countries.

While data is limited for emerging economies, Piketty's compiled data shows that income inequality is great and comparable to many developed nations, but still lower than that of the modern-day US. One case that stands is China due to its communist wages and entire lack of private capital; free market reforms led to a greater gap in income inequality.

Other than poor recordkeeping, the income records of developing economies are damaged by the advent of computerized records (also seen in developed countries), as well as "black hole growth", which is the discrepancy between often inflated production statistics and deflated household income surveys.

The Illusion of Marginal Productivity

For normal income earners, the idea of marginal productivity works in determining a fair wage: the direct marginal output of one's labor translates to income. However, supermanagers complicate this model and have a great effect on the earnings and capital of the top decile.

To introduce managers and attempt to determine their wages introduces the problem of "imperfect information" between them and the company. Their jobs are unique, as Piketty states, "the very notion of 'individual marginal productivity' becomes hard to define" (331). Much like as in society, the extravagant wages of a small minority can affect wages for the rest of the group.

Supermanagers are unique also in that their wages are often set by themselves, or executive committees (corporate compensation committees), and are dependent more on a manager's hierarchical relationships and relative bargaining power. Furthermore, corporate practice can be influenced by a state's various tax policies, regulations, and institutions; the "conservative revolution" is an example of public policy that directly correlated with the rise of supermanagers and their wages.

"In any case, the extremely generous rewards meted out to top managers can be a powerful force for divergence of the wealth distribution" (334).

These rewards often do not correlate at all with the actual performance of a company. This system of supermanagers and politicians and interest groups creates a revolving door full of various coinciding interests. Supermanagers become rich and accumulate wealth and power through their companies; in turn, they influence interest groups, influential friends, and think tanks, which control tax laws and subsequently reduce the top marginal income tax rate (the top rate for currency taxed after a certain threshold). Also, the cultural factor of "extreme meritocracy" leads to the idolization of winners and a justification of their large wages.

Inequality of Capital Ownership

As stated before, the concentration of wealth is always greater than that of income. Inequality was greatly reduced in WWII due to the collapse of high incomes from capital (supposedly from direct loss and destruction of capital).

Direct data about wealth comes from various sources. In France, a uniform estate tax (1-2%) and property records allowed for uniform data since the French Revolution. In the UK, the tax reform of 1894 unified various types of financial assets taxes. In the United States, an income tax was established in 1916.

Up to WWI, in France, Britain, and Sweden, wealth concentrated slowly, with the top decile owned 80-90% of wealth, while the top centile owned 60-70%. Wealth has not risen back to this level since the 1914-1945 shocks, which is kept in check by a "patrimonial middle class" that owns a third of the wealth. America initially started out more egalitarian due to the low capital of immigrants, but did not suffer as greatly in the World Wars, so the US is more inegalitarian than Europe today. (Piketty shows Americans "arguing that inequality is a prerequisite of entrepreneurial dynamism and decrying Europe as a sanctuary of Soviet-style egalitarianism" (348).) Such a dynamic with income generates the different "nostalgic" ideas among these two continents: in Europe, people long for the Trente Glorieuses, and the "heyday of state interventionism" (350); while in America, people feel similarly about the romantic Revolutionary era and the fight against government overreach and regulation.

The Mechanism of Wealth Divergence: r versus g in History

The fundamental mechanism in capital inequality is the fact that the return rate r has always been greater than the growth rate g. "Wealth accumulated in the past is recapitalized much more quickly than the economy grows, even when there is no income from labor" (351). This implies that an economy can stagnate and its output slowing down would actually increase the income concentration at the very top (an "inheritance society"). The pure rate of return r is highly correlated with capital's share of income alpha.

The wartime shocks created a heavily regulated and statist political climate, which led to large progressive taxes, and rapid growth and reconstruction. This period was one of relative egalitarianism, which would be offset in the future by the conservative revolution. Public policy and institutions, therefore, can play a strong role in regulating the balance between capital and labor.

The inequality $r > g$ has been true for most of history, since growth rates have been stagnant long before the Industrial Revolution and the rate of return on capital must be at least 4-5% in purely agricultural societies. The growth rate will return to low levels once society has finished its demographic transition and has reached a technological peak, where growth approaches 1%.

The idea of "time preference" is that an economic actor will be affected by a factor θ which characterizes how impatient they are i.e. a θ of 5% implies this actor will sacrifice 105 units in consumption tomorrow to consume an additional 100 units today. Corollary: people view sell off capital (as opposed to saving it) when the yield is low, lowering capital stock; a perfect capital market will save or dissave until equilibrium.

Is There an Equilibrium Distribution?

Societies do eventually approach an equilibrium such that if the capital/income ratio spirals out of control, then income from labor and output is low, so rates of return on capital begin to fall; however, this process may take decades.

Many developed societies eventually adopted equal inheritance over primogeniture as a force for egalitarianism. However, the rate of growth of shared fortunes still outpaces the growth of income from labor.

The distribution of wealth tends towards an equilibrium level of inequality which is an increasing function of the r-g gap. Obviously, the r-g gap measures the rate at which wealth from capital diverges from wealth from labor output. The long-term equilibrium distribution is a Pareto distribution (a power law function), where the coefficient (the degree of inequality) is a directly increasing function of the difference r-g.

Mathematical aside: the Pareto power function in the context of Pareto inequality is to introduce a heterogeneous model i.e. the observed distribution of wealth follows a function f(income) = percentage (see this mathematical explanation):

$$Pr[\,Income > y\,] = y^{-1/\eta}$$

Where η is the factor of Pareto inequality.
Using Piketty's literature, in Pareto and Piketty: The Macroeconomics of Top Income and Wealth Inequality (Jones, 2015), the author determines the constant of inequality to be

$$\eta = \frac{r - g - \tau - \alpha}{n + d}$$

Where r and g are still the rates of return of capital and growth rate of labor output,
tau is the tax rate,
alpha is the consumption rate,
n is the rate of population growth,
and d is the death rate.

Concretely, equipartition of estates did have an effect on the Pareto coefficient, which is still greatly influenced by the r-g gap.

Furthermore, if the r-g gap passes a certain threshold, then inequality will diverge forever, as the top capital holders choose to save indefinitely.

Piketty argues that Pareto's contributions are in using power laws to model wealth inequality especially at the high-income end of the spectrum, his anti-socialist bias led to a support of inequality equilibrium, which of course, could not be true, as it implies the distribution of wealth remains stagnant over time.

Why Inequality of Wealth Has Not Returned to the the Levels of the Past

Piketty argues the factors applied in the postwar years such as high progressive taxes and financial regulation and state intervention to greater equality and less concentration (i.e. a more egalitarian distribution) of wealth. Many states also nationalized their large industrial firms in the postwar years. The largest fortunes comprised of accumulated capital in the form of land and factories, as well as foreign accounts, like foreign debt in the Russian Empire.

Many governments began to pass income tax laws during the World Wars, which took a portion of saving out of the upper classes. The rise of the middle class compensates for loss in income, which means only the distribution, not the amount of wealth, changes. A progressive estate tax can reduce the top centile's share of wealth.

Merit and Inheritance in the Long Run

In a stagnating society with little overall growth, inherited wealth plays a greater role, and dominates saving within one's lifetime, and it grows even without labor.

The amount of inherited wealth closely follows the capital/income ratio beta; the former similarly fell greatly during the destruction of capital of the World Wars and subsequent regulation, and begins to rise in the 70s and during the conservative revolution, which inspired lower taxes in international business competition.

There are two ways to measure the flow of capital from one generation to the next: fiscal flow, derived from tax and inheritance data; and economic flow, projected from a nation's private capital stock.

This projected inherited economic flow is
$b_y = \mu \times m \times \beta$
where mu is the ratio of average wealth at death to average wealth of all living individuals,
m is the mortality rate,
and beta is still the capital/income ratio (alternatively, the ratio of private wealth).

Decreased mortality and longer lives do not necessarily lead to less inherited wealth. Longer lives mean that more wealth tends to accumulate, and gifts between living individuals become more important over time. Furthermore, the baby boom caused a great decrease in mortality rates due to the creation a large, young generation that stands to increase mortality in the next thirty years.

This catch-up of wealth over time to inherited generations can be summed up as the mu X m effect, where this rising ratio represents the annual rate of transmission by inheritance, or alternatively, the rate of estate devolution. The average age of decedents and inheritors were stable at around 3.3% between 1820 to 1920, rose gradually since the 1920s, are currently 80 and 50, and are projected to return to stability past 2040.

The World Wars caused a great destruction of capital, from which most older people could not recover from. This led to "reconstruction capitalism": the temporary economic boom generated from having to rebuild all aspects of society.

Inheritance Flows in the Twenty-First Century

Inheritance flow data is summed up as the annual value of bequests and gifts in units of national income. This fell from 24% at the height of the Belle Epoque, to a mere 4% after WWII, and has already began to recover and will return to its former level, dependent on the r-g gap. The rapid growth of the postwar years explains the lesser importance of inherited wealth.

The factor $\mu \times m$ is mostly constant and dependent only on the length of generation — lower mortality rates simply mean older people can gather more wealth, and attend more years of college, retire later, etc.

Stock of Inherited Wealth

Obviously, the flow of inheritance is directly correlated with the cumulative value of inherited wealth, which represented nearly 90% of total wealth of the living. This also follows the r-g gap.

The share of inheritance in total resources follows a 30 year gap from the flow of inheritance, owing to how people, on average, inherit from one generation at the age of 30 (when people inherit later, gifts become more important).

Living standards of the 1% inheritors were 25-30 than the total amount of resources available to the average person. This follows the r-g gap, unlike the resources for the top 1% of laborers, which has remained constant.

"A society in which income from inherited capital predominates over income from labor at the summit of the social hierarchy...two conditions must be satisfied. First, the capital stock, and, within it, the share of inherited capital, must be large...the second condition is that inherited wealth must be extremely concentrated" (410). Concentrated wealth, of course, leads to the inegalitarian spiral and its dominance over labor.

Piketty visits "meritocratic extremism" again in an aside. Before, he documented the Anglosphere exclusive tendency to reward supermanagers, citing their value and ability. He reaffirms that this excessive praise of winners and justification of their higher wages is dangerous and unsustainable for society. This attitude of the rich being more pious/intelligent is not new and reflects a constant need for the justification of inequality.

The Society of Petits Rentiers

The capital-income ratio has returned to the same levels of the Belle Epoque era, suggesting that wealth has returned to the forefront. However, there has been a great shift in the concentration of wealth owing to the previously discussed rise of a "patrimonial middle class". Larger estates have gone away over this period in favor of smaller, yet still greater than average, incomes and inheritances. This has led to a rise in the proportion of people (usually middle/upper class) receiving an inheritance greater than the lifetime earnings of a bottom 50% laborer.

The growing trend in the economics of a society divides labor and capital further. Managers are further and further removed from their own workers, and so are their sources of income. Also, perfect competition simply leads to rentiers finding the most efficient returns on their capital in ever more complicated financial markets and institutions.

The phenomenon of inherited wealth has been seen in other developed countries, such as the UK, Germany, and the US, with slight variations: in the UK, a low gift giving rate; in Germany, a higher rebound of inherited capital due to its great destruction and then accumulation in the postwar reconstruction; and in the US, a demographic lag leading to higher population growth than Europe and less importance in inherited wealth, which could be corrected by the end of the Baby Boomer generation.

Global Inequality of Wealth in the Twenty-First Century

The inequality of returns on capital can also lead to a great divergence in the concentration of capital. Greater amounts of capital create better stock/bond/savings options, allow for the hire of strong financial managers that can invest in higher-risk/foreign stocks.

Piketty has limited data on the possessions and capital flows of extremely wealthy people and he relies on Forbes' rankings — as discussed before, household surveys and government forms rarely capture an accurate and complete picture of total wealth. Similarly, so called "global wealth reports" can only obtain so much information, being run by individual banks or NGOs. Those at the very top earn 6-7% on average (real growth rate), while the average capital and income growth rates are 2.1% and 1.4% respectively.

The forces for divergence concentrate greatly at the top, amplified by the exponential r-g gap and can lead to a global accumulation and inegalitarian distribution of wealth.

Once again, Piketty revisits the justification of high wealth, noting previously that it is inegalitarian to have either wealthy heirs or wealth entrepreneurs i.e. neither inequality due to meritocracy nor inequality due to birth are justified. "A progressive annual tax on the largest fortunes worldwide...is the only way of democratically controlling [the divergence of wealth concentration] while preserving entrepreneurial dynamism and international economic openness" (444). Piketty notes that the skill or personality of a billionaire rarely coincides with their income and return on capital. Still, it is important then, to think about the general mathematical and structural laws that affect wealth and its accumulation.

Piketty attributes the rate of return on capital to true entrepreneurism, pure luck, and "outright theft".

The data for university endowments reveals a greater trend about the relation between a sum of capital and its return rate: larger endowments had greater annual returns, ceteris paribus. Note that neither university reputation nor alumni cash flow truly affect the majority of capital flow. The most prestigious Ivy Leagues had a 10% return rate on capital, while endowments greater than a billion (Berkeley) had 8%, and schools lower than half a billion had return rates around 6-7%.

Aside for investment: "If we look at the investment strategies of different universities, we find highly diversified portfolios at all levels, with a clear preference for US and foreign stocks and private sector bonds [with fewer (often low-yielding) government bonds]. The higher we go...the more often we find 'alternative investment strategies,' that is, very high yield investments such as shares in private equity funds and unlisted foreign stocks, hedge funds, derivatives, real estate, and raw materials" (449). The use of these "alternative" strategies increases in proportion of invested capital, with 10% of endowments less than 50 million euros, and rising linearly to 60% of endowments above 1 billion euros. This is the phenomenon of "economies of scale in portfolio management" (450). Furthermore, personal fortunes complicate over time and with globalization, with the advent of trust funds, charitable foundations, offshore accounts, etc.

Even inflation affects various economic classes differently. While lower classes often put money in savings accounts which barely outpace inflation, people with more to spare put their capital in a diversified portfolio of many assets; these assets also rise with inflation on top of their real growth value. However, Piketty disagrees with me, writing "in practice, the redistributions induced by inflation are always complex, multi-dimensional, and largely unpredictable and uncontrollable" (453).

A Social State for the Twenty-First Century

To review: a high saving and reinvestment rate leads to the accumulation of capital over time and generations, causing an "endless inegalitarian spiral" (471). A progressive wealth tax slows the saving rate and accumulation, and shifts capital into public hands.

The role of government greatly increased as a result of the World Wars. This shift towards financial regulation and direct government intervention led to the control of the Great Recession's possible damage, by "agreeing to create liquidity necessary to avoid the waves of bank failures that led the world to the brink of the abyss" (472). Piketty notes the important roles of banks in both causing and solving financial crises by providing lending services as the last financial resort of society.

Progressive income taxes rose greatly in the 20th century, but they were also made for the 20th century. High growth meant that labor income was the majority of total income, hence, it was heavily taxed (not necessarily to prevent the growth of large fortunes). A progressive capital tax effects great change in the distribution of wealth.

Governments collected more taxes (in units of national income) starting from WWI and rising gradually all the way to the 80s, where it began to stabilize. This reflects a shift from governments paying for "regalian" functions (base functions and issues inherent to government without argument: police, courts, army, foreign affairs, general administration, etc.) — then, to more social functions. Total taxes collected rose from 7-8% of national income to 55% in Sweden and 30% in the US.

In units of national income, health and education consumes 10-15%. Replacement incomes e.g. pensions and unemployment compensation, and transfer payments e.g. family allowances and guaranteed income, make up 10-20%. 2/3 of this proportion goes to pensions.

Modern Redistribution

"Social distinctions can only be based on common utility" (Declaration of the Rights of Man and Citizen). One of the fundamental problems in wealth distribution is the true need for entrepreneurial dynamism and financially guided innovation. The conservative revolution set about to achieve this competitive utopia by lowering taxes and loosening financial regulations.

The social systems that grew out of the French revolution, including the small 1-2% estate tax, intended to protect property rights. Further distinctions were made between the right to achieve economic equality vs. actual “forced” equality/equity and the improvement of real living conditions of the least advantaged.

Piketty argues that since the state needs to be effective before it can be expanded, current government should be made more efficient i.e. the public sector should be reorganized to efficiently spend tax dollars. Also, the notion of a public sector is really semantic; often, the public sector simply coordinates between the government and private supplies, such as how the NHS negotiates to purchase privately owned medical goods with taxpayer dollars.

Piketty decides to tackle two issues: equitable access to education, and the reform of PAYGO pension systems in a world of low growth.

Do Educational Institutions Foster Social Mobility?

Higher education faces a great inegalitarian problem in its rising tuition costs, which can be prohibitively expensive. Students can be conditioned for prestigious college enrollment at a young age, and Piketty mentions the role and concentration of donations in students’ application years.

The great issue is that many universities rely on large tuitions, especially in the American “model”, of which its universities are the “envy of the Western world”. Piketty argues that governments should step in to fund and subsidize a mix of public and private universities to allow access to society’s most disadvantaged classes.

The Future of PAYGO Systems

A pay-as-you-go (PAYGO) pension system collects contributions and adds them to a pool to be distributed to retirees. This is contrasted from an investment system that directly gives people their own reinvested contributions at a later date.

Thus, people’s rewards in the future are based on the wages now. There is an inherent social contract i.e. older people have an incentive to invest in the health, education, and prosperity of younger generations. However, the latter system is much more efficient and can achieve a rate of return comparable to private capital. Transitioning to this system would be difficult in that it would take the pensions and agreements of at least one generation.

Developing countries have a harder time collecting and spending taxes. The social and institutional structures are not in place to collect larger amounts of taxes (from nearly 50% of national income in social-democratic countries to 10-15% in these emerging economies). This erodes public trust in government and its functions such as healthcare and education, which can further the cycle by stopping tax hikes and financial regulations.