

Income and wealth

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THE LARGE AMOUNT OF DATA on income distribution has proved useful in shedding light on inequalities, standard of living, and related problems such as poverty. However, in order to reach appropriate conclusions on such issues, it is important not to confuse income and wealth. Although some correlation exists between the two, it is far from perfect.

Inequality and poverty continually fuel debates in the political and academic spheres. Measures are commonly based on income and would present quite a different picture if based on wealth. For example, the statement that the elderly are among society's poorest members could be either true or false, depending on whether the measure is income or wealth. If wealth, the statement could be false. Retired persons often have less onerous liabilities, since mortgages and other obligations such as educational debts have already been paid off. While the flow of income is smaller for most elderly persons, their stock of wealth could be larger.

This article begins by looking at the basic concepts that distinguish income and wealth: flow and stock. Wealth and income distributions are then used to show the difference between these two concepts using a variety of tools (see *Techniques used*).

Wealth is a stock, income a flow

In everyday language, little distinction is made between income and net worth (wealth). It is sometimes said that a person with high earnings is rich—for example, an athlete. Sometimes, being rich is evaluated on the basis of assets owned. The two ideas are quite different.

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A flow is a quantity per unit of time. A stock is a quantity at a given point in time. A useful image is an open faucet from which water runs into a bathtub. The water running from the faucet is a flow. A specific number of litres flow per minute or per hour. On the other hand, the quantity of water accumulating in the bathtub is a stock. To determine this quantity, the only time information required is when the stock was measured. No periodicity is necessary. The link between the flow from the faucet and the quantity of water in the tub is obvious: the greater the former, the more rapidly the latter will increase.

The concepts of flow and stock are used widely. For example, in demography, population growth is a flow, whereas the population at a given point in time is a stock. In accounting, the items on the income statement (income, expenditures, profits) are flows, while those on the balance sheet (assets, liabilities, equity) are stocks.

In the case of income and wealth, income is a flow, since it is meaningful only when defined in relation to a period of time (hourly, weekly, monthly or annual income). Net worth is a stock, increasing as new assets are acquired, debts repaid, or savings accumulated. Each of these elements depends more or less directly on income.

However, income and net worth are not synonymous. Just as a strong flow from the faucet could be running into an empty bathtub, a high income may be associated with low net worth. This is the case, for example, with young people starting their careers. Conversely, just as a weak flow from the faucet may be running into a nearly full bathtub, so could a low income accompany high net worth. This is the case with some retirees who have little income but who have accumulated and paid for substantial assets—for example, a house or RRSPs.

The link between wealth and income can be expressed as a simple mathematical equation:

$Wealth(t) = Wealth(t-1) \cdot (1+r) + \text{after-tax income}(t) + \text{net inter-family transfers}(t) - \text{expenditures}(t)$ with t as the present time and r the constant annual rate of return.

The wealth of a family at a given point in time is simply the sum of its net assets, which could include inheritances, and its savings invested at an annual rate of return r , plus inter-family transfers. Savings are equal to after-tax income minus expenditures. A family that spends all its after-tax income in a given period will not be adding to its wealth during that period (see *Data source and definitions*).

Net worth and after-tax income: a clear but imperfect relationship

If income and wealth were synonymous, people better off in terms of income should also be better off in terms of wealth. In other words, the top 20% of persons in terms of income should also be the top 20% in terms of net worth. The corresponding case should apply for the bottom 20% and for all other quintiles.

For example, in a table of income quintiles by wealth quintiles, the cells on the main diagonal should all have 20% of the population and all the other cells should have 0%. If income and wealth were totally unrelated, the population would be distributed equally among all the cells. In that case, all the cells would have a value of 4%. Clearly, this is not the case (Table 1). Consider, for example, the lowest income quintile. Only slightly more than half of this quintile (11% out of 20%) are in the lowest wealth

Table 1: Households by income and net worth quintiles

	Lower limits (\$)	Net worth quintile				
		1	2	3	4	5
		0	7,400	50,000	126,100	270,400
Income quintile		%				
1	0	11	4	2	2	1
2	16,000	5	5	4	3	2
3	27,700	2	5	5	4	3
4	40,100	1	4	5	5	4
5	58,700	0	1	4	6	9

Source: Survey of Financial Security, 1999

quintile. Indeed, one-twentieth of them (1% out of 20%) are in the highest wealth quintile.

However, income and wealth have an imperfect but clearly discernible relationship. A person who is poor from a net worth standpoint has more than one chance in two of also being poor from an income standpoint. However, there is a 45% chance that the person will fall into a higher quintile for income than for net worth. On the other hand, a person in the top net worth quintile has a 45% chance of also being in the top income quintile. But then again, 55% of people who fall into the top net worth quintile do not fall into the top net income quintile.

Household shares of income and wealth differ

Households in the top and bottom quintiles have a larger share of net worth than after-tax income (Table 2). Households in the third and fourth quintiles have a larger share of after-tax income than net worth, while the second quintile shows equal shares of income and net worth.

This relationship can also be observed in terms of centiles of after-tax income. (Centiles divide households into 100 equal portions ranging from lowest income to highest.)

If after-tax income and net worth shares were identical, the relationship between the two measures would take the form of a straight line (Chart A). In effect, each centile would claim the same percentage of after-tax income as of net worth. On the contrary, the shares of income and wealth are different in many respects, whichever centile is considered.

Households in the lowest after-tax income centiles generally have a larger share of wealth than of after-tax income. This may be because elderly persons, for whom C/QPP and OAS are often the only sources of income, fall into the low after-tax income centiles. On the other hand, they have substantial net worth in the sense that they have paid off most of their debts. These centiles also contain self-employed workers who may be sustaining losses, causing their after-tax income to be negative even though they have substantial net worth.

Table 2: Household shares of wealth and after-tax income

After-tax income quintile	Average after-tax income	Average net worth	Share of after-tax income	Share of wealth
	\$	\$	%	%
1	8,300	135,700	5	6
2	22,000	128,700	11	11
3	33,500	173,400	17	16
4	48,400	260,800	24	22
5	104,200	889,300	43	45

Source: Survey of Financial Security, 1999

The higher centiles contain many families with a larger share of after-tax income than net worth. These families earn sizeable incomes but also have sizeable liabilities such as mortgages, student loans, and other debts.

Between the two extremes are centiles in which shares of after-tax income and net worth are equal. (The relationship between shares of income and net wealth for economic families and unattached individuals is the same as that observed for all families since all families, are composed of economic families plus unattached individuals.)

Income and wealth tend to vary in the same direction but not at the same rate

Continuing the analogy of net worth and net income to water from a faucet running into an open bathtub: the water from the faucet is income, the water accumulating in the tub is wealth. What goes down the drain represents current expenditures—that is, the portion of income that has been consumed and not kept as wealth.

This relationship is always present, but varies considerably from one stage in the life cycle to the next. While the particular experiences of individuals differ considerably, everyone tends to follow a general pattern: we are born, grow as children, go to school, set up a household, and start a family. We

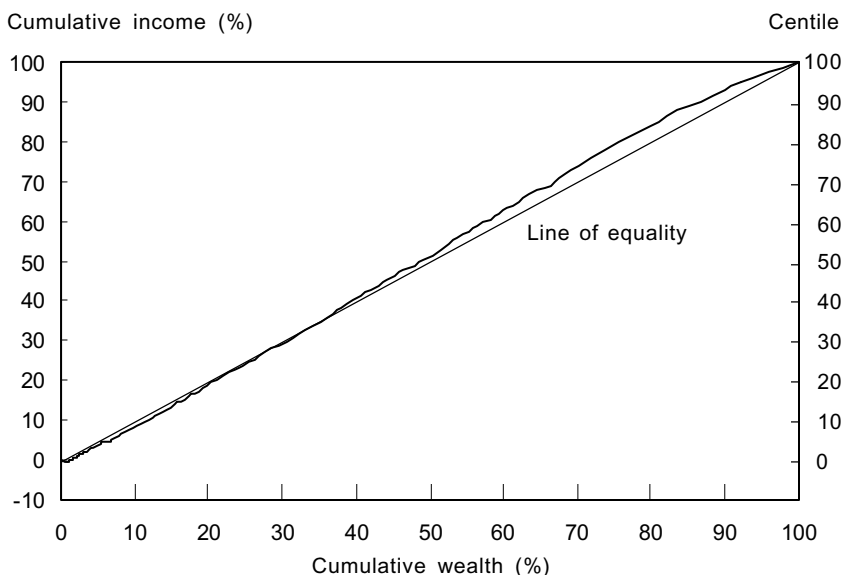
struggle to find our first job, pursue a career, and eventually retire. This is the life cycle. Each stage involves very different behaviours with respect to income creation, expenditures, and savings.

In the absence of longitudinal data, cross-sectional data by age must be used to approximate various stages in the life cycle. Rather than following the same individuals over their lifetime, different individuals are compared at different stages in the cycle. The data used reflect not only life-cycle effects (purely age) but also cohort effects (Table 3).

Persons in the under-25 age group appear to be the poorest in terms of both net worth (\$1,800) and after-tax income (\$12,600). This group is probably made up largely of students with unstable jobs or no income, or of young workers who are unskilled or just starting their career. Also, with respect to wealth, they would have had little time to accumulate savings.

The 25 to 34 age group is likely made up largely of young people beginning their career and starting families. Income and assets increase rapidly, but so do debts. This has the effect of slowing the increase in net worth. Persons from 35 to 49 are advancing in their careers. Their earnings increase slowly but rise steadily. Debt growth slows, causing net worth to increase very

Chart A: A household's share of wealth is not the same as its share of after-tax income.



Source: Survey of Financial Security, 1999

Table 3: Median after-tax income, wealth, assets and debts

	After-tax income	Net worth	Total assets	Total debts
		\$		
Less than 25	12,600	1,800	5,900	2,900
25 to 34	33,000	28,100	54,900	15,000
25 to 29	28,800	13,900	27,000	10,700
30 to 34	36,900	45,500	102,400	23,000
35 to 49	42,100	86,500	155,000	26,000
35 to 39	39,200	65,300	138,900	30,000
40 to 44	41,000	89,400	155,200	25,000
45 to 49	46,800	120,100	181,100	23,200
50 to 64	39,300	164,900	215,000	7,100
50 to 54	44,700	152,700	216,800	18,000
55 to 59	41,200	171,500	221,300	6,000
60 to 64	29,200	174,600	200,200	500
65 and over	24,400	154,600	161,800	0
65 to 69	27,800	176,600	193,700	0
70 to 74	26,200	174,500	177,000	0
75 to 79	23,800	146,700	148,000	0
80 and over	19,400	109,500	109,500	0

Source: Survey of Financial Security, 1999

rapidly. Whereas income rises from \$33,000 to \$42,100, an increase of 28%, net worth more than triples, climbing from \$28,100 to \$86,500, an increase of 208%.

Between 50 and 64 years of age, earnings hardly increase at all. Nevertheless, assets continue to grow as a result of saving, and total debt declines as homes and cars are paid off. Those aged 50 to 64 have the greatest net worth, even though their income differs little from that of the preceding age group. The 65-and-over age group is phasing into retirement. Income falls dramatically, from an average of \$39,300 to \$24,400, making them the poorest after those under 25 in terms of after-tax income. Assets also decline. But because debts are now almost non-existent, net worth does not decline as much. In fact, the 65-and-over age group is in second place in terms of net worth.

One way to see the relationship between income and wealth is to look at after-tax income, net worth, assets and debts by age and, for each variable, compare one group's median with the highest median for all groups. This value is then expressed as a percentage (Chart B).¹ This approach shows how each variable changes over time—when it peaks and when it declines—not the

Data source and definitions

This study used the 1999 **Survey of Financial Security**, which gathered data on the assets and debts of families and unattached individuals.

Family unit: economic family or unattached individual.

Economic family: two or more persons who live in the same dwelling and are related to each other by blood, marriage, common law or adoption.

Unattached individual: person who lives alone or with unrelated persons.

Total income: income from all sources (including government transfers) before deduction of federal and provincial taxes. Total income is also known as income before taxes (but after transfers). It includes market income and government transfer payments.

Market income: total earnings (from paid employment or self-employment), investment income, retirement income (private pension plan) and other income. It corresponds to total income minus government transfers. It is also known as income before taxes and transfers.

Government transfers: all direct payments to individuals and families by the federal, provincial and municipal governments: Old Age Security, the Guaranteed Income

Supplement, Spouse's Allowance, Canada and Quebec Pension Plan benefits, Child Tax Benefits, Employment Insurance benefits, workers' compensation benefits, credits for the goods and services tax (GST) or the harmonized sales tax (HST), provincial or territorial tax credits, social assistance payments, and other payments.

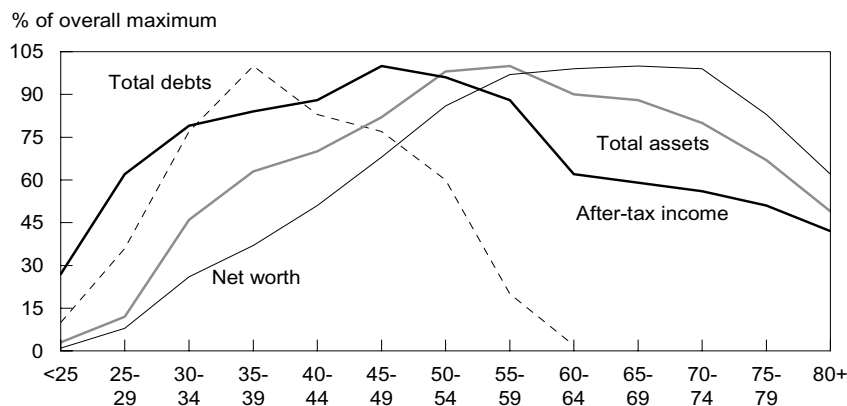
Income tax: total federal and provincial taxes on income and capital gains in a given year.

After-tax income: total income minus income taxes.

Assets: all family assets, including financial assets (RRSPs, other registered plans, deposits in financial institutions, mutual/investment funds, stocks, savings bonds and other bonds, and other financial assets) and non-financial assets (principal residence, other real estate, vehicles, other non-financial assets, and equity in a business).

Debts: all debts owed by the family. They include mortgages, lines of credit, credit cards, student loans, vehicle loans, and other debt.

For further information on the definitions of the different components, see the concepts and definitions guide produced by the Income Statistics Division.

Chart B: Debts peak early and virtually disappear after age 65.

Source: Survey of Financial Security, 1999

actual levels. (Because of sample size limitations, the two extremes were collapsed—under 25, and 80 or more.)

After-tax income and net worth evolve along similar lines in that they grow at the beginning of the cycle and then slowly decline. However, some differences are apparent. After-tax income peaks in the 45 to 49 age group. The average income of this group is 3.5 times that of the under-25 group. Net

worth does not peak until 20 years later at the beginning of retirement in the 65 to 69 age group. At this age, median net worth is more than 98 times that of the under-25 group.

At the beginning of the life cycle, young households take on debt in order to finance their education and start a family. Debt is therefore the variable that increases the most rapidly for the first age groups. On a dollar level, debt is not very signifi-

cant in comparison with net worth and total assets. But debt change over time shows the relationship between net worth, total debts, and after-tax income over the life cycle. Debt reaches its peak in the 35-39 age group, falling rapidly until it almost disappears after age 65.

Income is also increasing for these groups, causing debt growth to cease and total assets to grow. Around 45 to 49 years of age, income growth ceases. Nevertheless, net worth continues to increase, owing not only to saving but also to declining debt and possibly to inheritances. But the growth in net worth is fleeting. Starting at 55 to 59 years of age, it slows appreciably and drops in the last two age groups.

In short, wealth and income evolve along similar lines but at a different pace. At the start of the life cycle, income increases more rapidly than wealth. Toward the middle of the cycle, income stalls while wealth continues to grow. In retirement, income and wealth both tend to decrease.

Summary

Income and wealth are commonly used to assess the well-being of individuals, families or entities. While the two measures are related, the relationship is not perfect: greater income is likely to mean greater wealth—but not always.

Perspectives

Note

1 The median value was used in the tables in preference to the average because the median is considered to be more representative of households in each group. The median is less sensitive to extreme cases, such as a small group of individuals with unusually high income or large assets.

Techniques used

The difference between income and net worth may be illustrated using several concepts, among which is the way each is distributed for a given population. A preferred way to determine the distribution of income or wealth is to look at the share of each held by a given percentage of the population of interest. The focus is therefore on quintiles, deciles or centiles. These describe what share of wealth or income is held by 20%, 10%, or 1% percent of the population, ranging from the lowest to the highest.

Quintiles and centiles have been used in this study. Quintiles (Table 1) divide the population into fifths from least to most for after-tax income and net worth. Centiles are given for after-tax income, and so wealth is also calculated by after-tax income centile to maintain the same population by centile. Net worth could also have been used as the starting point and then calculating after-tax income for each wealth centile.

As is generally done for studies on wealth and income where extreme values are common, median values are used. The median is less sensitive to values on the extreme.