CHAPTER 5, "Time and Interest," FROM THE BOOK:
The Science of Economics
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1. Time Preference

The term "interest" has been confusingly used by economists as the return on capital goods. As discussed in Chapter 4, this return can be called a "yield of capital" without confusing it with interest rates.

"Interest" is the premium that is paid in order to exchange future goods for present-day goods. It is not the return on capital goods, because, as we have seen, that yield is a combination of the depreciation of the capital good and the interest on the part that does not depreciate.

Foundational proposition #14 states that people tend to have a preference for present-day goods rather than goods in the future. This is called "time preference." Given a choice, which would you prefer, money today or the same amount of money one year from now? Even if you were assured that there would not be any inflation, most people would rather have the money now, for three purposes.

- First, many people would rather consume goods now than later.
- Secondly, entrepreneurs wish to invest in firms and production now rather than later.
- Third, people will want to buy a product to have it available just in case they need it, even if not for immediate consumption; hence it is a type of investment they want to make now rather than later.

One reason for wanting things sooner is that the future is uncertain, as stated by foundational proposition #15. People wanting goods now often borrow them, since they don't have the savings to spend to obtain them.

Since future goods are less desired than present ones, then to make the two equal in subjective value, a premium must be added to the future good. This premium is called "interest," as noted above. Another term for interest is a discount; without the premium, the future goods sell at a discount relative to the present-day goods.

We could say, half-jokingly, that interest rates prevent everyone from doing everything at the same time, just as land rent prevents us from wanting to do everything in the same place.

The rate of interest is the interest premium divided by the value of the present-day goods. For example, if you are indifferent between $100 today and $105 one year from now, the interest is $5, and the interest rate is 5/100 or 5%. Another term for it is **the discount rate**.

The [Austrian]economist **Eugen von Böhm-Bawerk** showed time preference is influenced by the productivity of roundabout production, the production of more goods by first producing more tools. A second influence on time preference and thus on interest rates is the time needed between producing the capital goods of higher order and the production of the final consumer goods, where the final payment is made for the goods. The American economist **Irving Fisher** (1867-1947) built upon the analysis of Bohm Bawerk in his book *The Theory of Interest* (1930), a main principle being that the rate of interest is affected by the productivity of investment.

More productivity induces people to shorten their time preference in favor of borrowing more today in order to reap the greater gains, increasing interest rates. As capital goods accumulate, their increase in productivity becomes reduced, due to diminishing returns, and thus the effect is to lengthen time preferences and reduce interest rates. However, technical progress can offset this by making new types of capital goods, such as computers, more productive.

2. Types of interest rates

In the market there are many types of interest rates. When you borrow money to buy a car, for example, and the bank offers to loan the money for, say, 10%, that is the "**market rate**" of interest for that type of loan. The rate, of course, will vary somewhat among different lenders.

Part of that market interest is paid to the bank for its overhead costs: their labor, computers, and other costs of operations. Suppose that makes up 1% of the market interest. Another part is paid to make up for bad debts, for people who don't pay back their loans. This is a **risk premium**, since the bank averages out this risk over all loans. Suppose this is also 1%. That leaves 8%. Who gets that? The depositors of the bank or owners of the institution get this as a return on their funds. This is called the "**nominal**" rate of interest, since this is the numerical amount of their return, such as $8 per $100.

But unfortunately, the money is inflating at 5% per year. So part of the nominal interest is being paid just to maintain the purchasing power of the return. If we subtract this 5% from the nominal 8%, we get 3%, which is called the "**real**" or "pure" rate of interest. **It is real because we have taken out the inflation, leaving the real purchasing ability, and pure because we have also taken out the risk.**

The real rate of interest is used in the capitalizing or commuting a flow into a stock, such as rent into land value. The flow of funds, like rent, is divided by the real interest rate to get the value of the stock, like land value. This assumes that the annual flow is constant and that there are no taxes. The tax rate on the value of the stock (e.g. price of land) is added to the real interest rate, so that, for example, $p = r / (i + t)$, price equals rent (or other yield) divided by the sum of the interest and tax rates.

The tax rate t can be converted to the tax rate on r as follows: the amount of tax is $t*p$, which is divided by r. Since $p = r / (i+t)$, we get $t*(r/(i+t))/r$. The r cancels out, and we are left with $t/(i+t)$, the tax rate on r. For example, if the tax on land is 20% of the price p and the real interest rate is 5%, then the tax rate on rent is $.20 / (.05 + .20) = .20/.25$ or 4/5 (80%) of rent.

Capitalization is similar to calculating the present value of a flow of income. At an interest rate of 5%, $100 invested today will be worth $105, or 100*1.05. Equivalently, the present value of $105 is $105/(1.05) = $100. Two years from now, $100 will be worth 100*(1.05)*(1.05), so to calculate the present value, we divide by (1.05)2. In general, the present value of a stream of income is the sum of the incomes for each year, divided by the quantity one plus the interest rate, raised to the power of the number of years into the future. Mathematically, P = sum of (ri/(1+i)t).

3. Interest rates, investment, and factors

Suppose you are an investment firm and have different possibilities for investment. Naturally, you choose those projects with the greatest expected rate of return. But alas, you have no money for investment. No problem, says your financial adviser; we can issue bonds at 10%. The firm will then invest in those projects whose return is greater than 10%.

Interest is usually in the form of money, and it is normally paid on financial capital such as savings accounts in banks, commercial paper (short term borrowing by firms), and bonds. Although the form is money, the substance is goods. By depositing money, you abstain from buying the goods that the money could have bought; when you get money interest, it is a claim on the current stock of goods.

A capital good that does not depreciate can be loaned out indefinitely. The good yields an interest, since funds equal in market value to that good could have been invested as financial capital. But it is an error to call all returns to capital goods interest. As noted in Chapter 4, if a capital good depreciates in one day, almost the entire payment for its use is for the depreciation or using up of the good.

Since the three factors of production are land, labor, and capital goods, and their returns are rent, wages, and a capital yield, which factor does interest belong to? Any of the three, depending on who does the borrowing.

- If someone borrows money and buys land, paying the interest on the loan from the rent of the land, then the interest received by the lender is actually rent from that land; hence, some of the interest earned by money in savings accounts which is loaned to landowners is rent. In effect, the lender of the money is the recipient of the rent rather than the nominal owner.
- Similarly, if a worker borrows money for his education and pays the interest entirely from his wages, then the return to the lender consists of wages; some of the wages are earned by the worker and some are in effect earned by the lender in return for investing in labor improvement, enabling the worker to have improved his skills sooner rather than later.
- Finally, if the borrowed funds are used to buy capital goods, the return to the lender is part of the yield on those capital goods.

If the loan is for consumption, then the interest paid by the consumer comes from his income in the form of wages, rent, or a capital yield, so the interest constitutes those returns earned in part by the lender. For example, if a landowner borrows money for a vacation and then pays it back from his rental income, the recipient of the interest income is getting some of that rent, because that is where the income originated. If all land rent is taxed, then a landowner cannot pay interest on loans from rent, and interest must then come from wages and capital yields. Investment in either better labor or more capital goods would be needed to yield interest. Loans for consumption then reduce the net returns from labor and capital goods of the borrowers, since some of the returns go to the lender. In effect, borrowing to consume now rather than tomorrow reduces your future net returns from your factors. Likewise, lending to consume tomorrow rather than today increases your future income, namely from the factors used to service the loan.

4. Interest and money, usury and illusions

So we see that interest is not an arbitrary, but a natural aspect of human life.

But isn't a high interest rate exploitative? **"Usury" is the name for an exploitative rate of return on loans. True exploitation can occur when there is some monopoly leaving borrowers desperate for present-day goods.** There can be restrictions on credit and banking, so that the supply of loans is artificially reduced. There can also be laws making it difficult for some people to borrow money; for example, too-liberal bankruptcy laws make personal loans too risky, driving up the risk premium and market interest rate. These exploitative rates on loans are premiums on monopoly and artificial risks, rather than pure interest due to time preference alone. Since pure interest is due to short time preferences, a high desire to consume today rather than tomorrow, it is not exploitative, so it cannot be properly called "usury."

Some people wish to abolish interest because they think it is caused by a money monopoly, since it is an amount paid for the use of money. But, as we have seen, the origin of interest has nothing to do with money, but with time preference. The same interest could also be paid as goods. Money is the medium of loans and borrowings, but goods are the substance.

In the short run, interest rates can be affected by changes in the money supply. Suppose the government increases the supply of money. There is now more to loan out. It is as though savings had increased, and the supply of loanable funds has gone up. An increase in voluntary savings means time preferences have shifted towards less consumption today and more tomorrow. An artificial increase in the money supply (not caused by a demand to hold more money) and thus of loanable funds makes interests rates go down, just as they do when savings go up. But real time preferences have not changed. So the added investment is not economically warranted. Too many capital goods will be produced, such as shopping centers and office buildings that stay half empty. The extra money pushes prices up and so the money supply relative to prices goes down to where it was before. Interest rates then go back up to their natural level. So changes in the money supply can make interest rates change in the short run, but not in the long run. In the long run, the natural rate of interest, caused by time preference, will prevail.

Pure interest cannot be abolished, just as rent cannot be. If the government prohibits the payment of interest, then a borrower is in reality receiving the interest - the benefit of present-day use of resources - if he does not need to pay interest, just as tenants of land receive the land rent if they do not need to pay it to others. If banks share in the profits from enterprises that borrow funds rather than directly charging interest (a practice in Islamic banking), then this bank share is implicitly interest whether one wishes to label it so or not.

Another illusion is the notion that interest creates inflation because more money is needed to pay back a loan; if you borrow $100 and pay back $110, we need $10 more in cash, creating inflation. But if the loan is for current consumption, the interest is paid by the borrower's reduced future consumption; he must in the future consume less in order to also pay back the loan. No new money is needed. One person is paying interest and another receiving it; so the net demand for cash is the same.

We see, then, that pure interest itself does not cause inflation, nor does it exploit any factor of production. What does cause economic problems is the distortion of natural interest rates and the increase of premiums by government interventions, whether directly, in the form of interest-rate controls, or indirectly by money creation, banking monopolies and restrictions on credit, and monopolies which force desperate people to borrow at high rates in order to survive. Poor people with bad credit, for example, may have to borrow money at high rates from loan sharks; this is not pure interest but a premium for high risk and credit monopoly (the restriction of credit due to loose bankruptcy laws and banking regulations).

In a pure market economy, with no restrictions on honest and peaceful money, banking, or lending, interest rates simply ration goods over time between future and present-day uses, enabling those who most urg