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Dutch peaks since 1600; "since modern capital markets came into existence, there have never been such high long-term rates" as in this period.[13] Before modern capital markets, there have been accounts that savings deposits could achieve an annual return of at least 25% and up to as high as 50%.[14] Prime rate floats about 3% above the federal funds rate. Credit card interest rates Auto loan interest rate 4% months new autos. Prime rate 10 year Treasury bond United States Consumer Price Index Federal funds rate Political short-term gain: Lowering interest rates can give the economy a short-run boost. Under normal conditions, most economists think a cut in interest rates will only give a short term gain in economic activity that will soon be offset by inflation. The quick boost can influence elections. Most economists advocate independent central banks to limit the influence of politics on interest rates. Deferred consumption: When money is loaned the lender delays spending the money on consumption goods. Since according to time preference theory people prefer goods now to goods later, in a free market there will be a positive interest rate. Inflationary expectations: Most economies generally exhibit inflation, meaning a given amount of money buys fewer goods in the future than it will now. The borrower needs to compensate the lender for this. Alternative investments: The lender has a choice between using his money in different investments. If he chooses one, he forgoes the returns from all the others. Different investments effectively compete for funds. Risks of investment: There is always a risk that the borrower will go bankrupt, abscond, die, or otherwise default on the loan. This means that a lender generally charges a risk premium to ensure that, across his investments, he is compensated for those that fail. Liquidity preference: People prefer to have their resources available in a form that can immediately be exchanged, rather than a form that takes time to realize. Taxes: Because some of the gains from interest may be subject to taxes, the lender may insist on a higher rate to make up for this loss. Banks: Banks can tend to change the interest rate to either slow down or speed up economy growth. This involves either raising interest rates to slow the economy down, or lowering interest rates to promote economic growth.[15] Economy: Interest rates can fluctuate according to the status of the economy. It will generally be found that if the economy is strong then the interest rates will be high, if the economy is weak the interest rates will be low. Main article: Real versus nominal value (economics) Further information: Fisher equation The nominal interest rate is the rate of interest with no adjustment for inflation. For example, suppose someone deposits \$100 with a bank for one year, and they receive interest of \$10 (before tax), so at the end of the year, their balance is \$110 (before tax). In this case, regardless of the rate of inflation, the nominal interest rate is 10% per annum (before tax). The real interest rate measures the growth in real value of the loan plus interest, taking inflation into account. The repayment of principal plus interest is measured in real terms compared against the buying power of the amount at the time it was borrowed, lent, deposited or invested. If inflation is 10%, then the \$110 in the account at the end of the year has the same purchasing power (that is, buys the same amount) as the \$100 had a year ago. The real interest rate is zero in this case. The real interest rate is given by the Fisher equation:

r
=

1
+
i
1
+
p
−
1

{\displaystyle r={\frac {1+i}{1+p}}-1\!\,}

 where p is the inflation rate. For low rates and short periods, the linear approximation applies:

r
≈
i
−
p

{\displaystyle r\approx i-p\!\,}

 The Fisher equation applies both ex ante and ex post. Ex ante, the rates are projected rates, whereas ex post, the rates are historical. There is a market for investments, including the money market, bond market, stock market, and currency market as well as retail banking. Interest rates reflect: The risk-free cost of capital Expected inflation Risk premium Transaction costs According to the theory of rational expectations, borrowers and lenders form an expectation of inflation in the future. The acceptable nominal interest rate at which they are willing and able to borrow or lend includes the real interest rate they require to receive, or are willing to pay, plus the rate of inflation they expect. Under behavioral expectations, the formation of expectations deviates from rational expectations due to cognitive limitations and information processing costs. Agents may exhibit myopia (limited attention) to certain economic variables, form expectations based on simplified heuristics, or update their beliefs more gradually than under full rationality. These behavioral frictions can affect monetary policy transmission and optimal policy design.[16] The level of risk in investments is taken into consideration. Riskier investments such as shares and junk bonds are normally expected to deliver higher returns than safer ones like government bonds. The additional return above the risk-free nominal interest rate which is expected from a risky investment is the risk premium. The risk premium of an investor depends on the risk preferences of the investor. Evidence suggests that most lenders are risk-averse.[17] A maturity risk premium applied to a longer-term investment reflects a higher perceived risk of default. There are four kinds of risk, repricing risk basis risk yield curve risk optionality Most economic agents exhibit a liquidity preference, defined as the propensity to hold cash or highly liquid assets over less fungible investments, reflecting both precautionary and transactional motives. Liquidity preference manifests in the yield differential between assets of varying maturities and convertibility costs, where cash provides immediate transaction capability with zero conversion costs. This preference creates a term structure of required returns, exemplified by the higher yields typically demanded for longer-duration assets. For instance, while a 1-year loan offers relatively rapid convertibility to cash, a 10-year loan commands a greater liquidity premium. However, the existence of deep secondary markets can partially mitigate illiquidity costs, as evidenced by US Treasury bonds, which maintain significant liquidity despite longer maturities due to their unique status as a safe asset and the associated financial sector stability benefits.[18][19] A basic interest rate pricing model for an asset is

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+
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p

{\displaystyle i_{n}=i_{r}+p_{e}+r_{p}+1_{p}\!\,}

 where in is the nominal interest rate on a given investment ir is the risk-free return to capital in is the nominal interest rate on a short-term risk-free liquid bond (such as U.S. treasury bills). rp is a risk premium reflecting the length of the investment and the likelihood the borrower will default lp is a liquidity premium (reflecting the perceived difficulty of converting the asset into money and thus into goods), pe is the expected inflation rate. Assuming perfect information, pe is the same for all participants in the market, and the interest rate model simplifies to

i
n
=
i
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+
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{\displaystyle i_{n}=i_{r}+r_{p}+1_{p}\!\,}

 The spread of interest rates is the lending rate minus the deposit rate.[20] This spread covers operating costs for banks providing loans and deposits. A negative spread is where a deposit rate is higher than the lending rate.[21] Interest rates affect economic activity broadly, which is the reason why they are normally the main instrument of the monetary policies conducted by central banks.[22] Changes in interest rates can affect firms' investment behaviour, either raising or lowering the opportunity cost of investing. Interest rate changes also affect asset prices like stock prices and house prices, which again influence households' consumption decisions through a wealth effect. Additionally, international interest rate differentials affect exchange rates and consequently exports and imports. These various channels are collectively known as the monetary transmission mechanism. Consumption, investment and net exports are all important components of aggregate demand. Consequently, by influencing the general interest rate level, monetary policy can affect overall demand for goods and services in the economy and hence output and employment.[23] Changes in employment will over time affect wage setting, which again affects pricing and consequently ultimately inflation. The relation between employment (or unemployment) and inflation is known as the Phillips curve.[22] For economies maintaining a fixed exchange rate system, determining the interest rate is also an important instrument of monetary policy as international capital flows are in part determined by interest rate differentials between countries.[24] The effective federal funds rate in the US charted over more than half a century The Federal Reserve (often referred to as 'the Fed') implements monetary policy largely by targeting the federal funds rate (FFR). This is the rate that banks charge each other for overnight loans of federal funds, which are the reserves held by banks at the Fed. Until the 2008 financial crisis, the Fed relied on open market operations, i.e. selling and buying securities in the open market to adjust the supply of reserve balances so as to keep the FFR close to the Fed's target.[25] However, since 2008 the actual conduct of monetary policy implementation has changed considerably, the Fed using instead various administered interest rates (i.e., interest rates that are set directly by the Fed rather than being determined by the market forces of supply and demand) as the primary tools to steer short-term market interest rates towards the Fed's policy target.[26] Financial economists such as World Pensions Council (WPC) researchers have argued that durably low interest rates in most G20 countries will have an adverse impact on the funding positions of pension funds as "without returns that outstrip inflation, pension investors face the real value of their savings declining rather than ratcheting up over the next few years".[27] Current interest rates in savings accounts often fail to keep up with the pace of inflation.[28] From 1992 until 2012, most Western economies experienced a period of low inflation combined with relatively high returns on investments across all asset classes including government bonds. This brought a certain sense of complacency[citation needed] amongst some pension actuarial consultants and regulators, making it seem reasonable to use optimistic economic assumptions to calculate the present value of future pension liabilities. Because interest and inflation are generally given as percentage increases, the formulae above are (linear) approximations. For instance,

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{\displaystyle i_{r}={\frac {1+i_{n}}{1+p_{e}}}-1\!\,}

 The two approximations, eliminating higher order terms, are:

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{\displaystyle {\begin{aligned}(1+x)(1+y)&=1+x+y+xy&\approx 1+x+y\!\!{\frac {1}{1+x}}&=1-x+x^{2}-x^{3}+\cdots &\approx 1-x\end{aligned}}

 The formulae in this article are exact if logarithmic units are used for relative changes, or equivalently if logarithms of indices are used in place of rates, and hold even for large relative changes. Main article: Zero interest-rate policy A so-called "zero interest-rate policy" (ZIRP) is a very low—near-zero—central bank target interest rate. At this zero lower bound the central bank faces difficulties with conventional monetary policy, because it is generally believed that market interest rates cannot realistically be pushed down into negative territory. In the United States, the policy was used in 2008-2015 (2008 financial crisis) and 2020-2022 (COVID-19 pandemic).[29] Nominal interest rates are normally positive, but not always. In contrast, real interest rates can be negative, when nominal interest rates are below inflation. When this is done via government policy (for example, via reserve requirements), this is deemed financial repression, and was practiced by countries such as the United States and United Kingdom following World War II (from 1945) until the late 1970s or early 1980s (during and following the Post-World War II economic expansion).[30][31] In the late 1970s, United States Treasury securities with negative real interest rates were deemed certificates of confiscation.[32] Main article: Negative interest on excess reserves A so-called "negative interest rate policy" (NIRP) is a negative (below zero) central bank target interest rate. 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Along similar lines, John Maynard Keynes approvingly cited the idea of a carrying tax on money.[34] (1936, The General Theory of Employment, Interest and Money) but dismissed it due to administrative difficulties.[35] More recently, a carry tax on currency was proposed by a Federal Reserve employee (Marvin Goodfriend) in 1999, to be implemented via magnetic strips on bills, deducting the carry tax upon deposit, the tax being based on how long the bill had been held.[35] It has been proposed that a negative interest rate can in principle be levied on existing paper currency via a serial number lottery, such as randomly choosing a number 0 through 9 and declaring that notes whose serial number end in that digit are worthless, yielding an average 10% loss of paper cash holdings to hoarders; a drawn two-digit number could match the last two digits on the note for a 1% loss. 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This was proposed by an anonymous student of Greg Mankiw,[34] though more as a thought experiment than a genuine proposal.[36] Both the European Central Bank starting in 2014 and the Bank of Japan starting in early 2016 pursued the policy on top of their earlier and normally the main instrument of the monetary policies conducted by central banks.[22] Changes in interest rates can affect firms' investment behaviour, either raising or lowering the opportunity cost of investing. Interest rate changes also affect asset prices like stock prices and house prices, which again influence households' consumption decisions through a wealth effect. Additionally, international interest rate differentials affect exchange rates and consequently exports and imports. These various channels are collectively known as the monetary transmission mechanism. Consumption, investment and net exports are all important components of aggregate demand. Consequently, by influencing the general interest rate level, monetary policy can affect overall demand for goods and services in the economy and hence output and employment.[23] Changes in employment will over time affect wage setting, which again affects pricing and consequently ultimately inflation. The relation between employment (or unemployment) and inflation is known as the Phillips curve.[22] For economies maintaining a fixed exchange rate system, determining the interest rate is also an important instrument of monetary policy as international capital flows are in part determined by interest rate differentials between countries.[24] The effective federal funds rate in the US charted over more than half a century The Federal Reserve (often referred to as 'the Fed') implements monetary policy largely by targeting the federal funds rate (FFR). This is the rate that banks charge each other for overnight loans of federal funds, which are the reserves held by banks at the Fed. Until the 2008 financial crisis, the Fed relied on open market operations, i.e. selling and buying securities in the open market to adjust the supply of reserve balances so as to keep the FFR close to the Fed's target.[25] However, since 2008 the actual conduct of monetary policy implementation has changed considerably, the Fed using instead various administered interest rates (i.e., interest rates that are set directly by the Fed rather than being determined by the market forces of supply and demand) as the primary tools to steer short-term market interest rates towards the Fed's policy target.[26] Financial economists such as World Pensions Council (WPC) researchers have argued that durably low interest rates in most G20 countries will have an adverse impact on the funding positions of pension funds as "without returns that outstrip inflation, pension investors face the real value of their savings declining rather than ratcheting up over the next few years".[27] Current interest rates in savings accounts often fail to keep up with the pace of inflation.[28] From 1992 until 2012, most Western economies experienced a period of low inflation combined with relatively high returns on investments across all asset classes including government bonds. This brought a certain sense of complacency[citation needed] amongst some pension actuarial consultants and regulators, making it seem reasonable to use optimistic economic assumptions to calculate the present value of future pension liabilities. Because interest and inflation are generally given as percentage increases, the formulae above are (linear) approximations. For instance,

i
n
=
i
r
+
p
e

{\displaystyle i_{n}=i_{r}+p_{e}\!\,}

 is only approximate. In reality, the relationship is

(
1
+

i

n

)
=
(
1
+

i

r

)
(
1
+
p
e

)

{\displaystyle (1+i_{n})=(1+i_{r})(1+p_{e})\!\,}

 so

i
r
=

1
+

i

n

1
+
p
e
−
1

{\displaystyle i_{r}={\frac {1+i_{n}}{1+p_{e}}}-1\!\,}

 The two approximations, eliminating higher order terms, are:

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{\displaystyle {\begin{aligned}(1+x)(1+y)&=1+x+y+xy&\approx 1+x+y\!\!{\frac {1}{1+x}}&=1-x+x^{2}-x^{3}+\cdots &\approx 1-x\end{aligned}}

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