twenties to complete their census forms. No census manages to count every member of the population. Certain categories of people, such as immigrants and the homeless, are the most likely to be missed and, therefore, undercounted and potentially underserved.

Some censuses, such as colonial censuses in Africa, have also raised concerns regarding motive, and some censuses have even involved human rights abuses of vulnerable subpopulations, such as the forced migrations of Native Americans in the nineteenth century. These abuses have been particularly evident during times of war. After the 1941 attack on Pearl Harbor, U.S. census data was used by the War Department (now the Department of Defense) in the identification and relocation of Japanese Americans to detention camps. Census data from Germany and occupied regions was central to furthering Nazi interests before and during World War II (1939–1945). It was used in propaganda, in the identification of Aryans and non-Aryans, in the extermination of Jews and others, and in advancing the regime's military goals.

The United Nations Statistics Division, through the World Population and Housing Census Program, has been active in supporting national census-taking worldwide, including the development of census methodology, the provision of technical assistance in conducting censuses, and the dissemination of census data. As census technology, techniques, procedures, research, and guidance become increasingly refined, awareness of various issues is heightened and they can be better addressed.

SEE ALSO *Aryans; Data; Data, Pseudopanel; Demography; Ethnicity; Human Rights; Measurement; Native Americans; Nazism; Population Growth; Population Studies; Public Health; Racial Classification; Religion; Survey*

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CENTER FOR POLITICAL STUDIES

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SEE *Dependency Theory.*

CENTRAL BANKS

Central banks came into being in Europe in the late seventeenth century (Sweden in 1668, England in 1694) as government sponsored banks that were either state-owned (Swedish Riksbank) or privately owned (Bank of England). Their initial functions were basic in nature: giving financial support to the state in return for legislative advantages and monopoly power in the banking business. Central banks were also established to help centralize and standardize payments systems in countries such as Italy, Germany, and Switzerland, and, in Austria in 1816, to restore the value of the currency after government overspending during the Napoleonic wars. Regardless of the initial functions assigned to central banks, they slowly evolved into bankers' banks—in addition to being the government's bank—by becoming the main reserves depository institutions for the banking system.

Theories on central banking did not emerge until the late nineteenth century, when it was recognized that discretionary monetary policy had macroeconomic consequences for domestic economic activity as well as international trade balances, especially with regard to exchange rate policies under the gold standard, which was a commodity-money system since the currency was backed by gold reserves at the central bank (and the Bretton Woods system in the twentieth century, under which the U.S. dollar replaced gold as the international reserve currency). One of the early analysts of central banking, Walter Bagehot (1826–1877), founder of *The Economist* magazine, argued in his famous *Lombard Street* (1873) that central bankers are incapable of thinking theoretically about the daily transactions they engage in.

THEORY

Central banks play a crucial role in macroeconomic policy by acting as a lender of last resort to the banking system and by regulating and supervising the financial system. Policy priorities and the emphases of policies, however, differ depending on the theoretical framework from which central bank economists draw their policy inspiration.

Mainstream Approach The mainstream (neoclassical) approach argues that central banks should focus on price stability through money-supply targeting or inflation targeting. According to the logic of this argument, money is neutral in the long run; therefore any increase in the quantity of money would only lead to inflation in the long run. The mainstream approach recommends that the central bank be completely independent from the fiscal authority to prevent monetary expansions by irresponsible governments. Instead, the central bank is commissioned to expand the money supply steadily at a pre-announced rate (a monetary rule). This approach relies on the assumption that the central bank can actually control the quantity of money (verticalist or exogenous money approach) through the three traditional monetary tools: required reserve ration, discount rate, and open market operations. Hence the central bank can increase the quantity of money by decreasing the required reserve ratio, decreasing the discount rate, or buying bonds; and it can decrease the money supply by doing the opposite. The neoclassical view holds therefore that the quantity of money is exogenously determined by the central bank, whereas the interest rate is an endogenous variable determined by the interaction between money supply and money demand. This neoclassical model came under attack during the Great Depression by Cambridge University economist John Maynard Keynes, and later by the followers of the Keynesian revolution.

Post-Keynesian Approach The Post Keynesian approach, by contrast, argues that the money supply is an endogenous process over which the central bank has no control. The quantity of money is driven by the demand for credit by the private sector. The demand for credit is systematically accommodated by profit-seeking banks regardless of the required reserves available to them (horizontalist approach). In a fractional reserve banking system, financial innovation is the key to a successful banking operation. Banks usually extend credit to creditworthy customers, then worry about meeting their reserve requirements. Reserve requirements can be met by borrowing from domestic or foreign banks, by selling financial assets, signing repurchasing agreements with other financial institutions, shifting checking account balances to low-reserve requirement savings accounts, and, as a last resort, borrowing from the central bank (the lender of last resort). Post-Keynesian economists argue that the central bank has no control over an expanding economy, as it is the demand side that is pulling reserves from the central bank, with the latter being compelled to accommodate the market or else risk a financial crisis. For instance, a rapidly expanding economy requires a credit expansion by the entire banking system; the latter will face an inevitable shortage of reserves, thus driving up short-term interest rates above the central bank's target rate. The central bank must therefore intervene by providing liquidity to the market to prevent financial instability due to rising interest rates. The Post-Keynesian approach holds that the central bank's policy target cannot be the quantity of money, but rather the short-term interest rate that serves as a benchmark for the entire economy. Hence the interest rate is set exogenously while the quantity of money is an endogenous phenomenon.

Major financial crises have been prevented through central bank intervention as a lender of last resort, as for example after the September 11, 2001, attacks in the United States. In anticipation of a panic after the reopening of financial markets, the Federal Reserve Bank in an emergency meeting lowered its short-term interest rate target by fifty basis points; but most important, it snapped up all government securities offered by dealers, thus pumping up a record sum of $70.2 billion on September 13, 2001. As Paul Davidson notes in his 2002 book, the liquidity injection served not only to prevent a bond-market crash but also to reinstate positive expectations about the stability of the financial system.

Central bank leaders also play a crucial role in the formation of market expectations. Financial investors pay close attention to statements made by central bank officials because they know that central bankers have access to more accurate economic information and unpublished economic indicators, in addition to being in charge of key interest rates that act as benchmarks for the rest of the economy. If, for instance, investors detect a signal from the central bankers suggesting that the central bank is worried about inflation acceleration, and that the central bank is about to raise interest rates, then one would expect bond prices to go up, thus encouraging bond investors to buy more bonds and sell them at a later date; the reverse would ensue if investors were led to believe that the central bank was about to lower interest rates.

CENTRAL BANK INDEPENDENCE

The advocates of central bank independence argue that politicians cannot be trusted to make the tough political decisions as they tend to give in to political pressures, thus only an independent central bank can take action without fear of political retaliation. An independent central bank is expected to slow down the economy by raising interest rates when the unemployment rate drops low. This neoclassical argument rests on the idea that there is a trade off between unemployment and inflation, and that low unemployment rates will inevitably lead to accelerating inflation.

In addition to improved credibility and transparency, central bank independence favors the implementation of monetary rules. This is based on the New Classical view that money is neutral and that monetary policy is ineffective. The Lucas policy ineffectiveness argument states that any anticipated monetary policy will not affect output (thus will not affect employment). The policy ineffectiveness argument does not hold in the case of long-term labor contracts because policymakers in this case can change their behavior (for instance, the central bank can cheat on the announced rate of growth of the money supply). Thus a systematic monetary policy can have real effects. Finn Kydland and Edward Prescott (1977) argue that private agents are rational and thus expect the central bank to reoptimize its (previously announced) policy in the future. In game theory terms, this can be illustrated in a noncooperative Stackelberg game in which the central bank is the leader (it has private information and could change its policy at almost any time) and the private agents are the followers. This will lead the economy to a time-consistent suboptimal (Nash) equilibrium in which the social welfare function is not optimal, even though both the leader and the followers have tried their best to maximize their own respective utilities. It is noteworthy that the concept of the monetary authorities' credibility is of critical importance to the dynamic game described above, if the central bank wishes to implement a monetary rule rather than discretionary monetary policy because of the repeated aspect of the game.

Between 1970 and 1982 New Classical economists demonstrated that anticipated monetary policy is ineffective because economic agents are rational. During that period they produced a substantial literature explaining business cycle fluctuations in terms of the rational expectations hypothesis and supply-side (mainly technological) shocks. The rational expectations hypothesis states that economic agents' subjective expectations concerning economic variables will coincide with the true or objective mathematical conditional expectations of those variables. This assumption should not, however, be considered as synonymous with perfect foresight. Rational expectations in the forward-looking approach (as opposed to the backward-looking approach of the adaptive expectations) imply that economic agents will use the publicly available information and will not systematically form wrong expectations. William Nordhaus used this approach to show that "a perfect democracy with retrospective evaluation of parties will make decisions against future generations" (1975, p. 187). Politicians can use an expansionist monetary policy during an electoral period in order to reduce unemployment and thereby collect more votes. Once reelected, the government can start fighting against the inflation caused by money expansion and therefore push unemployment probably above its initial level. Governments succeed in making use of this political business cycle because the public has a short memory and will not recognize the use of this policy during the next election. The political business cycle theory represents a major argument for central bank independence, meaning that an independent central bank is more likely to implement a noninflationary monetary policy that is consistent with the stability of the general level of prices. The empirical evidence, however, does not show any significant correlation between central bank independence and inflation. In fact, one of the key variables used to measure the central bank independence index is inflation. This approach tends to reduce inflation to expansionary monetary policy and does not take into account other factors such as price-setting power and external shocks in international commodity markets.

DEVELOPING COUNTRIES

Central banks in developing countries face considerable challenges. The conventional wisdom argues that developing countries must maintain a steady inflow of financial capital to finance their savings gap and to fuel the process of economic development. To ensure such conditions, the central bank has to keep inflation low and stable and the exchange rate pegged to a basket of hard currencies, and in some cases to a single hard currency such as the U.S. dollar or the euro. Such strategies entail keeping interest rates high and the value of the currency artificially overvalued—thus the need to accumulate hard currency reserves to defend the value of the currency. Most developing countries, however, run trade deficits that must be financed through borrowing in hard currencies, which accounts for most developing countries' recurring external debt problem. In order to prevent financial crisis, the central bank is then obliged to cater to the needs of financial markets by keeping interest rates artificially high, which helps create an inadequate climate for domestic investment. This neoliberal view has dominated central banking in developing countries since the 1980s. The primacy of the low-inflation goal over other macroeconomic goals has crippled many economies in the developing world. As Gerald Epstein (2005) argues, this approach stands in sharp contrast to what central banks have historically done in both developed and developing countries, namely financing government spending, promoting full employment, managing exchange rates, enforcing capital controls, and allocating credit to sectors of special social need such as health care, education, and housing.

WHAT CENTRAL BANKS CAN ACHIEVE

Post Keynesians argue that the central bank can help coordinate the achievement of full employment in both developed and developing countries. Because the government is the monopoly-issuer of its sovereign currency, it follows that there can be no financial constraint on government spending. Money is injected into the system through government spending, and is withdrawn from it through taxation or bond sales. Bonds are not issued to "finance" government deficits, but rather to give the private sector an interest-bearing alternative to cash. The government accepts its own money in payment of tax liabilities, hence creating a demand for the sovereign currency. The value of money then depends on the government's (and the central bank's) capability to manage the quantity of money and the level of interest rates in the economy. From this perspective, the government can finance a full employment program by offering to hire anyone at a fixed, socially established living wage to perform socially desirable tasks that the private sector would not otherwise perform. The role of the central bank becomes crucial in financing the program, managing the national debt, and adopting a flexible exchange rate regime. As L. Randall Wray (1998) observes, the central bank independence mantra becomes meaningless if one accepts the necessity of policy coordination between the treasury and the central bank in order to accommodate the economy.

SEE ALSO *Business Cycles, Real; Economic Crises; Economics, Keynesian; Economics, Neoclassical; Economics, New Classical; Economics, Post Keynesian; Expectations, Rational; Federal Reserve System, U.S.; Financial Markets; Full Employment; Game Theory; Inflation; Interest Rates; Macroeconomics; Monetarism; Monetary Base; Monetary Theory; Money; Nash Equilibrium; Policy, Monetary; Unemployment*

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CENTRAL INTELLIGENCE AGENCY, U.S.

As a U.S. senator (D-MO), Harry S. Truman was well aware of the significant loss in lives and matériel that resulted from America's inadequate intelligence prior to the Japanese attack on Pearl Harbor in 1941. During his