■ seigniorage

Seigniorage is profit from money creation, a way for governments to generate revenue without levying conventional taxes. In the days of commodity money, seigniorage revenue was the difference between the face value of the minted coins and the actual market value of the precious metal they contained. When this markup was insufficient for the government's revenue needs, the authorities might substitute less valuable base metal for some of the precious metal that was supposed to be in the coins. Such a practice has a long history, dating back at least to Roman times. Although this allowed the government to issue more coins without acquiring more precious metal, the coins quickly depreciated as agents became aware of their less valuable content. The continued partial precious metal backing still placed some limit on the possible issuance.

With the demise of the gold standard in the early 1930s, almost all nations abandoned commodity-backing for their currencies and adopted a fiat money standard under which the paper issued is backed by nothing more than faith and confidence in the issuer. Under this system, the cost of issuance declines close to zero and there is no longer any limit on the quantity of money that can be issued. Under a fiat money system, seigniorage revenue is given by the product of the inflation rate and the inflation tax base. This inflation tax base reflects the purchasing power of the public's money holdings and is the level of *real* money balances (nominal money holdings divided by the price level). Undertaking more rapid monetary expansion causes the inflation rate to rise, but the revenue effects are partially offset as individuals attempt to quickly spend the extra money before it depreciates further. If people spend money faster than it is being printed, the rate of price increase comes to exceed the rate of money issuance.

Hyperinflation A government that is unable to fund its expenditures through conventional taxes or bond sales may become dependent on seigniorage revenues to maintain its existence. Attempts to raise seigniorage revenues are, however, not only inflationary but eventually self-defeating. Under circumstances where the decline in real money balances becomes proportionately larger than the rise in the inflation rate, the inflationary policy actually backfires and lowers seigniorage revenue. The economist Phillip Cagan's classic analysis of hyperinflations, with inflation rates exceeding 50 percent per month, suggested instances where the process had, in fact, been pushed beyond the revenue-maximizing point. It is possible that lags in the adjustment of inflation expectations may actually have allowed continued seigniorage gains, however, and subsequent analysis of the 1921–23 German hyperinflation points to seigniorage levels rising year by year (see Cukierman 1988).

Whatever success the German government may have attained in raising seigniorage revenues, such surging, and highly volatile, inflation rates interfere with the price mechanism and cloud production and employment decisions. Meanwhile attempts to economize on money balances require devoting more and more time to simply turning over the currency. By the end of the German hyperinflation, workers were being paid more than once a day because otherwise the value of the money would fall too much between the beginning and end of the shift! Other innovations, such as the indexation of bank deposits to inflation or establishing deposits denominated in a stable-value currency, require even faster rates of note issue to maintain seigniorage revenues, given that part of the money supply is now insulated from the inflation tax. This factor was particularly evident in the record-breaking post–World War II Hungarian hyperinflation. Negative effects on economic growth emerge well before such extreme circumstances, however. Recent work suggests that significant negative effects of inflation may emerge below the 10 percent level in both industrial and developing economies (Burdekin et al. 2004).

Certainly, even though conventional taxes impose their own distortions on the economy, few would argue that this justifies reliance on seigniorage as a deliberate policy choice. Dependence on seigniorage revenue seems, in practice, to be highly correlated with the degree of political instability. Vulnerability to this effect tends to be greatest in developing economies that are less democratic and/or more socially polarized (Aisen and Veiga 2005). High indebtedness is another common factor. In this respect, even a government that is initially able to fund its deficit through selling bonds to the public may eventually resort to inflation finance as the amount of debt approaches the saturation point. Thomas Sargent and Neil Wallace argue that such “unpleasant monetarist arithmetic” implies that, in the face of continued budget deficits, tighter monetary policy today simply implies more inflationary policy tomorrow once the limit on bond issuance is reached (see Sargent 1993). Furthermore the greater the outstanding stock of bonds, the greater the potential governmental gains from inflating away the real value of these obligations through inflation—which, in turn, likely limits the demand for such bonds unless inflation protection is built in.

The typical mechanism of inflation finance is for the government to sell bonds to the central bank, which then immediately “monetizes” the debt with new money emissions. This is therefore properly characterized as money finance rather than true bond finance and provides the government with new funds to spend only via excess money creation. Conversely selling bonds to the public, rather than the central bank, is likely to be far less inflationary and has no direct effect on the money supply.

Making the central bank independent of the fiscal authority would seem to be a way of ending automatic government access to the printing press, and nations with independent central banks have historically tended to have lower inflation rates. But even in the United States, large deficits such as those incurred under the Reagan administration put considerable pressure on the central bank to at least partially monetize them insofar as very large bond issues push down bond prices and put upward pressure on interest rates. Moreover in a developing economy where the market for government bonds is much thinner, it is unrealistic to expect the central bank, nominally independent or not, to resist monetization pressures when no other financing options exist. Instituting central bank independence is probably better thought of as a way of discouraging future fiscal profligacy rather than something that alone can end an ongoing reliance on deficit monetization and seigniorage.

Reducing Reliance on Seigniorage Revenue A more drastic way of weaning a government away from reliance on seigniorage revenue is to dollarize the economy, following the example of countries like Panama (since 1904) and Ecuador (since 2000), which abandoned domestic currency issuance and adopted the U.S. dollar as their monetary standard. Another option is to maintain the domestic currency but link it to the U.S. dollar or another currency via a currency board arrangement, whereby the monetary authority commits to exchange local currency for the foreign currency on demand at a predetermined, fixed rate of exchange. Such a strategy still allows for some seigniorage revenue on interest-bearing dollar-denominated assets held to back the local currency. Although Hong Kong’s currency board arrangement with the U.S. dollar has been maintained since 1983, Argentina’s link with the U.S. dollar collapsed in 2001 in the midst of soaring unemployment and political unrest. The Argentinean case not only illustrates the potential dangers of tying the domestic currency to the dollar but also serves as a reminder that no such announced commitment is truly irrevocable. Another alternative is to enter into a currency union, such as the euro zone, that eliminates the scope for domestic inflation finance by dispensing with the national currency entirely yet allows participating nations to share in seigniorage revenue earned by the group as a whole.

See also commodity-price pegging; common currency; currency board arrangement (CBA); currency crisis; currency substitution and dollarization; dollar standard; euro; European Central Bank; Federal Reserve Board; gold standard, international; money supply; multiple currencies; quantity theory of money

FURTHER READING

Aisen, Ari, and Francisco José Veiga. 2005. "The Political Economy of Seigniorage." IMF Working Paper 05/175. Washington, DC: International Monetary Fund. Available at http://www.imf.org/external/pubs/ft/wp/2005/wp05175.pdf. Reviews factors influencing the extent to which governments rely on seigniorage revenue and presents evidence on the importance of political instability.

Banaian, King, J. Harold McClure, and Thomas D. Willett. 1994. "The Inflation Tax Is Likely to Be Inefficient at Any Level." *Kredit und Kapital* 27 (1): 30–42. Emphasizes that the costs of resorting to the inflation tax are significantly augmented by the increased uncertainty that typically accompanies higher levels of inflation.

Burdekin, Richard C. K., Arthur T. Denzau, Manfred W. Keil, Thitithep Sitthiyot, and Thomas D. Willett. 2004. "When Does Inflation Hurt Economic Growth? Different Nonlinearities for Different Economies." *Journal of Macroeconomics* 26 (3): 519–32. Examines the thresholds at which inflation may start to exert significant negative effects on growth in both industrialized and developing economies.

Cagan, Phillip. 1956. "The Monetary Dynamics of Hyperinflation." In *Studies in the Quantity Theory of Money*, edited by Milton Friedman. Chicago: University of Chicago Press, 25–117. Classic analysis of money demand and seigniorage using data from a number of post–World War I and post–World War II experiences. Cagan's work essentially gave birth to the study of hyperinflation as a burgeoning subfield in macroeconomics.

Cukierman, Alex. 1988. "Rapid Inflation—Deliberate Policy of Miscalculation?" *Carnegie-Rochester Conference Series on Public Policy* 29, edited by K. Brunner and B. McCallum (autumn 1988), 11–84. Reprinted in P. Siklos, ed. 1995. *Great Inflations of the 20th Century.* Aldershot, UK: Edward Elgar. Reexamines the seigniorage revenue raised during the post–World War I German hyperinflation and suggests that the inflation may have been more profitable to the government than the original Cagan analysis implied.

Gros, Daniel. 2004. "Profiting from the Euro? Seigniorage Gains from Euro Area Accession." *Journal of Common Market Studies* 42 (4): 795–813. Examines the distribution of the European Central Bank's seigniorage revenue and the prospective gains accruing to the new member states from Central and Eastern Europe.

Sargent, Thomas J. 1993. *Rational Expectations and Inflation*. 2d ed. New York: HarperCollins. Chapter 5 covers the "unpleasant monetarist arithmetic" when tight monetary policy is combined with continuing budget deficits, and chapters 2 and 6 assess the implications of the Reagan deficits and their possible rationale.

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