

The effective lower bound

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2026-09-22

Abstract

Why the policy rate cannot fall much below zero, why that matters more when the natural rate is low, and what a liquidity trap does to the usual policy logic.

Every tool in this course exists because of one constraint: the short-term nominal interest rate cannot be pushed far below zero. Cash pays zero, so a deposit rate much below zero would send savers to the vault. Central banks call the level at which this bites the **effective lower bound** (ELB); it is somewhat below zero once the costs of storing and insuring cash are counted, as Negative interest rates shows, but it exists.

Why the bound is a problem

Conventional policy stabilises the economy by moving the real interest rate around the natural rate r^* . When a recession pushes the natural rate below zero, and expected inflation is low, the real rate the central bank can deliver,

$$r_t = i_t - \pi_t^e \geq \underline{i} - \pi_t^e, \quad (1)$$

has a floor above the level the economy needs. Policy is then *too tight by default*, not by choice. The gap between the required and the deliverable real rate is what the tools in the following lessons try to close.

Krugman brought the problem back into macroeconomics with Japan in the 1990s: a central bank at zero that cannot lower rates further, an economy that needs a negative real rate, and a public that does not believe the central bank will tolerate the inflation that would deliver it (Krugman, 1998). His proposed cure, a credible promise to be “irresponsible” later, is the intellectual origin of Forward guidance.

Two ways to lose at the bound

Definition 1 (Liquidity trap). A situation in which the short-term nominal rate is at its lower bound and additional base money is held rather than spent, so that conventional open-market operations no longer change anything. Demand is short of potential and the central bank cannot stimulate it through the policy rate.

The first way to lose is the **deflation spiral**. Falling prices raise the real rate in (1) even though the nominal rate is fixed. Higher real rates depress demand, which lowers prices further. The dynamics are unstable in the direction the central bank least wants.

The second is **anchoring at the wrong level**. If the public comes to expect low inflation permanently, the nominal rates consistent with that expectation are low too, which leaves less room above the bound in the next recession. Japan after 1995 and the euro area after 2013 are the two clearest examples.

Why it matters more now than in 1990

The bound is not new; what changed is how often it binds. The natural rate of interest fell by several percentage points across advanced economies between the 1980s and the 2010s. With r^* near 1 percent and a

2 percent target, the neutral nominal rate is around 3 percent, which gives a central bank about three points of cutting room before it hits zero. Typical recessions in the United States saw cuts of five points or more. The arithmetic is why the ELB moved from a Japanese curiosity to the central problem of monetary policy in a decade.

Eggertsson and Woodford formalised the optimal response inside the New Keynesian model: when the bound binds, the best the central bank can do is to commit to keeping rates low *after* the constraint has stopped binding, accepting a period of above-target inflation and output, because the expectation of that future stimulus lowers long real rates today (Eggertsson & Woodford, 2003). Everything in Forward guidance is an attempt to make that commitment credible.

What the tools are

The rest of the course covers the instruments in the order central banks reached for them.

Tool	What it changes	Lessons
Forward guidance	Expected future short rates	2
Asset purchases	Term premia, risk premia, signalling	3, 4
Negative policy rates	The bound itself	5
Balance sheet as an instrument	Reserves, remittances, fiscal exposure	6
Yield curve control, exit	Direct control of long rates; normalisation	7

Bernanke's presidential address to the American Economic Association is the best single overview of how these tools performed in the United States and what they can be expected to deliver in the next downturn (Bernanke, 2020).

Bernanke, B. S. (2020). The new tools of monetary policy. *American Economic Review*, 110(4), 943–983. <https://doi.org/10.1257/aer.110.4.943>

Eggertsson, G. B., & Woodford, M. (2003). The zero bound on interest rates and optimal monetary policy. *Brookings Papers on Economic Activity*, 2003(1), 139–233. <https://doi.org/10.1353/eca.2003.0010>

Krugman, P. R. (1998). It's baaack: Japan's slump and the return of the liquidity trap. *Brookings Papers on Economic Activity*, 1998(2), 137–205. <https://doi.org/10.2307/2534694>