

Lessons and open questions

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Abstract

What the toolkit can deliver, its side effects, the argument that it stayed on too long after 2021, how the frameworks changed, and an exercise on balance sheet data.

Fifteen years of unconventional policy produced a toolkit that central banks now consider permanent. This lesson takes stock.

What the tools can deliver

The evidence in Asset purchases: evidence and Forward guidance supports a modest, positive answer. At the lower bound, the combination of guidance and purchases lowers long real rates by an amount comparable to a few percentage points of conventional easing, and that easing raises output and inflation with the usual lags. Bernanke's estimate that the new tools add roughly three points of equivalent policy space is the optimistic end; the mid-range of the literature is somewhat lower (Bernanke, 2020; Bhattarai & Neely, 2022). Negative rates add perhaps half a point before the reversal rate of Negative interest rates bites. Together, that is enough for a normal recession and not enough for a severe one, which is why fiscal policy carried more of the load in 2020 than in 2009.

Side effects that are established

- **Asset prices and distribution.** Purchases work through raising asset prices; holders of assets gain first. The effect on wealth inequality is real in the short run; the effect on income inequality runs the other way, through lower unemployment. The net is contested and depends on the horizon.
- **Financial stability.** Long periods of low rates encourage duration risk and leverage. The 2023 failures of US regional banks holding long bonds bought at 2021 yields, and the UK pension-fund episode of September 2022, are consequences of the same duration that made The central bank balance sheet expensive.
- **Fiscal entanglement.** Central bank losses, deferred remittances, and the size of holdings of government debt have made central bank independence a live political question in the euro area, the United Kingdom and Switzerland.
- **Market functioning.** Bond markets in which the central bank holds half the stock trade differently; Japan is the extreme case.

The 2021–2023 question

Purchases continued in the United States until March 2022 and in the euro area until mid-2022, while inflation had risen above 5 percent in late 2021. Critics argue the tools were state-dependent instruments used as if they were unconditional, and that the guidance frameworks of 2020, designed for a world of too-low inflation, delayed the response by two to three quarters. Defenders argue that the supply shocks of 2021–2022 would have produced most of the inflation regardless and that the exit, once begun, was fast. The honest summary: the tools proved harder to stop than to start, because stopping them was read as tightening at a time when the outlook was uncertain, and because guidance had promised otherwise. Odyssean commitments have a cost when the state changes.

How the frameworks responded

The Fed's 2020 framework, with its emphasis on inflation shortfalls, was revised in August 2025 toward a flexible inflation-targeting formulation, as Rules in practice: Fed, ECB and SNB describes. The ECB's 2021 strategy kept a symmetric 2 percent target and stated that unconventional tools would remain part of the toolkit, to be used with proportionality (European Central Bank, 2021). Both banks now treat the lower-bound tools as part of the standard kit rather than emergency measures, with the important qualification that purchases are to be *state-contingent*: for market dysfunction or for the bound, not as a general-purpose stimulus.

An exercise

Plot the Fed's balance sheet relative to GDP and mark the programmes from Asset purchases: channels. The series are on FRED; the code needs `pandas` and `pandas-datareader`.

```
import pandas as pd
from pandas_datareader import data as pdr

assets = pdr.DataReader("WALCL", "fred", "2007-01-01")           # total assets, weekly,
    ↪ millions
gdp = pdr.DataReader("GDP", "fred", "2007-01-01")               # nominal GDP, quarterly,
    ↪ billions
ratio = (assets["WALCL"].resample("QE").last() / 1000) / gdp["GDP"].resample("QE").last()
events = {"2008-11-25": "QE1", "2010-11-03": "QE2", "2012-09-13": "QE3", "2017-10-01":
    ↪ "QT1",
        "2020-03-15": "pandemic", "2022-06-01": "QT2"}
print(ratio.dropna().round(3).tail(12))
for date, label in events.items():
    q = pd.Timestamp(date).to_period("Q").to_timestamp("Q")
    print(label, date, f"{ratio.get(q, float('nan')):.2f}")
```

Two things to check: the ratio at the 2022 peak, and how much of the post-2022 decline came from QT versus from nominal GDP growing under high inflation. The second is larger than most people expect, and it is the clearest illustration of why inflation reduces the real burden of a balance sheet just as it reduces the real burden of debt.

Open questions

1. Is there a size of balance sheet beyond which purchases stop working, or start harming market functioning?
2. Can guidance be made state-contingent enough to avoid the 2021 problem without losing its power?
3. Should the central bank pay interest on all reserves at the policy rate, given the fiscal cost, or tier remuneration as the ECB and SNB did for negative rates?
4. How much of the toolkit is transferable to small open economies like Switzerland, where the exchange rate does much of the work?

None of these has a settled answer. That is the state of the field, and the reason the course ends here rather than with a conclusion.

Bernanke, B. S. (2020). The new tools of monetary policy. *American Economic Review*, 110(4), 943–983.

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Bhattarai, S., & Neely, C. J. (2022). An analysis of the literature on international unconventional monetary policy. *Journal of Economic Literature*, 60(2), 527–597. <https://doi.org/10.1257/jel.20201493>

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