Contractionary Interest Rate Cuts

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[1]This presentation is based on a project the author initiated at Goldman Sachs in 2019 and completed at the Financial Services Forum in 2020. The views expressed in this presentation do not necessarily reflect those of Goldman Sachs and FSF.

Background

- Interest rates have been declining in the past forty years. Nominal interest rates have remained extremely low in the U.S. after the 2008 financial crisis and became negative since 2014 in the Euro Area.

- The decline in nominal interest rates appears to have a number of causes, for instance, slower productivity growth, aging population in advanced economies, and increased demand for safe assets. See Summers (2015), Del Negro, Giannoni, Giannone, and Tambalotti (2017), and the references therein.

- The current interest rate environment may limit the ability of central banks to counter future economic slowdowns with conventional short-term interest rate cuts.

Federal Funds Rate Dynamics

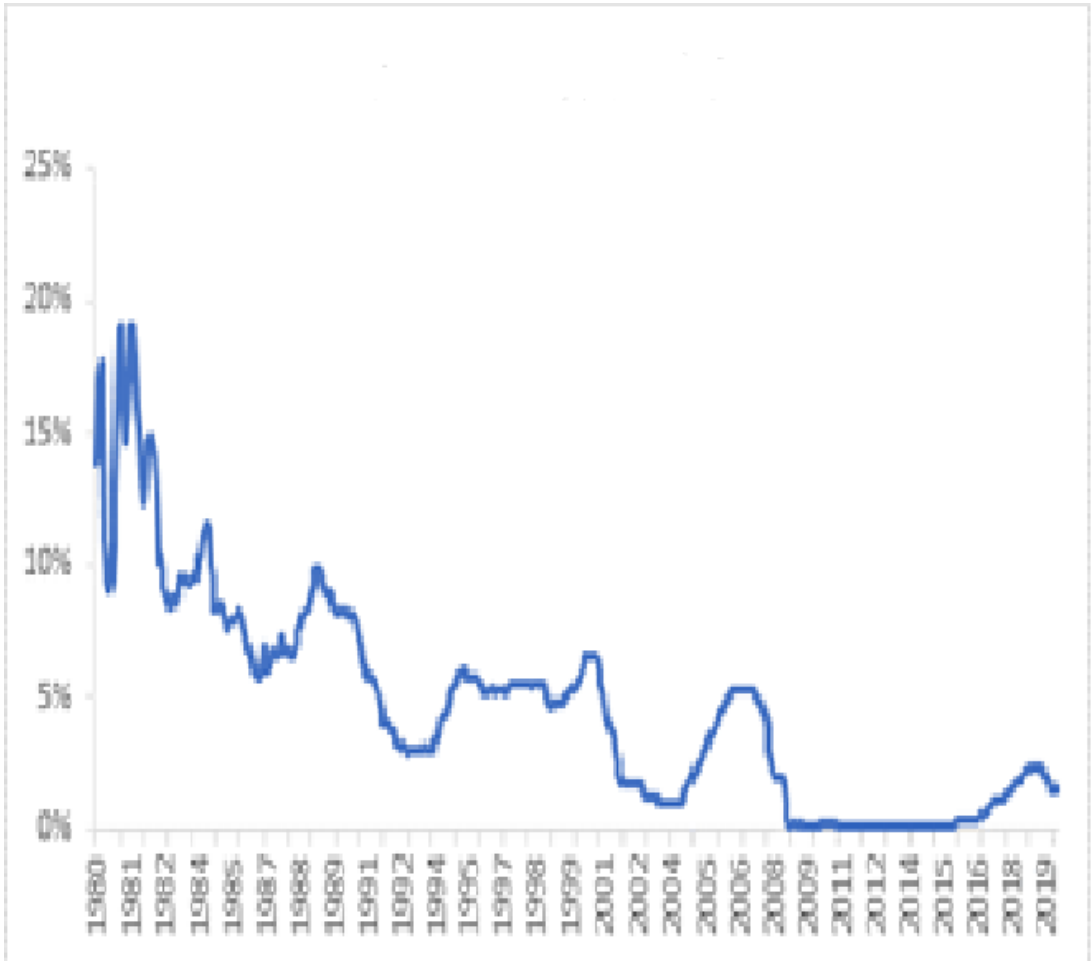

Figure: Effective Federal Funds rates from 1980 to 2019Q4 on a monthly basis. Over this time, the Federal Funds rate has peaked at 19.1 percent and has been as low as .07 percent. Source: Federal Reserve Bank of St. Louis Economic Data and the author's calculations.

Discussion Outline

- I will build on existing research (Brunnermeier and Koby (2019) and Borio, Gambacorta, and Hofmann (2017)) to show that the bank lending channel of monetary policy (MP) may break down in the current rate environment, where policy rates have remained excessively/persistently low for a long time (L4L) and have become negative in the Euro Area. In this environment, conventional short-term rate cuts can reduce bank lending, increase lending (loan) rates, and may ultimately reduce output.

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- First, I will illustrate that capital regulation can induce a lower bound on policy rates below which the bank lending channel may collapse. Next, I will highlight the existence of a lower bound on deposit rates (DLB) in the Euro Area. Below the DLB, lending rates and volumes seem to stop responding to rate cuts. Rate cuts in the negative territory can become contractionary due to capital constraints.

Consider the following net worth maximization problem of a typical bank from a pool of many identical banks (a variation of the Monti-Klein model):

$$\max_{D,L,X} N = r_l L + f(r)X - r_d D$$

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- At time zero, the bank decides how much deposits D to take, the amounts of loans L to give out, and the amount of investments X to make in a portfolio of safe securities (government bonds). The bank chooses D, L, and X to maximize its net worth N in the next period $T > 0$.

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- r_l is the interest rate on loans, r_d is the interest rate on deposits, and r represents the central bank policy rate.

In our formulation:

$$\max_{D,L,X} N = r_l L + f(r)X - r_d D$$

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- The initial balance sheet identity is $L + X = D$. We also assume that $X > 0$ (due to the presence of liquidity regulation).

The Impact of Conventional MP on Bank Net Worth

- That the L4L rate environment negatively impacts the net worth of banks has been documented empirically and analyzed by a number of researchers (Borio et al. 2017).
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- Let $N_r \equiv dN/dr$. The Monti-Klein framework can capture this adverse impact on the bank net worth through $N_r \geq 0$:

$$N_r = (1+c)f'(r)X \geq 0$$

where the Lagrange multiplier c is positive and $c(\omega L - N) = 0$. The L4L asset valuation effect results in $f'(r) \geq 0$.

- In the absence of capital constraints, the bank lending channel works in normal times through $L_r \leq 0$ and $dr_l/dr \geq 0$.
- Recall the capital constraint $\omega L \leq N$. Cutting r increases lending L, reduces net worth N ($N_r \geq 0$ in the L4L regime), and so tightens the capital constraint. At a lower bound $\underline{r}$, the capital constraint binds. Consequently, at $\underline{r}$, the bank would need to cut its lending and instead invest more in fixed income securities.

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- As capital regulation becomes more restrictive, i.e. as ω increases, the lower bound $\underline{r}$ also increases. That is, the bank lending channel may collapse faster under more restrictive capital requirements in the L4L environment.

US GSIB Common Equity Tier 1 Capital

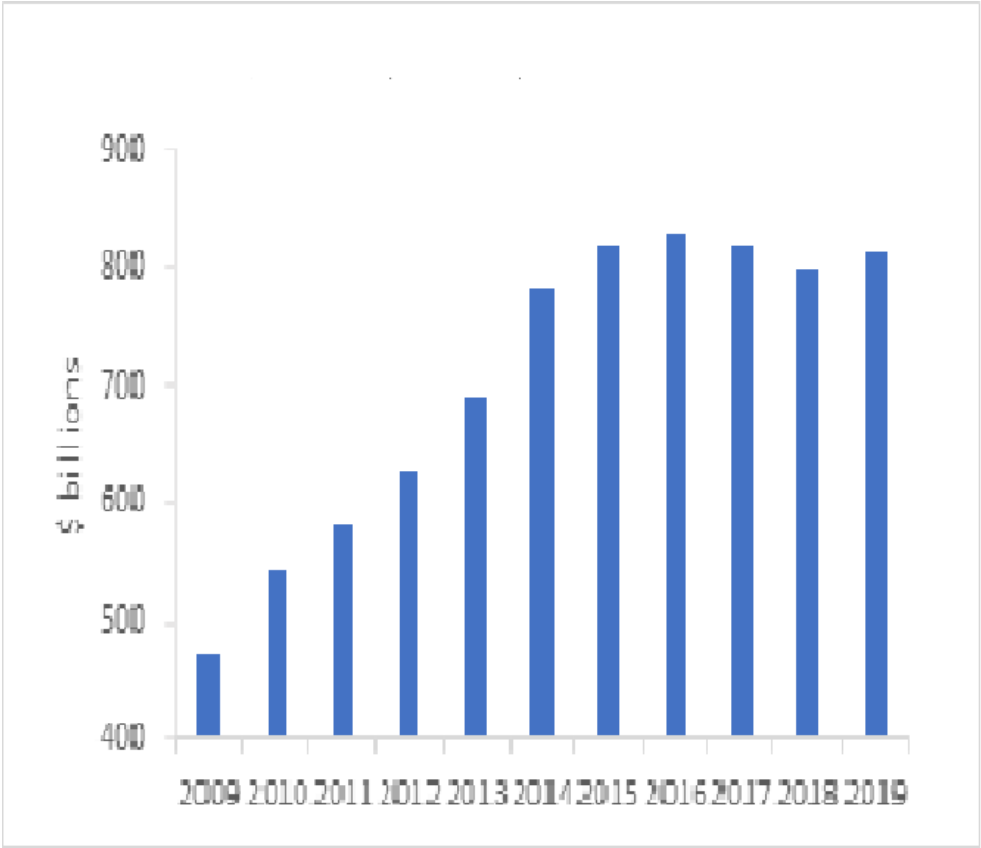

Figure: The aggregate common equity tier 1 capital of the 8 US global systemically important banks (GSIBs) from 2009 to 2019. Numbers represent end of year data for 2009-2019. Aggregate common equity tier 1 capital grew from $\$477$ billion in 2009 to $\$811$ billion in 2019. Source: Federal Reserve Y-9C and the author's calculations.

Negative Rates and the Deposit Rate Lower Bound

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- Using our simple model, it can be shown that when r_d does not respond to rate cuts due to the existence of DLB, we will have $N_r \geq 0$, and this can be independent from asset valuation effects under the L4L regime. So, the combination of rates falling below the DLB and stringent capital constraints guarantee the existence of $\underline{r}$. Rate cuts below $\underline{r}$ increase lending rates and decrease lending volumes.

US GSIB Deposit Portion of Liabilities

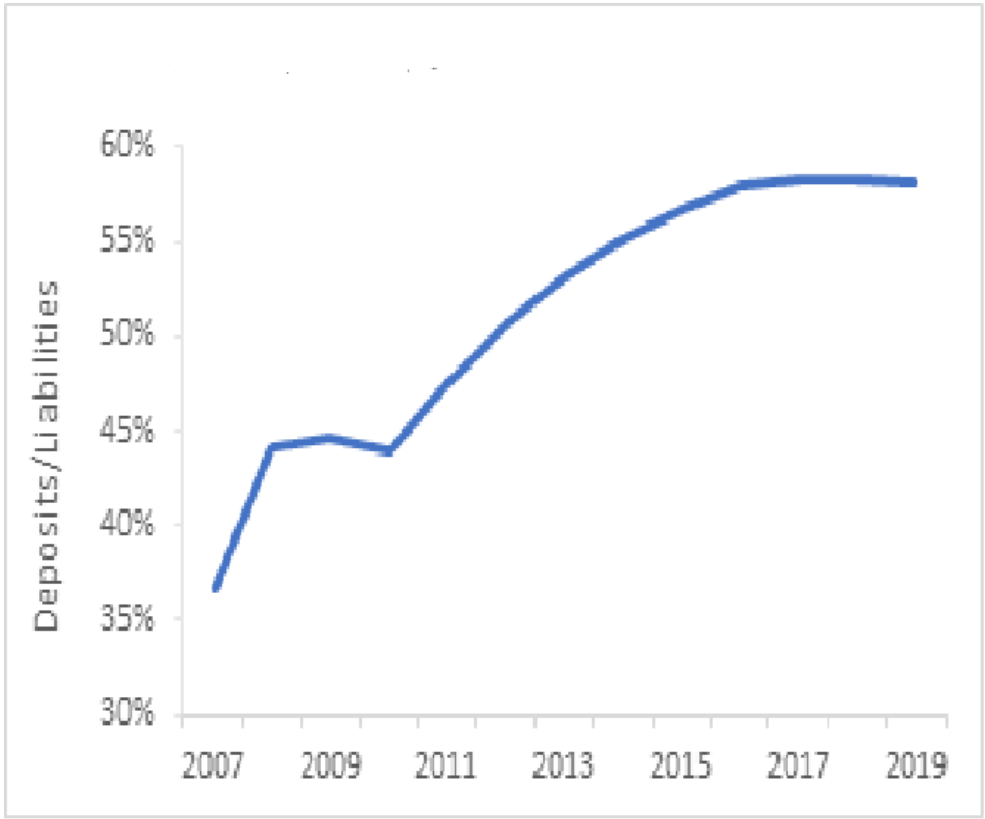

Figure: The aggregate deposits of the 8 US GSIBs as a portion of aggregate liabilities from 2007 to 2019. Numbers represent end of year data for 2007-2019. Aggregate deposits as a portion of liabilities has grown from 37% in 2007 to 58% in 2019. Source: Federal Reserve Y-9C and the author's calculations.

Macroeconomic Impact

- To quantify the macroeconomic impact of rate cuts in the L4L or negative environment, a banking model in partial equilibrium should be embedded in a dynamic general equilibrium model where policy rates can stimulate aggregate demand, and where lending rates are endogenously determined by loan supply and demand.
- This has been done by a number of researchers, e.g., by Brunnermeier and Koby (2019), Eggertsson et al. (2019), and Kumhof and Wang (2019). All results show contractionary effects of low or negative policy rates for output.

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- Eggertsson et al. show that a policy rate of $-.5$ percent increases borrowing rates by 15 basis points and reduces output by 7 basis points in Sweden. Brunnermeier and Koby show that the lower bound on the policy rate below which output decreases need not be negative.

Concluding Remarks

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- These results can be viewed in the context of the impact of *financial conditions* on economic activity. The behavior of intermediaries is subject to complex/nonlinear threshold effects. Bank capital constraints may reverse the impact of rate cuts – this nonlinear effect may not be captured appropriately by the existing macro models.