The Fed Policy Conduct during the Interwar Period

New Evidence from an Augmented Taylor Type Rule and Nonlinear Analysis

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Issues about the Fed behavior in the literature

- Why did Fed officials fail to respond appropriately to the crisis?
- Did they perceive domestic monetary conditions easy or tight?
- What was the consistency of the Fed’s strategy?
- Was there a shift in monetary policy driven by a change in policy tools after the crisis was triggered?
Conventional wisdom on Fed policy during and after 1929 crisis

- A monetarist dominant view: Inept policy, monumental mistake, erroneous understanding of monetary conditions

- Friedman and Schwartz’s (1963) hypothesis that the Great Depression of 1929 occurred because the Central Bank failed to undertake expansionary monetary policy.

- Counterfactual analysis driven by Bordo et al. (2002, EEH) : had expansionary monetary policy been conducted in the 1930s, the Great Depression would have been avoided.

New issues addressed in this paper

• Did the Fed monitor signals of liquidity tensions in the market and subsequently adapt its behaviour?

• Does historical and narrative evidence corroborate the conjecture that liquidity shortage episodes induced a shift in the Fed’s policy?

• Should we necessarily conclude that Fed policy was systematically flawed?
Innovation of the paper: new econometric tools to test conventional wisdom on Fed policy during the 1929 crisis

- Applying a non-linear framework (STR methodology) to monetary history over the interwar period
- Assessing the consistency of the Fed monetary policy response to the 1929 crisis in light of an augmented Taylor-type rule
- Ultimately: Questioning conventional wisdom about the Fed policy conduct
What did Fed officials supposedly target for monetary policy conduct during the interwar period?

- Nominal interest rates, operations in government securities, volume of discount loans (Chandler, 1958; Wicker, 1966)
- “The Fed did not specify specific targets for these tools but used them as indicators of credit conditions” (Wheelock, 1989)
- Wheelock pioneering work (1989, Explorations): first econometric regression of a Fed policy reaction function based on the total volume of Federal Reserve Credit (FRC) outstanding = federal government security holdings + bankers’ acceptance holdings + discount loans to member banks.
A Regime Switching Model by Wheelock (1990, JMCB)

• Wheelock (1990) tested a nonlinear relationship between borrowing and the spread based on the estimation, in difference, of the theoretical Golfeld-Kane model (1966):

  \[ \Delta \text{Borrowed Reserves} = \text{function}(\text{Spread, Non-borrowed, Stock Adjustment}) \]

- In this methodology, structural breaks imply durable and abrupt changes without possible reversion.

- Toma’s (1989) general reservations: misleading indicator + lack of data before 1929, annual data, which lessens the relevancy of performing econometric tests on quantities. Not a completely relevant guideline for monetary policy.
Purpose of our paper

• Extending the work of Wheelock (1990) by estimating a nonlinear relationship between the discount rate and its drivers using STR (Smooth Threshold Regression) modeling, which allows for smooth transition.

• Using credit spreads between open market rates and the Fed’s instrument rates as a proxy for liquidity risk (like in Gorton and Metrick, 2012)

• Testing whether credit spread actually played the role of transitional variable in the Fed policy reaction function

• Identifying whether the Fed was well aware of such risks as early as 1930, reacted to the financial stress and altered its monetary policy in consequence.
Data

- Our data are monthly and cover the 1922:1 - 1933:12 time periods for five variables
  - the discount rate $r$
  - deposits in suspended banks $s$ which is used by Bernanke (1983) as a measure of the importance of bank failures.
  - the M2 money supply $m$
  - the industrial production index $y$ (considered as a proxy of the real economic activity)
  - the consumer price index $p$
Data: Liquidity shortage variables

- $Spread_1 = \text{Call loans NY} - \text{discount rate}$
- $Spread_2 = \text{Call loans NY} - \text{Bankers’ acceptance rate}$
- $Spread_3 = \text{Commercial paper} - \text{Bankers’ acceptance rate}$
- $Spread_4 = 3-6 \text{ months Treasury notes} - \text{discount rate}$
- $Spread_5 = 3-6 \text{ months Treasury notes} - \text{Bankers’ acceptance rate}$
- $Spread_6 = \text{commercial paper} - \text{discount rate}$
Dynamics of Spread1 to Spread6
Data Properties

• All variables (endogenous, explanatory and transition) need to be stationary in STR models
• We conduct usual unit root tests and all variables are differentiated of order one except the suspended deposits variable.
• Concerning the transition variables, it is clear that the spread variables are weakly stationary. At the least, they are stationary around a structural break in the end in 1929.
• We check this a priori performing the Lee and Strazicich LM unit root with structural break test (2004) which gives evidence in favor of the stationarity of the transition variables.
A nonlinear Model

\[ r_t = \beta_1 z_t + \beta_2 z_t G(\gamma, c, s_t) + u_t, \]
\[ z_t = (w_t', x_t'), \quad w_t' = (1, r_{t-1}, \ldots, r_{t-q})' \]
\[ x_t' = (y_t, \ldots y_{t-p}, p_t, \ldots, p_{t-p}, d_t, \ldots d_{t-p}, m_t, \ldots, m_{t-p})' \]
\[ G(\gamma, c, s_t) = \left(1 + \exp\left\{-\gamma \prod_{k=1}^{K} (s_t - c_k)\right\}\right)^{-1} \]
• $u$ is an iid innovation, $z$ a vector of explanatory variables which can be decomposed into $q$ lagged endogenous variables stacked in a vector $w$ (here the lagged discount rate) and in exogenous variables (vector $x$).

• In vector $x$: $y$ is the output measured by the IPPG proxy, $p$ is the CPI, $m$ is the monetary supply M2 and $d$ denotes the suspended deposits; $l$ denotes the number of lags in lagged exogenous variables.

• $G$ stands for a continuous transition function bounded between 0 and 1: as a consequence, the model is able to explain not only the two extreme states but also a continuum of states between the extreme cases.

• $\gamma$ is the smoothness or slope parameter, which is an indicator of the speed of transition between 0 and 1.

• $c$ is a threshold parameter referring to the transition variable: it indicates where the transition (the smooth regime switching) takes place.

• $s$ denotes the transition variable i.e. spreads 1 to 6
Call loans spread 1 dynamics and threshold value
Main Results 1: Evidence of 3 clear-cut periods

• The estimations with call loans and bankers’ acceptance spreads lead to very similar results.

• Considering the six models as a whole, we find that all the variables except the CPI one enter the linear and non-linear part significantly.

• Evidence of 3 clear-cut periods: a “regular regime” where linear patterns dominate, from 1922 to the end of 1927; a “Liquidity shortage state” from mid-1928 to January 1930, where non-linear patterns dominate; then a return to a “regular regime” from January 1930 to March 1933
Main Results 2: Under the « regular regime », the coefficients of sensitivity of the interest rate to IPPG and M2 conform to theoretical predictions

• The instrument rate reacts positively to industrial production (IPPG), the central bank raising its discount rate in response to economic recovery (leaning against the wind).

• The interest rate reacts negatively to a rise in M2: an increase in the money supply logically implies a decrease in the interest rate.

• Under this “regular” regime, the Fed raised its discount rate when bankruptcies (proxy Bernanke) increased. *This suggests a strategy of eliminating bad banks.*
Main Results 3: Under the « Liquidity shortage state », all signs are reversed

- CPI, still not significant (as in the regular regime)
- The discount rate reacts negatively to Industrial Production Index: changes in output lost their influence on the normal conduct of monetary policy
- The discount rate reacts negatively to increasing bankruptcies: illustration of regime switching
- M2 becomes not significant: *insensitivity of the interest rate to a move in M2*. The Fed lost control in monetary policy
- Smoothness coefficient reveals that the return to normal regime is not accomplished instantly but that usual transmission channels are at stake again as soon as the end of January 1930: *the Fed policy was far from passive and inactive.*
Historical interpretation of our outcomes

• We provide evidence that the Fed had drawn the lessons from the episode of 1928-1929 and wished to avoid the extension of liquidity risks
• Repelling liquidity risks appears to be the essence of this new belief and priority as soon as 1930.
• What Meltzer (A History of the Fed, 2003) qualifies as inaction, passivity, misinterpretation of current economic conditions proved to be a deep understanding of the damage caused by the liquidity shortage episodes of 1928-1929.
Historical Evidence

• January 1930: Institutional change at the Fed: The OMIC is replaced by a new OMPC (Open Market Policy Conference)

• The evolution of the speech: Progressively, the Minutes of the Fed cease to mention mere risks of speculation but speak of risks of paralysis of the system: liquidity risks lead to bank insolvency

• In 1931 and 1932, direct references to “idle reserves”, “currency hoarding” and “renewed banking failures”.
Conclusion

• STR analysis highlights that the Fed reinstated a policy conduct that prevailed before the crisis had been triggered.

• This behaviour reveals the consistent use of a single strategy over the entire interwar period (except during the turmoil of 1928-1929 characterised by the predominance of non-linear patterns)

• The importance and statistical significance of the variable ‘Liquidity shortage’, which acts as the transitional variable in our model, lead us to name this strategy: ‘liquidity crisis avoidance’.
Was the Fed policy necessarily flawed?

• Historical and narrative evidence corroborate econometric findings and confirm that Fed officials were well aware of the dangers of liquidity crisis and targeted indicators of tension in the open markets.

• Since banking failures occurred in the early thirties, at least the diagnosis of the crisis risks by the Fed did not prove to be erroneous

• Using augmented Taylor-type rules in a non-linear framework seems perfectly complementary with narrative history.

• It appears as a necessary and useful tool for cliometric purpose, in the sense that it strengthens historical evidence and helps selecting and testing appropriate readings of the past.