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POLITICAL MONETARY CYCLES UNDER ALTERNATIVE INSTITUTIONS: THE INDEPENDENT TREASURY AND THE FEDERAL RESERVE

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The theory of opportunistic political business cycles predicts incumbent politicians will alter their economic policies to spur short-run growth to attract additional votes for the upcoming election. There has not been much emphasis on the possibility of historical political business cycles prior to the Keynesian Revolution. No study has yet undertaken a systematic approach to testing for policy cycles during this period. Our study will bridge this gap by considering cycles in monetary policy for the periods of 1879–1914 until the start of Fed operations, and 1914–1932 until abandonment of the gold standard. To properly test for political cycles, it is necessary to develop reaction functions for the Treasury and compare against the reaction function later held by the Fed. This also reveals that creation of an independent monetary authority to be insulated from political pressures changed the manner in which policy was directed, aside from political issues. The evidence is not consistent, however, with monetary cycles closely tied to electoral concerns.

> . . . no semblance of acquisitiveness prompts [the Federal Reserve Board's] operations; no banking interest is behind, and no financial interest can pervert or control it. It is an altruistic institution, a part of Government itself, representing the American people, with powers such as no man would dare misuse.
> (Carter Glass, House of Representatives, Sept. 10, 1913)

1. INTRODUCTION

THE THEORY of opportunistic political business cycles predicts that incumbent politicians will choose expansionary policies to spur short-run growth during election periods. Following elections, they will change policies to slow inflation and growth to resume the cycle later in their terms. Empirical evidence for these types of growth cycles timed around modern

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elections has been scant. There is evidence, however, that monetary policy is partly explained by the electoral patterns of low monetary growth early in a presidential term, followed by higher monetary growth closer to the next election. For example, Grier (1987) found that the Federal Reserve produced opportunistic monetary cycles under presidential pressure and Beck (1987) observed that fiscal cycles drove monetary cycles so as to stabilize interest rates. These and other studies have been limited to the period since World War II (WWII), leaving open the question of whether political cycles were present under earlier monetary regimes. As noted in Heckelman (2001), few studies have tested for electorally induced business cycles prior to WWII, and none have yet tested for the presence of policy cycles.

There are two types of political business cycles often described in the literature. Opportunistic cycles, described above, rely on manipulating policy for electoral gain by generating short-lived economic booms near an election in order to make the incumbents attractive to a myopic electorate.[1] According to this theory, the goal of all incumbents is simply to get re-elected, and economic conditions during an election period are assumed to closely match subsequent electoral fortunes.

Partisan cycles, on the other hand, are based on the notion that different parties may have different economic goals. In the inflation–unemployment tradeoff of the short-run Phillips curve, one party will focus on reducing inflation, while the other party will focus on lowering unemployment. Economic policies will therefore change as incumbent parties are voted out of office. Partisan cycles in output and unemployment will also result, and be maintained throughout a given party's tenure if the economic agents employ adaptive expectations, or eventually return to the natural rate if they have rational expectations.

We focus here exclusively on opportunistic policy cycles, and accordingly any further references to political cycles will imply those consistent with opportunistic behavior. Despite the general rejection of (opportunistic) political business cycles in the US during the modern era (Alesina et al., 1997; McCallum, 1978; Mueller, 2003), the accumulated evidence for monetary cycles consistent with opportunistic policy is quite strong (Beck 1987, 1991; Grier, 1987; Haynes and Stone, 1989). We extend the political monetary cycle literature by investigating the pre-WWII period. The evidence on opportunistic political business cycles before WWII is mixed. Heckelman and Whaples (1996) generally reject such cycles for the growth of

[1]Policy cycles of this sort can also be achieved if voters are rational but lack perfect information on the competency of the incumbent government. In one equilibrium, incumbents may signal their competence by engaging in fiscal policy that is more expansionary than less competent governments could properly manage (Rogoff and Sibert, 1988). Such cycles would be difficult to observe over a series of elections since a stable pattern would require all incumbents to be of equal competence and for a separating equilibrium to always exist. These criteria are typically ignored in the empirical literature (e.g. Alesina et al., 1997).

nominal gross national product (GNP), real GNP, and the GNP deflator from 1869 to 1929 but report mild evidence that real GNP growth may have been highest above trend in election years prior to 1896. Klein (1996) considers business cycle turning points as far back as 1854. He finds that expansions are more likely to begin close to an election but contractions are no less likely to end soon before an election.

There are several reasons to believe that opportunistic monetary cycles may not be only a modern phenomenon. Most of the ideas and institutions contributing to monetary policy cycles since WWII were also present earlier. Substantial parts of the public and many economists believed in the benefits of easy money in the short run; incumbents were penalized for depressed economic conditions at election time, and there was scope for discretionary monetary policy under the gold standard. For example, Hume (1752), Mill (1844), and Fisher (1911, ch. 4) described short-run "transitory" effects of monetary changes on output, the perceived tight-money policies of the second Bank of the United States were partly responsible for its elimination (Gouge, 1833), and the greenback and silver controversies of the latter nineteenth century were popular contests over monetary policy that ebbed and flowed with elections (Friedman and Schwartz, 1963, ch. 3; Unger, 1964; Wood, 2005, ch. 6). Keynes (1936, ch. 23) presented his *General Theory* as a theoretical underpinning for policy views prevalent among economists and the public.

In fact, money and inflation were active political issues even before the founding of the nation. In 1722, the Governor of Pennsylvania wrote of the popular "Ferment on Account that for some time past their usual Trade has stagnated for want of a sufficient currency," which the colony took steps to remedy, "with a prodigious good Effect" (Lester, 1939, pp. 68–72). Hamilton (1790) proposed that Congress's power to regulate money be exercised through a privately owned national bank to limit political abuse. "The stamping of paper is an operation so much easier than the laying of taxes that a government in the practice of paper emissions would rarely fail [in 'trying emergencies'] to indulge itself too far in the employment of that resource to avoid, as much as possible, one less auspicious to present popularity." These "trying emergencies" could include close elections.

Such action was possible even under the gold standard. Large and prolonged inflation was unacceptable, but commitment to convertibility did not prevent monetary expansion in the short run. The authorities were not limited by the "rules of the gold standard game," and tended to offset the impacts of international gold flows on domestic money and prices (Bloomfield, 1959; Triffin, 1968). The gold standard was neither inflexible nor automatic. The security given by long-term commitments might have even increased the potential for discretionary monetary policy (Bordo and Kydland, 1996).

The Treasury acted as the principal monetary authority from the end of the Bank of the United States in the 1830s until the creation of the Federal Reserve System in 1913. We explore two main sets of hypotheses concerning (1) the existence of opportunistic political monetary cycles during the period of the gold standard between 1879 and 1932, and (2) whether policies differed between the two regimes, both in terms of political considerations and general responsiveness to economic conditions.

The Federal Reserve Act provides the opportunity to examine the differences between monetary authorities under otherwise similar intellectual and institutional frameworks, specifically the belief in short-run monetary effects, electoral sensitivity to economic conditions, and the gold standard. The overall period of analysis was determined by the existence of the gold standard from the resumption of convertibility (after the Civil War suspension) at the beginning of 1879 and its abandonment at the beginning of the New Deal in March 1933. The change in monetary authorities in 1914 was distinct. The Independent Treasury Act of 1846 ordered that the Government's gold and silver – important components of the monetary base – be kept in Treasury vaults. The purposes of the Act were to remove Treasury funds from politics and risky banks. After President Jackson vetoed the renewal of the charter of the Bank of the United States in 1832, and transferred Government deposits to "pet banks," politically aligned banks competed for them and the deposits were a source of monetary instability as they were shifted between regions, especially from the port cities, where tariffs were collected, to banks in other states proportional to their populations.[2]

The American monetary system was heavily criticized in the decades before 1913 because of the inflexibility of bank reserves and credit during the frequent financial panics. The Federal Reserve System was designed to fill this need – "to provide an elastic currency" – by lending to banks on the basis of their credit. The Fed became the government's chief fiscal agent and holder of its gold, which served as the reserve for the Fed's currency. The new System had a federal structure, with 12 Reserve Banks directed by member commercial banks and a supervisory Board in Washington appointed by the President. The long and overlapping terms of the members of the Federal Reserve Board and dispersal of powers were intended to prevent the dominance of monetary policy by political or financial interests (Meltzer, 2002, p. 3).

Given that the Treasury is part of the Executive branch, it might be expected that the prevalence of opportunistic cycles would be greatest during its control of monetary policy. Although there are several examples of

[2]For a discussion of these periods and the Independent Treasury Acts of 1840 (repealed in 1841 in a disappointed anticipation of a new bank of the United States) and 1846, see Krooss (1969, pp. 1055–1173).

unusual Treasury activity during particular election years, we find no evidence to support the notion of a consistent four-year cycle timed around elections. The Treasury supplied funds to the financial market in the presidential election years of 1872, 1884, 1888, and 1896, but also on other occasions as well.[3] In addition, although the structure of the Fed would imply a degree of separation from the Executive office, public-choice scholars have questioned the Fed's actual independence from the political arena (Grier, 1987; Keech, 1995). In fact, what little evidence we do uncover suggesting an opportunistic political monetary cycle might exist occurs under the Fed's watch, but even here support for a systematic cycle is somewhat tenuous. We do, however, present strong evidence that the Fed was more activist in general compared with the Treasury.

The paper is organized as follows: section 2 sets the stage with examples of the economic and political sensitivities of monetary policy. We are interested in whether they were systematic or merely occasional. Using methods that have been applied to post-WWII samples for comparison, section 3 presents evidence relating to opportunistic political monetary cycles for the earlier periods. Money is affected by more than official operations. Economic downturns are associated with depressions in money growth so that the appropriate measure of policy might be direct actions on the monetary base, for example, security purchases by the Treasury (via early redemptions) as well as by the Federal Reserve. Estimates of "reaction functions" aimed at political and economic determinants of monetary policy are reported in section 4. Section 5 summarizes evidence relating to monetary policy between 1879–1914 and 1914–1932, and compares them with the period since WWII.

2. HIGHLIGHTS OF MONETARY POLICY UNDER THE INDEPENDENT TREASURY AND THE FEDERAL RESERVE

The Independent Treasury System exposed the monetary base to fluctuating budgets. Seasonal movements in net Treasury receipts often took reserves from circulation at the times they were most needed, such as the autumnal pressures on the money markets associated with financing crop movements. The fiscal surpluses common to peacetime had longer-term deflationary effects. During the nearly two decades of falling prices preceding 1896, Treasury balances rose from $51 million to $258 million – significant amounts compared with a monetary base near $1 billion (Taus, 1943, app.).

Secretaries of the Treasury were sensitive to these effects, and violated the spirit and even the letter of the 1846 Act by supplying funds in times of stress. Early debt redemptions were undertaken as early as the 1850s,

[3]See Friedman and Schwartz (1963, pp. 127–128, 144–155), Timberlake (1993, pp. 80–82, 160–164, 188–191), Taus (1943, pp. 67–133) and Treasury *Annual Reports*. Secretaries were outspoken about their actions and objectives.

coupons were paid early, there was considerable discretion over the rate of silver purchases under various Acts, and Treasury funds were allowed to accumulate in banks. The last was a liberal interpretation of Civil War legislation that permitted banks to be temporary depositories of the funds they raised by floating Government debt. Taus (1943, p. 82) suggested that Secretary Fairchild's (1887–1889) "guardianship over the general banking situation shows that he acted like the head of a central bank," and in a section on "central banking activities of the Treasury" in the first decade of the twentieth century, Friedman and Schwartz (1963, pp. 149–152) declared that its "monetary powers were very great indeed."

The usual arguments which suggest monetary policy could be influenced by the election cycle in the post-Keynesian era also apply during the gold standard years. First, the electoral fortunes of presidential incumbents were correlated with economic conditions. During our sample period, in the elections from 1868 to 1932, the incumbent's party won six of eight presidential elections held during the expansionary phase of the business cycle, compared with only four of nine during contractions.[4] Fair's (1978) analysis suggests the state of the economy close to an election is a useful predictor of presidential vote shares as far back as 1916, although the model performed poorly for elections from 1896–1912.[5] Interestingly, the break in model performance occurs with creation of the Fed, lending further credence to our decision to analyze the pre-Fed sample period separately from the Fed period. Niskanen's (1979) presidential vote-share model uncovers a statistically significant relationship between output growth and incumbent party vote share from 1896 to 1972, with roughly equivalent effects for both parties. Niskanen also finds a consistent impact of growth on incumbent party vote share across subsamples for the pre- and post-New Deal periods.

Second, monetary manipulation was still possible under the gold standard. The Treasury possessed a large gold reserve and access to credit that would have permitted discretionary monetary expansions as well as resistance to monetary contractions by neutralizing gold outflows. The gold standard would have been secure in the presence of monetary expansions and gold losses as long as the country's long-term commitment was credible. Doubts about this commitment during William Jennings Bryan's campaign against the "cross of gold" led to J. P. Morgan's sale of bonds in Europe at the behest of President Cleveland.

Third, the view was widespread that monetary policy might affect economic activity. For example, during the debate to repeal the Silver Purchase Act of 1890, Senator John Sherman defended his role in that legislation:

[4]See also Akerman (1947) who notes that 16 of the 20 elections held from 1865 to 1945 follow the pattern of the incumbent party being replaced during economic downturns and retained during economic expansions.

[5]Fair's (1996) more recent iterations of the basic model still yield better results after 1912.

> Sir, "give the devil his due." The law of 1890 may have many faults, but I stand by it yet, and I will defend it, not as a permanent public policy, not as a measure that I take any pride in, because I yielded to the necessity of granting relief . . . Without it, in 1891 and 1892 we would have met difficulties that would have staggered us much more than the passing breeze of the hour . . . The immediate result of the measure was to increase our currency, and thus relieve our people from the panic then imminent.
>
> (Miller, 1913, p. 398)

The timing of the passage and repeal of the Silver Purchase Act fits within the theory of opportunistic policy cycles. Legislation was passed late in 1890 leading to large increases in the monetary base in 1891 and 1892, in time for the next election. Repeal came soon after the election, at a special session of 1893 called by the President, resulting in a monetary contraction that would occur early enough in the term that it could be counterbalanced later on, prior to the next election.[6]

The Federal Reserve was unlike the Independent Treasury in its being established specifically to influence aggregate money and credit. Political interest in money did not end with the creation of the Fed, which was called on to finance a large portion of war expenditures in 1917–1918, as in 1941–1945, and was pressured by administrations to support bond prices after the end of hostilities in both cases. The Fed was permitted to raise rates beginning in November 1919, and the turn from rapid inflation to the severe deflation of 1920–1921 inspired the first of many congressional enquiries into monetary policy (US Congress, 1922).[7] As in 1951, the release of monetary policy from Treasury control was facilitated – perhaps made possible – by congressional support, although Secretary Mellon was interested in monetary policy throughout his term (1921–1931) (Havrilesky, 1993, chs. 2–3).

The influence of the gold standard continued to be complex. There had been a large inflow of gold during and after WWI, and gold flows were large and variable throughout the 1920s. The Fed neutralized them in the interests of domestic stability (Chandler, 1958, pp. 191–200). This might have changed after 1929; the Fed's timidity in the Great Depression has been attributed to its fear of losing gold (Eichengreen, 1992). Concern for the gold standard was as great as in the 1890s.

The Fed's political independence later in the century has been questioned by public-choice scholars, who have detailed the avenues by which the President and Congress influence public policy (Havrilesky, 1993; Keech,

[6]Of course, this is not the only interpretation of events possible. Alternatively a partisan cycle could be envisioned where the Republicans, led by then President Harrison, favored monetary expansion, and the Democrats, who successfully took the White House following the 1892 election, favored a tight monetary policy. This is the reverse of the way Republicans and Democrats are expected to behave in contemporary partisanship theory.

[7]For Fed testimony to congressional committees in the 1920s, see Harding (1925) and Strong (1930).

1995). The Fed might have been even less independent of politics at its start than at present since the Board included the Secretary of the Treasury and Comptroller of the Currency until 1936. Furthermore, the greater openness of the Independent Treasury compared with the Fed could have allowed divergent political interests in Congress and administrations to serve as watchdogs over each other to keep money out of politics. Thus, it is not clear from their legal structures which institution would have been more responsive to political and economic conditions. To determine this, we must examine the evidence.

3. THE POLITICAL MONETARY CYCLE EVIDENCE

Tests for political cycles in monetary policy usually rely on the M1 form of money supply. Grier (1987) finds robust evidence of a political monetary cycle which peaks in the presidential election quarter for 1961–1980. Beck (1987, 1991) confirms these findings, although as mentioned above and to be detailed below, he does not believe the cycle to be an independent event. Haynes and Stone (1989) also present a cycle for 1951–1986, although the form of the four-year cycle they uncover differs markedly from Grier (1987). This is because of their unrestricted coefficient approach, whereas Grier considers both predetermined patterns and polynomial distributed lags (PDLs), which constrain the possible range of cycles. Grier's results suggest a parabolic cycle whereas Haynes and Stone present a cycle which appears roughly sinusoidal, but the peak occurs in the quarter after the mid-term elections, and a second smaller peak occurs in the presidential election quarter.

An exception to these findings is Alesina et al. (1997), who are unable to find significant evidence of a political monetary cycle in the US. There are several differences in their study that may explain this result. First, they used four-quarter growth rates in M1, rather than one-quarter growth as in the previous studies. Second, their time period covers 1949–1994, much longer than either the sample considered by Grier or Beck. As several important institutional changes took place during this period, it is unlikely that a single series would be stable over the entire sample. Finally, and most important, their tests relied on a single dummy variable which takes on a positive value for up to five quarters preceding a presidential election. This representation considers only a 12–18-month cycle consisting of a prespecified form, namely of a one-time jump in the money supply, rather than the multiple of flexible routines considered by others.

As mentioned in the introduction, our sample covers the period for which money formally operated under the gold standard; as dictated by the Resumption Act of 1875, this officially begins in January of 1879, and continues until the end of 1932 before elimination of the gold standard in early 1933. The sample is broken at 1914:4 with the beginning of the operation of the

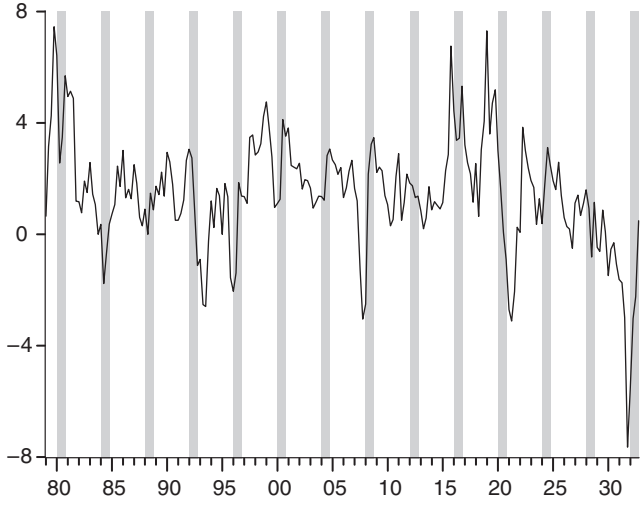

Figure 1. Quarterly growth rate of seasonally adjusted M2, 1879–1932.

Federal Reserve system. M1 statistics do not date back to our starting point in 1879. Instead we rely on seasonally adjusted M2 numbers, taken from Friedman and Schwartz (1970). The quarterly growth rate of M2 is presented in Figure 1. Presidential election years are highlighted in the graph.

3.1 Free-Form Cycles in Money Supply

Following convention of the literature, we first determine the optimal lag structure of money growth, assuming it can be represented as a truncated autoregressive series. The Schwarz criterion is minimized using a lag structure of AR(1) for the entire period. To consider the impact of institutional change and traumatic events, we test for structural breaks caused by the depression of 1896, the start of the Federal Reserve System, and the Great Depression. We use the Chow forecast test which forecasts future values based on the sample data prior to the hypothesized breakpoints of 1896:1, 1914:4, and 1929:4. We are unable to reject the null of no break beginning in 1896:1 but confirm a break with the start of the Fed in 1914:4 and another break from the Great Depression.

The finding of a structural break could represent either a simple intercept-shift, different parameter values, or new functional form. A dummy variable for the Federal Reserve years was not statistically significant, and breaking the sample into two periods revealed that M2 growth under the Independent Treasury and Fed followed different paths. For the subsample under the Independent Treasury, the optimal specification increases to an AR(2), but under the Federal Reserve the optimal lag is reduced to the AR(1). Retesting for a breakpoint in 1896:1 under the new lag structure for the Independent

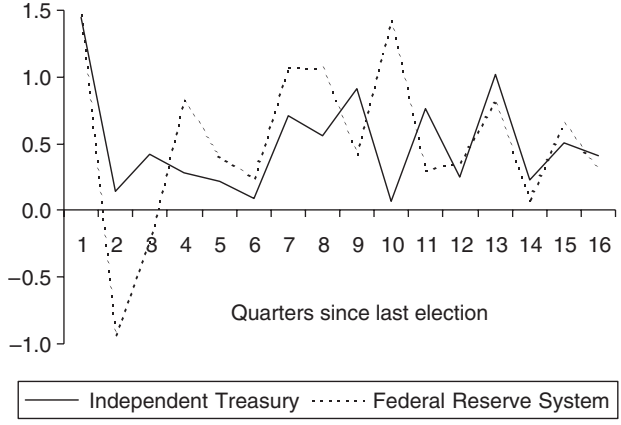

Figure 2. Monetary cycles under differing institutional arrangements: Free-form quarterly coefficients.

Treasury period still resulted in a statistically insignificant test statistic and a dummy variable covering the four quarters of negative output growth in 1896 is also not statistically significant, suggesting the depression of 1896 did not affect monetary growth in any systematic manner.

The test statistic for a structural break caused by the Great Depression in the reduced Fed sample period is now only borderline significant (p-value = 0.056) but including a dummy variable to represent a one-time intercept shift is statistically significant at conventional levels (p-value = 0.039) and has a negative coefficient suggesting that monetary growth during the Great Depression was lower than might otherwise have been predicted. This is consistent with the literature that accuses the Fed of being tight during the Great Depression (e.g. Friedman and Schwartz, 1963).

To investigate the effect of elections on monetary policy, we supplement the base regressions with 16 dummy variables, representing each of the quarters during the four-year presidential term. As explained above, M2 growth is modeled as AR(2) for the Treasury years and AR(1) with a Great Depression dummy for the Fed years. Estimated coefficients from each of the 16 quarterly dummy variables are plotted in Figure 2. The estimated patterns are not suggestive of a standard political cycle. Under the Independent Treasury, residuals of the base money growth equation are relatively flat after an initial sharp decline, until about the mid-term election period where thereafter peaks and troughs appear in successive quarters for the remaining two years. Under the Fed, monetary growth follows an even steeper initial contraction immediately after a presidential election, followed by successive peaks and troughs, with the highest peak occurring in the 10th quarter (and year and a half prior to the next election), which was the point of lowest money growth under the Treasury.

Individual *t*-statistics on the quarterly dummy variables are hampered by strong multicollinearity, and the estimates may be very imprecise. Haynes and Stone (1989) suggest a semi-parametric test to regress the estimated dummy coefficients on their first two lags. As reported in Table 1, the lags are neither individually nor jointly significant under either regime, suggesting the patterns in Figure 2 cannot be distinguished from white noise. Grier (1987) adopts a PDL specification to preserve degrees of freedom, which is then converted back to their implied 16 quarterly coefficient values. The PDL smooths the estimated coefficients by restraining them to lie on the proposed polynomial. He reports estimates up to a fourth-degree PDL are invariant, each representing a simple quadratic generating a single turning point and peaking in the election quarter. Our results proved sensitive to the order of the PDL, with each higher order creating an additional turning point in the induced coefficient pattern.

Table 1 Autoregressive Pattern for Estimated Coefficients of 16 Quarterly Dummies (*t*-ratios)

Institution	Constant	Coefficient (−1)	Coefficient (−2)	*F*-value	R^2
Independent Treasury	0.619	−0.353	0.121	1.37	0.17
(1879:1–1914:3)	(2.48)	(−1.28)	(0.44)		
Federal Reserve	0.693	−0.221	−0.130	0.37	0.05
(1914:4–1932:4)	(2.56)	(−0.80)	(−0.47)		

Notes: Estimated coefficients for quarterly dummies presented in Figure 2. Independent Treasury based on coefficients estimated from regression including AR(2) lag specification on M2 growth. Federal Reserve based on coefficients from regression including AR(1) lag specification on M2 growth and a dummy variable for Great Depression.

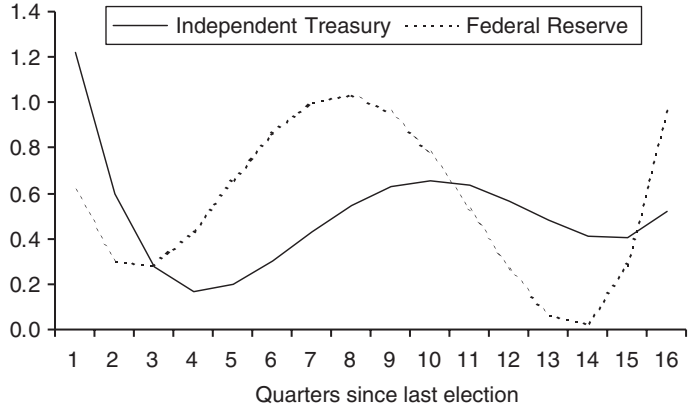

Figure 3. Monetary cycles under differing institutional arrangements: implied quarterly coefficients from fourth-order polynomial distributed lag.

The PDL-induced patterns are at best only mildly suggestive of a political monetary cycle in money. Consider for example the fourth-order PDL results presented in Figure 3. Under the Independent Treasury, monetary growth appears to undergo a severe contraction for the first year of a presidential administration, peaking six quarters later and then remaining relatively flat for the rest of the presidential term. The pattern of monetary growth under the Fed more closely resembles the unconstrained 16-quarter dummies pattern found by Haynes and Stone (1989) with an early trough in the third quarter and peaking in time for the mid-term elections, followed by another trough in quarter 14, and finally steeply increasing growth in the last two quarters.

As mentioned above, however, the PDL patterns were sensitive to the choice of order. Each of the PDL patterns were tested for statistical significance by creating a PDL variable taking the estimated induced coefficient value for each respective quarter during the 16-quarter cycle. The single PDL variable was then included as an independent regressor in the base regressions. The PDL variable was never found to be statistically significant at the 5% level, although the third degree PDL comes close. In addition, we find the higher-order PDLs are dominated by the linear component from the first order, which Beck (1991) also found when testing M1 and monetary base (MB). Even a PDL variable created from the single-order PDL was not found to be statistically significant either, however. From these results we would have to conclude M2 growth was not significantly affected by the nature of the election cycle under either regime.

3.2 Specified Cycles in Money

McCallum (1978) is credited with the first formal testing of political business cycles. He presented a series of electoral variables, which are designed to detect potential electoral unemployment cycles consistent with various prespecified models. Grier (1987) adapted McCallum's approach to monetary cycles, with the variable specifications presented graphically in Figure 4.

Since the ultimate objective of monetary manipulations is altering output and employment, and it is not clear what is the appropriate lag frame, Grier considered several potential patterns. E1 and E2 are both similar to an unsmoothed parabolic function, differing only in when the trough is reached. The E3 specification predicts a steady decline in the first year of a new term, and then a subsequent acceleration starting two quarters after the mid-term election, then peaking and holding steady at the start of the final year for the remainder of the term. Finally, his E4, E5, and E6 all predict normal cycles in money for the first two years of a presidential term and then offer divergent patterns for the second half. Note that E4 most closely represents the single dummy one-time jump specification assumed by Alesina et al. (1997). Grier found the best fit for political monetary cycles from 1961 to 1980 to

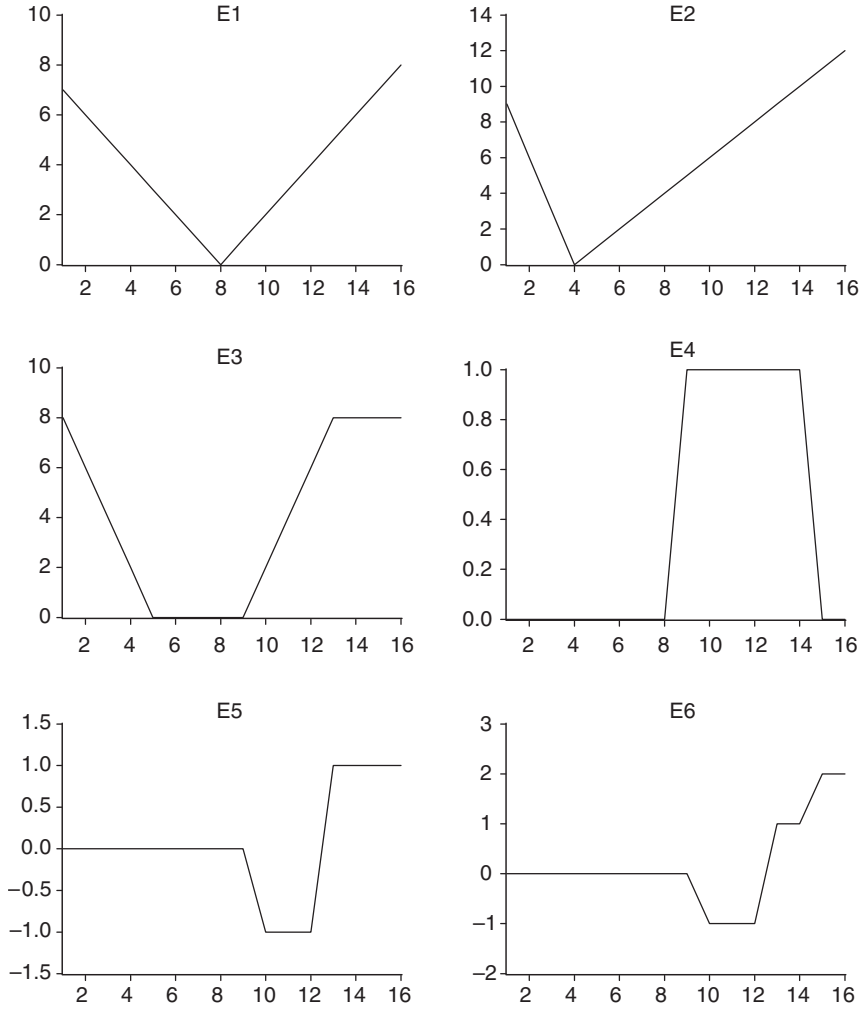

Figure 4. Grier's predicted political policy cycle patterns.

come from his E2 specification, although E3 also yielded strongly significant results. Weaker significance was found for E1 and E6, but E4 and E5, although of the predicted positive sign, were not close to achieving significance at conventional levels.

To replicate Grier's procedure for our sample time period, the quarterly dummy routines are replaced by the electoral cycle variables one at a time, and the individual coefficients and *t*-statistics are presented in Table 2. Under the Independent Treasury, the E6 specification generates the highest *t*-statistic, but still falls short of statistical significance at the 10% level. Two

Table 2 Significance of Political Policy Cycle Patterns in Determining Growth of M2

	Independent Treasury			Federal Reserve		
	Coefficient	*t*-Statistic	SEE (base = 1.13)	Coefficient	*t*-Statistic	SEE (base = 1.48)
E1	0.0050	0.012	1.13	−0.063	−0.85	1.48
E2	0.0017	0.061	1.13	−0.012	−0.24	1.49
E3	−0.063	−0.22	1.13	−0.054	−1.04	1.48
E4	−0.26	−1.32	1.13	0.12	0.34	1.49
E5	0.15	1.04	1.13	0.071	0.28	1.49
E6	0.15	1.39	1.13	0.097	0.51	1.49

Notes: Independent Treasury regressions include AR(2) lag specification on M2 growth. Federal Reserve regressions include AR(1) lag specification on M2 growth and a dummy variable for Great Depression.

of the specifications generate reverse signs from expected. The electoral pattern does not appear any stronger under the Federal Reserve. Half the variable specifications have reversed signs, and none approach statistical significance at conventional levels.

We also reran these regressions including the level of GNP and the deflator as controls for the economic environment, both individually and jointly. None of the electoral variables gained significance in these regressions. Thus, we conclude that neither the PDL nor the specified electoral variable patterns are suggestive that money supply follows a stable four-year cycle under either the Independent Treasury or after creation of the Fed.

4. REACTION FUNCTIONS

Interpreting the patterns of money supply may be problematic. Since the monetary authorities do not directly control money supply, other exogenous factors can hamper their ability to create the desired effects. In Beck's (1987) terminology, political monetary cycles, for example, may be "passive" rather than "active," meaning they were not purposely generated to improve electoral fortunes of the incumbent president, but instead naturally follow other policy or business cycles which, as it turns out, are "actively" created. Beck therefore argues that a more direct test for political monetary cycles would be to test for systematic changes in *monetary policy*, or specifically the monetary instruments under direct monetary authority control. This has been a relatively unexplored area in the monetary literature for our sample period. In his survey of Fed reaction function analyses, Khoury (1990) does not list any studies which consider monetary policy prior to the Great Depression. Examining reaction functions will help reveal if creation of an independent monetary authority changed the manner in which policy was directed, even aside from political issues. Monetary historians have noted

that both the Independent Treasury and the Federal Reserve were active in influencing monetary flows (Friedman and Schwartz, 1963; Taus, 1943) but the Fed had greater scope of policy instruments. In addition, the Fed is particularly famous for having strived to stabilize interest rates, as has been documented by the elimination of the seasonal effect in interest rates soon after its creation (Miron, 1986).

Beck (1987) considers Fed reaction functions for changes in the Federal Funds rate and non-borrowed reserves adjusted for changes in reserve requirements.[8] He later argues monetary base is the best proxy for Fed policy as it represents a "near instrument" (Beck, 1991). The monetary base (or high-powered money) is held in the forms of currency in the hands of the public, including banks, and also, after the creation of the Fed, bank deposits (claims on currency) at the Fed. As Cagan (1965) details, changes in high-powered money are because of changes in national bank notes (until the 1930s), the monetary gold stock, and the federal surplus/deficit, as well as Treasury and Fed actions, primarily shifts of Treasury cash between its own vaults and banks before 1914, and Federal Reserve credit thereafter. Thus,

$$DH = DG + DN - S + DT, \tag{1}$$

where DH is the change in high-powered money, DG is the change in gold holdings, DN is the change in national bank notes secured by US bonds, S is the budget surplus during the time period, and DT are the remaining changes from monetary authority discretion. Therefore, although monetary base is more directly controllable than a broad money aggregate such as M1 or M2, it is still a blunt instrument for directly testing monetary policy.

Instead, the monetary instrument may be defined as

$$DT = DH - DHO, \tag{2}$$

where $DHO = DG + DN - S$ is "other" influences on high-powered money to which the monetary authorities respond. The growth rates are then defined relative to the previous level of high-powered money.

To keep financial markets stable, the monetary authorities would respond to changes in the other components of monetary base, as well as changes to interest rates, measured here by the prime commercial paper rate (CPR), and the overall demand for money, proxied by the growth rate of real GNP. To capture Beck's (1987) contention that monetary policy accommodates fiscal policy, which could be tied to an election cycle, we also consider the size of the fiscal surplus/deficit. The monetary base data are quarterly averages of monthly data taken from Treasury *Annual Reports* through 1917:3, and

[8]Alesina et al. (1997) also consider Fed reaction functions from 1949 to 1993 for the Federal Funds rate, discount rate, three-month Treasury bills and 10-year Treasury notes, but fail to find significant changes to any of these interest rates during presidential election years. Note, however, their methodology is subject to the same criticisms listed above for their money supply regressions.

TABLE 3 MONETARY AUTHORITY REACTION FUNCTIONS

	Independent Treasury		Federal Reserve	
	Coefficient	*t*-Statistic	Coefficient	*t*-Statistic
Constant	2.59	7.49	2.89	4.71
DHO	−0.88	−5.96	−0.954	−46.79
Real GNP growth	−0.06	−0.63	0.518	3.08
CPR change	−0.002	−1.18	0.009	1.46
Fiscal surplus/deficit	0.002	0.37	−.0008	−1.37
Great Depression dummy			3.32	2.60
AR(1)	0.45	5.46		
R^2	0.55		0.98	
F-value	230.63		388.39	
E1	0.008	0.10	0.092	0.68
E2	0.03	0.54	0.186	1.84
E3	0.04	0.78	0.146	1.40
E4	−0.12	−0.34	0.917	1.51
E5	0.06	0.28	0.126	0.78
E6	0.06	0.38	0.118	0.36

Notes: Regressions also include quarterly dummies. Each of the electoral variable results represents estimation from a separate reaction function by including the electoral variable as an additional regressor in the base reaction function. Estimation by instrumental variables using lagged values of DHO, real GNP growth, and CPR change; quarterly dummies, Great Depression dummy and electoral variables.

then from Federal Reserve Board *Banking and Monetary Statistics*. Total monetary gold stock and national bank notes data are from Treasury *Annual Reports* through 1915:2, then from Federal Reserve Board *Banking and Monetary Statistics*. CPRs are from Macaulay (1938) and real GNP (measured in 1972 dollars) data are from Balke and Gordon (1986).

If there are indeed long and variable lags in the influence of monetary policy, the current values of the economic variables will be exogenous to the monetary instruments. But if they respond within the current quarter of measurement, they will be endogenous. To avoid problems associated with simultaneity, we use instrumental variable techniques to estimate the reaction functions, using one-period lags of the right-hand-side economic variables as instruments.

The base reaction functions for the Treasury and Fed are given in the top half of Table 3. Since the data are not seasonally adjusted, we include quarterly dummies as a crude control. In addition, monetary instruments under the Treasury suffer from a high degree of serial correlation, so an AR(1) error term is included, but although this is not needed for the Fed regressions, a dummy for the Great Depression remains significant. Our estimates suggest the Independent Treasury would respond to largely offset changes in the other components of the monetary base (*DHO*), but did not

respond systematically to other economic conditions as none of the other variables achieve standard levels of statistical significance.

The Fed also responded to maintain stability in high-powered money,[9] but was not so single-minded in its approach, as it also was accommodating in the face of increased demand for money (as proxied by real GDP growth), acting in a procyclical manner.[10] However, the positive coefficient for the Great Depression dummy suggests the Fed was looser (not as tight) than it would normally be for the economic conditions of this period, although, as we have seen, not sufficiently loose to prevent the fall in money growth. Thus, by comparing reaction functions, it appears that creation of a new semi-independent monetary authority used its discretionary influence on monetary policy more actively than had the Treasury.

To test if the monetary authorities also considered election concerns in setting policy, we next include the six electoral pattern variables, one at a time, as an additional regressor in the reaction function estimates. Their inclusion does not alter the sign or significance of any of the other variables. For brevity, the bottom portion of Table 3 presents estimates from the separate regressions for only the electoral variables. None of the election variables themselves approach conventional levels of statistical significance during the period run by the Treasury, suggesting its behavior was not altered by the presidential election cycle, although all the specifications are of the expected positive sign. Under the Fed, the strongest relationship holds for the parabolic function E2, which is in line with Grier's (1987) finding for the 1961–1980 period, although the level of significance we find is weaker, falling between the standard 5% and 10% acceptable error ranges.

5. CONCLUSIONS

Most of our results suggest that monetary policy did not change systematically over a four-year period timed around presidential elections, either under the Fed or the Independent Treasury. M2 growth failed to generate statistically significant results under a battery of tests. Reaction functions suggest monetary policy was more active under the Fed compared with the Treasury, without strong evidence of electoral cycles under either regime. We do find, however, that Fed credit may have been increasingly loose in each quarter leading up to a presidential election beginning with the end of the administration's first year after being increasingly tight during the first year, consistent with Grier's (1987) finding during the 1960s and 1970s. The constructed variable representing this residual pattern was only borderline

[9]In fact, we estimate a greater responsiveness by the Fed compared with the Treasury. Wald tests reject the coefficient being equal to 1 for the Treasury, but do not reject this for the Fed.

[10]This is not simply an artifact of the Great Depression. These results hold even if the sample is truncated to end in 1928.

significant (8%) and so this result is only suggestive. No other patterns that Grier considered came close to statistical significance.

Our evidence does not suggest the Treasury was subject to the sort of political influences that Woodrow Wilson and others sought to eradicate. If anything, the newly created Fed showed more signs of political activity than its predecessor, although as mentioned above the evidence here is only weakly supportive of such activity. We can more strongly conclude, however, that monetary policy was more active in general under the Fed than it had been under the Independent Treasury. The Fed offset influences on the monetary base more thoroughly and responded positively to economic activity which was consistent with stabilizing interest rates and promoting the "needs of trade," but was also procyclical. Activist monetary policy under the Fed has been observed in other contexts through, for example, the well-documented elimination of the seasonal effect in interest rates (Friedman and Schwartz, 1963; Miron, 1986).

Our search for political monetary cycles has been limited to a few simple forms, leaving out possible interactions between congressional and presidential elections and the party compositions of Congress and the President, including whether the composition of government was unified or split across the parties. The interplay between Congress and presidential interests in party survival suggests policy cycles may not be stable. We leave open these possibilities to be explored in further research.

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