RULES VERSUS DISCRETION: THE UNITED STATES GOLD STRATEGY, 1933-1934

By

NATHANAEL L. MICKELSON

(Under the Direction of William D. Lastrapes)

ABSTRACT

Drawing on original archival research and utilizing a sequential game framework, this paper contextualizes the Roosevelt administration's monetary policies during the Great Depression within the context of the "rules versus discretion" (RvD) debate to identify how institutional and political considerations affect Nash Equilibria outcomes. The literature review provides an overview of the following topics: RvD, the role of monetary factors during the Depression, and historical narratives surrounding FDR's monetary policy. By considering these literatures in tandem, this research postulates through a sequential game that if monetary authorities know private agents' possible responses and have the authority to regulate them, as FDR's administration did, authorities can create Nash Equilibria. Finally, it considers this analysis in relation to Kydland and Prescott's (1977) findings and offers several points for future discussion, including implications for inequality, political feasibility, and static versus dynamic processes.

INDEX WORDS: Discretion, Rules, FDR, Gold, Revaluation, Act

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NATHANAEL L. MICKELSON

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By

NATHANAEL L. MICKELSON

Major Professor: William D. Lastrapes

Committee: Robert Grafstein
Stephen Mihm

Electronic Version Approved:

Ron Walcott
Interim Dean of the Graduate School
The University of Georgia
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DEDICATION:

For my parents, who are perhaps even more thrilled than I am to see this completed.

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TABLE OF CONTENTS

Page

ACKNOWLEDGEMENTS v

LIST OF FIGURES vii

CHAPTER

1. INTRODUCTION 1
2. THESIS AND STRUCTURE OVERVIEW 4
3. LITERATURE REVIEW 7
   - Rules Versus Discretion 7
   - Money, the Gold Standard, and the Depression 19
4. FROM THE ARCHIVE 24
5. THE GAME 33
6. IMPLICATIONS 43
7. CONCLUSION 47
8. REFERENCES 49

LIST OF FIGURES

Page

Figure 1 31

Game 1 38

Game 2 40

Figure 2 44

Chapter 1: Introduction:

On January 31st, 1934, Franklin Delano Roosevelt issued a presidential proclamation which changed the statutory price of gold from $20.67 per troy ounce to $35. The decision followed a year-long series of policy maneuvers aimed at creating "controlled inflation".[1] Since the Emergency Banking Act (EBA) signed into law on March 9, 1933, the United States increasingly consolidated its control over gold within its borders. Starting with prohibitions on the export of gold, by April, the United States effectively left the gold standard. Following this decision, a series of executive orders (Nos. 6102, 6111, 6260, 6261) and congressional amendments (Thomas Amendment) increasingly required private agents to surrender gold to the United States. Just prior to Roosevelt's decision to revalue, private party's gold holdings were constrained to no more than $100, or roughly five ounces. When revaluation occurred, paired with the gradual stock piling of private gold holdings, the results were immediate as the U. S. Monetary Gold Stock jumped from $4.04 billion to $7.14 billion over the course of a month.[2]

This thesis utilizes an interdisciplinary approach to argue that the policy sequence preceding the revaluation of the USD was, in some sense, an attempt by the United States to circumvent rational expectations and the problem of time

[1] Edwards, 2018, 51.
[2] "Monetary Gold Stock for United States, 1914-1946", FRED, accessed through: https://fred.stlouisfed.org/series/M1476BUSM027NNBR .

inconsistency, a la Kydland and Prescott, within its institutional framework.[3] Given that the U. S. Constitution endows Congress with currency powers, I argue that the key to interpreting U. S. monetary policy resides not in the Executive Branch's monetary plan, but in the Congressional strategy. Archival research demonstrates private agents were ready to respond to the threat of revaluation through several strategies: hoarding gold, exporting gold in exchange for foreign currency, and enforcement of the gold clauses in contracts. Congressional debate would signal private agents who then could rationally adjust their expectations and make speculative moves. To prevent this, Congress transferred powers to Roosevelt, who then used executive order "shocks" to constrain private agents' responses. Without this strategy, either the attempt to expand the money supply would have failed or been limited, or speculative agents' responses would serve as a sufficient deterrent to keep the United States on the Gold Standard.

This reinterpretation of the U.S. monetary policy during the 1930s has implications beyond historical clarification. While Lucas, Sargent, Wallace, Kydland and Prescott contributed significantly to 'rules versus discretion' (RvD) policy debate, their arguments centered on the ability of agents to adapt their expectations based on prior experience within dynamic games.[4] In particular, Kydland and Prescott identified the "time inconsistency of optimal planning".[5] This observation identified how, within dynamic games, private agents incorporate authorities' past decisions into their future

[3] Kydland and Prescott, 1977.
[4] Lucas, 1976; Sargent and Wallace, 1975; Kydland and Prescott, 1977.
[5] *Ibid*.

behavior. Within the context of patents, inventors' incentives are directly related to authorities' defense of their intellectual property. If those authorities attempt to optimize short-term outcomes by vacating patents, inventors would be disincentivized from future innovations. The result, Kydland and Prescott argue, is that "optimal planning" outcomes based on "discretion" are suboptimal to those under policy "rules". This paper suggests agents' threats to hoard gold, buy or export it, and enforce gold clauses reflects elements of Kydland and Prescott's concerns regarding optimal planning. To counteract these threats, the U. S. relied on regulatory force throughout 1933 and early 1934. Given central banks' resiliency against rules regimes and the renewed RvD discourse following the Great Recession, this paper suggests discretionary monetary policy coordinated alongside legislated negative incentives may improve outcomes over rules or optimal planning.

Chapter 2: Thesis and Structure of the Paper

My goal is to demonstrate how institutional factors and political pressures led the United States to a controlled inflation and its implications for RvD. This process is intriguing for economists in several respects. Primarily, the U. S. policy underwent a surprising transition from a rules regime to a discretionary regime. In effect, the United States orchestrated the "cheating" scenario envisioned by Barro and Gordon (1983b) and reaped its benefits while limiting the costs to reputation.[6] While the gold standard did not mandate controls on the money supply per-se, gold reserves' slow growth effectively capped currency in circulation. Any discretionary departure from the gold standard then involved inflationary expectations adjusting. These adjustments were partially the consequences of some degree of private speculation on gold and "hoarding". Secondly, part of the United States revaluation strategy included capital controls that prevented gold outflows. While Romer (1992) demonstrates how overwhelming gold inflows from abroad increased the U.S. money stock and coincided with overall economic recovery, the role capital controls played in preventing speculative gold outflows is left unmentioned.[7] Finally, U. S. political institutions thoroughly influenced the revaluation process. While prior research attributes the New

[6] Barro and Gordon, 1983b, 1.
[7] Romer, 1992; This inflow came in at such a degree that in later years, Treasury Secretary Morgenthau "sterilized" these inflows by selling Treasury bonds. The intent of U. S. monetary policy was to create "controlled" inflation. The inflows of gold over the course of the 1930s dwarfed the U.S.'s earliest positions to such an extent, sterilization was necessary.

Deal's monetary policy to FDR, the ability to coin and determine the value of money is allocated by the United States' Constitution to Congress. While excellent studies explore how FDR and his cabinet arrived at the decision to revalue Gold, notably Sebastian Edwards (2018), little research explores Congress' decision to transfer the application of these powers to the executive branch.[8]

To address these points, this paper takes an interdisciplinary approach through three literatures. The first literature is an overview of RvD, starting with the early debates in the 1928 Strong Hearings through more recent controversies. It covers the normative and positive approaches underscoring RvD, the various paradigms, and concludes with opportunities for further research. The second literature involves monetary policy's role in ending the Depression. This section confirms the importance of gold inflows and elaborates on the various controls used to ensure the U.S. gold supply expanded. The final literature focuses on the decision to leave the Gold Standard and revalue over the course of 1933 and 1934. While Edwards (2017, 2018) and Rauchway (2016) discuss revaluation by emphasizing FDR and the executive branch, this view overlooks the role of Congress and the political pressure applied by Southerners and Westerners in getting such legislation passed. The paper briefly covers this political pressure, while highlighting problems within the current analysis. It then offers original archival research on the legislative strategy held by Congress.

[8] Edwards, 2018.

Building on Barro and Gordon's (1983a) analysis that monetary policy is a noncooperative sequential game, this paper posits that if the monetary authority also has the authority to create rules for financial speculation, then it can effectively create by discretion a Nash Equilibrium superior to rules.[9] It considers how authorities' capacity to design the "rules of the game" for private agents can alter the analysis posited by Kydland and Prescott (1977). Partially contributing to this result is the authorities' ability to limit the "dynamic" process. In effect, by banning the private ownership and export of gold, FDR's government created a new, possible outcome that made an otherwise undesirable policy tenable. While agents can still learn from earlier games and form expectations, their ability to act on these expectations is constrained by authority's rules. This process is expressed by a sequential game tree that demonstrates how controls can create a unique Nash Equilibria and approximates the decision to leave the Gold Standard during the Depression. The paper then concludes with a discussion regarding the political feasibility of such policy, its desirability, and other implications.

[9] Barro and Gordon, 1983a, 2.

Chapter 3: Literature Review

Rules versus Discretion

While the Rules versus Discretion (RvD) debate literature is marked by paradigmatic papers, any attempt to delineate monetary regimes into clear categories of "rules" or "discretionary" regimes is difficult, if not impossible. Complicating matters is the nonexistence of a clear divide between rules and discretion, with both encompassing a broad spectrum of policy arrangements. A rules regime is typically defined as any form of institutionalized constraints on the monetary authority's ability to influence the money supply. In contrast, a discretionary regime is marked by confidence in monetary authorities to identity the optimal response as dictated by the economic context. In practice, neither definition is as rigid or mutually exclusive as perceived, with proponents of both policy strategies formulating similar policy prescriptions in practice.[10] Despite this murkiness, monetary authorities have periodically revealed preferences for either rules or discretion, typically in accordance with the contemporary state of economic theory. A historical overview of these preferences, as well the literature that informed them, is useful for understanding the state of the debate today and what critiques of monetary policy remain.

[10] As an example, both Ben Bernanke (1991) and John Taylor (1993) preferred inflation targeting, with the former referring to it as a "framework" for discretion and the latter formulating a hard interest rate rule based on real inflation.

Following the Federal Reserve's inception in 1913, the early days of RvD emphasized institutional questions surrounding the competency of expert bankers.[11] Prior to the Great Depression, this involved debate over whether price stability originated from Benjamin Strong's (New York Fed) utilization of open-market operations to stabilize bank reserves or as a consequence of Adolph Miller's (Federal Reserve Board) reformulation of the real bills doctrine. This debate reached its climax in 1928, when Congressman James G. Strong (R-KS) held Congressional hearings to consider mandating price stability as the central goal of the Federal Reserve.[12] Galvanized by Irving Fisher and Stable Money Association's demands for inconvertible paper money with carefully governed growth, Congressman Strong sought to institutionalize the policies advocated by Governor Strong in order to address concerns the Gold Standard would eventually lead to deflation.[13] With the Gold Standard in place, the world's monetary authorities believed price stability to largely be controlled by the supposed self-regulating nature of international payments. In the face of unified opposition from Miller and Governor Strong, the Fed persisted in defending its independence and the motion failed. When Benjamin Strong died later that year, power returned to the Federal Reserve Board and it pursued monetary policy under the formulation of a real bills doctrine. Consequentially, the Federal Reserve made moves

[11] Glasner, 2017, 31-33.
[12] Hetzel, 1985, 3-4.
[13] *Ibid,* 11.

to defend the value of the dollar in the late 1920s, significantly contracting the money supply. This policy coincided with and abetted the onset of the Great Depression.[14]

The Strong Hearings and their aftermath personified early concerns regarding discretionary policy. As monetary economics remained under development, so too did the range of assumptions regarding money's role in prices. Individual bankers, and the stances they took, had an outsized impact on the overall health of the financial system. A deluge of monetary and fiscal theories marked the Depression, as economists Irving Fisher, Harry Simons, and John Maynard Keynes, among many other economists and more dubious, self-declared "experts" designed policies intended to address the economic crisis.

Following WWII, Keynes's theories on the business cycle dominated research. His approach emphasized short-run macro-economic fluctuations. Optimal planning, in which policymakers tailored monetary policy in response to current conditions, seemed an intuitive extension of this focus.[15] Given skepticism that markets could self-regulate, it appeared a necessity that policy makers adapt action to the present economic environment. Influenced by Simons, Milton Friedman (1948) attempted to reorient RvD towards an emphasis on long-term objectives, with a clear preference for rules prescriptions for both fiscal and monetary policy.[16] While he would later articulate a constant money growth rate rule, at the time, Friedman's monetary policy resembled

[14] Friedman and Schwarz, 1964, 418-419.
[15] It is worth considering whether the perceived success of the FDR's administration also helped contribute to the favorability of optimal planning.
[16] Friedman, 1949, 245.

the Chicago Plan of the 1930s which called for 100% reserve banking.[17] By using automatic adjustments to government spending, Friedman believed discretionary policy would be limited to determining a reasonable objective for policy to pursue. There would be no public issuance of interest-bearing government debt and an end to Federal Reserve open-market operations. Under such rigid measures, the quantity of money would then only fluctuate in accord with government surpluses and expenditures. To defend strict constraints, Friedman emphasized a new wrinkle in RvD – lags in response time.[18] Emphasizing the nature of the political process, Friedman noted three lags in discretionary policy: the gap between a need for action and recognition of that need, between this recognition and action,[19] and between action and its effects. While admitting the assumptions to be highly conjectural, Friedman contended that if authorities were ignorant to the need for a discretionary response, automatic adjustments could reduce the volatility of business cycles.

Though Friedman's scenario demonstrated an environment in which rules proved preferable to discretion, the rigidity of his policies failed to sway monetary authorities from the intuitive belief that optimal responses led to optimal outcomes. With the establishment of the Bretton Woods system, gold and fixed exchange rates reclaimed their role the key constraints on monetary policy. However, by the 1970s, the theory of rational expectations and increasing use of formal theory inspired economists

[17] *Ibid,* 247.
[18] *Ibid,* 254-258.
[19] Again, a present example is the length of political debate surrounding the stimulus package to combat the coronavirus.

to revisit RvD. Eschewing the stress of prior arguments on the political process, this new wave of literature emphasized formally modeling society through stochastic processes. Sargent and Wallace (1975) revisited Friedman's X percent growth rule and interest rate targeting and determined that, when accounting for public's rational expectations of future inflation, rules proved preferable to discretion.[20] While promising, Sargent and Wallace tempered expectations by noting the ad hoc nature of the model utilized.

Following Sargent and Wallace, Kydland and Prescott's (1977) classic paper redefined RvD by robustly critiquing optimal planning's underpinning logic.[21] Strategically, optimal planning considers monetary events as given by nature – i.e., current policy outcomes are determined only by current and past policies. However, in dynamic systems where the structure is well understood, private agents learn from past policies which in turn inform their future decisions. Kydland and Prescott found that, so long as agents have some knowledge about policymakers' likely response to changing economic conditions, consistent policy[22] proves suboptimal over infinite horizons to rule. This paradox of short-term optimization leading to long-term suboptimality was termed the "time inconsistency of optimal planning". To be clear, they note that this is no fault of the policymaker – this occurs due to their lack of control over future policymakers' consideration of private responses.[23] To demonstrate this

[20] Sargent, 1975.
[21] Kydland and Prescott, 1977.
[22] Here defined as the consistent application of the optimal policy to various economic contexts.
[23] *Ibid,* 474.

paradox, the paper posits two intuitive examples: flood plains and patent law. In both, the current short-term social benefits can be optimized through rebuilding levies or vacating patents. However, over the long-term these "optimal responses" create incentives for agents that lead to suboptimal outcomes. Short-term commitments to levies encourage people to move to flood plains, spurring further investment in levies in perpetuity. Vacating patents, meanwhile, disincentivizes experimentation and product development leading to a long-term drop in R&D.

Kydland and Prescott's theory led to a furious burst of literature throughout the late 1970s and early 1980s. While Kydland and Prescott focused on general policy conclusions, Robert Barro and David B. Gordon published several papers exploring the implications of time inconsistency's implications in relation to monetary policy. Responding to Calvo's (1978) work on monetary authorities' credibility, Barro and Gordon (1983a) argue that monetary authorities have the incentive to create unexpected inflation in order to generate higher economic activity.[24] In their framework, the benefits from unexpected inflation are threefold for authorities: 1) an uptick in economic activity through aggregate spending, 2) unemployment levels below the natural rate, and 3) a reduction in authorities' real debt obligations.

However, given a general awareness of this incentive, private agents integrate these incentives within their expectations to prevent the intended gains of unexpected inflation, altering the amount of real cash holdings they accrue. To evaluate these

[24] Barro and Gordon, 1983a; Barro and Gordon, 1983b.

incentives, Barro and Gordon explored four different optimization problems focusing on inflationary costs and the benefits of unexpected inflation. In one model, the economy responds using optimal planning. In the second, authorities follow a rule framework. The third and fourth models are "unreal" scenarios – the consequences of an optimal rule and the outcome if authorities could "cheat", i.e. signal a dedication to a rules regime and then shift to discretionary policy. They concluded that, given these expectations, rules can improve on general economic conditions.[25]

This period represented the high watermark for rules regimes. In his 1985 assessment of the developments, Barro notes the dramatic transformation in the debate following the time inconsistency problem.[26] Likening rules to commitments, the central counterbalance to discretionary policy rested in central banks' reputation and resistance to manufacturing unexpected inflation. However, Barro admitted that the role of economists determining optimal and suboptimal policy and its value was largely negligible in the present. Two years later, Alan Blinder's (1987) own assessment of RvD confirmed Barro's dour conclusion.[27] Repudiating rules advocates, Blinder delighted in the discretionary policy's resurgence, noting the drawbacks of X monetary growth rules when the economy grew at variable rates. Noting that the Bundesbank and Paul Volker both operated on shorter horizons and by critiquing the self-correcting nature of

[25] Barro and Gordon, 1983b.
[26] Barro, 1985.
[27] Blinder, 1987, 403-409.

markets, Blinder argues that, despite the protestations of rules theorists, discretion remained the optimal policy, if not by mathematical theory, then by practice.

Despite the battles of the 1980s, RvD is ongoing, though increasingly semantic. Inflation targeting, a policy in which central banks announced official inflation targets and explicitly acknowledge low and stable inflation (i.e. price stability) is the primary goal of monetary policy, is claimed by both proponents of discretion (such as Bernanke and Mishkin) and rules (such as Taylor). To borrow Blinder's analogy, both rules and discretion advocates have agreed on the temperature at which the thermostat should be set; they disagree on the conditions under which the temperature should be changed. Bernanke and Mishkin (1997) articulate the view that Inflation Targeting serves as a framework which bridges the gap between rules and discretion.[28] By setting reasonable expectations for the public, it captures the best aspects of rules while not infringing on monetary authorities' ability to confront present economic conditions. In this sense, inflation targeting acts as a discretionary policy that seeks to mimic the predictability and expectations derived from rules. Taylor (1993), meanwhile, perceives inflation targeting as a way of crafting a rules-based policy with the responsiveness of discretion. In a reduced form expression, Taylor argues that nominal interest rates should be tied to divergence in the actual inflation rate from target inflation rate, and real GDP from potential GDP.[29]

[28] Bernanke and Mishkin, 1997, 98.
[29] Taylor, 1993, 202.

The relatively narrow distinction between Taylor and Bernanke's views on inflation targeting encapsulate the difficulty in distinguishing between rules and discretion in practice. Highlighting this narrow divide is the Greenspan era. Rules advocates claim Greenspan closely followed the Taylor rule while discretion's advocates note the relative stability of the era did not call for drastic action.[30] When the Federal Reserve embarked on "easy" credit in the mid-2000s, both groups have claimed the failure of the other. Whatever desire the Fed had to abide by the Taylor Rule evaporated with the onset of the Great Recession as a series of discretionary policies, most notably, quantitative easing, poured from its accounts. Questions arose regarding the origins of the crisis, with some monetary experts like Taylor arguing that Greenspan had, under a discretionary policy, maintained low interest rates that incentivized the housing crisis.[31] Other advocates, such as Bernanke, meanwhile argue the dramatic action taken by the Federal Reserve staved off recession. In effect, RvD has settled into a circular series of arguments: if rules were abided by the crisis would not have been so great, or if rules were in place the Recession could not have been contained as it was.

At a 2017 conference hosted by the Boston Federal Reserve, John Taylor assessed RvD's current state. Covering the evolution of suggested policy, Taylor addresses the old questions of limitations on central banking and difficulty in designing "rules" that allowed for flexible policy actions. Working through the evolution of the debate, Taylor notes that the same reasons in favor of policy rules remain true. However, criticisms

[30] Sumner, 2017, 90.
[31] Taylor, 2017, 11.

have evolved leading to debates surrounding whether the period preceding the Great Recession amounted to a failure of rules or discretion. Given central bank's firm independence, Taylor concedes self-declared economic rules have certainly failed to limit discretionary monetary action. Echoing Harry Simons nearly a century earlier, Taylor concludes that legislative action to enforce rules might be necessary.[32]

Given Taylor's status as the foremost rules advocate, this conclusion is unsurprising, though not a lonely one. Over the past decade, Janet Yellen suggested numerous rules ranging from output gap tilting (2012), balanced rules (2015), and unemployment gaps (2016).[33] Likewise, Scott Sumner (2017) proposes a "market monetarism" perspective, an amendment of the Taylor Rule that emphasizes targeting Nominal GDP (NGDP). Under these rules, futures contracts on NGDP futures serves the function gold did under the gold standard.[34]

Despite rules receiving renewed attention, since the Great Recession monetary policy has continued to operate under unclear terms. This is partly due to, as Taylor notes, evolving skepticism regarding rules in practice. Laidler (2017) succinctly captures these concerns. Noting the absence of a convergence to a "true" economic model (in the sense of a model that universally and accurately captures the world), RvD remains in flux.[35] Given the unclear trajectory in theory and routine disagreement, policy remains something to be dealt with continuously. Recently, the dramatic response to the

[32] Taylor, 2017, 33-34.
[33] Nikolsko-Rzhevskyy et al, 2017, 59-71.
[34] Sumner, 2017, 93-96.
[35] Laidler, 2017, 12.

COVID-19 crisis consists of the largest and quickest monetary response in history.[36] Recent history has demonstrated the pressure to act, except in cases of great faith, renders a genuine rules regime infeasible. In line with Barro and Gordon's notions of "cheating", monetary authorities' policies in practice are described as signaling the characteristics of a rules regime during economically stable times, while retaining their full discretionary tool belt.

This strategy fails to credibly account for the time inconsistency problems that Kydland and Prescott originally noted. When monetary authorities shift from signaling a rules regime to discretionary policy, this amounts to a speculative event that encourages agents to respond. Perhaps abetting this flaw is the emphasis on defining agents' responses in the generalized notion of inflationary expectations. To date, rules advocates have used inflationary expectations as a catch-all phrase for an array of decisions made by private households in response to monetary policy. However, these inflationary expectations coincide with real individual decisions, as Kydland and Prescott noted with "moving into flood plains". Current residents of flood plains who would prefer not to move, are assured that the levees will be supported, which in turn incentivizes others who find opportunities there for whatever reason to also move into the area. This generalized notion allows models great flexibility in explaining how agents behave rationally based on their expectations and preferences in multiple

[36] Timiraos, Nick. "The Fed Transformed: Jay Powell Leads Central Bank into Uncharted Waters", *The Wall Street Journal.* March 30, 2020.

contexts. Still, it is worth considering the specific array of options available to agents in any specific setting.

One strategy available to private agents is to respond to inflationary expectations by speculating on assets likely to increase in value in response to inflationary pressures, notably bonds or stocks. It is feasible that, when monetary authorities feign dedication to some form of rule just to invalidate it in the face of crisis, private agents can counteract said policy to some degree by speculating against this response. However, this does not mean that the time inconsistency problem cannot be overcome or limited. Crucially, in both Kydland, Prescott, Barro, and Gordon's formulations, monetary authorities and agents faced dichotomous decision. For Kydland and Prescott, government could either reinforce or abandon levies, or honor or renege on patents.[37] For Barro and Gordon, government faced the option of attempting to increase unintended inflation and risk credibility or protect credibility and follow rules. In practice for monetary authorities today, this assumption of dichotomous moves is not so absurd. Traditionally, central bankers' options are: increase or decrease the discount rate, lower or increase the reserve ratio, and purchase or sell bonds on the open market or through repo operations. In recent years, though, new tools have been added including quantitative easing, signaling, and forward guidance. However, if the authority in question also has the capacity to regulate private agents' responses, then policy can alter the dynamic process such that authorities' preferences are optimized.

[37] Kydland and Prescott, 1977, 474-475.

This is an institutional question, however, and requires expertise about institutional rules. Fortunately, one such example exists in the government's decision to abandon the Gold Standard. To understand its significance, however, an appropriate understanding of the role monetary policy played in the Great Depression and economic recovery is necessary.

Money, the Gold Standard, and the Depression

Investigations into the role monetary policy played in both the onset and conclusion of the Great Depression is one of the most important contributions economic history has made to general economic theory. The discovery that monetary policy proved a necessary condition for recovery highlights its accomplishments.[38] Certainly, it has had far ranging consequences, such as informing Bernanke's response to the Great Recession in '07. Regarding RvD, most of the debate has centered on whether or not Federal Reserve policies preceding the Depression were disastrous due to poor economic concepts[39] or due to the constraints placed on policy-makers by the "rules" of the gold game.[40] These approaches largely emphasize the Federal Reserves' policy, an intuitive starting point given its function governing monetary policy. However, during the Depression, power over monetary policy shifted dramatically away from the Federal Reserve and towards the Executive Branch through several legislative acts, most notably the Gold Reserve Act of 1934.

[38] Eichengreen and Sachs, 1985; Romer, 1992.
[39] I.e. Friedman-Schwarz Thesis
[40] As advanced by Temin and Eichengreen.

In order to appreciate these transfers of authority, an adequate understanding of the monetary system and its role in the Depression is required. The interwar gold standard, as noted by Eichengreen, attempted to re-establish the stability that existed prior to WWI.[41] Under the "Classical" Gold Standard (1870-1914), a rules regime enforced cooperation by signaling creditworthiness. While South America experienced a credit crisis, the period was largely marked by general economic stability and adherence to the standard.[42] In Bordo and Kydland's (19990) assessment, this stability resulted from the classical gold standard operating as an effective rules system and was time consistent.[43]

However, following WWI the remarkable amount of debt stockpiled by belligerent nations and the insistence that gold transfers be utilized to offset trade deficits shattered the classical standard. Instead, nations shifted to a gold-exchange standard and backed their currency with both gold and foreign currencies.[44] Due to the constrained growth in gold, the system failed to establish the intended price stability. As nations' ran deficits, the system required they transfer gold reserves to surplus nations. This created deflationary pressures in nations running trade deficits. In theory, nations running surpluses would realize inflation in their markets from the increased circulation brought on by influxes of gold. The result would be a cycle of inflationary pressures, eventual deficits, and transferring gold back to now increasing countries. In

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[41] Eichengreen, 1995, 183-185.
[42] Bordo and Kydland, 1990.
[43] *Ibid,* 1.
[44] Eichengreen and Temin, 2000.

reality, nations sterilized their gold inflows and added to their reserves, forcing deflationary pressures on deficit countries. Wholesale prices crashed as global prices declined.

As deflationary pressures took hold, the Federal Reserve made moves to defend the value of the dollar. This involved an interest rate increase in 1928, a contractionary move that compounded the consequences of the 1929 banking panics following Black Friday.[45] Within the context of RvD, these actions and consequence are normally framed to suit both rules and discretionary advocates. Rules' proponents argue the Federal Reserve's discretionary judgement failed due to its basis in poor theory and faulty assumptions, such the connection between inflation and the money supply (the Friedman-Schwarz Thesis). Others, such as Temin and Eichengreen (2000), argue that the "rules of the game" forced the Fed into poor policy. Regardless of perspective, it is unquestionable that the U.S. Federal Reserve's policies during the crisis were disastrous. Over the course of August 1929 to March 1933, the money supply dropped by 33%.[46] Eichengreen and Sachs (1985) later provided the strongest indictment against the gold standard yet, noting that nations leaving the Gold Standard (or were never on it, like Spain) experienced quicker recoveries.[47]

Some scholars have suggested that if the rules of the game prevented the Fed from acting, it was surprising then that following the Fed's 1932 open-market operation

[45] Friedman and Schwarz, 1964.
[46] *Ibid,* 302.
[47] Eichengreen and Sachs, 1985.

gold purchases markets did not anticipate a departure from the Gold Standard.[48] There are some problems with this analysis, however. The psychology of the gold-exchange standard involved the commitment to currency being backed by gold – even in these extemporaneous purchases, it revealed the United States desired its currency to be backed by gold. Additionally, at this time, inflationary measures such as the 1932 version of the Glass-Steagall Act, which sought to address supposedly "hoarded" funds, were being driven by the minority party. Two Southern Democrats (Steagall - AL, Glass - VI) proposed the legislation to a Republican controlled Senate and White House which regarded the policy with anathema. It seemed, in 1932, a reasonable position to presume that revaluation would not occur.

As noted by Sebastian Edwards (2018) in his excellent treatment of the United States "default," a transition occurred in FDR's administration that set the U.S. on a path towards monetary expansion.[49] Prior research has failed to identify a clear origin for this strategy, though several reasonable candidates have been proposed.[50] Regardless, what is clear is the role monetary expansion played in reviving the economy. Christina Romer (1990) identifies how, rather than a market downturn initiating a self-healing process, the rate of economic recovery is directly correlated with increasing gold flows from abroad over the course of 1934-1941.[51] While prior narratives emphasized the decade required to return to pre-Depression era employment levels,

[48] Hsieh and Romer, 2006.
[49] Edwards, 2017a.
[50] Edwards, 2017b.
[51] Romer, 1992, 759-760.

Romer notes the U.S. economy experienced robust growth from 1933-1937, averaging 8% annually, followed by 10% annual growth from 1938-1941.[52] Recovery tracked alongside a monetary expansion of 10% annually from 33-37, followed by larger annual expansions over the years 1938-1941. Romer argues the initial 1933 devaluation set the stage for this expansion, which was then succeeded by capital flight from Europe in the face of political instability. Romer concludes with the bold proclamation that "natural recovery" played no part in the U.S. recovery over the 1930s. It was largely, if not exclusively, driven by an "accidental" monetary policy.[53]

[52] *Ibid,* 773-774.
[53] *Ibid,* 773-775.

Chapter 4: From the Archive

Though Barro (1985) notes the United States decision to abandon gold clauses demonstrates that the existence of rules does not ensure adherence, the strategic shift from the "rules" of the gold standard to a discretionary revaluation is largely ignored by RvD literature.[54] Perhaps the notion that FDR's policies were "accidental" explains this. In order to understand how the strategy for gold revaluation fits within RvD, it is necessary to correct the record regarding the degree to which revaluation was "accidental" (as understood by Romer) or "experimental" (as posited by Edwards). Prior research has, perhaps, taken too literally the idea of the leaving the gold standard as "FDR's" monetary policy. While indeed the executive branch concluded revaluation was necessary, the power to "coin" money and determine the currency of the United States is vested with Congress under Article 1, Section 8, Clause 5 of the United States constitution. Little argument is provided for why Congress surrendered their powers to define currency to the executive branch. By addressing the Congressional monetary policy, rather than the Executive strategy, the approach utilized for revaluation holds serious implications for RvD.

While some scholars have recently argued that FDR always intended to devalue the dollar, the consensus remains that Roosevelt had no clear monetary strategy

[54] Barro, 1985, 24.

entering his presidency.[55] Notably, no clear evidence exists within FDR's presidential papers to suggest an agreed upon monetary strategy. Most of his confidants, even the several members of the Brain Trust who preferred Irving Fisher's compensated dollar, neither held much sway over FDR following his inauguration nor were significantly invested in monetary theory. Furthermore, none of his advisor's recalled in any of their notes FDR demonstrating a preference for either maintaining or leaving the Gold Standard.[56]

Given that "every conceivable archive" has been explored, Edwards emphasizes Roosevelt's experimental nature and favorability to bold ideas and personalities.[57] Entertaining the possibility that policy was formulated verbally to ensure confidentiality, Edwards ultimately concludes that, given the backgrounds and distance between Roosevelt and his advisors, ultimately none had strong views about gold heading into March of 1933. To this end, FDR ultimately adopted the gold standard because he ran out of serious options.[58]

There is a curious note here.[59] Edwards argues that Senate actions forced Roosevelt to consider devaluation. In his excellent book, he elaborates, noting that Senate pressure resulted from radical silver politicians such as William Borah (R-ID) and Burton Wheeler (D-MO). While silver advocates ultimately failed in monetizing silver, Edwards suggests one inflationary measure ultimately forced Roosevelt's hand.

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[55] Rauchway, 2016; Rauchway, 2019; Edwards, 2017.
[56] Edwards, 2017b,.
[57] Ibid, 2.
[58] Ibid, 26.
[59] Edwards, 2017b, 27.

An amendment proposed by Elmer Thomas (D-OK) to the Agricultural Adjustment Act endowed Roosevelt with the authority to revalue the dollar by decreasing the gold backing by 50%, alongside accepting silver payments for debt, and issuance of greenbacks.[60] After furious debate, the executive branch accepted the amendments with serious revisions.

This amendment granted FDR sweeping authority over the United States currency. Intriguingly, it represents Congress as willing to transfer its authority to the executive branch. Implicitly, narratives of FDR's presidency disproportionately emphasize the power he brought to the executive office and ignored the careful power balances within the U.S. Constitution. While Rauchway (2016) suggests the lack of Congressional edits to Roosevelt's early legislation demonstrate his genius, Occam's Razer suggests a much simpler explanation – that the legislature was involved at the earliest stages of policy, perhaps prior to Roosevelt's election.[61] While bimetallism was a possible strategy for stimulating inflation with several proponents, the perceived radicalism associated with silver advocates and fears of uncontrolled inflation made it politically infeasible. Instead, Congress preferred inflationary strategies within the framework of the Gold Standard. As an example, the earliest formulation of Glass-Steagall intended to stimulate some inflation without altering the dollar.[62] With a Republican president and a Senate majority receptive to banking concerns, the

[60] Edwards, 2017a, 53.
[61] Rauchway, 2016, xxvi-xxviii.
[62] Robinson, Joseph T., "Letter to Loughborough", April 14th, 1932.

legislation failed. A significantly revised version passed under a Democrat-controlled government in 1933. Clearly, monetary policy was not only the concern of populist Senators but also conservative Democrats. By evaluating their archives, the origins of revaluation become clear.

As early as 1932, Senate Minority Leader Joseph T. Robinson (D-AR) corresponded with his good friend, James Fairfax ("Fax") Loughborough regarding revaluation. A partner at Rose, Hemingway, and Loughborough, the oldest law and one of the most prestigious law firms west of the Mississippi, Loughborough held an obsessive fascination with monetary policy. After working intimately with Robinson in the failed defense of banker A. B. Banks, Loughborough wrote to Robinson in April to gauge the sentiment of Congress regarding a revaluation. "… I have been wondering if perhaps a remedy [to the Depression] may be found in a change in our money base; that is, the reduction of the grains in the dollar."[63] Noting that the dollar had not been revalued from gold since 1837, and that the rapid expansion of the economy due to communication and transportation far outpaced new gold discoveries, Loughborough contemplated whether the restriction on money created the Depression. Typical of an enthusiast, Loughborough hoped Robinson would clarify the state of the debate in the Capitol. Robinson responded five days later, clarifying his own position. The view held by Washington Democrats was that the first Glass Steagall bill would provide all the inflation necessary, preventing the need for revaluation.[64]

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[63] Loughborough, J. F. "Letter to Robinson", April 9, 1932.
[64] Robinson, Joseph T. "Letter to Loughborough", April 14, 1932.

The flurry of letters in June established for Loughborough the parameters for analyzing the monetary debate. In November, Loughborough crafted a memorandum for Robinson on the possibility of revaluation and whether it could alter existing contracts. In the memoranda, he argued that, as Congress was expressly given the power to determine currency it had the ability to retroactively alter contracts. If it did not have that power, the contract theoretically could limit the government – a position that precedent determined only impacted the states.[65] Loughborough still cautioned against a reckless revaluation, however, but also noted that "government loans to help the situation are only temporary relief, they bear interest, and must be repaid." There existed "something wrong in our economic situation that we have not yet put our finger on, and there is urgent demand that we find out what it is." Loughborough, and by proxy Robinson, became increasingly convinced it had to do with the currency in circulation.

Of course, a comprehensive revaluation brought fierce opposition. Charles S. McCain, a fellow Arkansan and the chair of Chase National Bank, acted as the prime lender for the Southwest Joint-State Land Bank during Robinson's tenure as the bank's president. McCain and his economists fiercely opposed any discussion of changing the fineness of gold backing the dollar. In December of 1932, he wrote to Robinson listing his major critiques of any significant reduction of the fineness: 1) it would impugn the United States honor and reliability as a creditor, 2) contract obligations compel the

[65] Loughborough, J. F. "Memoranda on Currency Revaluation", November 22, 1932.

United States to pay in the present fineness and weight of gold, 3) a revaluation would create a "shock" due to loss of faith in the government's stewardship, 4) if a change were announced, before it could be made effective creditors would demand gold and it would flow abroad, 5) a general inflation would ensue counteracting any gains in income, and 6) the way out of the Depression is tariff reduction.[66]

Noting the merits of the argument, Loughborough formulated grounds for addressing each of McCain's concerns. To the first point, Loughborough agreed if the revaluation were dishonorable, no decent person should embrace it. Circumventing this, Loughborough made honor synonymous to legal, and given it was legal for the U.S. to change both private and public contracts, any change would be considered honorable. However, of all his repudiations, one stands most important. Loughborough agreed with McCain's analysis that the rational response to revaluation would be a run on gold and its exportation. Lenders would call in repayment of debts in gold, while speculators would purchase gold privately or purchase foreign currencies in order to hedge the maneuver. In this sense, Loughborough and McCain both recognized the rational expectations argument later articulated by Kydland and Prescott. However, Loughborough added a wrinkle to the argument. "Before it is seriously made to Congress the outflow of gold from the treasury should be prevented by executive order…" If the executive branch did not have that power, then Congress would need to

[66] Loughborough, J. F. "Response to McCain", January 2nd, 1933.

pass an act granting the President that power.[67] Robinson eagerly read Loughborough's analysis, and referred several of his fellow Senators and McCain's team to his letter.[68]

One of the men who received the memorandum from Robinson was Senator Tom "Cotton" Connally (D-TX), an ally of Robinson's.[69] When it became clear in Senate debate that the Wheeler Bill would fail, Connally announced on the Senate floor his intent to propose a bill that would debase gold by a third and ban future contracts from including the gold clauses.[70] In a quite unreliable autobiography, Connally claims credit for the strategy to revalue gold and that he recommended the policy to Roosevelt who in turn commended him later for the policies' success.[71] Connally did in fact lead the Senators in favor of Gold revaluation and fiercely debated Senator Carter Glass in defense of the policy. Connally, in Roosevelt's mind, became the face of the gold revaluation campaign. It is revealing that, when the Supreme Court handed down its decision in 1935, both Senators Robinson and Connally were present in the court, not members of the executive branch.[72]

The policy sequence that followed Roosevelt's inauguration caught private investors by surprise while simultaneously granting the new president maximum flexibility to determine monetary policy. While the United Kingdom had left the Gold Standard in September of 1931 after speculative attacks, the United States continued to

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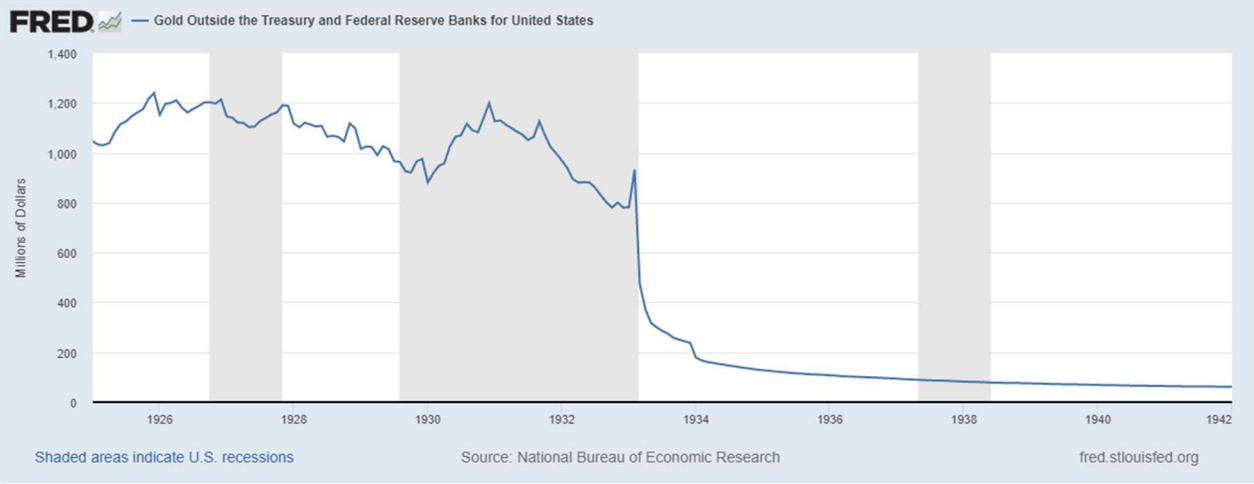
[67] *Ibid.*
[68] Robinson, Joseph T. "Letter to Loughborough", January 10, 1933.
[69] Robinson, Joseph T. "Letter to Louis McHowe", February 19th, 1934.
[70] "Inflation Plan Stricken from Bank Measure", Chicago Tribune, January 25th, 1933.
[71] Connally, 1954, 147-152.
[72] Edwards, 2018, 149.

signal commitment to the Gold Standard. Between these signals, Roosevelt's opaque campaign language, and faith in the gold clause contracts, investors were reassured that revaluation was unlikely. When the Emergency Banking Act passed in record time in March 1933, the prohibitions on gold exports and private ownership (later expanded by Executive Order 6102) enabled the United States to expand its currency base in accordance with the standard. However, it also served to consolidate private gold holdings in public control with a few exceptions for industry and crafts. When the U. S. abandoned the Gold Standard in April of 1933, while it licensed foreign nations such as Germany, Brazil, the United Kingdom, and others to repay their U. S. loans with depreciated dollars, the United States effectively shifted to monetary autarky with complete control over the domestic money supply.

Figure 1:[73]



[73] "Gold Outside the Treasury and Federal Reserve Banks for United States," National Bureau of Economic Research, Accessed: https://fred.stlouisfed.org/series/M1431BUSM144NNBR

Legislators were the impetus behind the intentional decision to leave the gold standard, not FDR. Rather than "accidental" policy, the monetary plan FDR's administration embarked on the course of 1933-1934 was specifically designed to increase the amount of currency in circulation. Notably, part of this process involved signaling a commitment to gold-backed currency, if not the current operation of the gold standard. This adds a unique aspect to the RvD debate. Presently, central banks and federal governments often coordinate spending policy in the face of crises. It follows then they can also coordinate policy that limits agents' capacity to anticipate and respond to the monetary authority's policies. As demonstrated by Connally's desire to ban gold contracts, this raises a unique question within the typical RvD debate. If monetary authorities can design the strategic game private agents operate in, can they simulate a "cheating" consequence as envisioned by Barro and Gordon? It is to this discussion the paper now turns.

Chapter 5: The Game

Kydland and Prescott's seminal work critiqued the application of optimal plans within dynamic economies.[74] While optimal plans provided a powerful tool in static environments, Kydland and Prescott demonstrated that dynamic processes provided agents the opportunity to learn from earlier policy plays and adjust future decisions accordingly. The classic examples they provide, government funded levies and patents, are dichotomous affairs. Policymakers either respond to the immediate optimal options, funding levies and providing patents, or refrain from these options. If the optimal plan were chosen, it would increasingly grow suboptimal overtime as agents adjusted to the policymakers' expected action. In the case of flood plains, the short-term optimal decision to construct levies leads to a population growth in flood plains, with agents aware that policymakers will preserve the levies. Overtime, the commitment to preserving levies proves suboptimal to having abandoned the flood plains. Kydland and Prescott named this novel outcome the Time Inconsistency of Optimal Plans.

Within monetary economics, Barro and Gordon adapted the notion of Time Inconsistency to explore the desirability of rules for money supply. In their formulation, monetary authorities utilized countercyclical monetary policy to maximize an objective that reflects "society's preferences on inflation and unemployment (or,

[74] Kydland and Prescott, 1977.

characteristically, its relationship to output).[75] However, when considering time inconsistency, this approach resulted in unemployment remaining unchanged while inflation grew excessively.[76] Barro and Gordon reasoned this was due to the inability of central banks to precommit its course of future actions and agents accordingly setting their expectations within contract negotiations. However, they argued these negative consequences could be avoided with the, initially costly, institution of a policy rule. Barro and Gordon assume that policymakers minimize a loss function that depends on inflation and unemployment, and that unemployment, inflation and inflationary expectations are linked through a standard Phillips Curve:

$U_t = U_t^n - a(\pi_t - \pi_t^e),\ a > 0,$

where the unemployment rate depends on the natural rate of unemployment (U_t^n) and the gap between actual inflation and expected inflation ($\pi_t - \pi_t^e$).

In this formulation, unemployment could be controlled through monetary policy affecting π_t. The boons of unexpected inflation, particularly for governments, go beyond reduced unemployment and corresponding bump in increased aggregate spending. Prior inflationary expectations inform agents' holding of real cash, M_{t-1}/P_{t-1}, where *M* denotes the nominal amount of currency in circulation for a period *t* related to its price level, *P*.[77] Surprise inflation, when ($\pi_t - \pi_t^e$) is positive, depreciates the real value of these holdings enabling the government to issue more new money in real

[75] Barro and Gordon, 1983a, 3.
[76] For a historical reference, consider the Weimar Republic.
[77] Note: Barro and Gordon do not specify these terms exactly in their paper, so this is my presumption.

terms, $(M_t - M_{t-1})/P_{t-1}$, reaping the benefits of seigniorage. Additionally, government obligations, defined as B_{t-1}/P_{t-1}, carry the nominal yield R_{t-1}, which is based upon people's inflationary expectations for the period. Surprise inflation depreciates the real value of these bonds, lowering the government's future real expenditures on interest and repayment.

The benefits of surprise inflation crucially factored in the United States evaluation of its monetary situation in 1933. As evidenced in the Loughborough-McCain debate, revaluation's advocates were distinctly interested in creating inflation to reduce unemployment, but also in increasing the money supply for its own-sake.[78] As evidenced by attacks on hoarding, Federal efforts to purchase and acquire gold, and Loughborough's arguments regarding the slow growth of money, there were legitimate concerns beyond the price level that simply not enough physical cash existed in the economy for it to healthily function. Additionally, when the Gold Reserve Act passed in 1934, it specified that the proceeds from seigniorage were utilized to fund the newly established Exchange Rate Stabilization Fund.

For private agents, their central concern centered on combatting the impact of inflation on their wealth. Prior to March 1933, the viable strategies for counteracting inflation were privately owning gold, exporting gold in exchange for foreign currencies, and enforcing gold clauses. Those holdings bonds were particularly concerned with the real reduction in government's obligations to them. While the gold clauses were

[78] Loughborough, J. F. "Response to McCain", January 2nd, 1933.

intended to counteract these fears, their viability was dependent on access to gold/gold markets or convincing courts to adjust the sums.

Within the framework of Kydland and Prescott, the decision to leave the gold standard posed a speculative game for private agents. Government was posed with two strategies: either leave the gold standard or remain (i.e., a "rule" response). However, there are wrinkles that differentiate it as a game apart from dynamic analysis. While in Kydland and Prescott's paper agents learn based upon authorities' past actions, this requirement is waived in the face of institutional considerations. Congressional debate would have provided ample time for private agents to gauge the likelihood of revaluation. If revaluation seemed evident, they could speculatively respond accordingly. In doing so, private agents would effectively counteract monetary policy goals, a la Kydland and Prescott's analysis.

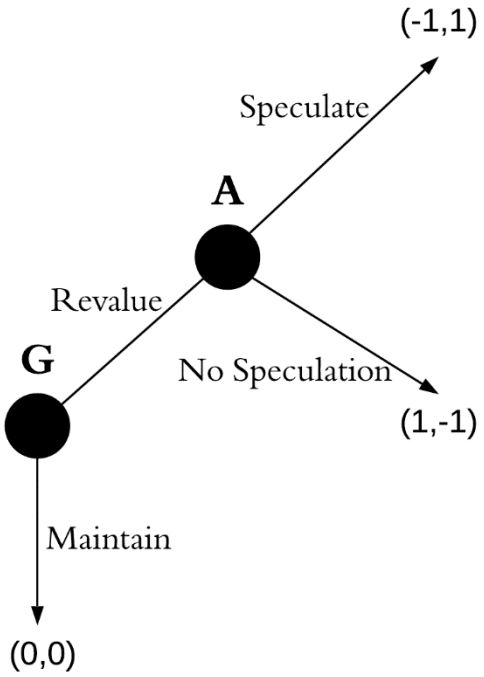
This was exactly McCain's argument against the gold grains per dollar – in the event of revaluation, financial institutions would speculate against the move, leaving the money supply unchanged and the federal government's credit reputation diminished (a la Barro and Gordon). To circumvent this, Loughborough devised an additional strategy. By confiscating gold and banning its export, agents would lose access to the two mechanisms for adjusting their inflationary expectations. While certainly creating a legal battle, Loughborough provided a viable argument to defend the maneuver.

In the spirit of Barro and Gordon's theoretical framework, this paper utilizes a strategic game trees between two players to indicate the speculative game that occurred

between authorities (player 1) and agents (player 2) over the course of 1933. The monetary authority's chief aim is to create unexpected inflation, thereby receiving the accompanying benefits of reduced unemployment/increased output, seigniorage, and reduced debt obligations. For Roosevelt's administration, this meant effectively increasing the money supply without uncontrolled inflation. For private agents, their intension is to hedge against unexpected inflation generally. As explained by McCain, this hedging amounts to gold hoarding, gold exports and foreign currency purchases, and pre-emptive enforcement of debt obligations.

While generalized payouts could be utilized, this game is intended to highlight how the government interpreted the viability and optimality of revaluation when facing private speculation. For the sake of clarity, payouts are normalized to 1, 0, -1. A payout of 1 indicates players have achieved their intended objective. For government, this means successfully creating unexpected inflation. For private agents, it means they have successfully hedged against inflation. Conversely, a -1 indicates that players have failed in their intended objective and have suffered the corresponding consequences. For authorities, this cost is reputational and in increased inflation without reduced unemployment. For private agents, this is the costs of unexpected inflation. A 0 indicates the status quo. Given institutional considerations, both players have complete information.

Game 1:



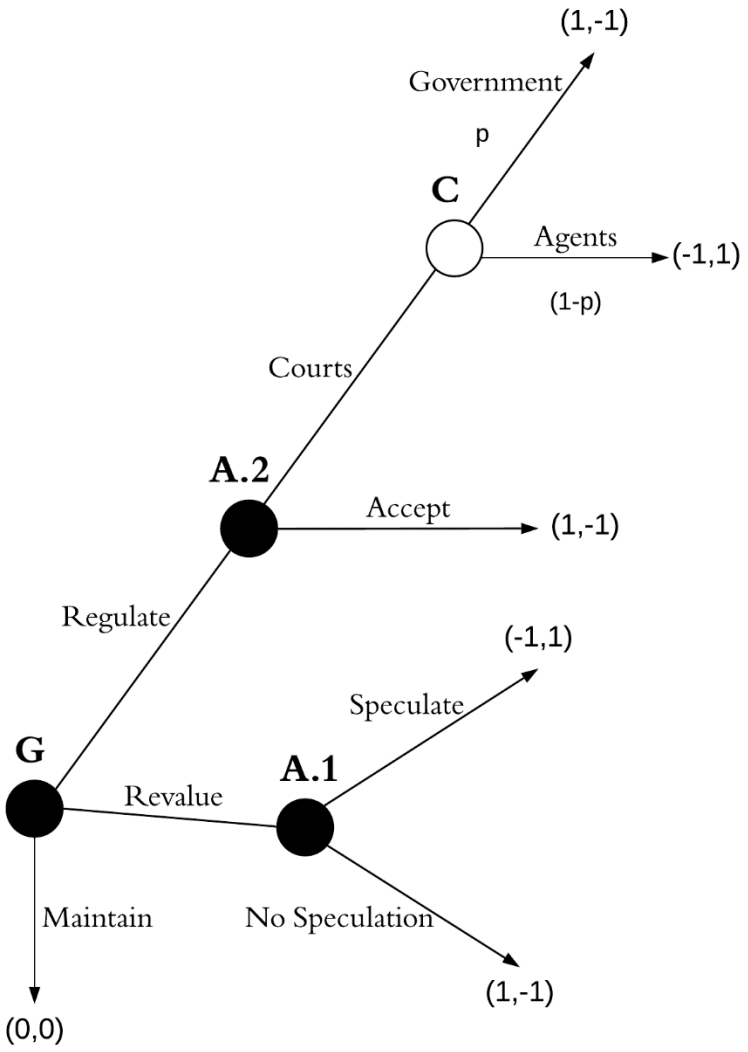
Game 1 presents the gold revaluation game in the spirit of Kydland and Prescott, where government (G) and private agents (A) share a payout vector (x,y); where x = G, y = A. Authorities are the first mover and face the option of continuing the gold standard rules, i.e. strategy "Maintain", or discretionarily pursuing countercyclical monetary policy, i.e. strategy "Revalue". If authorities choose to maintain the rules regime, inflationary expectations remain accurate and the game terminates at status quo. However, if authorities choose discretionary policy, the game enters decision node A, where private agents face the decision of whether to speculate against inflation or not. If they opt speculate, inflationary expectations adjust, defeating monetary authorities' aims. If agents do not speculate, then the monetary policy succeeds, and agents are hit by unexpected inflation.

Given that both players have complete information, the solution to the game is trivial and, by backward induction, the Subgame Perfect Nash Equilibria (SPNE) is: SPNE = {Maintain; Speculate}. At node A, since agents' payout for speculation (1) is greater than the payout for not speculating (-1), agents choose to speculate and adjust expectations, yielding payout (-1,1), and have no incentive to alter this action. Authorities, recognizing agents' with rational expectations will always choose to speculate, opt to maintain the rules regime as (0,0) proves optimal to the payout with discretionary policy, (-1,1). This simple game confirms the outcome Kydland and Prescott anticipated – when policy is understood as a dynamic, noncooperative strategic game, agents act in accordance with their preferences, thereby counteracting the intended benefits of discretionary policy.

Within the context of 1933 and 1934, this meant there were strong foundations for rejecting inflationary monetary policy outside the confines of the gold standard. As articulated by McCain, private agents paid close attention to Congressional debate to gauge the likelihood of discretionary policy. They would then make speculative moves accordingly. This meant, in the face of private responses, the United States would remain on the gold standard, prolonging the Depression. If the United States intended to circumvent this speculation, a new strategy would be required. Loughborough proposed restrictions by executive order on gold leaving the Treasury, whether by exports or in exchange for currency before revaluation was seriously considered. The executive order held significant advantages over statutory revaluation. Importantly, the president could abruptly declare shifts in monetary policy. Congressional debates were

constantly in the news and could not achieve the same degree of confidentiality. If paired with an adequate legal argument, this offered the possibility of circumventing time inconsistency.

Game 2:



Game 2 captures how regulations constraining agents' ability to adjust their inflationary expectations results in a new, multiple Nash Equilibria. Based on Game 1, it introduces a new "regulate" strategy for authorities. If selected, agents then face the option of accepting the new regulatory outcome, i.e. accepting the consequences of the

discretionary policy, or challenging the regulations in court and consequentially the revaluation itself. If they accept, the payout is the same as it would be if the government revalued and agents did not speculate. However, if agents choose to challenge in the courts, the game moves to a "natural" node where the courts rule in favor of the government with probability "p", and rule in favor of agents with probability (1-p). Given that agents' will always select "Speculate" in node A.1, "Maintain" strictly dominates "Revalue" for authorities. Similarly, a quick calculation of agents expected value in node A.2 reveals that, unless p = 1, agents will always challenge regulations in court.

However, authorities prefer strategy "Regulate" over "Maintain" when the expected value of "Regulate" exceeds the expected value of Maintain, i.e. when EV{Regulate} > 0. This requires solving for the values of "p" that this condition is satisfied. For government, their expected value in the court node is defined as:

$$(2) \quad EV_G = p(1) + (1-p)(-1)$$

To solve, set $Ev_G = 0$.

$$0 = p(1) + (1-p)(-1)$$

$$0 = p + p - 1$$

$$1 = 2p$$

$$.5 = p$$

Substitute .5 for p in EV_G to find:

$$EV\_G = .5(1) + .5(-1) = 0$$

When p = .5, i.e. when the probability of the court ruling in favor of the government is 50%, the government is indifferent between maintaining the gold standard and a regulatory revaluation given both have payouts of 0,0. Assuming the government is risk averse, it would likely defer to maintain. If p > .5, however, $EV_G > 0$ and regulate strictly dominates the maintain strategy. Conversely, if p < .5, $EV_G < 0$ and maintain strictly dominates regulate. The Subgame Perfect Nash equilibrium can now be written as:

SPNE = {Maintain; Speculate, Courts}, if p ≤ .5

{Regulate; Speculate, Courts}, if p > .5

While the payouts are normalized, these games serve to highlight the role institutional considerations play in time inconsistency problems. Effectively, Game 2 reveals that, if monetary authorities effectively anticipate and regulate agents' responses to discretionary policy, it is possible to arrive at a Nash Equilibrium optimal to rules. Notably, this outcome is subject to whether other institutions will permit the regulations to occur. In the context of the gold standard, this reflects the necessity of a competent legal strategy that stood a chance against likely court challenges. If such a regulatory strategy did not exist, the United States would likely, as Kydland and Prescott argued, find it optimal to maintain the rules regime.

Chapter 6: Implications

Beyond addressing the origins of the revaluation strategy, there are obvious implications for RvD. Rational expectations literature emphasizes two key assumptions for time inconsistency: 1) the game is structured as a dynamic process, and 2) agents learn from earlier games and incorporate it into their expectations. With Congress' ability to also legislate constraints on agents' responses, the revaluation sequence played out in a controlled manner that provided the U.S. the best chance of achieving its intended goals in the face competing private interests. Additionally, how agents build policy into their future expectations has been underdeveloped. The general term "future expectations" has sufficed to explain real-world actions. As demonstrated by McCain's criticism of revaluation, during the Depression expectations of a discretionary shift from gold would have amounted to a run on gold and enforcement of gold clauses.

These questions bring into focus the importance of institutions. Congress indeed had the power to regulate currency and utilized this power to structure revaluation. First, Congress utilized the Trading with the Enemy Act of 1917 to prevent the private outflow of gold abroad, amended by the Emergency Banking Act of 1933.[79] It was a step in-line with Loughborough's strategy and prevented the private outflow of gold (a

[79] Edwards, 2018, 37-40.

factor left unconsidered by Romer in her analysis of gold growth.) Additionally, the U.S. then compelled private agents to surrender their gold holdings to the U.S. Fed, which in turned surrendered its authority to the U. S. Treasury. A dynamic game would not have been necessary for private agents to incorporate expectations into their moves. Passage of the law through Congress would have involved time for private agents to speculate on the likelihood of passage and make appropriate bets. However, by utilizing the Agricultural Adjustment Act as a vehicle for a power transfer to FDR, who could then at his immediate discretion and by proclamation change the currency, this speculative attack was circumvented along with the ban on Gold Exports provided by the Emergency Banking Act of 1933 and the forced surrender of private gold holdings. When the United States finally revalued, it realized a dramatic increase in its monetary gold stock of nearly 69%, as shown in Figure 2.

Figure 2[80]*:*

[80] "Monetary Gold Stock for United States", National Bureau of Economic Research, Accessed: https://fred.stlouisfed.org/series/M1476BUSM027NNBR

Again, these steps were possible only because: 1) by institutional design, Congress had these powers and Roosevelt had executive orders, and 2) because when the case came to a head, the Supreme Court of the United States upheld, if not in spirit, then in practice these powers. Additionally, the devastation of the Depression led the public to demonstrate a high degree of tolerance for the move. As noted by Edwards, the U.S. dollar did not significantly depreciate or face a speculative run following the revaluation.

This outcome highlights, however, the earliest RvD debates over officials' competency. If monetary policy is not just limited to the traditional instruments and in fact encompasses regulatory and legal measures, then competency becomes crucial to ensuring desirable outcomes. It is worth noting that, of the several measures enacted in the first year of Roosevelt's presidency, Loughborough's strategy and legal arguments are one of the few cases that FDR's early policies survived the SCOTUS' conservative judiciary. If handled poorly, it is reasonable to assume that FDR's attempt to revalue gold could have failed in the courts.

To be clear these were exceptional strategies for exceptional challenges. If considered within the contexts offered by Kydland and Prescott, an example of a similar policy is that, while the government may build levies once, if those levies fail and a flood occurs, flood insurance does not pay for restoration but a proportion of the original value of the property and ownership transfers to the government. In this way, the game terminates rather than going for perpetuity. Is such a policy political feasible? Possibly, but unlikely – democracies are accountable to voters and the public's response

to government cajoling them is often contingent on the severity and the believed necessity of the act. Even if public opinion tolerates the use of force with discretion, there remains the classic problem of collective action versus special interests. However, this does little to change the fact that the government can, through legislative blunt force, design new optimal economic outcomes.

Chapter 7: Conclusion

This paper has sought to address the following questions: 1) where did the origins of revaluation come from, and 2) how does understanding the discretionary move from Gold in 1933 affect theories on RvD, and 3) what role does institutional design play in the time inconsistency problem. Recognizing that the strategy for revaluation originated in Congress, the dual nature of the legislature as both a monetary authority and rule-maker enabled the U.S. to circumvent the time inconsistency problem by "controlling" inflation. Crucially, Congress transferred powers to FDR in order to fend of an expectational adjustment by private agents in the form of speculative attacks. The implications for RvD are substantial: while central bankers are unable to do so, if monetary policy is coordinated with legislative rules, optimal planning can result in Nash Equilibria that have optimal outcomes to policy rules.

However, this outcome returns to the earliest debate over RvD: the competency of authorities. Loughborough was an exceptional figure – he combined a thorough awareness of quantity theory along with institutional knowledge of the legal process. It is remarkable that, of all the flurry of legislation passed in Roosevelt's first year, Loughborough's arguments were one of the few to hold up to the Supreme Court's scrutiny. Given this concern, as well as the exceptional desperation and general

tolerance for government action in the 1930s, it is worth pondering with skepticism whether blunt legislative force could achieve the same goals in the present.

Ultimately, the decision to revalue the dollar in 1933 may have a simultaneously more general and nuanced implication for RvD than the points made here. History suggests the RvD debate will continue without resolution. Rules advocates, largely in the academic sphere, will identify the short-comings of discretion and highlight how rules might improve on those short-comings. Discretionary advocates, often the monetary authorities, will respond with critiques of rules in general and their political infeasibility. This is an unproductive cycle. However, if like in the context of inflation targeting, rules are treated as an ideal to aspire to and discretion is tempered in response to rules' criticisms, perhaps improvements can be realized on current monetary policy. In that sense, the U.S. legislative controls during the 1930s do not suggest legislative force be utilized to manufacture outcomes. Rather, it is a lesson in how discretionary policy's limitations can be recognized and addressed when coordinated with legislation.

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