The Treasury Standard: Causes and Consequences

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Abstract

The U.S. dollar is the global reserve currency and the U.S. Treasury security is the global reserve asset. Conventional explanations suggest that this state of affairs is explained through path dependence following the collapse of Bretton Woods, the absence of a better alternative, and/or the prevalence of invoicing international trade in terms of dollars. These narrowly rational explanations of what I will refer to as the Treasury Standard miss the forest for the trees. In fact, the Treasury Standard is the latest stage of an evolutionary process aimed at financing large-scale, open-ended military conflict that arguably dates back to the Military Revolution. In this paper, I discuss the evolutionary process of the world financial system against the backdrop of this fiscal/military constraint. I then discuss the deliberate policy actions of the U.S., including its control of the international institutions created under the Bretton Woods system, that have brought about this outcome. Finally, I discuss the economic implications of this system and the role that the dollar plays in U.S. foreign policy.

Key Words: political economy of money, institutions, monetary systems
JEL Codes: E02, E42

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1 Introduction

The U.S. dollar is the global reserve currency and the U.S. Treasury security is the global reserve asset. I will refer to this state of affairs as the "Treasury Standard." Conventional explanations for this state of affairs are that this outcome is the result of path dependence following the collapse of the Bretton Woods system, a lack of a desirable alternative (Prasad 2014), and/or the prevalence of invoicing international trade in dollars (Gopinath and Stein 2021). These narrowly rational theories miss the forest for the trees. In this paper, I present an alternative view.

The alternative theory that I provide is that the Treasury Standard is part of an evolutionary process of state intervention in money and finance that dates back to the earliest emergence of coinage and the state monopoly of the mint. In doing so, I build on the work of Glasner (1989, 1998), Thompson (1997), and Selgin and White (1999), who separately developed fiscal theories of the government's role in money. I emphasize the evolutionary nature of this process because I do not mean to imply that any of this was necessarily by design. Instead, constraints on revenue generation and war finance caused states to experiment with a variety of tools and institutions designed to provide emergency financing. I contend that state action was largely driven by trial and error, learning-by-doing, and copying the successful strategies of others. Given the nature of war, those who failed either suffered severe setbacks or simply ceased to exist. War therefore acted as the selection mechanism for successful strategies.

The central features of my theory are evident in the earliest attempts to provide emergency finance. By controlling the mint, the state not only had a source for a constant flow of revenue, but also had the ability to raise significant amounts of revenue during wartime (Glasner 1989). To make this work, states had to anchor long-run money demand and prevent potential usurpers from access to the same resources.

The development of banking and finance and the introduction of bills of exchange and bank notes led people to economize on the use of coins made of precious metals thereby weakening the role of the state's monopoly over the mint as a source of emergency finance. Meanwhile, the Military Revolution led to much more expensive and open-ended military conflicts, which

created greater demand for emergency finance. The result was a dramatic experimentation with alternative means of financing. These included dramatic government debt consolidation schemes like the South Sea Company and John Law's bank, which are most notably associated with stories about bubbles that also miss the forest for the trees. Other, more notable experiments include the earliest creations of central banks. Again, despite significant changes to the financial system, the new tools of emergency finance were subject to the same constraints as the earlier era. A state had to anchor long-run money demand to maintain its source of emergency finance and prevent potential revolutionaries from having similar capabilities.

The Bank of England emerged from this process as the premier institution for providing emergency finance. Central to this role was the Bank's use of the gold standard. During times of war, the British would suspend the convertibility of bank notes into gold at the Bank of England with the promise to resume convertibility at the previous parity at the conclusion of the war. This helped the Bank to provide large, open-ended funding the British government for war finance by anchoring long-run money demand. A comparison between the Bank of England and the early Swedish Riksbank demonstrates the significance of this innovation by the British and the essential role it played in war finance.

Nonetheless, when the belligerents in World War I suspended the gold standard during the war, this tool had outlived its usefulness. The attempt at resumption during the interwar period required the resolution of a coordination problem between central banks. Ultimately, central banks prioritized domestic considerations and mistaken beliefs about the operation of the gold standard over coordination. The result was an excess demand for gold that required a significant increase in the real price of gold. Since nominal gold prices were fixed by definition under the gold standard, a rising real price of gold required a policy-induced deflation which resulted in the Great Depression.

The subsequent interruption of World War II meant that the world had to wait for its new monetary standard. What emerged after World War II was the Bretton Woods system. The late entry into World Wars I and II by the United States had meant that the U.S. accumulated a large

gold reserve during those times of the war. This disrupted the balance of power in the world's monetary and financial system and gave the U.S. the ability to push through its preferred system with the U.S. dollar and gold as substitutes.

But the Bretton Woods system was short-lived. The system ended when it became apparent that this system did not facilitate the financing of open-ended military conflict. This was evident in the balance of payments deficits that arose as a result of the wars in Korea and Vietnam. The outflow of dollars from the U.S. proved to be a problem as other countries wanted to redeem these dollars for gold. The Vietnam War made clear that the Bretton Woods system could not continue without significant changes to fiscal policy or foreign policy.

The U.S. responded by closing the gold window and moving to the Treasury Standard. The U.S. used foreign policy and international institutions like the World Bank and the International Monetary Fund to create a consistent, underlying demand for dollars in international markets. After a tumultuous decade in the 1970s, the U.S. also followed systems of the past in its commitment to relative price stability, albeit through modest, positive rates of inflation. Furthermore, unlike in past systems, the Treasury Standard has been used by the U.S. as a tool for conducting foreign policy and in altering the incentives of potential adversaries.

In what follows, I outline this theory of the state monopoly over money and use an evolutionary framework to argue that historical evidence is consistent with the theory.

2 A Theory of State Involvement in Money

2.1 How Would The Market Handle Money?

Economists typically begin their analysis about the role, purpose, and emergence of money with abstract discussions about the nature of exchange. This usually involves contrasting the use of money with the use of barter or the use of credit. Barter is often costly. Trading goods for goods is subject to the double-coincidence-of-wants problem. The buyer must want to buy what the seller is selling and the seller must want to buy what the buyer is selling. If this is not true, then

some indirect form of exchange must occur. Even if it is true, it might be difficult to determine the terms of trade. How many pairs of shoes is a cow worth? Also, the price of cows in terms of shoes and the price of cows in terms of shirts must be consistent with the price of shirts in terms of shoes. Yet, the two parties to the trade might not have any knowledge of the relative price of shirts. In addition, it is unlikely that the person selling the cow for shoes wants the number of pairs of shoes required to purchase the cow. The seller of the cow therefore must also become a seller a shoes. The transactions costs associated with all of these actions in a barter economy suggest that specialist middlemen are likely to emerge, investing in information, buying and selling specific goods, and arbitraging away discrepancies in relative prices.

It is at this point that one might expect a medium of exchange and unit of account to emerge. However, things are a bit more complicated than that. Monetary exchange is not the only alternative to barter. Another alternative is credit. Some non-economists have argued that credit existed prior to evidence of monetary exchange (Graeber 2011). This need not amount to a rejection of the economic theory just described. In fact, economic theory suggests that money is essential when credit is not feasible (Kocherlakota 1998). This is likely to occur when borrowers lack the ability to commit to future actions and enforcement mechanisms that provide an incentive to honor one's commitment are lacking. Early forms of credit are therefore possible when trade is especially local. However, greater anonymity of trade necessitates monetary exchange.

The emergence of a unit of account might simply be a way to economize on transaction costs. The choice of something for which the value is commonly known might aid in the process of exchange. The emergence of a medium of exchange, if it is to be spontaneous, is also likely to be something that aids in the reduction of transaction costs. If the medium of exchange is to allow for a reduction in transaction costs, it is likely to have particular properties. It is likely to be divisible, portable, durable, easily recognizable, and "resaleable" in the sense that one is likely able to get others to accept it in the future (Menger 1892). What emerges as a medium of exchange also needs to satisfy the last period problem. If at some point in the

future, the medium of exchange is no longer accepted as such, backward induction implies that it should not be presently accepted. For a medium of exchange to emerge, it must have some value beyond its use as a medium of exchange.

It is possible that the medium of exchange might be distinct from the medium of account. Indeed, Burns (1927) suggests that early units of value emerged prior to, or at times were distinct from, media of exchange. The unit of value was a given quantity of a frequently-traded good, but the good itself need not be exchanged. Evidence that the ox served as a unit of account during the Neolithic era is evident in both language and literature. Burns (1927, p. 10) uses etymology to make this point:

> It is well known that the Latin *pecunia* is derived from *pecus* (cattle) . . . The English *fee* is traced through Anglo-Saxon to the Gothic *faihu*, meaning cattle . . . The Indian *rupee* can be traced to a Sanskrit word *rupya*, which again is derived from a word meaning cattle.

In literature, the ox is used as a unit of account in the *Iliad*, the *Rig Veda*, and the Zoroastrian *Zend Avesta* (Burns 1927, p. 8). This suggests the ox served as a unit of account in Greece, India, and Persia.

To what extent the ox served as a medium of exchange is unclear, but Burns (1927, p. 10) says that the evidence suggests "they were probably much more used as a unit of value than a medium of exchange." There are obvious impediments to its use as medium of exchange. Most notably, an ox is large, difficult to transport, perishable, and indivisible (at least if it is to still be called an ox). The ox also had characteristics that made it difficult to use as a unit of account. Not all oxen are created equal. They are different ages and sizes. In this context, the advantages of metals over the ox seem quite clear.

There is evidence that bronze was used as a medium of exchange in the ancient societies of Egypt, Babylon, and China (Burns 1927, p. 13). Other metals like copper, gold, silver, and even iron were subsequently used in the course of exchange. Unlike oxen, metals are divisible and non-perishable. However, they are also unlike oxen in that they lack any obvious standard unit of measurement. Early use of bronze and iron typically resolved this problem by using weapons

or tools in exchange, since these items tended to have common measurements (Burns 1927, p. 28 - 31). Gold and silver were not used to make weapons or tools. In hindsight, it is easy to assume that one could measure these metals by using their weight. However, this presupposes not only a definition, but an understanding of weight. Early notions of weight required the use of balancing scales. Trade therefore required definitions of weight and "weigh-masters" with their own scales (Burns 1927, p. 34).

Naturally, the use of weigh-masters could be costly. An alternative would be to have precious metals transformed into standardized weights by a trusted third-party who would attest to this measurement. This began with ingots and later coins. Initially, this was done through the marking, stamping, or punching of the weigh-masters and assayers themselves. The markings attested to both the weight and fineness of the metal. Eventually this gave way to actual mints, producing coins in the form that one might recognize at present. The standardized coins produced by mints not only attested to weight and fineness, but also featured milled edges designed to prevent coin clipping (Selgin and White 1987).

Although coins reduce transaction costs in comparison to the prior alternative, significant transaction costs remain. Coins are costly to store and transport across long distances. As trade expands, both local and foreign coins will circulate. This might mean the circulation of coins made of different metals or common metals with different units of account. People also lack knowledge of the reputations of foreign mints. To economize on these costs, specialist middlemen emerge in the form of money changers (Selgin and White 1987, Glasner 1989). These experts on coins use their specialized knowledge to determine proper rates of exchange. Soon thereafter, people economize on trips to the money changer by establishing an account with the money changer denominated in the local unit of account and are able to transfer balances to other local customers by book entry. In this way, money changers start to resemble banks.

Long distance trade requires alternative methods. What emerged in continental Europe in the Middle Ages were bills of exchange. An exporter could draw a bill of exchange on an importer. This bill would require that the importer pay the exporter for the goods at some

future date. The exporter could present the bill at the local bank and sell it (at a discount) to the bank for the local unit of account. The correspondent bank in the location of the importer would then receive payment at some future date in local currency. These bills acted as early forms of credit. They also helped to economize on the use of coins and thus the transportation of such over long distances. Later, the negotiability of bills of exchange allowed for further economization on the use of coins.

In England, people brought coins and bullion for storage to the local scrivener or goldsmith. Initially used as a storage service, these warehouses began providing transfer services. When this service first emerged, customers would physically deposit and withdraw coins and bullion. However, since the same coins and/or bullion were often associated with a corresponding withdrawal or deposit by another customer, transfers began to take place at the vault, and then simply through transfers on the books of the scrivener or goldsmith.

The description of money changers and warehouses suggests something akin to our modern understanding of banking. However, modern banks issue liabilities that serve as a medium of exchange and as intermediaries between borrowers and lenders. With the original emergence of money changers and warehousing there was no intermediation and the main service provided was in the transfer of balances. Nonetheless, it is straightforward to observe how such roles would emerge. For both money changers and warehouses, there is a realization that outstanding liabilities can exceed their reserves. This is true because money is fungible and "the law of large numbers with random withdrawals and deposits makes a fractional reserve sufficient to meet actual withdrawal demands with high probability" (Selgin and White 1987, p. 443). This meant that some of the money held by the money changer or the warehouse could be lent out.

As a practical matter, warehouse receipts became promissory notes and negotiability turned these into bank notes. The circulation of bank notes was made possible by the commitment to redeem them on demand for a fixed quantity of the precious metal. In short, bank notes are perpetual American options on the underlying commodity. When banks commit to redemption, the value of the bank notes is equivalent to the value of underlying commodity (Hendrickson

2022). Legally, this was made possible by the common law's treatment of checks and bills of exchange as negotiable (Glasner 1989, p. 26).

This brief sketch of the history of money demonstrates how one might proceed from the basic problems of exchange that began this section to explain the spontaneous emergence and evolution of money. Exchange inherently involves transaction costs. There is a natural incentive for people to try to reduce or eliminate those transaction costs. Incentives lead to innovation. Although on net transaction costs decline with each innovation, new forms of transaction costs emerge that spur new innovation. Money and the monetary system naturally evolve to minimize transaction costs, without any directed or top-down design. Some version of what has been presented here makes up a common narrative in the economic literature (Menger 1892, Selgin and White 1987, Glasner 1989). And yet, this narrative neglects an important aspect of the history of money: the intervention of the state. Contrary to what some might have you believe, the state's role in money does not undermine or refute the narrative of money's spontaneous emergence and evolution just described. One way to think about the state's role in money is as a periodic intervention in this evolutionary process in an attempt to achieve particular objectives. Such thinking requires a theory of state involvement in money. That is the subject of the next section.

2.2 Money and the State

The appeal to the abstract notion of exchange reveals the essential role that money plays in a monetary economy. The power of this argument is aided by the historical record. The spontaneous emergence of objects that serve as money and the evolutionary nature of the monetary system all reinforce the simple, abstract model used by economists. And yet this approach leaves out an important aspect of the story: the state.

The state has intervened in the monetary and financial system since the beginning of the historical record. A subset of scholars has used this observation to turn the prior argument on its head. These scholars effectively argue that money cannot exist without the state. Yet,

such arguments cannot explain the complete historical record. They must ignore evidence of the spontaneous emergence of money and must exclude counterexamples as mere exceptions to the rule. One is then left to wonder how many exceptions to the rule can be allowed before the purported rule loses its explanatory power. These scholars mistake sufficient conditions under a purely fiat standard, such as the role of taxation in solving the last period problem, as a similarly sufficient condition under commodity standards. In doing so, they fail to recognize that the commodity itself solves the last period problem. Nonetheless, one must be careful not to throw the baby out with the proverbial bath water. The state's involvement in the monetary and financial system since the beginning of written record calls out for explanation.

The narrowly rational argument for explaining state intervention is that a monopoly over money gives the state a source of revenue. I call this narrowly rational because on some level it is correct, but upon deeper inspection poses more questions than it answers. For example, doesn't any state-controlled monopoly generate revenue? If the government is looking for revenue, wouldn't any monopoly do just fine? During times when states lacked the infrastructure to generate revenue for the state through taxation, state monopolies seem like an obvious workaround. However, once states develop the bureaucracy necessary to collect tax revenue, is the state monopoly necessary? Why does the state's monopoly on money persist?

Advocates of the narrowly rational argument can no doubt provide narrowly rational responses to each of these questions. However, these answers are likely to be incomplete. Any theory of the state's involvement in money needs to be comprehensive. Piecemeal arguments simply will not do.

People who are on the right track often point out that there is something special about money. However, even these arguments tend to fall short. A simplified version of this argument is that having a monopoly over money gives one the ability to create money. Thus, the state doesn't have to rely solely on tax revenue, but can resort to money creation as a source of revenue. There is a sense in which this argument is correct, but it is ultimately incomplete because it ignores the physical and economic constraints associated with creating money. Gen-

erating revenue through money creation can only be successful by competently dealing with these constraints, a point that I will return to shortly.

Across the many centuries of the human written record, many state monopolies have come and gone. Only two state monopolies seem to persist across these centuries: the monopoly over money and the monopoly over violence. It stands to reason that one might begin the inquiry by examining whether these two monopolies are related.

The focus on the state monopoly on violence focuses our attention on the role of defense. For the moment, allow me to abstract from any other role of the state and focus solely on the role of defense. The primary role of the state is to protect its inhabitants from predation. It is possible to provide adequate defense by limiting the incentives for predation, designing institutions with defense functions, and/or creating sources of revenue (Thompson 1974a; Thompson 1979; Hickson and Thompson 1991; Hendrickson, Salter, and Albrecht 2018; Hendrickson 2019; Hendrickson 2023). In early societies, one would naturally expect that incentives for deterrence and institutions would fill this role whereas there is a greater role for taxation in the modern world. For the purposes of the present argument, a discussion of taxation will suffice.

Ideally, given the incentives for the defense, the tax system would be designed to balance the necessary trade-offs. The creation of wealth generates private benefits along with a social cost since the wealth must be defended. Wealth creation generates a negative externality. Optimal tax policy calls for a tax on capital (Thompson 1974a). This tax simultaneously limits the incentive for predation by internalizing the social cost of capital accumulation and generates sufficient tax revenue for the provision of defense. Nonetheless, this is an equilibrium argument. Unexpected conflict pushes one outside of equilibrium and requires a dramatic increase in military spending. The state could try to raise additional revenue through higher taxation or it could come up with alternative sources of revenue.

A state has good reason to smooth taxation over time (Barro 1979). Indeed, there is historical evidence that this is what states like Britain tried to do (Sargent and Velde 1995). During wars and other emergencies, states are likely unable and unwilling to fund such rapid increases in

spending with dramatic changes in tax rates. Thus, defense requires an alternative funding source capable of providing significant amounts of revenue in a short period of time.

A state monopoly over money differs from other state monopolies in that it has the potential (and unique) ability to generate significant amounts of revenue in short periods of time through debasement, devaluation, and currency issuance. Yet, one must be careful with this argument. These tools are not a source of unlimited funding. Seigniorage revenue is proportional to real money balances. In equilibrium, real money balances are determined by money demand. A history of debasement, devaluation, and excess currency issuance will only serve to reduce long-run money demand and therefore the "tax base." In order for these tools to be a source of funding over the long run, the state must take steps to anchor money demand.

From these insights, an explanation of the state monopoly over money begins to emerge. The state monopoly of money is predicated on the desire of the state for a particular type of revenue that one might call emergency financing. A competitive money supply not only undermines the state's ability to generate emergency funding, but also represents an internal threat to the stability of the state. A rival money producer also has the ability to raise emergency financing to fund a revolution and overthrow the existing rulers of the state. The monopoly is not only an essential source of revenue, but also prevents internal threats to the existing regime.

For a state to adequately and consistently use its monopoly for emergency finance over the long term, it must anchor long-run money demand. This means that the state monopoly over money must be associated with some commitment by the state to long-run price stability (Glasner 1989, 1998; Thompson 1997). Otherwise, the state will find its monopoly of little use in providing emergency funding.

None of this requires that states, or more specifically the rulers of states, understand the underlying economic argument I have put forth. In general, all that one needs to believe is that these rulers desired an adequate level of defense for their survival. This desire leads them to seek out practical solutions to their problems. Through experimentation, learning-by-doing, and imitation rulers discover what works and what doesn't. In some sense, violence is the

ultimate evolutionary selection mechanism. States that figured out how to properly utilize their monopoly over money are, all else equal, more likely to have military success whereas those that did not would be subject to military defeat.

If this theory of the state's monopoly over money is correct, one would expect to observe states using the monopoly to generate emergency funding during wartime and the treatment of challenges to the monopoly as tantamount to revolution or treason. Furthermore, one should expect that states that use this monopoly effectively to demonstrate commitments to long-run price stability. States that failed to commit to long-run price stability should be expected to suffer military defeat and perhaps even cease to exist. One should also expect rules, institutions, and legislation that serve to increase the demand for money during normal times.

There is evidence in support of this view in early times. As the previous section outlined, the emergence of ingots and coins made of precious metals seem to have emerged spontaneously, or without any central direction. That this was done privately and not by the state is evident by the fact that stamps and markings found on the ingots and coins are too numerous to have been done by the state. The markings on these early media of exchange are "neither regal nor civic in origin" and "cannot be identified with any civic authority" (Burns 1927, p. 75). This is true of the earliest coins found in Lydia dated to the 8th century B.C., but also of those found in the ancient civilizations in Asia Minor, Italy, Russia, and China (Burns 1927, p. 76 - 77).

However, by the 6th century B.C., there is evidence of state involvement in money in the form of more uniformity in coinage in places like Lydia. When the Persians took over Lydia, they did not have an established monetary system. Nonetheless, Darius the Great took over the monopoly on gold coinage (Burns 1927, p. 84). The state monopoly over coinage also helped to prevent internal challenges to power. As Burns (1927, p. 82 - 83) argues:

> ... coinage and tyranny are probably both rooted in the revolution in conditions of life in the Mediterranean ... Having risen to power, the tyrant assumed the monopoly of coining. This step was probably part of a policy aimed at the enhancement of his own power and commercial success and the hindrance of rivals. He kicked away the ladder by which he had risen lest others might attempt to use it ... Lydia probably affords the best example of the establishment of state coining

> in this way. Tyranny as well as coinage are said to have originated there, and the tyrant Gyges (687 - 652 B.C.) was probably responsible for making the right to coin the precious metals a state monopoly.

As further evidence of this point, Burns cites Ure (1922) as pointing out that Sparta lacked both tyranny and coinage.

There seems to be clear evidence that the state monopoly on coinage was motivated by the demands of emergency financing for war rather a consistent source of revenue. For example, the ancient Greek cities had the ability to each mint their own coins, but when alliances of these cities went to war, the coins of the major power in the alliance became the dominant form of money (Burns 1927, p. 85 - 86). During the sixth century B.C., bars of metal were kept within the city temples and minted into coins during times of war (Burns 1927, p. 341). Centuries later, this was still the case as "bullion in the temple treasury and the gold statues in the Parthenon were the national reserve, and they were coined when events called for the use of the reserve" (Burns 1927, p. 348).

Furthermore, the principles of emergency finance that I have articulated are evident in Athens. Burns (1927, p. 377 - 378) notes that Athens maintained a stable currency during times of peace, a characteristic he attributes to its democracy. Nonetheless, he notes that during emergencies the Athenians did resort to debasement. A prime example of this was during the Peloponnesian War when Athens issued plated brass coins, which resulted in gold and silver being hoarded. The brass coins depreciated after the Athenian defeat and disappeared from circulation (Burns 1927, p. 365).

Most interestingly for the purposes of emergency finance is that in subsequent wars with the Spartans,

> [The Athenian general Timotheus] met his debts to the troops by issuing a fresh bronze currency to circulate as token money along with the existing silver, and persuaded merchants to accept and circulate the new coins, promising to convert any coin left on their hands . . . Temporary token money . . . was issued by the Greeks from time to time under the burden of political and financial trouble, with promises to redeem in good coin at a later date (Burns 1927, p. 365 - 366).

The practice of issuing token coins along with the promise to redeem them at face value allowed the Athenians to create money to finance the war while also providing a commitment to long-run price stability. This appears to be the first such recorded commitment.

In the Roman Republic, coinage was controlled by the Senate. Devaluation and debasement were used sparingly and for emergencies, such as to help finance the Second Punic War. During the Social War between Rome and its Italian allies, military commanders were given the authority to issue their own money, of which the Roman general Sulla took full advantage. In subsequent years, Gratidianus "either redeemed in good coin the Sullan plated issues, or arranged means by which they could be distinguished from the bad" following his ally Marius's seizure of Rome (Burns 1927, p. 403).

As the theory would predict, in the shift to empire Augustus declared that only the Roman emperor could issue gold and silver coins, although other parts of the empire were allowed to issue bronze coins for small change under the supervision of the emperor (Burns 1927, p. 407). Nonetheless, the experience of the Roman Empire is a testament to the limitations of debasement and devaluation. Beginning with Nero, the emperors seem to have exploited the monopoly for profit. However, centuries of periodic devaluation and debasement ultimately required currency reforms under Aurelian, Diocletian, and Constantine.

The experience of the Middle Ages is similar to the ancient history just described. Selgin and White (1999, p. 157) argue that a fiscal theory of the state's involvement of money can explain why the prerogative of coinage varied with the boundaries of "sovereign realms" as well as why "European monarchs of the middle ages insisted that the right to mint coins belonged exclusively to the sovereign." However, maintenance of a monopoly over coinage is easier than the optimal exploitation thereof. Nonetheless, there is evidence that some rulers tried to implement optimal emergency finance by committing to price stability during times of peace in order to generate significant revenue during wartime.

For example, Smith (2023) details the recoinage of the Anglo-Saxon king, Alfred the Great. A significant debasement of the currency occurred during the period of Viking raids on modern-

day England. Alfred the Great ascended to the throne in 871 and spent his early years at war with the Vikings before negotiating peace. During this time of peace, he engaged in two separate recoinages to restore the metallic value of the currency. This commitment has apparently had a long tradition in England. Glasner (1998, p. 35) cites Sir Albert Feavearyear in pointing out that "between 1100 and 1300 there were seven recoinages designed to eliminate worn, clipped, and counterfeit coins" as well as Feavearyear's claim that the significant debasement of the currency under Henry VIII was facilitated by the prior century of stability.[1] Nevertheless, it was not unique to England. The Low Countries similarly practiced resumption (Glasner 1998, p. 36). In other places, like France, rulers were either unwilling or unable to make such a commitment (Glasner 1998, p. 35). It is hard to explain why rulers would have practiced resumption if not for the emergency finance motive.

The differences in the use of the monopoly between the Roman Republic and the Roman Empire and between England and France of the Middle Ages are likely best explained by the incentives of the ruler. In order for the state to use its monopoly for emergency finance, it has to maintain its "tax base" in the form of real money balances. This requires a commitment to long-run stability in the value of the currency. However, as Glasner (1998, p. 36) points out, the willingness to commit to long-run price stability was likely tied to political property rights. A political leader with a tenuous grip on power is more likely to use inflation as a consistent source of revenue and less likely to restore the currency to its previous purchasing power following a debasement or devaluation. This would seem to explain the differences across space and time. As Glasner (1998, p. 37) explains:

> While Rome was still a republic with a restricted citizenship and governed by a small oligarchy, inflation was resorted to only in wartime emergencies. Monetary stability thus was maintained for the first century or so of the Empire. But as competition to become emperor grew more intense, competitors increasingly resorted to inflation to finance obligations they had incurred while soliciting backers (usually from the army and the imperial guard).

Similarly, the French kings of the Middle Ages were "merely one of many political entities

[1] A note on this citation. Glasner incorrectly refers to Sir Albert Feavearyear as "Arthur."

performing rudimentary state-like functions" (Henneman 1999, p. 101). The belief at that time was that the king should generate revenue from land holdings and French kings struggled to justify their fiscal authority (Henneman 1971, 1999).

The present monetary system does not resemble the monetary system of the ancient world or even the Middle Ages. Nevertheless, the need for emergency finance persists. My hypothesis here is that exogenous shocks that impact the provision of emergency finance occur for several reasons and that these exogenous changes can explain the evolution of the monetary system and emergency finance from ancient times to the present. These exogenous shocks have three types.

First, there are various private innovations in the financial system that have the potential to undermine the provision of adequate emergency financing. An example is the development of banking and finance, which undermined the ability to raise revenue from monopolization over the mint. Bills of exchange and later bank notes created the means by which people could economize on holding coins made of precious metals. A reduction in the demand for real *outside* money balances limited a state's ability to generate seigniorage revenue in both the short run and the long run. Thus, in response to such innovations, my theory would suggest that states attempt to create alternative means of emergency finance through trial-and-error and imitation of the success of others.

Second, changes to the nature of warfare bring about changes in the scale of emergency finance. The introduction of gunpowder and what is commonly referred to as the Military Revolution represent examples of shocks that require an adjustment in the provision of emergency finance. These changes in military technology, strategy, and organization shifted the balance of power away from fortification and toward standing armies and long, expensive, open-ended military conflict. While military conflict had always required the ability to raise emergency revenue in a short period of time, the Military Revolution necessitated the ability to raise emergency revenue for an open-ended conflict and a scale of funding that did not exist in earlier eras. Thus, one would expect that such shocks would result in new policies and institutions to

provide emergency finance.

Other shocks are those to political constraints or those brought about by failures of top-down design that threaten the ability to provide adequate financing. Examples of such shocks would include the failed resumption of the gold standard following World War I and the revelation that the Bretton Woods system was incompatible with U.S. domestic and foreign policy goals.

In response to such shocks, I argue that history reveals a clear and consistent pattern of evolution. As the monetary and financial systems have evolved, it has been consistently co-opted by the state for the purpose of emergency finance. To do this effectively, states not only need a monopoly over money, but they also need to create and maintain a stable long-run demand for their money. What this means is that it is not sufficient to simply point to evidence of states using the monetary and financial system to finance war. There should be the predictable pattern of behavior I described above.

Since my hypothesis involves issues of national defense, military conflict should act as a selection mechanism. It follows that states with a monopoly over money that also enact policies to promote stable money demand should be more likely to achieve military success and survive. States that do not enact such policies are more likely to suffer military defeat because of their inability to finance open-ended military conflicts. Thus, if my theory is correct, states that behave consistent with the theory should be expected to have greater military success.

In what follows, I examine the response of the tools of emergency finance following the sort of exogenous shocks listed above. I begin with a discussion of the Military Revolution and the emergence of central banking and the role of the gold standard. I argue that the Bank of England developed a strategy of emergency defense consistent with my strategy that lasted through World War I. The failure of central bank coordination in the resumption of the gold standard during the interwar period revealed that the old tool of emergency finance no longer worked in the way that it had previously. This led to the Great Depression and the creation of the Bretton Woods system. However, this system revealed itself to be incapable of providing adequate emergency financing to the U.S., which led to the current Treasury Standard. Along

the way, I take a detour to discuss the role of experimentation following the Military Revolution and how this experimentation does a better job of explaining the earliest financial bubbles better than theories based on irrationality.

3 The Military Revolution, Gold, and War Finance

The introduction of gunpowder weapons in Europe dramatically changed both the nature of warfare and the state. During the Middle Ages, defense largely took the form of fortification in the form of city walls and castles. The fortifications allowed for the storage of food and supplies and provided protection from attack. As a result, siege warfare was the most frequent type of battle (Bachrach 2008, p. 65). Open-field battles were mainly fought by cavalry, but "the rising strength and number of castles made those battles less and less decisive" (Bean 1973, p. 205).

The introduction of gunpowder weapons dramatically altered the nature of war over the subsequent centuries. According to McNeill (1982, p. 81), gunpowder was introduced in Europe in 1326, but wasn't widely used until a century later.[2] Experimentation with the use of gunpowder weapons initially led to the development of the cannon, which could destroy city and castle walls and when "the new artillery appeared, existing fortifications became useless" (McNeill 1982, p. 89). In response, beginning in the 16th century, walls were shortened and thickened and ditches were dug around the walls and castles to increase the distance of the attacker's artillery (Parker 1996, p. 10). Walls were made jagged and men and artillery were stationed atop the walls.

Prior to the cannon, ships were often constructed to be lightweight for speed and naval warfare consisted of "ramming and boarding" (McNeill 1982, p. 99). Following the introduction of the cannon, ships became larger and added gun ports for cannons, dramatically altering the nature (and cost) of naval warfare.

The introduction of effective handheld gunpowder weapons occurred in the 1550s, but even

[2]It is important to note that what is sometimes referred to as the Military Revolution is often dated from 1500-1800 (Parker 1996). Some have criticized referring to a centuries-long process as a "revolution" rather than an "evolution." I will abstain from that debate and use the common terminology where appropriate.

as late as the early 1600s were of limited use because of the amount of time that it took to load the weapons (Parker 1996, p. 17 - 18). Nonetheless, in the 1600s, the Dutch developed and the Swedes mastered the "volley technique" for soldiers with handheld gunpowder weapons (Parker 1996, p. 19 - 20). The problem of time-consuming reloading was solved by having soldiers line up in rows with the first row firing their weapons and then retreating to the back of the line to reload while the next row stepped up and fired their weapons. This process led to a continuous barrage of gunfire.

Of particular importance for my argument is how all of these changes dramatically changed the cost of war. Construction and maintenance of the new fortifications was costly. The new style of fortification also required a larger number of troops to provide defense and fire artillery. This also meant that the attacking military required more troops and artillery. The new size and scale of siege warfare also required new supply logistics and the artillery itself was quite expensive. Downing (1992, p. 74) notes that "a single cannon cost as much as feeding 800 soldiers for a month." Infantry were not only larger in number, but now also required regimented training and drilling.

These dramatic changes brought corresponding changes to governance and the state. In fact, there is a large literature that has discussed the role of war in the development of the state.[3] As Bean (1973), Ames and Rapp (1977), and Batchelder and Freudenberger (1983) argue, these changes in military technology technology shifted Europe away from feudal systems and toward the modern, centralized, bureaucratic state capable of generating sufficient tax revenue to finance the resulting costly are large-scale warfare. One would also expect that the change in military technology would also result in corresponding changes in the provision of emergency finance.

England represents an important case study. This is not only because the country's relative isolation from the conflicts in continental Europe meant that the Military Revolution and its

[3]See, for example, Peacock and Wiseman 1961; Bean 1973; Tilly 1975, 1985, 1992; Ames and Rapp 1977; McNeill 1982; Batchelder and Freudenberger 1983; Mann 1986; Brewer 1988; Rasler and Thompson 1989; Downing 1992; Ertman 1997; Hoffman and Rosenthal 1997; Ferguson 2001; Kiser and Linton 2001; Besley and Persson 2010; Bates 2010; Morris 2014; Gennaioli and Voth 2015; Hendrickson 2024.

corresponding fiscal pressures came much later, but also because England is the source of the main innovation in emergency finance during the period of the development of the modern state.

It was not until the Glorious Revolution that the changes brought about by the Military Revolution came to England and the centuries consumed by war that followed (Brewer 1988, p. 7). Elsewhere in Europe, countries struggled with the rising cost of conflict. For example, by the late 17th century, countries like Spain and France had to "repudiate or unilaterally reorganize their debts" (Brewer 1988, p. 23). These countries had to resort to selling offices to raise to revenue. This was a costly strategy because the privileges granted to these office holders often exceeded the revenue generated by the sale (Brewer 1988, p. 16). These arrangements were driven by the need for emergency financing during war (Brewer 1988, p. 19), but the net cost created by these privileges made such a strategy unsustainable.

England avoided selling offices, at least anywhere near the scale as other Europeans, for several reasons. The first is that the common law interpreted selling additional offices as a taking against those who had previously purchased offices (Brewer 1988, p. 19). England did sell the rights to various government-granted monopolies during times of war (Brewer 1988, p. 18), perhaps as an alternative to restrictions brought about by the common law. However, the main reason that England was able to avoid the necessity of office selling was that it did not face the same fiscal constraints as countries on the continent, most notably France (Brewer 1988, p. 19).

Only the Dutch were able to incur high levels of debt brought about by war without repudiating or reorganizing its debt, thanks in part to its banking system. This point is particularly important given the ascension of William of Orange to the English throne following the Glorious Revolution.

Early attempts to deal with the rise of banking and the threat to the state monopoly over money often resulted in convoluted schemes aimed at emergency finance or the prohibition on competition in the supply of money. Following the Glorious Revolution, England followed a different path.

In 1688, William of Orange arrived in England with a Dutch army and England's King James II fled to France. Parliament ruled that James II had abdicated the thrown, which led to the coronation of William (William III) and his wife Mary (the daughter of James II). The Franco-Dutch War had made enemies of French King Louis XIV and William III (Sherwood 1893, p. 136). Louis XIV supported the restoration of James II to the throne. William III meanwhile saw his reign as an opportunity "to build a European alliance which at best would destroy French hegemony in Europe and which would at worst hold Louis XIV in check" (Brewer 1988, p. 140). This became apparent with England's immediate entry into what is now called the Nine Years' War.

As early as 1692, the financial strain of the war was apparent. According to Lord Macaulay (1986, p. 487):

> Taxation, both direct and indirect, had been carried to an unprecedented point: yet the income of the state still fell short of the outlay by about a million [pounds]. It was necessary to devise something. Something was devised, something of which the effects are felt to this day in every part of the globe.

What Lord Macaulay is referencing is the Bank of England. The distrust of the Stuart kings that began with the attempt of Charles I to govern without Parliament and led to the English Civil War, the repudiation of England's debt with Great Stop of the Exchequer in 1672 by Charles II after the Stuart Restoration, and the prospect of a Jacobite rebellion to restore James II to the throne all made it difficult for William III to borrow money. These financial constraints motivated the whigs in Parliament to charter the Bank of England in 1694 in exchange for the stockholders' commitment to lend £1.2 million at 8 percent interest to the crown. As Glasner (1998) notes, although William III was unlikely to find anyone else who would have lent to him on these terms, the typical practice was for only one corporate charter to be given out in each industry. As a result, stockholders in the new bank might have been willing to lend at favorable terms to the crown with the expectation of future monopoly profits.

Although the Bank of England gave the crown greater access to credit – and on more favorable terms – the creation of the Bank in and of itself was not the innovation that altered

the course of emergency finance. As Lord Macaulay (1986, p. 500 - 501) notes, national banks already existed in Genoa and Amsterdam. It should be noted that the Swedish Riksbank already existed as well, but upon its founding was not permitted to lend to the government (Fregert 2018, p. 91).[4] Rather, the Bank of England brought about two major innovations in emergency finance.

The first major innovation of the Bank of England was a government-debt-owning central bank. Sherwood (1893, p. 141) noted this innovation when he stated that "a government is stable so long as the financial managers of the country are allied with the government." While it is true that, by holding government debt, the interests of the shareholders of the Bank were aligned with the interests and success of the government, this understates the innovation.

The main benefit to the existing regime of a government-debt-holding central bank pertains to the threat of revolution. As Thompson and Hickson (2006) detail, successful revolutionaries have the ability to repudiate the debt of the prior regime. It is costly for the existing regime to repudiate its debt. Doing so would harm the reputation of the regime and lead to corresponding increases in borrowing costs. Revolutionaries can repudiate the debt because the revolution itself is a rejection of the legitimacy of the existing regime. Successful revolutionaries have no reason to assume the debts of their illegitimate political predecessors.

Within this context, a government-debt-holding central bank acts as a "poison pill" against potential revolutionaries (Thompson and Hickson 2006, p. 230). The reason that this is the case is that any revolutionary who repudiates the debt as a consequence of a successful revolution will render the central bank insolvent. This is not only likely to lead to a financial crisis, but also eliminates the state's source of existing emergency finance to the new rulers. Thus, by holding government debt, the central bank substantially increases the cost (or reduces the benefit) of revolution. This was particularly important in England given the threat of the Jacobites to the new king.

The second major innovation concerns emergency financing itself and came much later during England's participation in the French Revolutionary Wars and the Napoleonic Wars. In

[4]Nonetheless, as Hendrickson (2020) details, and as I discuss below, the Riksbank did become a source of credit for the Swedish crown – albeit an ineffective one.

the early years of war, gold began to flow out of the Bank of England. In 1797, rumors of a French invasion of Wales created a panic and a further drain on gold reserves at the Bank of England. The British government suspended the convertibility of notes into gold. This suspension lasted until 1821 when convertibility was officially restored at the pre-war parity. The period from 1797 to 1821 is known as the Bank Restriction Period and is known for the period of inflation that took place during wartime and a corresponding deflation that followed in the aftermath of the conflict that left the price level roughly the same in 1821 as it had been in 1797.

The Bank Restriction Period revealed an important innovation in emergency finance. Since war creates the need for large and immediate expenditures, a central bank can allow a state the ability to meet the demand for such large expenditures by providing access to credit. Nonetheless, this does not mean that the government is free of borrowing constraints. For a central bank that is not permitted to issue bank notes, the borrowing constraint is the amount of gold reserves. Once those reserves are exhausted, there is no way for the central bank to offer additional loans to the government.

A central bank that is allowed to issue bank notes relaxes this constraint since the bank can fund the loan with an issuance of bank notes. However, if the convertibility of bank notes into gold is maintained, there are limits to the ability of the central bank to expand its balance sheet. Large amounts of government debt and military defeats might create a risk a default, which threatens the solvency of the central bank. This could lead to a run on the bank. Similarly, over-issuance of bank notes by the central bank will lead to a wave of redemptions of bank notes for gold thereby draining gold reserves. This limits the ability of the central bank to meet future redemption requests and might also lead to a run on the bank by those note-holders who fear that the bank will not be able to meet redemption requests. Drains on gold reserves therefore limit the ability of the central bank to lend to the government.

A possible solution to this constraint is the suspension of convertibility, which prevents waves of redemptions from taking place and the corresponding drain on gold reserves, but does not eliminate constraints on borrowing. Without convertibility, inflation becomes the primary

constraint on government borrowing from the central bank. For the central bank to be able to provide open-ended financing of wars and other national emergencies, the central bank must be able to expand the balance sheet in real terms. This is not possible if inflation expectations are not anchored. Under an inconvertible paper money standard, an excess supply of bank notes results in a higher price level. If the central bank funds loans with an expansion of bank note issuance, this would cause inflation expectations (and the nominal interest rate) to rise and reduce money demand. The inflationary effect of the increase in note issuance combined with the inflationary effect of a decline in money demand would cause real money balances to decline since the price level rises by more than the increase in the money supply.

The commitment to restore convertibility of notes into gold at the pre-war parity solves this problem by anchoring inflation expectations and long-run money demand. Although the increase in the supply of bank notes will lead to inflation during the war, the promise to restore convertibility at the pre-war parity is tantamount to a promise that any inflation experienced during the war will be followed by a period of deflation. As a result, an increase in the supply of bank notes leads to a less than proportionate change in the price level (Thompson 1997).

The idea that this scheme to suspend and then restore convertibility was essential to emergency finance is evident by contrasting the British experience with that of others. Most notable is the Swedish experience. Following the failure of Sweden's first attempt at a central bank, Stockholms Banco, the Swedes established the Riksbank in 1668. The Riskbank was not permitted to issue bank notes nor was it permitted to lend to the government (Fregert 2018). Of particular importance is that the first restriction on bank note issuance was adhered to up until the Sweden's Frihetstiden (Age of Liberty), but the restriction on lending to the government didn't even last a decade as the Riskbank lent to King Karl XI during the Scanian War (Hendrickson 2020).

When Karl XII ascended to the thrown, Sweden controlled much of the land around the Baltic Sea. Seeing an opportunity to capitalize on the lack of experience of the new king, Denmark, Russia, and Saxony went to war with Sweden in an attempt to regain land they had

previously lost. The result was the Great Northern War, which lasted from 1700 to 1721. Although Karl XII quickly defeated the Danes and the Saxons, the war with Russia continued. The Riksbank served as an important source of financing during the war. However, its restriction on bank note issuance meant that loans had to be made out of its existing reserves. War dramatically drained the reserves at the Riksbank. By 1709, reserves had fallen to a level that made it impossible for the bank to lend (Hendrickson 2020, p. 323). This culminated in Sweden's defeat at the Battle of Poltava in 1709. At the battle, the Swedish military was running out of artillery, gunpowder, and other supplies (Bain 1895, p. 182). Just one month prior, "the paymaster general sent a desperate appeal to the board of directors [of the Riksbank]: there was no money left, troops in the field and garrisons in fortified towns were dying of starvation. The reply was that money was not coming in" (Wetterberg 2009, p. 66). This was the turning point in the war and Sweden never recovered. In 1711, Karl XII tried to get the bank to issue bank notes, but his request was denied. He finally had to resort to issuing token money (Hendrickson 2020, p. 324). Ultimately, Sweden lost the war because of its inability to provide adequate emergency finance.

In addition to the contrasting experience of Sweden and England, the Bank Restriction Period offered important lessons for emergency finance is given by several other observations. For example, in the midst of the U.S. Civil War, the New York Times ran an article entitled "WAR FINANCE IN ENGLAND.; The Bank Restriction Act of 1797–Suspension of Specie Payments for Twenty-four Years–How to Prevent Depreciation of the Currency" about the lessons that the U.S. could learn from Britain about financing a war without a long-run depreciation of the currency.[5] Furthermore, the fact that the combatants in World War I suspended the gold standard and attempted to restore convertibility after the war suggests that this strategy was widely understood by that time.

The innovations of the Bank of England provided the British with the ability to adequately provide emergency financing for wars and other national emergencies. The resumption of

[5] https://www.nytimes.com/1862/01/27/archives/war-finance-in-england-the-bank-restriction-act-of-1797suspension.html

the convertibility of bank notes into gold at the pre-war parity resembles earlier attempts at recoinage. It is only through the commitment to long-run price stability that central banks were able to provide adequate emergency finance. In addition, it is important to recall that the state's monopoly over the mint not only gave the state the ability to use effective emergency finance, but it also prevented internal threats to power from acquiring power through the use of a competing mint. Government-debt-holding central banks similarly deterred internal threats to the power of the existing rulers by making debt repudiation of any new ruler prohibitively costly. This method of emergency finance continued until the interwar period of the 20th century.

4 A Brief (But Necessary) Diversion Through Financial Bubbles

Although there might be some disagreement on the particular details, the idea that central banks have been used to finance war is hardly controversial. However, a central claim of my argument is the process by which the monetary system has evolved has required a great deal of experimentation, trial and error, and learning-by-doing. Thus, one should not only expect to observe successful attempts at dealing with emergency finance, but also failed attempts.

A surprising example is found in the history of famous asset price "bubbles." The discussion of these historical events is often framed in terms of human psychology or rationality (more specifically, the lack thereof). The idea that there was a bubble is taken to be self-evident and this observation calls into question how such a bubble could occur in the first place when things seem so obvious in hindsight. Such scholars prognosticate about the deviation of an asset price from its fundamental value as though this statement means something. This claim is made as though the concept and definition of fundamental value is defined on a third tablet of Moses, apparently lost to history but known to men's hearts. The idea of fundamental value is a model-based notion. Indeed, those less inclined to blame fools, ignorance, or irrational exuberance have set forth to examine whether price was indeed different from simple model-based notions

of fundamental value given the information that investors had at the time (Garber 1990).

Nonetheless, much of the discussion of these events ignore the underlying political economy or simply relegate the historical and political details of these schemes to mere background information. In reality, well-known bubbles such as the South Sea Bubble and the Mississippi Bubble were massive experiments in the consolidation of government debt.[6] As such, these events are best understood as an example of the experiments that states made with financing during periods of open-ended conflicts following the Military Revolution. Although the Bank of England was a successful innovation for emergency finance, John Law's scheme and the South Sea Company were similar, but failed attempts to satisfy the growing revenue demands of the state.[7]

The War of Spanish Succession (1701 - 1714) left all of the participants, including England and France, deeply in debt (Carlos, Neal, and Wandschneider 2005). Following the death of Louis XIV, Louis XV was too young to ascend to the thrown and France was governed by a regent, the Duke of Orléans Phillipe II. With France in a dire fiscal condition, the Duke of Orléans turned to John Law.

John Law was born to a Scottish goldsmith, but he preferred gambling to the family business. Early in his life, he murdered a man in a duel and was sentenced to death. He ultimately escaped from prison and spent subsequent years evading the law before finally settling in France with his mistress and their children (Ferguson 2001, p. 312). When the Duke of Orléans turned to John Law, Law got the opportunity to implement the idea for a monetary system that he had already pitched to other governments (without success).

In 1716, Law was granted a charter to create a bank, Banque Generale. It was an ordinary bank that also had the ability to issue bank notes. In 1718, the Banque Generale was re-chartered as the Banque Royale and the bank purchased government debt with an issuance of shares in

[6] A third famous bubble, so-called Tulipmania, wasn't actually a bubble at all. What really happened is that delivery price on futures contracts were legally changed to the strike price on an option contract. Thompson (2006) demonstrates that once this legal change is revealed, the evidence of a tulip price bubble disappears.

[7] Although these experiments did not create durable government financing, Thompson and Hickson (2006) argue they did nonetheless provide a significant short-term gain to their respective states. This will be discussed below.

the newly chartered bank (Neal 2000, p. 130). The bank notes were redeemable for either gold écus or silver livres (Neal 1990, p. 73). The bank was explicitly supported by the Duke of Orléans, who not only deposited money in the bank but also made the bank notes publicly receivable (Ferguson 2001, p. 312 - 313).

In 1717, Law created the Mississippi Company (Compagnie d'Occident), which consolidated some of the government's debt in exchange for overseas trading privileges. (Neal 1990, p. 70). The company allowed holders of government debt to exchange the debt for shares in the company. Over the next few years, Law issued new shares in the company and used the proceeds to purchase "the rights to the state's tobacco revenue; next Colbert's French East India Company; then the exclusive right to mint coins; and finally the right to collect almost all of France's taxes" (Thompson and Hickson 2006, p. 233).

All of this activity spurred a run-up in the share price of the company. The price appreciation was further fueled by the fact that Law (a) required purchasers of new issuances to already own shares, (b) allowed people to purchase the shares using a payment plan, and (c) the bank allowed people to borrow using the company's stock as collateral (Neal 1990, p. 75; Ferguson 2001, p. 315; Chancellor 2022, p 52). When the stock price reach 10,000 livres, Law committed to fixing the stock price at this high level. He began using newly issued bank notes to purchase shares of the company to support the price. If one thinks about the bank and the company in terms of a consolidated balance sheet, this effectively meant that the combined entity was increasing its liabilities without increasing its assets since the one liability was being used to purchase another at over-valued prices. Thus, once the market price of the stock started to fall, this would necessarily lead to a collapse in the value of the currency. Law tried to manage the decline in prices by lowering his price target to 9,000 livres and then 5,000 livres and announced plans to reduce the money supply (Chancellor 2022, p. 57). However, these prices were still higher than the market was willing to pay. The result was a collapse in the price and rampant inflation. Law resigned, fled France, and the company and bank were dissolved.

In the midst of the War of Spanish Succession, the South Sea Company was chartered in 1711

as part of a debt consolidation scheme. The basic idea was that the holders of the government's debt of £9 million would be required to exchange the debt for shares of the company's stock. The government would repay the debt to the company (at a lower interest rate) and the company would pay dividends to its shareholders. The company was also given a monopoly over trade in South America. The purpose of the company was not only to provide a source of financing for government debt, but also to provide a political counterbalance to other large holders of government debt, such as the Bank of England. As Brewer (1988, p. 120) explains, political rivalries were at the heart of the company's creation:

> when a large number of those who held the short-term debt were incorporated into the South Sea Company in 1711, the object . . . was not only to restructure the debt but to create a tory – or, at least, non-whig – rival to the whig-dominated Bank of England.

In 1720, the South Sea Company agreed to pay the British government £7.2 million in exchange for the rights to purchase the entire outstanding national debt of £30 million that was not held by other corporations (Ferguson 2001, p. 317). The purchase was to be financed with the issuance of new shares of stock and any debt purchased by the company would earn 5 percent interest from the government for the first seven years and 4 percent after that initial period (Garber 1990, p. 48).

In the immediate aftermath of these rights being granted to the company, the stock price rapidly appreciated for the next few months before reaching a three-month long plateau. By the end of the year, the price of the stock collapsed below the March 1720 level. The significant run-up in the price can be explained by (a) "bribes paid to ministers and MPs" (Ferguson 2001, p. 317), (b) loans offered by the company to investors to purchase shares, and (c) unrealistic promises of future dividends. Garber (1990) attributes the collapse of the stock price to the enforcement of the Bubble Act passed in June 1720, which sought to limit the competition faced by the South Sea Company, and the international credit crunch caused by the collapse of John Law's system. Both events caused a liquidity shortage, which led to the collapse in the price. Following the collapse of the stock price, the British Parliament forced the company "to sell

off parts of its debt to the Bank of England" and "stripped the Directors of the Company and several government officials of their wealth (2 million pounds) and directed the payment of the proceeds to the company" (Garber 1990, p. 51).

What these two events demonstrate is that the evolution of the tools used for emergency finance has been a messy process of trial and error. The hypothesis of emergency finance is not some just-so story applied retroactively to the successful innovations. Instead, the narratives reveal that these famous historical "bubbles" were actually massive government debt consolidation schemes that transformed debt into equity in order to meet the growing revenue demands of the state. Also, although neither of these experiments produced durable institutions capable of providing emergency finance, they did create short-run benefits to each state. As Thompson and Hickson (2006, p. 234) argue "the French Crown ... used its immense trading profit from the Mississippi bubble to make itself the company's dominant creditor and thereby retire a large part of the national debt and reacquire its previous revenue-generating rights." This provided debt relief to the French Crown, but delayed the French adoption of a national-debt-holding central bank like the Bank of England. Meanwhile, the Bank of England was able to purchase debt from the Tory-backed South Sea Company at a discount, which benefited the Whig-supported bank and supporters of the new lineage of the English Crown.

5 The Great Depression

The durability of Britain's policy of suspending the convertibility of bank notes into gold during a war and restoring convertibility of the notes at the pre-war parity is evident by its continued use in Britain and elsewhere. This practice continued through World World I.

The 40-year period prior to World War I was characterized by an international gold standard, which was governed by the following basic characteristics (Batchelder and Glasner 1991). Each monetary unit was legally defined as a particular quantity of gold. An issuer of bank notes (whether private, commercial banks or a central bank) was required to redeem the notes for the

appropriate quantity of gold on demand. By the time that World War I arrived, the suspension of gold during times of war with the promised resumption at the previous parity had become commonplace.

The gold standard worked as follows. Since each monetary unit was defined as a particular quantity of gold, this meant that the nominal price of gold was fixed. For example, suppose that the dollar was defined as 1/20 of an ounce of gold. This would imply that the dollar price of gold was $20 per ounce. Since the nominal price of gold was fixed in each country, exchange rates were fixed by the definitions of the various units of account. The supply of and demand for gold determined the price of gold relative to all other goods. Since the nominal price of gold was fixed, this meant that the price level had to adjust to fluctuations in the supply of and demand for gold.

The implications are important. In this system, bank notes represented perpetual American call options on gold (Hendrickson 2022). In the same way that writing financial options contracts has no effect on the value of the underlying stock, the issuance of bank notes had no effect on the price level. It was the supply and demand for gold that determined the price level rather than domestic monetary factors. Since the market for gold is an international market, this meant that the price level in all member countries moved in parallel and corresponded with changes in the supply of or demand for gold.

During periods in which convertibility was suspended, this was no longer the case. One can think of convertibility as a commitment to buy and sell unlimited quantities of gold at the fixed nominal price. The suspension of convertibility meant the suspension of this commitment. That meant that the nominal price of gold was free to adjust. Fluctuations in the supply and demand for gold still determined the real value of gold, but this adjustment could occur through changes in the nominal price of gold. This implies that the price level was no longer determined by the supply and demand for gold. The fact that the domestic currency was no longer redeemable meant that the purchasing power of the currency, and therefore the price level, was determined by the supply and demand for the currency itself. This is why I argued earlier that the promise

to restore convertibility at the previous parity was tantamount to promising that any inflation experienced during the war would be followed by a corresponding deflation upon the conclusion of the war.

Since suspension periods necessarily meant a decline in the demand for gold, the real price of gold declined even if the nominal price rose. Resumption of convertibility therefore meant that deflation would be required. To give a concrete example, suppose that during the war the nominal price of gold rose from $20 to $25 and the price index doubled from 100 to 200. This would imply that the real price of gold declined from $0.20 to $0.125. An attempt to return to the previous parity would require the real price of gold to be $0.125 (to clear the gold market) and the nominal price of gold to be $20 (to match the pre-war parity). This implies a price level of 160, or a deflation of 20 percent from the postwar price level. In the event that the nominal price of gold remained around $20, this would require a deflation of 50 percent. This argument simply describes a no-arbitrage condition. That example, however, assumes that the demand for gold would not rise following resumption. This is almost certainly not the case. Countries returning to the gold standard would likely want to accumulate additional gold reserves, which would necessarily increase the demand for gold and therefore require a more significant deflation.

When World War I started, the main belligerents in the war suspended the gold standard. According to Crabbe (1989, p. 426), these countries

> exported gold and borrowed heavily to finance the war, but these tactics raised only a fraction of the large sums of money that the war required. Because new taxes did not and could not make up the difference, the continental belligerents financed a large share of the war by printing money.

For those that remained on the gold standard in the early part of the war, like the United States and Sweden, the overall decline in the demand for gold evident in those gold exports created inflation. In the countries that had suspended the gold standard, domestic monetary conditions determined the domestic price level. Thus, the resort to paying for some part of the war with money creation led to inflation and the rate of inflation varied between countries based on the

growth in the domestic money supply in comparison to the growth of money demand.

As had been the case historically, there was a general expectation was that countries would restore convertibility at the pre-war parity when the war ended (Batchelder and Glasner 1991, p. 13). Restoration of the international gold standard would have required a significant and costly deflation. The real value of gold had declined by about 50 percent implying a doubling of the price level, but some countries had experienced even higher rates of inflation (Batchelder and Glasner 1991, p. 13). Countries had an incentive to devalue their currencies relative to the pre-war parity since doing so would allow them to avoid deflation. This is the familiar dynamic inconsistency problem (Kydland and Prescott 1977). Of course, doing so would undermine the tool discovered by Britain over a century earlier. Nonetheless, there was political pressure to devalue, especially for countries that had experienced the highest rates of inflation and therefore would have to experience more severe deflations.

The U.S. found itself in a desirable position at the center of the global financial system. The U.S. never formally suspended convertibility during the war. Early on in the war, the U.S. remained neutral and remained on the gold standard. As a result, the U.S. was the recipient of significant gold inflows. Even after entering the war, the U.S. maintained its commitment to the official nominal price of gold ($20.67 per ounce) and the only restriction on the gold standard was an effective restriction on the export of gold (Crabbe 1989). Following the war and elimination of the export ban, it was still true that maintaining convertibility after the war required a deflation to offset the wartime inflation caused by the wartime decline in the demand for gold. The U.S. experienced deflation during the so-called Forgotten Depression of 1920 - 21, albeit not significant enough to restore the price level to its pre-war level (Mazumder and Wood 2013).

In 1922, the Genoa Economic and Financial Conference was held to attempt to resolve various economic issues in Europe. One issue was the resumption of the gold standard. As Batchelder and Glasner (1991, p. 14) detail, the conference did not resolve the issue,

> but it did produce a general understanding that central banks ought to moderate

> their demand for gold reserves in seeking to re-establish the gold standard nationally. The conference explicitly endorsed the idea of a gold-exchange standard under which countries would join the gold standard not by making their currencies formally convertible into gold coin on demand, but would maintain a fixed parity between their own currency and other currencies (in particular the dollar) which were already convertible into gold.

This proposal meant that the United States and the United Kingdom, the only countries that maintained pre-war parities, would be at the center of the system and maintain convertibility with their gold reserves.[8] Other countries would hold their existing gold as well as dollars and pounds as reserves. The reason for attempting to establish this gold exchange standard was to avoid deflation. Devaluation was a way to prevent domestic deflation. However, it was not sufficient to prevent global deflation from a resumption of the gold standard. The change in the distribution of gold reserves during the war was significant. After the war, the United States owned about 40 percent of global gold reserves (Batchelder and Glasner 1991, p. 15). All else equal, any attempt by a particular country to increase its gold reserves as a mechanism to demonstrate its commitment to convertibility would result in a net increase in the demand for gold. This would increase the real price of gold and therefore, for any country that had resumed the gold standard, this would cause deflation. In the event that a significant number of countries engaged in this sort of behavior simultaneously, this would result in a significant and costly global deflation. Although some, like Mazumber and Wood (2013) maintain that the resumption of the gold standard made it likely that deflation was inevitable, the idea behind the proposal of a gold exchange standard was to attempt to avoid deflationary pressures by encouraging countries to treat reserves of dollars and pounds as equivalent to gold.

As Batchelder and Glasner (1991) point out, the size of its gold reserves put the U.S. in a unique position. Should other countries attempt to increase their gold reserves, the Federal Reserve could allow an outflow of gold reserves. This would leave the net demand for gold reserves unchanged and prevent deflation. In the mid-1920s, this is what the Federal Reserve

[8] Britain's inability to wait until prices had fallen sufficiently to restore the pre-war parity caused the pound to be over-valued. This caused balance of payments deficits and a corresponding outflow of gold. This further solidified the U.S. as the new center of the global financial system.

appeared to do, lowering interest rates in response to deflationary pressures and allowing gold outflows. By the late 1920s, however, Batchelder and Glasner (1991) list a number of factors acted to create deflationary pressure. The first was the French passed a law for the stabilization of its currency in 1928 that required the Bank of France to hold gold reserves rather than other foreign currencies in reserve. This required the sale of foreign exchange for gold and therefore represented an increase in the demand for gold. All else equal, this put upward pressure on the real price of gold. With the nominal price of gold being fixed in all gold standard countries, this meant that it created deflationary pressure for all countries on the gold standard.

The second source of deflationary pressure was Germany's indebtedness from the First World War. With regards to the United States, Germany could effectively repay its debt in one of two ways. The first was by accumulating gold to make payments on the debt. The second was for the Germans to run a balance of payments surplus with the U.S. Batchelder and Glasner (1991, p. 20) argue that Herbert Hoover's electoral victory brought with it the expectation that the new administration would follow through on its promise to increase tariffs. The expectation of higher future tariffs meant that it would be harder for Germany to use balance of payments surpluses to finance its debt. Instead, Germany would have to tighten monetary policy by raising interest rates in order to accumulate gold to repay its debt.

Both the French and German accumulation of gold represented an increase in the demand for gold. All else equal, this would be expected to result in a higher real price of gold, which could only be achieved through deflation since nominal gold prices were fixed. All else need not be equal. The Federal Reserve, with its substantial gold reserves, could have moved toward a more expansionary monetary policy and allowed gold to flow out of the U.S. However, the Federal Reserve failed to do so.

Glasner (1989) and Batchelder and Glasner (1991) attribute the Federal Reserve's failure to act to prevent deflation to its preoccupation with the booming stock market. In doing so, they reject conventional explanations that attribute the stock market boom and subsequent crash to a speculative bubble. Instead, they contend that the Federal Reserve's early willingness to adjust

policy to deflationary pressures as Europe began its resumption of the gold standard signaled a level of global coordination led by the Federal Reserve's leadership that gave confidence to investors that a global deflation would be avoided. Growing investor confidence led to higher stock prices. However, the Federal Reserve interpreted rising stock prices in the U.S. as a sign that artificially low interest rates necessary for the outflow of gold were the source of a credit-fueled stock market boom. The Federal Reserve therefore committed itself to preventing these stock market excesses. Thus, when the French and the Germans increased their demand for gold in 1928 and 1929, the Federal Reserve refused to lower interest rates in response to deflationary pressures because of their concern for stock market speculation. As a result, there was no counterbalancing decline in the demand for gold necessary to prevent a global deflation. When it became apparent that deflation was on the horizon and the Federal Reserve would not respond to such pressure, the stock market crashed.[9] What followed was "a five-year increase in the real price of gold, whose magnitude was unprecedented in recorded history" (Thompson 1974b, p. 449) and the corresponding Great Depression.

As evidence in support of this theory, Bernanke and James (1991) have shown that countries on the gold standard experienced a dramatic deflation whereas countries that were not on the gold standard largely avoided deflation. This is consistent with the model of the gold standard I described above in which deflation is caused by either an increase in the demand for gold or a decrease in the supply of gold. As Sumner (2015) shows, it is the demand-side factors that explain the rising real price of gold. In addition, countries that abandoned the gold standard had better economic performance than those that did not. Bernanke and James (1991, p. 42) find that "between 1932 and 1935, growth of industrial production in countries not on gold averaged about seven percentage points a year better than countries remaining on gold."

The major significance for the international monetary system of the catastrophic attempt to restore the gold standard is that it marked the end of temporary suspensions of convertibility with a promised resumption at the pre-war parity. The experience of the Great Depression

[9] Glasner (1989) attributes this theory of the stock market crash to Earl Thompson.

caused by the failure to coordinate on the resumption of the gold standard not only revealed that the tool developed by the British was no longer adequate for emergency finance, but gave the impetus for the development of a new global monetary system. The long-run solution has been the Treasury Standard. However, in the intervening years, the international monetary system was governed by the Bretton Woods system.

Under the Bretton Woods system, the dollar was defined in terms of gold and redeemable for gold by foreign central banks. All other member currencies set fixed exchange rates with the dollar. In some sense, this was a way of formalizing the gold exchange standard that had been proposed during the interwar years. One way to rationalize the system was that it was supposed to create a dual reserve system. Central banks would (in theory) be indifferent between holding gold and dollars. Since the Federal Reserve can create dollars, a shortage of gold would (in theory) no longer have the undesirable consequences of the interwar period. Instead, the Federal Reserve could create additional dollars, which would serve as a perfect substitute for gold with foreign central banks.

In reality, the ability of the dollar to serve as a perfect substitute for gold was actually a function of the Federal Reserve's commitment to redeem dollars for gold on demand to foreign central banks. As long as that commitment held, then foreign central banks would be indifferent between dollars and gold. However, as I detail below, the goals of U.S. policy proved to be inconsistent with the willingness and the ability to redeem dollars for gold. It was the U.S.'s desperate attempt to retain its hegemonic status and maintain both its foreign policy goals and its central place in the global financial system that led to the Treasury Standard.

6 The Treasury Standard

6.1 The Collapse of Bretton Woods

The importance of national defense in explaining monetary arrangements is quite clear in the U.S. abandonment of the Bretton Woods system. Military conflict in Korea and Vietnam resulted

in significant balance of payments deficits. During the Vietnam War, the combination of the balance of payments deficits, the overall growth in the supply of dollars, and the required gold reserve ratio in the U.S. created concerns that the U.S. would not be able to continue to redeem dollars for gold. Rather than take steps to reduce the balance of payments deficits or the supply of dollars, the U.S. chose to close the gold window. The choice to close the gold window is a clear indication that the U.S. would not sacrifice its foreign policy goals to maintain the international monetary system.

The idea that the U.S. would not sacrifice its policy goals for the system is not controversial. Theories of the system that came next emphasize path dependence. The dollar-based international monetary system is explained as a continuation of the old system. The dollar dominates because of a lack of a good alternatives or because the invoicing of international trade in terms of dollars. However, this gets the history wrong. The dollar certainly had an advantage over other alternatives coming out of the Bretton Woods system, but it was not a competitive process that brought about dollar dominance. The deliberate policy actions of the U.S. government brought about the modern international monetary standard.

Concerns about the U.S.'s commitment to the Bretton Woods system were evident in the early 1960s. During the presidential campaign of 1960, the market price of gold rose to $41, or $6 above the official gold price (Hudson 2021, p. 322). Although President Kennedy (1960) promised in a speech just prior to the presidential election to reverse the trend in the balance of payments deficits, the U.S. did not adjust its policies. Instead, the U.S. resorted to accounting tricks and international coordination. One accounting trick that the U.S. used was to give the "nonmarketable, noncovertible, medium-term U.S. Treasury securities to foreign central banks in lieu of gold" (Hudson 2021, p. 323). This not only prevented the U.S. from having to redeem dollars for gold, but also adjusted the accounting. Rather than a gold outflow, this purchase of a U.S. security was recorded as a capital inflow.

In order to limit capital outflows, the U.S. government put a 15 percent tax on net foreign interest in 1962. The peculiar consequences of this tax policy with the aforementioned account-

ing trick are of note. Capital outflows that otherwise would have been used to purchase foreign securities with higher yields were instead re-directed toward the purchase of European companies. The companies exchanged the dollars they received for their domestic currency. Foreign central banks, unable to redeem those dollars for gold, had to exchange those dollars for the nonmarketable U.S. Treasury securities previously described. As Hudson (2021, p. 326) points out, the consequences are peculiar in the sense that from an aggregate accounting perspective this is equivalent to a policy in which the U.S. government borrows money from foreign central banks, distributes the proceeds to private sector, which in turn uses the money to purchase European businesses.

In addition, the U.S. set up the "London Gold Pool" with seven European countries in 1961. The U.S. agreed to match the contribution of gold made by the other countries and therefore contributed half of the gold in the pool. The purpose of the Gold Pool was for the central banks of the member countries to use gold to intervene in the gold market to maintain the official $35 gold price. The Gold Pool was short-lived. Since U.S. policy did not fundamentally change, the pool saw a net outflow of gold over time. By 1967, France withdrew from the Gold Pool and requested its gold be moved from New York to Paris. In March 1968, due to a drain on gold reserves, the U.S. Congress had voted to remove the 25 percent reserve ratio for gold. Just days later, the Gold Pool dissolved.

Following the dissolution of the Gold Pool, the U.S. sought policy solutions to prevent the drain of gold reserves. The U.S. government made both formal and informal agreements with other countries to have the foreign central banks lend dollar balances to the U.S. Treasury rather than redeem them for gold. Formal policies included one with Canada that suspended the aforementioned 15 percent tax on foreign interest in Canada in exchange for the Bank of Canada using its dollars to purchase U.S. Treasury securities (Hudson 2021, p. 344 - 5). Years later, the New York Times reported that the U.S. had threatened to withdraw troops from West Germany "if the German central bank didn't renounce its rights to convert surplus dollars into American gold" (quoted by Hudson 2021, p. 375).

Another policy solution was the introduction of Special Drawing Rights (SDR) at the International Monetary Fund. Barrett and Greene (1968, p. 10) explain the introduction of the SDR as a way "to assure an adequate supply of international liquidity for a growing world economy if, as is expected, the growth of more traditional reserve assets – gold and foreign exchange – should prove inadequate." In reality, the problem was not so much that the supply of gold and foreign exchange were insufficient to meet increasing demand in a growing world economy, but rather that the growing supply of dollars in foreign central banks coupled with an inadequate balance of gold in the U.S. to meet redemption requests.

The SDRs were an attempt to solve this problem by effectively creating paper gold reserves within the IMF. The initial allocation of SDRs was done in proportion to each country's quota at the IMF. The SDR was valued in terms of gold and could be used in the following ways. First, the SDR could be used to purchase other currencies to help settle balance of payments deficits. Second, countries could redeem their dollars for SDRs rather than gold. Countries that had fewer SDRs than their allocation had to pay interest on this deficit. Countries that had more SDRs than their allocation earned interest on the excess balances. Even though the SDR was only a claim to gold and not gold itself, this did provide countries an incentive to convert their dollars to SDRs since there was a belief that the dollar was overvalued given the dramatic decline the U.S.'s gold reserve ratio and the fact that SDRs paid interest. However, as Barrett and Greene (1968) noted, the interest on SDRs was less than that on U.S. Treasury bills. As a result, countries had an incentive to redeem dollars for Treasury securities rather than the SDR.

The logic underlying the introduction of SDRs was provided by Robert Triffin in his discussion of what has come to be known as the Triffin dilemma. The basic idea was that the failure of gold production to keep pace with global economic growth would create an excess demand for gold and therefore deflation. Deflation could be prevented through a greater supply of dollars, which had been designed by the Bretton Woods System to be a perfect substitute for gold. However, the only way to increase the international supply of dollars was through balance of payments deficits. This process would ultimately prove unsuccessful when foreign

holders of dollars and dollar-denominated debt lost faith in the ability of the U.S. to redeem the dollar for gold and attempted to "run" on the dollar. To solve this problem, Triffin proposed the "creation of a new, explicitly international credit money, issued perhaps as a liability of the IMF" (Mehrling 2022, p. 139).

A contrary view was that the balance of payments deficits were nothing to worry about. This view, most closely associated with Charles Kindleberger (1981), is that the Keynesian-style income accounting approach to the balance of payments is flawed. Instead, one should view the balance of payments as reflecting the U.S.'s role as intermediary to the world. In the aggregate, the U.S. was running trade deficits while simultaneously lending and investing substantial sums abroad. The dollar balances in foreign countries were then returned in the form of purchases of U.S. Treasury securities. The U.S. therefore resembled a bank in the sense that it was borrowing short and lending long. The lack of confidence in the dollar was caused by "the attitudes of government officials, central bankers, academic economists and journalists, and reflects their failure to understand the implications of this intermediary function" (Despres, Kindleberger, and Salant 1966 [1981], p. 43).

This line of argument took for granted that the role of the U.S. as intermediary to the world was the result of market forces. That assumption significantly discounts the role that policy played in generating this outcome, both intentionally and unintentionally. The Bretton Woods system was itself a political agreement that put the dollar at the center of the international monetary system. To say that foreign central banks and the governments they represent were content to hold dollars is to beg the question as to why the Gold Pool and SDRs were deemed necessary. Also, if the U.S. should just be seen as a intermediary, why cut short the analogy? Banks that issue convertible paper money commit to redeeming that paper on demand for a fixed quantity of the underlying commodity. The rising dollar price of gold reflects an increase in the probability that this commitment is reneged (Cutsinger and Hendrickson 2023). The U.S. responded not by reiterating that commitment, but rather by making political agreements designed to prevent a run on the dollar.

Even the expansion of the Eurodollar market, often used to bolster the U.S.-as-intermediary-to-the-world view, was driven (at least in part) by U.S. policy. In this case, this was not deliberate. Regulation Q prevented banks in the U.S. from paying interest on demand deposits and also stipulated maximum interest rates that could be paid on certain deposit accounts. These regulations, coupled with rising inflation resulted in an expansion of Eurodollar deposits by foreign branches of U.S. banks that found it easier to attract deposits at market interest rates (Balbach and Resler 1980).

The primary difference between Triffin and Kindleberger is in terms of thinking about the mechanisms that affect the balance of payments. The national income approach used by Triffin suffers from the fact that users often toggle between accounting identities and the language of causality. This is evident when arguments claim (or imply) that trade deficits cause indebtedness. It is easy to see how one might be led by the accounting identities to draw this conclusion through the casual observation that trade deficits mean that more goods are coming into the country than are being exported and there is a net outflow of dollars. If government debt is increasing and if those dollars are used to purchase government debt, one might be tempted to conclude that the U.S. is financing trade deficits with government borrowing. However, this assigns causation where it does not exist. Foreign holders of dollars could just as easily use the dollars to purchase dollar-denominated assets, including those in the U.S. Similarly, foreign holders of dollars might choose to purchase U.S. Treasury securities even if the supply of those securities is constant or declining (i.e., government debt is constant or declining).

The advantage of Kindleberger's approach is that he dispenses with national income approach to the balance of payments. For Kindleberger, the balance of payments is really about settlement. Each component used in the national income approach is an equilibrium outcome. The balance of payments simply reflects the net inflows or outflows of dollars resulting from the equilibrium outcomes. In this sense, Kindleberger's approach is not dissimilar to the monetary approach to the balance of payments. The basic idea underlying the monetary approach is that

the balance of payments reflects equilibrium portfolio choices.[10] Where Kindleberger erred is not in his approach to the problem, but rather in his interpretation that this outcome was simply the result of market forces when, in fact, policy was designed to increase the demand for U.S. Treasury securities in order to prevent redemptions of dollars for gold.

Triffin's argument that the system was unsustainable can also be best understood in the context of Kindleberger's framework. If one thinks of the U.S. as one giant intermediary for the rest of the world, it's liabilities would include dollars and U.S. Treasury securities. As is true of a bank issuing convertible paper money, growth in liabilities with a constant or decline stock of gold reserves can provoke a run. But what Kindleberger's approach reveals is that this problem cannot be solved through policies aimed at reducing the trade deficit. Such policies are unlikely to provoke the desired adjustment and might prove counterproductive. According to intermediary view, concerns about a "run" on the world's intermediary could be alleviated by limiting the growth in the money supply and/or reducing or eliminating the government budget deficit. These actions, however, were inconsistent with LBJ's Great Society and the U.S.'s commitment to an open-ended war in Vietnam. As a result, the policy response was an attempt to increase the demand for these U.S. liabilities.

By 1971, the various policies enacted to increase the demand for dollars and U.S. Treasury securities proved insufficient. In fact, not only were countries like Belgium, France, and the Netherlands redeeming hundreds of millions of dollars for gold, but many foreign central banks started diversifying their reserve holdings by trading dollars for the Swiss franc and West German mark (Garten 2021, p. 41; Hudson 2021, p. 370). By May 1971, West Germany revalued the mark and the Swiss revalued the franc. However, the revaluation also proved insufficient. Following the revaluation of the West German mark, there was speculation that the mark would continue to appreciate which led to substantial flows of dollars into Bundesbank as they were exchanged for marks (Garten 2021, p. 42).

[10] Kindleberger rejected this view of the balance of payments on the grounds that some of its advocates seemed to make similarly misleading arguments about causation as well, arguing that changes in money demand were the *cause* of changes in the balance of payments.

Throughout the summer of 1971, the turmoil continued and U.S. gold reserves continued to decline. Paul Volcker, who was then Undersecretary for International Monetary Affairs at the U.S. Treasury Department, formulated a plan that called for temporarily closing the gold window and instituting a 10 percent surtax on all imports Garten (2021, p. 153). The purpose of these proposed measures was two-fold. First, by temporarily closing the gold window, this would allow the dollar to float against other currencies. The market would then find the relevant exchange rates and fixed exchange rates could be reintroduced at the new market-determined exchange rates. Second, the belief was that by temporarily closing the gold window and instituting the tariff, the U.S. would demonstrate that it was serious about negotiations and would force the Europeans and Japan to the negotiating table.

By early August, billions of dollars were flowing into foreign central banks as people began to speculate on the depreciation of the dollar. By mid-August, the political pressure on the U.S. and the turmoil in financial markets culminated in a three-day meeting at Camp David between President Richard Nixon and his advisors. Then, on August 15, 1971, President Nixon offered the details of his "New Economic Policy" to the general public in a nationally televised speech. As part of this policy, Nixon announced the closing of the gold window. The speech called this action temporary, and indeed accounts of the meeting at Camp David suggest the plan was for a temporary closure to promote negotiation. Yet, the gold window did not re-open and the dollar's convertibility into gold has never been restored.

Whether or not the Nixon administration had any intention of restoring the gold standard is debatable. Some, like Paul Volcker, preferred an adjustment in exchange rates and to preserve the Bretton Woods system. Others, like George Schultz, preferred moving to a floating exchange rate regime. The lack of any commitment to the Smithsonian Agreement at the end of 1971, in which the U.S. agreed to devalue the dollar and others agreed to revalue their currencies, also sends a mixed signal as to the desires of policymakers. Fortunately, the evolutionary approach that I use here does not need to spend a great deal of thought on motives. In the evolutionary approach, durable policy changes tend to be a reflection of the desired aims of policy – otherwise

policy would not be so durable.

Throughout this entire experience, the one constant is the U.S.'s commitment to its desired policies. At no point did the U.S. reverse course on policy as a result of the pressure for the redemption of dollars. Instead, U.S. policymakers constructed various agreements and tried to use international institutions to continue the policy. Once it became evident that these solutions were not going to work, the U.S. abandoned the Bretton Woods system entirely. This is a clear indication that the pivot from the Bretton Woods system to the current international monetary regime was due to the fact that the prior system would not allow the U.S. to finance open-ended military conflict. In short, the Bretton Woods system did not allow the U.S. to generate what I have broadly defined as open-ended emergency financing.

A number of observers seem to misunderstand the events that culminated in the closing of the gold window. Garten (2021), for example, argues that the closing of the gold window was part of the Nixon administration's strategy for a more multilateral world in which U.S. allies would have to share the burden. Although this is somewhat consistent with the *rhetoric* of the Nixon administration, the actions of the administration paint a clearer picture. At no point did the Nixon administration consider altering its domestic or foreign policy to stem the outflow of gold. Instead, the administration pushed for its allies to alter their trade policies such that the U.S. could export more to the rest of the world. This idea was based on the Keynesian income approach to the balance of payments in which a reduction or elimination of the trade deficit would reduce the outflow of dollars from the U.S. Setting aside whether this is the correct policy approach or whether this would have actually reduced the net outflow of dollars, the strategy was clearly to make others adjust to U.S. policy.

In short, what the Nixon administration wanted to achieve was the same global leadership, but with its allies paying some of the financial cost of the U.S.'s actions. This is evident by the fact that the Nixon administration coupled its calls for opening up foreign markets to U.S. exports with calls for allies to pay some of the cost of U.S. foreign policy. Specifically, the administration wanted Western Europe and Japan to pay

> for the stationing of U.S. troops on their soil and for a larger share of the cost of American military equipment used to protect them. Washington also wanted the allies to procure more of their defense needs from U.S. suppliers. In all cases, the purpose was to alleviate the pressures on the United States' budget and its merchandise trade balance (Garten 2021, p. 53 - 54).

This was not an attempt to create a more multipolar world, but rather one in which the cost of U.S. leadership and foreign policy would be shared with its allies.

This view was not unique to the Nixon administration. Robert Roosa, the Undersecretary for Monetary Affairs at the U.S. Treasury Department during the Kennedy Administration, wrote that

> Throughout the decade of the 60's, there has been an ambivalence among the critics of the United States balance-of-payments performance. Our deficits have been continually criticized; our efforts to correct them, particularly when the traditional formulae of deflation were being applied, have brought anguished complaints. Yet these two approaches need not be either surprising or inconsistent. They flow from four major aspects of the United States position which, in their combined effect, distinguish us from all other countries–and distinguish us enough to require a separate addendum to, if not a completely separate version of, any comprehensive theoretical formulation of an appropriate process of balance-of-payments adjustment within the world economy.
>
> First, the United States is large, accounting for nearly one-third of all production and capital formation in the world, although for much less than one-sixth of all trade. Second, the United States dollar is far and away the most widely used transactions currency in international commerce, and it now provides the principal common medium for the Euro-currency market. Third, the United States has spawned a widely diversified complex of multinational corporations that is unique in scale and performance across the world. Fourth, as political leader of the free world, the United States has undertaken external commitments, both military and economic, that together far exceed the external expenditures for these purposes of any other nation, not only in gross amounts but also as a proportion of gross national product. (Roosa 1970, p. 182)

This statement is not only notable in the sense that it makes a Kindleberger-type argument that balance of payments adjustment might not be necessary for the U.S., but also explicitly notes that one of the four main reasons for this is the U.S. foreign policy required of "the political leader of the free world." The primary difference between Roosa and the Nixon administration appears

to be in terms of whether the U.S. needs to do anything about the balance of payments. For Roosa, the balance of payments might not require adjustment given the unique characteristics of the U.S. For the Nixon administration, the balance of payments deficit could be resolved by policy adjustments of U.S. allies. Neither suggested a departure from existing U.S. policy.

The result of the Nixon Shock was the beginning of what I have referred to here as the Treasury Standard. It is clear to see how the Treasury Standard emerged to replace the Bretton Woods system. The U.S. government had already been using both formal and informal arrangements to convince foreign central banks to hold U.S. Treasury securities rather than redeem their dollars for gold. The U.S. Treasury security not only had a head start over other possible reserve assets, but policymakers made an explicit effort to solidify the dollar's and the U.S. Treasury security's role in the international monetary system.

U.S. policymakers insisted that adjustment should come from the rest of the world. If the problem was the balance of payments deficit, the Nixon administration insisted that the U.S.'s foreign allies should agree to adjust trade policy to import more goods from the United States.

The connection between U.S. military involvement throughout the rest of the world and persistent twin deficits was used by the Nixon administration to argue that U.S. allies needed to pay their fair share of the collective defense. One way that this could be done is by U.S. allies earmarking parts of their budget to purchase more American-made weapons, which would return some of the excess dollars in foreign hands to the U.S. thereby reducing balance of payments shortfalls that the U.S. blamed, in part, on their defense initiatives abroad (Hudson 2021, p. 428).

Alternatively, the purchase of U.S. Treasury securities by the governments in West Germany and Japan was also seen as a way of forcing these countries to internalize the cost of their defense. Hudson (2021, p. 429) argues that the idea was to create a budget item on the books of the West German and Japanese government in which one of its "expenditures" would be the purchase of U.S. Treasury securities in some proportion to the cost of the U.S. military presence. To understand the logic, this would be equivalent to the U.S. government issuing a perpetuity

in order to finance the defense of Germany indefinitely and having the German government purchase the perpetuity. In terms of the "gains from trade" associated with such a setup, the Germans would be paying for the U.S. to provide defense. In effect, the interest would operate akin to something like a rebate paid for the U.S. strategic advantage of having troops in these regions.

Although the U.S. did not win on specifics, the dollar maintained its status and the U.S. Treasury security continued to serve as a reserve asset. The U.S. prevailed in part because it was committed to preserving the dollar's status and Europe and Japan could not coordinate on an alternative. This was partly due to competing interests, but it is also important to note that many U.S. allies were "essentially military dependencies of the U.S." at this time (Kirshner 2008, p.421). As a result, the U.S. was able to use defense-based arguments to drive a wedge between their allies that helped maintain the dollar's status as global reserve currency.

The U.S. also took direct steps to solidify the dollar's status and to create a long-term demand for dollars. The oil price shocks of 1973-74 created the potential for instability in an international monetary system that remained in a state of flux following the closing of the gold window. In response to the oil price shock, policymakers were concerned about the implications for the balance of payments of oil-importing countries. The trade surpluses of the oil exporters meant that these oil-producing countries experienced a corresponding inflow of money from foreign countries, which led to 3 different concerns among policymakers. The first concern was whether the market would resolve payment imbalances across countries that resulted from the oil price shocks. A second concern was related to financial stability. Oil exporters tended to deposit their money in banks in the U.S. and Europe. The concern was that banks would suddenly have significant maturity mismatch between loans and deposits, with these exporters as relatively large depositors. The reduction in depositor diversification coupled with maturity mismatch could lead to liquidity or solvency problems in the banking system if not properly managed. The third concern was that the oil-exporting countries would use these large quantities of foreign money balances as a political tool in financial markets.

In the U.S., policymakers were also concerned with how foreign, oil-importing countries would respond to these trade imbalances and the implications for the balance of payments. Although a trade deficit with oil exporters could be offset by a trade surplus with the rest of the world, the trade surpluses of the oil-exporting countries had to match trade deficits *somewhere*. Countries that couldn't pay for oil in their domestic currency would need to ensure a net inflow of foreign currency, which was inconsistent with a balance of payments deficit. The U.S. State Department explicitly outlined concerns that this would lead to deliberate currency devaluations, import restrictions on goods other than oil, and/or export subsidies (Spiro 1999, p. 30). Although these policies might be individually rational, they would be a collective failure if they were adopted by all countries trying to correct payment imbalances. U.S. policymakers urged international cooperation in dealing with disruptions to the international financial system from the oil price shock.

Although the official policy stance of the United States was to encourage international cooperation, in reality the U.S. acted unilaterally to maintain the dollar's status as reserve currency and to encourage oil producers to use their oil revenues to purchase U.S. Treasury securities. In July 1974, U.S. Treasury Secretary William Simon went to Saudi Arabia and made a deal that allowed Saudi Arabia to purchase U.S. Treasury securities independent of the typical Treasury auctions (Spiro 1999, p. 107). Such an agreement meant that the U.S. Treasury would be able to have smaller public auctions than would have been true otherwise and funnel the dollar balances flowing into Saudi Arabia to fund U.S. budget deficits. In addition, the ability to purchase U.S. Treasury securities outside of the auction allowed the Saudis to purchase the securities in secret, which was a required condition of the agreement (Wong 2016). According to Wong (2016),

> Tensions still flared 10 months after the Yom Kippur War, and throughout the Arab world, there was plenty of animosity toward the U.S. for its support of Israel. According to diplomatic cables, King Faisal's biggest fear was the perception Saudi oil money would, "directly or indirectly," end up in the hands of its biggest enemy in the form of additional U.S. assistance.

The "add-on" agreement that allowed the Saudis to purchase Treasury securities outside of the auction granted them that secrecy. The U.S. also had a reason to support the secrecy of the agreement. Since U.S. policymakers publicly encouraged international cooperation to resolve payment imbalances, news of a unilateral deal with the Saudis would undermine this public position (Spiro 1999, p. x).

In exchange for using its dollars to finance U.S. government debt, the Saudis were given military aid. According to Spiro (1999, p. 116):

> A former American ambassador to the Middle East attributes Saudi purchases of T-bills to an explicit U.S. offer to provide a security umbrella for the Gulf. If this is so, the success of the United States in recruiting SAMA [Saudi Arabian Monetary Authority] funds is easier to understand and theoretically more interesting to the political economist. Unfortunately, such an agreement would have to be secret and informal (or else it would be subject to confirmation by Congress), and therefore evidence of it is difficult to find.

Nonetheless, Wong (2016) reported on the secret agreement between the U.S. and Saudi Arabia and confirmed that,

> The basic framework was strikingly simple. The U.S. would buy oil from Saudi Arabia and provide the kingdom military aid and equipment. In return, the Saudis would plow billions of their petrodollar revenue back into Treasuries and finance America's spending.

Wong's reporting cites confirmation from Gerry Parsky, William Simon's deputy, who traveled with Simon to make the deal with the Saudis.

The U.S. also took steps to isolate the IMF and prevent the organization from resolving payment imbalances. The IMF had been set up to resolve payment imbalances. Countries that needed foreign currency could borrow from the IMF. Thus, it would seem that IMF was uniquely equipped to deal with payment imbalances caused by the oil supply shocks of the early 1970s. However, the U.S. saw a growing role for the IMF as a threat to its own hegemony in the global financial system. In the aftermath of the oil shocks, the IMF proposed a facility in which the oil-producing countries running a balance of payments surplus could lend this surplus to the

IMF (Spiro 1999, p. 96). The IMF would then lend the money to countries that needed this foreign currency to deal with their balance of payments deficit. The U.S. preferred that the oil-producing countries use their surplus dollars to purchase U.S. Treasury securities. Because of the voting process within the IMF, the U.S. had a unique ability to stifle attempts from the IMF to serve as an intermediary between surplus and deficit countries. Voting power within the IMF is determined by the quotas of currency pledged by each country. Any change to the balance of power within the IMF required a supermajority of 80 percent. Since the U.S. quota was over 20 percent of the total, this meant that the U.S. had veto power over any such change (Spiro 1999, p. 106). The addition of China and Saudi Arabian participation in the IMF's oil facility threatened to erode the veto power of the U.S. As a result of it's veto power, the U.S. was in a unique position to negotiate. In fact, the U.S. could effectively dictate terms. The U.S. agreed to increase the Saudi Arabian quota at the IMF if the percentage of votes required for a supermajority was increased (in order to maintain its supermajority, despite having a smaller percentage of the overall quota) and if the Saudis would agree not to pursue any efforts to price oil in terms of the IMF's Special Drawing Rights instead of the U.S. dollar (Spiro 1999, p. 104 - 105).

The theory that I have put forth in this paper has emphasized that the observed evolution of the monetary and financial system has a consistent and coherent pattern across time, which is the desire to have adequate emergency finance. This does not require that states and policymakers had a grand plan to create institutions and implement policies that achieve this goal. All that is required is that policymakers proceed by trial-and-error in an attempt to achieve a particular objective. The history of the collapse and aftermath of Bretton Woods is certainly consistent with that approach. The collapse of the Bretton Woods system was largely driven by the fact that the system was inconsistent with the U.S.'s policy objectives. This is demonstrated by the fact that the U.S. preferred abandoning the system to abandoning its policy objectives. Yet, something had to replace the Bretton Woods system.

Narrowly rational explanations for why the dollar emerged (or one might say remained) as

the global reserve currency in the aftermath of Bretton Woods are appeals to path dependence or the lack of viable alternatives. Implicit in these arguments is the idea that "the market has spoken." However, it would be wrong to attribute the dollar's status to these narrowly rational explanations. They ignore the deliberate actions of the U.S. government. In reality, market-based explanations have been offered as "an ex post facto legitimation of America's endeavor to reassert its hegemonic dominance" (Spiro 1999, p. 125).

By contrast, the idea that trial-and-error in pursuit of a state objective holds up much better to the evidence. Policymakers across the Nixon, Ford, and Carter administrations maintained the same general strategy. Not only that, these policymakers often acted at the risk of significant costs across all three administrations. The secrecy of the agreement made with Saudis deliberately kept Congress from playing any role. The Carter administration came into power with explicit goals for multilateral cooperation between the U.S. and its allies. However, policymakers within the administration went to great lengths to keep any deal with the Saudis a secret, including from Congress, and the U.S. Department of Treasury even scolded the CIA for a lack of secrecy on the agreement (Spiro 1999, p. 116 - 121).

In short, the Treasury Standard is not happenstance, path dependence, or the spontaneous outcome of international finance. Instead, the Treasury Standard is the direct result of U.S. policymakers' desire for the U.S. to maintain global hegemonic power, especially in regards to national defense and emergency finance.

6.2 Emergency Finance

At this point, it is worth evaluating this new system in terms of the emergency finance hypothesis. The primary claim of this hypothesis is that the state monopoly is driven by the desire to provide open-ended funding during wars and perhaps other national emergencies. To maximize the revenue that one can generate, there must be a commitment to overall price stability to anchor money demand as well as a commitment to prevent competitive alternatives.

To illustrate the evolution of emergency finance, it might be worth comparing and con-

trasting the constraints on emergency finance across regimes. Under a pure commodity-based monetary regime, the constraint on financing is the physical commodity. Emergency finance is facilitated by debasement of the currency. This includes clipping and shaving coins as well as other means of reducing the metallic content of coins relative to the definition of the unit of account. Limitations on emergency finance were due to two factors: physical limitations of the stock of the commodity that could be debased and expectations. Promised revaluations and re-coinages were necessary to continue to rely on this source of funding.

The combination of more costly warfare following the Military Revolution and the emergence of banking undermined this mechanism. Bank notes and deposit balances led to the economization on the use of coins thereby limiting the tool of debasement. In this world, central banks became an important source of emergency finance. However, emergency finance did not simply consist of money printing and extensions of government credit, as often asserted. Durable emergency financing requires a long-run commitment to price stability. As a result, during periods of war and national emergency, the redeemability of bank notes into gold would be suspended with the promise that redemption would be restored at the previous parity at the conclusion of the emergency. The contrast between the Bank of England and the Riksbank is indicative of the importance of this component of the emergency financing. The interwar period revealed that this mechanism was no longer feasible. For this mechanism to continue to work, it would require the coordination of all member countries. The resulting deflation and Great Depression revealed such coordination was unlikely.

Ideally, the Bretton Woods system would solve this problem. The basic idea was that the U.S. dollar would be a perfect substitute for gold. The dollar was defined as a particular quantity of gold and all the remaining currencies had fixed exchange rates to the dollar. In theory, this would prevent the sort of costly deflation caused by the excess demand for gold observed in the interwar period. As long as the U.S. agreed to redeem the dollar for gold with foreign central banks at the official price, the dollar and gold would be perfect substitutes. As such, emergency financing could be obtained by the U.S. with long-run money demand anchored

by that commitment. However, as the experience of the 1960s and early 1970s revealed, the substitutability of the dollar and gold is only as good as the foreign central banks' belief about the U.S. commitment to the redemption mechanism. U.S. foreign policy commitments were not consistent with the monetary commitment and the system was abandoned.

The Treasury Standard was in some sense the natural evolution in this process. It replaced the neutral reserve asset of the past with a debt security issued by the sovereign. In doing so, the Treasury Standard replaced the commitment to redemption with a more moderate commitment to relative price stability.[11] In that sense, however, the Treasury Standard did not truly begin until the Volcker disinflation.

What the shift to the Treasury Standard did was give the U.S. greater flexibility with regards to emergency finance. A war or national emergency leads to greater borrowing. Since the debt instrument of the U.S. is the global reserve asset, the U.S. has the ability to expand its debt at a much lower cost than would be true otherwise. If the expansion of debt leaves Treasury securities in excess supply, this will tend to increase the yield on U.S. debt, all else equal. However, if the wars and national emergencies are expected to be temporary and if the U.S. maintains a commitment to relative price stability, the effects on yields are likely to be small. Thus, the U.S. is able obtain emergency financing without incurring a substantial cost.

In previous historical regimes, the monopoly over money served the purpose of creating a means of emergency finance, but also prevented others from doing so. Private mints were considered a threat to sovereignty and counterfeiting has been considered treasonous. As the discussion of the Bank of England illustrated, the monetary system could also be used as a tool to align the interests of would-be adversaries of the state. The Bank of England, as the center of Britain's financial system and a large holder of sovereign debt, not only aligned the interests of the shareholders with the government, but also provided an important check against revolutionaries. One hallmark of revolution is the repudiation of the debt of the old regime.

[11] In the post-Bretton Woods era, I am using the conventional terminology of price stability to refer to low, stable rates of inflation. Ideally, price stability would refer to the level of prices rather than their rate of change. Nonetheless, this is a battle that does not need to be fought here.

Since the debt was an important asset of the bank at the center of the financial system, such a repudiation would have severe consequences for the entire financial system. A sovereign-debt-holding central bank is a poison pill for revolution. This limited the benefits of revolution and increased its cost. Sovereign debt-holding central banks thus helped align the interests of the state with potential *internal* adversaries. Along these lines, the Treasury Standard has also expanded the policy toolbox of the U.S. with regards to foreign policy generally. The dollar's role as global reserve currency and the U.S. Treasury security's role as global reserve asset give the U.S. government the unique ability to punish *foreign* adversaries.

The U.S. dollar's role as medium of exchange and the U.S. Treasury security's role as the global reserve asset give the U.S. the unique ability to levy sanctions on foreign adversaries. Financial sanctions are created by executive orders of the President of the United States and enforced by the U.S. Treasury Department's Office of Foreign Asset Control (OFAC), which maintains a list of Specially Designated Nationals (SDNs). Those with an SDN classification are forbidden from making cross-border transactions and can have their dollar denominated assets frozen. An SDN classification can be assigned to individuals, firms, or even government institutions like a foreign central bank. The U.S. government can enforce these sanctions on payments through its jurisdictional authority over U.S. financial institutions and the Clearing House Interbank Payments System (CHIPS), which facilitates nearly all dollar-based international payments (McDowell 2023, p. 25). The U.S. government's ability to freeze assets is made possible by the fact that a substantial amount of dollar-denominated reserve assets of foreign governments are held at the Federal Reserve Bank of New York and Treasury securities are held in accounts with the U.S. Treasury (McDowell 2023, p. 26).

Financial sanctions can be used against both adversarial states and non-state entities. These sanctions have been used to target terrorists and terrorist organizations as well as individuals and firms tied to adversarial states.[12] The U.S. has also targeted state institutions directly,

[12]For a comprehensive list of those sanctioned via executive order, see Appendix B in McDowell (2023), which lists the year the sanctions were issues, the year the sanctions ended (if they have ended), the justifications given by the U.S. government, and whether the target is the state or non-state actors.

including foreign central banks.

In recent years, sanctions have become an important component of U.S. foreign policy, in particular by the Obama and Trump administrations. Some have even argued that it is now the primary tool of foreign policy (Drezner 2021). The U.S. froze tens of billions of dollars in assets tied to the leadership of the Libyan government in 2011, froze assets held in U.S. jurisdiction by the central banks in Iran and Venezuela in 2012 and 2019, respectively (McDowell 2023, p. 38). The sanctions against Iran were suspended in 2015 with the signing of the Iran nuclear deal, but subsequently re-introduced by the Trump administration. Sanctions on Russia have been the clearest sign of this new tool in foreign policy. Following Russia's invasion of Ukraine in 2014, the Obama administration designated "a list of individuals and entities close to Putin's regime as SDNs" (McDowell 2023, p. 43). In 2018, the U.S. sanctioned Russian oligarchs and firms as well as government officials, which were justified as a response to "Russian interference in the 2016 U.S. presidential election, other cyber-related crimes, and human rights violations" (McDowell 2023, p. 43). Following Russia's invasion of Ukraine in 2022, the U.S. froze the assets of the Russian central bank and Russia's sovereign wealth fund that are held within the U.S.'s jurisdiction (McDowell 2023, p. 38).

In theory, these sanctions can be used to align foreign actors with the interests of the U.S. government in the same way that sovereign-debt-holding central banks acted as a poison pill against potential revolutionaries. However, in comparison to earlier innovations in isolating opponents of a particular regime, the sanctions used in the Treasury Standard are imperfect. States that are adversarial to the U.S. have an incentive to limit their exposure to the U.S. dollar system. These countries can do so in one of two ways. The first is by transacting in currencies other than the dollar when possible. The second is by removing reserve assets from U.S.-governed jurisdictions.

There is some evidence of this sort of backlash against U.S. sanctions. For example, Russia has responded to U.S. sanctions by increasing its gold reserves and reducing the amount of foreign exchange reserves and gold reserves that it holds within U.S. jurisdictions (McDowell

2023, p. 44 - 47). In addition, Ferranti (2023) shows evidence of a relationship between the origin of military imports and the change in gold reserves for a sample of 81 countries. Specifically, he finds evidence that those countries with a larger share of military imports from China and Russia (in comparison to the U.S.) are likely to hold more gold reserves. This is evidence that gold reserves are at least in part driven by financial sanctions and the threat thereof. More generally, McDowell (2023) finds that both direct sanctions and the threat of sanctions are associated with a statistically significant increase in gold reserves. He also finds that direct sanctions are associated with a statistically significant reduction in U.S. Treasury security holdings.

The use of this tool therefore represents an important trade-off for the U.S. The success of the Treasury Standard depends on a stable, long-run demand for dollars and U.S. Treasury securities. If sanctions are successful, they prevent adversarial behavior and reinforce the network effect of the current system. However, sanctions have the potential to disrupt the system itself. The larger the pool of sanctioned entities or those threatened by potential sanctions, the greater the likelihood that states will begin to diversify away from the dollar in both payments and in the use of Treasury securities as a store of value. In the absence of an obvious alternative, diversification away from the dollar is likely to be gradual and confined to those countries that are directly sanctioned. Nonetheless, the more widespread the use of sanctions become, the more likely the U.S. is to create conditions under which a network effect for an alternative could emerge.

6.3 Economic Implications

Under a pure gold standard, or at least one in which all note holders can redeem their notes on demand for gold, the supply of the reserve asset is determined by production in the gold market and the relative value of monetary gold and non-monetary gold. Under this system, the price level is determined by the supply and demand for gold. This is because the unit of account is defined as a particular quantity of gold. This definition implies that the nominal price of

the reserve asset is fixed. Fluctuations in the supply and demand for gold determine the real price of gold. Since the nominal price is fixed, this implies that the price level must adjust to clear the international gold market. International arbitrage implies that all countries on a gold standard have price levels that move together in response to fluctuations in the gold market. The definition of the unit of account determines the fixed exchange rates between different units of account.

At least in theory, the explicit aim of the Bretton Woods system was to create two, perfectly substitutable reserve assets in the form of gold and the U.S. dollar. This alters the working of the system. Since the supply of dollars is determined by the central bank, perfect substitutability can be tenuous. As long as the central bank remains committed to redeem dollars for gold at the official price, dollars and gold will indeed exist as perfect substitutes. However, the more likely it is that the central bank will renege on its commitment to redeem dollars for gold at the official price, the dollar will cease to be a perfect substitute for gold and the value of the dollar will decline (Hendrickson 2022; Cutsinger and Hendrickson 2023). These declines in the value of the dollar can show up in the price level and exchange rates. This is precisely what was observed during the 1960s. Inflation increased. The price of gold in terms of dollars at times rose above the official price and others speculated that other currencies would appreciate relative to the dollar despite fixed exchange rates.

The closing of the gold window in 1971 and the introduction of the modern Treasury Standard alters the method of international adjustment. With the U.S. Treasury security as the global reserve asset, the supply and demand of these securities determines the interest rate on the debt securities. However, one can be more specific. The supply and demand for U.S. Treasury securities determines the spread between the yield on risky assets and the yield on the U.S. Treasury security (Farhi and Maggiori 2018). The difference between the yield on the risky asset and the yield on the U.S. Treasury security is akin to the marginal value of the rent that goes to the monopoly supplier of the global reserve asset. There are several important implications that follow.

In the steady state, the supply of the reserve asset will grow at the same rate as wealth of the rest of the world. Outside of the steady state, an excess demand for the reserve asset will tend to cause the yield on the reserve asset to decline. Since the reserve asset is a debt instrument of the government, this implies that the lower yield will tend to reduce the cost of running budget deficits and increase the level of debt back toward the steady state. When there is an excess supply of the reserve asset, yields will tend to rise, which provides an incentive to reduce the growth rate of the debt to its steady state growth rate.

At the same time, foreign holders of the global reserve asset need to acquire dollars to purchase Treasury securities. As the monetary approach to the balance of payments suggests, a net demand for dollars will manifest as current account surplus. In the U.S., which is supplying the reserve asset, there is a reciprocal current account deficit that provides the outflow of dollars. Here, the relative value of the dollar serves as the equilibrating mechanism. If U.S. current account deficits are too small in comparison with the desired surpluses of the rest of the world, there will be an excess demand for dollars that will push up the value of the dollar relative to other currencies. This will tend to result in larger current account deficits. This change can occur through changes in consumption patterns or in production patterns, such as the relocation of production facilities abroad for multinational firms. The weaker the incentive for consumption patterns, the more likely the moves in the dollar are sufficient to generate changes in production patterns since foreign investment by multinational firms will tend to be guided by optimal stopping problems. Sufficient movements in the dollar will tend to result in lumpy relocations of production. The key point is that when a government debt instrument serves as the reserve asset, the means of supplying the reserves requires the issuing government to run persistent twin deficits over time.

The defense-based explanation of the monetary system that I have articulated here emphasizes the importance of price stability. Long-run price stability increases money demand while also anchoring money demand during emergencies. Those in decision-making positions, however, cannot perfectly commit to future actions. Thus, in the past, there was always a chance

that debasement and devaluation would be permanent. The state might never commit to re-minting coins in the aftermath of debasement. Under convertible currency regimes, the state might choose to re-define the unit of account into a lower quantity of the commodity thereby permanently devaluing the currency. Indeed this risk seems to have been well-understood. The British experience with the suspension of convertibility during the Napoleonic Wars and the U.S. experience during the Civil War show that significant military successes and setbacks influenced the value of the currency consistent with what would expect if those military outcomes influenced expectations of permanent devaluation (Antipa 2016, Cutsinger and Hendrickson 2023).

Under the Treasury Standard, when policymakers have imperfect commitment, devaluation (or, more accurately, depreciation) remains a possibility. This prospect of depreciation during an emergency makes it possible that there could be a run on the reserve asset. This could occur due to economic fundamentals or it could be a self-fulfilling prophecy, as in Diamond and Dybvig (1983) and Calvo (1988). As Farhi and Maggiori (2018) show, for sufficiently low levels of debt, policymakers would have no incentive to devalue in an emergency. For sufficiently high levels of debt, policymakers would always resort to devaluation. However, this latter case cannot be an equilibrium because a run would occur with certainty and policymakers would never choose a path for policy that results in a certain run. For the intermediate range of debt, the producer of reserves may or may not choose to devalue during an emergency. Thus, for this intermediate range of debt, there is some positive probability that a run will occur. Since the issuer of the securities that serve as the global reserve asset has an incentive to issue debt to maximize the monopoly rent, the issuer will choose a level of debt in this intermediate range if it maximizes its rent. This can be true even though the choice of a level of debt in this intermediate range makes the system potentially fragile. This implies that the fragility of the Treasury standard is inherent in the system. If the demand for Treasury securities as reserves is sufficiently high, the U.S. will be driven to expand its debt beyond the safe range and will risk a run.

7 Conclusion

The two most durable state monopolies across history are the state's monopoly on violence and the state's monopoly on the currency. This paper offers a theory and a historical narrative that explains why. The primary role of the state is to provide adequate defense since the inability to do so threatens the very existence of the state. A crucial input into the provision of defense is the ability to finance defense expenditures. This includes the ability of the state to raise significant revenue in a short period of time during wars and other national emergencies. The argument that I have made in this paper is that it this desire for emergency finance that explains the state's monopoly over its currency and the evolving role thereof across history.

Nonetheless, the mere ability to debase or devalue the currency or to print money is not sufficient for the provision of emergency defense since the purchasing power of that money is a function of those decisions. The ability to provide emergency finance meant that states often had to resort to measures that might seem curious outside of my theory. For example, why would rulers attempt to revalue the currency after a debasement? Why would a central bank promise to restore the convertibility of the currency into gold at the pre-war parity? The reason is that successful emergency finance requires a commitment to long-run price stability. Without this commitment, the state's ability to use its monopoly over money to provide emergency finance is limited. This is because expectations of debasement, devaluation, and inflation cause prices to rise faster than the money stock and thereby limit the state's ability raise sufficient real purchasing power through money creation in a short amount of time.

The evolution of the state's role in money is largely driven by particular technology and constraints. In early times, the state's monopoly over the mint gave it control over the money supply, provided it with the ability to debase or devalue the currency, and prevented would-be private mint owners from being potential rivals for power. However, the introduction of banking, bills of exchange, and bank notes caused many to economize on the use of coins. The Military Revolution also dramatically raised the costs of waging war and created a greater need for emergency finance, and on a larger scale. These changes resulted in state involvement in

banking.

The Bank of England epitomized the state's role in banking with regard to emergency finance. The Bank of England's temporary suspension of convertibility of bank notes into gold during times of war with a commitment to restore convertibility at the previous parity provided Britain with the ability to finance open-ended conflict.

By World War I, the lesson of the Bank of England's suspension was apparently well-known. While it would be possible to argue that the suspension of convertibility was an inevitable outcome of war, the belligerents' commitment to restore convertibility was a deliberate policy choice. The scramble for gold and the resulting deflation brought an end this long-standing strategy. The short-lived monetary system that emerged from the agreement at Bretton Woods was meant to solve the problem. However, by the time that the U.S. entered its war in Vietnam, it became evident that the Bretton Woods system was incompatible with U.S. foreign policy and the need for emergency finance.

The Treasury Standard thus replaced the system put in place at Bretton Woods. To this point, the Treasury Standard has served U.S. interests better than the previous monetary regimes. Nonetheless, the Treasury Standard is not without its own costs and risks. Although the Treasury Standard has enabled the U.S. to engage in unprecedented levels of emergency finance, it requires that the U.S. be a net exporter of dollars and that U.S. debt grow at the same rate as the growth in the demand for reserves throughout the rest of the world. As a result, the Treasury Standard is potentially unstable. Since the reserve asset is the debt security issued by the U.S. government, the system encourages the U.S. to accumulate large levels of debt to keep up with growing demand for reserves. High levels of debt increase the likelihood that the U.S. will resort to inflation at some point in the future when tax revenues prove insufficient for repayment. The very possibility that the U.S. will resort to inflationary finance makes the system susceptible to a self-fulfilling prophecy among debt holders.

At the same time, the effectiveness of the Treasury Standard potentially has important implications for the choices made by U.S. presidents and other policymakers when it comes to

issues of war and other conflicts. Historically, one constraint on war was its cost in conjunction with the possibility of defeat. Significant and costly defeats were often followed by political defeats and even new political regimes. The prospect of defeat thus conveyed a particular constraint on decision-making. By weakening the financial constraints of war, the Treasury Standard has similarly weakened these political incentives.

The future of the Treasury Standard is the subject of speculation, which is a futile exercise. Predictions of the demise of the dollar as the global reserve currency have been persistent for decades. My purpose here is not to engage in any sort of prediction, but rather to illustrate the consistent pattern across history that has culminated in the Treasury Standard. In offering this explanation, several lessons can be drawn. First, the Treasury Standard's continued existence is in the interest of the U.S. government and its foreign policy. I would expect the U.S. to take steps to maintain the status quo, even in ways that might otherwise be unexpected. Second, there are challenges to the system's continued existence inherent in the system itself. In particular, there is an inherent fragility built into the system caused by the fact that the global reserve asset is a debt instrument of the U.S. government. Finally, threats to the monetary system are also threats to foreign policy. Both proponents and opponents of the system should therefore be cognizant of the ways in which the system alters the incentives of policymakers.

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