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Author(s): J. Lawrence Broz
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Origins of the Federal Reserve System: International Incentives and the Domestic Free-rider Problem

J. Lawrence Broz

From the Civil War to 1914, the United States had one of the worst financial systems in the world. The dominant institutional feature of the system was the absence of a central bank, and its most salient performance characteristics were the recurrence of banking panics and severe seasonal interest-rate fluctuations. These financial problems were economically costly; panics were accompanied by sharp declines in the money supply, reduced economic activity, and increased unemployment and business failures. In 1913 Congress created the Federal Reserve System to safeguard the nation from panics and smooth out interest-rate seasonals. In more general terms the Federal Reserve was established to provide the national public good of financial system stability. In this study I explain how American society overcame the collective action problems that normally constrain the production of public goods to inadequate levels. In other words, the article is about the political effort that produced an infrastructural cornerstone of the modern U.S. economy in the face of incentives that should have left few people with sufficient motivation to "pay" for the improvement.

I bring to bear a "joint products" (selective incentives) argument to explain the voluntary collective action behind the Federal Reserve Act.[1] The lobbying effort was about solving the panic problem, to be sure, but because this expected benefit approximated a societywide public good, it did not, on its own, motivate collective action. Instead, the United States faced a second problem of financial organization before 1914, and it was this problem that created a private inducement to lobby for the Federal Reserve. The structure of the domestic financial machinery contributed not only to instability at home but also to the near complete absence of the U.S. dollar in global financial affairs. Indeed, the United States was the only major trading country whose currency did not function as an international currency before 1914. The New

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1. See Olson 1965; and Sandler 1992.

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York financial elite had the most to gain from rectifying this situation, since the benefits of international currency status are demonstrably concentrated and specific to money-center banks. However, society at large benefited from the bankers' lobbying effort because the private good (internationalizing the dollar) could not practicably be disassociated from the production of the public good (domestic financial stability). This aspect of the argument is crucial because the joint products model hinges on the inseparability of the excludable and nonexcludable goods.

In this article I provide a "road map" of the joint products model and demonstrate empirically the supply constraints that bound together the public and private goods of the Federal Reserve Act. Additionally, the inferences of joint production are clearly specified and evaluated with respect to an important case. Although the main historical finding is that students of the Federal Reserve have not paid sufficient attention to international factors in explaining the creation of the Fed, I also confirm the wider applicability of the joint products model.

The Mechanics of Joint Production

The joint products model provides a simple, elegant, yet powerful explanation of how public goods are produced.[2] The basic intuition is that most collective action situations yield multiple benefits, public and private. The collective action problem arises whenever a desired good is public; in such situations additional incentives are needed to move group members to action. Distinct from the collective aspirations of a group, the added incentives are excludable goods that accrue selectively to individual members, contingent on their participation in the group effort. Hence, the payoff to contributors includes both the nonexcludable public good and the excludable private good, but it is self-interest and not collective interest that leads to the provision of the public good. The basic hypothesis is that the extent of free riding associated with the production of a public good is inversely related to the proportion of private benefits available to participating members of a group.

In some collective action situations, however, the model may be inappropriate. The risk is that it is all too easy to assume the existence of some private return whenever we observe a public good. The crucial requirement of the model, often ignored, is that the private and public goods in question cannot be disaggregated due to some prevailing supply constraint. Otherwise, the argument is open to the "separate-provision" critique.[3] In other words, if people contribute to a public good because of the selective benefits offered, then an efficient solution is to disconnect the private good from the collective good, since it would be cheaper to produce it independently. Joint production thus requires that it is difficult or impossible to realize a private benefit without contributing to the associated collective good. Yet the failure by

2. See Sandler 1992 for a formal representation. For substantive examples, applied to interest groups, popular dissent, and international alliances, see respectively Moe 1980; Lichbach 1995; and Conybeare and Sandler 1990.

3. See Stigler 1974, 360; and Sugden 1982.

many researchers to problematize the technology of supply has created doubts about the relevance of the model.

In summary, the mechanics of joint production requires that three conditions be met. First, a public goods problem must exist. The task before the analyst is to identify the desired public good and define the good according to a specific group of individuals. The public good in question may benefit only two specific people or the whole world. The point is that public goods can only be defined with respect to some specific group. Second, a private good must be available to induce select members of the group to participate in the collective effort. The analyst must identify the desired private good and define the good according to a specific subset of the larger group. Third, a private benefit can only induce collective action when it cannot be enjoyed in isolation of the public good. In other words, the joint goods cannot be separately produced. The analyst must bind the public and private goods together by way of defining the supply technology that makes it impossible to disaggregate the joint goods.

The article is organized into three sections. In the first section I define the public goods problem with respect to the workings of the U.S. financial system before 1914. I furnish national-level data on the economic costs of panics and other financial disorders to substantiate the claim that provision of a more reliable financial system was a public good for nearly everyone in the country. I also provide historical background on the legal and institutional characteristics of the system that left it prone to such financial disturbances.

In the second section I define the private good that induced select individuals to contribute to a solution. I begin by showing how the structure of the domestic financial system before 1914 precluded a role for the dollar as an international currency—an argument that finds support in the literature on key currencies. I then unpack the distributional effects of international currency issue to illustrate that the benefits are concentrated heavily on money-center banks. The main finding is that these banks earn what are known as "denomination rents" from global use of the home currency—profits associated with enhanced demand for banking services of the issuing country. Finally, I document lobbying for the Federal Reserve Act and provide qualitative evidence, drawn from public and private records, that the political effort of bankers was motivated by the desire to obtain this selective benefit.

In the third section I evaluate the claim that producing the private good (international currency status) and producing the collective good (domestic financial stability) could not be separated. To obtain the private good required improving the breadth, depth, and flexibility of the domestic financial machinery. Since an interrelationship exists between these characteristics and domestic financial stability, money-center bankers had incentives to internalize the costs of producing the public good. As evidence, I show that bankers acknowledged a close relationship between their realization of denomination rents and domestic financial stability. This section closes with an evaluation of alternative explanations of banker lobbying for the improvements embodied in the Federal Reserve Act. In the conclusion I discuss the implications of this study.

Financial System Stability as a Public Good

The financial system is the infrastructure on which the functioning of the entire economy rests.[4] When a financial system is operating smoothly, it is almost invisible. Advances and transfers of money take place between individuals and firms with little regard to the underlying infrastructure, facilitating exchange and maximizing aggregate social welfare. In this sense, financial system stability is literally a public good, and the beneficiaries include nearly all citizens of a nation. The public nature of financial stability is especially clear in its absence. When a financial system is unreliable or prone to collapse, people become aware of it because the costs of its poor organization are made manifest in forgone everyday exchange. Breakdowns in financial intermediation services reverberate through the real economy, causing a reduction in economic activity, higher unemployment, and increased commercial failures.[5] Yet simply because society at large benefits from a sound financial system does not make its provision automatic. Provision is problematic because any effort to improve the infrastructure is itself a public good and, therefore, subject to the dilemmas of collective action—free riding, undervaluation, and underprovision. The following discussion demonstrates these points empirically, with respect to the instability of the U.S. financial system before 1914.

The National Banking Acts of 1863, 1864, and 1865 determined the basic structure of the U.S. banking system until 1914.[6] The legislation had two main purposes: to provide a uniform national currency and to raise revenue for the federal government during wartime. Prior to 1863, the national currency supply consisted primarily of notes issued by literally thousands of state-chartered banks. The problem was that the notes of these banks circulated at various discounts from par, depending on the reputation of the issuing bank, the time passed since the note was issued, and the distance to the issuing bank. Determining the quality of a particular note involved unnecessarily high transaction costs. The national banking legislation substantially reduced these costs by allowing for the incorporation of banks chartered by the federal government ("national banks") that would issue currency backed fully by U.S. government bonds. By effectively making all bank currency a liability of the government, and, therefore, risk-free, the bond collateral feature did create a uniform currency that circulated at par throughout the country.[7] Another motive, however, was to create an artificial market for government debt. Requiring banks to secure their note issue with Treasury securities increased demand for government bonds, and the provision was thus valued jointly as a revenue-raising measure during the Civil War.

Although the system succeeded in establishing a uniform currency (and raising revenue for the government), it did not solve all the defects of the financial system. The remaining flaw was that the currency was "inelastic" in the short run, which led

4. Humphrey 1990.
5. Bernanke and Gertler 1990.
6. See James 1978; and White 1983.
7. Cagan 1963.

to large seasonal swings in interest rates and banking panics. None of the various forms of currency in circulation—national bank notes, gold and silver coin, gold and silver certificates, and greenbacks—could vary much in the short run.[8] Law fixed the quantity of greenbacks, gold and silver certificates could be issued only if the Treasury held equivalent specie as backing, and the use of silver was rigidly controlled. The supply of national bank notes, in turn, tended to exhibit "perverse elasticity," contracting when it should have expanded. National banks had to obtain government bonds to issue additional notes, a slow and expensive process; moreover, they could not issue notes against general assets. When bank reserves were low and business very active, banks could ill afford to have their funds tied up in bonds and redemption deposits, resulting in a contraction of the note supply.

The underlying cause of this short-term rigidity, however, was the absence of a central bank. Although the United States had maintained a central bank during much of the antebellum period, the most distinctive feature of the national banking period was the absence of an institution with the power to provide funds at times of high demand through a discount window or through open market operations. Other institutions, however, attempted to fill this void. The most important example was the New York Clearinghouse Association, which became a quasi-central bank in the nation's financial center.

Most banks in New York were members of the city's clearinghouse association because of the services the association offered in settling payments between banks. But the clearinghouse evolved to take on the function of pooling member bank reserves and issuing emergency currency (known as "loan certificates") during panics.[9] Although there was no legal mechanism to increase the supply of currency quickly, loan certificates provided a private, if unlawful, way to free up a sizable amount of cash. The issue of loan certificates thus reduced somewhat the need for a central bank to provide liquidity during crises. But the clearinghouse was not sufficiently powerful to have major effects on the quantity of reserves, and there were numerous panics despite the use of loan certificates.

In the absence of a true central bank, short-term rigidity in the supply of currency caused problems with respect to seasonal shifts in demand for currency, arising from the annual agricultural cycle. In the fall, during the harvest season, the demand for currency was intense, since agriculture still accounted for a large share of economic activity and cash was required for many farm transactions.[10] With supply held rigid, interest rates were driven upward.[11] This deviation of interest rates from their trend level was suboptimal since it did not arise to counter overheated macroeconomic conditions. The extra demand derived solely from the need to "move the crops." Banks were thus induced to run down their reserves in the fall, which left them vulnerable to runs. As Jeffery Miron documents, panics occurred with much higher

8. Friedman and Schwartz 1963, 168–69, 292–95.
9. See Timberlake 1993, 198–213; and Gorton and Mullineaux 1987.
10. Eichengreen 1984.
11. See Champ, Smith, and Williamson 1996; and Miron 1996.

frequency in the autumn, when high interest rates and low deposit–reserve ratios prevailed.[12]

Panics were the most obvious manifestation of the inelasticity problem during the national banking period.[13] Major panics occurred in 1873, 1884, 1890, 1893, and 1907.[14] In addition, there were twenty-four lesser panics between 1873 and 1909.[15] Although the immediate cause of each panic varied, ranging from the failure of a specific bank to a stock market crash, the most serious panics (1873, 1893, and 1907) ended only after solvent banks everywhere had suspended the convertibility of deposits into currency.

The effects of panics were not restricted to the financial sector alone.[16] Suspension of payments, which lasted from one to three months, was one mechanism that transmitted the shock to the real sector of the economy. Suspension meant that banks closed their doors to firms and individuals needing currency to meet payrolls or make transactions, causing disruptions in economic activity and increasing the number of commercial bankruptcies. When banks suspended payments, brokers began buying and selling currency at a premium to deposits. Such premiums, which averaged 1 to 2 percent and ranged as high as 4 percent in 1907, reflected the wealth lost by depositors. In addition, banks were forced to curtail loans and ration credit, due to pressure on their reserves. Even if credit contraction was only momentary, the effects on the real sector were often severe, since firms relied on short-term loan facilities to finance commerce and temporary shortfalls. Table 1 provides some evidence of the economic costs of major panics during the period.[17]

In summary, seasonal interest-rate fluctuations and the shortages of a medium of exchange during panics imposed large costs on American society. These problems were largely rectified with the establishment of the Federal Reserve, justifying the claim that the installation of the Fed was a public good. The principal reason for the founding of the Federal Reserve was to assure stable and smoothly functioning financial markets, a function that predates the more purely monetary functions of engaging in open market and foreign exchange operations and setting reserve requirements. Miron shows that the frequency of panics and the size of seasonal movements in interest rates declined substantially after the founding of the Fed.[18] The realization of these generalized and nonexcludable benefits, however, does not square with the narrow scope of the lobbying effort undertaken by New York bankers (discussed later) in the run-up to the legislation. My claim is that money-center bankers took up the cause because they sought a separate, group-specific benefit—namely, the internationalization of the dollar. As documented in this article, the national banking

12. Miron 1986.
13. Champ, Smith, and Williamson 1996.
14. Sprague 1910.
15. Kemmerer 1910.
16. Economists differ on how financial disturbances influence the real economy. For a test of the two main hypotheses, see Bordo, Rappoport, and Schwartz 1992.
17. For a fuller accounting, see Grossman 1993.
18. Miron 1986, 125.

TABLE 1. *Summary of the major national banking era panics*

	1873	*1884*	*1890*	*1893*	*1907*
Proximate cause	Stock market crash/closure	Stock market crash	Stock market crash	Stock market and commercial failures	Run on NYC trust companies
Suspension of payments?	Yes	No	No	Yes	Yes
Premium on currency (% average, during suspension)	1	—	—	2	2
Liabilities of commercial failures (% change)[a]	NA	80.7	62.9	389.2	130.4
Industrial production (% change)[a]	−6.9	−4.0	−2.9	−26.6	−28.5

Sources: Calomiris and Gorton 1991; and Sprague 1910.

[a]Percentage change from the same interval the year prior to the panic. Panic intervals are: June–December 1873; March–August 1884; August 1890–February 1891; April–October 1893; August 1907–February 1908.

system induced financial instability at home and prevented bankers from realizing the private gains of having New York serve as an international banking center.

The Private Benefits of Internationalizing the Dollar

According to the logic of joint production, a special inducement is required to give rational agents the motivation to contribute to a public good. In this case, internationalizing usage of the U.S. currency was the special inducement for bankers to lobby for the Federal Reserve. This section begins with information on international currency use in the era, which reveals the surprising absence of the dollar from global finance prior to 1914. Drawing from the literature on key currencies, I then show that (1) the parochial position of the dollar was due to domestic (supply-side) institutional factors, and that (2) issuing an international currency would generate concentrated benefits, with most of the gains accruing to money-center banks. Together, these findings make the point that reforming the U.S. financial system offered significant private benefits to money-center banks.

The international use of a currency occurs whenever a national currency performs the three functions of money outside the borders of the nation that issues it. As a medium of exchange, an international currency is used to settle foreign trade transactions and to discharge international financial obligations. As a unit of account, it is

used to invoice merchandise trade and to denominate financial instruments. As a store of value, it serves as an investment asset held by private and official nonresidents. It should be noted that "money" held as a store of value is not usually held in the form of money at all, but in liquid interest-bearing assets. This fact will play an important role in the argument I later develop.

Although data on international currency use before 1914 are sketchy, estimates indicate the predominance of sterling, a rising role for the German mark, some reserve currency usage of the French franc, and the virtual absence of the U.S. dollar in global financial affairs. Sterling was used to invoice from 80 to 90 percent of world trade by the early nineteenth century.[19] In the second half of the century, the vehicle currency status of sterling declined somewhat, but estimates still range from 60 to 90 percent of world trade.[20] The mark also made strong inroads as an international medium of exchange and unit of account, as did the franc as a reserve asset.[21] The dollar, however, remained insignificant in world payments throughout the period. Sterling remained the primary currency for invoicing and settling U.S. trade, and sterling bills formed the basis not only of British trade with the United States but also of U.S. trade with other regions. "However important the position of New York in domestic trade finance, as a capital distributing center, and in settling domestic balances, its position was unimportant in financing foreign trade."[22]

As for the store-of-value function, foreign governments and central banks held a large portion of their reserves as sterling assets in the London money market by the 1880s. The position of London as reserve center slipped after the 1890s as Berlin and Paris became rival reserve centers. Yet, as Table 2 illustrates, the dollar was not utilized as a store of value by nonresidents.[23]

Patterns of international currency use before 1914 are sufficiently clear. Although sterling remained preeminent, its vehicle and reserve currency roles fell somewhat between the 1870s and 1913, tracking England's relative economic decline. In contrast, the mark advanced significantly, in association with Germany's rapid economic ascent on the world stage. For these currencies, international usage followed changes in global economic position. The U.S. dollar was the crucial exception. Why?

Specialists in global finance consider both international and domestic factors in explaining patterns of currency use. These factors fall neatly into the basic categories of economic analysis: the supply-side conditions, which are domestic and institutional, and the demand-side factors, which involve the relative position of nations in the global economy.[24] The evidence points to supply-side factors, namely, the ab-

19. See Morgan-Webb 1934, 53–54; and Williams 1968, 268.
20. The higher figure is from Whitaker 1919, 555; the lower from Williams 1968, 268.
21. See Tilly 1991; Hertner 1990; and Lindert 1969.
22. Beckhart 1932, 253. See also Carosso and Sylla 1991.
23. However, $142 million of the "other currencies" held by private institutions in 1913 consisted of the U.S. dollar assets of Canadian banks. Absent the close ties between Canadian banks and the New York money market, it is unlikely that the dollar would have served any reserve currency role before 1913. See Lindert 1969, 17, 22.
24. The terminology is from Tavlas 1991 and 1992. See also Mundell 1989, 189–210.

TABLE 2. *Growth and composition of foreign-exchange assets, 1900–13 (in millions of dollars)*

	End of 1899	*End of 1913*	*Change*	*1913 index (1899 = 100)*
Official institutions[a]	246.6	1,124.7	878.1	456
Known sterling	105.1	425.4	320.3	405
Known francs	27.2	275.1	247.9	1,010
Known marks	24.2	136.9	112.7	566
Other currencies	9.4	55.3	45.9	590
Unallocated[b]	80.7	232.0	151.2	287
Private institutions	157.6	497.8	340.2	316
Known sterling	15.9	16.0	0.1	100
Known francs	—	—	—	—
Known marks	—	—	—	—
Other currencies	62.0	156.7[c]	94.7	253
Unallocated[b]	79.7	325.1	245.4	408
All institutions	404.2	1,622.5	1,218.3	401
Known sterling	121.0	441.4	320.4	365
Known francs	27.2	275.1	247.9	1,010
Known marks	24.2	136.9	112.7	566
Other currencies	71.4	212.0	140.6	297
Unallocated[b]	160.4	557.1	396.7	347

Source: Adapted from Lindert 1969, tab. 3, 22.
[a]Central banks and treasuries.
[b]Foreign asset figures not broken down by currency.
[c]$142 million of this total were U.S. dollar assets held by Canadian banks in New York City.

sence of broad, deep, and resilient domestic financial markets, as the hindrance to wider usage of the dollar before 1914.

Taking the global, demand-side factors first, the basic logic is that a nation's position in world economy affects the attractiveness of its currency. Demand for a currency reflects the relative size of markets in it, and it is the currencies of countries that loom large in world trade and payments that are demanded. In this respect, the choice of an international currency is much like the choice of a world language: both are "not made on merit, or moral worth, but on size."[25] Indeed, a large and growing share of world trade has been shown to increase international use of a currency.[26] Yet data on the U.S. position in world trade indicate that global position was not the source of the parochialism of the dollar before 1914.

Table 3 presents trade statistics for the largest exporting countries—the industrial nations of Western Europe, the United States, Canada, and Japan. This is a reasonable substitute for truly worldwide trade, since the United States and Europe together accounted for about 80–90 percent of world trade in manufactures and for about 65 percent of world trade in all goods during this period.[27] The data strongly suggest a

25. Kindleberger 1967, 11.
26. Page 1981.
27. Eysenbach 1976, 39, 51–53.

TABLE 3. *Merchandise exports of the major trading states, 1872, 1899, 1913 (in millions of dollars)*

Exporter	*1872*	*1899*	*1913*
United Kingdom	1,246	1,604	2,556
United States	492	1,204	2,484
Germany	544	1,002	2,405
France	726	816	1,359
Other Western Europe[a]	473	911	1,679
Canada	—	164	432
Japan	—	113	315
Total	3,481	5,814	11,230
Share of total (%)	*1872*	*1899*	*1913*
United Kingdom	35.8	27.6	22.8
United States	14.1	20.7	22.1
Germany	15.6	17.2	21.4
France	20.9	14.0	12.1
Other Western Europe[a]	13.6	15.7	15.0
Canada	—	2.8	3.8
Japan	—	1.9	2.8

Sources: Kindleberger 1956, tab. 3–4a, 58–59; Maizels 1963, tab. A1, 426–27; and U.S. Department of Commerce 1975, pt. 2, tab. U317–34, 903–904.

[a]Includes Belgium-Luxembourg, Italy, Netherlands, Norway, Sweden, and Switzerland. Excludes goods consigned from the Netherlands. Switzerland and Norway are not included in the 1872 figures.

rising role for the dollar as an international currency. Note that U.S. exports rose from 14.1 percent of this "total trade" in 1872 to 22.1 percent by 1913, a share virtually identical to that of England and Germany. As early as 1899, the United States was the second largest exporter in the world, yet the dollar played no role in short-term international finance.

Another demand-side consideration is a nation's balance-of-payments position. Persistent current account surpluses, offset by capital outflows, serve as a "promotional mechanism for the international use of a nation's currency."[28] The promotional effect occurs for two reasons. First, the export of capital induces foreigners to acquire balances, denominated in the capital-exporting country's currency, to service the obligations. Second, the transfer of liquidity from the capital-exporting country to the deficit country is accompanied by a transfer of goods and services in the same direction, increasing demand for claims in the currency of the exporter to pay for imports from the surplus nation. In short, the current account surplus/capital outflow pattern increases demand for a currency, since foreigners acquire short-term claims denominated in that currency to both service long-term loans and to pay for imports from the surplus country.

28. Tavlas 1991, 11.

Table 4 reports the evolving balance-of-payments position of the United States between 1872 and 1913. During this period the U.S. changed from running persistent current account deficits, financed by capital inflows and occasional gold outflows, to running persistent current account surpluses, financed by capital outflows and gold inflows. Although surpluses generally prevailed in merchandise trade from as early as 1875, it was not until after 1896 that the country reversed its overall payments position. American investors then began to extend long-term credit overseas to finance the growing discrepancy between the nation's exports of goods and services and its imports. From the mid-1890s to 1905, the United States was a consistent net capital exporter. After 1905, it reverted to being a net capital importer, but at a level well below the levels reached in the 1870s and 1880s. Although the United States remained a net debtor until 1914, it lessened its dependence on foreign savings and developed into a large exporter of its own funds.[29]

The constraints on dollar usage apparently did not involve the nation's global position. In areas known to influence demand for international currencies, the U.S. dollar was poised to play a large role before World War I. The implication is that the constraints on dollar usage before 1914 were on the supply-side, involving the domestic financial attributes of the United States.

Transaction costs are the overriding consideration on the domestic, or supply-side, of international currency issue. "A currency is used as a vehicle currency when the transactions costs (e.g., the costs of information, search, uncertainty, enforcement, and negotiation) involved in using it are less than the transactions costs involved in using other currencies."[30] More generally, "The microeconomics of money, whether domestic or international, is fundamentally about frictions. . . . Frictions—costs of transacting, costs of calculation—cause agents to use national monies as international media of exchange, units of account, and stores of value."[31]

Chief among the supply-side factors affecting transaction costs is the character of the issuer's domestic financial markets. Specifically, "a country whose currency is used internationally should possess financial markets that are broad (i.e., with a large assortment of financial instruments traded), deep (i.e., including well-developed secondary markets), and substantially free of controls (such as . . . capital controls)."[32] Broad, deep, and open short-term financial markets are required to supply assets appropriate for international currency use (such as treasury bills, commercial paper, and bankers' acceptances), reflecting foreigners' preference for liquid and safe short-term financial instruments. Hence, "the more liquid and diverse the national capital markets, including the short-term money markets, the more attractive is the national currency as a store of value and transactions medium."[33] Although the United States kept capital controls low throughout the period, breadth and depth were certainly not characteristics of its financial markets before 1914.

29. Lewis 1938.
30. Tavlas and Ozeki 1992, 2.
31. Krugman 1984, 262.
32. Tavlas and Ozeki 1992, 41.
33. Henning 1994, 32.

TABLE 4. *U.S. balance of international payments, 1872–1913 (in millions of dollars)*

	Current account		*Capital account*			
Year	*Balance on goods and services*	*Unilateral transfers, net (to foreign countries [−])*[a]	*U.S. capital flows, net (outflow of funds [−])*[b]	*Foreign capital flows, net (outflow of funds [−])*[c]	*Changes in monetary gold stock (increase [−])*	*Errors and omissions, net*
1872	−246	4	242	—	—	—
1873	−181	14	167	—	—	—
1874	−61	−11	82	—	−11	—
1875	−99	−14	87	—	27	—
1876	20	−11	2	—	−10	—
1877	102	−13	−57	—	−33	—
1878	218	−11	−162	—	−44	—
1879	202	−8	−162	—	−44	—
1880	114	−4	30	—	−140	—
1881	137	−5	−41	—	−91	—
1882	−55	−13	110	—	−42	—
1883	−12	−22	51	—	−17	—
1884	−59	−24	105	—	−23	—
1885	12	−27	34	—	−19	—
1886	−77	−28	137	—	−32	—
1887	−157	−28	231	—	−46	—
1888	−226	−30	287	—	−30	—
1889	−166	−44	202	—	−30	—
1890	−150	−45	194	—	1	—
1891	−90	−50	136	—	4	—
1892	−20	−54	41	—	33	—
1893	−119	−44	146	—	17	—
1894	98	−54	−66	—	22	—
1895	−127	−55	137	—	44	—
1896	43	−49	40	—	−25	—
1897	132	−41	−23	—	−68	—
1898	444	−44	−279	—	−121	—
1899	427	−68	−229	—	−130	—
1900	507	−95	−143	−75	−91	−103
1901	438	−104	−212	−33	−61	−28
1902	258	−105	−105	−30	−71	53
1903	340	−115	−41	20	−71	−11
1904	279	−137	−109	59	−25	−67
1905	298	−133	−139	56	−71	−11
1906	296	−147	−46	114	−171	−46
1907	296	−177	−65	136	−154	−36
1908	427	−192	−135	89	−44	−145
1909	26	−187	−112	171	18	84
1910	46	−204	−90	345	−71	−26
1911	274	−224	−123	171	−90	−8
1912	257	−212	−209	232	−81	13
1913	374	−207	−165	252	−25	−229

Source: U.S. Department of Commerce 1975, series U168–92, 564.

[a]Private and government.

[b]Private (direct investment and other long-term) and government.

[c]Long-term.

U.S. financial markets were largely concentrated in New York City and functioned in the same impersonal manner as they do today, although both the variety and the volume of securities traded were much smaller. At the long-term end of the market, private securities (such as railroad securities) were actively traded on the stock exchange, whereas public issues (such as government and state bonds) accounted for only a small portion of securities transactions.[34] More importantly, no short-term Treasury securities, such as notes and bills, were outstanding at any time before 1914.[35] Funds available to the market on short term found outlets in call (demand) loans made on stock exchange collateral or in commercial paper.[36] Of these alternatives, call loans carried less default risk and formed the primary liquid outlet for temporary surplus funds. Much of the credit extended by banks was to stock market brokers, and such call loans were "considerably more important than the commercial paper market" in New York.[37] Call loan rates were generally lower (by about 1 percentage point) than those on commercial paper. Although commercial paper was bought, endorsed, and sold by bill brokers and commercial paper houses from the 1840s, the secondary market was very thin, since interbank rediscounting of commercial paper was extremely rare.[38] Most important, there were no primary or secondary markets in bankers' acceptances, the era's main instrument of short-term international finance. This condition seriously compromised the dollar in world affairs.

Bankers' acceptances are instruments through which banks act as intermediaries between importers and exporters, by guaranteeing to make payments to the exporter on a specific date. The purpose of the bankers' guarantee is to lower transaction costs in international exchange. By adding a bank's creditworthiness to that of the less well known importer, bankers' acceptances reduce the informational costs of short-term cross-border finance.[39] Hence, "a well-developed bankers' acceptance market in a country contributes to the amount of trade financed in its currency and, thus, to the amount of trade invoiced in that currency."[40] But U.S. banks did no accepting before 1914 due to regulatory restrictions. Banks "were either legally forbidden or (what amounted to the same thing) lacked specific authorization to accept drafts or bills of exchange."[41] Since the National Banking Acts did not explicitly authorize banks to accept bills, the courts repeatedly refused to legalize the activity.[42] The United States was thereby unable to offer the very instrument that, due to low transaction costs, was used to finance trade and settle short-term obligations between nations.

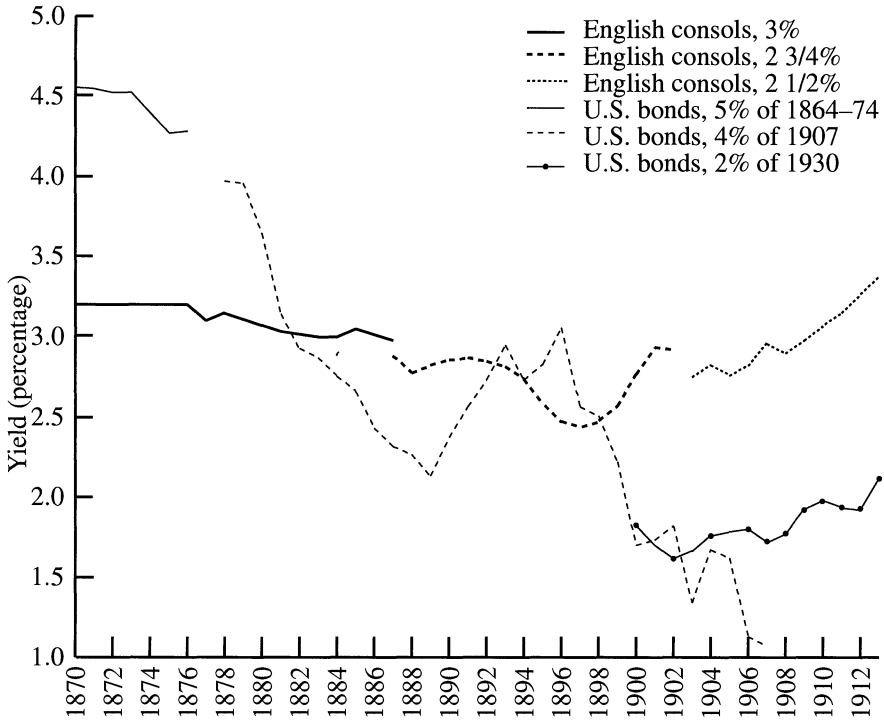
34. Gray 1978, 34–35.
35. Studenski and Krooss 1963.
36. James 1978.
37. Goodhart 1969, 20.
38. See Davis 1965, 355–99; Greef 1938, 304–305; and James 1978, 153.
39. LaRoche 1993.
40. Tavlas and Ozeki 1992, 41.
41. Carosso and Sylla 1991, 53.
42. For the specific rulings, see Laughlin 1912, 93–94.

In London (and Berlin), by contrast, banks bought, sold, and rediscounted bills and bankers' acceptances, and secondary markets in these instruments were deep and articulated.[43] "A very high proportion of international trade among countries other than Britain was financed by sterling bills drawn on importers by exporters, which were due in 90 days or 6 months. If these commercial bills were guaranteed against default by an acceptance house, exporters, in turn, could freely sell these sterling bills to a London bank (discount house) at the world's lowest open-market rates of interest."[44] More succinctly, "London without its specialized discount market would be London without its greatness."[45]

Although depth and breadth are important, resilience—the ability to accommodate shocks—is another domestic characteristic of key currency countries. When nonresidents hold working assets as a store of value, they need to be certain that such assets will always have a ready home market. To this end, a center country usually maintains a reliable rediscounting facility of last resort. Business firms or financial institutions do not hold substantial balances in a foreign market without the assurance that these assets can be rediscounted at any time. Indeed, before gold or convertible currencies can be obtained and repatriated, it is first necessary to convert working balances into the local currency. A core function of central banks is to provide resilience to the market during periods of stress. According to Barry Eichengreen, the "London discount market's attraction was its safety, and it was safe because the discount houses could turn in the last resort to the Bank of England."[46] By contrast, the absence of a rediscount market for acceptances and other short-term instruments such as was facilitated by the central banks of other leading nations obstructed U.S. participation in international short-term finance.

A comparison of interest rates in the United States and England provides evidence in support of this supply-side view. At the long end of the market, the United States generated interest rates that were as low as those in London before 1914 (Figure 1). Yields to maturity on long-term U.S. government bonds fell below yields on British consols as early as 1882, and remained there until 1914, with the exception of four years in the mid-1890s. Foreigners, as indicated earlier, took advantage of low long-term U.S. interest rates and floated securities in the United States. At the short end of the market, however, U.S. rates were usually above the London discount rate before 1914 (Figure 2). Call loans, of course, were not equivalent to three-month London bankers' acceptances, but even three-month U.S. commercial paper rates were consistently above the London discount rate before 1914. The reason why U.S. short-term rates were not competitive was "institutional rather than purely economic."[47] Although U.S. financial markets produced long-term rates lower than London's, the "lack of a central bank and a discount market for bankers' acceptances meant that the

43. By 1913 the annual turnover in acceptances in the London discount market was about $1 billion. King 1936, 265–82.
44. McKinnon 1979, 84. See also Williams 1968, 269.
45. King 1936, 321.
46. Eichengreen 1987, 9. See also Eichengreen 1992, 42–43.
47. Carosso and Sylla 1991, 53.



Source: Homer and Sylla 1991.

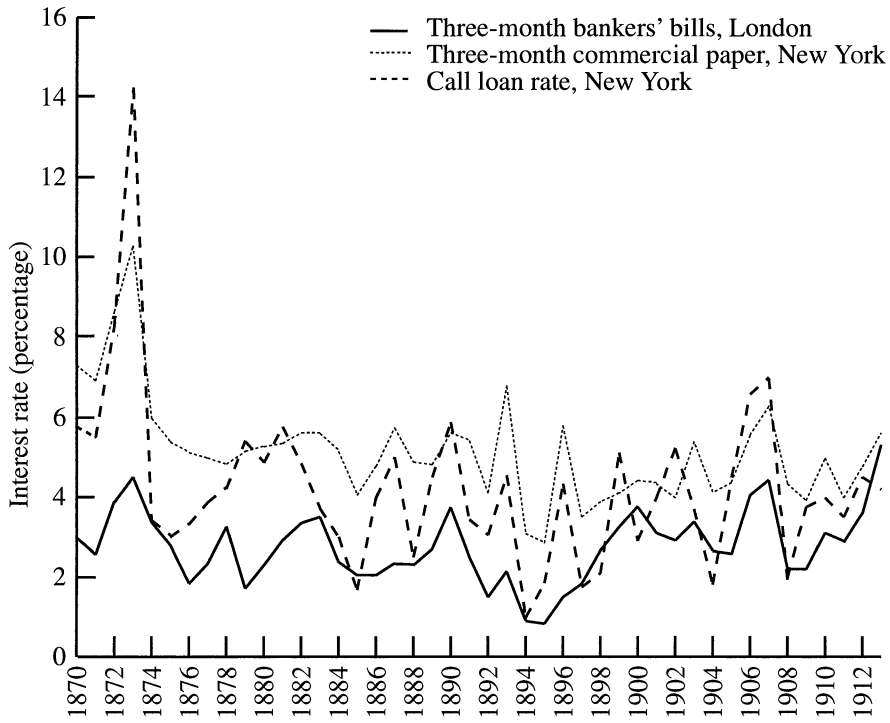
FIGURE 1. *Yield on government bonds in England and the United States, 1870–1913 (annual average)*

United States could not compete on the field where the contest of international short-term finance was played."[48]

Distributional Aspects of International Currency Status

My claim is that globalizing the U.S. currency through improvements in domestic institutions offered selective benefits adequate to motivate collective action. The argument hinges on whether international currency issue yields benefits that are concentrated on select agents. In this section I draw on the international finance literature to demonstrate that money-center banks derive such benefits. Following the analytical discussion, I document banker lobbying on behalf of domestic financial reform and present evidence that internationalizing the dollar motivated these efforts. Since others have plowed this ground before, I also consider alternative explanations of banker lobbying.

48. Ibid.



Source: Homer and Sylla 1991.

FIGURE 2. *Short-term interest rates in England and the United States, 1870–1913 (annual average)*

The distributional implications of international currency issue are typically discussed in terms of the gains and losses accruing to issuing versus nonissuing nations. Yet, with recognition that the national benefits are not distributed symmetrically among domestic residents, this analysis can also serve as the basis for a systematic evaluation of the domestic distributional effects. These effects, in turn, suggest the possibility of collective action in support of internationalizing a currency.[49]

Economists identify three main benefits conferred on nations that issue international currencies: seignorage, reduced foreign exchange costs and risks, and denomination rents.[50] For simplicity, I treat the first two benefits as distributionally neutral in the domestic context and ignore them here.[51] The third benefit, however, is directly

49. For similar approaches, see Frieden 1991; and Henning 1994.

50. Cohen 1977, 70–73.

51. Seignorage—the gain associated with the difference between the value of the money issued and its costs of production—accrues to the government of the issuing country. Hence, any local distributional effects are determined by extant transfer mechanisms. Similarly, the exchange-rate benefit—the gains associated with no longer having to deal in foreign currencies or hedge against exchange-rate fluctuations—

relevant to the analysis. The term *denomination rents* connotes the profits earned by the banking sector of issuing nations. Inasmuch as the banking sector of the center country has an effective monopoly over the issue of monetary liabilities denominated in the vehicle currency, expansion of such liabilities to meet the needs of nonresidents means that the banking sector earns profits that it would not have received had its liabilities been denominated in another currency.[52] In other words, "the average level of profits of the banking system of an issuing country will tend, other things equal, to be higher [due to the extension of the market] than that of the banking systems of other countries."[53] As the international use of currency expands, loans, investments, and purchases of goods and services will increasingly be executed through the financial institutions of the issuing country. Thus, "the earnings of its financial sector are likely to increase [relative to the financial sectors of nonissuing nations]."[54] These extra earnings include not only the commissions charged for the increased volume of foreign exchange transactions but also the fees charged for investment services, such as the placement of foreign securities and the purchase of domestic financial assets for foreign accounts. In addition they include the interest earned on the higher total of foreign loans and investments.[55] When a nation's currency is used internationally, there is simply "more business for the country's banks and other financial institutions."[56]

Denomination rents are also unevenly distributed within the issuer's banking sector, since not all banks provide international banking services. The average bank in the hinterlands does little business that gives rise to foreign transactions. Instead, a small group of large, specialized firms located in the national money center typically handle the foreign short-term financial business of the entire nation. Money-center financial firms should thus have intense preferences for installing the domestic institutions that underpin international currency status. Not only do they earn the commissions, fees, and interest associated with financing world trade and payments, but also use of the home currency as a reserve asset brings large inflows of funds into the central money market, thereby increasing demand for banker services.

Money-center bankers thus benefit directly when the national currency serves as an international currency. "International bankers perceive a strong business interest in wide acceptance of the national currency. That acceptance favors not only their individual banks, but their national financial center, such as London or New York, as an international financial center."[57] My claim is that earning denomination rents was the private inducement that led New York bankers to internalize the costs of reforming the national banking system.

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accrues to all domestic residents involved in world trade and payments. For an analysis incorporating these gains, see Broz 1997.

52. Swoboda 1968, 105–106.

53. Ibid., 106. Swoboda shows how the rise of the Euro-dollar market eroded the monopoly position of U.S. banks and distributed denomination rents to banks of other countries.

54. Tavlas 1991, 12.

55. Cohen 1971, 37.

56. Frankel 1995, 11.

57. Henning 1994, 23–24.

Lobbying for the Federal Reserve

Given the poor performance of the national banking system, political officials responsive to national constituencies (that is, presidents, cabinet officials, and party leaders) might have assumed leadership of the reform movement. Yet the historical record is rich with evidence that large bankers were the principal protagonists.[58] As one contemporary expressed it, 'bankers had directed the discussion, bankers had financed it, and bankers had kept it alive.'[59] Although there is debate about this lobby's motivation, it is clear that a subset of society shouldered the costs of institutional change.[60] I recount these efforts and document the role that internationalizing the dollar played in the lobbyists' incentive structure.

Money-center bankers drafted the initial reform legislation and funded an expensive public relations campaign aimed at securing mass support and the approval of Congress. A key event took place in 1910 when a group of bankers convened at J. P. Morgan's duck-hunting club to draw up prospective legislation. Paul Warburg (Kuhn, Loeb & Co.), Frank Vanderlip (National City Bank), Henry Davison (Bankers' Trust Company), Charles Norton (First National Bank), A. Piatt Andrew (Harvard economist), and Senator Nelson Aldrich (Rhode Island) attended.[61] The plan this group produced—the "Aldrich Plan"—was based largely on the work of Warburg and served as the blueprint for the Federal Reserve Act.[62]

After the meeting, the group mobilized to rally broad political support for the Aldrich Plan. To Warburg, "it was certain beyond doubt, that unless public opinion could be educated and mobilized, any sound banking reform plan was doomed to fail."[63] To this end, the bankers formed and financed the National Citizens' League for the Promotion of Sound Banking,[64] a nationwide public relations organization, intended to "carry on an active campaign of education and propaganda for monetary reform, on the principles . . . outlined in Senator Aldrich's plan."[65] Although the league appeared to spring from grass roots in 1911, it was from the outset "practically a bankers' affair."[66] Great pains were taken to keep New York's role in the league hidden, given prevailing populist prejudice against Wall Street. Warburg recognized that "it would have been fatal to launch such an enterprise from New York; in order for it to succeed it would have to originate in the West."[67]

National Citizens' League officials estimated that it would cost $500,000 to carry out the program of public education. A quota of $300,000 was assigned to the New York clearinghouse, $100,000 to the Chicago clearinghouse, and the balance appor-

58. See Kolko 1963; Laughlin 1933; Reed 1974; West 1977; White 1983; and Wiebe 1962.
59. Willis 1915, 33.
60. See, for example, Kolko 1963; and Livingston 1986.
61. See Stephenson 1930, 373–79; Lamont 1933, 96–102; and Chernow 1991.
62. See West 1977, 52–66; and Chernow 1993. Warburg's publications and speeches are collected in Warburg 1930.
63. Warburg 1930, 1:68.
64. See Welton 1922; and Laughlin 1933, 56–69.
65. Warburg 1930, 1:569.
66. *New York Times,* 6 July 1911, A4. See also Laughlin 1933, 59–61.
67. Warburg 1930, 1:68.

tioned among clearinghouses in other major cities. The New York clearinghouse formed a special committee to look after member bank contributions. This committee based the cash contribution of each bank on its size, measured by capital and surplus; the specific formula was $.32 per $1,000 of capital and surplus.[68]

With the funds, the league published and distributed 15,000 copies of a currency primer, "Banking Reform."[69] It established a fortnightly journal, also named *Banking Reform,* with a circulation of 25,000—mainly newspaper editors. The league also published 950,000 free pamphlets of pro-Aldrich Plan statements and speeches and provided newspapers all over the country with "literally millions of columns" of copy.[70] In many instances, newspapers and newspaper chains published the league's pre-written galleys with no editing whatsoever.[71] The league also supplied speakers for gatherings of various interest group organizations and sponsored mass letter-writing campaigns to Congress.

In the final analysis the league probably accomplished its task of creating popular acceptance of the need for reform along the lines of the Aldrich Plan.[72] The Aldrich Plan, however, died in committee shortly after it was introduced in Congress in 1912 for reasons that are not directly relevant to this analysis (see the third section, "Limitations"). Its political liability was that it placed monetary policy control too much in the hands of bankers.[73] In addition, when the Democrats won the presidency and the Senate in the election of 1912, a reform measure that bore Aldrich's name—the politician most closely associated with Wall Street—had little chance in Congress. Nevertheless, the bill that finally emerged as the Federal Reserve Act, though bearing the imprimatur of the Democrats in terms of the monetary policy control issue, very closely followed the Aldrich Plan blueprint—a "near identity" according to Milton Friedman and Anna Schwartz.[74] This reflected the league's work in building mass support for a financial system modeled on European practices. In speaking of the Federal Reserve bill, which he co-sponsored, Senator Carter Glass stated tersely, "No league, no bill."[75]

Throughout the campaign, Warburg and other bankers emphasized that financial reform was needed if the dollar was to compete more effectively with sterling and the mark as international currencies. Although financial reform was couched in terms of the national interest, Warburg explicitly tied it to improving the international position of the dollar. In so doing, he gave the New York banking community private incentives to assume leadership of the reform effort.

68. *New York Times,* 7 December 1911, A7. See also National Citizen's League, Organizational Report, 15 June 1912, James Laurence Laughlin Papers, Manuscript Division, Library of Congress.

69. Laughlin 1912.

70. Welton 1922, 36.

71. For examples of the league's newspaper copy, see the National Citizen's League files, James Laurence Laughlin Papers, Manuscript Division, Library of Congress.

72. Warburg 1930, 1:76.

73. Timberlake 1993, 214–34.

74. Friedman and Schwartz 1963, 171*n*. For an item-by-item comparison of the two bills, see Warburg 1930, vol. 1, chap. 8, 9.

75. Welton 1922, 36.

Warburg's analysis consisted of comparing American financial structures with European systems. He advocated the development of a European-styled discount market for acceptances supported by a central reserve-holding agency that would stand ready to absorb the surplus stock of eligible acceptances from the market. In advocating acceptances, Warburg showed how bills of exchange that were guaranteed by well-known banks served as the basis of discount markets in Europe but had only a small position in the American system due to restrictive legislation. His point was that the addition of the banker's endorsement turned commercial paper into an instrument with much greater security, negotiability, and liquidity.[76] Moreover, the transaction costs advantages of bankers' acceptances were crucial to international exchange by virtue of the difficulty in securing foreign credit information. For this reason, bankers' bills were employed as a basis for international short loans as well as for holding foreign exchange reserves. Lawrence Jacobs of National City Bank made the point with respect to sterling acceptances:

> Obviously the guaranty of a banker of high standing adds an important element of security to bills of exchange as a basis for the lending or investment of bank funds. It is an additional assurance to the foreign exporter that he can discount his bills at a low rate so that he can afford to make a favorable price to the English buyer. It makes them all the more satisfactory investments for foreign banking institutions.[77]

Because of the absence of such bills, the United States was excluded from participating in financing international commerce. To Warburg, the problem was not simply that national banks were forbidden from accepting bills of exchange arising out of foreign trade. Equally important was that acceptances, supported by shipping and insurance documentation, were not used to any significant extent even within the United States. Nonresidents rarely invested in U.S. commercial paper because it was too difficult for them to judge its quality and the reputations of the local commercial paper houses that gave it their seal of approval; in other words, commercial paper carried higher default risk than acceptances.

For these reasons, America's short-term financial markets were "as backward as Europe at the time of the Medicis, and Asia, in all likelihood, at the time of Hammurabi."[78] A discount market in bankers' acceptances and other two-name paper simply did not exist, and the consequence was that foreigners found the dollar unattractive as an international currency:

> New York is in a class by itself. Without bank-accepted bills, it can have no discount market. Without a discount market, funds cannot move to it as they do between financial centers of Europe, because there are no bank-accepted bills in which foreign banks can invest. Our commercial paper is not suitable. Foreign banks will not purchase it because they are not acquainted with, or sure of the rating of miscellaneous mercantile establishments, and because such paper could

76. Warburg 1930, 1:186.
77. Jacobs 1910, 38.
78. Warburg [1907] 1930, 9.

> not be readily disposed of in case it became necessary or profitable to withdraw funds from New York for remittance elsewhere.[79]

Money-center bankers thus understood that the creation of an American discount market was a prerequisite for developing the dollar as an international store of value and medium of exchange. They also anticipated the denomination rents that would accompany the rise of the dollar as an invoicing and reserve currency. Warburg's many references to "forgone profits" and "tribute" paid to London resulting from the "dependence" on sterling acceptances shows cognizance of the rent-earning possibilities of issuing international money.[80] Casting the situation in terms of both rents and prestige, he wrote: "It is impossible to estimate how large a sum America pays every year to Europe by way of commissions for accepting such documentary bills . . . but the figure runs into the millions. The annual tribute to Europe resulting from our primitive financial system is not merely a waste of money, but reflects upon the dignity of a nation of the political and economic importance of the United States."[81] National City Bank, the most ambitiously international New York bank, estimated that English banks earned $150 million per year in commissions just from financing U.S. exports before 1914.[82] Such figures do indeed suggest a strong private motivation for bankers to absorb the costs of financial reform.[83]

My point is that internationalizing a currency confers large gains on a restricted segment of society. Money-center banks are the primary beneficiaries, since they earn rents from the globalization of the domestic currency. Collective action by this group in support of domestic institutions that underpin international currency status is thus rational and predictable. This, however, raises one final issue. If New York bankers were primarily interested in globalizing the dollar, why did they also contribute to the much larger effort to improve the stability of the U.S. financial system? Both the Aldrich Plan and the Federal Reserve legislation certainly had wider objectives rooted in domestic financial problems. Yet bankers lobbied for the entire (and more costly) package. Even politicians hearing testimony on the Federal Reserve bill were puzzled. During a session with a New York banker, one exasperated senator exclaimed: "Most of our experts who come here are more interested in the foreign banking business than in our domestic banking business."[84]

The Inseparability of Jointly Produced Goods

The key challenge for the joint products model is to demonstrate that the public and the private goods cannot be disassociated. Otherwise, agents would seek to discon-

79. Jacobs 1910, 9. See also Warburg [1908] 1930, 43.
80. See, for example, Warburg [1910a] 1930, 187–88; and Warburg [1911] 1930, 227–28.
81. Warburg, [1910a] 1930, 187–88.
82. National City Bank 1920, 5. See also Mayer 1987.
83. See Moyer 1907; and Abrahams 1976.
84. Joseph Bristow (Kansas), U.S. Senate 1913, 1394. For the source of Bristow's puzzlement, see the testimony of Charles Conant, Fred Kent, Frank Vanderlip, and James Cannon.

nect the private good from the collective good, since it would be cheaper to produce the selective benefit separately. New York bankers, for example, could have lobbied for only the institutions affecting the position of the dollar, leaving others to deal with the weaknesses of the financial system that gave rise to panics. The reason they did not was that production of the two goods involved a supply technology in which the private output (international currency status) could not feasibly be separated from the associated collective output (domestic financial stability).

Recall that the causes of the parochialism of the dollar before 1914 were domestic and institutional. To internationalize the dollar, the nation needed to broaden, deepen, and make more resilient its short-term financial markets. Yet these same characteristics would also improve the stability and efficiency of the domestic financial machinery, almost by definition! Consider, for example, the concordance between the supply-side requirements of international currency issue and the general goals of the Federal Reserve Act. According to its preamble, the act was created "to provide for the establishment of Federal reserve banks, to furnish an elastic currency, to afford means of rediscounting commercial paper, to establish a more effective supervision of banking in the United States, and for other purposes." In other words, its main objective was to improve the resilience of the financial system through a depth-enhancing system of reserve banks, rediscounting a broad range of eligible acceptances and commercial paper. This equivalence with the needs of the dollar suggests that bankers, lobbying for the private good of denomination rents, had incentives to contribute to the production of the collective good, since doing otherwise would have meant that the private good was not then available. More direct evidence is that bankers understood that the institutions required to enhance the international standing of the dollar presupposed the production of domestic financial stability.

In the lobby's literature, the banker-specific benefits of making the dollar an international currency were tied explicitly to attaining a diversified and resilient internal financial system. In other words, bankers clearly understood that building a modern discount market involved joint benefits. "It would be a great national achievement in itself to bring about . . . the creation of an important worldwide discount market, which in turn would have, as a consequence, the turning into a broad bill market of the many millions that now flood and overflood Wall Street."[85] Note the mutual dependence of the joint goals expressed in the following passage:

> Bills will be drawn on American banks and bankers, instead of on London, Paris, or Berlin, and instead of being financed by others we may gradually become the "financiers" of others. . . . Once we establish the modern banking bill in the United States, its use will grow and our own banks will reap the tremendous advantage of being able to invest their deposit money in assets upon which they can realize at home and abroad. As the use of this modern paper increases, so will the financial safety of the banks and the business community.[86]

85. Warburg [1913] 1930, 559.
86. Warburg [1910b] 1930, 132.

To be sure, the development of a modern discount market was only part of the reform agenda. Even though bills carrying the endorsement of reputable banking firms represented the most marketable form of short-term credit, at times even this paper could not be resold by banks.[87] When a run on a single institution spreads for lack of stabilizing expectations, throughout the banking system accepted bills would be no more liquid than any other asset. The existence of the discount markets of Europe presupposed the liquidity guarantee inspired by the central bank rediscount window. Bankers expressed the dependence of a discount market on a central bank, arguing that a discount market could not develop in New York unless foreign and domestic purchasers of acceptances had confidence that they could liquidate their assets at any time. Warburg constantly referred to the institution that provided this confidence in European systems—the central bank—and argued for the necessity of establishing one on American shores:

> In order to make our paper part and parcel of the means of the world's international exchange, it needs, however, as a preliminary condition, to become the foundation on which our own financial edifice is erected. It must always have a ready home market, where it can be rediscounted at any moment. This is insured in nearly every country of the world claiming a modern financial organization, by the existence of some kind of central bank, ready at all times to rediscount the legitimate paper of the general banks.[88]

This reference to the "preliminary condition" for internationalizing the dollar reflected the dual and inseparable goals of the Federal Reserve Act: increasing the liquidity of the financial system through a system of rediscounting reserve banks was a prerequisite to making the dollar an international currency. The joint products interpretation of U.S. banking reform is particularly clear in the following passage:

> American commercial paper will not be considered a quick asset and will not take the place of the stock-exchange call loan unless the purchasers—both local and foreign—know that there will be a possibility of rediscounting a safe proportion of their holdings, if need be, with a central institution. While as a matter of fact the actual rediscounting by central institutions may be unimportant in normal times, the existence of such institutions creates the ultimate basis of confidence without which a discount market cannot be developed. No law can create a discount market without a central reserve.[89]

In summary, the societywide benefits of the bankers' political entrepreneurship were external to their drive to internationalize the U.S. banking system. The bankers' core objective was to advance the dollar as an international invoice, payments, and reserve currency, and thereby to allow New York City to become a worldwide financial center commensurate with the position of the economy in the world system. Yet their institutional agenda also enhanced the nation's economic welfare by addressing

87. Tallman 1988, 2–21.
88. Warburg [1907] 1930, 12–13.
89. Warburg 1930, 1:560.

extant financial shortcomings (such as insufficient liquidity in panics and seasonal credit market pressures). This general benefit, however, was a by-product created by the inseparable and complementary nature of the joint products. Improving the depth, breadth, and flexibility of the national financial system was bound to complement the production of domestic financial stability.

Alternative Explanations

The political entrepreneurship of New York bankers in lobbying for the Federal Reserve Act has been the subject of several other studies. Some analysts adopt a cartelization framework, whereas others tend toward a "privileged group" explanation of banker support for reform. These arguments are unconvincing.

One view is that bankers wanted the Federal Reserve Act because it offered the private benefit of cartelizing the banking industry to the advantage of Wall Street.[90] The proliferation of trust companies and state chartered banks, operating under less restrictive regulations than New York's nationally chartered banks, supposedly posed the competitive challenge. As in my view, the public good of stabilizing the financial system did not provide the primary impetus for banker lobbying. However, this alternative joint products argument falls victim to the "separate-provision" critique. Although the Federal Reserve Act did allow national banks to enter the trust banking business, this restriction was a minor regulatory change that could have been effected without the massive financial restructuring of the Federal Reserve Act. Moreover, the argument ignores the empirical evidence that the largest and most powerful "competitors" of Wall Street were actually owned and operated by Wall Street national banks themselves.[91] As John James notes, "One response to the threat posed by the trust companies was combination, so that it was not uncommon to see a national bank and a trust company operated and controlled by the same stockholders, frequently in the same building."[92] That New York banks innovated around the legal restrictions imposed by their national charters further undermines the notion that cartelization motivated bankers to organize and lobby.

Banker lobbying might also be understood by way of the "privileged group" model, which relaxes the condition that a public good provides uniform, symmetric benefits.[93] If the gains of collective action are distributed unevenly within a community, the benefit going to one or several members may be sufficient to justify this subgroup providing the public good single-handedly, even if other beneficiaries free-ride.[94] James Livingston implicitly adopts a privileged group framework, arguing that bankers and members of the corporate elite organized for political action, not because

90. See Kolko 1963; and Rothbard 1984.
91. Neal 1971, 51.
92. James 1978, 40.
93. See Olson 1965; and Stigler 1974.
94. Although he does not directly address the origins of the Federal Reserve, Thomas Furguson's "investor theory" of politics is a variant of the privileged group model in which large bankers figure prominently. Furgeson 1983.

they would gain a distinct private benefit, but because they would benefit disproportionately from provision of the public good of financial stability.[95]

Livingston ties the origins of the Fed to the emergence of the modern corporation in the 1890s. He asserts that the new corporate class was very sensitive to financial instability, not only because panics meant short-term losses but also because of the potential for "economic anarchy and political unrest, if not revolution."[96] The argument hinges on whether financial instability is more debilitating to a corporate economy or to an economy organized around smaller firms. To Livingston a corporate economy fares much worse, although from an industrial organization perspective it is easy to infer just the opposite. In an economy composed of many small firms with few formal ties with each other, a reliable financial system is probably more essential, since the large number of arms-length trades requires an equally large number of credit transactions and money transfers to settle payments. In contrast, in a corporate economy, characterized by a small number of large integrated firms, many transactions are internalized within the firm, reducing the need for money transfers altogether. In other words, market transactions that would otherwise require credit and payments are taken inside the corporation, thereby reducing the importance of financial system stability to such firms. Lacking a more careful specification of the disproportionate gains accruing to bankers and the corporate class, Livingston's account falls victim to faulty inference.

Limitations

Although I have sought to provide the underlying rationale for money-center bank interests, this study is limited in two important respects. First, I make no claims about the optimality of the Federal Reserve Act as a solution to the nation's financial problems. There is a normative literature claiming that laissez-faire in the issuance of notes and deposits by private, competing banks ("free banking") is superior to central banking as a means of insuring a stable financial and monetary environment.[97] In this sense, there was nothing inevitable about the creation of the Fed. Furthermore, empirical studies attribute the weaknesses of the pre-1914 U.S. financial system not to market failure, but to extant government regulations, such as the prohibition on branch banking.[98] Congress, however, did not elect to create a free banking system in 1913. Since this study is an exercise in positive political economy, I have tried to explain what Congress actually did, not what it should have done.

Second, I do not directly address the monetary control features of the Federal Reserve Act. Creating a central bank meant vesting some group of people with monetary authority, and there were fierce battles over just which group should have this authority. Republicans, big bankers, and northeastern business interests wanted a central banking system with only a few reserve banks topped by a central governing

95. Livingston 1986.
96. Ibid., 27.
97. White 1993.
98. Calomiris and Gorton 1991.

board under private (banker) control. Centralization and private control were expected to improve the prospects for low inflation. Democrats, agricultural interests, and rural bankers favored a decentralized system with as many as fifty reserve banks and a central governing board controlled by political appointees. Decentralization and political control reflected populist distrust of concentrating monetary power in the hands of groups most inclined toward hard money. In the final compromise, Congress settled on a maximum of twelve banker-controlled reserve banks and a governing board that was entirely politically appointed.[99]

The conflict leading up to this monetary compromise belies the notion that the Federal Reserve Act was a public good, pure and simple, since it would have faced no opposition. These battles, however, were over monetary policy and who would control it, an issue that is conceptually distinct from financial system stability, which is literally a public good. Although the distributional aspects of the policymaking structure of the Federal Reserve Act are surely important, I have ignored them here in order to focus on the broad allocative aspects of the Act.

Conclusions and Implications

Before 1914 the United States faced two major problems of financial organization. On the one hand, it experienced panics and severe seasonal interest-rate fluctuations long after other nations had found solutions to these problems. Indeed, the nation experienced panics in a period "when they were a historical curiosity in other countries."[100] On the other hand, the dollar lacked international currency status, and major U.S. banks did not participate in financing international trade. Domestic institutions and regulations not only failed to produce stabilizing expectations at home but also kept the dollar a purely national currency, even as the nation's advancing global position generated worldwide demand for dollar-denominated financial services.

From a national welfare perspective, domestic financial instability involved wasted resources, since panics and large seasonal fluctuations in interest rates rebounded negatively on financial intermediation services and on real economic activity. Yet simply because society would benefit from a better financial system did not make its provision easy or automatic. Provision was problematic because any effort to improve the system was itself a public good and, therefore, subject to the dilemmas of collective action. Fortunately, New York bankers were willing to expend resources lobbying for the improvements contained in the Federal Reserve Act. Why this group worked to make all of society better off is explained by the joint products model. Internationalizing the dollar and reducing domestic financial instability were two distinct but interdependent goods that differed in "publicness"—the former offered excludable, localized benefits, whereas the latter presented diffuse, general benefits. National welfare was advanced because the production of the concentrated private

99. For a treatment from the "time-consistency" perspective, see Faust 1996.
100. Bordo 1985, 73.

benefits required production of the general public benefits. Hence, it was rational for the small group seeking the private international benefit to design and lobby for institutions that simultaneously advanced the provision of both goods.

With the establishment of the Federal Reserve, the domestic financial system became markedly more stable, notwithstanding the banking crisis of the 1930s.[101] In addition the dollar began to compete seriously with sterling as an international currency, and New York began to challenge London as an international banking center.[102] By 1916 the dollar had largely replaced the pound as the means of payment, not only for U.S. exports and imports but also for most of Europe's trade with Latin America and Asia. By 1919 the total volume of dollar acceptances outstanding had reached $1 billion, approximating London's prewar level.[103] The New York discount market eroded London's dominant position as reserve center by offering relatively cheap credit facilities for borrowers as well as reliable investment opportunities for foreigners seeking a stable store of value. In short the United States emerged as a nascent "world banker," providing dollar-denominated liquidity to the international system. Nonresidents accumulated dollar balances to maintain liquidity and/or undertake investment, to pay for imports invoiced in dollars, and to service loans for capital development that were denominated in dollars. America's halting, tentative first steps as financial "hegemon" in global affairs date from this period.

An important implication of this study is that the literature on the rise of the United States in global financial affairs has paid insufficient attention to the role of domestic institutions in this transition. For most analysts, World War I was the shock that upset the international economic hierarchy. Although the war greatly accelerated the pace of America's economic ascent in the world system, the institutional innovations of the Federal Reserve Act surely facilitated the transformation. By allowing national banks to accept bills of exchange, and by establishing the Federal Reserve banks to give acceptances and other short-term paper a ready market of last resort, the act helped establish the kind of discount market on which Britain's position as world banker had rested. The outbreak of the war and the establishment of the Federal Reserve System tended to reinforce each other in this respect: the war enhanced the attractiveness of the New York money market and the dollar just when the institutional foundations for global banking had been put in place. In short, "if the World War provoked the expansion, it is also true that the American banking reforms permitted it, granting our banking institutions full freedom to enter the foreign field without those legal restrictions to which they had previously been subject."[104]

A current analog is the process of economic and monetary union (EMU) in Europe. If the process remains on schedule, the creation of a new currency, the euro, may pose a serious challenge to the position of the dollar at the center of the international financial system. The share of global trade and payments resulting from EMU will increase to encompass the trade and payments of all member nations adopting the

101. See Miron 1986, 125–38; and Schwartz 1986.
102. See Abrahams 1976; and Beckhart 1932.
103. Beckhart 1932, 310.
104. Phelps 1927, 132.

euro, producing a sudden transformation in the global financial hierarchy not unlike the "disturbance" created by World War I. There will be vastly more traders, investors, and official agents transacting either directly or indirectly with euro nations, implying just the kind of demand-side network externalities that enhanced global demand for the dollar.[105] On the supply side, however, there are reasons to be skeptical about the displacement of the dollar by the euro. If substantial euro balances are to be held by private and official agents, there must be a convenient medium for holding them. In this respect a principal reason for the predominant role of the dollar is the size, depth, and liquidity of U.S. financial markets, particularly the Treasury bill market. As Richard Cooper notes, "there is nothing comparable to this market on the European continent, or in Japan, and there is not likely to be for decades to come."[106] The development of a deep and liquid government securities market in Europe, with bonds and bills denominated in euros, will require domestic-qua-European legal and regulatory changes not fundamentally unlike those introduced by the Federal Reserve Act.

Inasmuch as domestic financial institutions remain important to international currency use, the political analysis of this article has continued relevance. To put it generally, global financial capability does not arise naturally or automatically from international forces, as in hegemonic stability theory.[107] The capacity to issue an international currency and serve as a world banker also hinges on domestic institutional and policy choices. This brings domestic politics into the foreground. In this article I have provided a causal mechanism by which a nascent hegemonic power adjusted its domestic institutions in accordance with its rising international position. At the core of this mechanism bridging the international and domestic environments are rational, maximizing individuals. Here, I employ international currency economics to extrapolate the stakes involved in the issuance of international money and to derive expectations regarding collective action in respect to domestic financial market institutions. My chief claim is that money-center banks have private reasons for internalizing the costs of improving the depth and liquidity of domestic financial markets, an argument that should carry over to other contexts, such as contemporary Europe.

The broadest implication of my argument concerns the production of public goods. The finding that an institution, like the Federal Reserve, that provides collective benefits for society can arise from the self-seeking interests of the few is starkly counterintuitive. The core insight of the rent-seeking literature is that special interest lobbying is inherently wasteful: a form of "directly unproductive, profit-seeking" behavior.[108] However, when inseparable joint products are at stake, rent seeking can yield social improvements. The origin of central banking more generally follows this pattern,[109] as does the formation of other national and international institutions.[110] In

105. See Prati and Schinasi 1997; and Bergsten 1997.
106. Cooper 1998, 12.
107. For a review, see Lake 1993.
108. Bhagwati 1982.
109. Broz 1998.
110. See Lowry 1997; Gradstein 1993; Gilligan 1997; Conybeare and Sandler 1990; and Sandler 1993.

the case of the Federal Reserve, financial system reform made everyone better off, but it was the concentrated distribution of the gains from international banking that gave money-center bankers incentives to pay for it.

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