

**Banking on the Periphery: The Cotton South, Systemic Seasonality, and
the Limits of National Banking Reform**

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Under the National Banking System from 1863 to 1913, the United States experienced a serious banking panic roughly every decade (Sprague 1910; Miron 1986). Yet, despite this anomalous record of financial and economic turbulence, the federal government did not take the decisive step toward comprehensive reform until the panic of 1907. Less than a year later, Congress adopted the Aldrich-Vreeland Act. Establishing the National Monetary Commission, the Act mobilized leading policy makers, bankers, and economists to propose “what changes are necessary or desirable in the monetary system” (White 1911, App. A; Wicker 2005).

Through a parallel private organization representing “the general business public,” J. Laurence Laughlin weighed in on the policy debate.² In his influential edited volume *Banking Reform* (1912), Laughlin elaborated the consensus view on the defects of the National Banking System, and emphasized its negative impact on Main, not just Wall, Street. Its artificial note-issue and reserve regulations, he argued, diminished the elasticity of currency but more importantly banks’

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2. “Currency Reform: Its Popular Side,” New York Times, July 26, 1911, p. 8.

short-term credit supplies. The latter constraint was particularly evident during the harvest and crop-moving seasons in the fall and early winter months. Faced with peak demands for credit, banks in agricultural regions turned to their money center correspondents for accommodation, but paid a premium for increasingly scarce bank reserves, which they passed onto their farm customers. And, he noted, the resulting financial strains on correspondents increased their vulnerability to runs and panics.³

The excess seasonal demands for credit, Laughlin (1912, esp. ch. 19) observed, were especially acute in the cotton-growing states. Like other field crops, the cotton culture was subject to wide seasonal variations in labor and other input requirements with the peak period occurring at harvest time. What distinguished the Cotton South from other agricultural regions, however, was its “colonial-style” dependence on the production of the fleecy staple for domestic and international markets (Wright 1986, pp. 22-23; Fox-Genovese and Genovese 1983, p. 50). The cotton culture, although “not [even] the totality of southern agriculture,” was nonetheless the largest sector of the regional economy. Moreover, as Wright notes, it “defined the opportunities and pace of [Southern] *economic* life” (Wright 1986, p. 59; italics added). In other words, cotton’s impact including its seasonal rhythms was systemic, afflicting related segments of the cotton economy and its pivotal financial intermediaries.

In the spirit of Wright’s regional perspective, we explain this systemic seasonality by institutional failure, not simply a “lack of banking capital” (Laughlin 1912, p. 106; Ransom and Sutch 1972; James 1981). We emphasize the dilemmas of collective choice in determining industry standards in the Cotton South. In the case of the cotton industry itself, the region lacked

3. For an alternative view on U.S. banking panics, see Calomiris and Gorton (1991).

a centralized marketing organization like the Chicago Board of Trade that could galvanize the collective interests of its members and affiliates to develop, diffuse, and ultimately institutionalize through state policy uniform quality standards for grading commercial crops (Rothstein 1966; Cronon 1991, pp. 114-19). By enhancing the information and so economic value of local warehouse receipts, this innovation would have decoupled the link between financial flows into and actual cotton shipments out of the region and so lessened banks' financial burdens during the marketing season.

In the banking industry local intermediaries confronted the opposite problem of uniform national standards poorly adapted to regional conditions. During the era of Republican rule the federal government enacted national banking policies designed to integrate monetarily the increasingly interdependent regions of the Northeast and Midwest – not surprisingly the base of the Republican party (Redenius 2007b; Sylla 1969; Egnal 2009). Its standards for bank formation and note issues bolstered by Republican's increasing commitment to the gold standard, put peripheral agricultural regions like the Cotton South in a monetary straightjacket.⁴ These institutional failures “conspired,” to paraphrase Kuznets (1933, p. 9), to transmit the seasonality of the cotton culture to the marketing-shipment stage of the cotton cycle, amplifying local banks' seasonal cash and credit demands and so the seasonal premium on short-term interest rates.

We develop our institutional thesis in three sections. In section one we elaborate our institutional perspective on systemic seasonality in the Cotton South, and through a simple model show how this systemic seasonality interacted with a rigid national banking policy to increase the

4. On the design of the National Banking Acts and its impact on peripheral regions, see Redenius (2007b), Sylla (1969), and Ransom and Sutch (1972, pp. 643-51). Along similar lines, Wright (1986, esp. ch. 7) refers to New Deal labor policies as an “assault on the low wage economy” of the South (see also Fleck 2010).

liquidity costs of financial intermediation in the region. Sections two and three document the greater systemic seasonality in the Cotton South as compared to a mixed farming region in the North and its negative impacts on the banking system. Because of the seasonal rhythms of the dominant cotton culture, we show, banks were burdened with excess and insufficient reserves at different times of the year, and so incurred greater actual and opportunity costs in accommodating their customers' short-term credit demands.

In the conclusion we return to Laughlin's diagnosis of the mutual problems afflicting the national and Southern banking systems, but find only mixed support for his policy prescription. Our evidence affirms the disproportionate impact of Cotton South banks on the seasonal liquidity strains in the New York and national money markets prior to the founding of the Fed. Moreover, the Fed's design along the lines proposed by Laughlin effectively relaxed the macro constraint on seasonal supplies of currency and reserves and in turn smoothed the seasonal variation in interest rates in the New York and national money markets. Yet, the Fed could not remedy the structural constraints on Southern banks, which were firmly rooted in the region's historic economic dependence on the cotton culture.

Systemic Seasonal Constraints on "Country" Banks

Despite their ambivalence, postbellum farmers relied on commercial banks for the most vital economic services. Besides supplying them with the very means of payment to conduct their daily transactions, banks were the principal source of short-term credit to finance current production, either directly or through other intermediaries like the local country store.⁵

5. Haney (1914, p. 14), Carson (1923, p. 322), Moulton (1931, pp. 98-107), Wickens and Jensen (1931), Garlock (1932), and Wall (1932, 1937). Many of these sources also provide evidence on the role of banks

Commercial banks also provided “intermediate” credit for longer-term investments, but in this realm they faced greater competition from other sources: wealthier neighbors, local savings banks and trust companies, and distant life insurance and land companies.

Banks’ short-term credit instruments ranged from unsecured promissory notes (with or without an endorsement) to collateralized loans backed by maturing crops, chattel, and land. Despite these differences, they functioned like a line of credit with a fixed maturity or repayment date. Once banks approved the loan, farmers could draw on – that is make payments against – their account until they reached the borrowing ceiling or end of the term (although they could renegotiate both). From a bank’s perspective, then, these short-term credit instruments functioned like a demand deposit, effectively increasing borrowers’ current account balances against which they could write checks or purchase bank drafts on demand.

This parallel underlies the potential synergy or complementarity between banks’ deposit and short-term credit services, as both draw on the same pool of liquid reserve assets and so share a fixed implicit or opportunity cost. Banks could realize this benefit or economies of scope, only if their customers’ deposit withdrawals and short-term borrowing were weakly (better yet negatively) correlated.⁶ Under these theoretical conditions, banks could effectively fund customers’ liquidity demands, whether deposit withdrawals or short-term borrowing, with the influx of funds from new deposits and loan repayments. In turn, they could economize on their

and other sources in financing longer-term investments.

6. Our analysis of the complementarity between banks’ dual payments and credit services draws on Kashyap, Rajan, and Stein (2002). For alternative views which emphasize banks’ other distinctive role in supplying information-intensive lending, see Calomiris and Kahn (1991) and McAndrews and Roberds (1999).

reserve assets by holding fewer reserves against their outstanding loans and even offering longer terms to their customers (see also Baltensperger 1974, 1980; Morrison 1966).

Writing in the interwar period, agricultural economists grasped these necessary conditions for a more efficient rural banking sector, but expressed them concretely in terms of the “type of agriculture” or “agricultural system” (Garlock 1932). Banks’ reserve assets, Garlock (p. 2) observed, would constitute a stable “revolving fund,” but only under ideal conditions such as in the diversified crop and livestock regions of Iowa. By combining hog, cattle, and dairy production with more seasonal crop cultures, farmers evened out their labor demands over the year but also their receipts and expenses. Consequently, they generated the precise pattern of mutually offsetting flows of funds into and out of local banks, and in turn relatively stable levels of outstanding deposits, loans, and hence reserves.⁷

These “banking methods” were “poorly adapted” to other agricultural regions like the Cotton South, where producers depended on a single staple crop – a monoculture for short (Garlock 1932; Wall 1932). In this case deposit withdrawals and short-term borrowing were highly correlated, as farmers expenditures but especially their incomes were more “periodic,” that is seasonally concentrated. The experience of Texas banks in 1925, depicted in Figure 9.1, vividly illustrates the point. Drawing on their credit lines, farmers steadily accumulated short-term debts from February through June (as shown by the “total borrowed” series). They could only discharge their

7. Following the theoretical literature, we couch the argument in terms of an individual bank. More realistically, however, it applies to an integrated regional banking network, a hub-and-spoke system focused on a local market center (Chang et al. 2008). Banks at these sites often formed a clearinghouse, and pooled their reserves which more effectively smoothed out any large transitory or seasonal net withdrawal shocks. Individual banks in turn could benefit from this network externality by forming a local funds market for borrowing and lending excess reserves (Garber and Weisbrod 1990; James and Weiman 1910).

mounting obligations “periodically,” after the cotton harvest in late August through early November (as shown by sudden increase in the “total repaid”). On net, then, banks total outstanding loans series followed a pronounced inverted U-shape pattern, peaking in July and August.

To fill this seasonal funding gap, banks turned to correspondents in distant money centers, mainly New York, for accommodation. By contrast, after the marketing but before the next spring planting season, banks were flush with deposits but faced diminished demands for short-term production credit. To meet future seasonal excess demands for liquidity, however, they could not commit these funds to longer-term agricultural loans, but instead held them in “quick” assets, initially excess bankers’ balances and later in the period call loans and commercial paper.

Banks in monocultural regions, in other words, functioned more like a brokers, bundling their customers’ loans and deposits for ultimate placement with or by their correspondents. Moreover, they paid a premium for this long-distance financial intermediation, which they passed on to their customers in the form of higher rates and shorter maturities. To secure a credit line, New York correspondents required banks to hold compensating balances, equal to 20 to 25 percent of their seasonal borrowing levels. And they charged an average of 6 percent interest on seasonal loans, as compared to the standard 2 percent interest paid on excess bankers’ balances.⁸

8. Lockhart (1921, pp. 156-58) specifies the terms of seasonal correspondent lending; see also Watkins (1929, pp. 151-64), James (1976), and Gendreau (1983). The interest rate spread roughly corresponds to the seasonal range in the New York call loan rate (Kemmerer 1910, p. 15; Miron 1986). The call loan rate is the relevant benchmark because it represented the opportunity cost of excess reserves for New York banks (James and Weiman 2010; Goodfriend and Whelpley 1998, p. 17; Myers 1931, p. 271; Morrison 1966, pp. 83-88).

It is tempting to explain the seasonal constraints on Cotton South banks by the peak labor and other demands at harvest time. Yet, along this dimension, the cotton crop was no more seasonal than other commercially important crops like wheat and corn (see the next section). We do, however, find clear evidence of a more *systemic* seasonality that permeated subsequent stages of cotton's economic cycle. Numerous studies of rural banking in early twentieth-century Cotton South remarked on the rapid turnover of the cotton crop right after it was picked (Copeland 1912, p. 180; U.S. Department of Agriculture, 1922, p. 387; Macklin 1922, p. 150; and Carson 1923, pp. 169, 321). Often under pressure from creditors whether country stores or local banks, growers immediately delivered their crops to primary market centers, where they were ginned, pressed, and sold to local buyers.

The seasonality of local marketing accelerated loan repayments by farmers and country stores, but did little to replenish the liquid reserve assets of country banks. Despite the increasing centralization of cotton marketing among specialized dealers in distant commercial centers, many local buyers operated independently and relied on country banks to finance their purchases via credit lines or demand notes.⁹ When cleared and settled by local banks, these transactions only transformed one kind of cotton-related loan into another on their balance sheets. In other words, they effectively extended the maturity on banks' outstanding cotton-related loans until late December or early January, and so their liquidity pressures and demands for accommodation from New York correspondents.¹⁰

9. See especially Carson (1923) and Moulton (1931, pp. 195-96). Woodman (1968), Ransom and Sutch (1977), and Wieher (1977) analyze the changing channels of cotton distribution after the Civil War.

10. Expressed in terms of Figure 9.1, the marketing stage extended the peak loan period from late August when farmers began to sell their crops and repay their loans to late November and December (Moulton 1931, pp. 105, 190-201). The process in fact required a few more steps, involving the bundling and

Of the several reasons suggested for this “hand-to-mouth” marketing of cotton, these studies all fault local, independent warehouses.¹¹ Because of their humble origins, independent warehouses supplied inadequate storage capacity, which could not effectively protect crops from the elements and theft and increased the risks and insurance costs of storing them locally. As important, they lacked the environmental conditions and expertise to grade crops according to industry standards (Olmstead and Rhode 2003; see also Moulton 1931, p. 187). Backed by crops of uncertain quality and value, their warehouse receipts conveyed limited economic information and so were heavily discounted outside of their immediate market area. Consequently, the burden of financing cotton inventories fell on local banks, which could inspect and approve the receipts to collateralize the loans to local merchants and other intermediaries. In the Midwest by contrast standardized receipts issued by licensed and regulated local warehouses were the foundation of a complex chain of financing that extended to regional commercial centers and funded the more “orderly” delivery of crops to final markets (Cronon 1991, esp. ch. 3; Harris 1911).

Perhaps more symptom than cause, the region’s sparse fragmented network of warehouses can be traced back to the pre-Civil War period and the region’s formative institution, the slave plantation.¹² Because of their scale, plantations bypassed local intermediaries and transacted

shipping of crops from local markets to compress centers and then to the larger “concentration” market where they were graded, sorted, and aggregated. Only at this final stage – about three months after the harvest -- were the crops issued a certified bill of lading that could back a financial instrument recognized in national and international money centers.

11. Carson (1923, pp. 446-49); U.S. Department of Agriculture (1922, pp. 134, 403-04). The “chaotic” conditions in the cotton distribution system prompted direct federal intervention through the passage of the Cotton Futures Act of 1914 and the Warehouse Act of 1916. The former established a uniform system of standards for grading cotton. The latter created an inducement for states to license and regulate warehouses based on federal standards, as their bonded receipts would constitute eligible paper for discounting at the Fed.

12. Wang (2010) makes a similar argument about the co-evolution of cotton textile production and

directly with cotton factors in interior and coastal port cities. They favored these more personalized marketing arrangements to capitalize on fine differences in crop qualities, and expected factors to represent their interests in negotiating sales. Despite the “decline of cotton factorage” after the Civil War, postbellum planters continued to rely this more decentralized marketing system, in which factors now commission merchants peddled actual samples of stored bales to meet the more refined demands of textile manufactures.¹³ Unlike in the Midwest, then, there were no dominant marketing institutions and intermediaries that could coordinate the development, diffusion, and enforcement of uniform standards for grading crops, often under the auspices of state governments.¹⁴

After Reconstruction Cotton South banks faced a second institutional constraint, which reinforced the economic burden of their more chronic problem of systemic seasonality. The Republican “revolution from above” not only wiped out the region’s main type of collateral, but integrated it into a common currency union even though it was not an ideal candidate for membership.¹⁵ Regulated by uniform National Banking Acts after 1865 as well as a tighter gold

marketing firms and the local banking sector in Boston and Philadelphia. This institutional perspective on the Cotton South is developed in Wright (1986), Weiman (1990), and Olmstead and Rhode (2010).

13. Copeland (1912, pp. 182-92). On the connection between technology of textile production and cotton quality, see Copeland (1909) and Saxonhouse and Wright (1984).

14. Rothstein (1965, 1966). The development of these standards in the cotton economy ultimately depended on federal policy innovations during the interwar period from the Cotton Futures (1914) and Warehouse (1916) Acts to the Smith-Doxey Act of 1937 to develop uniform marketing standards, as well as the U.S. Department of Agriculture and local extension agents to improve production conditions on the ground (Olmstead and Rhode 2003).

15. Rockoff (2003), Redenius (2007b), and James and Weiman (2010b) analyze the problematic origins of the U.S. common currency union. Wright (1986, p. 7) and Carlton (1990) explicitly recognize the constraints on the Cotton South because of its location in a political economic union, adjacent to a more developed urban industrial region to its north.

standard constraint after 1873, banks in the region operated in a more confined monetary environment, characterized by highly inelastic supplies of currency and reserves.

Combined with this “macro” money constraint, the region’s acute seasonal demands for cash and credit reinforced the seasonal swings in New York call loan and interbank borrowing and lending rates.¹⁶ We illustrate this point through a simple sorting model in which banks in core (New York City) and peripheral (Cotton South) regions compete for a relatively fixed supply of bank reserves (given by the length of the horizontal axis in Figure 9.2). Each point on the horizontal axis represents an allocation of reserves between New York banks (read from left to right) and Cotton South banks (read from right to left). Reflecting the vast demand for call or overnight loans in metropolitan financial markets, the demand for additional reserves by New York banks is highly elastic. In the peripheral (Cotton South) region, by contrast, systemic seasonality resulted in banks’ polar demands for reserves – large and inelastic during the peak season and vice versa during non-peak times.

At the equilibrium allocation where the two demand curves intersect, banks in one sector do not have an incentive to bid away reserves from banks in the other. Their demand prices, in other words, is less than the opportunity cost of funds, measured by the value that other banks place on their reserves. In other words, banks in neither sector have an incentive to bid away reserves from those in the other. In the peak season peripheral banks are willing to pay a premium for additional reserves to meet their customers large, inelastic harvest and crop-moving loan demands. Consequently, New York call loan rates soar, as reserves are drained from large correspondent banks, either through direct cash shipments or seasonal loans to country banks in the Cotton South.

16. Laughlin (1912) as well as Kemmerer (1910, pp. 76-79) and Lockhart (1921, pp. 226-27). In the conclusion we return to this point and present quantitative evidence to support these claims.

In the non-peak season, country banks face fewer, more marginal local lending opportunities, and so take advantage of the relatively higher rates offered by New York correspondents which can channel these funds into the call loan and commercial paper markets. With this influx of excess reserves into New York banks, money market rates plummet.

Systemic Seasonality in the Cotton South

Our empirical analysis of systemic seasonal liquidity risk draws on the obvious analogy to a more commonly cited item affecting the costs of banking in monocultural regions, loan default risk (James 1976; Bodenhorn 1995). The latter depends on the composition of the bank's loan portfolio and the variance of and correlation between the returns on each loan (or type). Banks can only reap the benefits of pooling when the returns on each loan (type) are weakly or negatively correlated, in other words when their customers derive their incomes from diverse, independent sources. By contrast, they face greater undiversifiable or systemic default risk, when their customers are prone to large, correlated negative income shocks.

The same logic applies to the liquidity side of the bank's business, its portfolio of current accounts.¹⁷ In this case, however, we gauge seasonal liquidity risk in the regional banking system by: (1) the variance in and correlation between the seasonal cycles of distinct commercial activities that constitute the regional economy and (2) their relative economic importance. The more extreme seasonal variation in the outlays and receipts of a particular sector would significantly add to the seasonality of banks' liquidity positions, but only when it accounted for a relatively large share of the regional economy and its seasonal peaks and troughs were not offset by the

17. Historically, these demand deposit accounts routinely included a credit line or overdraft facility and so captured a customers' total demand for and supply of bank liquidity.

complementary flows of other sectors. What mattered, in other words, was the correlation between, not just the variation in, these flows.

We first dispel the simplistic notion that explains the extreme seasonal liquidity demands in the Cotton South by the natural seasonal cycle of its fleecy staple. To illustrate this point, we plot in Figure 9.3 data on the percentage of the annual crop harvested and then marketed by month for three important staples: cotton, corn, and wheat.¹⁸ The harvest series show the timing of farmers' demands for extra seasonal labor to gather and process their crops for sale, while the marketing stage delineates the timing of crop sales to local buyers and subsequent shipments to major commercial centers. As noted above, the effective liquidity pressures on banks depended on the sequencing of these two stages, which ultimately determined the length, and hence liquidity, of outstanding bank loans tied to current crop production.

For all three crops, the harvesting stage was highly seasonal. Farmers reaped the bulk of each crop over a three month period, September through November for cotton versus June through August for wheat. The seasonal peaks and overall seasonal variation in the corn and wheat culture were actually greater in magnitude than in the case of cotton. The standard deviation in the monthly shares of crops harvested – a simple measure – was 14.3 percent for the two Midwestern commercial crops but only 12.7 percent (or 11 percent less) for cotton.

18. The underlying data for Figure 9.2 come from a variety of sources: (1) U. S. Department of Agriculture (1921), Table 289, pp. 727-28 for the crop harvesting series; (2) Macklin (1922), p. 149 for cotton ginning over the period 1915-18 and shipments in 1919; (3) U.S. Department of Agriculture (Oct. 1916), p. 99, for cotton marketing in 1915; (4) U.S. Department of Agriculture (1921), Table 11, p. 516 and Table 26, p. 527 for wheat and corn marketing in 1914-15 and (5) U.S. Department of Agriculture (1922), Table 32, p. 529, for wheat marketing over the period 1916-21. We thank Paul Rhode for bringing these sources to our attention.

In the ensuing marketing stage, however, these rankings are inverted. Even though cotton was not an intrinsically perishable crop especially in comparison to corn and wheat, producers tended to “rush” their harvested crops to local markets for sale. In the peak three-month marketing period just after the harvest, cotton producers sold just over 60 percent of their crops, as opposed to 51.3 percent of the corn and 48.1 of the wheat crops sold in their respective peak quarters. So, despite the greater seasonal variation in harvesting corn and wheat, the standard deviation in the monthly shares of crops marketed was 6.88 percent for cotton but only 5.47 percent (or 20 percent less) for corn and wheat. Viewed another way, the correlation in the monthly shares of crops harvested and marketed was nearly two-thirds in cotton (0.656) but only one-half in wheat and just under one-quarter in corn (see also Kuznets 1933, pp. 372, 386, 388).

In addition to the temporal relationship between the harvesting and marketing of crop, the liquidity demands on banks also depended on farmers’ diversification of their commercial, not just total, agricultural production.¹⁹ For this step, our analysis relies on monthly indices of commodity shipments to final markets, compiled by the Federal Reserve for the period 1919 to 1928.²⁰ The cotton series is comprised mainly of cotton fiber shipments. The other series for grains, animal products, and livestock are composites and so may already capture some of the benefits of diversification. Still, these indices reflect a small number of products, which were

19. We emphasize farmers’ commercial production, because diverse income sources could increase cash flows over the year, which would enable farmers and their banks to use these internal sources to finance current production at least partially. Self-sufficient production, of course, reduced cash outlays and so farmers’ credit-liquidity demands on banks; on the role of self-sufficient production on the farm, see Wright (1986), pp. 107-15.

20. These data were published in the *Federal Reserve Bulletin* over the period (see for example pp.183-88 of the March 1924 issue). Kuznets (1933, Appendix I) had access to and analyzed these data disaggregated by crop and stage in the production and distribution cycle.

typically produced in mixed farming regions – for example, wheat (60%), corn (24%), and oats (6%) for the grain index and dairy (55%) and poultry (40%) products for the animal product index.

We estimate the seasonal index for each product type by the monthly deviations in shipments relative to the evident trend growth over the entire period (see Figure 9.4).²¹ All product types followed the same seasonal pattern with a peak in local sales and shipments after the harvest period and a sharp decline in activity afterwards. The variation in shipments was most extreme in the case of the cotton culture, and mildest for a more year-around activity like livestock production. The standard deviation in shipments for each product type corroborates this implied ranking from most to least seasonal; it varies from 74.2 for cotton to only 12.3 for livestock.

The graphs in Figure 9.4 also illustrate the potential economic benefits to farmers and their banks from commercial diversification in products with complementary seasonal patterns. As a relevant example, consider the joint production of grains and animal products. The shipments of each were significantly less seasonal than those for cotton, but as important they were staggered over the course of the year with the peak shipments of animal products occurring in the late spring and early summer and for grains in the late summer and early fall. In other words, because their seasonal indices were negatively correlated with each other (equal to -0.366), the joint production of these products in mixed farming regions would generate a smoother distribution of market activity and so of net demands on banks and other intermediaries over the course of the year.

To gauge the actual impact of commercial diversification by region, we estimate the relative importance of the agricultural sector and of each product in the mix of total farm output in the

21. Our indices were constructed to “wrap around” to form a continuous series over the year. All calculations are based on monthly estimates, not those after December and before January, which are artifacts of the statistical method.

Cotton South and two states representing diversified and more specialized agricultural regions in the Midwest and Plains States respectively (see Table 9.1). The Cotton South, as Wright noted, was not literally a staple monoculture, but its economy was dominated by the agricultural sector and in particular the cotton culture. Just over 60 percent of the value of regional output as enumerated in the census was produced on farms, and cotton accounted for 43.7 percent of the total (and so 27.4 percent of total commodity production). This figure probably understates the importance of cotton in the agricultural sector, as other crops and farm products such as corn and hogs were often consumed domestically or locally, not sold in long-distance markets (Ransom and Sutch 1977; Wright 1978, 1986). In turn, they put less pressure on the banking system, because farmers could stagger their production to avoid using seasonal peak labor and did not require credit to finance storage and shipment costs.

Iowa affords a striking contrast of a more diversified agricultural economy. Like the states of the Cotton South, the Iowa economy was relatively dependent on its agricultural sector, which accounted for just over two-thirds of the value of agricultural and manufacturing output. Yet, its farmers produced a greater mix of products, which combined corn and other feed crops (52.6 percent of agricultural output) with commercial livestock (an additional 33.3 percent) and dairy farming (13.2 percent). The Plains States like North Dakota most closely resembled the Cotton South because of their economic dependence on the highly seasonal wheat culture.

The U.S. Department of Agriculture (1915, p. 70) monthly crop reports provides related evidence corroborating our results. For each state and region, it contains estimates of the monthly shares of the gross “receipts” from the sale of farm output, total and by type. Focusing on Georgia and Iowa on the eve of World War I, we compare the seasonal variation in gross proceeds from the sale of crops and all farm products. For both series, the standard deviation in monthly shares was

much greater in Georgia than in Iowa, 7.15 versus 3.70 percent for crops and 9.00 versus 2.76 for all farm products. More relevant to our argument, monthly crop and total revenues were highly correlated in Georgia (equal to 0.998) but not in Iowa (only 0.395). In Georgia 59.1 percent of crop and 68.1 percent of total revenues were concentrated in the last quarter of the year, the peak cotton marketing season.²² In Iowa, by contrast, there was no real seasonal peak in revenues. Farmers recorded their highest rate of sales from December through January, but even so their receipts during this period accounted for 40.7 percent of their crop and only 37.6 of their total revenues.

Mediating Systemic Seasonality

With data on bank clearings and balance sheets, we analyze the impact of systemic seasonality on country banking in the Cotton South. The clearings data record the monthly value of check and draft payments and receipts settled through a local clearinghouse, in this case in Augusta, Georgia and Des Moines, Iowa. Because both cities were regional commercial centers, their clearings data serve as an accurate barometer of the pace of economic activity in their surrounding agricultural hinterlands (Odell and Weiman 1998).

In Augusta, not surprisingly, the monthly variation in bank clearings directly parallels the seasonality of the cotton harvest and sales-shipments. From the trough (June through August) to the peak (October through December) of cotton's economic cycle, the value of payments and receipts processed by Augusta banks more than doubled. They reached a slightly lower peak at

22. The more relevant correlation, perhaps, is between the monthly shares of crop and total revenues and the monthly shares of the cotton crop shipped or marketed. Regardless of the latter series chosen, the correlation was 0.979 for crops and 0.972 for total farm revenues.

the spring planting-purchasing season, and then diminished steadily until the start of a new cycle. To underscore the point, we find a strong correlation between the seasonal patterns of Augusta bank clearings in the late postbellum period and the Department of Agriculture estimates of crop (equal to 0.867) and farm (equal to 0.852) sales in Georgia in 1914.

Des Moines banks mediated the smoother monthly flows of payments and receipts generated by the mixed cereals-livestock agricultural sector in its hinterland (Garlock 1932). Accordingly, local clearings fluctuated within a much narrower band, only 36.3 percentage points from peak to trough versus 95.6 percentage points for Augusta. Moreover, the two seasonal peaks in clearings – in March and October – were caused by customary arrangements for tax, rent, and mortgage payments, and not by the purchases and shipments of farm products per se.²³

The *Annual Report of the Comptroller of the Currency* furnishes the most direct evidence on the impact of seasonality on banks' operations. For each state, it publishes the aggregate balance sheets of country banks on five call dates spread out evenly over the year. Over the period 1885 to 1892, we estimated the average deviation from trend in total deposits and loans (relative to average total loans) on each call date for country banks in the Cotton South and Iowa.²⁴ The results, plotted in Figure 9.5, depict the broad seasonal movements in deposits and loans and so the actual synergies between banks' dual depository and credit functions.

23. Garlock (1932, pp. 10-13). To underscore our point, the correlation between Des Moines bank clearings in the late postbellum period and total sale of farm products in Iowa in 1914 was only 0.30.

24. National banks were required to submit balance sheets to the Comptroller of the Currency on five call dates each year. The Comptroller published only one individual country bank balance sheet per year, but five aggregate balance sheets per state, one on each call date. The 1885-1892 period was chosen because the call dates most closely tracked the crop cycle. Still, these data will tend to understate the effects of seasonality on bank operations, because there are only 5 observations per year and they do exactly coincide with the turning points in the seasonal cycle.

In the case of the Cotton South, the strong negative correlation between the two indices (equal to -0.780) implies that country banks faced recurrent seasonal local funding deficits and surpluses. The deficits mounted during the crop growing through the marketing seasons (between the mid-February and late December call dates), when outstanding loans grew by 6.7 percent but deposits fell by 7.5 percent. During the rest of the year, banks faced the opposite condition of current account surpluses. The deposit index jumped by 13.7 percentage points but the loan index fell by an almost equal and opposite amount, 10.0 percentage points.

Our analysis of the balance sheet data also shows how country national banks managed their seasonal funding gaps and surpluses. The relevant items (not shown here) are the excess liquid reserves (including all cash items and bankers' balances) and interbank borrowing (referred to as "rediscounts" and "bills payable"). Banks met their local funding gap in two steps. They first depleted their excess cash items and bankers' balances by around 6.5 percent (mainly from late February to late July), and then increased their short-term borrowing from correspondents by 8.7 percentage points (from late July through September). After the harvest and marketing seasons, they quickly repaid their loans and replenished their correspondent balances (by late December) and then more gradually accumulated cash reserves.

Systemic seasonality more directly affected the operations of smaller, state-chartered banks which diffused further down the urban hierarchy to transport and distribution hubs.²⁵ When broken down by location, the variation in key balance sheet items of Georgia state banks over three call dates from early winter to early fall clearly evince this city-size effect (Table 9.2). For banks

25. Odell and Weiman (1998). In late September 1892, none of Georgia's 32 national banks operated in cities with fewer than 1,000 people, and only 3 were located in cities with 1,000 to 2,499 people. By contrast, 16 state banks (20.0 percent) operated in places with less than 1,000 people and 17 (21.3 percent) in those in the next size category.

in local market centers with less than 1,000 people, the gap between loans and deposits more than doubled over the cotton cycle as compared to a less than a 10 percentage point increase for banks in the largest cities.²⁶ The seasonal indexes for interbank borrowing and deposits also varied more widely for these truly “country” banks. This finding is consistent with later Federal Reserve data, showing a seasonal variation in demand deposits of 26.3 percentage points for member banks in smaller centers as compared to only a 10.1 percentage point range for banks in centers with at least 15,000 people (Wall 1937).

Iowa country banks, by contrast, more closely realized the necessary condition for a truly “revolving fund” of reserves to fund customers’ withdrawal and short-term borrowing demands. The loan and deposit indices across the five call dates were weakly correlated (equal to -0.025). For example, the March peak in clearings discussed above hardly appears as a funding problem for Iowa banks (in Figure 9.5), precisely because these payments largely involved transfers between local banks and so tended to offset each other. Moreover, the funding gap between the two varied by only 4.9 percentage points from the trough in late February to the peak in late December and was met mainly by banks’ excess reserves especially in the form of surplus bankers’ balances (Davis, Hanes, and Rhode 2009).

Unlike in the Cotton South, these seasonal patterns were roughly comparable across all Iowa banks, whether located in small or large population centers. As measured by the standard deviation, the seasonal variation in demand deposits was only marginally greater for Fed member banks in lower order transport versus higher order market-money centers. For state banks in

26. The June 30th figure is actually higher than the one for September. The difference likely reflects the fact that the harvest was well under way by September 30. For state banks as a whole, the range in the loan-deposit index over the year was only 13.4 percent, comparable in magnitude to that for Georgia national banks (13.8 percent).

Michigan (various years) where we can track seasonal fluctuations in balance sheet items along the same lines as in Table 9.2, lending in small agricultural communities also appeared to be fairly steady over the course of the annual cycle.

Systemic Seasonality, the New York Market, and Monetary Reform

New York correspondents constituted a national clearinghouse, mediating payments and financial flows between banks throughout the country, especially in regional centers (James and Weiman 2010). Consequently, the varying demands for their payments and credit services and so the net flow of funds into and out of the New York money market reflected systemic seasonality at the national level, that is the residual seasonal demands net of offsetting flows within and across regions. These seasonal pressures were clearly evident in the sharp fluctuations in the benchmark call loan interest rate. Varying inversely with the cash reserves of New York banks, loan rates increased from their trough of 2 to 3 percent in late July and August to a peak of 6 to 7 percent in late November and December (Kemmerer 1910, p. 15).

Despite the relatively small size of the banking sector in the Cotton South, its systemic seasonal demands had a disproportionate impact on the New York and hence national money markets. Southern banks accounted for 30 percent of the net cash flow of funds into New York during the late winter and early spring months, and about a quarter of the cash outflows in the fall.²⁷ And they had a voracious appetite for interbank loans to finance seasonal deficits in the harvest and crop-moving seasons. On the September 1904 call date, for example, over one-half of national banks in the cotton-growing states reported at least some interbank borrowing, and they

27. Kemmerer (1910, pp. 76-79). These banks accounted for less than 4.0% of total bank assets in the U.S. in 1900.

accounted for just over one-half of the total amount (\$37.3 million) borrowed by all national banks.²⁸ By way of comparison, only 30.1 percent of Iowa national banks reported any interbank borrowing on that date. Moreover, their demand for interbank loans – and that of national banks in other mixed farming states – did not exhibit a strong seasonal pattern and so did not reinforce the demand for cash reserves in New York due to the seasonal repatriation of surplus funds in their correspondent accounts.

Our analysis confirms Laughlin's diagnosis of a "fundamental defect" of the National Banking System, especially in peripheral regions like the Cotton South (Laughlin 1912, p. 12). The peak demands of Cotton South banks reinforced the liquidity strains on Wall Street in the late fall and early winter months, and as a result magnified the premium on interbank and local lending at this time of the year. Faced with these credit terms, farmers, merchants, and local buyers in the region accelerated the sale and shipment of their crops and so their seasonal credit demands.

Laughlin's solution – greater cooperation among banks through the pooling of their reserves in regional "associations" – could mitigate but not fully resolve this two-fold problem (Laughlin 1912, pp. 16-21). A blue print for the Fed, Laughlin's reserve associations would operate a discount window and more elastically supply reserves to member banks in response to their peak seasonal demands. Just like private correspondents, they would turn banks' loan "assets into cash," but at lower more uniform discount rates and without the macroeconomic side effects. This reform, he predicted, would reduce the cost of bank credit in peripheral regions and relieve the financial

28. This evidence was reproduced in the testimony by Charles N. Fowler to the U.S. Senate, Committee on Banking and Currency (1913, pp. 1888-90) during its hearings on the proposed Federal Reserve Act. See also various issues of *Annual Report* of the U.S. Comptroller of the Currency. According to Fowler's evidence, Cotton South banks borrowed \$35.1 million from New York correspondents as of June 1913, which was again about one-half of the total amount borrowed by all national banks.

strains on New York and other money center banks. The evidence from the early Federal Reserve years bears out his predictions. Its policies during the 1920s virtually eliminated the seasonality in interest rates in Federal Reserve bank and branch cities as well as bank panics, and regional differences in national bank loan rates narrowed sharply (see Federal Reserve Bulletin for various year; Miron 1986; and Redenius 2007a).

The Cotton South remained a spatial economic outlier, however, with rates stubbornly higher than those in the Northeast and the Midwest. This chronic problem attests to the systemic limits to national banking reform especially in peripheral regions. On the one hand, relatively few Southern banks had direct access to the Fed's discount window, because they could or would not comply with its stricter national standards.²⁹ As a result, only about a third of all banks in the Richmond, Atlanta, and Dallas Fed districts had joined the system by 1926. On the other, a purely monetary reform could not lessen cotton's grip on the regional economy, and with it the systemic seasonality that increased banks' liquidity costs and default risks in accommodating their customers' short-term loan demands. Overcoming this structural constraint would call for more profound economic revolution, whose foundations were laid in the New Deal era (Wright 1986, Fleck 1910, Olmstead and Rhode 2003).

29. If regional banks joined the fledgling system, their access to the discount window was limited, because they often lacked the requisite collateral. For this reason as well as others (such as the Fed's mandate for par clearing), the vast majority opted out of the system, because they saw few benefits and significant costs from membership (Watkins 1926, p. 122; Jessup 1967; White 19 1983, esp. ch. 3).

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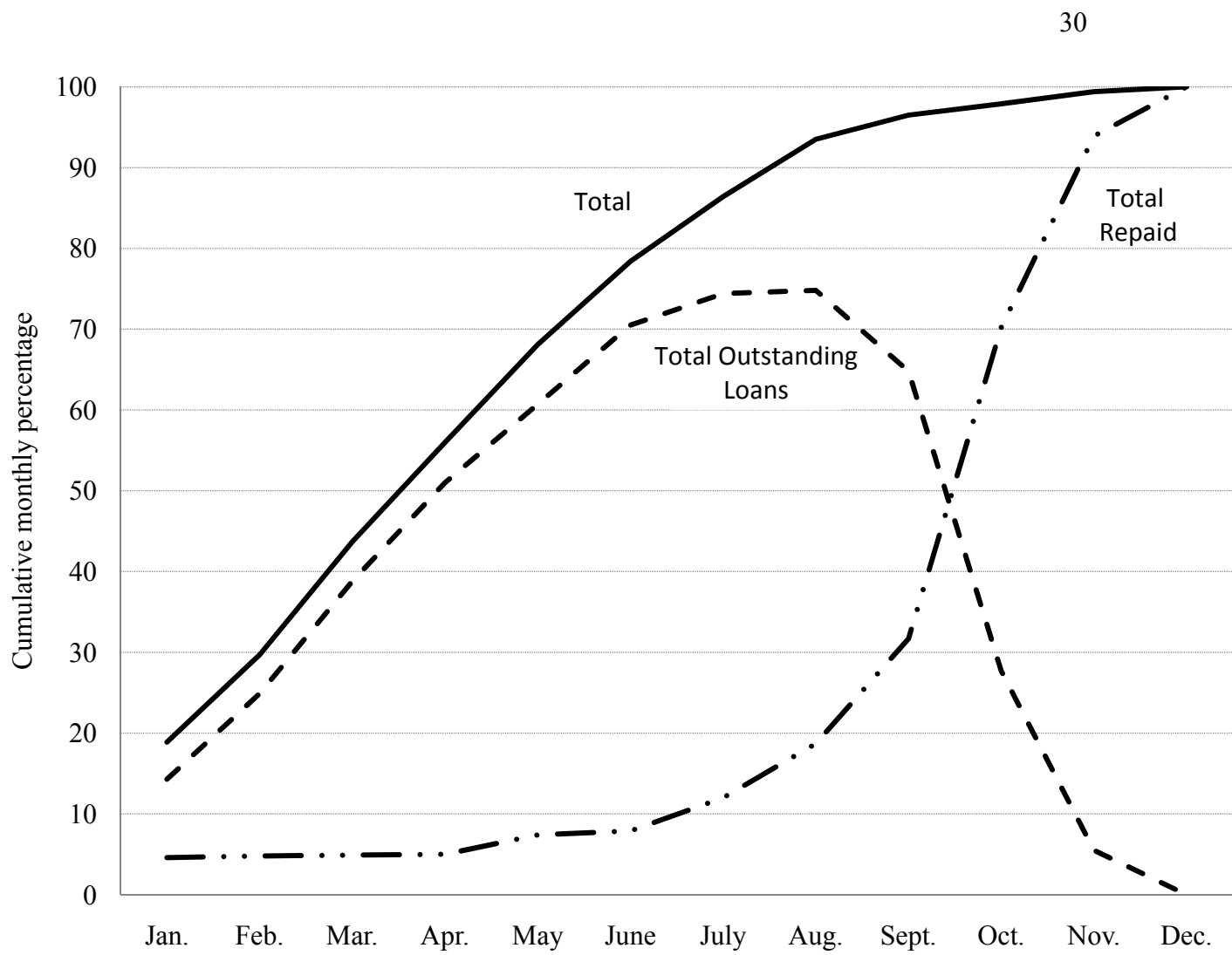


Figure 9.1: Cumulative Monthly Percentage of Amounts Borrowed and Repaid by Texas Cotton Farmers in 1925
 Source: Moulton (1931), p. 5.

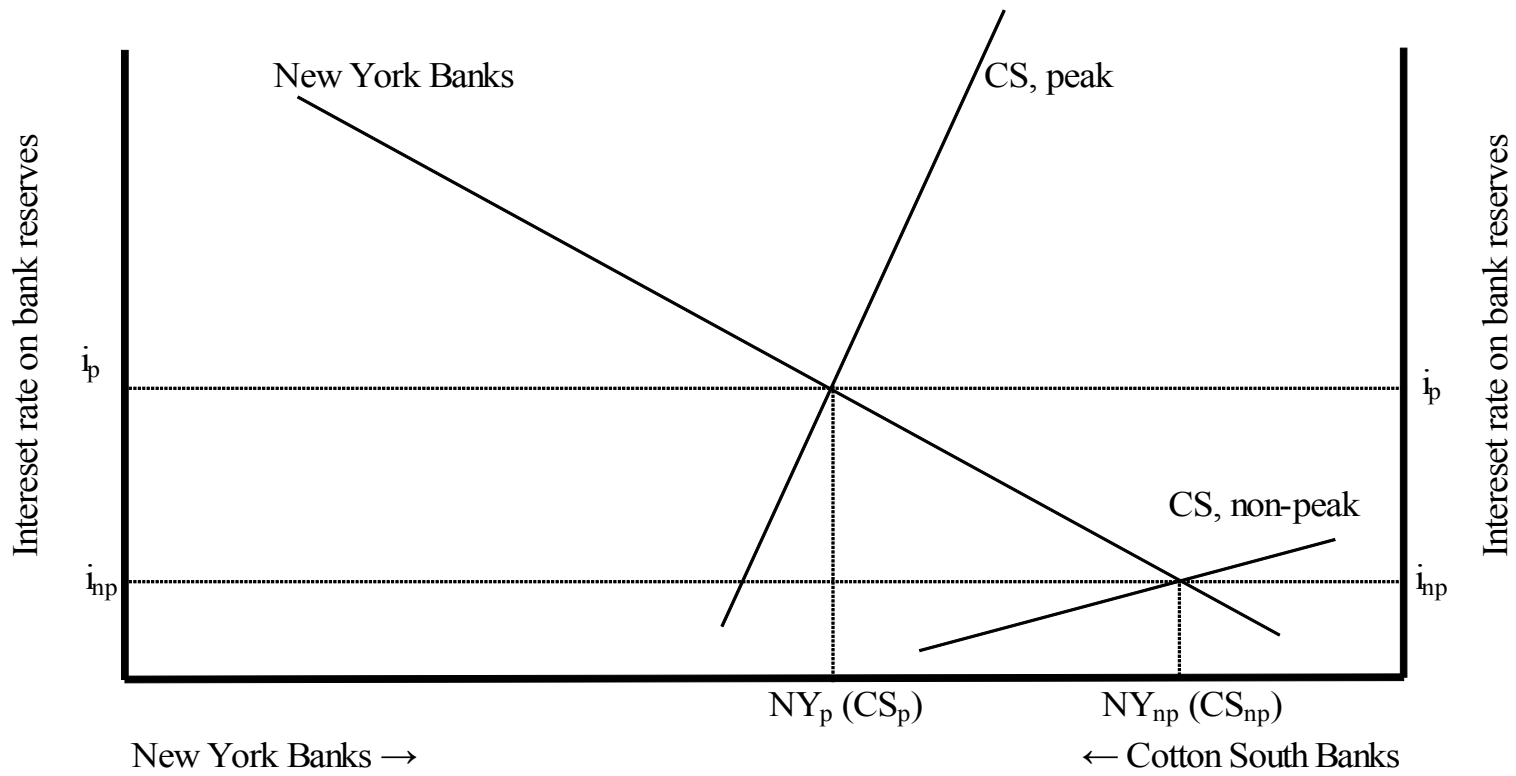


Figure 9.2: A Model of the Seasonal Variation in the Cost of Bank Reserves in Postbellum America

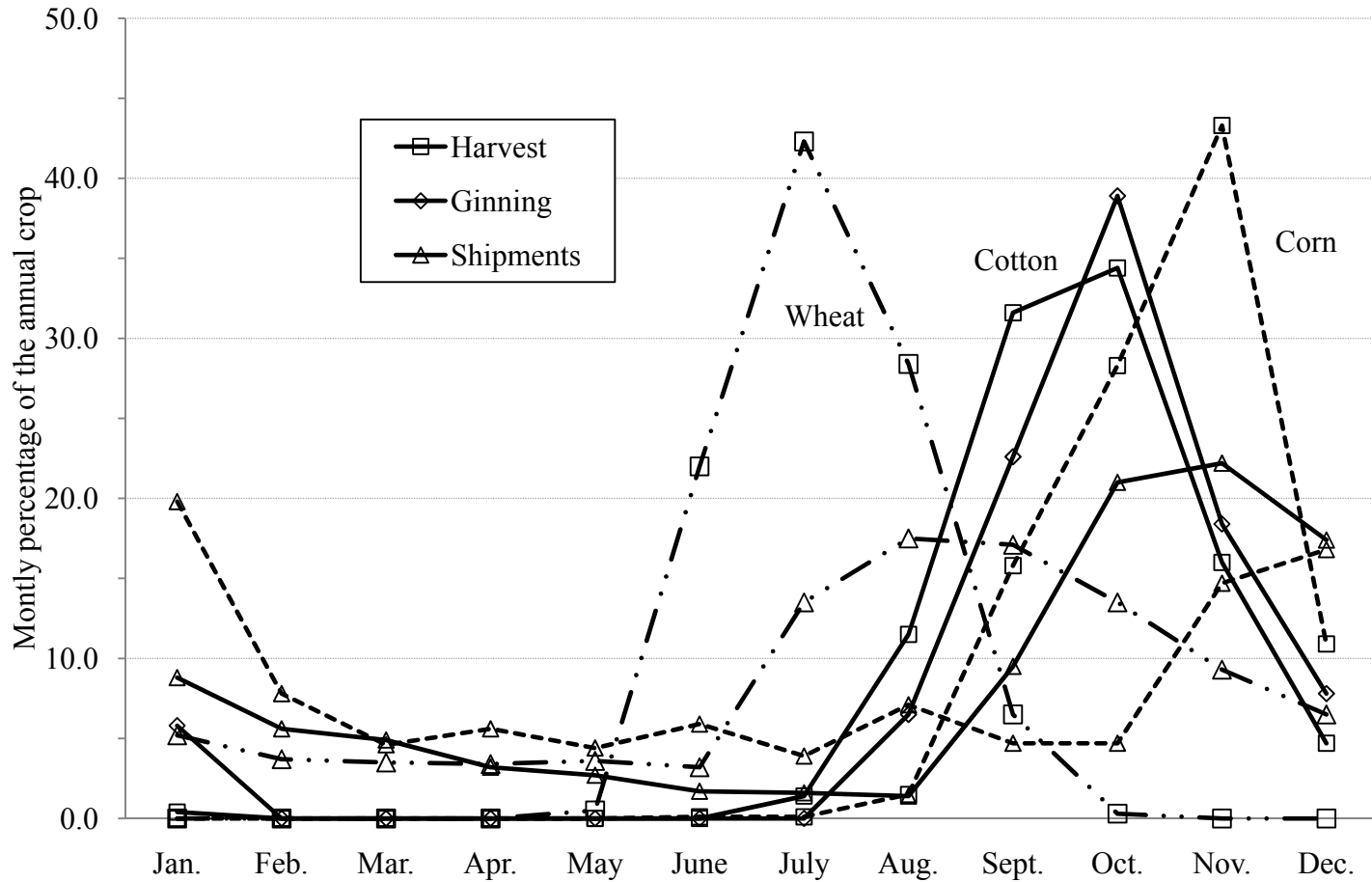


Figure 9.3: The Seasonality of Harvesting and Marketing Cotton, Corn, and Wheat Crops
Sources: See note 16 in the text.

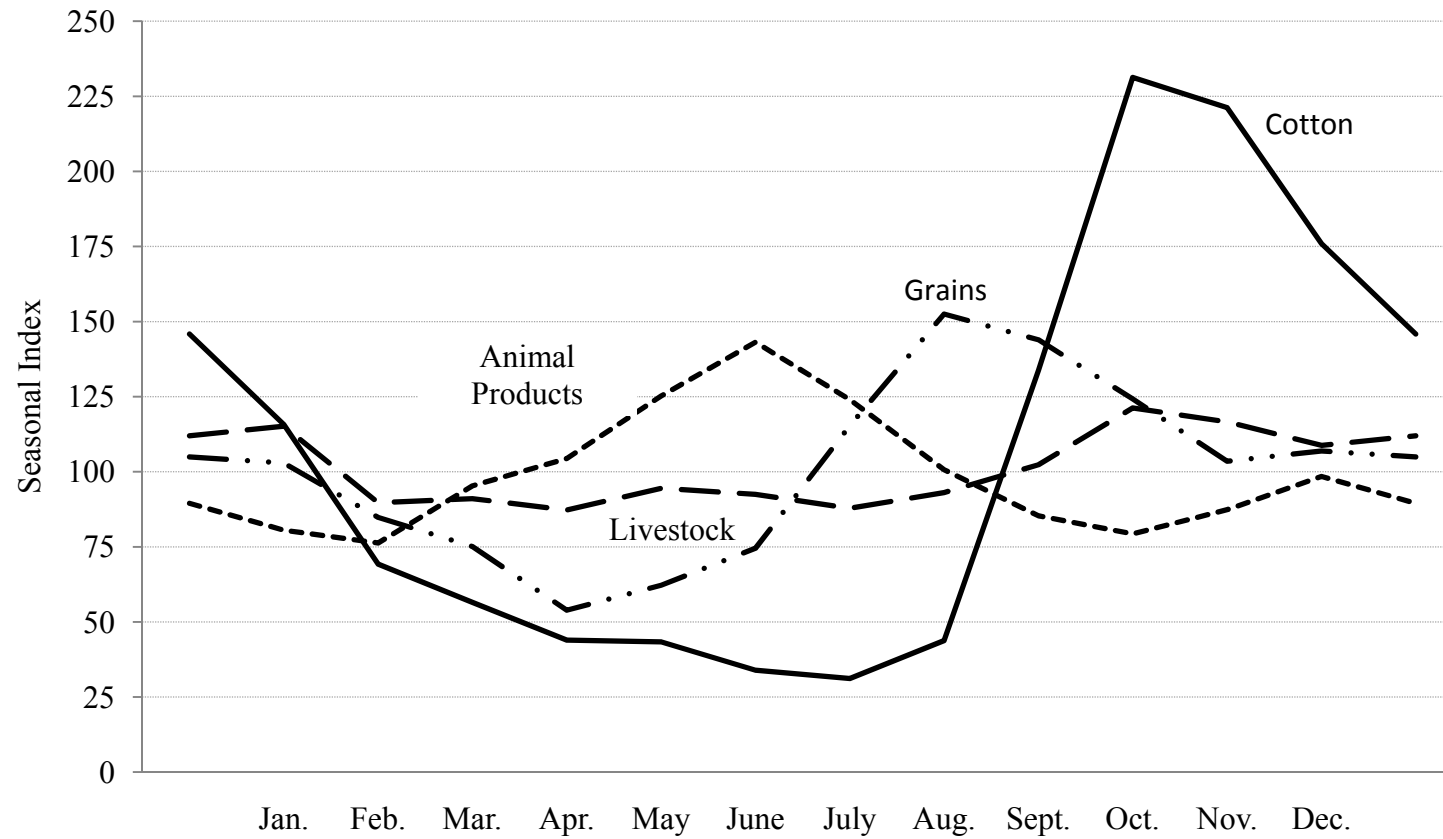


Figure 9.4: The Seasonality of Agricultural Shipments by Product Type, 1919-1926

Source: See note 18 in the text.

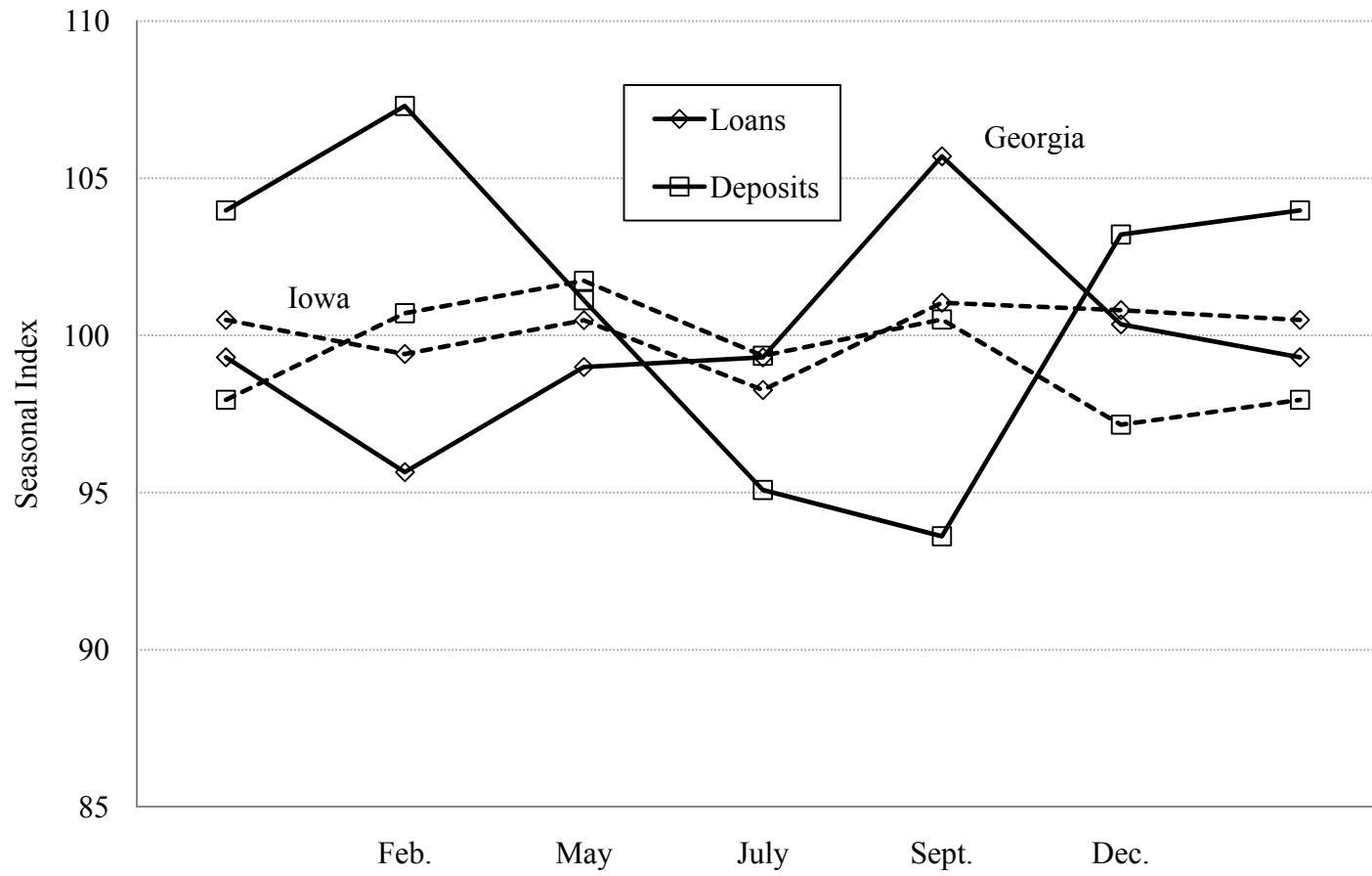


Figure 9.5: Seasonal Variation in Deposits and Loans of Georgia and Iowa Country Banks, 1885-1892

Table 9.1: State Agricultural Economies, 1899

State	Agr. Share of output ¹	% of the Value of Agricultural Output						
		Crops				Animals		
		All Crops	Cotton	All Cereals	Wheat	Corn	Livestock	Animal Products
Cotton South ²	62.7	75.7	43.7	20.1	1.5	16.4	10.9	11.1
Alabama	57.2	77.4	46.0	20.2	0.6	18.7	7.8	12.1
Arkansas	69.6	71.3	35.2	25.4	1.7	22.1	10.9	14.7
Georgia	54.1	79.7	47.0	19.6	1.5	16.5	7.3	10.0
Louisiana	48.7	84.3	37.2	19.9	0.0	14.2	4.1	9.7
Mississippi	76.5	79.9	52.7	18.9	0.0	18.4	6.9	10.3
South Carolina	56.5	83.5	50.6	18.6	1.4	13.4	5.2	8.5
Texas	71.5	68.2	40.3	19.7	2.9	14.4	18.9	11.5
Mixed Farming								
Iowa	68.6	52.6	0.0	40.5	3.1	26.6	33.3	13.2
Spring Wheat								
North Dakota	88.1	83.9	0.0	62.5	49.4	0.6	8.5	7.4

Notes: ¹Agricultural share of output measures the value-added of agricultural products (net of livestock feed) relative to the total value-added of agricultural and manufacturing (net of intermediate goods) output.

²States are included in the Cotton South, if the cotton crop accounted for at least 30 percent of value of agricultural output.

Source: U.S. Census Office (1902a, 1902b, 1902c).

Table 9.2: Georgia State Banks, Selected Balance Sheet Indexes, 1892

Population, 1890	Number of banks	Loans - deposits			Interbank borrowing			Interbank deposits		
		Jan. 2	Jun. 30	Sep. 30	Jan. 2	Jun. 30	Sep. 30	Jan. 2	Jun. 30	Sep. 30
< 1,000 ¹	12	59.8	122.2	117.9	84.4	105.4	110.1	110.0	90.9	99.1
1,000 - 2,499	17	85.8	105.8	108.5	93.4	100.0	106.6	106.5	97.9	98.6
2,500 - 4,999	7	86.2	104.6	109.2	95.4	100.0	104.6	105.6	98.1	96.4
5,000 - 9,999	8	85.7	107.8	106.5	94.8	101.8	103.4	103.6	97.8	98.6
10,000+	19	96.8	98.3	104.9	97.9	99.2	102.9	101.9	98.9	99.2
All centers	63	92.7	101.1	106.1	96.5	99.8	103.7	102.8	98.4	98.9

¹ Includes places that were not separately returned in the population census.

Notes: The indexes are computed as a percentage of the balance sheet averages for the three dates. The tabulations include the records of all banks that reported at all three dates and for which there were no significant data problems. The dates of the reports varied somewhat; the most common dates are used as the table headings.

Sources: Georgia, Treasury Department (1892); and U.S. Census Office (1895).