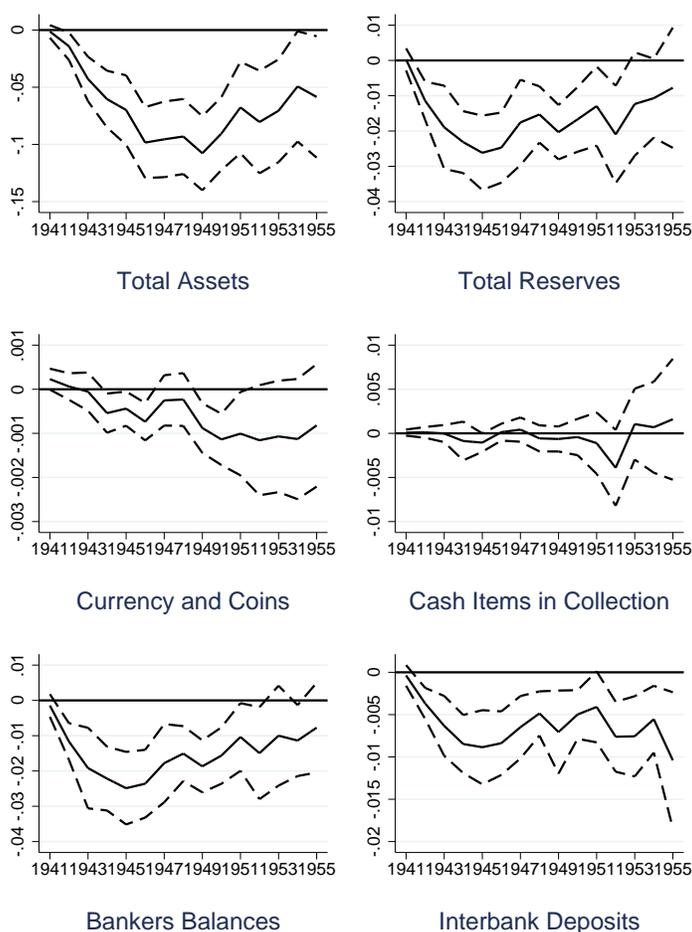


G Appendix G: The Components of Reserves

G.1 Some Additional Empirical Evidence on the Behavior of Reserves

This appendix is intended to map out the changes in reserves in response to war contracts in more detail. As is mentioned in the main paper, what I call reserves is made up of three components: total currency and coin, cash items in the process of collection and bankers balances. Figure 1 shows the response of the components of reserves. As the reader can see from the figure, slower growth in banker's balances are driving the overall response of reserves. The response of total assets is included for reference.



Dashed lines are 95% confidence intervals.

Figure 1: The Response of the of Reserve Holding in response to WWII Contract Spending

I have also included the response of interbank deposit liabilities from the main text for reference and to make one point about the response of reserves. Interbank deposits are the supply side and bankers balances are the demand side of the interbank deposit market. There is a large difference in the demand side and the supply side response to war spending. This difference is likely attributable to the fact that banks also held deposits at Federal Reserve banks¹. The total response of bankers balances is largest in 1946 at -2.4 cents per dollar of contract spending. Privately supplied interbank deposits account for less than half of the total response. What is also striking is that the decline in privately held interbank deposits is permanent in a way that the other responses of the subcomponents of reserves are not. However, this change in interbank deposits is still relatively small, accounting for only around 10% of the change in total deposits.

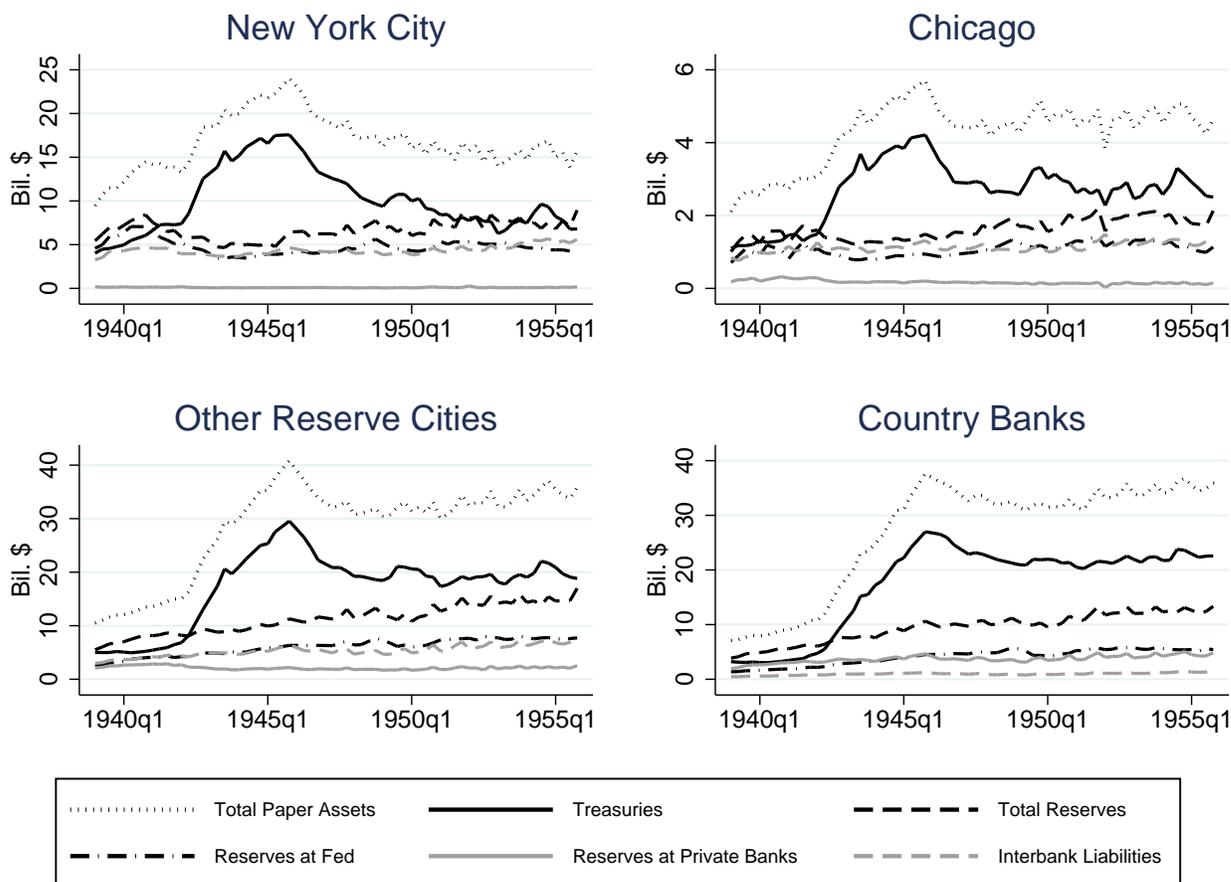
G.2 Historical Evolution of Interbank deposits and Treasury Holdings

Figure 2 shows the evolution of paper assets for member banks from 1939Q1 to 1955Q4, by class of bank. It is plausible that the large influx of Treasury Bonds—sold to bond dealers primarily based in New York—would reinforce traditional correspondent relationships. More broadly, since reserve cities are likely to also be manufacturing centers the interaction between bond demand and interbank deposit relationships could be a potential source of endogeneity.

As Figure 2 shows, however, there seems to be very little relationship between interbank deposits and Treasury purchases for all classes of national banks. Once the government began large scale borrowing in mid 1942 all classes of member banks absorbed Treasury debt at a rapid rate. Relative to the large increase in Treasury holdings between 1942 and 1945 interbank deposit liabilities, reserve assets held in other private banks, and reserves held at Federal Reserve Banks changes little.

This is a function of two main, reinforcing phenomenon. First, the 1933 prohibition on interest rates paid on demand deposits sprung directly—though misguidedly—from a desire to suppress interbank deposits (Cox, 1967). While interest rates on Treasury bonds were capped during the war, their interest rate was still higher than zero. Banks availed themselves of longer term bonds (Meltzer, 2003) because the rate cap of 2.5% also meant that holders were protected from interest rate risk, adding to long term bond’s liquidity. Time deposits, another type of interbank funds that paid interest rates were likely more competitive, but lacked the liquidity of Treasury bonds. At any rate, interbank time deposits held by member banks—a small portion of overall interbank deposits generally—begin to shrink in absolute

¹These are not recorded separately in the source data



Source: Supplement to Banking and Monetary Statistics. Section 2, Table 1-5

Figure 2: Selected Paper Assets and Interbank Liabilities of Member Banks 1939-1955

size from 1940 to 1949².

The second reason for the likely relative decline in importance of bankers balances as a source of liquid assets is that Treasury bond markets were fully national in scope. The government, both the Treasury and Fed, dealt directly with a small group of bond dealers in New York City. However, these firms had national networks of branch offices and regional dealers. The telegraph and telephone were the underlying technology that allowed these networks to form and WWI provided the market for such an expansion (Garbade, 2012). This network sprang into action in support of the Second World War. The Federal Reserve system was also a relatively decentralized network for the distribution of Treasury Bonds. Banks, of course, also bought and held bonds through traditional correspondent networks,

²See Figure 2 for source.

but these networks competed with other ways for banks to acquire or unload Treasury debt (Garbade, 2016).

The historical record points to the fact that interbank holdings of Treasury bonds do not play a significant role in determining reserve and deposit holdings. The historical record also points to the fact that measured state level Treasury holdings are, generally, direct holdings. Most convincingly, the prohibition of interest on demand deposits likely drove banks to minimize interbank deposits generally in the face of a glut of an alternative highly liquid but interest bearing asset. The reduction in importance of traditional banking relationships due to the parallel national market in Treasury bonds likely reinforced this phenomenon.

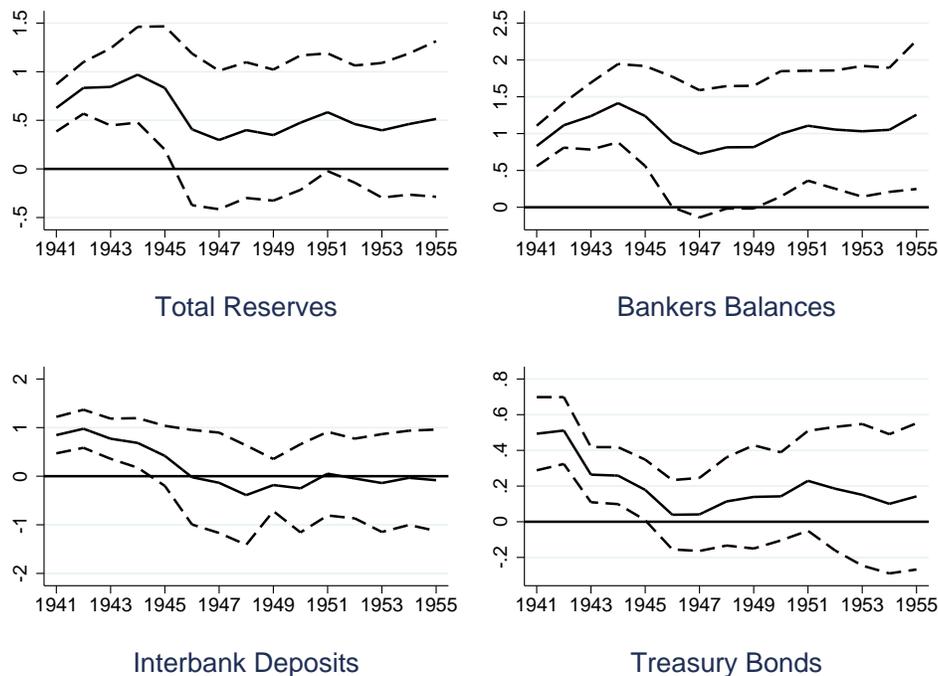
H Supporting Empirical Evidence

Empirical evidence also backs up the historical evidence above that suggests that during the war inter-state correspondent banking was not a major source of endogeneity in the empirical analysis of the main paper. A simple empirical test of the role of inter-state correspondent banking can be performed using a variant of the regression in the main paper. We can run a regression of the form:

$$DEPOSITS_{it} = \beta_0 + s_i + y_t + \delta_1(y_t * RESERVES_{it}) + \beta_1 I_{it} + \beta_2 MAN_{it} + \epsilon_{it} \quad (1)$$

Here we can “map” the relationship of total DEPOSITS in state i in year t to the components of RESERVES in each state and each year. It is then possible to transform the elasticity δ_1 into a multiplier effect. This gives us the contemporary correlation between within state deposits and reserves for each year t . Income and manufacturing income have been included as they were in the main regression, though removing those control variables does not change the conclusions drawn below.

Figure 3 shows these regressions for total reserves, bankers balances and interbank deposits as well as for treasury holdings. There are two obvious periods with respect to the relationship of deposits and reserves. The first period is the war period from 1940-1945 and the second period is from 1946-1955. These two period need to be discussed separately.



Dashed lines are 95% confidence intervals.

Figure 3: The Response of Total Deposits to Contemporary Reserve Holdings

The war period shows a very clear relationship between state level bankers balances and state level deposits. The peak responses of total deposits to bankers balances are in 1944 when a one dollar increase of state level bankers balances is associated with a state level increase in deposits in 1944 and a \$1.41 increase in 1944. This suggest very clearly that during the war bankers balances are supporting multiple within state deposits. This is only possible if correspondent relationships are primarily within states. The fact that bankers balances show an association with a larger amount of total deposits than reserves more generally reinforces this conclusion. A one dollar increase in of total reserve holdings are only associated with 97 cents increase in state level deposits in 1944. This result is also striking given that, as discussed above, about half of all bankers balances were held at Federal Reserve banks and would not have created private deposits. The empirical evidence supports this historical evidence that across state correspondent banking did not play a significant role in explaining the results in the main paper.

This seems to be contradicted between 1945 and 1950, where the correlation between bankers balances and within state deposits is weaker both in terms of the average relationship and statistical significance. However, the basic relationship between total deposit growth

and paper assets changes dramatically after the war. This changing relationship is due to a “decoupling” of paper assets from deposit growth which is evident at the national level. The very similar lack of relationship between interbank deposits and total deposits and Treasury bonds and total deposits have been included to illustrate this decoupling.

As discussed in the main paper, bank lending at the national level was stagnant during the war. This meant that deposit growth would necessarily be driven by reserve and treasury increases during the war. However, once the flow of Treasury Bonds and reserves ended with the war, bank lending then became the driving force of deposit growth. Figure 4 shows index for major components of commercial bank balances sheets at the national level (1940=100). Treasury bonds have been included here because they illustrate the decoupling phenomenon most clearly. Total deposits shrink from 1945 to 1946, but otherwise grow (though relatively slowly) after 1946³. However, Treasury bond holdings by commercial banks move dramatically in the opposite direction after 1946.

The relationship between total deposits and interbank deposits is similar, though the change in interbank deposits is far more muted generally. Where Treasury bonds holdings in the commercial banking system increase by 387% from 1940-1946 interbank deposits increase by only 21%. However, as will treasury bonds, interbank deposits fall after 1946 steadily until 1950. The orthogonal behavior of paper assets and total deposits at the national level explains the post 1945 response of deposits to bankers balances discussed above. While it is obviously difficult to draw any conclusions for the statistically insignificant result, it is worth point out—looking back at 3—that even when the relationship between bankers balances and deposits is at it’s nadir in 1947 a \$1 bankers balances are associated with a 72.5 cent increase in deposits, this is essentially double the mean estimate (though still statistically insignificant) for total deposits.

³The empirical state level relationship and the historical national level relationship relation discussed here between demand deposits and bankers balances, interbank deposits and treasury bonds is very similar to total deposits. However, demand deposits grow continuously at the national level from 1945-1955

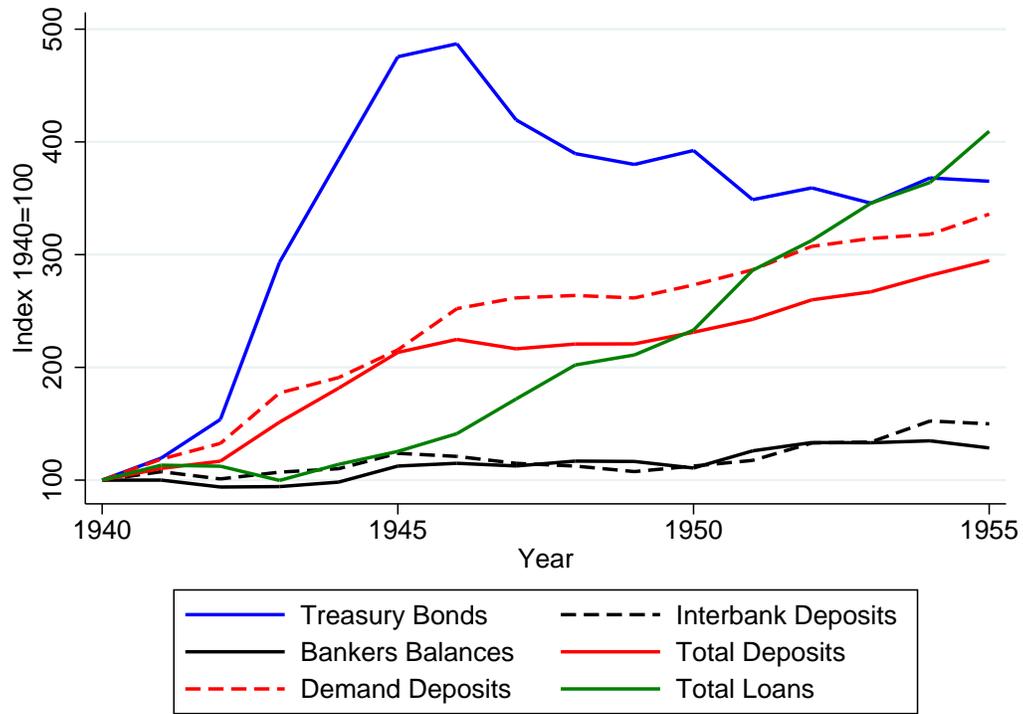


Figure 4: Growth of Various Assets and Liabilities of Commerical Banking System 1940-1955

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