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Commercial Bank Reserves

An appraisal of a plan for uniform reserve requirements.

What's New in Industry?

The impact of recent technological developments will be widespread.

Commercial Bank Reserve Requirements: a Reappraisal

Address before the Forty-seventh Annual Conference,
National Association of Supervisors of State Banks
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Your President, Dick Rapport, put me on the spot when he asked me to discuss the highly controversial subject of commercial bank reserve requirements. Nevertheless, I was happy to accept his invitation because it is an important current topic and because I believe firmly that the best way to arrive at solutions to controversial public problems is through the democratic process of frank and open discussion. Everyone in this room has a peculiar responsibility to help solve this particular problem in whatever way is best for the country. In that sense, we are all on the spot.

It may help to keep the main points in mind if I ask three basic questions at the outset:

1. Why should banks be required to maintain reserves against deposits?

2. What amount of reserves should all banks collectively be required to maintain?

3. How should each bank's share of the total be determined?

It is easier, of course, to ask than to answer these questions. I do not expect all of you to agree with the answers I give. I have arrived at them after many discussions with commercial bankers, bank supervisors, central bankers, legislators, and college teachers. I expect my thinking to be influenced further by comments from this strategic audience.

1. Why should banks be required to maintain reserves against deposits?

The idea of requiring banks by law to hold at least a minimum of their deposits in reserves apparently developed from a desire to assure maintenance of the liquidity of banks. Governments once thought the obvious solution to a bank's inability to pay depositors on demand was simply to require every bank to hold at least a certain minimum of reserves at all times. In arriving at this solution, they apparently overlooked the fact that a bank cannot pay out reserves that it must hold. Required reserves can be used to meet a withdrawal only to the extent that they cease to be required or become freed by the withdrawal itself. The only way withdrawals could be met completely out of required reserves would be to fix requirements at 100 per cent of deposits.

Under a fractional reserve system, a drain must be met primarily by selling assets or borrowing. If, for example, a bank is required to maintain a reserve of 20 per cent and holds no excess reserves, it must either liquidate 80 cents of assets or borrow 80 cents for each dollar of deposits withdrawn. Thus, a bank's ability to pay its depositors depends mainly on the quality and marketability of its assets and its ability to borrow. So long as the withdrawals remain modest, other private buyers and lenders can usually be found directly or indirectly. But if withdrawals become widespread, panic may ensue.

As you know, the panic of 1907 had much to do with the creation of the Federal Reserve System. One reason for establishing the System was to provide an elastic money supply and thus prevent currency panics. The method adopted was to authorize the Federal Reserve Banks to create reserves and money. Unfortunately, however, the authors of the Act could not foresee future developments and imposed what proved to be inappropriate limits on the amount of notes the Reserve Banks could issue,

on the amount of reserves they could create, on collateral for notes, and on the collateral against which the Reserve Banks could lend. These restrictions seriously aggravated our monetary problems in the Great Depression. Some of them have since been removed, as in the Banking Act of 1935, which in effect made all sound assets of member banks a potential basis of advances by Federal Reserve Banks.

The founders of the System were interested in far more than the prevention of money panics. They charged the System with responsibility for influencing continuously the supply availability, and cost of money, of which deposits are the largest element. Now, although a system of fractional required reserves does not provide liquidity, adequate control over reserve requirements is an indispensable tool in regulating the volume of money in a country with some 14,000 independent banks. Without such requirements, the commercial banks would have too wide a degree of freedom as to the amount of deposits they could create or maintain on a given amount of reserves. For example, $1 of reserves will support $5 of deposits if the reserve requirement is 20 per cent but will support $10 of deposits if the reserve requirement is 10 per cent. If banks were not required to maintain minimum reserves, they would be able to increase the supply of money by reducing their reserve ratios.

A short answer to our first question, therefore, is that *unless commercial banks are required to maintain at least minimum reserves against deposits, the country would be without a mechanism for regulating the supply of money in the general interest.*

2. *What amount of reserves should all banks collectively be required to maintain?*

Reserve requirements are one of the two factors which determine the ability of a banking system to create deposits. The other is the aggregate amount of reserves available to the banks. Control or influence over these two factors are complementary means of influencing the volume of money. Adequate administrative authority over both is needed to enable the Federal Reserve System to discharge its responsibility by developing a flexible policy adapted to changing conditions.

The System has been obliged to shift its emphasis as one or the other of these basic instruments appeared inadequate or inappropriate to existing circumstances. Until the Great Depression, the Reserve authorities operated entirely through changes in the amount of reserves, which they influenced primarily through open market operations and the discount rate. They had no authority to change reserve requirements, which were fixed in the statute. Authority to change requirements was first given in 1933. At about that time, banks began to acquire automatically several billion dollars of excess reserves as a result of imports of gold over which the System had no direct control. Although the System was pursuing an easy money policy at the time, it was clear that its power over the volume of reserves would be inadequate if the flood of gold continued and a strong inflationary movement developed. The System increased requirements to the legal maximum several years before we entered the war in order to absorb some of the excess reserves so that the System would again be able to use open market operations effectively. On December 31, 1940, the Board of Governors, the Presidents of the Federal Reserve Banks, and the Federal Advisory Council jointly recommended that Congress give the System authority to increase requirements to double the level then existing. Such authority, however, was not granted.

During the war the System directed its efforts primarily to supporting Government securities in order to assure success in financing the war. The most important decision was to maintain an established pattern of rates on such securities. The Reserve Banks paid for securities with deposits, thus creating member bank reserves. This meant in effect that the decision to support Government securities implied loss of control over the volume of reserves. At the end of the war the System was confronted with the alternatives of (a) continuing support of the rate pattern at the expense of controlling the volume of reserves, (b) regaining control over the amount of reserves and making the necessary changes in its program of support of Government securities, and (c) acquiring additional authority to immobilize reserves and thus make them unavailable for further expansion. As you know, it has done a little of each. Cooperation with the Treasury in using a large Treasury cash surplus to keep banks under the necessity of acquiring reserves has, of course, been the major factor. The resulting liquida-

tion of securities by banks to meet reserve deficiencies has had some restraining effect on still further liquidation for the purpose of making loans. The System has continued to support the 2½ per cent long-term yield level but has withdrawn some of the newly acquired reserves by allowing short-term rates to rise, thus making possible disposal of short-term issues. It also has used part of the limited additional authority secured in the special session of Congress to increase reserve requirements of all member banks and has increased requirements at central reserve city banks—which had been reduced in 1942. Increases in reserve requirements under the new authority may be expected to have effects similar to those achieved through the use to which the Treasury cash surplus was put in the last fiscal year.

I have recounted this experience to indicate that the monetary authorities can do a better job if they can change reserve requirements as well as the amount of reserves.

The amount of required reserves cannot, of course, be considered without reference to the assets that are counted as reserves. The definition of such assets should be related to the purpose that the requirements are supposed to serve; namely, limiting the volume of deposits. Obviously—to take an extreme example—the volume of deposits would be virtually unlimited if banks could count all assets as reserves.

In the United States, Congress has placed responsibility for the volume of money on the Federal Reserve authorities. To discharge that responsibility, it would be desirable if the only asset that a commercial bank could count as reserves would be a liability of a Federal Reserve Bank. For reasons that I shall give later, it isn't particularly important what form that liability takes or whether the commercial bank holds it directly or indirectly. But it is important that the proportion be uniform and that it be in the form of a liability of the central bank. I need not remind you gentlemen that some of the assets that many banks may now call reserves do not, in the final analysis, provide either control or liquidity.

This discussion provides a basis for a brief answer to our second question. *Banks should be required to maintain reserves at such a level that the reserves available to them will support the volume of money that is appropriate to existing economic conditions.*

3. How should each bank's share of the total be determined?

Required reserves may be thought of as immobilized assets that cannot be further loaned or invested. The amount of such assets that a bank holds may be viewed as that bank's contribution to an effective national monetary policy. The question is: How much should each bank be required to contribute?

I suppose all agree that the basic standard should be equity—that each bank should be required to hold its fair share of the total. It is when we try to apply this principle that we run into disagreements. As a general proposition, it would seem to me that under an equitable system banks that are alike in general nature of business, size, and character of deposits should be subject to the same reserve requirements. As you know, this is not true under our present structure. Banks that are alike in the characteristics I have mentioned may have widely different requirements, depending exclusively upon their location, the authority that has granted them charters, and status of membership in the Federal Reserve System. I would be the first to admit that these characteristics are very important in many ways. At the same time, I must confess that I cannot see how they are relevant in determining the equitable contribution a bank should make to keeping the nation's monetary house in order. That is a very important responsibility for the safety of the country and its place in the world today. It is a responsibility which, as you all know, rests upon the banking authorities of the States as well as of the Federal Government.

In addition to being equitable, a structure of reserve requirements should be administratively feasible. Also, in the development of a new structure of requirements, attention should be devoted to conditions at the time of the changeover so that a smooth transition from the old to the new structure may be made without creating unnecessary hardships for individual banks. One might think of this standard as equity in the short run.

Views differ, of course, as to the precise structure that best meets these criteria. From time to time the System has had members of its staff work on the problem. As you know, I

have been chairman of the staff committee that suggested a plan of uniform reserve requirements. Many individuals have contributed to the results. It is not possible to mention all of them; but I do wish to single out two who made major contributions, namely Mr. E. L. Smead and Mr. J. E. Horbett of the Board's staff. Many of you know both of them.

Your President has asked me to review that plan, which was presented to and published by the Joint Committee on the Economic Report. I should like to emphasize that the plan has not been approved by the policy-making officials of the System. Establishment of the plan would involve a number of changes in the Federal Reserve Act. Although the plan deals only with member banks, the staff committee feels that consideration should be given to the desirability of prescribing uniform reserve requirements for all commercial banks. Counsel has advised us that such an extension would clearly be constitutional. I have given you reasons for my conviction that such a system would be much more equitable than the present system or other alternatives that might be considered feasible from various points of view.

I should like to emphasize that the plan for uniform reserve requirements does not contemplate any change either in existing chartering authority, Federal or State, or with respect to membership in the System. I am not an expert in supervision, but I see no inherent reason why a provision of this kind could not be administered in the same way that the regulations concerning security and consumer loans—Regulations U and W—have been administered.

The plan itself consists of five interrelated points. *The first point* is negative in that it would abolish central reserve city and reserve city designations of banks. The Federal Reserve Act now classifies banks into three categories: central reserve city banks, reserve city banks, and banks not in reserve cities (so-called country banks)—and the Board of Governors establishes reserve requirements for each category within the limits prescribed by the Act. Classification of cities was a method of identifying banks that were eligible to receive reserve deposits of other banks under The National Bank Act. The obvious intent was to require reserve depository banks to carry larger reserves. The law, however, subjected all eligible banks to the higher requirements, whether or not they actually held reserve deposits of other banks. This method of basing reserve requirements on the location of a bank rather than the character of its business has resulted in inequities. Inequities are bound to arise when some banks in a city hold substantial amounts of interbank deposits and others do not. The only choice before the Board of Governors is to classify the city as a reserve city or as a non-reserve city. If it does the former, it penalizes —relative to banks doing similar business elsewhere—the banks with little or no interbank deposits. If it does the latter, it favors—relative to banks doing similar business elsewhere —the banks with such deposits. Such inequities have been mitigated slightly by the qualification that the Board may designate outlying banks in central reserve and reserve cities as country banks; but not all inequities can be eliminated because the adjective "outlying" also relates to location, not to character of business. I need not remind you, who are bank supervisors, of the headaches involved in the administration of a law that is inherently inequitable.

The second point of the plan is that, for purposes of assessing reserve requirements, deposits be classified into interbank, other demand, and time deposits. Many theoretical hairs have been split in disputes over whether and how deposits should be classified. The compelling practical objection to treating all deposits alike is that, depending on the level set, launching such a system would create enormous excess reserves in central reserve city banks, enormous deficiencies in non-reserve city banks, or both. The compelling practical objection to a detailed system of classification is that it would be impossible to administer. Any classification is somewhat arbitrary. Advantages of the proposed classification are that, by and large, the three classes of deposits are used for different purposes, are readily identifiable, have traditionally been treated differently, and differential treatment would minimize initial disturbances while yet retaining effective overall control.

The staff committee concluded that initial requirements might be established at 30 per cent against all interbank deposits, 20 per cent against other demand deposits, and 6 per cent against other time deposits. Several factors

were taken into account in selecting these particular ratios. They were chosen wholly on the basis of practical results after considerable discussion and observation of conditions as they existed several months ago. Many different combinations were tested. On the basis of tests made at the time, the suggested initial requirements seemed to be more appropriate than others in that fewer individual banks would need to make significant adjustments from present positions to meet the new requirements.

I should like to emphasize that the initial requirements of any new system should be established with particular reference to total existing requirements at the time and with respect to the impact of the change on individual banks rather than with reference to any preconceived or established ratios. It is likely, for example, that the exact ratios mentioned would be inappropriate today because of changes that have been made in requirements since those ratios were proposed. In general, the proposed requirements would hit banks now subject to "country" bank reserve requirements which nevertheless hold substantial amounts of interbank deposits. Banks that are "loaned up" and have relatively small amounts of vault cash and balances due from correspondents would also be deficient. Conversely, banks with relatively large amounts of vault cash and balances due from correspondents would experience reductions in their required reserves. In other words, the inequities which now exist would in large measure be eliminated.

The third point is that banks be allowed to count vault cash as legal reserve. The role of vault cash in the banking system has changed fundamentally in the past half century. Before the Federal Reserve System was established, vault cash was the ultimate reserve of the banking system, since it alone was available to meet cash withdrawals. The Federal Reserve Banks, however, have been empowered to create additional reserves or cash when needed. The use of vault cash as reserves would not impair the System's influence over the volume of bank credit, provided initial requirements are established at appropriate levels to offset the change. From the point of view of credit control, System authorities need not be concerned as to the form of Federal Reserve Bank liability—whether Federal Reserve notes or reserve deposits—that a member bank prefers to hold as reserves.[1] The transition to the new system of reserve requirements would be facilitated by permitting banks to count vault cash as legal reserves. Establishment of the suggested uniform requirement against other demand deposits would increase required reserves of country banks. Since, however, such banks hold somewhat larger amounts of vault cash, relatively, the increase in their total requirements would be offset in part by permitting them to count vault cash as legal reserves.

The fourth point is that a bank be permitted to count as reserve that portion of its balances due from other member banks which those banks, in turn, are required to hold as reserves against such balances. The relationship between correspondent balances and reserves is a knotty problem with a long history. After many discussions the committee came to the conclusion that correspondent balances ought to be related to reserves in such a way that (a) a shift of funds by member banks into or out of "due from banks" would not affect the total volume of excess reserves in the system as a whole; (b) "reserve credit" would be allowed for precisely the portion of "due from banks" that is on deposit with Federal Reserve Banks (by way of the reserve requirement imposed on deposits due to banks); and (c) correspondent bank relationships and interbank balances would be recognized as an established part of our banking system. The fourth point is designed to accomplish this result. So long as the rate at which the depositing bank is allowed reserve credit for its "due from" balances is equal to the rate at which depository banks are required to maintain reserves on interbank deposits, a given reserve will support the same volume of nonbank deposits irrespective of how the owner-bank distributed its reserve among deposits with its Federal Reserve Bank, with its correspondents, and cash in vault. In all cases, only vault cash and balances which are directly or indirectly on deposit with Federal Reserve Banks would constitute legal reserves.

The fifth and last point of the plan is that the appropriate System authorities should be authorized to change the requirements within

[1] It is recognized that vault cash may not be exclusively in the form of Federal Reserve notes; but the existence of other forms of currency and coin such as we have in the United States does not involve any significant difference in principle.

limits established in the law. I have already discussed the desirability of enabling System authorities to change reserve requirements from time to time within prescribed statutory limits in order to prevent injurious credit expansion and contraction. Although the chief purposes of authorizing changes in reserve requirements is to influence total reserves that all banks must hold, experience has demonstrated that discretion should be granted as to the requirement for each type of bank or deposit as well as to requirements as a whole. In this connection, it should be pointed out that different groups of member banks could be variously affected by selective use of changes in the requirements against different classes of deposits. Thus, combinations of changes in requirements on the three classes of deposits could be utilized to exert differential influence on banks doing different types of business. For example, because of the proposed new treatment of balances due from banks, an increase in the requirement against interbank deposits would result in increases in required reserves of banks with an excess of "due to other banks" over "due from other banks," while at the same time causing increases in excess reserves of banks with an excess of "due from other banks" over "due to other banks." If all commercial banks were subjected to the requirements, no change in the total amount of required reserves would result from an increase in the requirements against interbank deposits. An increase or decrease in the requirement for either nonbank demand deposits or time deposits would, of course, affect all banks alike in proportion to their holdings of such deposits.

We are now in position to give a brief answer to our third question. *A reasonably equitable economically defensible, and administratively feasible system of reserve requirements can be based on the three major classes of deposits, irrespective of the location or the enfranchising authority of the individual bank, provided the reserve, whether held directly or indirectly, is a liability of the central bank.*

Concluding comments

I regret that the necessities of the occasion have made these remarks rather technical. I want to repeat my sincere appreciation for the opportunity to expose these thoughts on reserve requirements to your critical judgment. Incidentally, I have no pride of authorship in the specific structure of requirements, which contains no single item for which I could conscientiously claim credit. As chairman of a hard-working committee, I have collected praise for the work that others have done. It is only fair, therefore, that criticisms likewise be directed to me.

I shall conclude with a few very general observations. A century ago Karl Marx predicted that our type of economic system could not last, that depressions would become increasingly severe until a final depression overwhelmed the entire system. We are all determined to prove Marx wrong. We will leave no stone unturned to maintain employment and real output at high levels. We cannot do this through monetary policy alone; but neither can we do it without a proper national monetary policy. It would be unfortunate, therefore, if we judged proposals for changes in banking primarily from the point of view of local versus national sovereignty rather than in terms of this common objective.

In banking, as in all phases of life, we are torn between the forces of continuity and of change. We want a banking system suited to our changing needs. We know from experience that we will not maintain such a system if we resist adamantly all change, and yet we have become familiar with and adjusted to what we have. We hesitate to change also because our banking history includes numerous instances—such as the failure of reserve requirements to assure liquidity—in which seemingly obvious solutions have proved not to be solutions at all. Since we have no basis for assuming that we are noticeably more intelligent than our forebears, the study of banking history makes for humility of spirit. Humility, however, should not be confused with defeatism. History shows that we cannot be mere conveyors. We cannot—and we would not discharge our responsibilities if we could and did—merely pass on to our children what we have inherited from our parents. Instead we should cultivate cooperatively the legacy of our forefathers so that we may pass on an enriched testament to posterity.

What's New In Industry?

Rapidly changing technology opens up innumerable opportunities

Continuous casting, cold rubber, cooking with electrons, pressurized smelting, isotopes, rotary looms, television, and textile fibers made out of sand are some of the latest technological developments in our manufacturing industries. Scarcely a day goes by without the announcement of a new raw material, or a new product, or a new method of production.

While American industry has never been accused of backwardness in exploring new ideas, the war and post-war years seem to have been unusually productive of new developments. It is especially significant to observe that recent technical changes are occurring not only in the newer industries such as aircraft and synthetic fibers, but also in the older industries such as textiles and steel. Some of the oldest industrial arts—spinning and weaving, canning, tanning, and smelting—were thought to have attained substantial technological maturity. Now we are not so sure. A number of basic practices are undergoing changes that may have far reaching effects on our economy.

Technological changes speed up the growth of some industries and open up entirely new markets. New opportunities are created for investment of capital. Low-grade mineral resources and industrial by-products are utilized more effectively. New job opportunities are created. These and other consequences will be considered after surveying some of the new developments in our major industries.

Iron and Steel

Continuous casting is probably the most significant innovation in the steel industry since the introduction of continuous rolling in 1924. A relatively inexpensive mold takes molten steel directly from the furnace, forms the billets, cools and cuts them into desired length all in one continuous operation. It eliminates expensive and massive equipment such as ingot molds, soaking pits, and blooming mills employed in conventional steel making processes.

Since the development is a simplification in one branch of the steel industry, the principal advantage appears to be a great reduction in capital investment and reduced maintenance charges. The cost of producing steel billets—semi-finished shapes used for making into such products as rods, bars, and hoops—may be reduced considerably. It is also claimed that the new process will aid decentralization of steel production. However, this equipment must be operated in conjunction with basic furnaces and finishing mills.

Pressure blowing is the term applied to an improved method of blast furnace operation in the production of pig iron. Experimental operations over the past two years with several furnaces equipped for pressure blowing of air have resulted in increased output of 20 per cent together with a 12 per cent reduction in coke consumption per ton of pig iron. Furnaces with sufficiently powerful blowing equipment now installed can change to pressure blowing at a cost of $70,000 to $150,000 per furnace for alterations. This innovation is particularly important in view of the high costs of coke and the approaching exhaustion of our best grades of coking coal.

Among numerous technical refinements in iron and steel mill operations is the use of oxygen which is injected into the furnaces to increase output of pig iron and steel. Although still in the experimental stage, some companies report favorable results. Use of oxygen increases production by cutting down the time required to smelt iron from the ore and to make a batch of steel in the open hearth furnace.

Textile Industries

Developments in the textile industries range from new synthetic fibers to improvements in yarn production, cloth weaving, and finishing operations.

New Fibers. Natural fibers are almost certain to encounter more competition from synthetic fibers. Rayon, which already has run ahead of wool in volume of consumption, no longer has the field of synthetics to itself. In addition to nylon, which filled the wartime gap in civilian markets left by silk, are such new synthetics as Fortisan, Kohron, Terylene, Velon, Vinyon, Vicara, and Vitron—the last a glass fiber already in commercial production. By reason of special characteristics, the various synthetics alone or blended with other fibers produce results unmatched by natural raw materials.

Continuous Spinning. One of the leading rayon companies just announced perfection of a process for continuous spinning of filaments. The idea is not strictly new, but the process is. Before the war, another company produced rayon filament by a continuous process which proved successful after perfection of a special reel that allows the thread to spend just the right amount of time at each stage in the process. The latest development, scheduled to go into production this fall, uses the conventional type of spinning unit to form the filaments but performs subsequent operations like bleaching, cleaning, and oiling in long narrow troughs instead of a battery of reels.

Improved Weaving Processes. A number of new developments are taking place in the age-old art of weaving. The new Kellogg loom is a high-speed machine able to turn out cotton cloth at a rate 30 to 40 per cent faster than most looms now in use. Constructed on the principle of unit assemblies for each major function performed, it is possible to make easy replacement of any unit and so reduce the downtime for repairs.

One of our leading machine tool companies has just brought out an American adaptation of the Swiss Sulzer loom. The outstanding feature of this machine is the substitution of lightweight steel gripper shuttles for the old wooden flying shuttle to insert the filler yarn. Abrasion and tension are considerably reduced, and greater output is obtained by virtue of the fact that cloth of 110-inch width can be woven compared to the usual 36- to 60-inch widths. This machine is at present undergoing factory tests and is expected to be on the market next year.

What promises to be the most revolutionary change in weaving is the French designed Fayolle-Anget circular loom. It eliminates the shuttle entirely and is said to be capable of turning out cloth three to five times as fast as present-day looms. It offers a great variety of patterns without any reduction of speed and is adaptable to all kinds of fabrics. This machine is not yet in production, but some American machinery manufacturers are seeking licenses to make it here.

Improved Finishing Operations. Under pressure of rigid Army and Navy specifications, textile manufacturers developed new finishing techniques to cloth useful now for civilian use. By means of special finishing operations, fabrics are now being engineered to obtain particular characteristics. Typical examples are flame-proofing, mildew-proofing, and shrink-proofing. Availability of new synthetics, of course, increases the possibility of obtaining unusual results at all stages from fiber to finished cloth.

Automobile Industry

Strange as it may seem, the automobile industry, with a distinguished pre-war record for advancing technology, has performed no post-war miracles. This may be explained by the huge task of reconversion required, the frequent interruptions caused by labor-management disagreements and material shortages, or by the avidity of the public for new cars regardless of pre-war design. This is not to imply that the motor industry has made no technical progress; there have been changes, but nothing phenomenal. Higher compression motors which give greater fuel economy are in the offing, and there may be other developments in process to make their appearance when the market is considered to be ripe for them.

Machine Tool Industry

The automobile industry is one of the machine tool industry's best customers, but the two industries emerged from the war with market prospects as unlike as day and night. During the war, the machine tool industry built as many machine tools as in the preceding forty years. When the war ended there was a tremendous surplus stock which threatened to spoil the market for years to come.

The adverse effect of the war surplus turned out to be far less serious than was feared. Some

of the equipment had little or no peacetime utility and much of it was speedily rendered obsolete by subsequent improvements in technology. Present-day machine tools equipped with carbide cutting edges, individual motor drive, automatic lubrication and operating controls have at least a third greater productivity than those built during or just prior to the war. At present high wage rates most users of machine tools cannot afford to do without the most modern equipment.

Rubber Industry

Last year the United States consumed a million tons of rubber, about equally divided between natural and synthetic. The Rubber Act of 1948 requires the Government to keep in operation or in readiness 600,000 tons of synthetic capacity for purposes of national preparedness, and tire manufacturers must use 200,000 tons of it annually. Under the circumstances, rubber manufacturers have sought to bring the quality of synthetic up to that of natural rubber for use in motor vehicle tires — the principal rubber market. For some years prior to the war the market for synthetic rubber had been confined to certain special uses, for example, gasoline pump hose where it gave longer service than natural rubber.

The usefulness of synthetic rubber has been enhanced by the recently announced cold rubber process. By adding several new "speed-up" chemicals, compounding is done at temperatures ranging from zero to 41° Fahrenheit instead of 122° as heretofore. The product greatly reduces the tendency of synthetic rubber tires to overheat and crack under hard usage. This improvement promises to remove the chief obstacle to the use of synthetic rubber in motor vehicle tires.

Electrical Industries

Consumption of electrical energy in the United States has increased from 188 billion kilowatt-hours in 1940 to approximately 300 billion this year. The huge increase is indicative of both current high levels of business activity and the many new uses of electricity both in industry and in the home.

In industry, electricity is being used more and more for such operations as welding, annealing, brazing, radio-frequency and infra-red heating, and iron ore beneficiation. Despite the great expansion in aluminum producing capacity during the war, present demand for the metal is difficult to satisfy because of the scarcity of electricity required to produce it.

In the home, electricity is put to constantly expanding uses such as space heating, air conditioning, deep freezing, and the ever-widening list of household appliances like electric ranges, mangles, and water heaters.

Television is one of the fastest growing post-war industries. With 37 broadcasting stations already on the air, over 300 new applications are pending. Receiving sets are being manufactured at a rate six times faster than last year. The industry is rapidly approaching the billion-dollar class.

Petroleum

This is another rapidly expanding industry scarcely able to meet the post-war demand for its products. Railroads are shifting rapidly from coal burning locomotives to oil burning Diesels. Demand for fuel oil is rising fast as a result of the large number of installations of household oil heating units, and rapidly growing registration of motor vehicles is causing a sharp increase in demand for gasoline. Under pressure for more petroleum products, the industry is widening the search for new sources, re-surveying existing fields, drilling deeper, expanding transportation, refining and marketing facilities.

New developments in this field are taking the course of exploring the technical and economic feasibility of substitutes for our dwindling oil resources. From our estimated oil reserve of 21 billion barrels, we are using 2 billion barrels a year, whereas our total fuel reserves line up like this: 98.8 per cent coal and lignite, 0.8 per cent shale oil, and only 0.4 per cent about equally divided between oil and natural gas. Our tremendous coal reserves have induced efforts toward developing synthetic liquid fuels, utilizing coal as a basic material.

Conversion of a solid fuel like coal into a liquid fuel like gasoline requires the addition of hydrogen (hydrogenation) and removal of oxygen—a process which simultaneously changes the size and structure of the molecules. Both

industry and the Government are experimenting with two German processes to accomplish this —the Bergius process of direct hydrogenation and the Fischer-Tropsch method of indirect hydrogenation.

Industry Efforts. Eight oil companies have joined in building a $21 million gasoline-from-natural-gas plant at Brownsville, Texas, and another large oil company is investing $32 million in a similar plant in Kansas. This is the cheapest and quickest source of synthetic gasoline, but it can be only a temporary expedient because we have only an estimated 30 to 35 years' supply of natural gas at current rates of consumption.

An eastern oil company and a Pittsburgh coal company have joined resources to construct a pilot coal-to-oil plant in Pennsylvania. A plant of commercial size is estimated to cost $120 million.

Government Efforts. The Federal Government is exploring several synthetic processes. Last year a $2 million plant was completed in Colorado for the production of liquid fuel from oil-bearing shale. A $7 million coal-to-oil plant for direct hydrogenation (Bergius process) is scheduled for completion this year. This is a 200-barrel-a-day pilot plant. A $4.4 million pilot plant (80 barrels daily capacity) for indirect hydrogenation (Fischer-Tropsch) is to be completed this year.

Recently the Secretary of the Interior proposed a 10-year program for the establishment of a synthetic fuel industry with a daily capacity of 2 million barrels—the equivalent of 40 per cent of our present daily production of petroleum. Beginning with small commercial units, the entire program would ultimately require about $9 billion of capital and 16 million tons of steel.

Chemical Industries

In these industries, new processes and new products are so frequent as to be almost commonplace. One reason is the wide variety of products produced, such as dyes, fertilizers, pharmaceuticals, insecticides, plastics, soap, paint, solvents, industrial gases, explosives, and fabric coatings. Another reason is the nature of the industry—efforts to improve a product or to utilize a by-product waste material often lead to the development of a new product.

Chemical technology is always changing rapidly. This may be illustrated with reference to plastics, of which there are now a number of well-defined family groups. Before the war, cellulose plastics were in the lead; now vinyls hold first place. Polystyrene, scarcely heard of before the war, is now competing with cellulose plastics for second place, but several others are gaining rapid acceptance.

Atoms In Industry

The most dramatic wartime development was, of course, the $2 billion exploration into the atom which led to the atomic bomb. Since the end of the war, research into peacetime application of atomic energy has been carried on by Government, industrial, and university scientists. We are only beginning to appreciate the uses of isotopes, or "tagged atoms." As stated in the last semi-annual report of the Atomic Energy Commission: "The services that isotopes are capable of performing for science, medicine, agriculture, and industry are so fundamental that no complete inventory will ever be made of their potential uses."

Fields of practical utilization of atomic energy thus far are confined largely to medicine, plant physiology, bacteriology, chemistry, physics, industrial research, and metallurgy. Industries are finding isotopes most useful as tracers or "tags" to measure minute physical and chemical changes in manufacturing processes. For example, they will reveal the exact origin of impurities like sulphur in a batch of steel or the displacement of the minutest quantity of metal caused by friction in piston rings. As devices for measuring and controlling production, they offer possibilities far beyond the most accurate and sensitive instruments used heretofore. Industrial use of isotopes has thus far been limited by insufficient productive capacity. Use of atomic energy for power production is reported as a possibility within 15 or 20 years after conquering both technical and economic obstacles. Construction of an experimental atomic power plant at a cost of approximately $20 million is to be started this year, according to a recent announcement by the Atomic Energy Commission.

Shortages and the Industrial Arts

One of the chief stimuli to the widespread changes taking place in the industrial arts is a shortage of materials and labor. Through innumerable improvements in technology, production miracles were performed during the war; but meanwhile unfulfilled civilian demands kept piling up, so that after three years of peacetime operation at high levels we still are not caught up in many lines. The persistence of high-level demand and real shortages in the post-war period have continued to stimulate technological change.

During the war, over-all demand for all goods and services increased tremendously; but the greatest difficulties were encountered in those industries, like shipbuilding and aircraft, where output had to be redoubled many times over, and in those like rubber tires where raw material supplies were cut off. Labor shortages were encountered in all industries, and in the highly technical processes which required skilled labor ingenious methods had to be devised to meet the acute shortages in the skilled trades.

How improved technology came to the rescue to alleviate most serious shortages may be illustrated by some of the wartime developments in our leading industries. The rubber crisis was met by a $700-million synthetic rubber industry based upon petroleum as a raw material. Improvements in the refining process helped the petroleum industry to meet the greatly expanded demand for high octane aviation gasoline. The output of light metals for aircraft construction was supplemented by a ninety-fold increase in magnesium extracted in part from sea water. Shipbuilding was speeded up greatly by welding instead of riveting steel plates. Metal fabrication in numerous industries was simplified by the design of highly automatic machines that could be operated by relatively unskilled workers.

Ever since the end of the war, demand for goods and services has maintained business activity near the top of our productive capacity so that we have had continued shortages instead of surpluses. On top of the backlog of demand accumulated during the war are the requirements of an expanding population, the need for replacing rundown and obsolete equipment in industry, agriculture, commerce, transportation, and mining. But most of the time-saving techniques developed during the war had extremely limited civilian application. The continuing pressure of peacetime demand in excess of producing capacity has been a powerful stimulus for the development of new techniques to overcome current shortages.

The quest for improved technology is also motivated by the shortage and rising cost of labor. Each round of wage increases adds to the cost of production unless output is increased commensurately. In order to cut unit costs, manufacturers are installing modern equipment as rapidly as it is becoming available. As buyers' markets appear, price competition will provide another stimulus to technological improvements which increase efficiency and reduce costs.

While most of the technical improvements of the post-war period are of the type designed to cut costs of production or to permit utilization of substitute materials, there have also been some in the way of new consumer products. Televised radios, automatic dishwashers, and related home appliances are illustrations in point. Such products find easy markets in a period of high employment, high wages, and high profits.

Changing Technology and Capital Requirements

The multiplicity of technical changes taking place throughout American industries calls for heavy investments of capital. The amount of capital required in each instance varies, of course, with the nature of the technical improvement and the particular stage in its development. Every technological change usually goes through three fairly well-defined stages. The first is the laboratory, or experimental stage; the second is the pilot plant or trial-run stage; and the third is the commercial stage. In the initial stage, the idea is checked against previous experience in the field to avoid unnecessary pitfalls, and usually a laboratory or small-scale working model is built to test the practicality of the idea. In the pilot plant or trial-run stage, a working model of the machine or process is built and checked for the influence of change in size upon results. If unusually heavy costs are involved or if results are too indefinite, a larger semi-commercial model may

be constructed before full production is attempted. This has the advantage of removing the "bugs" and developing the "know how" before full-scale capital is tied up. In the commercial plant stage, the full-scale plant is constructed and its operation is turned over to straight operating personnel with a minimum of supervision by laboratory technicians and experimental engineers.

Ordinarily, capital requirements increase with each stage in the development of a new process. The technical innovations already referred to are in various stages of development. For example, the first carload of rolled bars made from continuously cast steel billets has already been made; several models of the American adaptation of the Swiss Sulzer loom are now in a commercial plant undergoing trial runs under everyday factory operating conditions, but most of the commercial applications of atomic energy are still in the experimental or laboratory stage.

Manufacturing plants spent over $7 billion in 1947 for new plant and equipment, and expenditures this year are running somewhat higher. Approximately half of these expenditures are for modernization of equipment. Although it is generally believed that post-war industrial expansion programs are approaching completion, the process of modernization is a continuous one. Technology is always changing.

The economically useful life of machinery and equipment varies greatly from one industry to another. Rates of obsolescence are very high in such industries as chemicals, machine tools, and petroleum. In automobile and some of the other mass production metal fabricating industries, some concerns have been known to buy equipment with a life expectancy of as low as one to two years. Substantial improvements in design take place so rapidly that in buying the machinery the manufacturer plans to write off its entire cost in two years or less. However, rates of obsolescence have been much lower in some of the older industries like textiles and leather.

Long life of the equipment in some branches of the textile industries has had a demoralizing effect upon competition. During the thirties, when there was an abundance of idle capacity, it was difficult to retire permanently some old equipment which was bought for a song at bankruptcies and was put back into production at much lower capital costs to menace the producers with modern equipment. However, we may not see a repetition of these developments in view of the revolutionary changes on the horizon in textile technology.

Effects of Technological Developments

Changing technology is one of the principal factors influencing the long-time growth of industries, and recent developments indicate that the historic balance among all industries in their competition for the consumers' dollar is due for a major upset. The long-time growth of an industry, as measured by the physical volume of its output, is usually characterized by four fairly well-defined stages. First is an experimental period during which the enterprisers stumble through numerous elementary improvements in both the process and the product. It is a pioneering stage in which markets have to be developed, costs are high, and many enterprisers fail to make the grade. It has been characterized as the "shirt losing" period. The second is a period of rapid progress in which major defects in the product have been eliminated, the process has been materially improved, and unit costs are reduced as market acceptance is obtained for the product. The third is a period of diminished rate of growth. Technical progress slackens because additional improvements in either process or product are more difficult to make. Demand continues to grow, but at a slower pace because the cream of the market has already been skimmed and an increased proportion of the total output is in the nature of a replacement demand. The fourth, or final period, is one of stability or decline. Continued improvements in the process or product occur less frequently and are more in the nature of minor refinements. Additional output can be obtained only at increased advertising and promotional expenses and substitute products are likely to cut in on the market.

While every industry goes through these stages of economic life, it sometimes happens that a major improvement in technology of a revolutionary nature gives the industry a new lease on life and causes the entire cycle to repeat, as it did in the glass container industry shortly after the introduction of automatic bottle blowing machines at the turn of the century. Similar developments may take place in chemi-

cals or textiles or food processing or aircraft. When a new industry is pushing ahead rapidly in its second stage of growth or when an old industry undergoes a rejuvenation by reason of a significant improvement in technology, the effects fan out through all sectors of the economy. New capital is required, and existing jobs are replaced by new employment opportunities. Closely related industries find the competitive going more difficult, and remotely related industries may be affected by the market stampede for the new products or existing products available at greatly reduced prices.

Technological changes exert great influence on our standards of living and modes of life. Our diets have been greatly affected by new methods of food preservation, modes of travel have been revolutionized by the automobile and the airplane, new controls over sound and light waves are completely changing the arts of entertainment, and important medical discoveries are prolonging the span of life so that the age composition of the population is undergoing substantial change. "Mr. Average Man" is older than he was a generation or two ago.

Recent discoveries of the close family relationship between matter and energy have opened up entirely new fields for exploration. It does not take much imagination to suppose that past accomplishments will be completely overshadowed in such areas as control over disease, generation and transmission of power, and more economical utilization of our natural resources. Today's dreams, like wireless transmission of power or 1,000-miles-an-hour air schedules, may be tomorrow's realities. In the words of Lewis Mumford: ". . . however far modern science and techniques have fallen short of their inherent possibilities, they have taught mankind at least one lesson: nothing is impossible."

BUSINESS STATISTICS

Production

Philadelphia Federal Reserve District

Indexes: 1923-25 = 100	Adjusted for seasonal variation						Not adjusted		
				Per cent change					
	Aug. 1948	July 1948	Aug. 1947	Aug. 1948 from Mo. ago	Aug. 1948 from Year ago	1948 from 8 mos. 1947	Aug. 1948	July 1948	Aug. 1947
INDUSTRIAL PRODUCTION	110p	112	108r	− 1	+ 2	+ 2	111p	107	109r
MANUFACTURING	111p	114	109	− 2	+ 2	+ 3	112p	110	110
Durable goods	115p	118	113	− 3	+ 1	+ 4	.....	.....	.....
Consumers' goods	106p	109	101r	− 3	+ 5	+ 3	.....	.....	.....
Metal products	135	139r	132	− 3	+ 2	+ 1	141	136	138
Textile products	79p	80	72r	− 2	+ 9	+ 9	74p	74	68r
Transportation equipment	124p	120	141r	+ 3	−12	− 1	119p	117	134r
Food products	124p	134	126	− 7	− 2	− 3	128p	122	131
Tobacco and products	121	106	108r	+14	+12	+ 2	129	115	116r
Building materials	46p	48	46r	− 3	+ 1	+ 9	53p	52	52r
Chemicals and products	181p	183	174r	− 1	+ 4	+ 7	182p	181	175r
Leather and products	75p	87r	90	−14	−17	+ 3	76p	79r	92
Paper and printing	121	120r	121	0	0	− 1	118	117	118
Individual Lines									
Pig iron	116	113r	113	+ 3	+ 3	0	102	104r	99
Steel	117	126r	112	− 7	+ 4	+ 4	119	115r	114
Iron castings	95	69	91	+37	+ 4	− 2	92	66	88
Steel castings	106	54	124	+94	−15	− 4	101	49	119
Electrical apparatus	181	188r	181	− 4	0	− 1	201	198r	200
Motor vehicles	35	31r	54	+11	−36	−33	29	32r	45
Automobile parts and bodies	111	110	143	+ 1	−22	−10	105	105	134
Locomotives and cars	65	63r	56	+ 3	+17	+ 6	65	63r	56
Shipbuilding	.....	.....	.....	+ 2	− 1	+16	.....	.....	.....
Silk and rayon	93	94	85	− 1	+ 9	+ 7	90	92	83
Woolens and worsteds	77p	84	72r	− 8	+ 7	+13	79p	78	74r
Cotton products	37p	38	42	− 3	−10	−14	34p	33	38
Carpets and rugs	120p	117	101r	+ 3	+19	+26	111p	108	94r
Hosiery	93	95	80	− 2	+16	+15	81	78	70
Underwear	131	150r	142	−13	− 8	+ 5	122	125r	132
Cement	70p	75	68r	− 6	+ 3	+17	88p	87	85r
Brick	55	57	56	− 4	− 3	+ 1	57	55	59
Lumber and products	28	26	27	+ 5	+ 1	+ 5	30	29	29
Bread and bakery products	.....	.....	.....	− 2*	0*	− 1*	113	116	113
Slaughtering, meat packing	100	99	99	+ 1	0	+ 5	88	90	88
Sugar refining	87	79	111	+11	−21	−17	75	80	95
Canning and preserving	201p	238	201	−15	0	− 5	222p	187	225
Cigars	122	107	108r	+14	+13	+ 3	131	116	115r
Paper and wood pulp	98	99	94	− 1	+ 4	+ 6	98	95	94
Printing and publishing	126	125	127	+ 1	− 1	− 2	122	121	123
Shoes	75p	84r	90	−11	−17	+ 2	81p	78r	97
Leather, goat and kid	75p	90r	90	−17	−17	+ 5	72p	79r	87
Explosives	113	114r	120	− 1	− 6	+16	113	112r	120
Paints and varnishes	121	129	111	− 6	+ 8	+ 8	123	120	114
Petroleum products	243p	244	233r	0	+ 4	+ 7	244p	245	234r
Coke, by-product	176p	172	171	+ 2	+ 3	+ 1	173p	169	168
COAL MINING	78	67	76	+16	+ 3	+ 1	77	65	75
Anthracite	74	63	72	+17	+ 3	+ 3	74	63	72
Bituminous	107p	96	104	+11	+ 2	−10	100p	84	98
CRUDE OIL	282	290	279	− 3	+ 1	0	282	290	279
ELECTRIC POWER—Output	501	493	481	+ 2	+ 4	+ 8	476	458	457
Sales, total	519	493	473	+ 5	+10	+10	493	463	449
Sales, to industries	353	328	333	+ 8	+ 6	+ 8	364	335	343
BUILDING CONTRACTS									
TOTAL AWARDS†	218	290	143	−25	+52	+59	211	267	139
Residential†	131	151	68	−13	+94	+41	147	171	76
Nonresidential†	221	347	150	−36	+48	+76	204	319	138
Public works and utilities†	474	489	370	− 3	+28	+48	412	420	322

* Unadjusted for seasonal variation.
† 3-month moving daily average centered at 3rd month.
p—Preliminary.
r—Revised.

Local Business Conditions*

Percentage change—August 1948 from month and year ago	Factory employment		Factory payrolls		Building permits value		Retail sales		Debits	
	July 1948	Aug. 1947	July 1948	Aug. 1947	July 1948	Aug. 1947	July 1948	Aug. 1947	July 1948	Aug. 1947
Allentown	+ 1	− 3	+ 3	+ 5	+83	+ 13	0	+38	− 4	+20
Altoona	+ 1	+ 3	+ 1	+18	+21	+456	+ 3	+ 7	− 2	+20
Harrisburg	0	− 1	+ 1	+ 9	+21	+109	0	+ 9	− 1	+20
Johnstown	+ 1	0	+ 3	+15	−12	− 4	+ 7	+14	0	+16
Lancaster	0	+ 8	+ 2	+17	+71	+253	−12	− 1	− 5	+ 8
Philadelphia	+ 2	+ 1	+ 4	+10	+38	− 8	+13	+13	+17	+48
Reading	+ 3	+ 6	+ 7	+22	+14	− 21	− 3	+ 5	− 1	+ 5
Scranton	− 1	0	0	+16	−42	+ 2	+ 6	+ 4	− 3	+21
Trenton	.....	.....	.....	.....	+ 3	+ 65	+ 1	+16	+14	+14
Wilkes-Barre	0	+ 3	− 2	+11	− 8	+ 15	+ 4	+18	− 8	+28
Williamsport	+ 1	+ 5	+ 2	+11	−90	− 59	.....	.....	− 8	+ 7
Wilmington	− 2	+ 6	0	+15	−16	− 1	+ 5	+17	−17	+21
York	+ 2	− 2	+ 3	+11	0	+180	− 5	+ 6	− 4	+22

* Area not restricted to the corporate limits of cities given here.

Production Workers in Pennsylvania Factories

Summary Estimates—August 1948

	Employment	Weekly Payrolls	Weekly Man-Hours Worked
All manufacturing	1,101,000	$57,289,000	43,468,000
Durable goods industries	626,700	36,002,000	25,031,000
Nondurable goods industries	474,300	21,287,000	18,437,000

Changes in Major Industry Groups

Indexes (1939 average = 100)	Employment			Payrolls		
	Aug. 1948 Index	Per cent change from July 1948	Per cent change from Aug. 1947	Aug. 1948 Index	Per cent change from July 1948	Per cent change from Aug. 1947
All manufacturing	128	+1	0	298	+5	+11
Durable goods industries	155	+1	0	343	+6	+11
Nondurable goods industries	105	+1	0	244	+2	+11
Food	126	+1	− 2	251	−4	+ 5
Tobacco	99	+5	− 3	219	+6	+ 1
Textiles	85	+1	+ 6	220	+3	+19
Apparel	93	+3	− 1	235	+5	+12
Lumber	96	+3	+ 6	215	+5	+14
Furniture and lumber prods.	94	+3	0	223	+2	+ 7
Paper	118	−1	− 2	266	+3	+10
Printing and publishing	136	0	0	276	+2	+ 7
Chemicals	123	0	+ 3	269	+3	+12
Petroleum and coal prods.	157	+2	+ 6	326	+3	+23
Rubber	144	0	− 9	292	+3	− 7
Leather	86	0	− 9	177	+1	− 4
Stone, clay and glass	136	+3	+ 1	303	+7	+12
Iron and steel	141	+2	0	312	+9	+13
Nonferrous metals	137	+1	−11	291	+6	+ 2
Machinery (excl. electrical)	209	0	+ 4	455	+3	+15
Electrical machinery	227	+1	+ 1	488	+4	+ 6
Transportation equip. (excl. auto)	233	+1	+14	458	+8	+29
Automobiles and equipment	146	−2	−18	305	0	−21
Other manufacturing	131	0	− 3	258	+4	+ 3

Average Earnings and Working Time

August 1948 Per cent change from year ago	Weekly Earnings		Hourly Earnings		Weekly Hours	
	Average	Ch'ge	Average	Ch'ge	Average	Ch'ge
All manufacturing	$52.03	+10	$1.318	+10	39.5	+ 1
Durable goods indus.	57.45	+10	1.438	+ 9	39.9	+ 1
Nondurable goods industries	44.88	+10	1.155	+11	38.9	0
Food	44.63	+ 7	1.083	+ 8	41.2	− 1
Tobacco	29.10	+ 4	.761	+ 3	38.2	+ 1
Textiles	46.12	+13	1.186	+13	38.9	0
Apparel	35.63	+13	.962	+12	37.0	+ 1
Lumber	41.75	+ 7	1.031	+13	40.5	− 5
Furniture and lumber products	43.74	+ 8	1.029	+ 7	42.5	+ 1
Paper	48.83	+12	1.127	+11	43.3	+ 1
Printing & publishing	57.29	+ 7	1.501	+ 8	38.2	− 1
Chemicals	52.15	+ 8	1.279	+12	40.8	− 3
Petrol. & coal prods.	63.28	+17	1.614	+15	39.2	+ 1
Rubber	50.28	+ 2	1.385	+ 6	36.3	− 3
Leather	35.26	+ 5	.993	+ 7	35.5	− 1
Stone, clay and glass	51.06	+11	1.245	+10	41.0	+ 1
Iron and steel	59.87	+12	1.500	+ 9	39.9	+ 3
Nonferrous metals	55.46	+14	1.393	+10	39.8	+ 4
Machinery (excl. elec.)	55.33	+10	1.384	+ 9	40.0	+ 1
Electrical machinery	60.00	+ 5	1.535	+ 6	39.1	− 1
Transportation equip. (excl. auto)	59.89	+13	1.541	+13	38.9	0
Automobiles & equip.	57.36	− 3	1.458	+ 9	39.3	−12
Other manufacturing	41.07	+ 6	1.124	+ 8	36.5	− 2

Distribution and Prices

Wholesale trade Unadjusted for seasonal variation	Per cent change: August 1948 from Month ago	Year ago	1948 from 8 mos. 1947
Sales			
Total of all lines	+ 6	+11	+ 4
Dry goods	+12	− 1	− 7
Electrical supplies	+23	+12	+ 4
Groceries	− 5	+10	+ 9
Hardware	+16	+22	0
Jewelry	+ 7	− 2	+ 8
Paper	+ 9	− 6	0
Inventories			
Total of all lines	0	+13	.....
Dry goods	− 3	+13	.....
Electrical supplies	+ 4	0	.....
Groceries	+ 7	+11	.....
Hardware	− 3	+16	.....
Jewelry	+ 6	+18	.....
Paper	+ 1	+47	.....

Source: U. S. Department of Commerce.

Prices	Aug. 1948	Per cent change from: Month ago	Year ago	Aug. 1939
Basic commodities (Aug. 1939 = 100)	317	− 3	+ 3	+217
Wholesale (1926 = 100)	169	0	+10	+126
Farm	191	− 2	+ 5	+213
Food	190	+ 1	+10	+182
Other	153	+ 1	+12	+ 91
Living costs (1935-1939 = 100)				
United States	175	0	+ 9	+ 77
Philadelphia	175	+ 1	+10	+ 78
Food	213	+ 1	+11	+128
Clothing	194	0	+ 7	+ 96
Rent	119	.....	.....	+ 16
Fuels	143	+ 5	+12	+ 48
Housefurnishings	203	+ 2	+11	+102
Other	150	+ 1	+ 8	+ 49

Source: U. S. Bureau of Labor Statistics.

Indexes: 1935-1939 = 100	Adjusted for seasonal variation: Aug. 1948	July 1948	Aug. 1947	Per cent change: August 1948 from Month ago	Year ago	1948 from 8 mos. 1947	Not adjusted: Aug. 1948	July 1948	Aug. 1947
RETAIL TRADE									
Sales									
Department stores—District	289	288	257r	0	+12	+10	216	207	193
Philadelphia	263	240	231	+10	+14	+ 8	179	161	157
Women's apparel —District	224	245	218	− 9	+ 3	+ 3	188	157	183
Philadelphia	231	239	224	− 3	+ 3	+ 3	187	148	182
Furniture	.....	.....	.....	+ 4*	+ 6*	.....	.....	.....	.....
Inventories									
Department stores—District	234	238	206	− 2	+13	.....	243	226	214
Philadelphia	203	209	196	− 3	+ 4	.....	213	192	205
Women's apparel —District	214	206	195	+ 4	+10	.....	237	186	216
Philadelphia	229	239	222	− 4	+ 3	.....	266	201	258
Furniture	.....	.....	.....	+ 2*	+ 6*	.....	.....	.....	.....
FREIGHT-CAR LOADINGS									
Total	139	136	145	+ 2	− 4	− 5	140	138	147
Merchandise and miscellaneous	122	121	131	+ 1	− 7	− 6	126	121	135
Merchandise—l.c.l.	74	70	88	+ 6	−16	−15	74	70	88
Coal	172	163	170	+ 5	+ 1	− 5	156	155	155
Ore	187	199	191	− 6	− 2	+ 2	278	298	285
Coke	208	190	185	+10	+13	+ 1	194	175	172
Forest products	79	90	90	−12	−12	− 8	96	101	109
Grain and products	125	121	151	+ 3	−18	−16	121	162	147
Livestock	63	72	89	−11	−29	−23	61	61	85
MISCELLANEOUS									
Life insurance sales	203	191	201	+ 6	+ 1	+ 1	171	185	169
Business liquidations									
Number	.....	.....	.....	−21*	+35*	+45*	34	43	25
Amount of liabilities	.....	.....	.....	−33*	+ 6*	+45*	32	48	30
Check payments	308	249	224r	+24	+38	+15	265	239	192

* Computed from unadjusted data. r—Revised.

BANKING STATISTICS

Reporting member banks (Millions $)	Sept. 22, 1948	Changes in—: Four weeks	One year
Assets			
Commercial loans	544	+14	+ 85
Loans to brokers, etc.	16	− 3	− 12
Other loans to carry secur.	12	− 1	− 3
Loans on real estate	88	+ 3	+ 9
Loans to banks	6	+ 4	+ 2
Other loans	272	+ 5	+ 56
Total gross	938	+22	+137
Total net	931	+22	+133
Government securities	1378	+37	−107
Other securities	282	− 1	+ 28
Total investments	1660	+36	− 79
Total loans & investments	2591	+58	+ 54
Reserve with F. R. Bank	519	+28	+ 34
Cash in vault	44	+ 1	− 1
Balances with other banks	100	.....	+ 6
Other assets—net	50	− 6	− 1
Liabilities			
Demand deposits, adjusted	2079	+46	+ 23
Time deposits	459	+16	+ 36
U. S. Government deposits	66	+ 5	+ 37
Interbank deposits	352	+ 8	− 23
Borrowings	16	+ 5	+ 16
Other liabilities	29	+ 1	+ 3
Capital account	303	.....	.....

MEMBER BANK RESERVES AND RELATED FACTORS

Third Federal Reserve District (Millions of dollars)	Changes in weeks ended—: Sept. 1	Sept. 8	Sept. 15	Sept. 22	Changes in four weeks
Sources of funds:					
Reserve Bank credit extended in district	+ 7	−14	+25	− 8	+10
Commercial transfers (chiefly interdistrict)	− 9	+11	−19	+65	+48
Treasury operations	−25	+30	+31	−21	+15
Total	−27	+27	+37	+36	+73
Uses of funds:					
Currency demand	+ 3	+10	−10	− 9	− 6
Member bank reserve deposits	−29	+17	+44	+48	+80
"Other deposits" at Reserve Bank	− 1	.....	+ 3	− 3	− 1
Other Federal Reserve accounts	.....	.....	.....	.....	.....
Total	−27	+27	+37	+36	+73

Federal Reserve Bank of Phila. (Dollar figures in millions)	Sept. 22, 1948	Changes in—: Four weeks	One year
Discounts and advances	$ 24.5	$+ 3.0	$+ 20.4
Industrial loans	.7	+ .2	− 1.2
U. S. securities	1561.5	+28.6	−125.1
Total	$1586.7	$+31.8	$−105.9
Fed. Res. notes	$1640.7	$+ 4.9	$− 17.3
Member bank deposits	911.6	+79.9	+ 81.7
U. S. general account	84.9	−82.4	+ 21.4
Foreign deposits	29.9	+ 1.9	+ 1.3
Other deposits	2.0	− .8	.....
Gold certificate reserves	1080.4	−30.9	+187.8
Reserve ratio	40.5%	−.8%	+5.9%

Member bank reserves (Daily averages; dollar figures in millions)	Held	Required	Excess	Ratio of excess to required
Phila. banks				
1947: Sept. 1-15	$424	$419	$ 5	1%
1948: Aug. 1-15	396	392	4	1
Aug. 16-31	398	393	5	1
Sept. 1-15	407	399	8	2
Country banks				
1947: Sept. 1-15	$394	$344	$50	14%
1948: Aug. 1-15	416	370	46	12
Aug. 16-31	413	371	42	11
Sept. 1-15	428	372	56	15