Sherman, Arthur E
A comparative study of
the lumber industry...

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A COMPARATIVE STUDY OF THE LUMBER INDUSTRY WITH SPECIAL REFERENCE TO PRICES, EMPLOYMENT, WAGES, AND PRODUCTION

by

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PREFACE

Lumber as a construction material has held an important position in the economy of the United States from the early colonial days down to the present. The industry behind this valuable product has gone through a number of periods of transition all of which have left it changed in some fundamental way.

In the days when logging was largely a matter of clearing the land the economics of the lumber industry were comparatively simple. Timber was abundant and often without value. It came to be accepted as an inexhaustible raw material the use of which was the natural heritage of the pioneer. As populations spread out from the centers of the East, this idea was carried with them to the new lands first beyond the Alleghenies, then beyond the Mississippi and finally to the shores of the Pacific. Like the land itself, timber, though serving as no other raw material could, was looked upon as a resource to be exploited in the satisfaction of the needs of the settler. As populations began to expand both in size and demands, lumber assumed the role of an ever diminishing commodity. The industry which had its inception in the East moved south and west and as it moved took with it various economic problems which after a number of periods of transition have emerged in the form in which we find them today.

Like agriculture lumbering is fundamentally an industry of the soil while in many ways it has characteristics more accurately reflected in some extractive or even manufacturing industry. Lumber prices in some respects are closely tied to those of agricultural commodities, in others more closely akin to prices of industrial products, while in still other basic features they seem to have little connection with either.

Employment in the industry, likewise has shown the characteristics of an industry of the soil while at the same time exhibiting a more than accidental similarity to manufacturing and the extractive industries. With the political, financial, and technological developments since the days of the pioneer this latter similarity becomes more and more pronounced; labor organization, usually considered an industrial attribute, being a case in point.

Still another feature of the lumber industry showing characteristics some of which are basically industrial while others are chiefly agricultural, is wages. In deriving a large portion of its labor from the rural section of the population, the lumber industry assumes a nature, with respect to wages, somewhat akin to agriculture. On the other hand as a result of economic and financial developments, wages in lumbering have assumed many of the aspects of those of industry.

Production and productive capacity are other points of vital importance in any comparison between industry, agriculture, and lumbering. While production in the latter industry

exhibits a character very similar to that of the manufacturing and extractive industries, it can hardly be said that while it is basically of the soil, it is entirely devoid of any of the features of an agricultural industry.

It is this problem of the inter-relations which exist between agriculture, lumbering and industry in general which forms the question of this paper. What ties between these closely related fields can be assumed and to what other ties does existing information point? Is it safe to predicate our forecastings in the lumber industry on agriculture alone or will industry more truly tell the story? Or would a blending and fusing of certain basic characteristics of both give a more final answer?

The writer wishes to express his appreciation to Dean S. T. Dana of the School of Forestry and Conservation, University of Michigan and also to Professor O. W. Blackett of the School of Business Administration for suggestions and invaluable supervision in this study.

TABLE OF CONTENTS

TABLE OF CONTENTS (CONT'D).

LIST OF TABLES

LIST OF CHARTS

PROCEDURE

Several reasons are advanced for the choice of the period selected for the study. First, between the years 1914 to 1939 occur every possible type of economic phenomenon. Following the years of the first World War, during which business conditions stood at an unprecedentedly high level, an exceptionally fine opportunity to evaluate conditions in sudden deflation is presented. Not only was the depression of 1921 sharply defined but in addition it carried markets to a new low which provides a chance to examine prices, wages, employment and production under dire economic stress, the recovery in 1931 unlike that following the crash in 1929 was clearly defined and without recession, in other words the type of recovery which in contrast to that of the later years showed a more healthy economy. The years after the first post-war depression were years of a stable and expanding business world with still other features of lumbering, agriculture, and industry available for study. This period is terminated in 1929 by over-expansion and collapse. Thus the conditions of 1920 are repeated but on a more grand scale without the stimulus of war-time inflation. So again in the thirties another depression is encountered but of a different nature than the first and of much greater duration. The low covered a greater period and recovery was much slower while several minor and one major recession occurred.

Within the scope of the lumber industry are found all of the activities involved in producing and preparing the raw forest material employed in the secondary wood using and wood producing industries. Logging and sawmilling are the primary activities of the industry. Seasoning and planing of lumber as well as shingle, veneer, box, and cooperage production, while closely allied to the lumber industry, are for the most part distinguished by different characteristics and problems and are related only in so far as the raw material used in the processing and wood using plants originates in the lumber industry. For this reason only logging and sawmilling are included in this study.

Basic data for the lumber industry were obtained from reports of the United States Bureau of the Census, United States Department of Agriculture and the Monthly Bulletins of the Board of Governors of the Federal Reserve Bank. Data for business and industry come largely from the Statistical Abstract of the United States as well as from various business reviews and periodicals. Material for construction of Appendix Charts showing general business conditions was obtained from "Federal Reserve Charts on Bank Credit, Money Rates and Business."

In the construction of the charts the method employed by the Federal Reserve Board in their graphs on banking credit and business was followed. This consists in the selection of a base year not only near the normal for the period but that also produces curves emphasizing trends and economic reactions. In most cases the year selected was in the middle twenties which was a period of rather stable business conditions. All

data were then reduced to a percentage of the base value and plotted over the appropriate year. In the case of Appendix Charts AI and AII values represented are in billions of dollars while Chart AIV shows interest rates in actual interest percent. In some cases, as for example the lumber employment curve, data were available for alternate years. On the other hand business averages by months were given by Federal Reserve Bulletins thus making a much more entailed chart possible. Despite the handicap of occasionally limited material, it is possible to establish certain trends which hold throughout the period studied.

In some cases it was impractical because of the radical fluctuations occurring in certain industries to reduce the data to chart form. The basic material was therefore tabulated and analyzed in the discussion. While being less satisfactory, it is thought that the reader will have little difficulty in following the analysis.

Throughout the study the underlying motive is an attempt to draw out certain conclusions from comparison of material presented for agriculture, lumbering, and industry. In some cases industries typical of the general trend are selected for study while in other cases attempt is made to point out the contrast between a specific industry, such as the extractive enterprises and lumbering. Wherever such a procedure was followed, it was because the industry selected was found to be typical of industry in general or of a certain section of industry. For other comparisons, for example Douglas fir wage rates, lumbering is likewise broken down into sections or regions which are used to

show certain general reactions.

ECONOMIC HISTORY 1914-1939

The Section of American history between the year 1914 and 1939 may be broadly divided into three rather distinct periods in which one finds economic conditions ranging from complete financial collapse to "booms" of unprecedented business activity. These periods may be defined as the war years from 1914 to 1920 during which prosperity was the dominant feature, the period from 1920 to 1929 covering the first post war depression to the period of over expansion leading to collapse in 1929 and lastly the depression and recovery. In order that full weight may be given the basic factors governing the economic fortunes of the lumber industry and also that an understanding of the factors which have helped to determine the conditions prevailing in the fields which the following work attempts to correlate with the lumber industry the ensuing pages are devoted to a more or less detailed outline of business conditions throughout the period.

THE FIRST WORLD WAR 1914-1920

The complete economic unpreparedness of 1914 resulted not so much in financial panic as in complete paralysis. The ten percent Bank of England rates, the moratorium on debts, prohibition of gold exports, the recourse of every European

government to paper money paint vividly a picture of shock and confusion throughout the world.

Because business was of essentually sound health, however, the reaction to new markets was automatic and rapid with New York becoming the financial center of the world. Re-establishment of confidence commenced. Deficits changed to surpluses, discount rates came down from the eight percent rate to four by mid winter, gold exports ceased and America turned toward the happy expectation of capitalizing on our period of neutrality.

The effect upon the American situation of European requirements for war material seemed at first to be inconsiderable but the situation changed very suddenly. Britain's production was in arrears. Tactics were changing and demands for the new materials of war such as tanks and planes were clamorously sanctioned by a radical change of British governmental policy. As Noyes explains in his book "War Period of American Finance"[1] this meant unlimited requisition on American manufacturers. Not only did munitions exports shoot skyward but foodstuffs, cotton goods, and shoes caught the fever as well. There was hardly an enterprise in American industry which by 1916 was not making phenominal reports and the scope of trade expansion was vividly reflected in banking activity. Everywhere economic good fortune seemed to be working for the United States.

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[1]Noyes, Charles Dana., War Period of American Finance. pp. 110-116.

Such was the beginning of the "war boom" in our domestic trade, surpassing in scope all previous episodes of the kind in the country's history. A spectacular expansion of trade activity ensued. The amount of bank checks exchanged and currency in circulation had far outrun all precedent (Chart AI Appendix). Prices of commodities had risen also. The "index number" of the United States Labor Bureau, based on 100 as the average of 1913, worked out at 99 in 1915 but by the middle of 1916 was at 146.[1] With credit thus abundant and with profits of trade and industry rising to exceptional heights the stock exchange was bound to reflect the situation in unheard of activity (Chart AIII Appendix).

Into these conditions of unprecedented prosperity was projected the election of 1916. The vote by states was astonishly close and only in the full count, not completed until three days later, was Mr. Wilson's victory certain. Events thereafter moved with unbelievable rapidity. Relations with the Central Powers became more strained. Repeated incidents and affronts led finally to the handing of his passport to Count Bernstorff and in April 1917 to the declaration of war.

With our entrance into the war, the first question to which the government had to address itself was that of meeting the financial demands of the Army and Navy. The answer was the "war finance bill" of April 1917, issuing interest bearing notes and long term bonds, the proceeds of which were to be

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[1]Jennings. The History of Economic Progress of the United States.

used to meet expenditures authorized for defense or to purchase foreign obligations; the origin of the celebrated war debt.

It was during this time of fast moving financial phenomena that the railroads came to grief. Congestion on the roads grew worse as the war developed, reaching such a state that in December 1917, President Wilson accepted the view that governmental operation was inevitable and announced that all railways would be taken over.

At the very moment in which this new chapter of railroad history was unfolding, the government was forced to immediate action on the piece of food. The American wheat crop of 1916 had run short and wheat skyrocketed on all world markets. Congress passed a measure permitting the President to determine and fix a reasonable price also allowing him to buy wheat at the fixed price and dispose of it to any citizen or foreign government.

As a natural consequence of tremendous demands on industry by the warring powers, prices reached new peaks. The situation plainly demanded regulation yet the only official body was the War Industries Board organized with purely advisory powers. Finally after conditions had reached the stage of collapse, the President extended the functions and powers of the Board. The chairman, Mr. Baruch, commenced at once formulation and application of price control, economy and conservation. Exercising these legally vague but practically very effective powers, the War-Industries Board brought down the

price of steel billets to $45 per ton with similar corrections in various other products.

In spite of adverse foreign exchange and immensely increased taxes, the economic position of the United States in the last stages of the war was in all essential respects extraordinarily strong. The export surplus ran well beyond $3,000,000,000. The gold import movement of 1916 had ceased while our advances to foreign powers made us undoubtedly the creditor nation of the world.

DEPRESSION AND INFLATION 1920-1929

With the coming of peace, the artificiality of the prevailing prosperity keyed up by war and, in the case of wheat, by the government's high guaranteed price was to become evident. Shrinkage was inevitable. The serious aspects of the situation were further complicated by the problem of labor. Disbanding of the citizen army and suspension of war production created so menacing a condition that widespread government relief seemed the only possible solution to the situation. Few foresaw the turn in events which was destined shortly to open our markets to a new post war prosperity. The turn came first in the very direction where the general public at the time of the armistice least expected it--in the export trade. The world outside of the United States had been virtually deprived of ordinary necessities during four successive years. The value of our export trade even in January 1919 was $118,000,000 greater than in the same month of 1918. So the

year 1919 drew to a close amid rapidly expanding trade and a belief in scarcity and unlimited price increases which latter was found to be complete illusion. Prices rose with a resultant extension of the already large speculation in basic raw materials. As afterwards described by a high banking authority it presented a picture of "an unprecedented orgy of extravagance, a mania for speculation, over-extended business in every section of the country, and general demoralization of the agencies of production and distribution."

It became evident that the country's credit organism was being subjected to a dangerous strain aggravated by outstanding short term government committments.

At about this time the money market's position also became complicated by two other incidents--the suspension of sterling purchases by the British and a continuing low discount rate which tempted speculators into the market. The nation-wide speculation, which converged on the New York Stock Exchange began fairly to run wild. It became evident that action on the question of easy money could no longer be postponed.

On November 3, 1919, the governor of the New York Reserve Bank announced an advance in that institution's rediscount rate. The effect on Stock Exchange speculation was immediate though temporary. The extravagant movement in the commercial markets continued. The rise in the cost of living, especially clothing and rent, (Chart AV) outraced even the advance in wholesale prices; labor costs were a source of ever increasing pressure. In the retail trade a new phenomenon

presently began to be discussed--the consumer's strike. But this attitude of public protest failed to check the movement. The Federal Reserve Bank was forced to act again, increasing its discount rate to seven percent. These signs of the times unmistakably portended the approach of financial crisis.

The warning came first from the outside when the speculative rage in Japan collapsed. Deflation was under way, average prices of commodities, which reached high-record for the period in May 1920, fell fourteen percent before Autumn, the decline in clothing being twice as great.

The falling Stock Market did not recover. Extreme tension in the money rates continued causing stocks and bonds to decline on the open market to such an extent that large scale liquidation of the Liberty and Victory Bonds occurred (Chart AIII Appendix).

It was amid this series of confusing events in finance and industry that the presidential election was held which resulted in a majority of wholly unprecedented magnitude against the party in power. The response by the stock market was in all respects disheartening with the declines during election week in industrials and railroads foreshadowing the crash.

Sweeping trade reaction and deflation were by now absolutely world wide phenomena with some of the largest wholesale purchasers unable to pay for the goods which had been sold to them. In the later month of 1920 the commercial machinery of the entire outside world came virtually to a stop. Although the American market was almost the last to face the dilemma on

its own account, it was deeply concerned with the foreign situation because of the unprecedented magnitude of both our imports and exports. Our effort to grasp the opportunity of world wide demands resulting from the war had been rashly overdone. It was impossible that either home or foreign banks could continue to finance indefinitely this speculative business. But when along with other difficulties, the credit on which merchants had been reckoning began to fail, a very critical situation was inevitable. So it was not strange that failures in American business in the third quarter of 1920 should have been greater by 1,903 in number and by $104,194,750 in liabilities than in the same months of 1919 or that, with the inevitable curtailment of production, the number of unemployed laborers should have increased 3,473,000 over the previous year. In the speculative markets, in home and foreign trade, in the entire field of American credit, the stage was set for widespread panic. Merchants faced expiring loans with nothing but cancelled and returned orders while the Stock Market was ridden with falling prices and over speculation. The banking position was indicated by the fact that, instead of reducing the enormous loan account necessarily put out in war time, the eight thousand national banks had enlarged their loans and discounts, between the middle of 1919 and September 1920, by $1,840,924,000.

The chain of financial calamity, stretching from the Wall Street speculator to the wholesale and retail merchant and thence to the agricultural producer, embodied in extremely aggravated shape the very element which brought the country's

credit structure to the breaking point. Prices on the stock exchange at the end of 1920 stood 33 percent under the average of April (Chart AIII Appendix). The country's production of steel fell from 42,132,000 tons in 1920 to 19,783,000 in 1921. Checks drawn on American banks in 1921 were less in aggregate value than those of 1920 by $113,000,000,000. Mercantile failures of 1921 were not only numerically more than double those of 1920, but in liabilities involved, they exceeded by $269,500,000 the highest previous yearly figure. The deflation process was as complete as it was swift. It left American finance and industry, by the middle of 1921, in a condition which rendered prediction of the future extremely difficult.

The post war deflation may be said to have run its course by the end of 1921 or the beginning of 1922. American price averages having fallen from May 1920 to January 1922 had recovered somewhat as early as March of 1923 and did not vary greatly for the next three years. The chapter which followed was necessarily made up of the prolonged and trying task of reconstruction; in the United States marked by readjustment of finance and industry to the changed conditions of the outside world.

The sudden and sweeping "deflation" of agricultural prices brought a great part of the farming districts, West and South, to a condition where loans granted by banks to farmers either had to be closed out when the security was not now worth half the face of the loan or else had to be indefinitely extended. When cotton had fallen from 43-3/4 cents

a pound in July to 23 in October, the Southern growers demanded that the ginners should cease altogether turning out cotton in marketable form until the price had recovered to 40 cents. Wheat had fallen to $1.00 per bushel in the autumn of 1921, which was a pre-war valuation and which in the case of many farmers, did not meet the still greatly increased cost of the necessary material and of farm labor; the average monthly wage paid Western farm hands in 1920 having been $73.36 against $33.51 in 1915, an increase of 126 percent.

But this was not the only factor in the farming West's financial embarrassment. During the high grain prices of the war years, the Western farmer had commonly invested his profits in additional acreage, for which he paid prices far above any precedent; few of them had established reserves of cash or available assets against a possible turn of fortune. Mortgages on the farms of the four Northwestern grain states had in 1920 risen to a total value nearly 20 percent above that of 1910, and the greater part of the increase was based on wartime wheat prices of $2.25 and upward. When wheat fell below $1.50 per bushel at the end of 1920 and below $1.00 in 1921, the bank loans of the farmers became simply unpayable. Some of the farm debt was foreclosed; in the four years beginning with 1920, out of 203,040 Northwestern farmers 5,388 went thus into actual bankruptcy. But the greater number of competent farmers were "carried" by their banks, which meant that not only older loans already due for payment were extended indefinitely but that new credit had to be granted to make possible the planting of the new crop. The Agricultural West and South were in fact

insolvent, the resources of their banks were tied up in non-collectable loans.

Not only did wheat at Chicago fall during 1923 as low as 96½ cents a bushel, but this reversion to the prewar price occurred when the price of commodities which the farmer had to buy had recovered substantially from the low point reached in 1921 or 1922. The average of 1919 for agricultural prices had been 221 while the non-agricultural average was 199. Even in 1920, however, the agricultural average went below the other; in 1922, while the price of non-agricultural commodities averaged 168; that of agricultural products averaged only 136¼.

It was a difficult question for the economic future. Although fortune favored the American grain producer in 1924, when the world's wheat production decreased more than 400,000,000 bushels from the year before, yet when the American crop increased 75,246,000 there was no assurance that the happy accident would be repeated. The harvest of 1924 was a very timely windfall; sold as the wheat crop was for an amount $400,000,000 greater than the valuation of the crop of 1923, and brining much the largest aggregate return of any wheat yield since 1920, it released the greater part of the agricultural "frozen credits" left after 1920. Yet the next years world harvest was some 250,000,000 bushels larger while our own was decreased by 193,262,000. This during the decade which is now sometimes spoken of as "the golden twenties" there existed the anomolous condition of a near bankrupt agricultur vieing with a prosperous and expanding industry.

The shortage of housing produced by the war resulted in

an upward movement of rents that continued till 1924, despite the fact that most other items in the cost of living had undergone a drastic price cut in 1920-1921 (Chart AV Appendix). The height of the building boom was reached in 1926-1928, though new contracts continued quite high for the next two years. It has been estimated that the amount of outstanding urban mortgage debt was tripled during these years.

Manufacturing in general after the reaction of 1920-1921 entered upon a period of fair prosperity as profits tended to rise. Federal tax cuts, low interest rates, (Chart AIV Appendix) and a high level of tariff duties helped further to strengthen the position of industry. On the credit market it was a decade of comparatively easy money and interest rates (Chart AIV Appendix) which increased the volume of long term debts (Chart AII Appendix) as well as tended to raise the price of all income-hielding property. Large runs went to the financing of installment sales from which an abnormal demand for durable consumers' goods arose.

Another outlet of surplus finds was found in the speculation on the stock markets which eventually developed into a movement far exceeding anything the country had ever before experienced.[1] In the two years after 1927 speculative interest, losing all sense of proportion, shot skyward at an unprecedented rate. The fact that by September 1929, New York brokers loans had risen to over $8.5 million suggests how extensively lendable

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[1]For discussion of post-war speculation see Noyes, Charles Dona, War Period of American Finance.

funds had been used for the support of this speculative craze which was pushing the country closer to financial disaster.

THE GREAT DEPRESSION AND RECOVERY 1929-1939

The crisis that broke with such unprecedented severity descended like a stroke from the blue upon a world little suspecting what was in store for it. In the last four months of 1929 the market value of stocks listed on the New York exchange decreased by $25 billion thus losing between a quarter and third of their value while deposits and currency, a censitive barometer of financial conditions, showed serious indications of economic strain (Chart AI Appendix).

The fall in the general level of prices during these years was precipitate and general throughout the world. In the more important countries the decline ranged from 30 to 40 percent of the 1929 level. Generally it was more marked in the case of agricultural products than in that of manufactured goods, except where counteracted by import restrictions. Wholesale prices fell to a point 38 percent below the 1929 peak, the low being reached early in 1933 at a point slightly below the prewar level. Farm prices, however, experienced a decline of almost 60 percent, dropping to a point about one-third below those of before the war. National income for 1933 was 44 percent below that for 1929. Whereas wage rates of hired farm labor were cut nearly in half, those of common labor were cut only one-quarter and those of factory workers less than one-fifth.

After 1930 interest rates fell to a low level and idle capital accumulated (Chart AIV). The process of withdrawing deposits and hoarding money began about the middle of 1931 and the question of bank solvency came to be of paramount importance. At the time of the crisis of 1933 the Federal Reserve ratio dropped to 53 which betokened danger. Over $1.5 billion was added to the amount of money in circulation. But, once such a run had gained full headway, no banking system could expect to stand up under it and when the new administration came into power in 1932, it found itself with a paralyzed banking system on its hands.

The first quick rebound from the bottom of the depression started in the spring of 1933 immediately following the general reopening of the banks. Temporarily stimulated by the N.R.A., it continued for about six months; but the last quarter of the year brought a slight reaction and 1934 opened with wholesale prices about 25 percent below the 1929 level. Production of nondurable goods was then a fifth below; production of durable goods was still less than half of normal. Estimated unemployment at this date had been cut to less than 11 million. The year 1934 brought no marked change in the general situation except for a sharp advance in the price of farm products, largely owing to poor crops, to a point about 30 percent below the 1929 level. This restored the price of farm products to a ratio as compared with non-farm products which was nearly the same as had prevailed just before 1929.

Between the years 1935 to 1927 there was, at first, a very moderate improvement and then, during the last twelve months,

a sharp advance. Production of non-durable goods reached the estimated normal by the close of 1936, while that of durable goods rose rapidly throughout the period and by the middle of 1937 was only about ten percent below normal. Meanwhile unemployment had been cut 5 million. Wholesale prices at the peak in April 1937 were only 8 percent below the 1929 level, and the more rapid rise of farm products carried them to within 12 percent of that level. Currency and deposits likewise reflected the upward trend (Chart AI Appendix). On the surface except for the still high number of unemployed, it looked as though recovery had been almost achieved.

Yet the last half of 1937 and the first half of the next year brought a sudden and severe reaction. The number of unemployed doubled; the production of both durable and non-durable goods slumped to about the level of 1934; wholesale prices declined over one-tenth and farm products over one quarter. Though the reaction was also felt abroad it was much less severe than in the United States. Evidently serious maladjustments, variously attributed to a rise in raw material costs, to the exhaustion of the 1936 stimulus of the soldier's bonus and to a sharp drop in government relief expenditures, still existed. At least it was clear that governmental efforts had not succeeded in laying the basis for a sound recovery.

Despite the sharpness of this reaction a much slower upward movement was under way in the latter half of 1938, stimulated by large crops and a revival of heavy government

expenditures. This continued so that by the beginning of 1940, production of both durable and non-durable goods had recovered the percentage of estimated normal attained before the reaction occurred.

In the following sections the reactions of industry and agriculture to the economic conditions as briefly set forth herein will be pointed out with a comparison of conditions as found in the lumber industry, agriculture, and industry generally.

PRICE COMPARISONS

Close on the heels of the pioneer, blazing his trails across the vast North American continent, came the hardy agriculturist with his family and plans for a home. To him the forest and its products was an abundant heritage to use in shaping a future for himself and a nation. As populations expanded, however, there came the problems of an economic society. No longer was timber abundant and as the more eastern forests were cut, as transportation became more efficient, as substitutes appeared, and as populations shifted lumber prices rose and the factors determining these prices began to make themselves more evident.

There are a multitude of factors responsible for the historical movement of lumber prices. The various costs of production, costs of retail distribution, activities of the lumber industry leading to control of prices, effective lumber supply on the market, industrial activity and substitution of competing materials all play a definite role.

Increasing demands and a diminishing supply which have been reflected in higher prices, as the forests nearer the centers of population were cut, have made transportation costs the most obvious, if not the most important, factor is the lumber price trend. With each regional shift in lumber production away from the central markets making higher prices

PER CENT

CHART I
PRICES
1926=100

FARM

ALL COMMODITIES

LUMBER

170
160
150
140
130
120
110
100
90
80
70
60
50
40
30

Made in U. S. A.

1914 1916 1918 1920 1922 1924 1926 1928 1930 1932 1934 1936 1938

possible, transportation costs have increased sharply and as Shames[1] has pointed out shifts in the centers of production of lumber have been closely correlated with advances in lumber price levels and rising transportation charges.

As with large deposits of virgin ore we might expect that the cost of lumber coming from the untouched forest resources of America might have been more closely tied to production costs than to those of stumpage. Theoretically this is true. Nevertheless, the period of belief in an approaching timber famine, which has yet to be totally dispelled, resulted in unwarranted speculative prices for the few remaining virgin stands so that often stumpage prices more than consumed the margin between costs and lumber values which necessarily suffered. Later, when the scare of a timber famine subsided, lumbermen were left with a burdensome overhead pressing liquidation, which resulted in a tendency to flood the already overloaded market with a consequent depressing affect on timber prices.

Price fixing by the producers, a much debated and poignant factor in maintaining an unnaturally high lumber price level, is exceedingly difficult to evaluate while conflicting evidence on the matter leaves an open questions as to whether such price fixing actually exists. In recent years, at least since World War I, governmental investigations have concluded keener competition and less restraint of trade than previously existed but accusations and counter-accusations in

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[1] An Analysis of Lumber Prices in the United States, Shames.

the long period preceding the war, when lumber prices steadily rose led to government prosecution which insisted that the lumber industry had consciously and repeatedly violated the anti-trust laws. Some of the claims made by these prosecutions appear exaggerated, but in some instances, the evidence does point to considerable success in efforts by the industry to control lumber production and prices.

ANALYSIS OF TRENDS IN LUMBER PRICES

Bearing these principles in mind as they influence the lumber market, it is instructive as well as interesting to follow the price trends through several periods in American economic and agricultural history in an attempt to discover, if possible, the relationship which forest products prices bear to general market conditions.

During the rather stable conomic period immediately prior to the first world war, lumber prices followed a trend below both that of agriculture and of industry. This period it should be pointed out was one of generally adverse business conditions in which the cost of living dropped, industrial and business activity lagged, (Charts AI, AII, AIV of the Appendix) and a nation just recovering from the depression of 1907 was feeling the effects of another period of unhealthy business conditions. In the months following the opening of hostilities in Europe, however, prices commenced a rise to unprecedented levels from which they were to descend only in the deflation of 1921. It will be noted here that considerable lag of lumber prices in relation to agricultural and industrial averages exists, Chart I. At no point in the period studied is this lag shown more clearly. Agricultural products as well as industrial output were in tremendous demand which fact is reflected in the prices presented in Table I, for agricultural products and Table II for the steel industry. Food grains doubled in price while the figures for steel show marked increases, especially in merchant bars and plates, both in great demand for military

TABLE I

UNIT VALUES, ANNUAL AVERAGE, OF IMPORTANT FARM PRODUCTS. (WHEAT-DOLLARS, ALL OTHERS-CENTS)

YEAR	WHEAT PER BUSHEL	COTTON PER POUND	MEAT PER POUND	MILK PER POUND	SUGAR PER POUND	ALL FARM PRODUCTS INDEX 1926-100
1914	.95	12.8	13.8	8.3	3.6	71.2
1915	1.28	8.7	13.9	8.2	4.7	71.5
1916	1.24	12.3	13.9	8.0	4.9	84.4
1917	1.99	18.2	17.9	9.7	6.2	129.0
1918	2.37	29.4	26.7	12.9	6.7	148.0
1919	2.41	33.9	31.5	14.3	7.8	157.6
1920	2.73	36.0	25.2	15.6	10.3	150.7
1921	1.55	16.2	17.9	12.5	5.3	88.4
1922	1.25	21.6	17.3	10.0	3.8	93.8
1923	1.18	29.6	14.4	11.3	6.5	98.6
1924	1.43	27.7	14.2	10.7	5.5	100.0
1925	1.72	24.5	20.1	11.7	3.7	109.8
1926	1.46	17.5	21.6	12.1	3.5	100.0
1927	1.42	17.3	18.4	12.3	4.1	99.4
1928	1.25	20.4	16.5	12.2	3.5	105.9
1929	1.24	19.7	17.9	12.1	3.0	104.9
1930	1.00	14.4	17.8	11.5	2.4	88.3
1931	.62	9.0	14.3	10.5	2.1	64.8
1932	.60	7.3	9.7	8.5	1.6	48.2
1933	.54	9.0	10.3	6.8	1.6	51.4
1934	.60	11.8	13.6	7.4	1.5	65.3
1935	..91	12.4	18.3	7.4	2.3	78.8
1936	.99	12.5	20.6	7.8	2.2	80.9
1937	1.11	11.9	20.7	8.5	2.2	86.4
1938	.90	9.8	17.9	7.8	2.1	68.5
1939	.58	10.9	16.7	7.0	2.8	65.3

Source-Department of Commerce, Bureau of Foreign and Domestic Commerce.

TABLE II

IRON AND STEEL-AVERAGE ANNUAL PRICES BY CLASS MERCHANT BARS, IRON BARS, TANK PLATES, STRUCTURAL SHAPES, (DOLLARS PER 100 POUNDS) 1911-1939.

YEAR	MERCHANT BARS	IRON BARS	TANK PLATES	STRUCTURAL SHAPES	COMPOSITE	INDEX 1926=100
1911-1915	1.31	1.47	1.32	1.32	1.54	66
1916	2.67	2.13	3.53	2.55	2.67	115
1917	3.64	3.83	5.88	3.67	2.67	115
1918	2.89	4.31	3.24	2.99	4.19	180
1919	2.50	4.10	2.72	2.52	3.54	152
1920	3.22	4.75	3.38	2.95	3.12	135
1921	1.82	4.47	1.93	1.94	3.74	161
1922	1.72	3.35	1.72	1.71	2.44	105
1923	2.36	3.50	2.43	2.43	2.12	92
1924	2.20	4.00	2.12	2.19	2.51	108
1925	2.02	4.52	1.91	1.99	2.33	100
1926	2.00	4.62	1.88	1.95	2.32	100
1927	1.84	4.68	1.82	1.83	2.20	95
1928	1.87	4.64	1.87	1.87	2.17	93
1929	1.92	4.13	1.93	1.92	2.29	99
1930	1.71	4.11	1.69	1.69	2.11	91
1931	1.63	3.69	1.62	1.62	1.96	86
1932	1.57	3.35	1.57	1.57	1.87	80
1933	1.64	3.35	1.61	1.68	1.85	80
1934	1.81	3.50	1.78	1.78	2.05	88
1935	1.81	3.50	1.80	1.80	2.07	89
1936	1.93	3.70	1.85	1.85	2.12	91
1937	2.40	4.50	2.21	2.21	2.54	110
1938	2.35	4.50	2.17	2.46	2.46	105
1939	2.19	4.40	2.10	2.10	2.31	100

use. Lumber, however, indicates no such an effect of war-time demand but generally lags behind the field. (Table III) Thus, Douglas fir rose from $10.59 per thousand board feet at the mill in 1915 to only $10.78 in 1916 when tank plates stood at $3.53 per 100 pounds as compared to an average of $1.32 between 1911 and 1915. Walnut which because of greater military demand might be expected to show a quicker response than other species actually declined in 1916 to rise to $12.99 per thousand in 1917, thereafter showing a steady by unspectacular upward trend, Yellow pine, large quantities of which were required for military housing and construction likewise indicates no haste in advancing, reaching only $19.00 per thousand from $12.41 in 1915. In the next two years it rose to $28.71; reaching its peak in 1920 of $35.89. Thus the tendency to lag behind the prices of other products both industrial and agricultural is reflected not only by the lumber market in general but by all individual species. As well which in the early years of the war show an average rise of less than 33 percent while steel and agricultural prices are in many cases doubling. Cotton had risen by 89 percent above the preward period of 1910-1914. Likewise steel tank plates reflected an unprecedented demand in an increase from $1.32 in the 1911-1915 period to $5.88 in 1917.

In the years immediately following the war and as its direct result, the country entered into a business slump popularly known as the first post-war depression. All prices dropped, with the resultant effect of marked reduction in the cost of

TABLE III

AVERAGE VALUES OF LUMBER AT THE MILL PER THOUSAND FEET BOARD MEASURE, BY KINDS OF WOOD FOR YEARS: 1915-1939

YEAR	DOUGLAS FIR	SPRUCE	WHITE PINE	YELLOW PINE	BIRCH	OAK	WALNUT	YELLOW POPLAR	ALL SPECIES	SOFTWOODS	HARDWOODS
1915	$10.59	$16.58	$17.44	$12.14	$16.52	$18.73	$48.37	$22.45	$14.04	$13.25	#17.48
1916	10.78	17.58	19.16	14.33	19.59	20.06	42.38	21.89	15.32		
1917	16.28	24.41	24.81	19.00	24.07	24.49	72.99	27.17	20.32	19.45	24.20
1918	18.77	28.65	30.84	24.38	29.94	31.11	77.60	35.06	24.79		
1919	24.62	30.76	32.83	28.71	35.79	37.87	72.13	41.65	30.21	28.39	37.32
1920	34.59	38.94	41.49	35.89	53.44	46.88	88.92	58.87	38.42		
1921	18.04	25.73	30.03	19.42	31.53	30.56	88.83	37.31	23.47	21.85	30.92
1922	20.93	25.47	36.37	23.66	35.84	34.01	80.08	39.18	26.15	24.79	33.50
1923	26.99	31.44	34.85	29.82	43.33	39.08	109.38	51.29	31.78	30.13	39.82
1924	22.08	30.18	32.66	26.52	43.83	36.13	103.66	44.38	28.57	26.52	37.84
1925	20.94	27.98	32.58	26.46	41.68	37.00	111.53	43.44	28.02	25.89	38.21
1926	20.17	27.27	31.36	26.54	50.80	35.57	113.57	38.63	27.34	25.22	37.34
1927	19.45	26.59	29.90	23.77	41.03	35.72	111.64	38.58	25.80	23.47	36.71
1928	19.02	26.50	28.71	24.62	40.30	35.23	112.54	40.90	25.61	23.41	36.35
1929	20.05	28.64	29.87	25.66	39.35	38.43	119.15	41.66	26.94	24.31	38.04
1930	16.91	23.66	21.81	21.06	86.39	29.29	100.75	35.19	22.81	20.88	31.49
1931	12.05	23.00	24.71	16.99	30.95	27.68	90.44	30.02	18.56	16.74	28.00
1932	10.61	17.73	21.58	13.32	25.26	22.84	57.87	26.02	15.12	13.94	22.45
1933	13.57	18.89	21.45	18.91	29.02	28.53	77.61	29.91	18.55	16.94	27.81
1934	16.14	21.75	23.75	21.64	30.58	27.54	86.60	30.01	21.47	20.05	28.01
1935	15.97	22.09	25.66	18.24	31.92	37.15	75.64	28.65	20.43	19.09	27.09
1936	17.67	23.92	26.28	20.76	34.48	27.46	74.64	27.78	22.20	21.03	27.92
1937	19.67	25.73	29.20	22.18	36.11	29.60	85.10	31.60	24.25	22.97	30.49
1938	17.29	23.72	26.77	19.01	34.72	25.41	71.26	25.75	21.45	20.42	27.09
1939	17.91	26.68	25.90	19.70	33.11	26.32	63.18	26.98	21.97	20.97	27.66

Source-Lumber, Lathe and Shingles; U.S. Department of Commerce; Bureau of the Census 1930.

living. The composite price of steel as shown in Table II declined from a high of $4.19 per 100 pounds in 1918 to $2.44 in 1922 and further in 1923 to a low of $2.12 per 100 pounds. The agricultural market was likewise hit when a price figure for food grains shows a decline from the preceding period of 46 percent with similar reductions in meat as well as in the average figure for all agriculture. This period introduced the so-called "agricultural depression" of the twenties during which accumulated debt and generally low agricultural prices opposed by prosperity in other fields were added to the farmer's woes of over-production and lowered purchasing power. The effect of agricultural difficulties on the lumber market during this period was very considerable as pointed out by Hallauer[1] in his article covering the farm consumption of lumber. Manufacturers were also sorely pressed by the post-war deflation, the precipitate drop in all prices being shown in Table II for steel as well as graphically in Chart I.

Considering the lag shown by lumber prices during the years 1916-1920, it might be thought that the decline would be correspondingly slow but inspection of Chart I shows that such was not the case with lumber reaching its low along with both agriculture and general industry. The composite figure for steel shows a drop from the peak of $4.19 per 100 pounds in 1918 to a low of $2.12 in 1923 while lumber had reached its

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[1]Hallauer, Frank J., Our National Timber Requirements; A National Plan for Forestry.

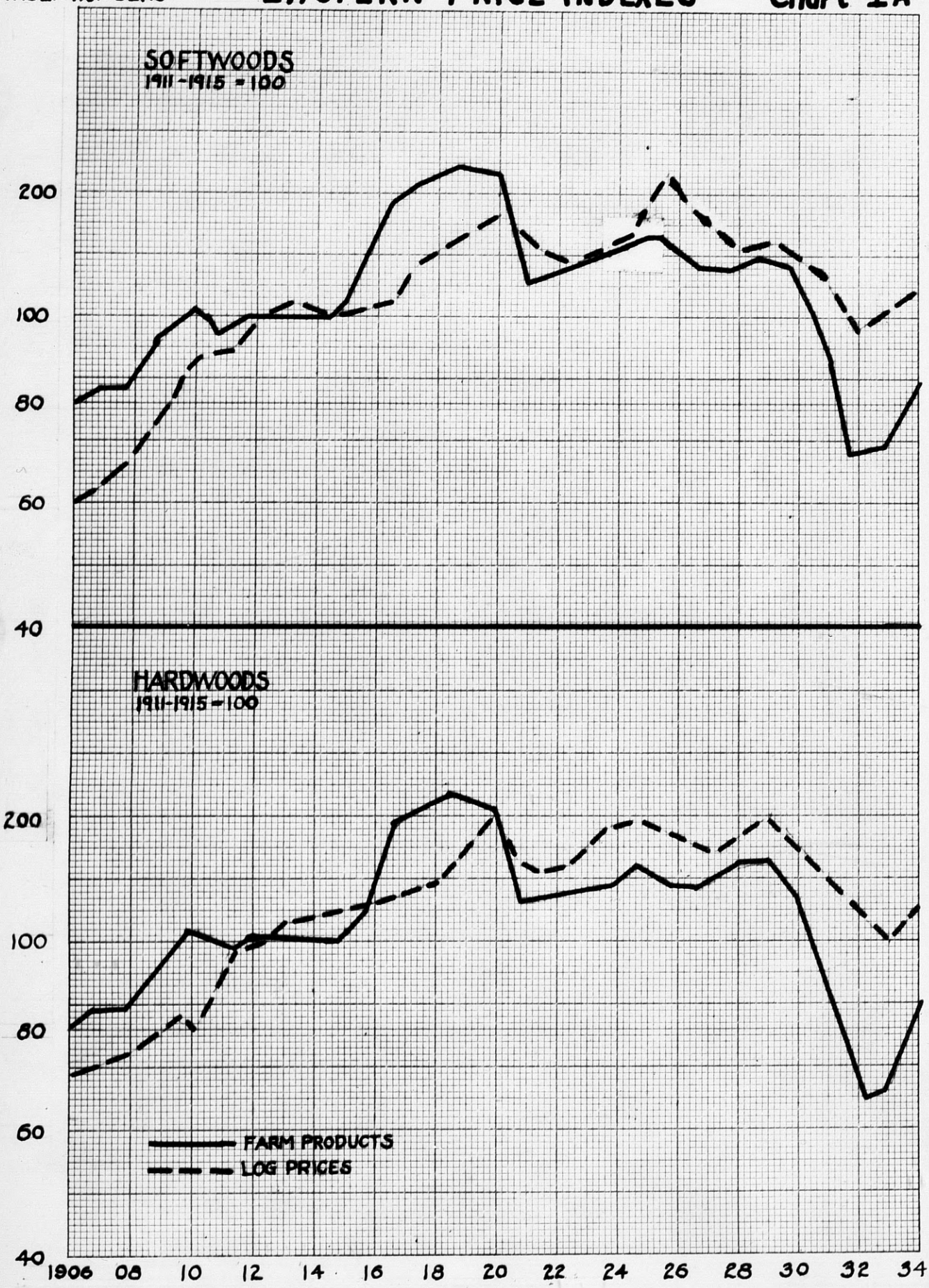
low in the preceding year of 1922 when the price average for all species stands at $26.15 per thousand. Individual lumber prices show a similar trend, with Douglas fir, White pine, Yellow pine, Birch, Oak and Yello poplar reaching a low in 1921. Agriculture likewise shows the general downward trend as seen in Chart I with a low slightly preceding that of lumber. Thus, despite its disinclination react along with industry and agriculture to the stimulus of wartime demand, lumber prices exhibited an ability equal to either industry or agriculture to tumble to new lows during the period of price deflation.

The next five years, being characterized generally by recovery and expansion show little of interest until overspeculation had run its course in the late twenties when business took another fall from a peak of great activity. During the years intervening between the first post-war depression of 1921 and the collapse of 1929 prices of lumber, industry and agriculture, show a decided tendency to adhere to the same trend. Thus the lumber average rose to a high in 1923 to show a slight but steady decline to $26.94 per thousand in 1929. Steel reached a high in 1924 of $2.51 per 100 pounds which it maintained until 1930 when it shows a price of $2.11 per 100 pounds. Agricultural products likewise recovered somewhat from the low of 1921 to remain steady with some minor fluctuations, until 1929. The main feature of this period of continued prosperity in business is a marked tendency for lumber prices to follow a trend very similar to

INDEX NUMBERS

EASTERN PRICE INDEXES

Chart IA



that of agriculture and industry.

The same, however, cannot be said of the years immediately following the crash of 1929. The market reversion, bringing an end to the era of unprecedented speculation gives us another good view of the tendencies of lumber prices in deflation. Chart I shows rather significantly the fact that lumber prices preceded all others in their reaction to the collapse.

Inspection of Tables I, II and III further emphasizes this fact. While the average mill value of lumber had reached a low in 1932 it was a year later before steel and farm prices had dropped to their respective minimums. Thus the value of all species had declined from $26.99 in 1929 to a low in 1932 of $15.12 per thousand. During the same period softwoods had gone from $24.31 in 1929 to $13.94 in 1932 while all hardwood species dropped from $38.04 in 1929 to $22.45 in 1932 the year in which they reached a minimum. Comparable figures for agricultural products show wheat at $1.24 per bushel in 1929 from which it receded to a low of $.54 per bushel in 1933 a year after the low occurring in the lumber industry. Milk dropped to 6.8 cents per pound in 1933 while sugar went to 1.5 cents per pound in 1934 both of which represent lows occurring one and two years respectively after a similar low in lumber prices.

STABILITY OF LUMBER PRICES

A characteristic of the lumber industry of equal

importance to that of lag is relative price stability which may be brought out by a comparison with the prices of other commodities. If such a comparison can be accurately made from available price records, the result should be a partial measure of the financial stability of timber growing and lumber manufacture in relation to production of other commodities. Such a relation, if it can be developed, would be particularly significant in the case of other products of the soil and some extractive industries such as mining which in many respects, both economic and physical, has much in common with the lumber industry.

The business of timber growing is, however, a relatively long time proposition when compared with other soil crops. Decades rather than seasons are the units of measurement in the business of timber growing especially when high grade, clear lumber of veneer is to be the product.

Future economic conditions cannot be forecast with sufficient accuracy to determine dependably the costs of production or the monetary returns which will be realized when timber has reached economic maturity and is sold. The selling prices of lumber and other forest products have been affected by general economic conditions in the past, as have prices of other commodities. If the relative price stability of standing timber as well as lumber can be determined with a reasonable degree of accuracy and compared with the price levels of other commodities, this should form some slight basis for estimating the relationship between the two price levels that can reasonably be expected in the future, and a partial indication, at

least, of relative price stability. It should also give some idea of the financial attractiveness of the business of enterprise of timber growing under scientific forest management as compared with other businesses, particularly the production of other raw materials.

The most significant feature brought out in Chart I is the general tendency for the lumber price curve to have less severe fluctuations, that is, greater stability in periods of depression or prosperity with correspondingly less variation between highs and lows than the other curves presented.

Let us consider the period from 1914 to 1920. Following the recovery from the depression of 1907, business continued on a generally low level until early 1914 when another depression was obviously forming. The cost of living was low as were open market money rates, Appendix Chart AIV, both of which are very good indicators of the state of business conditions. With the advent of the war in 1914, however, all indications of depression vanished.

During the years immediately preceding 1914, lumber prices in comparison with agricultural and industrial prices had continued low, the average figure for all species being $14.04 per thousand board feet in 1915, which in terms of 1926 prices is 58.0 percent. In 1916 the index went to 56.1, in 1918 to 112.0 and reached a high of 141.0 percent in 1919. In comparison the index for steel rose from around 70 percent in 1915 to 130 in 1918 and from there to its peak in 1920 which was almost 170 percent. During the same period agricultural prices followed

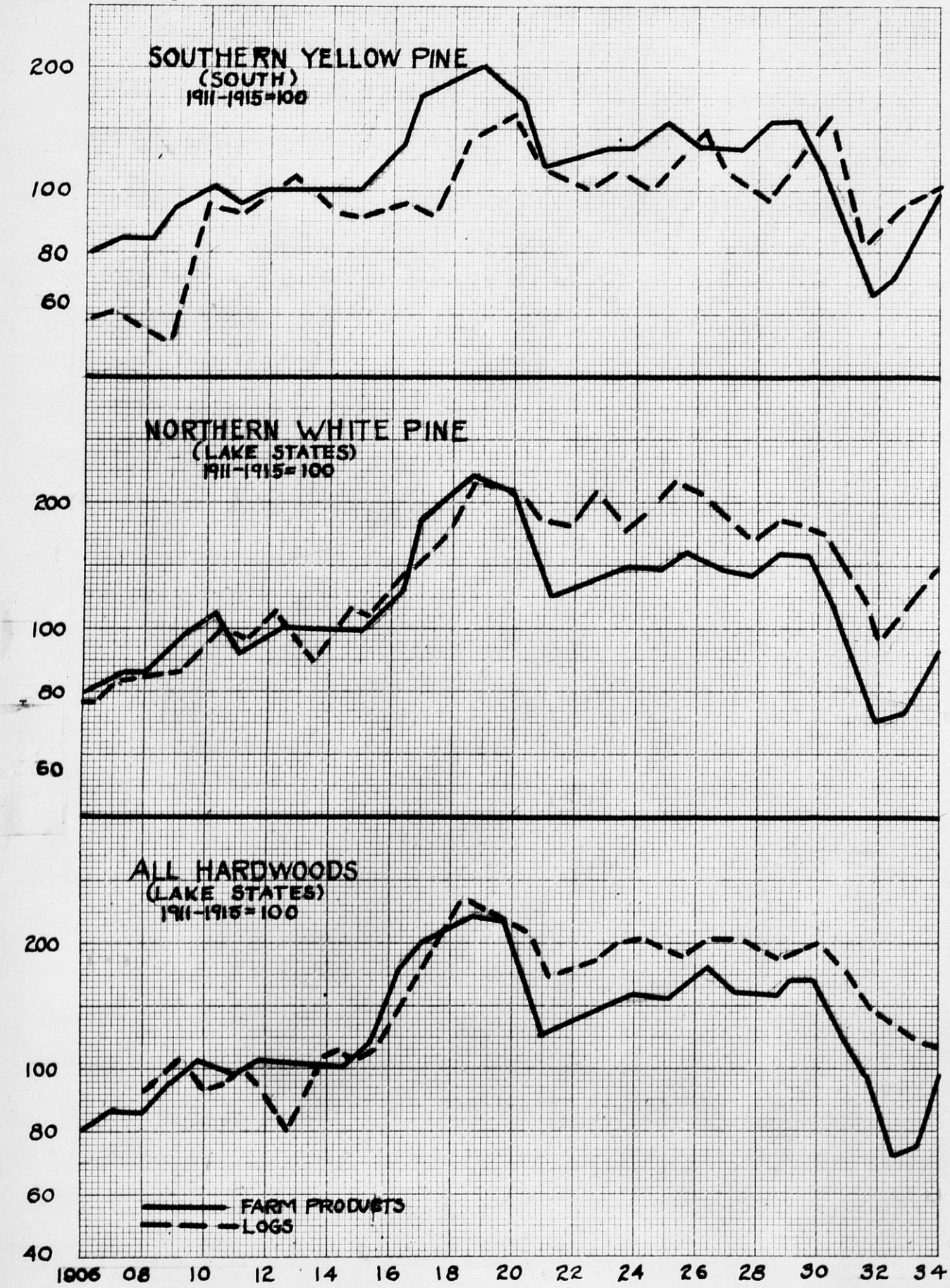
a trend very similar to those of industry though rising somewhat more sharply and holding a higher level for a longer period. Starting from an average index of 75 in 1914, agricultural prices rose rapidly throughout 1916 and 1916 attaining an average of 140 in the latter year which is equivalent to the highest figure attained by lumber prices. In 1918, to 1920 agricultural prices continued upward finally reaching a peak in 1920 at an index above 170 percent or about 30 percent above the maximum reached by lumber prices. At no time during the period did the prices for timber and lumber products exceed those for agriculture or industry, in face during most of this period of great business activity lumber prices showed a decided tendency to remain comparatively low while peak prices were definitely much below those of agriculture and industry.

In the years immediately following the cessation of hostilities all prices show a decided drop to a low in 1921. Living costs with the exception or rent, likewise, made a sharp drop at this time. As shown by Charts AII and AIII of the Appendix, stock prices and loans also fell off indicating a decided lull in business activity. Agriculture was perhaps most affected by the sudden reversal as shown by the precipitate drop of prices which centered on a low of around 80 percent in 1921. Lumber prices also reached a low in 1921 but somewhat above that of general agricultural prices. The greater relative stability shown by lumber prices at this time is better demonstrated by Tables II and III giving actual

prices for lumber and steel during these years. The composite price for steel declined from $4.19 per 100 pounds in 1918 to $2.12 in 1923 which is a drop of about 50 percent while the average price for all species of lumber is seen to have declined only slightly more than one third to a low in 1921. Even greater indication of stability is discovered if values of individual species are compared with prices such as occurred in tank plates which dropped from $5.88 per 100 pounds to $1.72 or over 70 percent. Similar comparison for lumber by species discloses no decline of over 50 percent while some species such as Walnut (Table III) show declines of only 20 percent or less.

Recovering from the post-ward deflation, prices tended upward on a gradual and steady recovery during which period no great fluctuations are shown until 1929 when all prices again tumbled, following the market crash of that year. In reacting to the catastrophe lumber prices again show remarkable stability with the all species price figure dropping from $26.94 per thousand in 1929 to $15.12 in 1932 or a decline of only slightly more than 45% while wheat prices receded from $1.25 per bushel in 1929 to $.54 in 1933 or nearly 60 percent of the former value. Cotton fell from 19.7 cents per pound in 1929 to 9.0 cents in 1933 or over 54 percent. Here it is to be noted, however, that there was a decidedly greater reaction to the depression by agricultural and forest products than by the more purely industrial items. While the composite price of steel dropped from $2.29 per 100 pounds in 1929 to

Chart I B


INDEX NUMBERS
SOUTHERN YELLOW PINE
(SOUTH)
1911-1915=100
200
100
80
60
NORTHERN WHITE PINE
(LAKE STATES)
1911-1915=100
200
100
80
60
ALL HARDWOODS
(LAKE STATES)
1911-1915=100
200
100
80
60
40
FARM PRODUCTS
LOGS
1906 08 10 12 14 16 18 20 22 24 26 28 30 32 34

$1.85 in 1933 or only about 20 percent, sugar had declined nearly 80 percent and meat approximately 90. Similarly, lumber, though showing greater stability than agricultural values, registered price recessions of from 20 to as high as 50 percent.

THE FARM FOREST MARKET

Farm wood lots constitute one third of the total commercial forest land area of the country and produce one-third of the total cut of timber of all kinds, according to recent estimates by the Forest Service. This includes one fifth of the sawlogs and a much larger proportion of other products such as pulpwood, cross ties, posts and firewood. The Bureau of Agricultural Economics estimated that forest products sold from the farm amounted to a total of $62,782,000 in 1934, ranking in ninth place among about 50 different crop items. The 1934 cash income from forest products produced on farms was about $3,000,000 greater than it was in 1933 and $8,500,000 greater than in 1932. Forest products from farms are particularly important in the eastern United States, where wood using industries are turning more and more to timber on farm woodlands for raw materials because of the depletion of once abundant virgin timber supplies.

For these reasons the price stability of logs produced on farms in relation to the price of other farm products is not only of great interest to farmers and foresters but gives a reliable indication of the desirability of so managing farm woodlands that they may produce crops of forest products continuously.

The index numbers of the average price of all logs f.o.b. the mill in the eastern United States since 1914 and of the price of all farm products are contrasted in Chart IA.

It will be noted that the log prices did not go as high during the years of inflation nor as low during the years of the depression as did the average price of farm products. It is also evident that log prices on the average did not descend to the pre-war level during the depressions, while the average price of all farm products was below the 1910-1914 average in 1931 to 1934.

If the relation between the index numbers of all logs and all farm products holds in specific instances, they are significant in indicating the desirability of the continuous production of forest products on farms and are not without important bearing in determining the best use of large areas of the poorer grades of farm load. The first step in the break-down of these data is a comparison of the prices of all farm products with those of all softwood and hardwood logs in the eastern United States Chart IA. Here again forest products prices have not gone as high in periods of inflation nor as low during the depress ion as all farm products. It is also interesting to note that hardwood log prices have been maintained, by and large, at higher prices since 1920 than have softwood log prices. Comparisons of index numbers of all farm products and logs for southern yellow pine in the Southern Pine region, all hardwoods in the Central region and while pine and all hardwoods in the Lake States have been made in Chart IB. There is some variation between the log price records in the

different regions and between the different species as was to be expected, but they show, generally speaking, the same relationship to the average price of all farm products since 1921 as did the price record of all log sales in the eastern United States. Table IA. The 1931-1934 level of log prices has in none of these instances been as low as the price level of all farm products, and only in the case of softwoods have prices in recent years gone below the 1910-1914 level.

All of the available statistical material uniformly points to the general conclusion that log and lumber prices have been more stable since 1914 than have prices of agricultural products. The data indicate that the business of growing and manufacturing timber has had a more stable market for its product than has farming in general. The extent to which price levels of lumber and logs retains this relation with the prices of farm products depends, among other things, on whether economic history repeats itself.

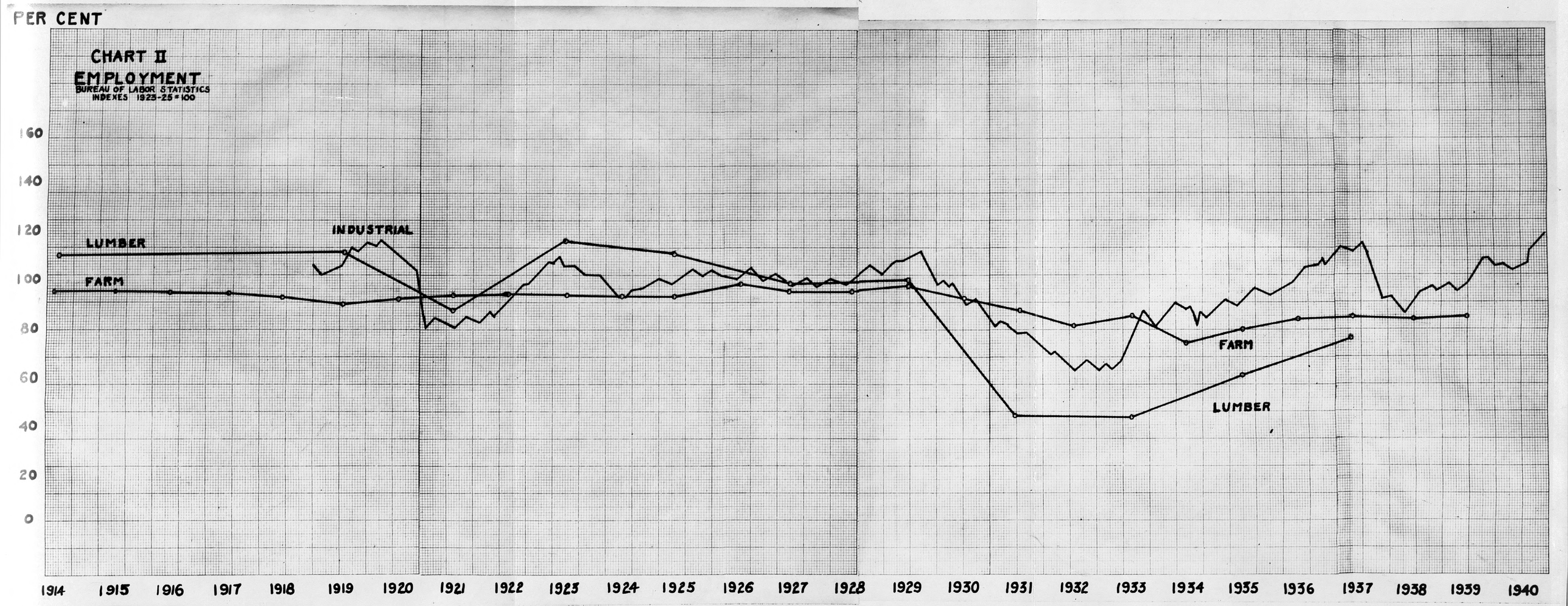
Several interesting features are brought out by the preceding considerations. First it may be said that the lumber industry can expect no such immediate benefits from periods of economic prosperity as are enjoyed by other industries as well as by agriculture. As is well demonstrated in the war boom of 1916 to 1920, lumber prices tend to lag behind the pricelevels found in other fields. On the other hand lumber prices show quite as promptly, if not more so, the reaction to times of unhealthy business conditions such as characterize major depressions. Secondly the relatively much greater

stability of lumber prices is apparent, showing definitely less severe fluctuations in times of great economic distress or prosperity than do either the prices of other industries or of agriculture. While this is more particularly true of upward trends, it is also seen in times of depression when lumber prices maintain a relative level above the other industries. Thirdly, consideration of log prices in several different sections brings out the important fact that the farm forest producer has a more stable market for his logs than he does for his other products. This is true not only of lumber and log prices as a whole but of sectional markets as well as is brought out by studies of conditions prevailing in the Northeastern region, the Souther Pine region, and also in the Lake States region. Because of the great volume of lumber products coming from the farm this fact is of great importance in the future of that branch of forestry.

EMPLOYMENT

Before attempting a detailed comparison of employment in agriculture, industry, and lumbering it is desirable to consider the underlying problemsnand developments which have occurred in the lumber industry since the turn of the century. Regional shifts, stranded populations in depleted areas, utilization of progressively less accessible or less desirable resources, and declining competitive power in relation to industries producing substitute materials are all important factors which have played major parts in determining the development of the lumber industry. The prevailing methods of lumbering in the United States have accounted largely for progressive depletion necessitating shifts to new areas farther and farther from the centers of consumption.

There have been two general methods of adjustment to timber depletion. One of these has been an improvement in techniques for exploiting the less desirable stands of timber with the same or a smaller expenditure of labor per unit of output. The other method has been a shift of production to smaller mills such as could be moved more readily less extensive and more remote stands of timber at comparatively small cost. Since 1920 the outstanding technological change has been the adaption of tractors, trucks and light cable yarders to logging operations. This type of equipment has made it


PER CENT
CHART II
EMPLOYMENT
BUREAU OF LABOR STATISTICS
INDEXES 1923-25 = 100
160
140
120
100
80
60
40
20
0
INDUSTRIAL
LUMBER
FARM
FARM
LUMBER
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
1924
1925
1926
1927
1928
1929
1930
1931
1932
1933
1934
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1936
1937
1938
1939
1940

possible to cut scattered stands and concentrate the logs at the mills at reduced cost while at the same time increasing output per man hour with a consequent adverse affect on employment.

A discussion of employment conditions as they have existed in the lumber industry will help to emphasize several points brought out later in the comparison between employment in lumbering, in industry, and in agriculture. In 1929 the number of wage earners employed in the lumber and timber products industry was 419,084. Salaried workers totaled 21,714. In the same year about 107,000 wage earners and salaried workers were employed in the planing-mill products industry and probably about 70,000 in the railroad transportation of lumber. The wholesale and retail distribution of lumber gave employment to about 177,000 workers. Thus the total employed in lumbering and closely allied enterprises in 1929 was about 800,000. In addition, considerable numbers were employed in manufacture of equipment as well as the rendering of necessary services in fields vitally connected with the lumber industry.

The employment of wage earners in the lumber and timber products industry was approximately the same in 1929 as in the years closely following the beginning of the century, but the extensive reduction in the hours of work was accompanied by a reduction in total man hours. Reference to Table V discloses the same to be true of the copper mining industry in which total man hours dropped from 138,954,128 in 1914 to 19,205,176 in 1929 while output per man hour steadily increased from 10,970 pounds in 1914 to 20.461 pounds in 1929. Between the years

1902 and 1937, the largest amount of employed was in 1909, when the number of wage earners in the lumber and timber products industry (not including planing-mill products and allied employments) was about 547,000 in contrast to the 419,000 employed in 1929. The peak of building activity in the twenties came before 1929, and there was a decline of employment in the lumber and timber products industry from 496,000 in 1923 to 419,000 in 1929. Between 1929 and 1933, employment in lumbering suffered much more severely than employment in manufacturing as a whole. In 1937, employment in lumbering was about 23 percent lower than in 1929, whereas employment in all manufacturing combined was somewhat larger in 1937 than in 1929.

In 1935 the Federal Emergency Relief Administration conducted studies in sample counties of six rural areas having high relief loads. These areas contained 36 percent of the nation's rural population and approximately one half of the rural families receiving direct or work relief from governmental sources. The Appalachian-Ozark and Lake States cut over regions, which represented two of the six problem areas, contained much cut over forest land. In the Appalachian-Ozark region 39 percent and in the Lake States cut over area 78 percent of the heads of families who were receiving relief were usually engaged in non-agricultural occupations. Many of those who considered their usual occupation to be farming were receiving relief because of the loss of supplementary employment. The need for relief arose in the Lake States cut over area, mainly because of the loss of employment in mining and lumbering, which was accompanied by the

development of small-scale farming on sub-marginal land. Loss of supplementary employment in the lumber industry was one of the major reasons for relief in that region. A later study of these same two areas likewise concluded that the loss of supplementary employment in lumbering and mining was the fundamental cause of the agricultural relief problem.

The general changes in volume of employment have been connected with the changes in the general demand for lumber and timber products and with changes in the amount of labor required per unit of output as well as basic changes in the agricultural society and society as a whole.

After the first decade of the present century, the main factor in the demand for lumber and consequently the demand for workers in the industry, was the slowing up of agricultural expansion. From 1920-1930 the number of farms remained almost stationary, and the agricultural depression of the twenties reduced the demand for normal repair and replacement of farm buildings. Other industry was healthy and thriving, it is true, but the growth of towns and cities made extensive use of multi-family dwellings requiring less floor space and building materials other than lumber had been given wide acceptance. In addition, there was a substitution of other materials for wood in various manufacturing industries.

There was a significant rise of output per man hour in the industry as a whole from 1919 to 1936. The output per man-hour from 1931 to 1936 was on the average 16.4 per cent higher than during the years 1925 to 1930 and 22.5 per cent higher than during the years 1919 to 1924.

The general increase in labor productivity was accompanied by a shift of production to areas of Douglas fir and Western pine, which are processed with comparatively small amounts of labor. The amount of labor required per unit of output in 1935 for the production of timbers, rough lumber, and planing mill lumber from southern pine was approximately twice as great as in production from Douglas fir, and was significantly greater in production from southern than from western pine.

The lumber industry has many employment problems not shared by industry generally. As has been pointed out, the utilization of seasonal labor is very common in the Lake States region while every other section has parallel labor problems sometimes entirely restricted to the lumbering industry.

For example, the use of negro labor in the South presents problems peculiar to that district where a system of paternal employment is typical. Company owned villages, commissarys, restaurants and even hospitals are common.

The employment in Southern lumbering reached 235,000 in 1914, at which level it stood, except in the depression year of 1921, until about 1925. In the mid-twenties employment began to decline, and during the depression year of 1933 it stood at 90,000. In 1937 it had risen again to around 149,000.

In 1910 over half the labor force was composed of Negroes and they still are in the majority. Many more negroes have worked in the sawmills than in the woods. Generally speaking the negroes have outnumbered the whites in the sawmills

about six to four in the unskilled jobs, while the whites have outnumbered the negroes two to one in the skilled classifications. The situation, however, varies from state to state. The Gulf States have used proportionately more negro unskilled labor in the sawmills. In the woods, the negroes have about equaled the whites for the region as a whole. In Arkansas, the whites in the woods work have definitely outnumbered the negroes three to one, and in Texas two to one. But in Florida, Georgia, and South Carolina the negroes have outnumbered the whites both in the woods and in the sawmills. In the other states the two groups have been about equally divided.

ANALYSIS OF EMPLOYMENT DATA FOR AGRICULTURE, INDUSTRY AND LUMBERING.

With the problems and developments which have arisen in the lumber industry during the last half century in mind it is possible to make a comparative study of the employment data of industry, agriculture, and lumbering presented in Chart II and Tables IV, V, and VI. Chart II which covers the years from 1914 to 1940 is based on continuous monthly data for industrial employment collected by the Board of Governors of the Federal Reserve System. Curves for farm and lumber employment are presented by yearly averages obtained from Bureau of Census statistics for the several years. Tables IV, V, and VI also represent material collected by the Bureau of the Census. Table IV exhibits values for employment, hours and hourly output for

TABLE IV

PRODUCTIVITY AND EMPLOYMENT IN COPPER MIXING
FROM 1914-1939

YEAR	NO. OF WAGE EARNERS	MAN HOURS	OUTPUT PER MAN HOUR POUNDS
1914	44686	138,954,128	10,970
1915	47174	102,760,464	21,788
1916	61228	113,691,200	13,003
1917	61275	151,457,136	12,222
1918	59447	152,684,504	12,328
1919	39327	152,883,424	12,559
1920	35254	94,851,928	13,433
1921	18300	89,456,952	12,768
1922	25739	35,690,368	15,788
1923	32477	60,039,864	17,583
1924	32477	82,457,728	19,372
1925	33266	81,821,160	19,796
1926	32723	83,366,424	20,097
1927	30724	84,095,792	20,985
1928	30561	77,002,536	22,399
1929	37147	79,205,176	20,461
1930	27692	95,869,696	20,987
1931	19687	66,001,896	25,416
1932	9555	41,019,314	24,981
1933	6976	18,608,421	27,334
1934	8084	13,471,547	31,076
1935	10188	14,726,617	33,094
1936	14102	22,293,255	34,475

Source-Compiled from National Research Project No. E-12.

the copper mining industry which it was found corresponded closely to the average industrial indexes and may be properly used as a basis of statistical comparison.

A notable feature of the curve of farm employment of Chart II is its extreme lack of fluctuation. Quite properly it may be said that it is invalidated in any comparison with either lumber of general industry. With the exception of a very slight drop after 1918 and an unsettled condition during the great depression of the thirties, this curve is without fluctuation throughout its entire length. Because agricultural employment does show adherence to a rather rigid trend it has been discarded as a basis of comparison with the two other groups of data presented.

When war broke upon the world in 1914, it brought an end to the period, following the depression of 1907, characterized by inactivity in business, low money rates, and slow, uncertain recovery. After the business world readjusted itself to the rather paralyzing shock of unexpected war, every effort was made to reap the harvest of the period of neutrality sending all indexes to unheard of heights. Charts AV, and AIV of the Appendix for cost of living and open market money rates show better than words the tremendous impetus given American industry during this period.

Table V which gives figures for employment in the copper mining industry shows an increase of wage earners after 1914 of about 40 percent to the wartime level in 1917 which is maintained until the advent of peace again slackened the demand. During the same period, however, employment in the Lumber and Timber products

TABLE V

EMPLOYMENT IN THE LUMBER AND TIMBER PRODUCTS INDUSTRY, BY REGIONS
1914-1939

YEAR	TOTAL	PACIFIC STATES	ROCKY MOUNTAIN STATES	SOUTHERN STATES	LAKE STATES	CENTRAL STATES	NORTH-EASTERN STATES	OVER-ALL INDEX
1914	479,786	64,377	12,240	235,050	62,243	59,070	45,352	116.0
1919	480,495	93,234	15,507	238,053	49,320	47,197	35,598	117.0
1921	364,247	75,161	11,735	183,242	35,872	30,298	27,256	88.0
1923	495,932	122,452	19,658	244,015	44,740	38,087	25,881	119.5
1925	467,000	115,904	20,601	227,588	45,503	34,420	21,931	113.0
1927	413,946	110,976	18,120	201,153	35,375	30,185	16,303	100.0
1929	419,084	115,224	20,443	202,324	30,539	32,858	16,177	101.0
1931	196,647	60,295	9,180	91,085	14,423	13,174	7,759	47.4
1933	189,369	60,014	6,811	90,035	11,693	13,091	7,344	45.8
1935	255,230	77,724	11,391	119,440	18,101	18,343	9,512	61.8
1937	323,928	102,632	15,973	148,550	20,130	22,808	12,883	78.0

Source- W.P.A. report. Figures were compiled from Census of Manufactures.

LUMBER EMPLOYMENT INDEX NUMBERS FOR GIVEN YEARS IN THE STATE OF OHIO

1924	-	101.2	1928	-	95.7
1925	-	105.3	1929	-	95.3
1926	-	100.0	1930	-	77.7
1927	-	101.8	1931	-	62.4
			1932	-	49.0

Source-Monthly Labor Review 39: 423-30 August 1934.

industry increased from 479,786 in 1914 to 480,945 in 1919 or only about .2 of 1 percent which is in sharp contrast to other industries upon which the war had a greater effect. Figures for agricultural employment show a decline from 2.917 million hired workers in 1914 to 2.481 million in 1919 which further emphasizes the fact that the factors and labor problems of the lumber industry are much more closely tied to those of industry than of agriculture.

With the coming of peace and post-war deflation, employment started on a downward path. In the lumber industry the number of wage earners dropped from 480,945 in 1919 to 364,247 in 1921 or about 24 percent. These figures show no marked contrast to industrial employment generally but when compared with copper mining which dropped from 59,447 in 1918 to 18,300 in 1921 or a percentage decline of nearly 70 percent, a decided difference is encountered. The curve of indexes for general factory employment does show a tendency to drop lower than that for the lumber industry, though this tendency is by no means marked.

In the recovery lumber employment reacted more quickly than copper mining, having climbed to a level above that of 1919 by the year 1923 while employment in the latter industry never did regain pre-depression levels. General industrial employment, likewise showed some tendency to trail behind lumber and does not again cross the lumber curve until 1926 after which it did not fall below it. The unusual activity in the lumber industry and the generally higher employment which it shows down to 1927 is due to the building boom which followed

TABLE VI

FARM EMPLOYMENT-AVERAGE NUMBER OF PERSONS EMPLOYED
1914-1939 (thousands)

YEAR	TOTAL	FAMILY[1]	HIRED	INDEX OF HIRED WORKERS 1923-25=100
1914	12,000	9081	2919	97.0
1915	11,981	9047	2934	97.1
1916	12,016	9050	2966	98.1
1917	11,789	8856	2933	97.0
1918	11,348	8507	2841	93.9
1919	11,106	8322	2784	92.0
1920	11,362	8479	2883	93.5
1921	11,412	8511	2901	96.0
1922	11,443	8528	2915	96.5
1923	11,385	8491	2894	95.5
1924	11,362	8488	2874	95.1
1925	11,448	8577	2871	95.0
1926	11,534	8507	3027	100.0
1927	11,246	8296	2950	97.5
1928	11,296	8340	2956	98.0
1929	11,289	8305	2984	98.8
1930	11,173	8323	2850	94.1
1931	11,159	8469	2690	88.8
1932	11,069	8571	2498	82.0
1933	11,023	8590	2433	80.3
1934	10,852	8506	2346	77.2
1935	11,131	8702	2429	80.4
1936	11,047	8486	2561	84.8
1937	10,892	8261	2531	87.1
1938	11,789	8169	2620	86.8
1939	10,740	8145	2595	85.5

[1]Includes farm operators and members of their families doing farm work without wages.

Source-Department of Agriculture, Bureau of Agricultural Economics.

the first post-war depression.

From the recovery period of the early twenties until the crash of 1929, employment in both lumber and other industries maintained a high and stable level, with lumber evidencing a steady though gradual decline which was to continue down to the end of the period covered.

In 1929, as a result of over expansion and speculative activities, market prices and demand dropped to lows below even those of the first post-war depression. Reflecting the conditions of the time, all employment figures commenced a sudden though not extremely rapid decline not to swing upward again until 1933-34. From a high of 419,084 in 1929 lumber and timber products employment dropped to 189,369 in 1933. During the same years over all industrial employment which had reached a peak of 115 percent in 1929 fell to nearly 65 percent in 1932-33. Employment in copper mining also reached a low in 1933 of 6976 from 37,147 in 1929. Continuing the decline started in the early twenties employment in the lumber industry fell considerably below the figures for industry in general and was to hold this relationship throughout the period of recovery.

In 1933 with the recalling of wage earners to all business activities, the curves again exhibit upward trends. The curve for factory employment shows a continuous rise from 1933 to the recession of 1937 after which it continued upward for the rest of the period. Beginning a recovery in the same year, employment in the lumber industry likewise rises steadily but at a decidedly lower index level than shown by industrial

employment generally.

ANALYSIS OF EMPLOYMENT DATA BY SECTIONS

A study of employment by geographical sections helps to emphasize certain features characteristic of the lumber and timber products industry. The following is an examination of figures given for employment in lumbering for the state of Ohio for the years 1924 to 1932[1] which cover the period of over expansion leading to the deflation of 1929 and the early years of depression. They correspond very closely to the figures given for the entire lumber industry which helps to establish the fact that the trends so far considered are applicable to the entire industry. In 1925, in the midst of the construction boom, the employment index for lumbering in Ohio is seen to be 105.3 (Table IV) while for the entire industry the figure stood at 113.0. Two years later the index for Ohio is 101.8 while for the lumber industry in general it is 100.0. A similar close correspondence between the two sets of figures is observed throughout the entire period for which data is available.

An inspection of the columns in Table IV giving figures by sections helps to bring out the fact that during the period covered tremendous shifts have occurred in the lumbering population. While total figures have been seen to develop trends very similar to other industries, an individual section may show characteristics very much unlike those exhibited

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[1]Monthly Labor Review 39:423-30, August 1934.

by any other.

Thus employment in the Pacific States has shown a steady rise from 64,377 employed in 1914 to 102,632 in 1937. The demands of the World War which caused a rise in employment in the copper mining industry of slightly less than 40 percent was reflected in employment in the lumber industry in the Pacific States of a like percent. During the same years the conditions in the other regions are quite dis-similar. For example, in the Northeastern States, the Central States and the Lake States regions employment in lumbering during the period actually decreased while the increase in the Southern Pine region was very slight. During the post-war years when the country was in the grip of depression, the shift of employment from East to West is likewise obvious. While the number of workers employed in the Pacific States declined less than 20 percent, the figures for the eastern states show declines in some cases of a much as 50 percent. Following the depression, another chance is obtained to evaluate the continuous westward shift in the lumber industry. While the South, responding to regenerating stands, shows a rise quite similar to that of the Pacific States with which it was in close competition for production supremacy, the Lakes States and Central States regions show only slight increases while in the northeastern states a continuation of the steady decline is encountered.

Throughout the steadily rising inflation of the twenties only the western regions and the south share signs of large scale production. In the northeastern states, in the

central region, and in the Lake States region the decline which has been evident since 1914 continued with employment steadily dropping to points equal to or below those of the depression of 1921. When his by the adverse economic developments of 1929, employment in all regions, shows signs of depression which for the first time in the period covered are remarkably alike. In all regions employment was approximately halved. In the West Coast region the figures dropped from 115,22 4 in 1929 to 60,295 in 1931, in the South the decrease was from 202,324 to 91,085 for the same period while in the Lakes States region the decline was from 30,539 before the depression to 14,423 in the worst years.

With recovery the only region showing employment figures close to those of pre-depression years was the Pacific states region. All other areas receperated more slowly and showed less tendency to rejoin normal production.

The foregoing comparisons help to point out in a concrete manner the fact that employment in the lumber industry since 1914 has shown a marked shift toward the west coast and to some extent to the South where rapid regeneration of cut over loads has helped to produce a new vigor in Southern lumber production. In the Northeast a steady decline is evident as is also true of the Lakes States region where liquidation of the pine stands which once made that region the source of a large percentage of the lumber consumed caused employment figures to fall rapidly after 1914.

There are three rather definite features to be noted in the foregoing comparison of employment as it has existed

in the lumber industry in agriculture, and in industry generally. First it should be pointed out that there is definitely a much closer correlation between lumbering and other manufactures in this respect than between lumbering and agriculture. Any attempt to make a comparison between the factors influencing the labor situation in agriculture and the lumber industry will obviously involve an inherent error. While it is true that a large percentage of the labor utilized both in the woods and in the mill is drawn from the agricultural population, it must be understood that the economic forces controlling the demands for this labor are the same as are found in other industries. Second, the general trend of employment in the industry has been downward. After the peak occurring in the "building boom" of the early twenties, the curve tends to decline steadily. This trend continues through the depression, recovery, and up to 1939. Closely connected with the decline in employment in lumbering is, of course the falling off of lumber consumption and production which have characterized the industry since 1906. Thirdly, while employment in the lumber industry does show a rather stable character, it appears to correlate very closely to industry in general in this respect. Though recovery from the depression following the First World War was somewhat more prompt, because of the "building boom", than was exhibited by other industries and regression to the low of 1929-1933 anticipated the event to some extent, these isolated events cannot be said to be characteristics which could safely be relied upon to formulate a general rule for use in prediction of the future.

WAGES

An outstanding economic development in the United States as indicated by Table VII is the radical change in the relative amount of income going to different main segments of the population. Although the national income in 1940 was much larger than in 1919, the income originating in agriculture was reduced from 11.1 to 6.0 billions of dollars. Changes of this nature indicate significant developments affecting the national economy.[1]

The fact of greatest significance apparent from Table VII is the large increase in the proportion of total income distributed as the compensation of Employees. Employee compensation was only 56.1 percent of total income in 1919 but rose to 68.2 percent in 1940. The relative increase in salaries and wages only was also considerable, although less marked, namely, 55.7 percent in 1919 to 63.4 percent in 1940. Compensation of employees includes salaries as well as wages and also payments described as supplements to salaries and wages. Some part of the latter is compensation to persons not normally in the employee group, as for example, payments to farmers for emergency employment to supplement their income from farm operations.

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[1]Monthly Labor Review, 39:423-30, August 1934.

PER CENT

CHART II
WAGES
1922-24=100

130
120
110
100
90
80
70
60
50
40
30
20

FARM

LUMBER

INDUSTRIAL

1914 1915 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940

Some of the increase in employee compensation as a proportion of total income was caused by the comparatively large increase of employment in those divisions of the national economy which normally distribute a high proportion of income as employee compensation. The increase in the proportion of the total income going to the employed groups was accompanied by a decrease in wages as a percentage of total income originating in certain important and comparatively homogeneous fields of employment, notably manufacturers, and the mineral industries. Wages in 1919 formed 64.6 percent of all income originating in these two fields, and in 1939, only 59.5 percent.

The estimates of total salaries and wages indicate a smaller total in 1940 than in 1929, but in terms of the purchasing power of the dollar there was a significant increase. The Federal Reserve Bank cost-of-living index (Appendix, Chart AV) was 18.2 percent lower in 1940 than in 1929, whereas the total os salaries and wages was only 7.8 percent smaller in 1940 than in 1929. Noteworthy shifts occurred in the proportions of total salaries and wages in the different industrial discussions. There were sharp declines in the total, the increases were less marked than were the reductions, but when the lower cost of living in 1940 is taken into account, most of the industrial divisions show some increase of total employee compensation adjusted by the cost-of-living index.

ANALYSIS OF PERCENTAGE ALLOTMENT OF TOTAL WAGE PAYMENTS TO EMPLOYEES OF THE BLAST FURNACE INDUSTRY, AGRICULTURE, AND THE LUMBER INDUSTRY

To bring out certain significant relationships a comparison is now made between the percentages of national income going to lumber workers, to laborers in agriculture and to workers employed by the blast furnace industry, which was chosen because of considerable similarity between the percentage of national income allotted to its laborers and to laborers in the lumber industry. Both the blast furnace industry and lumber have shown a steady decline in this respect while agriculture, though showing a decline, maintains a somewhat steadier and higher level than either of the other two. Though blast furnace percentages do show a larger drop from 1919 to 1939, being over 100 percent, it is believed that the blast furnace industry indicates trends rather characteristic of industrial totals.

The data presented in Table XII is from material collected by the Bureau of Labor Statistics, the United States Census of 1939, and United States Department of Agriculture.

Starting with the year 1919 during which employment in all fields was at a relatively high level, the figures are correct through 1939. The first feature noted is the gradual decline in the percentage of national income going to workers in all fields. Agriculture, due probably to the greater stability in numbers employed rather than increased compensation to fewer workers, has shown less tendency to fluctuate than either lumbering or the blast furnace industry. In 1919, 86 percent of the national income was going to employees of the lumber producing industries while agriculture and blast furnace workers received 1.6 and 1.13 percent respectively.

In 1921 when the national income had been reduced to 52.8 percent or 20 percent over 1919 the allottment to lumber workers was .79 percent or a decrease of 8 percent comparing favorably with agriculture which shows a drop of less than 10 percent while blast furnace workers received 50 percent less than in 1919. This figure for the blast furnace industry does not depict the condition in industry generally and in 1923 when the figure is .085 percent it shows a better comparison to the lumber industry. It does, however, indicate the general characteristic that fluctuations in the percentage of income allotted to wage earners were not as severe in the lumber industry as a result of the termination of the war and the post-war depression as they were in industries more vitally connected with munitions production. After the recovery from depression all three figures continue their steady downward trend until the crash in 1929. With the blast furnace industry, more seriously affected by technical developments, showing less ability to earn for its workers as great a proportionate share of national income as either agriculture or lumbering.

From 1929 to 1933 another sharp drop in percentage of national income assigned to workers in all fields is evidenced. Agriculture continued to show a superior stability in this respect, however, during this period when national income had declined over 50 percent. In the lumber industry the decline was from .64 in 1929 to .33 percent in 1933 or a drop of 51 percent over the former year. In the blast furnace industry the percentage drop was 54 for the same period

TABLE VII

NATIONAL INCOME BY INDUSTRIAL ORIGIN 1919-1939

YEAR	NAT. INCOME TOTAL*	AGRICULT. INCOME*	FARM WAGES AS PERCENT TOTAL NAT. INCOME	MANUFACT. INCOME*	BLAST FURN. WAGES AS A % OF TOTAL NAT. INCOME	LUMBER INDUST. PAYROLLS*	LUMBER WAGES AS % TOTAL NAT. INCOME	ALL INDUST. COMP. OF EMPLOYEES TOT. SAL. & WAGE	
1914									
1915									
1916									
1917									
1918									
1919	67.7	11.1	1.6	17.3	.113	.581	.86	38.0	37.7
1920	69.8	9.1	1.8	18.4	.056			44.7	44.4
1921	52.8	6.3	1.5	10.7	.056	.409	.79	35.6	35.3
1922	60.6	5.9	1.3	13.9	.061			37.6	37.3
1923	70.0	6.7	1.2	17.4	.085	.609	.87	44.2	43.8
1924	70.1	7.3	1.2	16.0				43.8	43.4
1925	74.8	7.7	1.14	17.4	.061	.603	.81	45.8	45.4
1926	76.9	7.3	1.16	18.0				48.5	48.1
1927	76.4	7.2	1.14	17.6	.058	.540	.71	48.6	48.2
1928	80.2	7.3	1.06	18.7				50.1	49.7
1929	83.4	7.3	1.00	20.4	.050	.538	.64	52.7	52.2
1930	69.0	5.6	1.12	15.1				49.9	57.4
1931	54.3	3.7	1.08	10.3	.035	.214	.39	40.3	39.8
1932	40.0	2.6	1.03	6.1				31.5	30.9
1933	42.5	3.4	.93	8.2	.027	.139	.33	29.6	28.5
1934	50.3	4.6	.85	10.6				34.2	32.4
1935	55.8	5.3	.95	13.5	.034	.225	.41	37.2	35.4
1936	65.1	6.0	.96	15.2				42.6	39.6
1937	71.4	6.44	1.04	17.5	.053	.340	.48	47.8	44.6
1938	64.4	5.4	1.10	13.3				44.9	44.1
1939	70.7	5.8	.99	16.4	.040	.310	.44	48.1	44.3

*Billions of Dollars.

Source-United States B ureau of Census; Statistical Abstract of the United States.

while agriculture showed a decline of only 15 percent.

The recovery again shows the close tie between the lumber industry and industry in general in this respect with both the blast furnace manufacturers and lumbering showing an increase of about 45 percent in the percentage of national income going to employees. During the same period, increase in agriculture was from .85 percent in 1934 to 1.04 percent in 1937 or a rise of about 23 percent.

ANALYSIS OF TOTAL PAYROLLS FOR LUMBER, AGRICULTURE AND OTHER INDUSTRIES

Another interesting comparison between industries is that of actual average total wages paid or what might be termed the total payroll. Here agriculture shows a less steady nature as is evidenced by the curves of Chart III. These curves are all based on indexes calculated from average figures for the years 1923-1933. Thus the indications are not of actual numerical values but percentages based on the averages of these years. Basic data was obtained from Federal Reserve Charts and Bulletins and from United States Bureau of Labor Statistics publications.

It is seen from the chart that the curve for lumber wage totals maintains a consistently lower level than either agriculture or industry in general. This is due to the fact that during the years used as a base the total wages paid in the lumber industry were abnormally high as a result of the "building boom". Abnormal in the respect that they stood at a relatively high level, thus tending to depress the other

sections of the curve. This does not invalidate any comparison of this curve with those of agriculture or general industry, however, but merely makes it necessary to visually bring the curves together. Thus in the period from 1929 to 1937 the great similarity of all curves is obvious but would perhaps be more striking if they more nearly coincided.

From the opening of the period studied until the peak occurring in the war years all curves show a rapid and continuous rise. Total wage payments in the lumber industry rose from $301.923 million dollars in 1914 to $581.395 million in 1919 or a rise of 93 percent over the figure of 1914 while the corresponding rise in wages paid to farm workers was 88 percent thus showing a rather decided likeness in reaction to stimulated production. During the deflation, marked similarity of reaction between the total payroll of agriculture and lumber is again noted, the percentage decline being 28 and 29 percent respectively.

The blast furnace industry, on the other hand shows a decidedly greater sensitiveness than either to curtailed production, dropping well over 50 percent from its level of 1919 (Table VIII).

Again in recovery, the lumber industry payroll data, while following the curve of general industry very closely, do not exhibit the great instability of a more tempermental industry such as stell production. Thus while the blast furnace industry has doubled its payroll figure, total lumber wages have advanced slightly more than 45 percent. Agriculture, now showing the first symptoms of the so-called "agricultural depression",

TABLE VIII

ESTIMATED GROSS INCOME TO WAGE EARNERS IN THE BLAST FURNACE INDUSTRY, AGRICULTURE AND THE LUMBER INDUSTRY 1914-1939 (Millions of Dollars)

YEAR	NET INCOME TO FARM OPERATORS	WAGES TO FARM LABORERS	INDEX	WAGES TO LUMBER WORKERS	INDEX	WAGES TO WORKERS IN BLAST FURNACE INDUSTRY
1914	3518	572	67.1			22.780
1915	3745	577	67.5			
1916	4687	634	74.1			
1917	7011	797	93.5			
1918	8674	947	100.0			
1919	9249	1078	126.0	581.396	91.5	76.445
1920	6778	1242	146.0			
1921	3603	805	94.0	409.441	67.7	29.639
1922	4057	775	90.5			
1923	4842	841	99.0	609.291	101.0	58.935
1924	5128	844	99.1		108.0	
1925	6103	856	100.0	603.307	100.0	45.312
1926	5699	893	105.0		97.7	
1927	5706	867	101.0	539.501	89.6	44.258
1928	5695	856	100.0		86.7	
1929	6044	863	100.8	538.007	89.0	41.958
1930	4329	774	90.8		67.6	
1931	2744	588	68.8	214.422	35.5	19.259
1932	1832	413	48.4		18.4	
1933	2569	368	42.5	139.300	23.2	11.564
1934	3362	432	50.5		30.9	
1935	3968	530	62.0	225.253	37.5	18.915
1936	4812	630	73.8		50.5	
1937	4825	741	87.0	339.786	56.6	38.001
1938	3915	709	82.7		48.5	
1939	3754	696	81.5	310.381	51.0	28.312

Source-Statistical Abstract of the United States.

shows less of an upward trend.

Throughout the twenties, no marked variations occur, with agriculture and industrial averages maintaining a remarkably level profile. Lumber, though declining slightly from the abnormal year of 1924, also shows a steady pulse.

In the year of the crash all curves turn sharply downward though still maintaining similar trends. Climbing upward after the low year of 1933 the profiles for all three curves show a definite likeness. Total lumber wages, nevertheless commence a slight but noticeable divergence from the other two in the bottom of depression which develops somewhat up to the end of the period. The change is slight, however, and the corresponding trends, especially those of agriculture and lumbering show a decided likeness.

ANALYSIS OF WEEKLY WAGES

In considering another of the many aspects of wages in lumbering use is made of Table IX in which is collected data related to the average monetary compensation derived by the Douglas fir worker from his contribution to lumber production. Also presented are figures for manufacturing and agriculture. Table X indicates the extent to which the figures for the Douglas fir industry may be applied to the entire United States.

Weekly earnings of Douglas fir workers in 1940 averaged $27.44. When average weekly earnings are viewed in the light of changes in cost of living, the real value of the

weekly pay check in 1940 was 26 percent greater than in 1927 and 11 percent greater than the average of the five years from 1935 to 1939 while for agriculture corresponding figures are a negative 25 percent and a plus 8.5 percent. Weekly earnings declined sharply between 1930 and 1932 for all laborers and although the cost-of-living index well also, the net result was a serious reduction of the weekly pay check in terms of purchasing power. After 1932, weekly earnings rose and after 1933 the index of cost-of-living advanced, but the net results was a sharp upturn in real weekly earnings beginning in 1933 and continuing with minor recessions to 1941.

The average weekly earnings of Douglas fir workers fluctuated in a narrow range around $25.00 per week from 1927 to 1930 then moved downward to about $14.18 throughout the depression. In March and April 1932 a sudden advance occurred, raising the average to $25.58 in 1937. There was no further important change until the autumn of 1940, when another upturn began.

Over the same period weekly wages in manufacturing show close correlation to those presented above for Douglas fir workers except that since 1936 the average weekly wages of the latter have been somewhat higher than those for manufacturing labor. However, it is noted in Table IX that workers in the Douglas fir industry averaged a higher wage than for the lumber industry generally which brings lumber wages more closely in line with those for manufacturing.

In 1927 and 1928 manufacturing wages averaged between $24.74 and nearly $25.00, figures slightly lower than those

TABLE IX

AVERAGE HOURLY AND WEEKLY WAGES PAID IN AGRICULTURE MANUFACTURING AND THE DOUGLAS FIR LUMBER INDUSTRY 1923-1940

	DOUGLAS FIR WAGES		MANUFACTURING WAGES		FARM WAGES(WITHOUT BOARD)
YEAR	AVERAGE WEEKLY EARNINGS	ADJUSTED BY COST OF LIVING	AVERAGE WEEKLY EARNINGS	AVERAGE HOURLY EARNINGS	AVERAGE WEEKLY EARNINGS
1923			$23.82	.522	12.25
1924			23.93	.547	12.25
1925			24.37	.547	12.20
1926			24.65	.548	12.71
1927	$25.77	88.4	24.74	.550	12.71
1928	25.58	88.9	24.97	.562	12.69
1929	25.31	87.8	25.03	.566	12.85
1930	25.31	89.7	23.25	.552	12.10
1931	21.04	81.9	20.87	.515	9.61
1932	14.18	60.7	17.05	.446	7.24
1933	15.50	69.7	16.73	.442	6.41
1934	18.34	80.2	18.40	.532	7.08
1935	20.35	86.9	20.13	.550	7.58
1936	24.41	102.6	21.78	.556	8.05
1937	25.58	102.5	24.05	.624	9.06
1938	24.86	100.4	22.30	.627	9.01
1939	26.38	107.2	23.86	.633	8.95
1940	27.44	111.2			

for the Douglas fir industry. In 1929 there is less difference, however, and the decline in the depression period was relatively less severe in manufacturing which figure reached a low of $16.72 weekly as compared to $14.18 for the Douglas fir worker. Since the depression, wages in the Douglas fir industry have advanced rather rapidly exceeding manufacturing wages in 1935 and widening the margin up to 1939.

Agricultural wages, not including board, averaged for the United States are about one half of those in the Douglas fir industry up to the low of the depression years after which they drop behind those for lumber and are only one third as great in 1939.

ANALYSIS OF HOURLY WAGES

Comparisons of hourly earnings are subject to many qualifications, regional, industrial and occupationa. The types of skill required in the lumber industry are necessarily in considerable part distinctive, with resulting problems of the movement of workers between lumber and other industry. The peculiar hazards and comparative isolation of lumbering are important considerations. Comparisons are nevertheless of interest, especially of industries employing mostly men and requiring somewhat similar degrees of skill. A comparison of this nature shows that Douglas fir workers received less per hour during August to October 1940 than did the workers in all major industries except flour milling, furniture, millwork, meat packing, and paints. In Oregon the average for Douglas fir workers was lower than the average for all but three major industries.

TABLE X

WAGE INDEXES FOR LUMBER INDUSTRY AND DOUGLAS FIR INDUSTRY
(1935-1939=100.0)

YEAR	LUMBER INDUSTRY OF UNITED STATES	DOUGLAS FIR LUMBER INDUSTRY
1934	90.7	83.0
1935	90.2	85.6
1936	92.8	94.4
1937	102.1	106.3
1938	104.0	106.4
1939	111.0	107.3
1940	116.8	110.5

TABLE XI

ENTRANCE WAGE RATES OF MALE COMMON LABORERS
IN WASHINGTON STATE, JULY 1940

INDUSTRY	NUMBER OF ESTABLISHMENTS	AVERAGE HOURLY ENTRANCE RATE
Brick, Tile and Terra Cotta	5	$0.587
Building Construction	37	.806
Cement	4	.703
Electric Light and Power	6	.561
Foundry and Machine Shop	15	.646
Lumber	86	.615
Manufactured and Natural Gas	3	.505
Paper and Pulp	20	.645
Slaughtering and Meat Packing	7	.576

Advisory Commission to the Council of National Defense, Bureau of Research and Statistics.

The Douglas Fir lumber industry:An Interdepartmental Study conducted under the direction of Dr. Dexter McKeezer, March 1941.

Entrance wage rates for common labor in nine industries of Washington for July 1940 (Table XI) give some indication of comparative earnings in different industries. The average of 61.5 cents per hour for common labor in the entire lumber industry of Washington was lower than the averages in the building construction, cement, foundries, and paper industries, but higher than in the brick, electric power, gas, and meat packing industries, most of the latter group being comparatively small industries.

Hourly earnings of Douglas fir workers are higher, and have been higher for years, than the earnings of the other major groups of lumber workers. A detailed study of the lumber industry in the late summer and early fall of 1939 showed an average of 77.3 cents in the Douglas fir region as compared to 68.9 cents in Western pine, 63.7 cents in redwood, and 46.4 cents in the Northeast, and 34.6 cents in the South. In recent years, however, earnings have increased somewhat more rapidly in the lumber industry as a whole than in Douglas fir (Table X). In December 1940, the average in the entire industry was 18.2 percent higher than the 1935-1939 average, and in June 1941, 28.4 percent higher.

In summary, it may be said that on the whole both hourly and weekly wages have been lower in the lumber industry than in most other industries. Certain sections, as for example the Douglas fir region, have maintained average wages comparing favorably with industry in general while other regions, notably the South, have shown averages far below those for other industries.

From the preceding paragraphs it is also evident that the agricultural share of national income allotted to its employees is somewhat greater than in the individual industries of lumbering and steel production and follows a decidedly more steady trend. The lumber manufacturing industry tends to react more sensitively to economic conditions than agriculture and in this respect can be more aptly compared with other industries.

As regards total wage payments, it may be said, that the lumber industry shows features very closely related to those of industry in general as well as to agriculture. No great stability is evident nor any evidence of a tendency to lag behind or anticipate economic events. On the other hand it may be said that no evidence is forthcoming to show such instability as is shown by industries, of which steel production is typical, more subject to the whims of markets and world politics.

PRODUCTION

Annual lumber output in the United States is determined by a multiplicity of complex, interrelated factors some of which, being without parallel in other fields of enterprise, introduce statistical complications which should be understood before an attempt is made to evaluate lumber production figures.

In any discussion of lumber output it would be impossible to ignore the question of capacity. As a result of population shifts, seasonal weather conditions, too heavy a tax burden forcing liquidation, and changing demands, the actual mill output often is merely a fraction of capacity. The tremendous excess capacity of the sawmills may best be illustrated by the following brief tabulation:

For discussion of factors entering into lumber production see: Problems of the Lumber Industry, Stone, P. A.

POINTS IN TOTAL INDEX

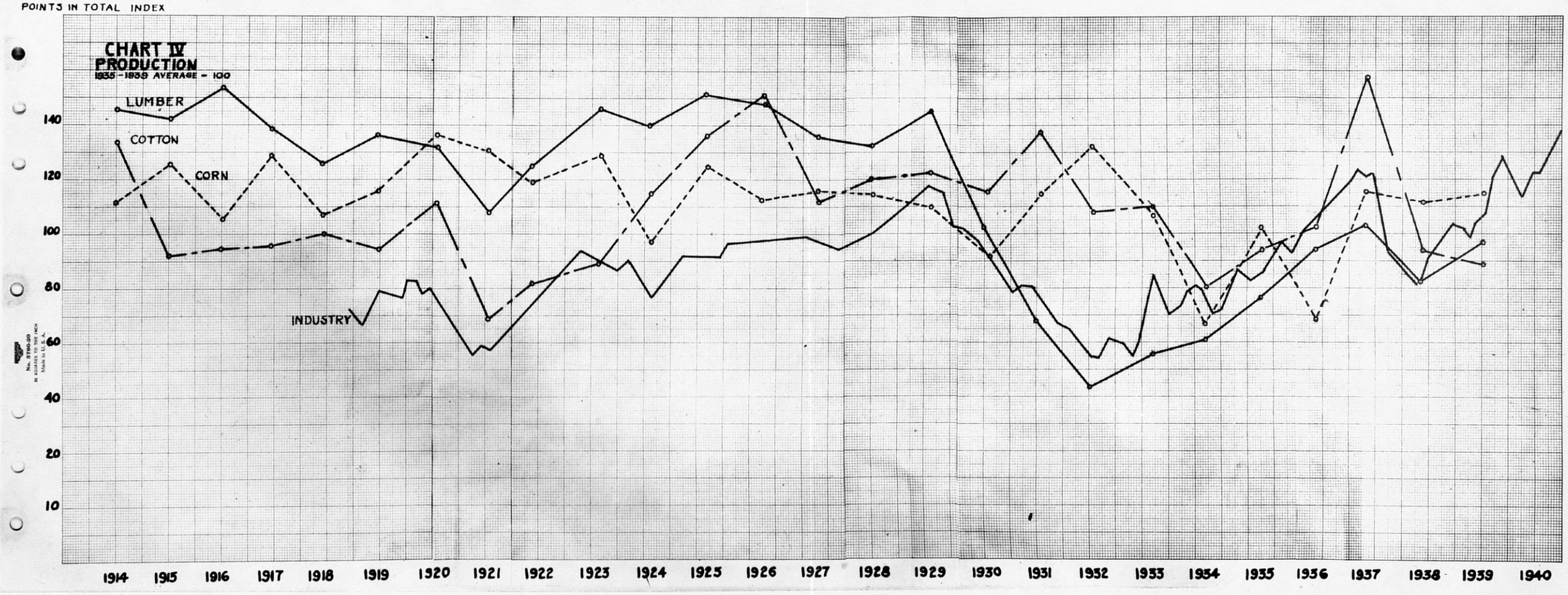

TABLE XII

SAWMILLS: RATIO OF RATED CAPACITY FOR 1934 TO REPORTED PRODUCTION IN THE PRINCIPAL LUMBER PRODUCING DIVISIONS

1929 Production (million feet)	Southern Pine	West Coast Fir (a)	Western Pine (a)	Appalach. & South. Hardwood (b)
	11,630	10,147	5,217	5,315
1929	2.3	1.4	2.1	4.2
1930	3.6	1.8	2.7	3.8
1931	6.1	2.6	4.0	4.4
1932	8.8	4.4	6.0	5.7
1933	6.4	2.9	4.7	6.8
1934	5.8	3.2	4.1	6.6
1934 Production (million feet)	4,680	4,275	2,649	1,950

(a) These softwood producing Divisions reported 81 to 84 percent of all lumber shipments originated therein.

(b) This hardwood producing group shipped approximately 70 percent of all hardwoods.

The over extended capacity of produce lumber has tended to the establishment of excessive inventions, for in many instances the shadow of this unused capacity has forced operating units into production schedules which were known to be in excess of the effective demand for the product.

Remembering that large mills generally are expensive installations almost universally backed by extensive timber holdings all requiring considerable investment, and that the small mills are generally without extensive timber backing and usually represent but small investment in equipment, it is easily seen that the economic pressure of taxes and interest

would be less severe on the mill of small capacity than on those divisions in which the large mills predominate. It is these considerable fixed charges which often forces mills to continue operation at a loss if such charges can thus be partially met.

Lumber output unlike the usual factory production is a forced and involuntary process. Articles produced in the average plant are perhaps for orders already in hand whereas lumber production is under pressure from a variety of forces. Merchantable timber is the raw material of the sawmills and being subject to maturity and deterioration must be utilized under pressure from nature if its value is to be fully realized, Logs must also be sawed to produce a maximum quality and size regardless of demand. Another great source of pressure on the lumber market resulting in oversupply is salvage operations either if mature or over mature timber already on hand; fire and insect Killed timber or occasionally stands destroyed by wind. Land under lease must be cleared before the lease period expires. Standing timber purchased to be paid for out of progressive utilization as well as stands bought for speculation and financed largely by bonds and mortgages must be liquidated to cover carrying charges. With the result that the market is further overburdened. In some regions, notably those of the West Coast, the foregoing conditions may exert considerably more pressure than is normal with production in that area being correspondingly forced. Other sections seeing their markets gradually disappearing step up their own production even though the products are in excess of demand.

Changing centers of demand have worked to build up a capacity and production which has long been a weight on the industry. Ascending volume of lumber production marked the westward movement of population with the settling of new farms, and opening up of towns to supply the new farming communities. This impetus to produce was followed by a long maintained demand resulting from city improvements, better buildings on the farm, and finally by the turn of population to the city.

Another force vitally affecting the volume of lumber manufactured is, of course, production costs. The varying conditions found throughout the industry will naturally affect materially these production costs. Differing techniques varying through wide cost ranges are common both in the woods and mill. The cost of standing timber will naturally vary depending upon several conditions and production costs and ultimately output will reflect these differences. In addition to raw material costs there are rough lumber conversion costs, dressing or planing costs, general overhead expenses and transportation all of which ultimately help to influence to some degree the amount of lumber produced.

When the softwood area of the Lake States region had been eliminated from the ordinary softwood competition, leaving the Southern Pine region as the principal softwood producing center, high transportation costs began to register their effect upon the price of lumber to the consumer. The reaction to this increase in price was first to bring back into production some

of the mills in the former production centers which could eke out a profit in some marginal production; another effect was to foster the small mills that could readily move to small areas of timber. Other major economic readjustments which have played vital roles in determining lumber price fluctuations may be cited. Thus prior to the opening of the canal, Douglas fir from the West Coast was practically barred from eastern seaboard markets, but with the opening of the canal, the Douglas fir manufacturers were enabled to deliver their products at a price in competition with rail moved Southern Pine lumber.

One of the many items of expense in the lumber industry is of course labor which contributes a considerable portion of the final price. Quality and volume of labor similarly has much control ever production. The number and type of employees, rate of turnover, unrest, wages and hours all are vitally important not only in their immediate effect on output but also as contributing to direct expenses, insurance and various costs which ultimately help to determine production. Organizational movements have added complications to the picture resulting in legislation, hours and minimum wage laws multiplying in recent years have meant much to the lumber industry in introducing new restrictions on lumber production.

Production control may be added as a salient feature of the last decade in the relation between the lumber industry and government. Agitation begun in March 1932 in a number of industries, including the lumber industry, for relief from the Anti-trust act. In the lumber industry the motivating force was the desire of controlling production. Previously attempts had been

made through trade associations at production and price regulation but any extensive market organization had been prevented through government intervention out of which several interesting cases have developed in which the industry has been charged again and again with illegal interference with freedom of trade. The opportunity to make effective the plans and hopes of the manufacturers for production control came in 1933, under the N.R.A. which proposed ambitious legislation aimed at price and production control, minimum wages and maximum hours. Concerning the effects of the N.R.A. and subsequent legislation on the industry there is a wide variety of opinion but it must be recognized that governmental control has had a considerable influence on the lumber output.

ANALYSIS OF VOLUME PRODUCTION OF THE LUMBER INDUSTRY AND OTHER INDUSTRIES

The factors influencing lumber production which have been discussed in the preceding paragraphs are those of greatest importance and should be borne in mind in the following comparison of production figures for the lumber industry, agriculture, and industry generally.

Chart IV is a graphic representation of the data of Table XIII the source of the tabulated data being publications of the Departments of Commerce and Agriculture. The curves of Chart IV are based on an average yearly index of 100 percent for the years 1935 to 1939 which shows the steady decline of lumber production and also emphasizes the close similarity of the two curves since 1932. Curves for agricultural production have been

TABLE XIII

TOTAL VALUE AND VOLUME OF OUTPUT IN THE LUMBER AND COPPER SMELTING INDUSTRIES 1919-1939

YEAR	LUMBER PROD. TOTAL	SOFTWOOD	HARDWOOD	TOTAL INDEX	LUMBER VALUES REPORTED*	COMPUTED	COPPER PRODUCTION VOLUME	COPPER PRODUCTION VALUE**
1914	37,346			141.0			1150	152,968
1915	37,011			140.6			1388	242,908
1916	39,807			146.0			1928	474,288
1917	35,831			138.0			1886	514,911
1918	31,890			122.2			1909	471,408
1919	34,552	27,407	7,145	133.0	750	750	1286	239,274
1920	33,799	26,810	6,989	130.0	842	810	1209	222,467
1921	26,791	22,186	4,775	103.0	650	811	506	65,221
1922	31,569	26,644	4,925	121.0	855	950	950	128,289
1923	37,116	30,904	6,262	142.0	1170	1290	1435	210,945
1924	35,931	29,406	6,525	138.0	1050	1150	1634	214,087
1925	38,339	51,710	6,628	146.1	1030	1110	1675	237,832
1926	36,936	30,469	6,467	143.0	1010	1080	1740	243,547
1927	34,532	28,442	6,090	133.0	906	1010	1684	220,609
1928	34,142	28,345	5,797	130.0	893	959	1826	263,930
1929	36,886	29,813	7,073	141.5	1020	1020	2003	352,504
1930	26,051	21,323	4,729	100.0	742	743	1394	181,271
1931	16,523	13,852	2,671	63.5			544	94,887
1932	10,151	8,746	1,406	40.5			450	34,273
1933	13,961	11,899	2,062	53.8			489	28,800
1934	15,494	12,735	2,758	59.8			763	39,076
1935	19,539	16,248	3,291	75.0			1223	63,295
1936	24,355	20,242	4,113	92.0			1669	112,499
1937	25,997	21,589	4,408	100.0			1125	201,988
1938	21,646	18,293	3,353	83.7			1425	110,216
1939	24,975	21,242	3,733	95.5			1818	148,235

Note: Smelter Output as here indicated represents the production of unrefined copper from domestic ores only.

Source-Department of Commerce Bureau of Census,(in cooperation with Depart. of Agricult., Forest Service, and Tennessee Valley Authority);reports of Biennial Census of Manufacturers and Annual Reports of Census of Forest Products.

*Millions of Dollars

**Thousands of Dollars

plotted merely to make obvious the fact which might be expected that there is no relation between agricultural and industrial production. Economic factors undoubtedly influence the farmer somewhat in his productive activities but weather, pests and disease, the great questions in agricultural production, are easily the controlling factors. Thus in 1932 when demand had slackened and lumber and industrial production were at a minimum corn and cotton are seen to have been at heights not attained in the preceding ten years. Figures for the copper industry presented in Table XIII and often referred to are not shown in graphic form because of their great fluctuation which would necessitate a scale far too gross to properly show the reactions of the other two.

From 1914 down to the years of our active participation in the First World War when demand for industrial products was high it is seen that a gradual decline in the output of the lumber industry occurred. The only year in which a tendency to react to war time demands is in 1916 when a rise of 2.786 billion board feet over 1915 is evidenced only to receive a severe setback in 1917 and still further in 1918. Meanwhile, however, copper smelter output shows indications of being greatly stimulated by the demands of war. A rise, as shown by table XIII, occurred from 1150 million pounds in 1914 to 1928 million in 1916. The following year saw a decline in copper production though by no means as pronounced nor of as long duration as occurred in the lumber industry.

With the recession occurring after the halting of hostilities in Europe, all markets turned sharply downward, prices and production falling to lows not attained since 1907. Lumber output, already on the downgrade, continued to fall to reach a low of 26.961 billion board feet in 1921 from a figure of 31.890 billion in 1918 or a percentage decline of about 16 from the 1918 figure. In the same year copper production stood at a new low of 506 million pounds as compared to 1907 million in the peak year of 1918, thus showing a decline of nearly 74 percent. Somewhat less of a constrast is seen when the curve for industrial production in general is inspected (Chart IV). Lumber here shows a drop from its peak year 1919 almost equal to that of the industrial decline, both being close to 20 percent. It is quite obvious that figures moderated by industries less sensitive to military demands than the copper industry would show fluctuations more closely akin to those of lumber. It may be safely inferred that production in the lumber industry is less likely to show drastic expansion or contraction under pressure of economic changes.

With recovery from the period of deflation, the conservatism of the factors of lumber production is once more evident. While both curves (Chart IV) show very similar rises, about 40 percent for each, the figures presented in Table XIII for copper again indicate that industry's radical fluctuations. From the year 1921 when lumber output stood at 26.961 billion board feet until 1923 when production was 37.166 billion board feet, or a rise of 38.5 percent, copper production had skyrocketed to 1435 million pounds yearly from its 1921 low of 506

million pounds thus showing the great contrast between lumbering and this typical example of an industry in the less stable mining field.

With minor fluctuations production in all industry continued at a high and stable level down through the inflationary years of the twenties. Both lumber production and industrial production in general reached peak output in 1929 from which the decline was to be rapid.

Thus in 1929 lumber production stood at 36.886 billion board feet or about 41.5 percent above the average of the base years of 1935-1939. General industrial production shows a relatively lower index of 120 percent. Reacting immediately to the break in speculative expansion, both curves show sharp declines in 1929 continuing until the bottom was reached in 1932. Dropping from a high index to a point below the general industrial average which it crossed in late 1930, lumber shows the effect of adverse market conditions decidedly more than at any previous period. Whereas general industrial production declined from an index of 120 to about 55, lumber shows a decline from 145 to 45 or 69 percent during these three years. Table XIII again makes it clear that despite its tremendous drop, lumber still shows a far more stable character than copper smelting. In 1929 lumber production is seen to stand at 36.886 billion board feet while in 1932 the figure is 10.151 billion board feet or only 27.5 percent of what it was before the collapse. Copper on the other hand shows in 1929 a production of 2003 million pounds; in 1932 450 million or an output of only 22 percent of its showing in the former year. Even in this period

of the most drastic slash of lumber production in the years covered, lumber fails to exceed the wild reaction of cooper production to the fortunes of the market.

Prior to the crash in 1929 lumber production has shown a relative level continuously above that of general industry. This results partially because of the years chosen as a base but this choice has resulted in demonstrating the fact that relative to the years preceding the depression lumber production following that event has been at a decidedly low level. In their recovery from the low in 1932 both production adhere to very similar lines. From 10,151 billion board feet in 1932 the production of lumber is seen to have risen steadily though remaining constantly below the general production curve, to a high of 25.997 billion board feet in 1937 thus showing a rise of slightly greater than 250 percent from the 1932 figure. In the same years copper production was up from 450 million pounds to 1669 million pounds or 370 percent again showing its temperamental nature.

In 1937 feeling the effects of too rapid expansion after years of low vitality the markets again fell in what is known as "the recession of 1937." Copper production was first to show signs of adversity declining to 1125 million pounds for the year 1937. Lumber in accord with its somewhat more temperate nature shows less of a drop, not reaching its low until several months after that of the copper industry.

ANALYSIS OF VALUE PRODUCTION IN THE LUMBER INDUSTRY AND COPPER SMELTING INDUSTRY

Included in Table XIII are figures for the value, both reported and computed, of total lumber output from 1919 to 1930. The table also contains like figures for the copper smelting industry during the same period. In the year 1919, reflecting the favorable market conditions created by the war all values are seen to have been at high levels. With the post-war deflation which occurred in 1921, output and consequently total value of product manufactured shows a drastic cut in both industries. The copper industry suffered much more heavily from loss of wartime markets than did lumber. While copper output had dropped from 1209 million pounds to 506 million in 1921 or a drop of only about 60 percent, the value of the product is seen to have declined nearly 160 million dollars, a cut of about 75 percent of its 1920 value. In lumbering on the other hand, the output had been reduced by approximately 25 percent of its 1920 volume but the value had dropped only about 20 percent for the same two years.

Because of the scarcity of housing after the war which resulted in the "building boom" of the early twenties, it is decidedly unfair to compare the relative affect of the business recovery on value and volume in lumber with value and volume increase in other industries. In passing, however, the relative values are examined more as a point of interest than as showing a typical reaction. In 1924 lumber values had risen to the figure of 1,050 million dollars which represents an increase of about 60 percent while volume had increased only 33.5 percent.

On the other hand copper production made value and volume increases of approximately the same percent, being 225 and 230 percent respectively over the 1921 figure. Thus while the relative volume increase in the copper industry was much greater due to the relative instability of that industry, its ratio of value to volume increase shows no elevation of values. In the lumber industry, however, while volume increased 33.5 percent, the value of this output had gone up 60 percent and tough benefiting less from recovery than the copper industry, the lumber industry did profit tremendously from recovery--and of course the "building boom"--through enhancement of the value of the output.

Again in the economic phenomenon of 1929, lumber values show a decidedly more stable nature than those of the copper industry. In 1929 the volume of lumber output was 37 million board feet while in 1930 it stood at 26 million thus registering a decline of 28 percent. In the same two years the value drop was from 1020 million dollars to 742 million or a decline of 27.5 percent. At the same time copper production had fallen from 2.003 billion pounds to 1.394 billion or a percentage drop of around 30 while value of the product had declined from 352 million dollars to 181 million or a drop of 48.5 percent. Thus the lumber industry again profited, in a way, by the fact that while its output was declining both as to volume and value, it suffered less by falling off of values than such a temperamental industry as copper smelting.

The data available points quite definitely to the fact that not only is the volume output of the lumber industry more

stable than in the other extractive industries, more dependent on a capricious market, but also that in terms of depression it suffers less from deflated values. In both depressions covered this characteristic is apparent. While because of the "building boom," as the scientist says, other things were not equal, lumber also showed greater enhancement of values in the period of prosperity following the first post-war depression than did the values in the copper industry. While the "building boom" invalidates any general conclusion, the characteristic of the lumber industry of having a more stable nature under stress of depression is apparent.

Considered wholly from the standpoint of production, the reactions of the lumber industry's output to market conditions and what may be expected in the future are quite obvious. That lumber production has declined tremendously since the first decade of the century is obvious and requires no discussion. From a continuing high level before the depression of the thirties the production fell during the collapse to a low from which it has not regained its former level. Entirely aside from this development, however, is the fact that throughout the period, during depression and prosperity lumber production has adhered to a trend closely following that of industry in general. Declines in periods of business slumps have neither lagged behind nor anticipated the event. With the notable exception of the drop in 1929-1932, fluctuations have been moderate and a stability quite in line with all industry is shown. Decidedly in contrast are the figures given for the copper smelting industry which showed a wide range of fluctuation, sudden declines

and as rapid reversals. What the future holds for business and industry can only be guessed at, but it is certain that, precluding revolutionary technological events, the lumber industry will continue a course of moderate production fluctuations and as in the past will adhere to a trend reflected very truly by general business conditions.

INDICATIONS

Prices

Several interesting features are brought out in the comparison of prices as they have reacted to market conditions since 1914. First it may be said that the lumber industry can expect no such immediate benefits from periods of economic prosperity as are enjoyed by other industries as well as by agriculture. As is well demonstrated in the war boom of 1916 to 1920, lumber prices tend to lag behind the price levels found in the other fields. On the other hand lumber prices show quite as promptly, if not more so, the reaction to times of unhealthy business conditions such as characterize major depressions. Secondly the relatively much greater stability of lumber prices is apparent, showing definitely less severe fluctuations in times of great economic distress or prosperity than do either the prices of other industries or of agriculture. While this is more particularly true of upward trends, it is alos seen in times of depression when lumber prices maintain a relative level above the other industries. Thirdly, consideration of log prices in several different sections brings out the important fact that the farm forest producer has a more stable market for his logs than he does for his other products. This is true not only of lumber and log prices as a whole but of sectional markets as well as is brought out by studies of conditions prevailing in

the Northeastern region, the SouthernPine region, and also in the Lake States region. Because of the great volume of lumber products coming from the farm this fact is of great importance in the future of that branch of forestry.

EMPLOYMENT

There are three rather definite features with respect to employment which it is wished to bring to the reader's attention. First it should be pointed out that there is decidedly a much closer correlation between lumbering and the other manufactures in this respect than between lumbering and agriculture. Any attempt at a comparison between the factors influencing the labor situation in agriculture and the lumber industry will obviously involve an inherent error. While it is true that a large percentage of the labor utilized both in the woods and the mill is drawn from the agricultural population, it must be understood that the economic forces controlling the demands for this labor are the same as are found in other industries. Second, the general trend of the employment in the industry has been downward. After the peak occurring in the "building boom" of the early twenties, the curve tends to decline steadily. This trend continues through the depression, recovery and up to 1939. Closely connected with the decline of employment in lumbering is, of course the falling off of lumber consumption and production which have characterized the industry since 1906. Thirdly, while employment in the lumber industry does show a rather stable character, it appears to correlate very closely to employment in general in

this respect. Though recovery from the depression following the first World War was somewhat more prompt because of the "building boom" than was exhibited by industries and regression to the low of 1929-1933 anticipated the event to some extent, these isolated events cannot be said to be characteristic which could be safely relied upon to formulate a general rule for use in prediction of the future.

WAGES

In summarizing the comparisons of wage conditions existing in the fields studied, it may be said that on the whole both hourly and weekly wages have been lower in the lumber industry than in most other industries. Certain sections, as for example the Douglas fir region, have maintained average wages comparing favorably with industry in general while the other regions, notably the South, have shown averages far below those of other industries.

It is also evident that the agricultural share of national income allotted to its employees is somewhat greater than in the individual industries of lumbering and steel production and follows a decidedly more steady trend. The lumber manufacturing industry tends to react more sensitively to economic conditions than agriculture and in this respect can be more aptly compared with other industries.

As regards total wage payments, it may be said that the lumber industry shows features very closely related to those of industry in general as well as to agriculture. No great stability

is apparent nor any evidence of a tendency to lag behind or anticipate economic events. On the other hand it may be said that no evidence is forthcoming to show such instability as is shown by industries, of which steel production is typical, more subject to the whims of markets and world politics.

PRODUCTION

The data available point quite definitely to the fact that not only is the volume output more stable than in the other extractive industries, more dependent on a capricious market, but also that in times of depression it suffers less from deflated values. In both depressions covered this characteristic is apparent.

Considered wholly from the standpoint of production, the reactions of the lumber industries output to market conditions and what may be expected in the future are quite obvious. That lumber production has declined tremendously since the first decade of the century is evident and requires no discussion. From a continuing high level before the depression of the thirties the production fell during the collapse to a low from which it has not regained its former level. Entirely aside from this development, however, is the fact that throughout the period, during depression and prosperity, lumber production has adhered to a trend closely following that of industry is general. Declines in periods of business slumps have neither lagged behind nor anticipated the event. With the notable exception of the drop in 1929-1932, fluctuations have been moderate and a stability quite in line with all industry

is shown. Decidedly in contrast are the figures given for the copper smelting industry, which show a wide range of fluctuation, sudden declines and as rapid reversals. What the future holds for business and industry can only be guessed at but it is certain that, precluding revolutionary technological events, the lumber industry will continue a course of moderate production fluctuations and as in the past will adhere to a trend reflected very truly by general business conditions.

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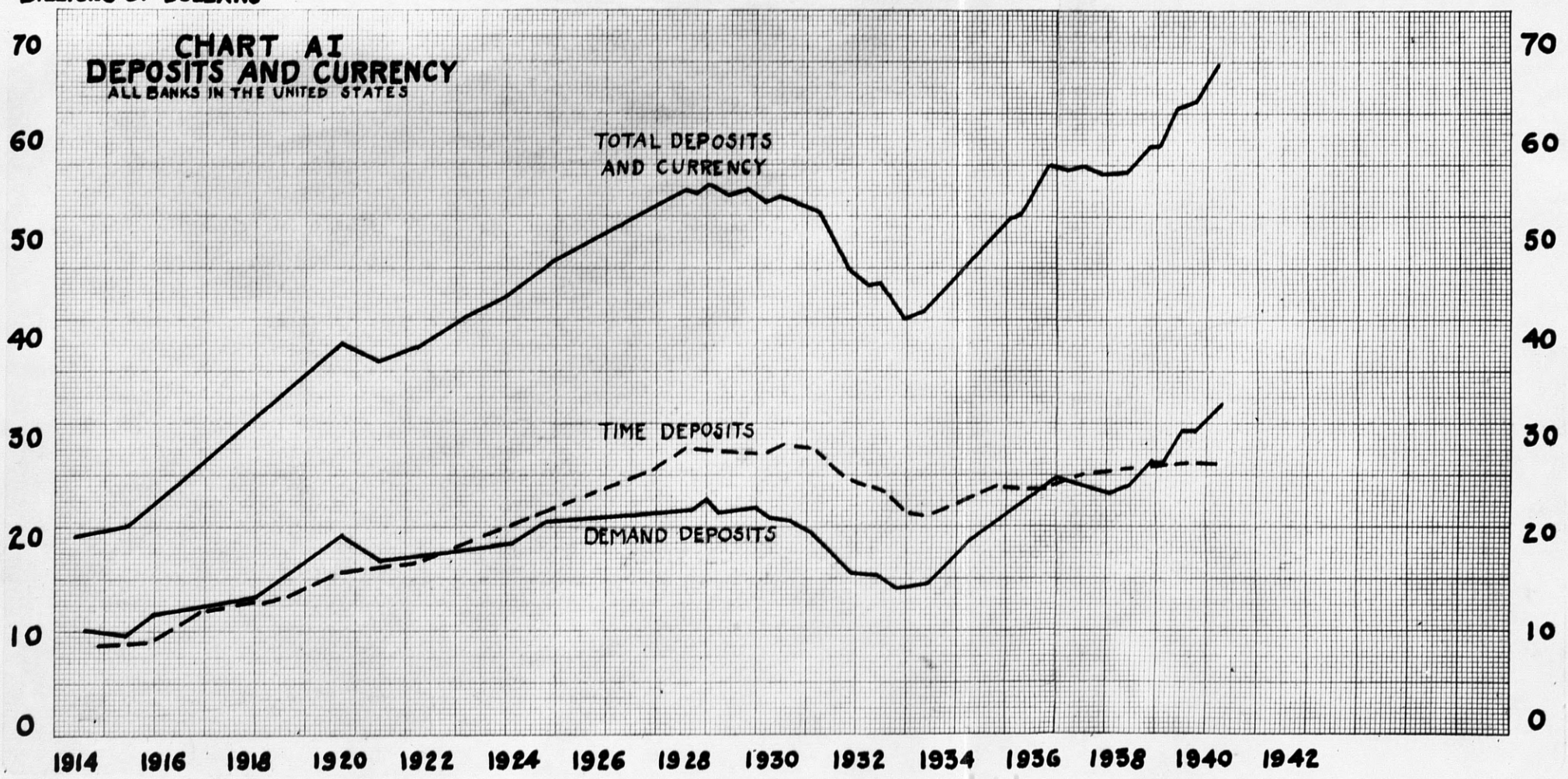
APPENDIX

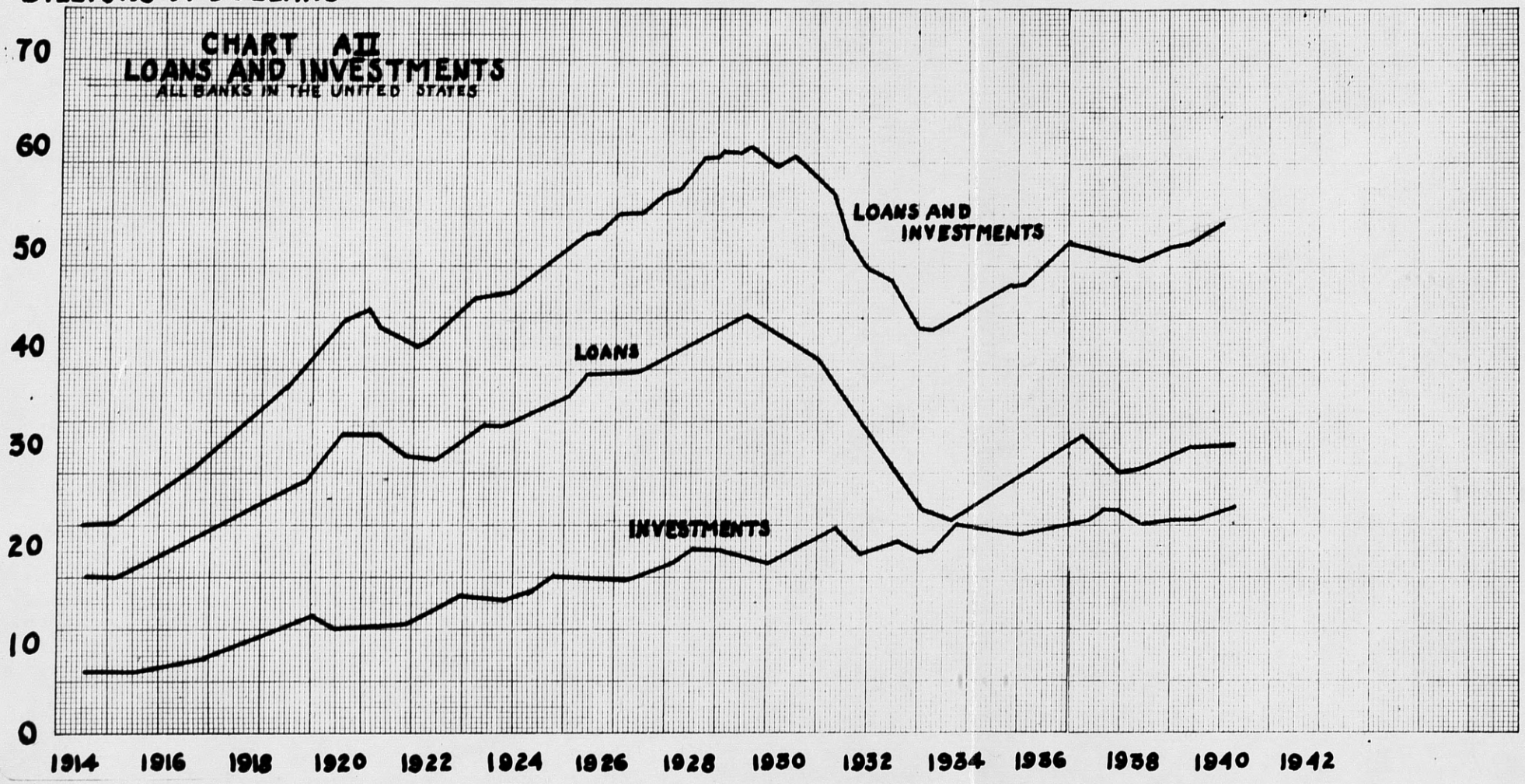
Made in U. S. A.

BILLIONS OF DOLLARS

CHART AI
DEPOSITS AND CURRENCY
ALL BANKS IN THE UNITED STATES



BILLIONS OF DOLLARS



Made in U. S. A.

Made in U. S. A.

CHART XIII
STOCK PRICES
MONTHLY AVERAGES
STANDARD STATISTIC COMPANY
1926 = 100

PER CENT

PER CENT

300
200
100
80
60
40
30
20
10

PUBLIC UTILITY

TOTAL

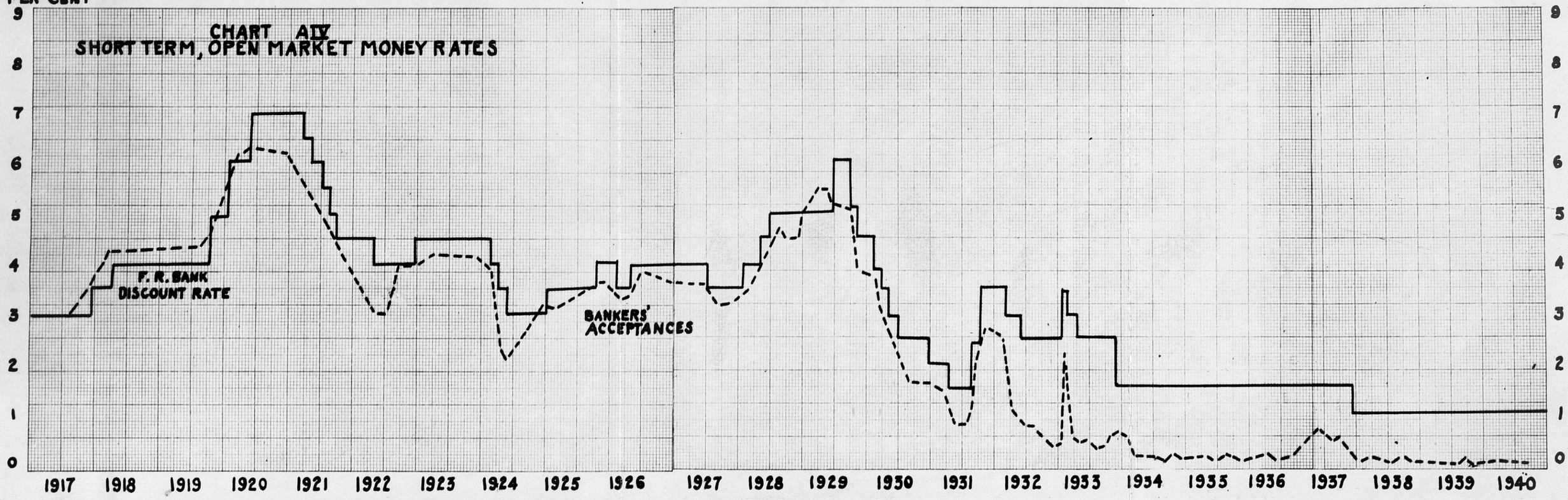
RAILROAD

INDUSTRIAL

N.Y. STOCK EXCHANGE CLOSED

1914 1916 1918 1920 1922 1924 1926 1928 1930 1932 1934 1936 1938 1940 1942

CHART AIV
SHORT TERM, OPEN MARKET MONEY RATES



Made in U. S. A.

Made in U. S. A.

CHART "A"
COST OF LIVING
BUREAU OF LABOR STATISTICS
1935 – 1939 = 100