

**MONETARY CONDITIONS AND THE U.S. LUMBER
AND WOOD PRODUCTS INDUSTRY**

By

John C. Redman and Vincent Cusumano



RESEARCH REPORT 15 : April 1973

In cooperation with

Northeastern Forest Experiment Station
Forest Service—U.S. Department of Agriculture

**University of Kentucky :: College of Agriculture
Agricultural Experiment Station :: Department of Agricultural Economics
Lexington**

TABLE OF CONTENTS

	Page
LIST OF TABLES	2
LIST OF FIGURES	3
SUMMARY	4
INTRODUCTION	5
THEORETICAL CONSIDERATIONS	5
METHODS	6
DATA AND RESULTS	7
TESTING THE NULL HYPOTHESIS	7
THE EXTENT OF THE ADJUSTMENTS	11
CONCLUSION	13
LITERATURE CITED	15
APPENDIX	17

LIST OF TABLES

No.		Page
A	Regression Results	8
B	Lumber Industry Percentage Adjustments Over The Business Cycle	9
	SUMMARY	
	INTRODUCTION	
	THEORETICAL CONSIDERATIONS	
	METHODS	
	DATA AND RESULTS	
	TESTING THE NULL HYPOTHESIS	
	THE EXTENT OF THE ADJUSTMENTS	
	CONCLUSION	
	LITERATURE CITED	
	APPENDIX	

LIST OF FIGURES

Page	No.	Page
8	1 Composite Index of Twelve Leading Indicators, Reverse Trend Adjusted to Coincide with Business Cycle (1967 = 100)	17
9	2 Index of Wholesale Lumber Prices, U. S. (1957-59 = 100)	18
	3 Index of Softwood Prices, U. S. (1957-59 = 100)	19
	4 Index of Hardwood Prices, U. S. (1957-59 = 100)	20
	5 Total Monthly Lumber Production, U. S.	21
	6 Total Monthly Softwood Lumber Production, U. S.	22
	7 Total Monthly Hardwood Lumber Production, U. S.	23
	8 Total Monthly Softwood Shipments, U. S.	24
	9 Total Monthly Hardwood Shipments, U. S.	25
	10 Total Monthly Lumber Shipments, U. S.	26
	11 Total Monthly Lumber Inventories, U. S.	27
	12 Total Monthly Softwood Lumber Inventories, U. S.	28
	13 Total Monthly Hardwood Lumber Inventories, U. S.	29
	14 Total Industry Employment, U. S.	30

SUMMARY

The evidence reported in this study suggests that the U. S. lumber and wood products industry is highly sensitive to changes in money market conditions. The time period covered by this study (1952-70) includes most of the post World War II years, and most important, the period following the Federal Reserve-Treasury accord of 1951 which activated monetary policy.

The generally accepted theoretical hypothesis that monetary policy has an unequal impact on economic activity was tested. Employing ordinary least squares and regressing the respective lumber industry economic indicator on a monetary policy proxy, i.e., interest rates on new issues of 3-month treasury bills, it was found that an inverse relationship exists between activities in this industry and monetary conditions.

The extent of the industry response was also calculated and the nature of its cyclical movements was described. Although the exact magnitude of the industry response varied, depending on the specific indicator, it was observed that in all cases the apparent response outweighed manyfolds similar reactions reported in the rest of the economy. This general tendency was especially magnified during periods of economic contraction.

Assuming the cyclical variations noted in the rest of the economy as the "ideal" response, it was concluded that the impact of monetary policy on the U. S. lumber and wood products industry appears to be excessive. Thus, this study supports the general notion that monetary actions instigated by the Federal Reserve authorities have an uneven distributive effect on economic activity.

MONETARY CONDITIONS AND THE U.S. LUMBER AND WOOD PRODUCTS INDUSTRY

by

John C. Redman and Vincent Cusumano¹

Introduction

The economic repercussion of monetary policy, instigated by the Federal Reserve System to combat inflationary tendencies in aggregate economic activity, has become a paramount political as well as economic issue. Since the 1951 Federal Reserve-Treasury accord, economists have argued that monetary controls have a differential impact on the various sectors and subsectors of the U. S. economy. Structural differences in the economic fabric are alleged to contribute to this uneven distributive effect. Small business, residential construction, and state and local governments are believed to be most effected by monetary controls, largely because of their overall dependency on the loanable funds market [8, 10, 11].

Although a number of studies have either quantitatively or qualitatively examined the relative effect of a restrictive monetary policy on sectorial activity [1, 7, 8, 9, 10, 11, 14, 23], attempts to determine the short-run responses of a particular industry are not documented. The primary purpose of this study is, therefore, to assess the overall

impact of monetary policy on a particular industry. It purports to measure the price, production, shipments, inventory and employment responses of the lumber and wood products industry (Standard Industry Code 24), which is perhaps one of the most fragmented and atomistically structured industries in the United States today. Characteristically, this industry is labor intensive, located near its raw material sources, and provides employment for more than 600,000 rural persons [23].

Theoretical Considerations

Evaluation of the nature of industry response to changes in monetary policy and aggregate economic activity should be predicated on some type of theoretical behavioral constructs. Although considerable debate exists as to the exact nature of the macroeconomic adjustment process that takes place because of changes in the availability of financial assets, many economists adhere to some variation of the portfolio theory [3, 5, 6, 12].

Briefly, the theory postulates a series of casual responses generated by spending units as they react to changes in macro conditions. Thus, a change in the ratio of financial assets to real assets induced by an increase or decrease in the stock of money causes the

¹Professor of Agricultural Economics, and Research Assistant in Agricultural Economics, respectively.

supply price of capital² to either increase or decrease. This change in the supply price of capital or interest rates affects the general level of economic activity. Rising interest rates, for example, brought about by a restrictive monetary policy will have a dampening effect on long-run and short-run decision making, both at the firm and at the household level. Consequently, the postponement or curtailment of investments or purchases of durable goods has the eventual impact of decreasing aggregate demand, and of course, the desired effect of dampening the inflationary spiral. By a similar argument, the opposite effect could be traced out for periods of decreasing interest rates or easy monetary policy. Here the objective of a relatively easy monetary policy would be to stimulate economic activity.

Applying this general theoretical notion of the lumber and woods product industry, we can hypothesize, *a priori*, similar directional responses in the industry's economic indicators to changes in monetary conditions. That is to say, an inverse relationship is expected between interest rates (the monetary policy proxy variable) and lumber production, shipments, and wholesale lumber prices; while a direct relationship is expected between interest rates and the levels of the end-of-the-month inventories.

Two questions are basic to this study. First, are the observed fluctuations in these lumber industry economic indicators consistent with *a priori* theoretical responses? Second, if these fluctuations are consistent with theoretical expectatives, what is the magnitude of these adjustments? At the outset it should be emphasized that in no way

does this paper want to suggest that decision-making in the lumber and wood products industry is restricted to monetary variables. Industrial decisions are too complex for such a simplistic treatment. It does, however, purport to identify the consequences of a restricted monetary policy on this industry.

Methods

In order to accomplish this task, the study was divided into three stages. First, monthly figures for wholesale prices, production, shipments, inventories, and employment were gathered [16, 17, 18, 19, 20, 21]. Likewise, monthly levels of interest rates on new issues of 3-month treasure bills and the index of 12 leading indicators, reverse trend adjusted to coincide with the business cycle, were obtained and analyzed [2, 22]. However, because of the extremely erratic nature of the lumber statistics, it was necessary to calculate 12-month moving averages to isolate the cyclical variation in these data. Second, ordinary least squares was used to determine the directional response of the U. S. lumber and wood products industry to changes in monetary conditions. Thus, the general form of the lumber industry response equation was formulated as follows:³

$$Y_t = f(i_{t-6})$$

where Y represents a vector of industry wide responses, be it prices, production levels, shipments, inventories, or employment; i denotes the interest rates on new issues of

²The supply price of capital is that price at which holders of wealth are willing to forego present consumption for future consumption.

³It is recognized that this type of estimation procedure is subject to a variety of errors, some of which may be sufficiently large to reduce the value of the estimate. In this study the errors stem basically from lack of knowledge of the precise nature of the industry response, and more importantly from nonspecification of other important casual variables.

3-month treasury bills lagged six months [15]. The t-test was then used to test for statistical significance. That is to say, if the calculated beta coefficient falls beyond the prespecified critical region, the null-hypothesis that no significant relationship between industry responses and movements in interest rates exists was rejected, and it was concluded that monetary policy had an effect that cannot be attributable to a change variation alone [4].

Fluctuations of the respective lumber industry figures were then examined relative to the business cycle, identified by the National Bureau of Economic Research's (NBER) index of 12-leading indicators, reverse trend adjusted to coincide with the business cycle [22]. The objective of this final stage was twofold. First, it measured the percentage adjustments and second, to determine the excessive nature of these adjustments, it compared these ups and downs with those registered in the rest of the economy.

Data and Results

The data for this study are summarized on 14 charts (Figs. 1-14) found in the Appendix, while the results of the statistical tests and measurements are presented subsequently in Tables A and B. The statistical findings of testing the null hypothesis that no significant correlation exists between monetary policy and U. S. lumbering activities are summarized in Table A. The percentage adjustments that apparently took place in the lumber industry as a result of monetary policy and changes in the business cycle from 1953 to 1970 are found in Table B.

Cyclical and secular movements in the U. S. lumber industry definitely exist (Figs. 2-14) and similar movements in the composite index of economic activity are clearly distinguishable (Fig. 1). However, before

discussing these data and results it should be reiterated that actual data observed in the literature of economic indicators are not shown in these figures. Instead, the plotted points represent a series of 12-month moving averages centered around the month of July from 1953 to mid-1971.

It should also be noted that because of the very nature of this study, the information illustrated in these figures had to be dichotomized into periods of economic contraction and periods of economic expansion. Hence, the shaded areas isolate periods of economic recession from the boom periods.

Testing the Null Hypothesis

As summarized in Table A, the null hypothesis that no significant association exists between monetary policy and lumbering activities must be rejected. The statistical results indicate the monetary policy variable is important in explaining the variation in the respective dependent variable. The calculated t-values for the interest rate regression coefficient are all significant at the 0.01 percent level. In general, therefore, it may be concluded that monetary policy has a definite impact on overall activities registered in the lumber and wood product industry. Excluding lumber prices the signs on the estimated beta coefficients are supportive of the theoretical expectations that rising interest rates have a dampening effect on the industry.⁴

⁴No attempt to elaborate on the magnitude of these estimated beta coefficients will be made because of the potential misunderstanding that may result. Since we excluded other explanatory variables from our response equation, these estimates suffer from nonspecification bias. What is important for this study, however, is the sign of the coefficient.

Table A.--Regression Results

Dependent Variable (Y)	Constant	Interest Rate Coefficient	T-Value	R ²
Industry-wide Employment	689.6	-20.6	-10.1*	.59
Total Lumber Shipments	3107.5	-26.7	-5.1*	.27
Softwood Shipments	2532.1	-26.6	-7.0*	.41
Hardwood Shipments	574.4	.0152	.008	.0001
Total Lumber Production	3124.2	-28.6	-5.6*	.31
Softwood Production	2535.9	-23.2	-6.2*	.35
Hardwood Production	585.9	-3.8	-2.5*	.08
Total End Month Inventories (1961-70)	6527.0	58.3	4.2*	.45
Composite Index of Lumber Prices	88.5	4.6	7.9*	.47

*Statistically significant at the .99 level.

TABLE B

LUMBER INDUSTRY PERCENTAGE ADJUSTMENTS* OVER THE BUSINESS CYCLE#
(1953-70)

	8/54 to (E) 7/57	7/57 to (C) 4/58	4/58 to (E) 5/60	5/60 to (C) 2/61	2/61 to (E) 3/66	3/66 to (C) 3/67	3/67 to (E) 11/69	11/69 to (C) 11/70
Composite Eco. Index	+30.99	-4.81	+21.94	-1.45	+59.77	-1.31	+20.29	-1.79
Wholesale Lumber Price	+10.13	-8.91	+9.37	-9.90	+14.57	-1.47	+35.55	-15.94
Wholesale Softwood Price	---	---	---	---	+11.33	-0.67	+42.45	-17.59
Wholesale Hardwood Price	---	---	---	---	+25.35	-7.42	+22.42	-4.47
Lumber Production	+10.11	-18.82	+15.97	-14.06	+18.96	-10.24	+11.12	-5.04
Softwood Production	+12.61	-17.74	+21.65	-18.51	+15.81	-10.51	+13.14	-7.92
Hardwood Production	+5.09	-27.12	+14.62	-13.13	+39.96	-11.88	+19.44	-8.36
Lumber Shipments	+13.24	-18.73	+12.94	-10.99	+19.15	-12.28	+12.69	-9.14
Softwood Shipments	+12.15	-17.24	+15.08	-14.21	+17.25	-12.87	+14.73	-9.35
Hardwood Shipments	+29.70	-29.57	+7.61	-4.02	+36.25	-12.57	+18.56	-20.33

(Continued)

TABLE B--Continued
 LUMBER INDUSTRY PERCENTAGE ADJUSTMENTS* OVER THE BUSINESS CYCLE#
 (1953-70)

	8/54 to (E) 7/57	7/57 to (C) 4/58	4/58 to (E) 5/60	5/60 to (C) 2/61	2/61 to (E) 3/66	3/66 to (C) 3/67	3/67 to (E) 11/69	11/69 to (C) 11/70
Lumber Inventories	-11.49	+19.60	-13.39	+18.57	---	+7.66	-12.48	+20.77
Softwood Inventories	-9.00	+17.83	-10.28	+15.76	---	+6.79	-8.89	+15.65
Hardwood Inventories	-15.42	+14.35	-7.12	+7.64	---	+25.93	-48.49	+90.63
Industry Employment	+61.43	-18.41	+7.22	-12.79	+5.02	-4.60	+0.96	-13.74

*Computed from peak to trough and trough to peak of respective 12-month moving averages.

#Adjusted for leads and lags.

(E) represents economic expansion.

(C) denotes economic contraction.

The Extent of the Adjustments

Once it was established that monetary policy did indeed play a paramount role in determining fluctuations in lumber activities, the second phase of this study focused on the extent of these cyclical fluctuations, especially during periods of economic contraction in part instigated by a tight monetary policy.

Before elaborating on the exact nature of this apparent response, a comparative basis should be established. Monthly movements in the U. S. economy since 1953 were based on the National Bureau of Economic Research's index of 12-leading indicators—reverse trend adjusted to coincide with the business cycle (Fig. 1). By measuring from peak to trough, the following reference dates are easily isolated:

Peak		Trough
4/57	to	3/58
10/59	to	10/60
3/66	to	2/67
11/69	to	8/70

The percentage adjustments during these dates were calculated (Table B). Since 1953, the largest single negative percentage change in aggregate economic activity took place during the 1957-58 recession when the index decreased some 4.8 percent. During the expansion period of 1961-66, the yearly increase averaged about 12 percent, whereas the 1969-70 economic downturn was reflected by a 1.79 percent decrease in the index.

The general pattern of monthly fluctuations in the wholesale price of lumber (Fig. 2) has been to increase during periods of economic boom and diminish in periods of recession, which is consistent with the business cycle. The overall lumber price decrease, because of unfavorable business conditions, ranges from two to seven times

greater than the general decrease in aggregate economic activity (Table B). In the 1969-70 economic slump, for instance, the wholesale price index of lumber decreased some 15.9 percent while the composite index showed a decrease of only 1.8 percent. An equally important observation is noted in the general tendency of wholesale lumber price index to reach its respective peak sometime before the rest of the economy, while lagging behind on the downturn (Fig. 2).

A comparative study of wholesale prices of softwoods and hardwoods reveals characteristics similar to the wholesale prices of lumber (Figs. 3 and 4). That is, there is a definite cyclical pattern in both hardwoods and softwood prices, and the same general lead-lag characteristic is exhibited. Also, hardwood prices generally tend to lag behind softwood prices. For example, softwood prices were showing signs of adjusting back upward during the 1969-70 economic recessions while hardwood prices show no noticeable signs of upward movements. Also, the amplitudes of softwood price fluctuation are relatively greater than those of hardwood prices. In a small way, this might be indicative of greater price stability in hardwoods than in softwoods, although the 7.4 percent decrease in hardwood prices during the 1966-67 downturn might contradict this.

Movements in total lumber production suggest a pattern consistent with the general business cycle (Fig. 5). From trough to peak, the average increase in production levels has been about 12 percent, while averaging about 14 percent on the downside of the general business cycle. Comparisons of these production responses with those registered in prices reveal that in recessionary periods the percentage decrease in production is much greater than the percentage decrease in wholesale lumber prices. During economic booms, however, the percentage increase in price outweighs the percentage increase in production. A plausible explanation for this might lie in the presence of many marginal

firms that are perhaps forced out of the lumbering business during economic recessions. Because of the loss of these firms, the lumber industry is unable to meet the expanding demand during the expansionary periods.

A very erratic pattern of the fluctuations in hardwood and softwood production existed (Figs. 6 and 7). Although difficult to discern, a cyclical behavior pattern may also be deduced. The impact of unfavorable market conditions seems to be greater for the hardwood firms than for the softwood firms. Note also that the long-run trend in hardwood production is an increasing one, while for the softwood production levels, the long-run trend is decreasing. The ever decreasing role of softwood in the general construction industry and the increasing demand for hardwood furniture partially explain these secular tendencies.

Cyclical variation in the quantity of lumber demanded, as measured by the level of monthly lumber shipments (Fig. 8) also moves with the business cycle, i.e., adjusting upward in the boom periods and downward in slumps. The lumber shipments averaged approximately 14 percent on the upward swings and about 13 percent on the downward movements. Relative to the wholesale lumber price adjustments, these quantity changes are similar to the production responses. Again, the decrease in the levels of lumber shipment is from four to six times that of the decrease in aggregate activity. This is exemplified in the 9.14 percent negative adjustment in the 1969-70 recession. Also consistent with the basic cyclical behavior patterns established in the other series were the cyclical and secular trends in shipments of hardwoods and softwoods (Figs. 9 and 10). Softwoods show a decreasing long-run trend

with respect to time; hardwoods, on the other hand, register a long-run upward trend.

In line with general hypothesized expectations, end-of-the-month inventory levels indicate definite contracyclical variations (Figs. 11, 12 and 13). Inventory levels of both softwoods and hardwoods increase in economic recessions and diminish during economic expansions. However, the impact of changing economic conditions seems to be relatively greater on hardwoods than on softwoods. Inventory levels for hardwoods increased some 90.7 percent during 1969-70. By contrast, in the same interval of time, softwood inventories increased only 15.7 percent.

Finally, the movement in industry-wide employment levels is also cyclical (Fig. 14). The observed pattern is also consistent with the general cyclical movements in aggregate activity. Employment patterns, however, differ in the long-run tendency of substituting capital for labor. In periods of economic booms, the average increase in the number of people employed in the industry, has been of about 5 percent. But, during periods of contracting economic activity the average decrease has been about 12 percent. These characteristics also support the hypothesis that many marginal firms in the industry are forced out of business because of adverse business conditions. For example, the 1969-70 slump in the general economy resulted in a 13.7 percent decrease in total industry employment. Considering that this industry is normally located close to the source of raw materials or in remote rural areas, and also that this industry is perhaps one of the most labor intensive industries, the impact of a restrictive monetary policy is felt by many rural workers in terms of unemployment.

CONCLUSION

The results of these analyses lead to the conclusion that the United States lumber industry is highly sensitive to changes in monetary policy and aggregate economic conditions. The visible cyclical and contracyclical behavior patterns and the results of regression analysis provide the basis for this conclusion.

However, in assessing these results a judgment as to the desirability of these relationships must be made. First, from the viewpoint of macroeconomics and economic stability, a question can be raised concerning the desirability of the United States lumber industry fluctuating according to changes in the interest rate in the described patterns. More importantly, assuming such fluctuations are desirable in that they reflect natural adjustments to market conditions, the question may be asked if the degree of the adjustments activated by a restrictive monetary policy is *excessive*.

Obviously, economic stability dictates that aggregate levels of prices, production and employment behave in harmony with the *needed* changes in aggregate economic activity. That is to say, industrial activity should respond to monetary policy so as to change the excessive nature of macroeconomic forces and thus bring about economic stability. Thus, in the general sense, the cyclical nature of lumbering is an economically desirably behavior pattern, if the cyclical variation is only a response to market forces. Conversely, it may be argued that because of the atomistic structure of the

lumber industry, and the presence of many marginal firms, the impact of changing aggregate conditions and monetary policy is excessive. This is emphatically documented in Table B. In every instance, the adjustment that resulted in the lumber industry outweighs manyfold the decrease in the composite index of economic activity. The excessive nature of this impact on lumbering is amplified if developmental dimensions are thrown into perspective. Sawmills must be located near or not far from their sources of raw material, or in rural areas, if they are to minimize transportation cost. Thus, if marginal firms are forced out of business because of the unfavorable market conditions associated with restricted monetary policy, rural employment and income suffer most. Also, it has been noted that hardwoods are extremely sensitive to changes in interest rates. One of the traditional industries of Central Appalachia has been the hardwood industry. For example, in the Central Appalachian state of Kentucky, 93 percent of all lumber produced in 1969 was hardwoods.

In conclusion, although it might be economically desirable for industries to react to monetary policy and to the extent that this cyclical response is excessive, monetary policy appears to be unfair and discriminating. The United States lumber industry apparently suffers from such treatment, i.e., assuming that the impact of monetary policy on other sectors of the economy is reflected by the index of economic activity.

LITERATURE CITED

- [1] Bach, G. L., and C. J. Hiuzenga, "The Differential Effects of Tight Money," *American Economic Review*, Vol. 51, No. 1 (March 1971), pp. 52-80.
- [2] Board of Governors, *Federal Reserve Bulletin*, Vols. 35-57, Federal Reserve System, Washington, D. C., 1953-1971.
- [3] Davis, R. C., "The Role of Money Supply in Business Cycles," *Monthly Review*, Federal Reserve Bank of New York, April 1968.
- [4] Dixon, W. J., and F. J. Massey, *Introduction to Statistical Analysis*, (McGraw-Hill, 1969).
- [5] Friedman, M., *The Optimum Quantity of Money and Other Essays* (Aldine Co., 1969), Chapter 10.
- [6] Friedman, M., and D. Maiselman, "Relative Stability of Monetary Velocity and the Investment Multiplier in the U. S., 1897-1958," *Stabilization Policies*, (Prentice-Hall, 1963).
- [7] Hamburger, Michael J., "Interest Rates and the Demand for Consumer Durable Goods," *American Economic Review*, Vol. 57, No. 5 (December 1967), pp. 1131-1153.
- [8] Klamann, Saul B., "Effects of Credit and Monetary Policy on Real Estate Markets: 1952-54," *Land Economics*, Vol. 31, No. 3 (August 1956), pp. 239-249.
- [9] McGouldrik, Peter F., "The Impact of Credit Cost and Availability on Inventory Investment," U. S. Congress, J.E., *Inventory, Fluctuations, and Economic Stabilization*, 1962, pp. 91-116.
- [10] McGouldrik, P. F., and J. E. Peterson, "Effects of Monetary Restraint on State and Local Governments in 1966," in *Readings in Money, National Income and Stabilization Policy*, by Warren C. Smith and Ronald L. Teigen (eds.) (Homewood: Richard D. Irwin, Inc., 1970), pp. 449-475.
- [11] Meltzer, Allan H., "Merchantile Credit, Monetary Policy and Size of Firm," *Review of Economics and Statistics*, Vol. 41, No. 4, (November 1960), pp. 429-436.
- [12] Patinkin, Don, *Money, Interest, and Prices*, 2nd ed. (New York: Harper Row, 1965).
- [13] Tobin, J., "An Essay on the Principle of Debt Management," *Fiscal and Debt Management* (Prentice-Hall, 1963).
- [14] Silber, W. L., and M. E. Polakoff, "The Differential Effects of Tight Money: An Econometric Study," *Journal of Finance*, Vol. 25, No. 1 (March 1970), pp. 83-97.

- [15] Solow, R. M., "Lags and Monetary Policy," *Stabilization Policies* (Commission On Money and Credit, Research Studies; Englewood Cliffs: Prentice-Hall, 1963), pp. 14-96.
- [16] U. S. Department of Commerce, *Business Statistics 1957 Biennial Edition*, U. S. Government Printing Office, Washington, D. C., 1957.
- [17] U. S. Department of Commerce, *Business Statistics, 1961-63, Biennial Edition*, U. S. Government Printing Office, Washington, D. C., 1963.
- [18] U. S. Department of Commerce, *Business Statistics, 1965 Biennial Edition*, U. S. Government Printing Office, Washington, D. C., 1965.
- [19] U. S. Department of Commerce, *Business Statistics, 1967 Biennial Edition*, U. S. Government Printing Office, Washington, D. C., 1967.
- [20] U. S. Department of Commerce, *Business Statistics, 1969 Biennial Edition*, U. S. Government Printing Office, Washington, D. C., 1969.
- [21] U. S. Department of Commerce, *Survey of Current Business, 1970-71*, U. S. Government Printing Office, Washington, D. C.
- [22] U. S. Department of Commerce, *Business Condition Digest*, U. S. Government Printing Office, Washington, D. C., February 1971, Page 108, June 1971.
- [23] Zarembe, J., *Economics of the American Lumber Industry*, New York, Robert Speller & Sons, 1963.
- [24] Zupnick, Elliot, "Consumer Credit and Monetary Policy in the United States and the United Kingdom," *Journal of Finance*, Vol. 17, No. 2 (May 1962), pp. 342-354.

APPENDIX

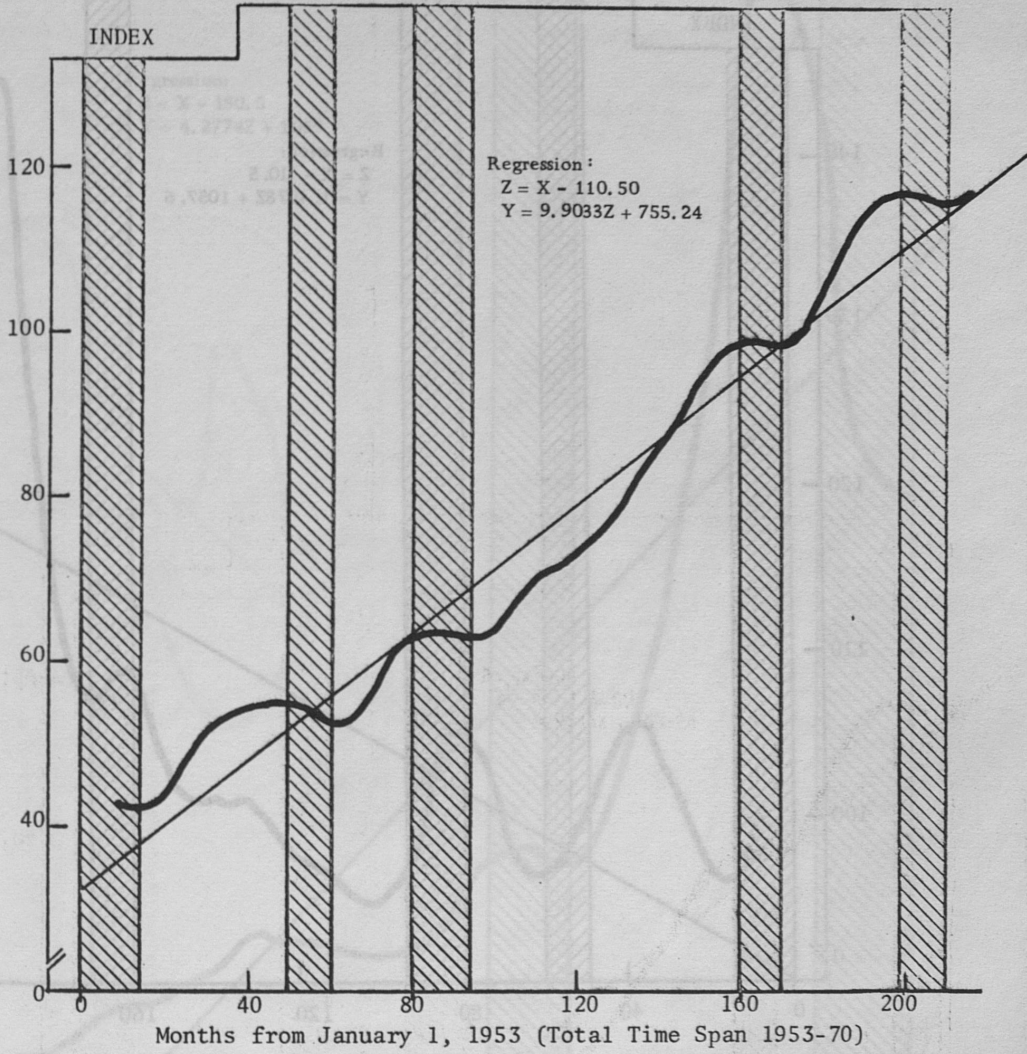


Fig. 1.--Composite Index of Twelve Leading Indicators, Reverse Trend Adjusted to Coincide with Business Cycle (1967 = 100).

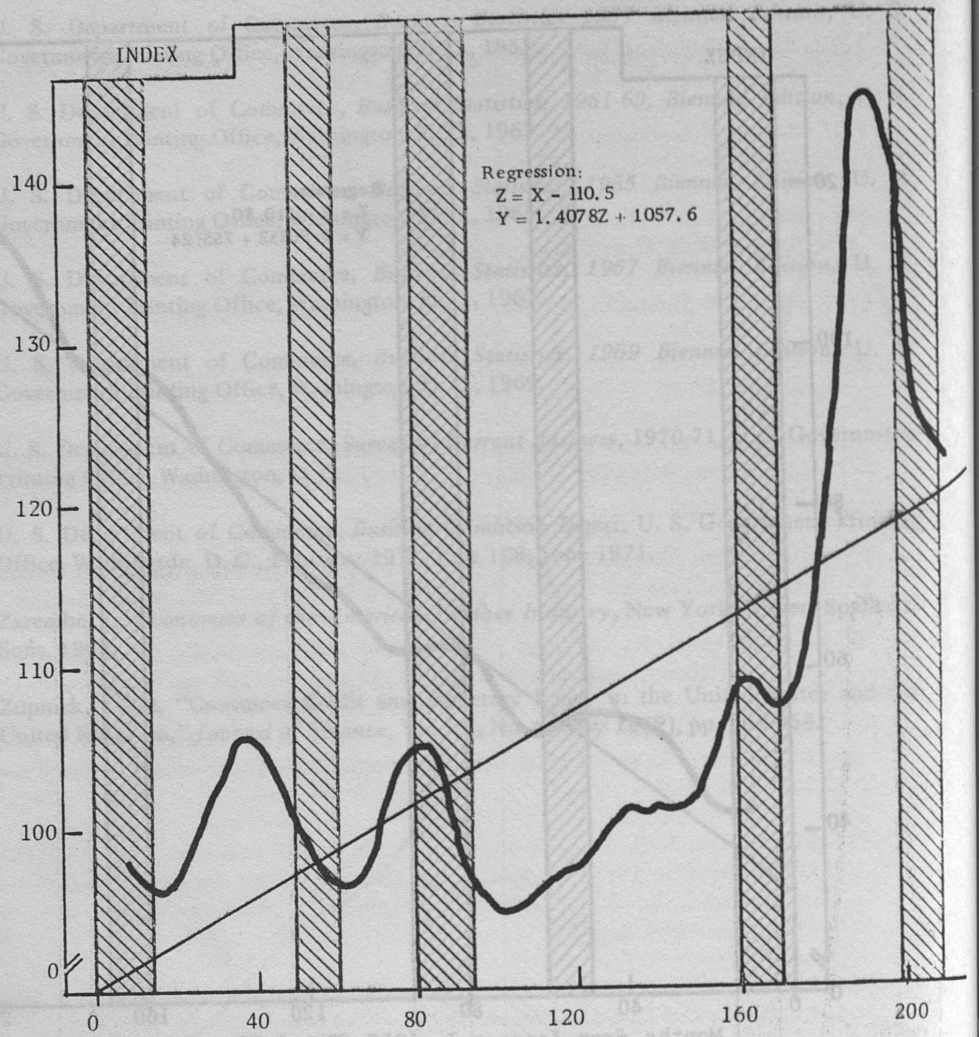


Fig. 2.--Index of Wholesale Lumber Prices, U. S. (1957-59 = 100).

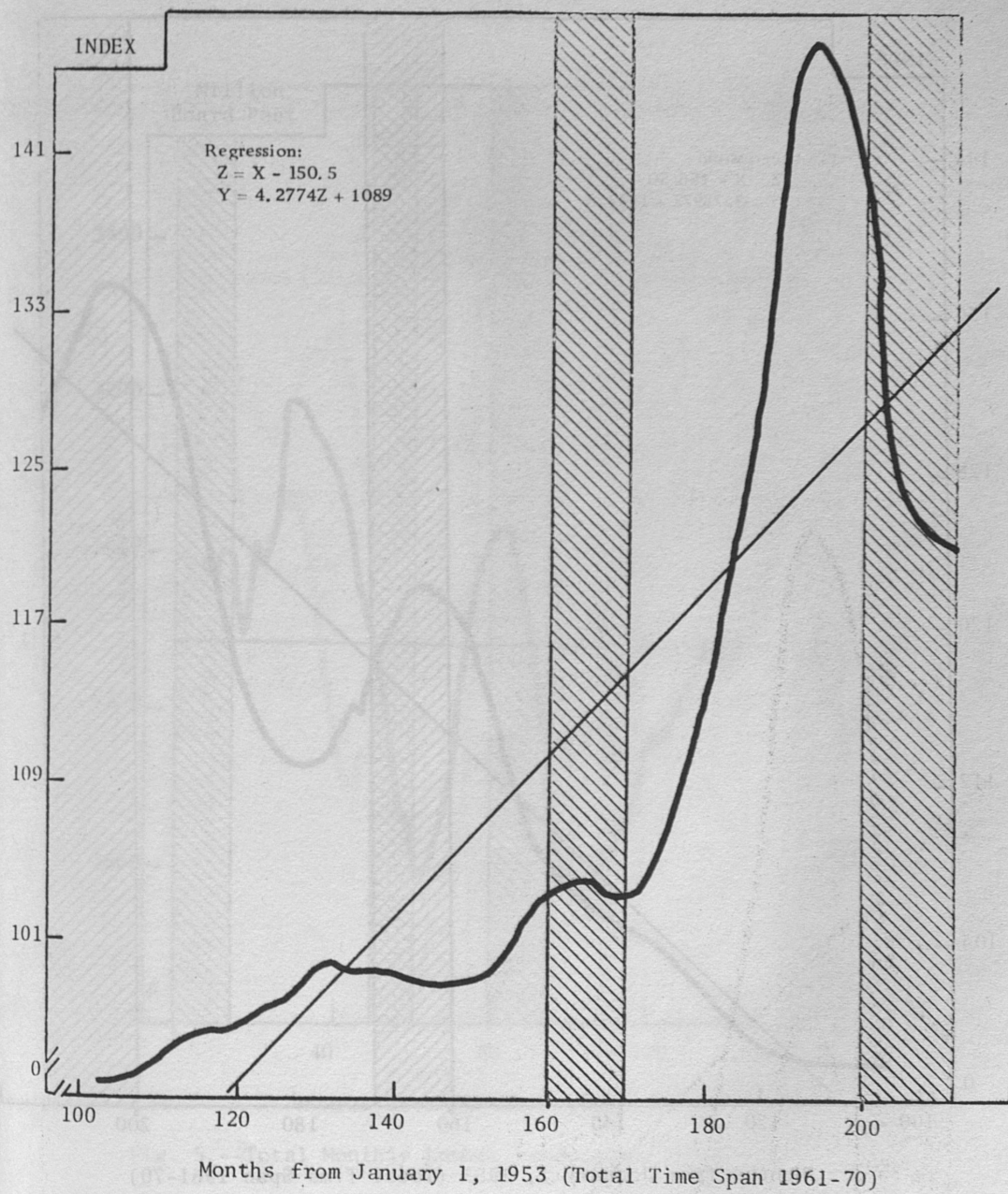


Fig. 3.--Index of Softwood Prices, U. S. (1957-59 = 100).

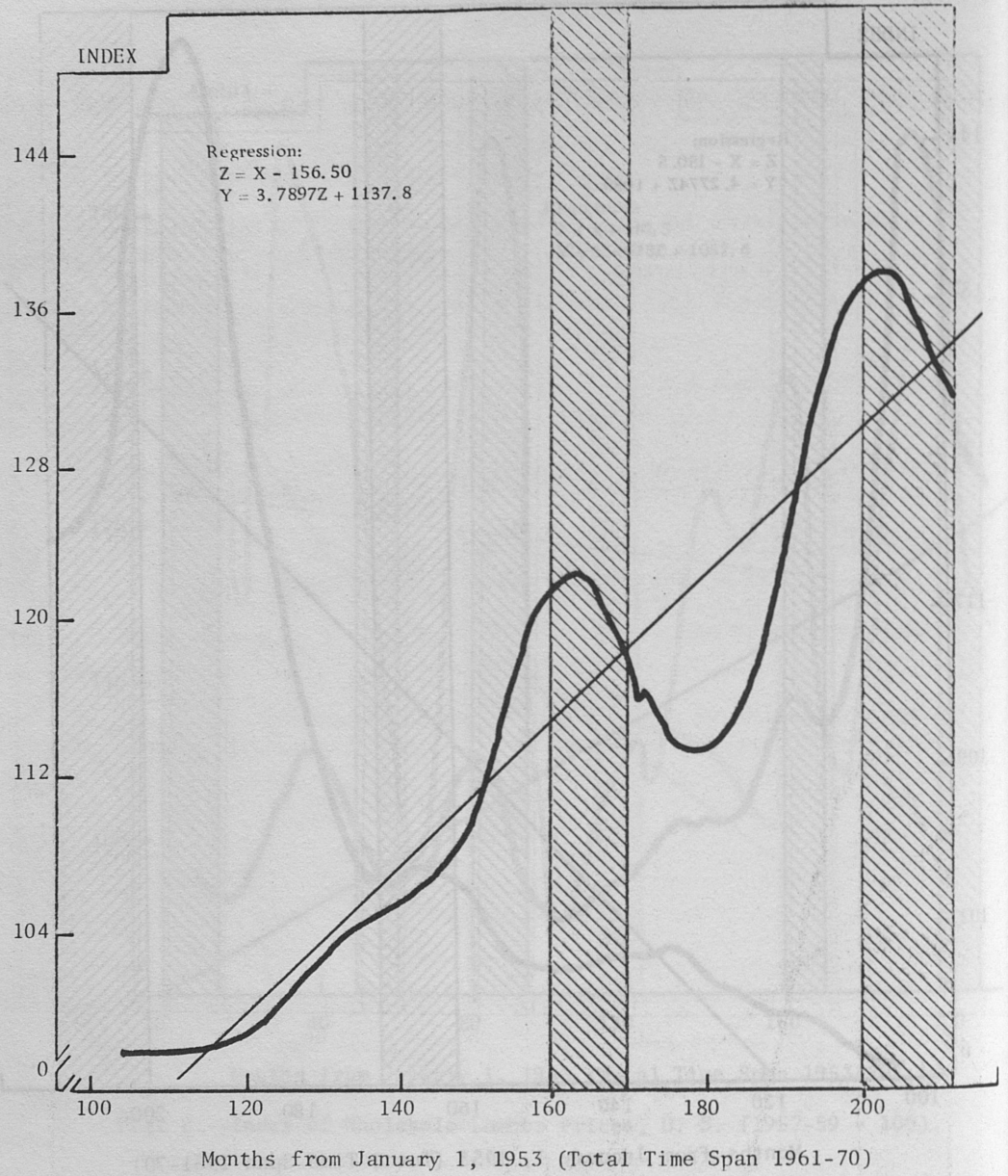


Fig. 4.--Index of Hardwood Prices, U. S. (1957-59 = 100).

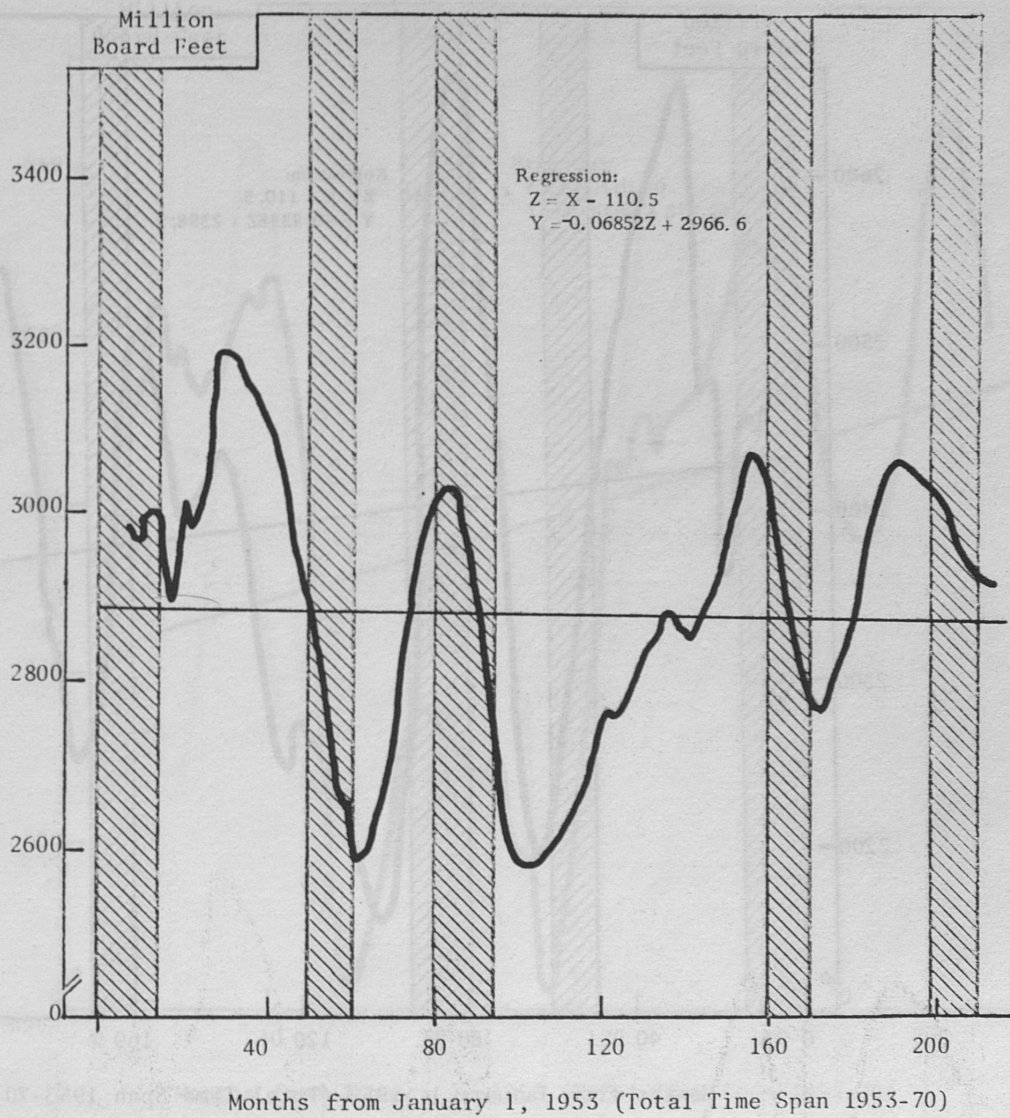
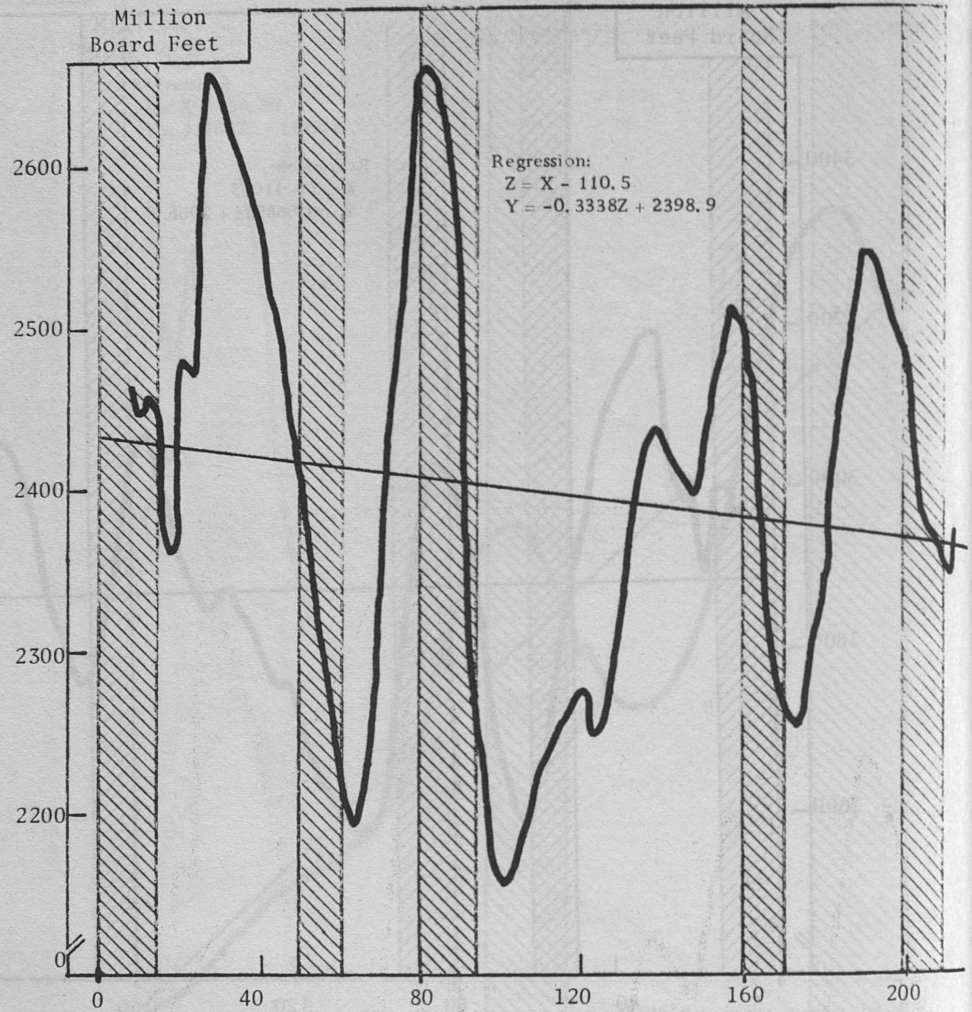


Fig. 5.--Total Monthly Lumber Production, U. S.



Months from January 1, 1953 (Total Time Span 1953-70)

Fig. 6.--Total Monthly Softwood Lumber Production, U. S.

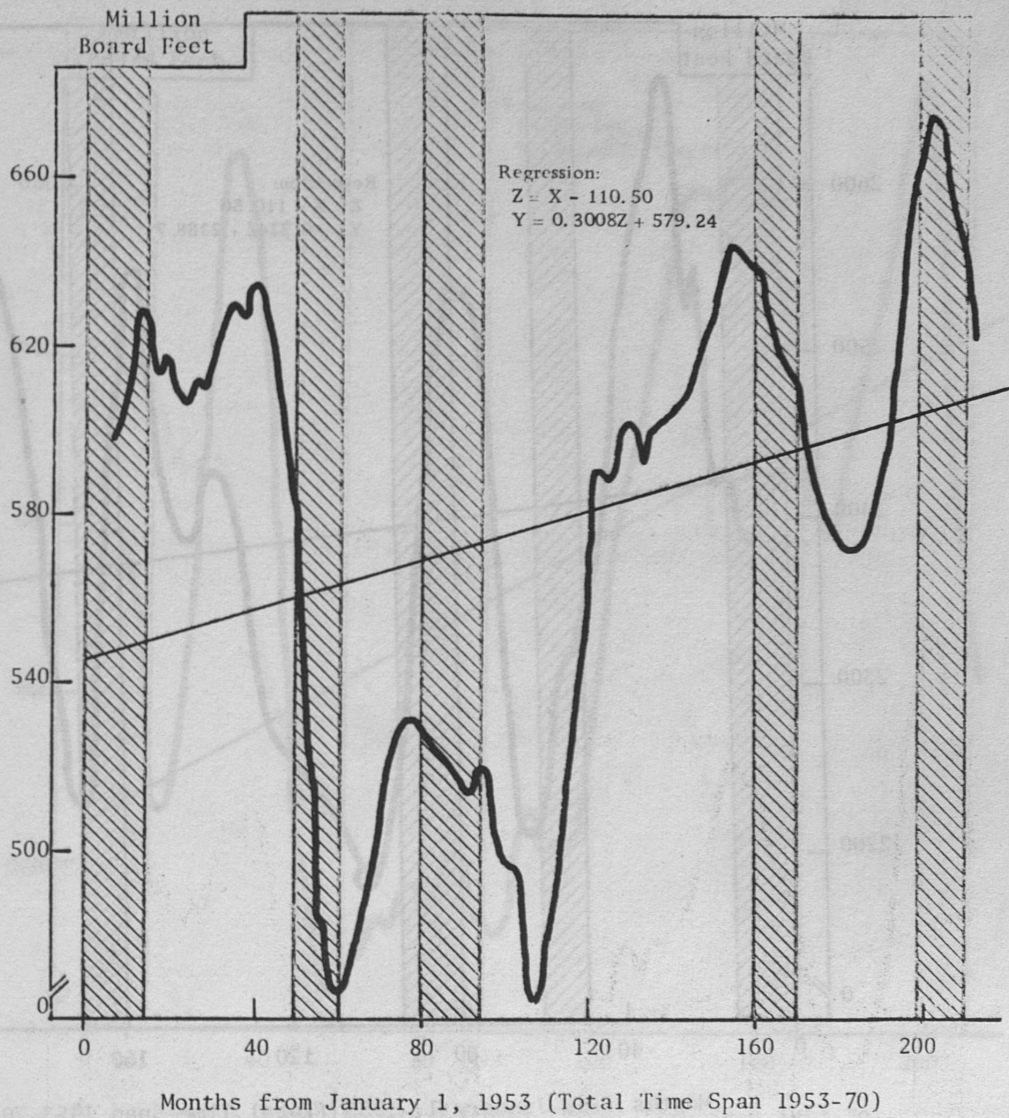


Fig. 7.--Total Monthly Hardwood Lumber Production, U. S.

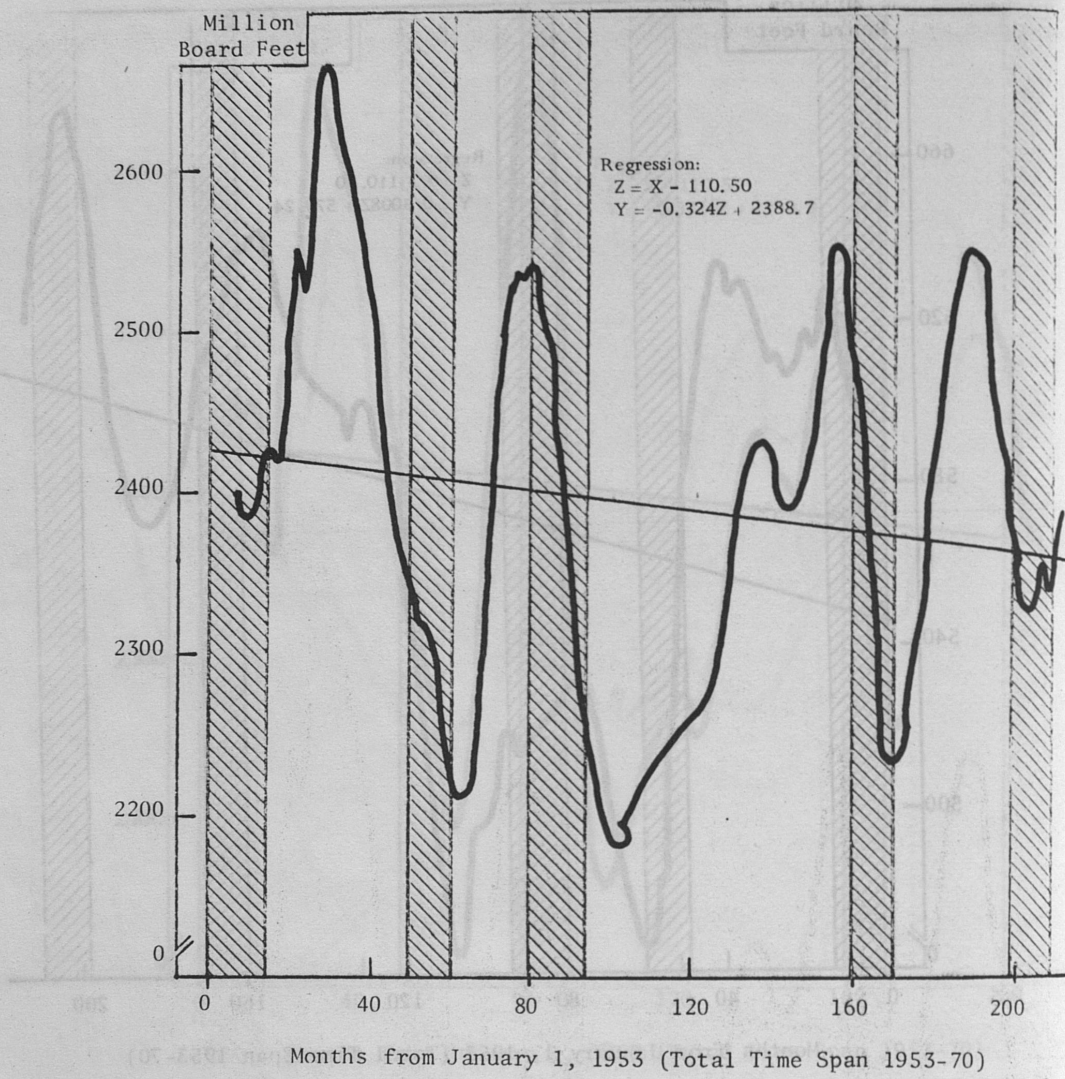


Fig. 8.--Total Monthly Softwood Shipments, U. S.

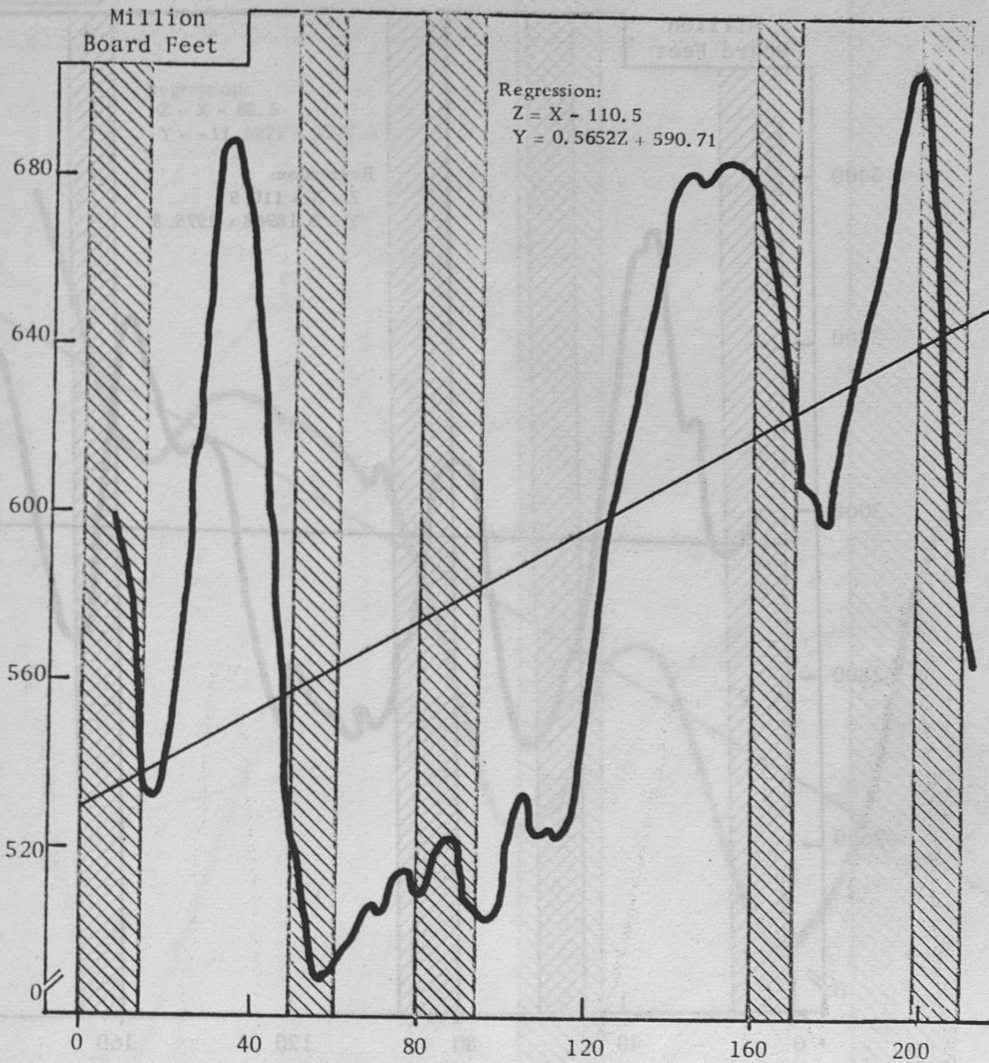


Fig. 9.--Total Monthly Hardwood Shipments, U. S.

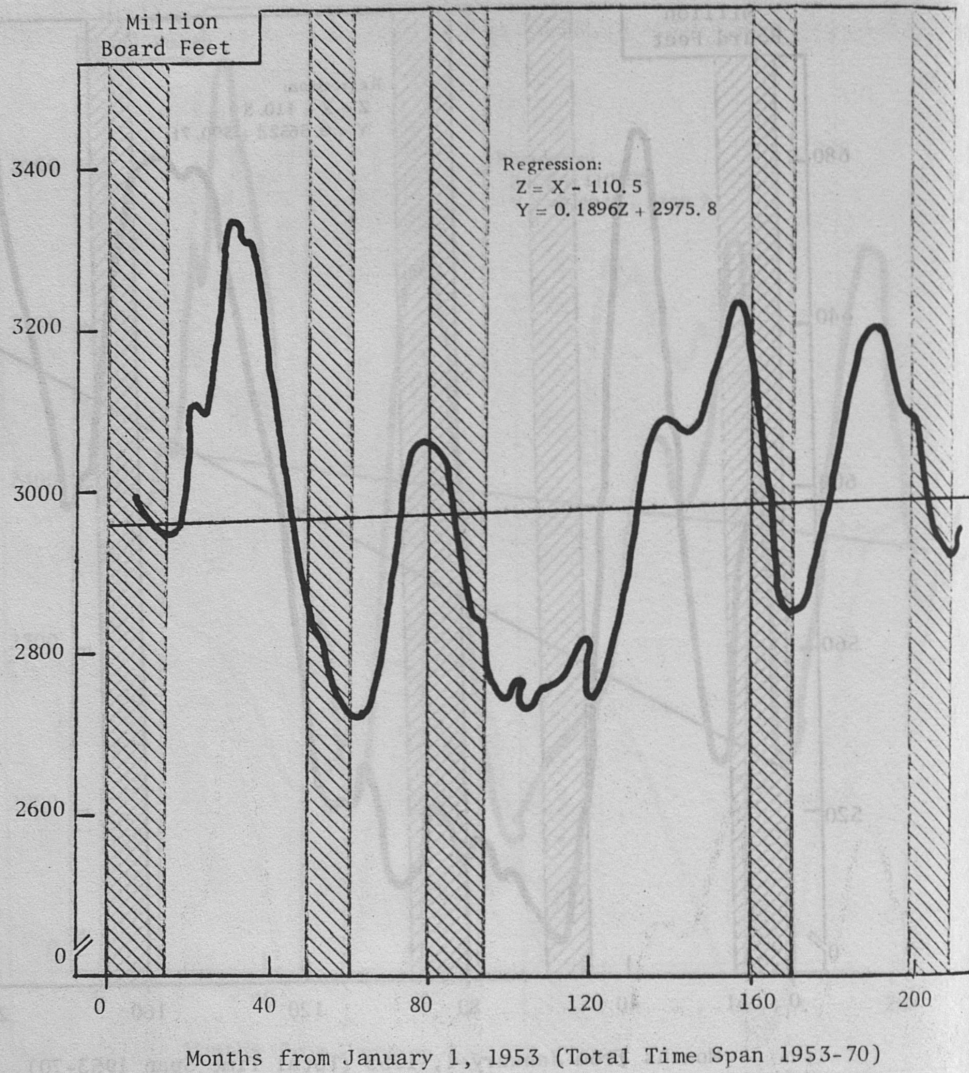


Fig. 10.--Total Monthly Lumber Shipments, U. S.

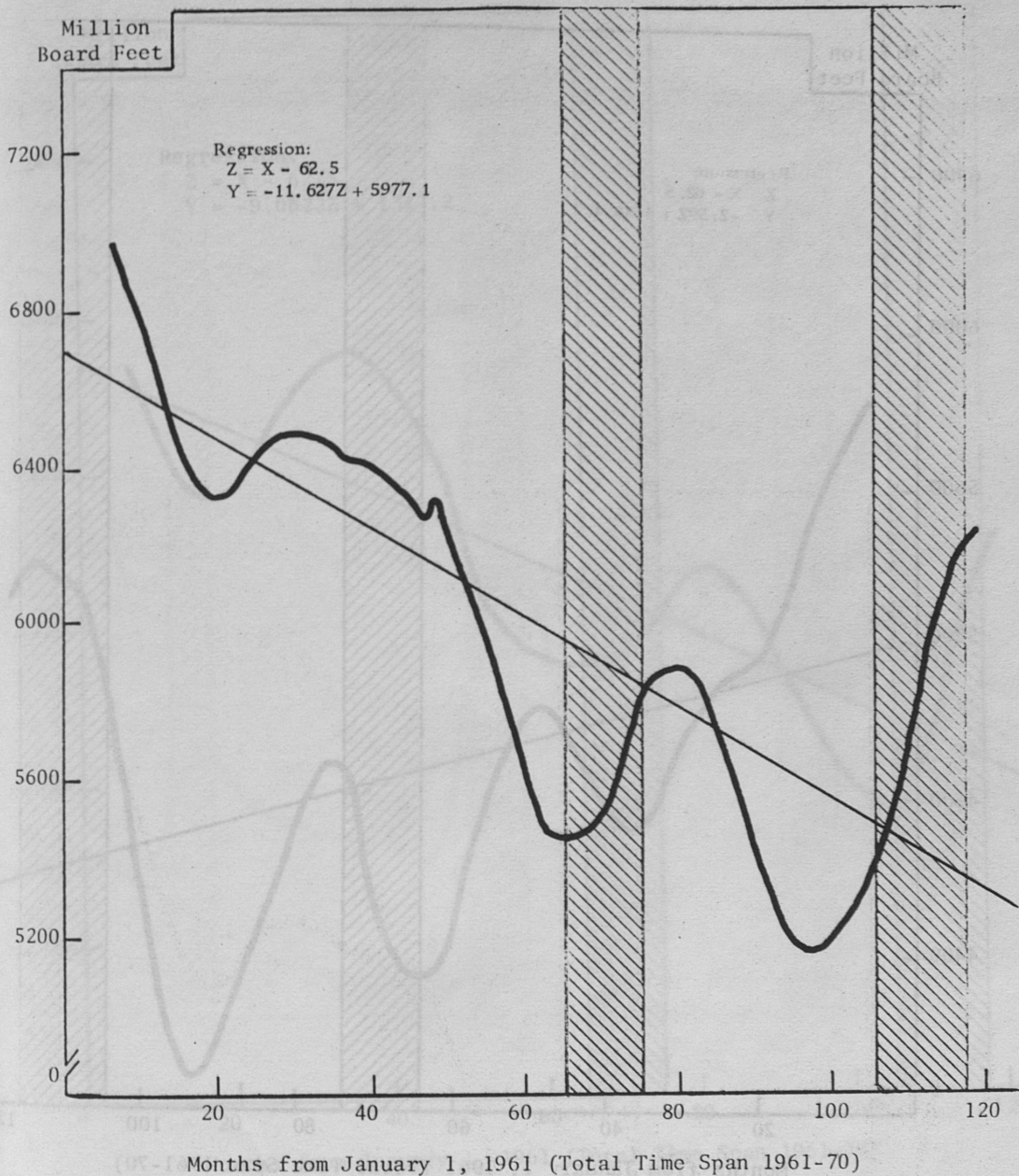


Fig. 11.--Total Monthly Lumber Inventories, U. S.

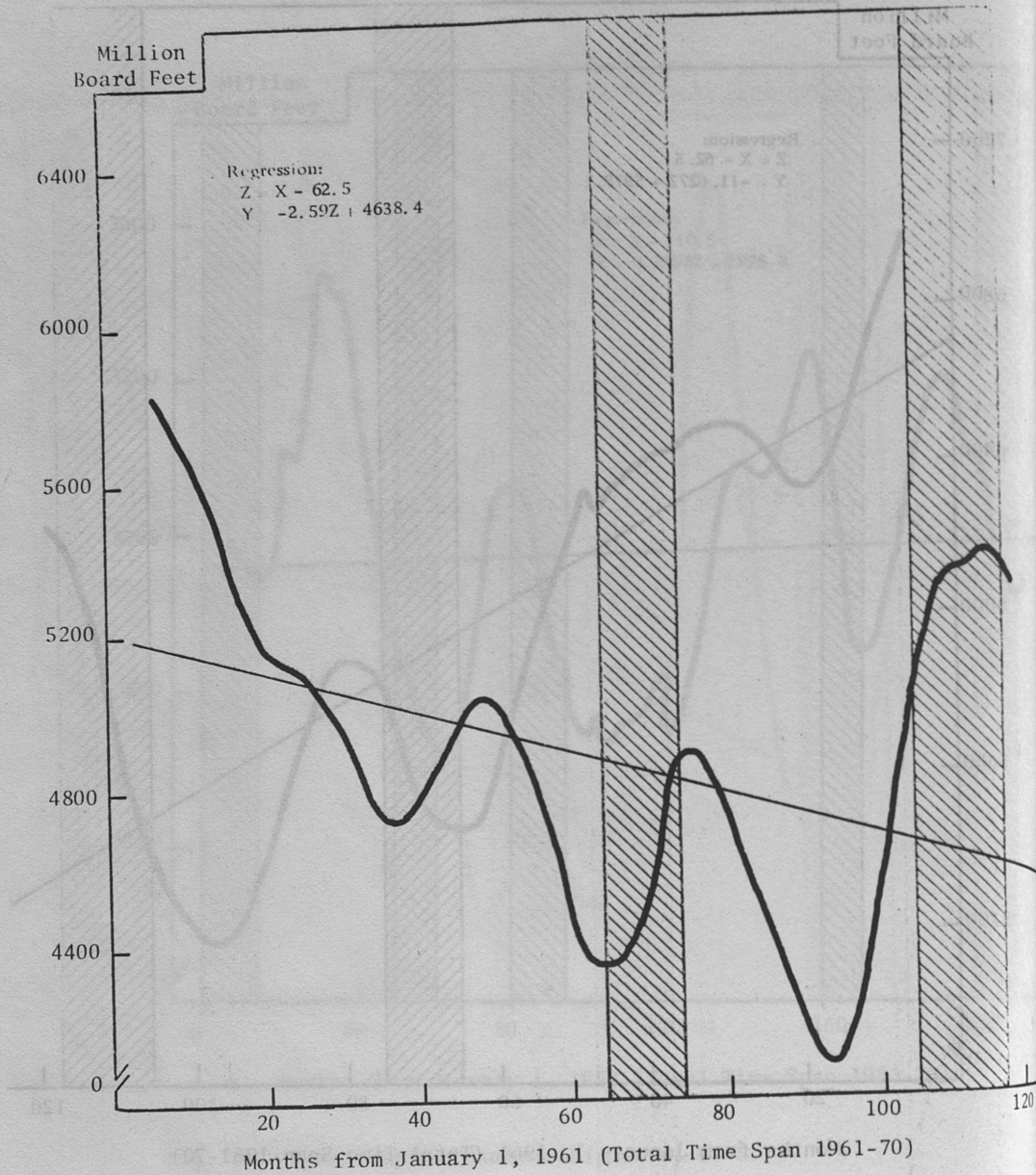


Fig. 12.--Total Monthly Softwood Lumber Inventories, U. S.

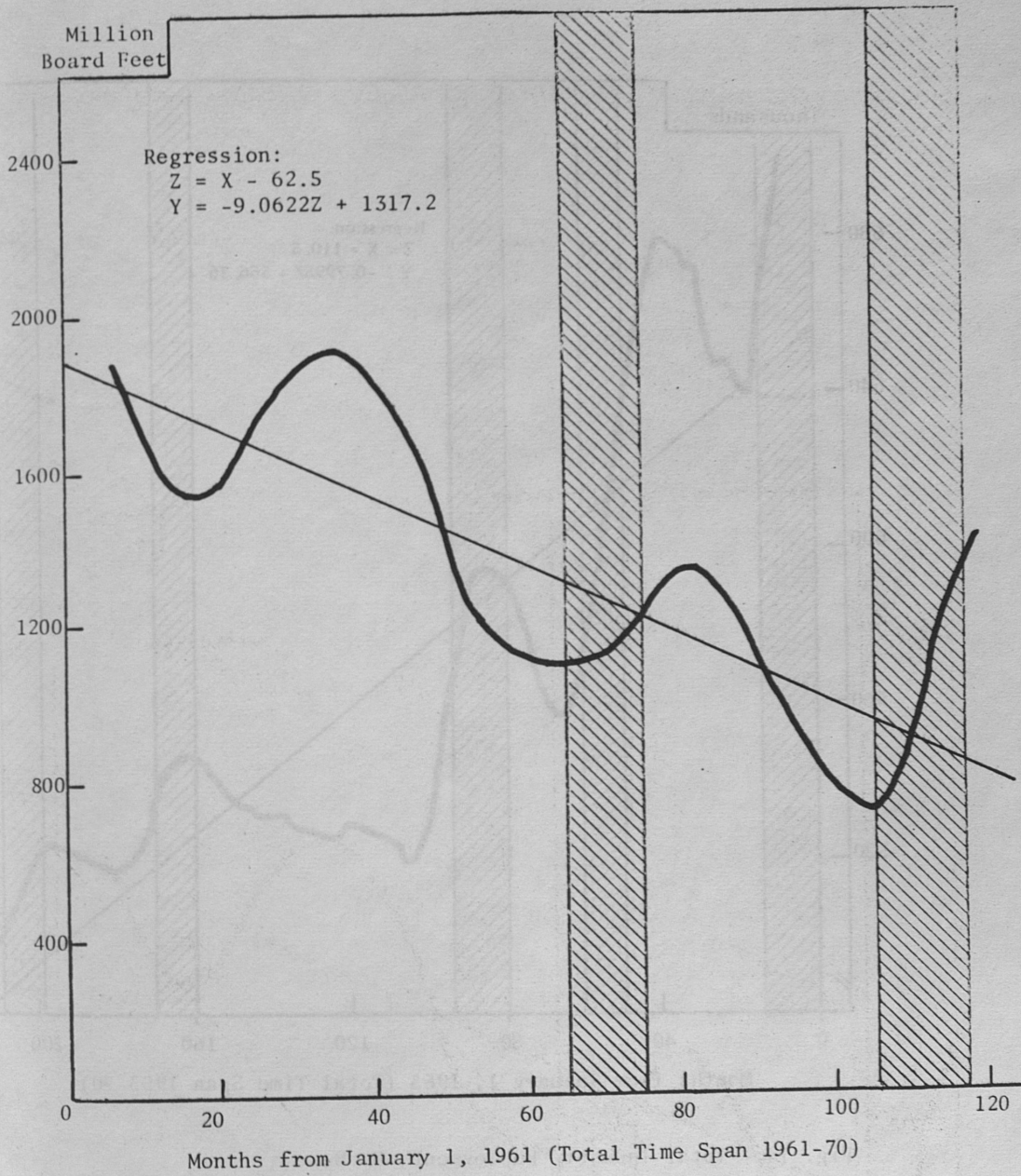


Fig. 13.--Total Monthly Hardwood Lumber Inventories, U. S.

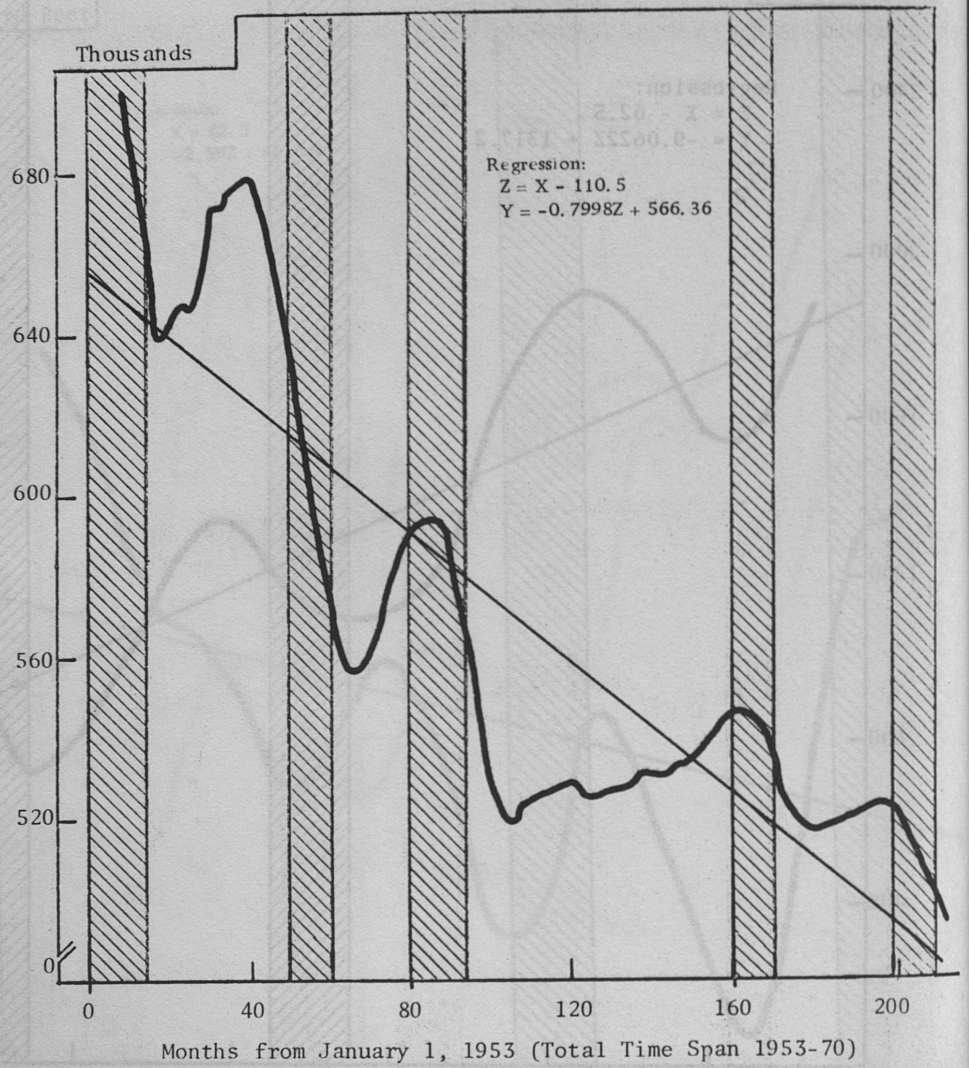


Fig. 14.--Total Industry Employment, U. S.

