

THE USE OF MARGIN CREDIT IN THE TRADING OF SECURITIES

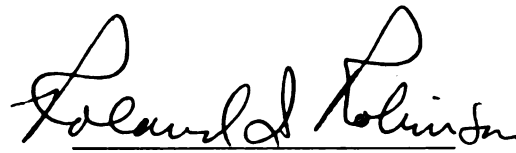
Thesis for the Degree of Ph. D.
MICHIGAN STATE UNIVERSITY
JOHN D. STOFFELS
1969



This is to certify that the
thesis entitled
THE USE OF MARGIN CREDIT IN THE
TRADING OF SECURITIES
presented by

John D. Stoffels

has been accepted towards fulfillment
of the requirements for
Business
Ph.D. degree in Administration


Major professor

Date June 10, 1969

RARY
gan State
iversity

the de
mainta
securi
specif
non-ba
preven
of the
concern
per se
to the
disrup
accoun
equity
able a
growth
stock m
price s
margin
destabi
upswing

ABSTRACT

THE USE OF MARGIN CREDIT IN THE TRADING OF SECURITIES

By

John D. Stoffels

Margin requirements are the only existing selective control over the demand for credit in the economy. Since the Federal Reserve Board maintains regulatory authority over the supply of credit to finance security transactions, through both general monetary controls and specific controls over the stock-secured loan activities of bank and non-bank lenders, margin requirements cannot be justified as a means to prevent the excessive use of stock market credit relative to the resources of the banking system. Instead, this selective control is rooted in the concern that excessive use of credit is disruptive to the stock market per se. On the one hand, higher required margins than were common prior to the 1929 stock market crash are justifiable in order to reduce the disruptive influence of wholesale liquidations of securities from margin accounts which occurs when declining market prices eliminate customers' equity. On the other hand, changes in margin requirements are justifiable as a response to rapid growth in outstanding margin credit if such growth is evidence that bank credit is being used to finance speculative stock market activity which amplifies, rather than stabilizes, stock price swings. The results of this study support the hypothesis that margin trading evidences speculative, price-oriented strategies which destabilize stock prices by adding buying pressure throughout market upswings and selling pressure throughout market declines.

a m

in t

brok

indi

secu

ing

Evid

valu

spec

stock

tradi

accou

teste

Janua

of st

signi

varia

impact

impact

earnin

of the

account

availab

Two approaches were utilized in testing the hypothesis. First, a model of the demand for margin credit was developed to explain changes in the aggregate amount of credit extended to margin customers by brokers. Second, the purchase and sale transactions in a sample of individual margin accounts were analyzed in terms of the riskiness of securities traded, the frequency of trading, and the response of trading to stock price changes.

Evidence of Speculative Behavior in Margin Trading

Contrary to investors, whose demand for stocks is based on the value of stocks reflected in discounted expected future returns, speculators base their demand on expected near-term price movements in stocks. Consequently, the degree of speculative influence on margin trading can be measured by the extent to which activity in margin accounts is explained by movements in stock prices.

An aggregate monthly model of the demand for margin credit was tested with data on credit extended by large brokerage firms between January, 1965 and May, 1968, in order to identify the relative influence of stock prices on margin credit change. The stock price variable was significant at the .001 probability level and was the most influential variable in the model, accounting for 34 per cent of the average absolute impact of all variables. An almost equal percentage of the average impact of all variables was provided by expectations regarding future earnings and inflation, that is, the value of securities. The remainder of the impact was provided by changes in purchasing power in margin accounts (10 per cent), interest rates (13 per cent), and credit availability (6 per cent).

of stock

thirty-

than 40

occurred

credit

stock p

periods

oriented

confirm

sample

selected

brokers

tions,

tested

day was

the dem

the ave

value o

daily b

variati

account

charact

Sample

of the

the Ame

Calculated on a monthly rather than an average basis, the impact of stock prices in the model varied considerably. In twelve of the thirty-nine periods studied, stock price movements accounted for more than 40 per cent of the impact of all variables, and each of these cases occurred during or near a period of sharp stock price movement. Margin credit changes thus reflected a substantial speculative sensitivity to stock price changes, on the average, over the period studied. And in periods of rapid price movement, the influence of speculative, price-oriented behavior on margin credit was highly significant.

Evidence of substantial speculative margin trading activity is confirmed through analysis of actual purchase and sale transactions in a sample of individual margin accounts. The sample includes 418 accounts selected at random from the accounts of one of the largest national brokerage firms, and it covers one period of sharp stock price fluctuations, from February 28, 1966 through June 17, 1966. A simple model was tested in which the net dollar value of stocks traded in the sample each day was regressed on stock price changes, with all other influences on the demand for stocks implied in an error term. It was found that on the average over the 78 day period tested, 50.8 per cent of the dollar value of market activity was accounted for by stock price changes. On a daily basis, stock prices alone explained 18.1 per cent of the total variation in net stock purchase activity. Moreover, study of the sample accounts provided evidence of a speculative orientation through characteristics of the stocks traded and the frequency of trading. Sample accounts traded only 858 different stock issues, or 32.5 per cent of the total number of issues listed on the New York Stock Exchange or the American Stock Exchange. These stocks, weighted by the dollar

about

the

for

when

earn

ing

lowe

the

in s

of t

trac

conc

the

sub

are

bot

the

wou

Eni

spee

crea

spee

of s

marg

of s

amount of trading, varied 47.5 per cent from their average price during the first six months of 1966, compared with a variation of 39 per cent for the weighted average of all trading in listed stocks. Similarly, when stocks were ranked according to the stability and growth in their earnings and dividends, stocks traded by the sample had an average ranking of 2.72, on a scale of zero through seven, some twenty per cent lower than the ranking of 3.35 for all trading in listed stocks. And the rate of turnover of dollar value of shares was 27 per cent per month in sample accounts, but only 1.83 per cent in all listed stocks. Each of these three comparisons is consistent with the finding that margin trading is speculatively oriented. Speculators would be expected to concentrate their purchase and sale activity in issues likely to provide the greatest short-term capital gain, including those stocks which are subject to the greatest price variability as well as those whose earnings are subject to wide fluctuation and thus to considerable variability in both expectations and market prices. And the short-term orientation of the speculator should be evident in a higher turnover of shares than would be the case with long-term investors.

Evidence of Destabilizing Behavior in Margin Trading

If margin traders functioned in the normal economic role of the speculator, there would be little cause for concern over the use of credit to support speculative margin activity. In such a case, margin speculators would stabilize the stock market by reducing the amplitude of stock price swings. To perform such a stabilizing function profitably, margin traders could adopt either of two patterns in their long trading of stocks. First, they could buy stocks when prices are falling but

bel

lev

the

the

fir

rela

this

rela

mont

valu

chan

the

purch

with

chang

buyin

selli

tradi

either

graph

daily

pressu

downsw

that m

of stoc

below their mean value level and sell them when prices rose above this level. Second, they could buy stocks when prices are rising but below their mean level and sell them when prices began to fall but were above the mean.

In order for the first of these stabilizing patterns to be confirmed, stock price changes would necessarily have to bear an inverse relationship to margin trading activity. Both of the models tested in this study, however, indicate that stock price changes are directly related to margin trading activity. In the test of both the aggregate monthly model of margin credit change and the daily model of the dollar value of sample account stock purchases, the coefficient of stock price change was positive and significantly different from zero at better than the .001 probability level. Thus both margin credit and market purchases of stock increase with increasing stock prices and decrease with declining stock prices.

Given that margin traders do respond directly to stock price changes, they could still be a stabilizing influence if they ceased buying stocks when prices exceeded their mean value level and ceased selling stocks when prices fell below this level. In other words, margin trading would be stabilizing if concentrated in the early stages of either price advances or declines. It is evident, however, from a graphical analysis of both monthly aggregate margin credit movements and daily sample purchases and sales, that margin trading adds buying pressure throughout price upswings and selling pressure throughout price downswings. Consequently, the evidence developed in the study indicates that margin trading is destabilizing because it amplifies fluctuations of stock prices around their mean value levels.

THE USE OF MARGIN CREDIT IN THE
TRADING OF SECURITIES

By

John D. Stoffels

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Accounting and Financial Administration

1969

657871

1-17-20

To Julie Ann
with all my love

helpful

Profess

of my d

both of

Reserve

patience

chairma

ment is

whose a

in prov

of indi

and gene

ship at

released

Finally,

Federal

the bulk

complete

position

any memb

ACKNOWLEDGMENTS

The writing of this dissertation benefited greatly from the helpful comments and suggestions of a number of people, including Professors Myles S. Delano and Thomas G. Moore, who served as members of my dissertation committee, and Ann Pike Ulrey and Edward C. Ettin, both of whom are associated with the Board of Governors of the Federal Reserve System. I am particularly appreciative of the interest, patience, and wisdom provided by Professor Roland I. Robinson, the chairman of my dissertation committee. A special note of acknowledgment is due the brokerage firm and the manager of its margin department, whose anonymity they wish preserved, for their most valuable cooperation in providing access to the confidential data which underlie the analysis of individual margin account activity. I am grateful for the resources and generous financial support provided initially by a research fellowship at the Federal Reserve Bank of Chicago and subsequently under released time at the Board of Governors of the Federal Reserve System. Finally, my thanks to colleagues in the Capital Markets Section at the Federal Reserve Board, especially again to Edward C. Ettin, who assumed the bulk of my responsibilities while the dissertation was being completed. The conclusions which follow do not necessarily reflect the position of the Board of Governors of the Federal Reserve System nor of any members of its staff other than myself.

Chapter

I. 1

II.

III. 8

TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION	1
Background of Security Credit Regulation	2
Early Regulation of Security Credit.	3
Attempts to Control Security Credit during the 1920's.	5
Legislative Action Following the 1929 Stock Market Crash.	8
Economic Rationale for Security Credit Regulation.	13
Effects on the Volume of Credit Available for Trade.	14
Inability to Prevent Massive Expansion in Security Credit	19
Controls on Aggregate Security Loans are Insufficient.	20
Support for Existing Regulation.	23
Existing Research.	24
Need for Research.	27
Hypothesis and Plan of Study	31
II. A MODEL OF AGGREGATE MARGIN CREDIT CHANGE.	34
Factors Affecting the Demand for Margin Credit	34
The Supply of Listed Stocks: S	35
Expected Future Growth in Earnings: E^e	36
Expected Rate of Inflation: I^e	37
The Cost of Borrowing: R	37
Extent and Direction of Change in Market Prices: P	38
Existing Borrowing Power in Margin Accounts: B	40
Factors Affecting the Supply of Margin Credit.	42
Regression Test of the Model	43
Specification of the Regression Test	51
Performance of the Model	53
Empirical Support of Hypothesized Margin Trading Behavior.	61
The Average Impact of Stock Prices	65
Stock Price Impact during "Critical Periods" of Stock Market Activity.	67
Summary of Supporting Evidence from Aggregate Model.	70
III. SECURITY TRADING BEHAVIOR IN A SAMPLE OF MARGIN ACCOUNTS	72
Description of the Sample.	73
Differences Between Active and Inactive Samples.	76
Representativeness of the Sample	78

Chapter	Page
Characteristics of the Account Sample.	82
Evidence of Speculative Destabilizing Behavior in	
Sample Account Trading of Stocks	91
Speculative Selection and Trading of Securities.	92
Response of Sample Account Trading to Market Prices.	97
Summary of Evidence of Speculative Destabilizing	
Behavior in Sample Accounts.	110
IV. SUMMARY AND IMPLICATIONS OF STUDY.	113
Evidence of Speculative Behavior in Margin Trading	114
Evidence of Destabilizing Behavior in Margin Trading	116
Limitations of the Study	118
Implications of the Study for Margin Regulation.	119
BIBLIOGRAPHY	121
APPENDICES	
A. THE INADEQUACY OF HISTORICAL MARGIN CREDIT DATA SERIES	126
B. SIMPLE CORRELATIONS BETWEEN TRANSFORMED VARIABLES IN	
THE AGGREGATE MARGIN CREDIT MODEL.	132
C. TEST RESULTS OF AGGREGATE MARGIN CREDIT MODEL FOR	
DISTRIBUTED LAG FORMULATIONS OF EARNINGS AND	
INFLATION EXPECTATIONS VARIABLES	133

Tab

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.

12.

13.

14.

15.

LIST OF TABLES

Table	Page
1. Demand for Margin Credit at Brokers	54
2. Demand for Margin Credit at Brokers -- Revised Model.	56
3. Illustration of the Impact of Stock Price Growth on Margin Credit Growth	59
4. Impact of Coefficients in Revised Model	66
5. Size Comparisons: Active vs. Inactive Accounts	77
6. Geographic Distribution of Sample Accounts and Total Shareownership.	79
7. Relationship of Sample Account Balances to Estimated Balance in All Margin Accounts.	81
8. Absolute Impact of Various Transactions on Sample Account Margin Debt Change.	83
9. Absolute Impact of Various Transactions on Sample Market Value Changes	85
10. Summary of Statistics on Trading of Securities in Sample Accounts.	87
11. Stocks Eligible for Margin Traded by Sample Accounts.	89
12. Stock Issues Most Traded by Sample Accounts	90
13. Security Selection and Turnover: A Comparison between Sample and Market Trading	96
14. Regression Tests of the Model of Aggregate Daily Share Purchases in Sample Accounts.	101
15. Impact of Stock Price Changes on Daily Share Purchases in Sample Accounts	107

LIST OF FIGURES

Figure	Page
1. Margin Credit and Stock Price Movements	63
2. Variation in Impact of Stock Prices on Margin Credit Change in the Aggregate Model.	69
3. Cumulative Daily Purchases and Sales in Sample Accounts and Stock Price Movements	104

Sto

num

sel

of

vol

ban

data

main

an e

thes

to s

on wh

debte

York

May,

York:

LIV (J

CHAPTER I

INTRODUCTION

A study of transactions handled on the floor of the New York Stock Exchange on October 19, 1966¹ showed that 18 per cent of the number and dollar amount of shares traded were either bought for or sold from margin accounts maintained by individuals with member firms of the Exchange. On this same date, 47 per cent of the total dollar volume of trading by all individuals (excluding exchange members, banks and institutions) originated in margin accounts. Since these data do not include the trading of securities for customers who maintain regulated securities loans with banks, margin trading is an even more significant factor in the exchange of securities than these data indicate.

Furthermore, the debt associated with margin trading is subject to substantial growth. At the end of January, 1966, the first date on which a revised data series became available, the aggregate indebtedness of individual margin investors to member firms of the New York Stock Exchange was estimated to be \$5.02 billion.² By the end of May, 1968, estimated margin credit had grown by over 32 per cent to

¹New York Stock Exchange, Public Transaction Study, 1966, (New York: New York Stock Exchange, 1967), pp. 5-11.

²Ann P. Ulrey, "Margin Account Credit," Federal Reserve Bulletin, LIV (June, 1968), p. 472.

\$6.64

Compe

publ

sets

with

impl

of s

Bank

dete

spec

secu

can

the

atte

pass

rati

esta

Boat

prec

1912

whic

peri

that

\$6.64 billion; over the same period, the New York Stock Exchange Composite Index advanced 10 per cent.

Margin trading, and the debt which arises from it, is a public policy responsibility of the Federal Reserve Board, which sets initial margin requirements. This responsibility was placed with the Board by the Securities Exchange Act of 1934, a law which implemented broad powers of the Federal Government over the trading of securities and the operations of exchanges. This act, and the Banking Act of 1933 which preceded it, reflected the vigorous determination of the Congress to curb what it considered dangerously speculative and manipulative practices in the use of credit in securities trading. The root of this Congressional determination can be found in the events leading to and following the onset of the stock market crash on October 29, 1929. A review of earlier attempts to regulate margin credit and of the events leading to passage of the Securities Exchange Act of 1934 will clarify the rationale for margin regulation, the intent of Congress in establishing the regulation, and the interest of the Federal Reserve Board in implementing the regulation.

Background of Security Credit Regulation

Concern over disruptive speculation using borrowed funds preceded the events of the 1920's. In its report to the Senate in 1912, the National Monetary Commission indicated the strong influence which security trading on credit had on the stock market during periods of financial crisis as early as 1873. The report concluded that much of the problem was a result of concentration of idle funds

in New Y

liquid a

from the

market

latter

market

loans 1

the dow

Theodor

Early 1

attemp

of the

Banks

Furthe

banks.

distr:

dustr:

it wa

purpo

forma

2-3,

Banki
1913,

in New York,¹ and the subsequent commitment of these funds to highly liquid and impersonal call loans. Such funds could be withdrawn from the market whenever commercial loan demand required or whenever market price declines threatened the security of loans. It was the latter action -- wholesale withdrawal of funds from the market in market declines -- which caused particular concern, since the call of loans led to forced sales of securities to permit repayment, feeding the downward pressure on prices. Even at the personal urging of President Theodore Roosevelt, Congress failed to act on requested legislation.

Early Regulation of Security Credit

The Federal Reserve Act of 1913 contained the first legislative attempt at reducing stock speculation with borrowed funds. A provision of the act prohibited banks from rediscounting with the Federal Reserve Banks any note resulting from the purchase or carrying of securities. Furthermore, by decentralizing the banking system from large New York banks, the creators of the act expected that funds would be more evenly distributed among geographic regions for local commercial and industrial development, rather than remaining in New York banks where it was thought that "pyramiding of the bank reserves for gambling purposes on the stock exchange,"² had occurred.

Also in 1913, the New York Stock Exchange adopted its first formal rule governing the trading of securities on margin. The

¹U.S., Congress, Senate, National Monetary Commission, S. Doc. 243, 62nd Congress, 1912, p. 8.

²U.S., Congress, Senate, Committee on Banking and Currency, Banking and Currency, Pt. 1, S. Rept. 133, 63rd Cong., 1st Sess., 1913, p. 7.

exchan

broker

carry

tradin

to bot

substa

could

Federa

market

ment,

ready

langua

instr

margin

be ta

prove

subst

borro

capab

same

marke

suppe

Spec

exchange passed a resolution providing for suspension of a member broker for up to one year for permitting customers to purchase or carry securities in an account without "proper and adequate margin."¹

These early attempts to control the use of credit for security trading were difficult or impossible to enforce. Banks which wished to both borrow from the Federal Reserve and at the same time provide substantial credit for stock purchases through the call money market, could do so by discounting other paper which was acceptable to the Federal Reserve. Country banks who at times found the call money market more profitable than loans to foster local commercial development, were still free to channel their funds into New York where a ready market continued to exist. And because of the uncertain language of the stock exchange rule, little if any guidance or instruction was given to brokerage firms in the handling of their margin business.

Furthermore, the only effective indirect action which could be taken as a means to reduce security credit under existing legislation proved unworkable in its first test. When it became clear in 1919 that substantial stock market activity continued to be carried out with borrowed funds, the Federal Reserve was unable to reduce bank lending capability through increases in the discount rate, because at the same time the Central Bank had committed itself to maintaining money market conditions favorable to the flotation of Treasury debt to support war costs at low interest rates. The social judgment that

¹State of New York, Report of Governor Hughes Committee on Speculation in Securities and Commodities, 1909, p. 817ff.

easy m

be rec

accom

Attem

Feder

coun

rate

init

Yor

dema

emp

cou

the

su

su

cu

s

w

c

easy money policy was desirable for support of war finances could not be reconciled with the social judgment that erratic stock price swings accompanying credit-using stock speculation were undesirable.

Attempts to Control Security Credit During the 1920's

Free of its responsibilities to the Treasury in late 1919, the Federal Reserve sought to curb excessive speculation through the discount mechanism. Between November, 1919, and July, 1920, the discount rate was raised progressively from 4 to 7 per cent. Accompanying the initial increase was a statement by the Federal Reserve Bank of New York indicating that action was being taken because as war finance demands were reduced, borrowing was "being diverted to speculative employment rather than to reduction of bank loans."¹ The action, of course, affected total credit, not just stock market credit. Although it was only partly the result of central bank policy, the subsequent contraction in the economy in late 1920 and 1921 prompted substantial criticism of the Federal Reserve. The dilemma of circumstances was clear: the Federal Reserve could not control selectively with a broad instrument.

With no additional regulatory authority, the Federal Reserve was even less prepared to face the phenomenal growth in security credit which occurred during the decade of the 1920's. Between 1922 and the market peak in 1929, the Standard and Poor stock average rose over 250 per cent and loans by brokers increased over 450 per cent, from \$1.5 billion to \$8.5 billion. In the three months prior to the

¹U.S., Congress, Senate, Agricultural Inquiry Hearings, before the Joint Commission of Agricultural Inquiry, under S. Concurrent Res. 4, Vol. 2, 67th Cong., 1st Sess., 1921, p. 712.

Octob

of \$6

selec

they

was p

were

beca

enti

run

for

192.

inc

lim

wer

con

rep

Sto

by

se

be

co

1

1

October 29th collapse, brokers' loans were increasing at an annual rate of \$6 billion. Even had the Federal Reserve been able to control selectively the extension of bank credit for the purchase of securities, they would still have been unprepared for the flood of call money which was provided by corporations and other non-bank lenders. Stock prices were expanding so rapidly, and demand for credit was so high, that it became profitable for corporations to issue new shares and lend the entire proceeds in the call market.¹ Before the long bull market had run its course, brokers' loans from sources other than banks accounted for over \$6.5 billion, more than 75 per cent of the total outstanding.

Although the Federal Reserve noted in its Annual Report of 1925 that the growth in reserve bank credit seemed largely due to increasing demand for loans on securities,² their response was limited to warnings to member banks that Federal Reserve resources were not to be used to aid stock speculation. In addition, previously confidential data on loans made to brokers and dealers by weekly reporting banks were made public for the first time, and the New York Stock Exchange began to collect and publish information on borrowings by their member firms. By informing the public of the high levels of security credit, it was hoped that the demand for security loans would be moderated.

Progressive increases in the discount rate from 3-1/2 to 5 per cent during 1928 failed to stem the rapid flow of credit into the stock

¹Lewis H. Haney, Hyman S. Logan, and Henry S. Gavens, Brokers' Loans (New York: Harper & Brothers, 1932), p. 156.

²U.S., Board of Governors of the Federal Reserve System, Annual Report, 1925, p. 16.

market

but be

by oth

to bro

other

billi

Reser

the "

cred

that

reas

to c

the

faci

this

the

refu

bro

swa

tha

Rese

time

Ann

market, not because the discount mechanism failed to reduce bank credit, but because this effect was overwhelmed by growth in call money provided by other lenders. Between January and September of 1928, while loans to brokers from New York City banks declined by \$670 million, loans by other lenders than banks increased, at an accelerated rate, by \$1.7 billion.

Early in 1929, a policy of direct pressure by the Federal Reserve replaced further shifts in the discount rate. Reacting to the "interference by reason of the excessive amount of the country's credit absorbed in speculative security loans," the Board concluded that it was "its duty to inquire into [conditions] and to take such measures as may be deemed suitable and effective in the circumstances to correct them; which, in the immediate situation, means to restrain the use, either directly or indirectly, of Federal reserve credit facilities in aid of the growth of speculative credit."¹ Although this policy led to considerable dispute within the system over both the possibility of identifying security loans and the propriety of refusing to grant them, it did result in some reduction in loans to brokers by New York City banks. However, the effect was again swamped by more rapid growth in loans to brokers by other lenders than banks, and total brokers' loans continued to soar higher.

Finally, in response to continued requests from the Federal Reserve Banks, the Board allowed the discount rate to rise, this time from 5 per cent to 6 per cent, on August 9, 1929. The change

¹U.S., Board of Governors of the Federal Reserve System, Annual Report, 1929, pp. 2-3.

did not

slow in

break

the br

additi

howeve

loans

yearen

billic

total

and ba

mainte

than t

Legis

the 1

money

been a

choice

occure

next f

culmin

contro

design

did not slow the expansion of brokers' loans by others; nor did it slow increases in stock prices.

The aftermath in the credit markets of the stock market break on October 29, 1929, was painful. In the first week following the break, \$2 billion in credit was called by other lenders and an additional \$800 million by out-of-town banks. New York banks tried, however unsuccessfully, to shore up the market by increasing their loans to brokers by \$1 billion and buying securities as well. By yearend, total brokers' loans had fallen from \$8.5 billion to \$4 billion, and stock prices had declined some 36 per cent. Of the total credit shrinkage, lenders other than banks withdrew \$4 billion and banks outside of New York withdrew the remainder. New York banks maintained slightly higher brokers' loans at the end of the year than they had outstanding prior to the market break.

Legislative Action Following the 1929 Stock Market Crash

The great ease of obtaining credit for security trading during the 1920's, coupled with the enormous withdrawal of funds from the call money market when prices began to decline, was thought by many to have been a major influence in accentuating the stock market crash. The choice of means for preventing such a disruptive influence from occurring again was the subject of almost constant debate during the next four years. The spirit of reform which developed in the Congress culminated in the enactment of The Banking Act of 1933, and the highly controversial Securities Exchange Act of 1934.

A number of the provisions of the Banking Act of 1933 were designed to increase the ability of the Federal Reserve Board to

direct

to pre

experi

arrang

vision

lender

and ou

inter

which

might

the F

Reser

surpl

which

offic

privi

restr

as we

other

elimi

by br

who a

Syste

money

directly control the extent of securities lending by member banks, and to prevent practices which had contributed to the severity of the 1929 experience. First, member banks were forbidden to serve as agents in arranging brokers' loans except for other member banks. This provision greatly reduced the influence of out-of-town banks and of other lenders by limiting the uncontrollable and rapid flows of credit into and out of the call market from these groups. Second, the payment of interest on demand deposits was prohibited for several reasons, one of which was to reduce deposit flows into New York banks, where funds might then in turn be lent excessively in the call market. Third, the Federal Reserve Board was empowered to stipulate, for each Federal Reserve District, the maximum allowable proportion of bank capital and surplus which could be represented by securities loans. Finally, banks which channeled reserve borrowings into securities loans in spite of official warnings were made subject to total suspension of borrowing privileges.

The Securities Exchange Act of 1934 contained provisions which restricted or controlled the use of stock market credit by individuals as well as brokers and dealers. The erratic influence of lenders other than banks, which the Banking Act of 1933 sought to reduce, was eliminated almost entirely by the 1934 Act which prohibited borrowing by brokers and dealers from essentially any source other than banks who are members or cooperating non-members of the Federal Reserve System. Control over the ability of individual investors to borrow money for stock purchases took the form of flexible margin requirements,

"[i]o

purpos

under

banks

Regula

secur

indiv

Regula

in a s

simila

and U.

market

(inclu

and ma

since

banks

Act of
Printi

Regula
The re
quarte
more,
equity
Board
ments
activi
saving
lender
and U.

"[f]or the purpose of preventing the excessive use of credit for the purpose of purchasing or carrying of securities."¹

Until recently, the authority of the Federal Reserve Board under the Securities Exchange Act was limited to control of loans by banks through Regulation U, and by brokers and dealers through Regulation T, for the purchase and carrying of registered, non-exempt securities. More effective control over security credit extended to individuals by other lenders is now achieved through newly imposed Regulation G.² Under new authority granted by Congress, transactions in a selected group of over-the-counter securities which are most similar to listed securities will be governed by Regulations G, T, and U. However, many unregulated transactions in the securities markets involving the use of credit still occur. Government bonds (including state and local issues) are exempt from margin rules, and many industrial bonds (except convertibles) are unregulated since they are traded over-the-counter. Furthermore, loans by banks which are not both for the purpose of purchasing and carrying

¹U.S., Securities and Exchange Commission, Securities Exchange Act of 1934 as Amended to August 20, 1964 (Washington: U.S. Government Printing Office, 1965), p. 5.

²U.S., Board of Governors of the Federal Reserve System, Regulation G, Effective March 11, 1968, (Washington, 1968), p. 1. The regulation requires that any person who during any calendar quarter extends \$50,000 or more, or has outstanding \$100,000 or more, in credit which is collateralized in any part by registered equity securities, must file a report with the Federal Reserve Board and must adhere to the currently applicable margin requirements for these loans. This regulation seeks to control the activities of all active lenders, primarily finance companies, savings and loan associations, factors, and some individual lenders, who have not previously been covered by regulations T and U.

1

secur

Regul

faith

secur

to co

stock

littl

threa

and l

the p

value

ment

of Ri

Senat

Hearin

S. Res

colle

broker

by He

Curre

on Bar

Committ

Sess.,

betwee

held a

be pro

value

is one

securities and collateralized by listed securities are not subject to Regulation U. Such loans are eligible for generally higher "good-faith" loan values, and an unknown proportion of them are in reality security loans which evade regulation.¹

Prior to the 1929 decline, credit was available in many cases to cover as much as 90 per cent of the purchase price of common stocks.² At this 10 per cent margin level, a drop in price of as little as 10 per cent would eliminate the customer's equity,³ threaten the security of the loan from the broker's point of view, and lead to calls for additional collateral. As a means of reducing the potential danger of forced sale from this loss of collateral value, initial margins⁴ under the Securities Exchange Act were set

¹A further discussion of such loans is contained in Appendix A.

²The official (but unwritten) New York Stock Exchange requirement which existed during 1929 was 25 per cent, according to testimony of Richard Whitney, president of the exchange, in U.S., Congress, Senate, Committee on Banking and Currency, Stock Exchange Practices, Hearings, before the Committee on Banking and Currency, Senate, on S. Res. 84, Pt. 1, 72nd Cong., 1st Sess., 1932, pp. 207-08. A recollection that the prevailing margin required in practice by brokers was 10 per cent and in some cases even lower, is provided by Herbert H. Lehman, Senator from New York on the Banking and Currency Committee at the time of, U.S., Congress, Senate, Committee on Banking and Currency, Stock Market Study, Hearings, before the Committee on Banking and Currency, Senate, Pt. 1, 84th Cong., 1st Sess., 1955, p. 278.

³Equity in a customer margin or loan account is the difference between the market value of securities contained in the account (or held as collateral by the bank) and the debit balance in the account.

⁴Margin is the percentage of the net purchase price which must be provided by customer equity, either in cash deposited or in loan value of securities not already supporting other debt. Loan value is one minus the margin requirement.

at a rate
requiremen
Governors
margins we
time, the
higher the
80 per cen

As

only to in
the New Y
25 per cen
be provid
that 30 p
drops bel
if the ad
to liquid

S

indicate
to change
standing.
speculati
havior of
decreases

1
Board in c
Jacob Cohe
Market," J
1966), 32.

at a rate varying between 25 and 45 per cent. Since 1934, margin requirements have been changed eighteen times by the Board of Governors of the Federal Reserve System. For a brief period in 1946, margins were set at 100 per cent (no borrowing allowed). Since that time, the margin requirement has not been less than 50 per cent, nor higher than 90 per cent. The current requirement (May, 1969) of 80 per cent has been in effect since June, 1968.

As they are currently applied, margin requirements relate only to initial purchases of securities. Once purchased, rules of the New York Stock Exchange permit equity to drop to as little as 25 per cent of market value before additional margin collateral must be provided. In practice, however, most brokerage firms insist that 30 per cent margin be maintained. If the borrower's equity drops below this level, the broker will call for additional margin; if the additional margin cannot be provided, the broker is empowered to liquidate the account without further notice.

Statements regarding reasons for changing margin requirements indicate that the Board, in almost all cases, has based its decision to change requirements partly on the volume of security credit outstanding. Other bases for judgment have included the volume of speculative activity, economic and credit conditions, and the behavior of prices in the stock market.¹ In most cases, increases or decreases in margin requirements have apparently had the effect of

¹For a summary of the reasons stated by the Federal Reserve Board in changing margin requirements in the post-war period, see Jacob Cohen, "Federal Reserve Margin Requirements and the Stock Market," Journal of Financial and Quantitative Analysis, I (September, 1966), 32.

slowing

outstand

thus dif

institut

of propo

the reg

are:

slowing or stimulating the growth in regulated security credit outstanding.¹ The pattern of regulated security credit usage is thus different from what it would have been had no regulation been instituted.

Economic Rationale for Security Credit Regulation

In Section 2 of the Securities Exchange Act of 1934, a number of propositions are set forth in order to establish the necessity of the regulation. Those which relate to the use of security credit are:

1. Transactions in securities involving the use of credit
 ". . . directly affect the financing of trade, industry, and transportation in interstate commerce, and directly affect and influence the volume of interstate commerce; and affect the national credit."
2. "Frequently the prices of securities on . . . [stock] exchanges and [in over-the-counter] markets are susceptible to manipulation and control, and the dissemination of such prices gives rise to excessive speculation, resulting in sudden and unreasonable fluctuations in the prices of securities which . . . cause alternately unreasonable expansion and unreasonable contraction of the volume of credit available for trade, transportation, and industry in interstate commerce."

¹For a summary of the effects on outstanding security credit of changes in margin requirements, see Jules I. Bogen and Herman E. Krooss, Security Credit (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1960), pp. 117-119.

3.

4.

These prop
suggest se
flows, the
of margin

Effects on

Fi
such as th
unavailabl
obtained;
that econo
desired.
era, sever
notable fo

1 U
Act of 1934

3. "Such sudden and unreasonable fluctuations in security prices, prevent the fair valuation of collateral for bank loans, and/or obstruct the effective operation of the national banking system and the Federal Reserve System."
4. "National emergencies . . . are precipitated, intensified, and prolonged by manipulation and sudden and unreasonable fluctuations of security prices and by excessive speculation on such exchanges and markets, and to meet such emergencies the Federal Government is put to such great expense as to burden the national credit."¹

These propositions, coupled with the actual form of the regulation, suggest several underlying assumptions about the nature of credit flows, the demand for and supply of security credit, and the behavior of margin investors.

Effects on the Volume of Credit Available for Trade

First, it was assumed that rapid growth in loans on securities, such as that which occurred in the late 1920's, made bank credit unavailable to some borrowers in the amount they otherwise could have obtained; consequently, resource allocation was upset to the extent that economic growth did not occur in the sectors where it was most desired. In the years preceding and immediately following the depression era, several theories were popularly advanced in this regard which are notable for their emotional appeal more than for their accuracy.

¹U.S., Securities and Exchange Commission, Securities Exchange Act of 1934 as Amended to August 20, 1964, pp. 1-2.

resul

"prod

growt

accep

accou

broke

cost

by re

to th

the a

that

block

The t

of se

of th

proce

for c

of ad

amoun

trans

proce

ignor

secur

are ne

of the

pansic

The most prevalent view was that expansion in stock credit resulting from stock exchange speculation diverted capital from "productive" uses, that is, absorbed credit and prevented economic growth through commercial and industrial expansion. The general acceptance of this view was presumably the result of taking into account only the purchase side of margin transactions, wherein brokers might lend to their customers 80 per cent of the purchase cost of a block of securities and subsequently borrow this amount by re-hypothecating the securities at a bank. Credit was absorbed to the extent that the borrowing of the broker increased. What the absorption theorists failed to consider, however, was the fact that on the other side of the transaction was a seller of this same block of securities who received cash for the amount of the sale. The transaction can be made more complex by presuming that the seller of securities was also a margin trader (so that at least a portion of the proceeds were used to reduce his debt), or that the cash proceeds were immediately reinvested in other securities purchased for cash, or that the proceeds were used as margin for the purchase of additional securities on margin. In any event, as long as the amount owed by margin traders increases, somewhere in the chain of transactions there must be a seller who is not on margin, and the proceeds of his sale are available for deposit in the banking system. Ignoring the effect of taxes, commissions, and profit or loss on securities trading, margin debt can increase only if margin traders are net purchasers of securities from cash investors. The proceeds of these sales by cash investors are unavailable for credit expansion only if they are held in currency.

Another view regarding the disruption of resource allocation caused by security credit expansion, was that because of the concentration of securities lending in New York, and because of the accessibility and profitability of the call money market to out-of-town banks, deposits from outlying banks flowed into the New York call market and business and industry in these regions were denied access to bank credit for expansion. In the study of security markets by the Twentieth Century Fund, Wilford Eiteman developed some evidence for this view through an analysis of reserve flows from 1927 through 1929.¹ Assuming that the proportion of total banking reserves held outside of New York should have remained unchanged from 1927 to 1929, there was a net drain of funds toward New York of \$65 million during 1928 and \$33 million during the first nine months of 1929. In terms of the relative flow of reserves held outside of New York City, outlying districts transferred 6.3 per cent of their average net reserves to New York in 1928 and 4.1 per cent of average net reserves during the first nine months of 1929. While these flows are not insignificant relative to the resources of outlying banks, only about one per cent of the peak \$8.5 billion in brokers' loans were made with funds which otherwise might have remained in outlying banks. Since the analysis makes the crucial assumption that the bank reserve distribution at the end of 1927 is both representative and appropriate, it cannot be considered conclusive.

¹Wilford J. Eiteman, "Brokers' Loans and the Absorption of Credit," in The Security Markets, (Findings and Recommendations of a Special Staff of the Twentieth Century Fund), ed. by Alfred L. Bernheim and Others (New York: Twentieth Century Fund, Inc., 1935), pp. 312-320.

In

vo

sp

as

co

th

sp

un

ar

ne

S

i

t

co

i

be

p

ra

s

re

g

b

la

he

Br

In any event, this evidence does not indicate that a substantial volume of reserves flowed into New York City at the height of speculative stock market fervor.

A third view consistent with the resource misallocation assumption was that some industries or companies within industries could potentially achieve disproportionate growth as a result of the speculative phenomenon in the stock market. For example, sporadic increases in the demand for luxury goods may result in unreasonable outlays by manufacturers of such goods for new plant and equipment. By classifying consumer goods into the broad (and necessarily arbitrary) categories of luxuries and necessities, Simpson determined that the value of luxury goods produced in 1929 increased by over 20 per cent from 1927, while the increase between the four year period 1923-27 had been only slightly more than 10 per cent.¹ In contrast, between 1927 and 1929, production of necessities increased only 5-1/2 per cent. Misallocation of resources would not be suggested by the growth in luxury goods output alone, but by the possibility that the primary influence on this growth could be rapidly mounting and transitory paper wealth generated by widespread stock price speculation rather than by optimistic expectations regarding future economic expansion. The rapid increase in luxury good demand in 1928-29 thus could have been influenced substantially by stock market conditions. Furthermore, capital availability to large companies, who easily floated large new issues of stock in the hectic market of 1928 and 1929, was far greater than to smaller

¹Kemper Simpson, The Margin Trader (New York: Harper & Brothers, 1938), pp. 101-105.

bus

Ever

med

mon

inc

And

cre

in

from

effe

be s

conc

over

larg

1933

futu

attr

Boar

sepa

vent

hood

contr

businesses which generally had to rely upon banks for expansion capital. Even though commercial loans did not become less available to small and medium-sized businesses because of the attraction to banks of the call money market, such loans clearly became more expensive as a result of increases in the discount rate during the second half of the decade. And these increases were made because of concern over the flow of credit to the stock market,¹ not over excessive inflationary demand in the general economy; the price level remained virtually constant from 1926 through 1929.

In summary, while some of the popular assumptions regarding the effect of stock market borrowing on credit available for other uses can be shown invalid, there might have been reasonable justification for concern over regional imbalances in credit availability as well as over potential misallocation of resources among industries and between large vis a vis small businesses. Provisions of the Banking Act of 1933 attempted to deal with regional imbalances by (1) preventing future payment of interest on demand deposits (a practice which had attracted funds to New York), and (2) allowing the Federal Reserve Board to stipulate maximum security loan to bank capital ratios separately for each Federal Reserve District. Less subject to prevention through specific controls on the banking system, the likelihood of resource misallocation justified in part the broader selective controls of the Securities Exchange Act of 1934.

¹Supra, p. 7.

Inab

in F

brok

was

(the

cent

bank

"great

in me

that

bank

actio

stock

price

the s

had c

the e

the e

as a r

provis

broker

ccoper

Act of

Inability to Prevent Massive Expansion in Security Credit

One of the clearest lessons of 1929 was that even sharp changes in Federal Reserve policy were ineffective in slowing the growth in brokers' loans once real speculative fever had taken hold. The reason was not that the banking system failed to respond to restrictive policy (the discount rate was raised from 3 per cent in early 1928 to 6 per cent on August 9, 1929), but that the overwhelming influence of non-bank lenders completely counteracted reductions in bank lending. The "great expense" to the "national credit"¹ referred to by the 1934 Act in meeting emergencies like that of credit conditions in 1929, was that non-bank lenders could apparently be influenced only by central bank policies so restrictive as to halt economic growth entirely. Such action, however, also destroyed confidence in near-term gains in the stock market, so the cost of stopping the dramatic upswing in stock prices and credit was to precipitate a decline. As the aftermath of the stock market crash so well demonstrated, this bludgeon technique had consequences far beyond the drastic shrinkage in equity values; the effects of faltering public confidence reverberated throughout the economy.

More direct control over aggregate security credit was sought as a result of this experience, and this control took the form of the provision in the Securities Exchange Act of 1934 which prohibited brokers from borrowing funds from any lender other than member or cooperating non-member banks of the Federal Reserve System. Lenders

¹U.S., Securities and Exchange Commission, Securities Exchange Act of 1934 as Amended to August 20, 1964, p. 2.

insensiti

from the

prohibite

Controls

H.

cooperati

lending b

and the al

reasonable

Federal Re

credit to

Reserve th

with monet

influence

for flexib

controls,

be support

1.

2.

insensitive to the Federal Reserve's monetary controls were eliminated from the market, with the exception that non-bank lenders were not prohibited from making loans directly to individuals.

Controls on Aggregate Security Loans Are Insufficient

Having limited the sources of security credit (only banks cooperating with the Federal Reserve), the flow of funds for securities lending between banks (limitation on payment of interest on deposits), and the ability of the banking system to expand security credit beyond reasonable limits (power to set maximum lending ability for each Federal Reserve District), the insensitivity of the supply of security credit to control through discount rates was reduced. The Federal Reserve thus should have had a sufficient arsenal of weapons to use with monetary policy in pursuing orderly economic growth through influence on all credit markets. Therefore, the further provision for flexible margin requirements, which, unlike any other credit controls, directly influences the demand for security credit, must be supported by the following additional assumptions:

1. Restrictions on the supply of margin credit cannot prevent the "quality" of credit from deteriorating in a market where high loan values are given to stocks at inflated prices; consequently the danger remains of forced sale of securities in declining markets as equity values disappear.
2. Restrictions on the supply of margin credit cannot effectively discourage speculative activity by margin traders which becomes "excessive" because of its impact on the stock market.

Beca

secu

lend

marg

were

cont

in m

of a

woul

requ

ducin

would

costs

flexi

assum

time

a num

was n

"appr

itsel

marke

to sup

securi

Report

Because of the low margins which were required in the 1920's on security loans, the borrower's equity could be eliminated, and the lender's security threatened, by a very small decline in the price of margined stocks. Even if excessive expansion of total margin credit were adequately prevented in the future through aggregate controls, continuation of low margins might still allow substantial declines in margin credit, and downward pressure on stock prices, in the event of a price break. The appropriate means of preventing this eventuality would be to create a greater equity cushion by establishing higher required margins than those which were common in the 1920's. By reducing the potential gain from leverage, a higher margin requirement would also make the demand for margin credit more sensitive to interest costs of borrowing.

In making margin regulations under the Act subject to flexibility by authority of the Federal Reserve Board, the additional assumption was necessary that the level of margin appropriate at any time could be adequately judged by movements in security credit. For a number of years, the Federal Reserve had indicated strongly that it was neither proper nor feasible for it to become the judge of the "appropriate" level of stock prices.¹ However, the Board had committed itself equally as strongly to the position that in critical periods of market activity margin credit was used in rapidly increasing quantities to support stock speculation. That is, margin traders bought and sold securities in response to their short-term price movements rather than

¹U.S., Board of Governors of the Federal Reserve System, Annual Report (Washington, 1929), pp. 2-3.

in respon

dividends

belief th

swings an

a stabili

I

per se, i

credit is

margin tra

that marg

of activit

are indica

margin cre

To

their inve

assertion

monetary c

direct con

I

credit was

bank resou

over the s

policy or

ratios. I

imply the g

margin trac

flexible ma

ing the gro

of the reas

the Federal

in the stoc

in response to expectations regarding their future earnings and/or dividends. Such price speculation was undesirable because of the belief that margin trading added buying pressure during price up-swings and selling pressure during price declines, and was thus not a stabilizing influence on the market.

In order to avoid judgments based on stock market behavior per se, it must have been assumed that the rate of growth in margin credit is a guide to identifying the intensity of speculation by margin traders. A rapid growth in margin credit is thus a signal that margin credit is potentially "excessive" in terms of its support of activity which destabilizes stock market prices.¹ Higher margins are indicated under such conditions than in periods when growth in margin credit is less rapid.

To assume that users of margin credit are destabilizing in their investment and borrowing activity is quite different from the assertion that the supply of margin credit is insensitive to general monetary control and consequently must be subjected to stabilizing direct control, different because the latter assertion presumes no

¹If the Federal Reserve were to make the judgment that margin credit was excessive in relationship to bank loan portfolios or total bank resources, the proper reaction would be to invoke its authority over the supply of margin credit, either through shifts in monetary policy or through lower maximum security credit to bank capital ratios. It is possible to avoid the assumption that flexible margins imply the goal of regulating the presumed speculative activity of margin traders. To do so, an alternate assumption must be made that flexible margins were instituted as a matter of convenience in regulating the growth in security credit extended by banks. However, evidence of the reasons underlying changes in margin requirements suggests that the Federal Reserve has attempted to counteract speculative activity in the stock market (See infra, p. 30.).

informat.

changes

has been

margin t

activiti

tend to

change i

fitted t

(more sp

farm imp

speculat

and short

consider

the trend

tive stoc

is no inc

dominated

tive stoc

failed to

would hav

present t

Support f

Th

credit emb

1E

informational content about the degree of speculative activity in changes in the level of security credit. Furthermore, little evidence has been developed to either substantiate or refute the belief that margin traders are substantially more speculative in their investment activities than those who deal with cash, or that their activities tend to destabilize by amplifying market price swings.

Eiteman, in the Twentieth Century Fund study found little change in the amplitude of oscillation of prices around trend lines fitted to stock prices in 1925-27 (less speculative) and in 1928-29 (more speculative).¹ In an analysis of price variations of three farm implement stocks, identified as speculative, moderately speculative, and non-speculative on the basis of share turnovers and short positions, he determined that the speculative stock had a considerably larger average and standard deviation of price around the trend. While this analysis presumably determined that speculative stocks were subject to wider, not narrower, price swings, there is no indication of the extent to which margin traders might have dominated the trading of these stocks. Also, since the most speculative stock was also the one with the greatest short position, Eiteman failed to consider the possibility that price swings in the stock would have been wider had not short sellers (speculators) been present to partially counteract price movements.

Support for Existing Regulation

Through enumeration of the propositions relating to security credit embodied in the Securities Exchange Act of 1934, and an analysis

¹Eiteman, "Margin Buying," in The Security Markets, pp. 287-293.

of the
found
secu
(1)
for
regi
capi
supp
mech
secu
indi
part
that
valu
of s
marg
and
beha
subje

stock

(Find
Centu
Haney
Trade

of the assumptions which presumably underlie them, support has been found for most of the existing provisions to regulate the flows of security credit. Restrictions on the supply of security credit include (1) limiting broker borrowing to banks, (2) regulating the competition for bank deposits through interest rates, and (3) restricting inter-regional flows of funds through regulation of security loan to bank capital ratios. These have all increased the sensitivity of the supply of funds for brokers' loans to control through the monetary mechanisms of the Federal Reserve. The restriction on the demand for security credit, both on the part of brokers and on the part of individuals arranging securities loans at banks, can be justified in part. If margin requirements were established at a level higher than that prevailing during the 1920's, greater shrinkage of collateral values could occur without destruction of customer equity and loss of stock market stability through wholesale liquidation of undermargined loans. But the rationale for flexible margin requirements, and its underlying assumption about the speculative, destabilizing behavior of margin investors, remains relatively unsupported and subject to further test.

Existing Research

Three studies of security credit appeared in the wake of the stock market crash of 1929.¹ All of these studies considered in

¹Alfred L. Bernheim and Others, ed. The Security Markets (Findings and Recommendations of a Special Staff of the Twentieth Century Fund) (New York: Twentieth Century Fund, Inc., 1935); Haney, Logan, and Gavens, Brokers' Loans; and Simpson, The Margin Trader.

detail

securi

activi

recomm

credit

credit

quite

exchan

appear

has oc

In add

with t

tradin

tradin

and Kr

sentin

quanti

of sec

of unre

require

Instru

Dissert

detail the activities of margin traders and the relationship of security credit to credit markets, the stock market, and economic activity. The Twentieth Century Fund and Haney studies included recommendations for new regulations governing the availability of credit for stock market transactions. In addition to security credit and margin trading, the Twentieth Century Fund study dealt quite broadly with the economic role and operation of security exchanges.

An extremely thorough history of security credit regulation appeared in 1958.¹ It provides documentation of each change which has occurred in margin requirements since the inception of the Act. In addition, it deals specifically, although in a qualitative manner, with the effects of margin changes on security prices, volume of trading, volume of security credit outstanding, and the "quality of trading" in security markets.

In a study underwritten by the New York Stock Exchange,² Bogen and Krooss traced the development of security credit regulation, presenting the opposing points of view on the need for qualitative and quantitative credit controls. They also investigated the importance of security credit vis a vis other types of lending, the availability of unregulated credit, and the apparent effects of changes in margin requirements on price and volume of trading of securities.

¹Robert E. Harris, Federal Margin Requirements: A Selective Instrument of Monetary Policy (University of Pennsylvania, Ph.D. Dissertation, 1958).

²Bogen and Krooss, Security Credit.

Mo
requirement
excess fl
protection
(3) the r
each case
and quest

A
which see
associate
of the B
effect o
credit an
determine
as oppose

adopts t
prices a
margin l

of Polit

Market."

the Stoc
Universi

Moore¹ discusses and evaluates the "success" of margin requirements in meeting presumed goals: (1) the prevention of an excess flow of credit toward the purchase of securities, (2) the protection of investors from becoming overburdened with debt, and (3) the reduction of fluctuations in stock market price levels. In each case, he concludes that regulation has been less than successful and questions the justification for continued regulation.

A somewhat different approach is taken by Cohen² in a study which seeks to isolate the criteria for margin change most closely associated with actual changes in margin requirements, irrespective of the Board's announced reason. In addition to an analysis of the effect of margin requirement changes on volume of bank security credit and market prices of securities, an attempt is made to determine the extent to which credit flows into securities markets as opposed to other financial and non-financial uses.

A recent dissertation in the area of security credit³ again adopts the goal of studying the effects of margin changes on stock prices and volume of trading. The study also seeks to identify margin levels in terms of their monetary effect.

¹Thomas Gale Moore, "Stock Market Margin Requirements," Journal of Political Economy, LXXIV (April, 1966), 158-167.

²Jacob Cohen, "Federal Reserve Margin Requirements and the Stock Market."

³Richard Lovell Bolster, The Relationship of Monetary Policy to the Stock Market: The Experience with Margin Requirements (The American University, Ph.D. dissertation, 1966).

the

ma

wh

how

and

ass

ed

in

be

be

19

tr

in

fl

de

th

by

do

te

ma

Ai

de

re

Need for Research

Studies of security credit and margin trading conducted during the 1930's were partly successful in supporting the rationale for margin regulation as it currently exists. In considering the effect which margin traders had on the changing fortunes of the stock market, however, the approach of these studies was not supported by empirical analysis. Instead, logical arguments were presented which first assumed that margin traders were speculators. Second, it was determined that reasonable amounts of both speculation and credit are healthy in assuring continuous and active markets, therefore neither should be entirely prevented. Third, the conclusion was reached that, because of the dramatic fluctuation in security credit in the late 1920's, "excessive" credit use and "excessive" speculation by margin traders must have magnified the unrealistic rise and meteoric fall in stock prices. None of these studies identified the relative influence of speculative as opposed to investment decisions on the demand for margin credit. Nor did any of them successfully validate the assumption that margin trading destabilizes the security markets by accentuating buying pressure in upswings and selling pressure in downswings.

Nearly all of the studies which have appeared within the past ten years have had as their central theme the effect of changes in margin requirements on security credit flows and/or stock prices. Although general models of the demand for margin credit have been developed and tested in these studies, the reliability of test results has been impaired through the use of distorted security

credit data.¹ For example, the customer net debit balance series collected by the New York Stock Exchange is seriously distorted by including temporary debt which exists in cash accounts and because it is reduced by the proceeds of short sales. Loans made by banks for the purpose of purchasing and carrying securities are also inaccurate measures of regulated margin credit. Bank loans to brokers and dealers include funds to support the brokers' investment positions and underwriting activities. Furthermore, such loans are not the only source of funds for brokers and dealers. Bank loans to others includes a substantial amount of loans made on over-the-counter securities, which are not covered by margin regulations. Data is unavailable on some bank loans which are not regulated because either the purpose of a loan for which stock collateral is taken is not the purchase and carrying of securities or the collateral taken for a loan to purchase securities is not stock. Many of these loans, however, are conceptually equivalent to security loans, and their magnitude cannot be measured. Finally, there is no data to indicate the amount of stock market credit which is provided by lenders other than brokers or banks. Most importantly, there is no way to judge the extent of substitution of regulated for unregulated credit when margin requirements are changed, so that the true influence of regulatory changes is unknown. Because all of the models in recent studies have been tested with some combination of these data, the conclusions reached regarding the effectiveness of margin requirement changes are

¹Because of the technicality of some of these distortions, a complete discussion is reserved for Appendix A.

questionable. And the validity of coefficients generated by these models, in assessing the relative importance of other factors on changes in margin credit, is equally questionable.

The only recent attempt to isolate the behavior of margin traders was made by Moore.¹ Testing a model of the demand for security credit in which margin requirements, stock prices, and changes in stock prices were the independent variables, he found a negative coefficient for the price change variable and concluded that margin traders were a rational, stabilizing influence on the stock market. Aside from the fact that the data representing the dependent variable in his tests were distorted,² the model ignores the influence of economic growth on the demand for securities and security credit. In another test, Moore developed evidence that the variation in stock prices was not significantly higher in the fifteen year period preceding margin regulation than in the fifteen year period following World War II, and thus concluded that stock price stability had not been increased after margin regulations were instituted. Whatever the results of such a test, it would be difficult to ascribe them to a single cause, in light of other structural changes between these two periods. Both monetary and fiscal policy became more active instruments in the latter period. Furthermore, in the immediate postwar years, the economy set upon a new path of economic growth, the uncertainty of which might reasonably have been reflected in wider stock price variations.

¹Moore, "Stock Market Margin Requirements," pp. 163-66.

²Moore used loans to brokers and dealers and loans to others made by banks.

On eight of the fourteen occasions when margin requirements have been changed since 1945, the Federal Reserve Board has at least partly based its decision on the level of "speculative activity" and the behavior of prices in the market.¹ For example, in commenting on the increase in margin requirements from 50 per cent to 75 per cent in 1951, the Federal Reserve noted:

. . . there had been some increase [in stock market credit] during the preceding several months, together with increases in the volume of trading and in prices of securities. The expanding business and economic situation appeared to be encouraging stock market activity and speculation. . .²

Explaining the second increase in margin requirements during 1955, first from 50 per cent to 60 per cent and ultimately to 70 per cent, the Board indicated in its annual report that the second action was taken

in the light of these evidences of continued speculative pressures in the stock markets and was designed as an additional step to prevent excessive use of credit from adding to such pressures.³

It is clear from these statements that flexible margin requirements have not been used by the Board solely for its convenience in

¹Cohen, "Federal Reserve Margin Requirements and the Stock Market," p. 32.

²U.S., Board of Governors of the Federal Reserve System, Annual Report, 1951, p. 81.

³U.S., Board of Governors of the Federal Reserve System, Annual Report, 1955, p. 84.

co

re

in

de

as

se

un

Co

se

or

ne

ea

to

cr

che

che

val

tra

sen

cha

div

sta

shi

controlling, through demand, the building up of excessive margin credit relative to the resources of the banking system. The flexible margin instrument has been used instead in response to the assumed speculative, destabilizing behavior of margin traders. The need to test these assumptions remains.

Hypothesis and Plan of Study

The need for research is established through evidence that the selective stock market credit instrument has been applied based upon untested assumptions about the behavior and impact of margin traders. Consequently, this study tests the hypothesis that margin trading of securities predominantly reflects strategies which are speculatively oriented toward short term stock price movements rather than investment oriented toward long term price appreciation through growth in earnings and dividends. Furthermore, margin traders are hypothesized to exert a destabilizing influence on stock price movements.

In Chapter II, a model of the supply of and demand for margin credit is developed, with the goal of identifying the extent to which changes in outstanding margin credit are influenced by stock price changes per se, as opposed to changes in credit availability and the value of securities reflected in economic growth variables. If margin traders are speculators, margin credit changes will be much more sensitive to short term fluctuations in the price of stocks than to changes in the discounted value of their future earnings and/or dividends. If the speculative activity of margin traders is destabilizing, then changes in prices should bear a direct relationship to the change in margin credit not explained by changes in either

val

pri

to

not

ili

by

Jun

ity

on

Jun

ity

cre

by

on

of

san

reg

cove

spe

stoc

stoc

cove

secu

as w

vary

value or credit availability, indicating that margin traders buy in price upswings and sell in price declines. Analysis of the model seeks to identify the absolute destabilizing influence of margin traders and not a destabilizing influence of margin traders relative to the stabilizing or destabilizing activity of those who invest or trade with cash.

The model is tested with monthly data on margin debt reported by large multi-regional brokerage firms, from January, 1965 through June, 1968. The time period is limited on one hand by the availability of new and more accurate data on margin debt beginning in 1965 and on the other hand by a change in margin requirements which occurred in June, 1968. Limitations on both the time period and sources of security credit were accepted in order to minimize distortions caused by credit arising from transactions other than in listed securities covered by Regulations T and U.¹

In Chapter III, the hypothesis is tested further using data on actual purchase and sale transactions which occurred in a sample of 418 individual margin accounts. The accounts represent a random sample of all margin accounts maintained by one of the large multi-regional brokerage firms on February 28, 1966, and the time period covered is from that date through June 17, 1966. If margin traders are speculators, they may be expected to concentrate their activity in stocks subject to higher price variability than would investors; these stocks provide the opportunity of greater short-term gain. As speculators

¹Essentially, the regulations effective during this time period cover margin transactions in all securities listed on a national securities exchange. The distortions present in other data series, as well as the problem introduced by including time periods with varying margin requirements, are discussed in detail in Appendix A.

2

0

5

in

2

se

di

ac

th

ab

ac

mo

sa

pri

for

is

inc

high

or ;

sect

mar

sett

margin traders would also be expected to exhibit their short-term orientation in a higher turnover of shares than investors. Finally, since speculators seek short-term price performance rather than investment quality or value, margin traders would be expected to be more active than investors in issues of companies which are less seasoned or unstable in their patterns of growth in earnings and dividends. Each of these presumptions is tested by comparing characteristics of trading in sampled accounts with those of trading on the New York Stock Exchange as a whole.

If the activity of margin traders is destabilizing in an absolute sense, the timing of purchases and sales of stocks in margin accounts should show a high positive correlation with market price movements. A simple model of the daily purchase and sale activity in sampled accounts is used in testing this proposition, with market price movements as the independent variable. A similar test is made for the most frequently traded stocks, where the independent variable is a price average of these stocks. Other groupings of trades tested include those made by large accounts and those made in stocks with high price variability and stocks or companies with either undemonstrated or fluctuating growth patterns.

In Chapter IV a summary of the results of the study is presented. Evidence developed in the study regarding the behavior of margin traders is discussed in terms of its implications for policy in setting margin requirements.

CHAPTER II

A MODEL OF AGGREGATE MARGIN CREDIT CHANGE

The hypothesis that margin trading is speculative and destabilizing to stock prices is tested through an aggregate model of margin credit change. The test seeks to identify the extent of speculative behavior by determining the importance of stock price changes in explaining margin credit changes. The timing of margin credit changes, relative to stock price changes, is analyzed as a test for destabilizing margin account activity.

After a discussion of the factors underlying the supply of and demand for margin credit, these factors are adapted to available data and incorporated into a reduced form regression equation. The model is tested with monthly data using generalized least squares techniques, and results are presented for both initial and revised formulations. Finally, the empirical performance of the model, and its support of the hypothesis, are discussed.

Factors Affecting the Demand for Margin Credit

The decision-making process of the margin trader may be subdivided into three broad and not necessarily mutually exclusive categories. First, the margin trader establishes his quantity demand for securities on the basis of his resources and the supply function of listed stocks. Second, the margin trader modifies his quantity demand to conform with

his d

secur

judgm

inves

capit

is:

the

The

by a

ther

to p

are

othe

qua:

are

holc

to p

How

hel

sup

inc

str

of

sec

his desire to accept additional debt. Third, he selects among individual securities, as does any purchaser of equities, on the basis of portfolio judgments and the relation of the market price of a stock to the investor's evaluation of the discounted value of future dividends and capital gains from that stock. The resulting demand for margin credit is:

$$C_d = f_{C_d}(S, E^e, I^e, R, P, B)$$

the arguments of which are discussed below.

The Supply of Listed Stocks: S

The supply of listed stocks is fixed in the short run, and held by a group consisting of investors and traders. At any point in time there will also be a group consisting of investors and traders who wish to purchase part of the fixed supply. Market prices for all securities are determined by the interaction of one group's demand to buy and the other group's demand to hold these securities, and the sum of the quantities demanded by these two groups is the fixed supply. The lower are prices of securities, the greater will be the demand by security holders to reserve their holdings from the market,¹ and the group wishing to purchase part of the fixed supply faces an upsloping supply function. However, since the demand for margin credit is a function of the securities held on margin as well as of securities purchased on margin, the relevant supply is the fixed supply, and increases in the fixed supply will increase the demand for margin credit.

¹It should be noted that this classical analysis may not strictly apply if falling stock prices, combined with expectations of further decline, precipitate an increase in supply from those security holders who wish to minimize losses.

Expected Future Growth in Earnings: E^e

Following Miller and Modigliani, in a market in equilibrium with rational investors acting under perfect certainty, the "price of each share must be such that the rate of return (dividends plus capital gains per dollar invested) on every share will be the same throughout the market over any given interval of time."¹ Were this not the case, shares with a lower rate of return would be traded for those with a higher rate of return until equality was achieved. The price of shares in the current period, and the determination of capital gain to be achieved in the next interval of time, are derived by discounting the future stream of earnings and/ or dividends at a rate of return which reflects the risk associated with each stock. The higher is the growth in earnings for all stocks, the greater is the future rate of return, and the demand for stocks increases relative to the demand for other financial assets, for example, savings accounts. Furthermore, since both rational behavior and perfect certainty are ideals not actually achieved in the trading and valuation of securities, evidence of greater growth than had been anticipated would also lead to increased demand for stocks until prices reflected the discounting of the greater expected future flow of earnings and dividends. In both cases, the demand for margin debt is increased because of the increase in demand for stocks, and a direct relationship between expected growth and the demand for margin credit is anticipated.

¹ Merton H. Miller and Franco Modigliani, "Dividend Policy, Growth, and the Valuation of Shares," Journal of Business, XXXIV (October, 1961), 413.

Expected

R

margin

judgment

the eco

very li

increas

investm

prospec

insofar

Consequ

in exp

The Co

on the

terms,

credit

inter

margi

incre

funds

share

ments

inves

made,

Expected Rate of Inflation: I^e

Expectations about inflation can influence the demand for margin credit in several ways. First, the rate of inflation affects judgments regarding growth in corporate earnings. Nominal growth in the economy, and thus in corporate earnings, investment return, and very likely stock prices are increased as inflationary expectation increases. Second, the relative appeal of equity over fixed dollar investment is greater, increasing the demand for stocks. Third, the prospect of inflation provides an advantage to users of margin debt insofar as their assets are supported by fixed-dollar liabilities. Consequently, a direct relationship is expected in the impact of a change in expectations regarding inflation on the demand for margin credit.

The Cost of Borrowing: R

The willingness of the margin trader to hold debt depends on the interest cost associated with margin borrowing. In aggregate terms, higher interest costs will reduce the quantity demanded of margin credit. It is worth noting here that the investor may not view the interest cost separately in making the decision to increase or decrease margin borrowing. Properly, interest cost should be offset against the incremental return from the additional shares purchased with borrowed funds. For example, on a purchase of 100 shares of stock at \$100 per share, the total investment is \$10,000. At 70 per cent margin requirements, \$3,000 of this amount, or 30 shares, would be the incremental investment resulting from margin borrowing. In justifying the investment made, interest cost over the time horizon should be offset against the

incremental flow of dividends and capital gains. The risk of assumption of this debt as well as the portfolio risk of the added investment would determine the appropriate rate of discount.

For the purposes of this model, however, it is not inappropriate to view interest cost as a discrete cost; the stream of anticipated returns is not ignored but is implicit in the expectations variables. Furthermore, it is not the investment decision per se but rather the decision to incur debt which is of concern here, and, whether directly or indirectly, the interest cost is relevant in the latter case.

Extent and Direction of Change in Market Prices: P

Let us define investors as those who do not attempt to profit from short-term movements in market prices. Their investment decisions, and thus their demand for stocks and for margin credit, are measured by expectations regarding future growth in earnings and dividends. Thus, while the quantity of stocks and credit demanded by investors may increase if stock prices decrease from influences other than reduction in expected future return, such an increase represents movement along, not a shift in, demand functions.

Let us define speculators as those who do attempt to gain from short-term price swings. The speculator's demand function for stocks and credit is influenced by stock prices and by anticipated changes in stock prices, whether or not these changes reflect changes in stock values. Thus the influence of stock price changes in determining changes in margin credit is also a measure of the influence of speculative trading on changes in margin credit.

The economically useful role of speculators is demonstrated by the actions of short sellers in the stock market. By selling short as market prices increase, the short seller is anticipating a decline in prices which will be profitable to him, but at the same time he is stabilizing the market because his selling dampens the increase in prices. Similarly, when stock prices do begin to decline, the short seller stabilizes through his buying to cover short positions. New York Stock Exchange rules, which prohibit short sales in continuous price declines, help to prevent the short seller from becoming a destabilizing influence, as he would be if he waited for confirmation of a price decline and added selling pressure through short sales in an already declining market.

There is no provision, however, to control similar destabilizing activity on the part of speculators who trade "long" in securities. Long speculators may amplify market price movements by adding buying pressure during market upswings and selling pressure once a declining market is confirmed. If margin traders are speculative and destabilizing to stock prices as is hypothesized in this study, then their speculative orientation will be demonstrated by the relatively strong influence of price changes, as opposed to value changes, on changes in margin credit outstanding. And destabilizing speculative activity by margin traders will be suggested by a direct relationship between price changes and margin credit changes. Such a direct relationship is not conclusive evidence of destabilization, however, since a stabilizing influence could be provided by margin purchases in rising markets and sales in falling markets which add pressure to return stock prices to their

mean or central value level. On the other hand, a truly destabilizing price sensitivity will be confirmed by evidence that margin traders respond directly to prices throughout price swings.

Existing Borrowing Power in Margin Accounts: B

For each customer margin account, the broker sets up and maintains a special miscellaneous account [SMA]. This type of account is authorized in Regulation T, which specifies that it may be used, among other things, for the purpose of receiving from or delivering to a margin customer any cash or securities. In the simplest of terms, this account is very similar to a checking account maintained by the customer with his broker. The account is debited for the amount of margin required to support purchases made by the customer, and it is credited with the maximum amount allowed by Regulation T whenever a sale is made. Cash deposits by the customer are credited to the account, and withdrawals by him are debited to it. Dividends received by the broker on stock held in the account are credited to the SMA. For all of these transactions, adjustments are also made to the debit balance in the margin account; however, the SMA and the debit balance are entirely separate account entities.

Whenever a transaction occurs which requires an entry to a margin account, the account is "marked to the market." This process involves calculating the maximum loan value of securities in the account and comparing it with the adjusted debit balance in the account, which is the sum of the debit balance and the SMA. If the maximum loan value is greater than the adjusted debit balance, the SMA is credited with the difference. The net effect of marking to the market is to establish a

line of credit for the customer equal to his maximum borrowing power. The amount which is not currently being borrowed by the customer is set aside in the special miscellaneous account. This "excess loan value" becomes customer equity, and it can be used by the customer in future periods as margin deposits to purchase additional securities, just as though it were a cash deposit.¹ The maximum market value of securities which can be purchased with the balance in an SMA is $1/m$ times the SMA, where m is the current margin requirement.²

What is most significant about these SMA balances is that they represent purchasing power for which the customer need deposit no additional cash or securities as collateral. Since no interest is earned on funds maintained in an SMA, it can be assumed that these funds represent the least amount by which margin customers anticipate utilizing their equity in the near future.³ That is, increases in

¹The SMA is not reduced in the event that marking to the market indicates that the adjusted debit balance is greater than the maximum loan value of securities in the account. As a result, equity generated by marking to the market remains in the account until it is used or until the account is closed. In addition, there are few restrictions on additional borrowing which results from the "spending" of balances in special miscellaneous accounts; as long as a customer's market value exceeds 130 per cent of his debit balance (the maintenance requirement imposed by the New York Stock Exchange), he may utilize SMA balances, and increase his borrowing.

²For example, if the customer's SMA had a balance of \$7,000, and the margin requirement were 70 per cent, a total of \$10,000 in securities could be purchased; the remaining \$3,000 would be borrowed from the broker.

³There are two exceptions to this reasoning. First, cash which is allowed to remain in the SMA (in the form of deposits or proceeds from sales), will reduce the interest charge in an account with a debit balance, so there is an opportunity cost of removing some of the funds making up SMA balances. Second there is evidence that SMA balances tend to accumulate in inactive accounts suggesting that part of SMA balances, even though available, are not actively used.

SMA balances are readily available for, and presumably committed to, future increases in demand for margined securities. A one month lag is assumed in the effect of changes in SMA balances on demand for margin credit.

Factors Affecting the Supply of Margin Credit

Since the major portion of funds lent by brokers to their customers is, in turn, borrowed from other sources, an important determinant of the supply of margin credit is the availability of borrowed money to brokers. Brokers also commit funds to their own investment position and to new issue underwriting activities, so the supply of margin credit is affected by the return on these alternative investments. The resulting supply function for margin credit is:

$$C_s = f_{C_s}(A, R, M)$$

where R is the margin credit lending rate, equivalent to the cost of borrowing in the demand function; the supply of margin credit is directly related to the rate of interest charged borrowing customers. The rate of return on alternate investment, A , represents the profitability of competing uses for funds obtained by brokers; the higher the rate of return from the firms' own investment positions and from their underwriting activities, the less margin credit will be supplied. M reflects monetary policy and represents availability of borrowed funds to brokers. The less stringent is monetary control, the greater is the supply of funds for margin credit to brokers.

tested,

The ac

MR

Stock

publi

Board

publi

sampl

margi

repre

appro

which

the

so t

twen

of t

Rece
Rece

Regression Test of the Model

The reduced form of aggregate demand for margin credit was tested, using generalized least squares, with the following equation:

$$\begin{aligned} MR_t = & a_1 DLR_t + a_2 IPR_t + a_3 CPR_t + a_4 NYR_t + a_5 SMAR_{t-1} + \\ & + a_6 FRD_t + a_7 TYD_{t-1} + a_8 CD_t + a_9 DD_t + \\ & + a_{10} ED_t + u \end{aligned}$$

The actual variables used are described below.

MR Margin credit extended to customers by large multi-regional brokerage firms which are member firms of the New York Stock Exchange. The data are obtained from the margin account panel published jointly by the New York Stock Exchange and the Federal Reserve Board.¹ The actual data used are disaggregated components of the published series, however, because the technique used to expand the sample to universe estimates introduces distortion.

For this new margin credit series, data on balances in customer margin accounts are collected from 38 firms. In constructing the sample, representation was sought from three strata. Stratum I accounts for approximately one-third of all margin credit and includes the five firms which reported the largest Customer Net Debit Balances [CNDB] prior to the formation of the sample. All five of these firms provide information, so that Stratum I is covered exhaustively. Stratum II consists of those twenty-six next largest firms maintaining approximately a second third of total margin credit. Five of these firms supply data, accounting in

¹U.S., Board of Governors of the Federal Reserve System, Federal Reserve Bulletin, Monthly issues, p. A-34; New York Stock Exchange, Research Report, Monthly issues.

total for about one-third of the total margin credit in Stratum II. Twenty-eight of the remaining 316 NYSE member firms supply sample data for Stratum III, accounting for roughly 7.5 per cent of CNDB reported by the stratum.¹

Universe estimates of total margin credit are obtained for Strata II and III by blowing up margin debt reported by sample firms with the inverse of these firms' percentage contribution to total CNDB. Recall that changes in CNDB cannot be taken as a reliable indicator of changes in margin debt because of the distortion caused by short sales and cash account debt. Thus, although the new margin credit series is more reliable than historically available series in isolating margin credit change between periods, it is still influenced, through blowup factors used, by factors unrelated to margin transactions. To eliminate this influence, the margin credit series was disaggregated, and the model is tested with the combined raw sample data in Strata I and II. The model is thus potentially valid only in explaining changes in margin debt originating in large multi-regional (nearly all with more than 50 branches) brokerage firms. Since about half of estimated margin credit is extended by such firms, and since the individual account data used in testing also reflects the characteristics of these large firms, the treatment seems justified. The data used represent approximately 40 per cent of total margin credit extended by New York Stock Exchange member firms to their customers. The data consist of account balances for all transactions executed by the last business day of each month.

¹A complete discussion of the new margin credit series is contained in Ulrey, "Margin Account Credit."

DLR The dollar value of all shares listed on the New York Stock Exchange,¹ divided by the NYSE index of stock prices. This variable serves as a proxy for the total supply of securities which influences the demand for margin credit; it is superior to both dollar value and number of shares listed, because both of these alternative series are influenced by other changes than in the supply of listed stocks.

In addition to reflecting changes in the supply of securities which occur through new flotation of securities and listing or delisting of securities, the unadjusted dollar value series is influenced by changes in the price of shares in the previously existing supply. Since price changes are included as a separate variable in the model, bias through intercorrelation could result. In fact, the simple correlation between rates of change in dollar value of listed securities and stock prices is rather high ($r = .71$). The alternative of using total shares listed is not an attractive one. By eliminating dollar values altogether, bias is introduced, because low priced shares are given weight equal to higher priced shares and because stock splits occur. Since the NYSE index is adjusted for stock splits and reflects general stock price movements as well, the adjusted share index which results from dividing the dollar value of listed securities by the NYSE Index is a relatively better measure of increases in the supply of listed stocks.

¹New York Stock Exchange, Monthly Report, Monthly issues.

IPR

The seasonally adjusted Total Index of Industrial Production as of the end of each month.¹ This variable serves as a proxy for real growth in corporate earnings; the latter variable is unavailable on a monthly basis. The use of the current value of the rate of output is, in addition, based on two assumptions about investor behavior. First, the investor is assumed to be correct in his formation of expectations, in that his projection of earnings growth and the actual growth in earnings, as indicated by output, are the same. Second, the investor is assumed to form his judgment of expected future earnings and dividends by projecting the current, short-run performance. The former assumption is unavoidable; investors' actual expectations are not visible. The latter assumption is supportable on two grounds. First, discounted future returns are most affected by near-term earnings performance. Second, if margin accounts are used for earnings-growth-oriented investment purposes rather than speculative price-oriented purposes, then the risk of the debt assumed will orient the margin "investor," more so than the cash investor, toward near-term earnings growth. That is, investment activity in margin accounts, because it is partially supported by debt, is assumed not to be directed toward capital gains in the "long pull" or based on long-term growth trends. Instead, margin account

¹U. S., Board of Governors of the Federal Reserve System, Federal Reserve Bulletin, Monthly issues, p. A-52.

invest

result

ance. 1

CPR

form

contin

NYR

as a

secur

Ameri

and m

total

accou

the p

closi

tions

ducin

resul

perfo

Reser

Index

pp. 1

Index

investment activity seeks to profit from near-term capital gains which result from current, and perhaps temporary, growth in earnings performance.¹

CPR The Consumer Price Index, chosen to reflect expectations regarding inflation.² Again, investors are assumed to form their expectations naively, by supposing that inflation will continue at its current rate. Data used are as of the end of each month.

NYR The average price of shares listed on the New York Stock Exchange. The New York Stock Exchange Index was chosen as a proxy for price movements of all securities listed on national securities exchanges.³ Because other exchanges, particularly the American Stock Exchange, are more heavily influenced by less seasoned and more volatile issues, the New York Stock Exchange Index is not totally representative. However, the fact that trading on the NYSE accounts for such a substantial proportion total share trading reduces the potential bias. The data used are a monthly average of daily closing prices.

¹The validity of this current period orientation for expectations regarding earnings growth and inflation was tested by introducing distributed lags for these variables into the model. The results of these tests confirm the greater significance of current performance. See Infra, p. 55n, and Appendix C.

²U.S., Board of Governors of the Federal Reserve System, Federal Reserve Bulletin, Monthly issues, p. A-60.

³New York Stock Exchange, Historical Data on NYSE Common Stock Index (New York: Research Department, New York Stock Exchange, 1966), pp. 15-25; and New York Stock Exchange, NYSE Common Stock Closing Indexes, Monthly releases.

SMAR Special Miscellaneous Account balances reported by a sample of member firms of the New York Stock Exchange. These data are also contained in the margin account panel from which margin credit data are obtained. The actual data used for this variable are the end of month SMA balances reported by sample firms in Strata I and II of the margin account panel, as is the case with the margin credit variable.¹ The series is lagged one period, following the assumption that changes in the purchasing power of SMA balances will be reflected in the demand for margin credit in the following period.

FRD Net reserves reported by member banks of the Federal Reserve System.² This variable serves as a proxy for monetary policy in the model. The data are averages of daily figures for the month. If positive, they are net free reserves; if negative, they are net borrowed reserves.

TYD The current yield on U.S. Treasury bills computed as an average of daily closing bid prices.³ A one period lag was introduced in this variable to achieve greater consistency in the relationship of interest rates to monetary and growth variables in the model.

Ceteris paribus, one would expect to find a negative relationship between the rate of change in margin credit extended and the change in

¹Supra, p. 43.

²U.S., Board of Governors of the Federal Reserve System, Federal Reserve Bulletin, Monthly issues, p. A-6

³U.S., Board of Governors of the Federal Reserve System, Federal Reserve Bulletin, Monthly issues, p. A-29.

interest rates. In fact, initial tests of the consistency of the variables indicated positive simple correlation ($r = .21$) between these two variables. Furthermore, the correlation of the current interest rate variable with other variables does not consistently reflect fundamental economic relationships.

The building up of demand pressures in the economy should be evident first through increased industrial output, second through increased interest rates reflecting rising investment demand, third through increased prices if growth in investment and output are insufficient to meet rising demand, and fourth through reductions in net bank reserves reflecting monetary attempts to counteract inflationary pressures. Although the correlation of interest rate changes with industrial production growth is significantly positive ($r = .31$), as it is with consumer price changes ($r = .32$), changes in net reserves are not negatively correlated with interest rates ($r = .03$), as would be expected.

The introduction of a one period lag in interest rate changes overcomes these difficulties. Correlation with changes in net reserves becomes negative ($r = -.10$), the correlation with growth in industrial production increases ($r = .45$), and the correlation with price changes is only slightly affected ($r = .23$). In addition, the anticipated negative relationship between interest rate changes and margin credit changes exists ($r = -.07$).

Interpreted in light of the model of aggregate margin credit change, such a lagged interest rate formulation is not unreasonable. Since the interest rate on margin balances has in recent years borne a fixed relationship to the prime bank loan rate, the changing

attractiveness of alternative investment of funds available to brokers is not necessarily reflected in the supply price. Instead, a more informal process must occur if brokers wish to divert funds from margin credit into underwriting activities, for example, as would be the case in periods of high investment demand. Such a process might take the form of reducing efforts to either obtain new margin account business or stimulate activity in existing margin accounts. In either case, there would be some time lag before these efforts took effect. The use of more direct means to reduce margin credit by refusing it to customers would, in normal markets, be extremely costly to brokerage firms if it led, as is certainly likely, to the transfer of margin customers to more cooperative competitors.

CD A dummy variable to account for the effect of amendments to Regulation T in March, 1968. The main effect of these amendments was to prohibit the inclusion of any bonds in margin accounts and to provide for special accounts and special margin requirements for convertible bonds. CD assumes a value of "1" in March, 1968, when bonds were removed from margin accounts.

DD Dummy variables introduced to account for the addition of and sample firms in Stratum II of the margin account panel.

ED One of these firms was added in July, 1965, and the other in November, 1965. Because of the influence of these additions on the rate of change in margin debt for those months, the dummy variables are assigned the value of "1" for the months when each addition was made.

u The residual.

Specification of the Regression Test

The model was tested with data covering 41 monthly periods from January, 1965 through May, 1968. With the exception of treasury yields all variables were transformed to rate of change, of the form:

$$\frac{(V_t - V_{t-1})}{V_{t-1}} \times 100$$

Treasury yields, since they already express a rate, were transformed to ordinary first differences.

Because the likelihood of error through autocorrelated residuals exists even in transformed time series data, generalized least squares techniques were used.¹ The technique assumes a residual term of the form

$$u_t = pu_{t-1} + e_t$$

where e_t represents the true estimation error. An estimate of p is made, and the regression equation is re-estimated:

$$y_t = py_{t-1} + a_0(1-p) + \sum_{j=1}^k a_j(x_{jt} - px_{jt-1}) + e_t$$

A new estimate of p is made, and the iterative process continues until two successive p 's are substantially equal, or until $(1-p)$ becomes zero. With all variables initially in first difference form, the effect of autoregressive transformation is to at least partially transform the variables into second differences. In the extreme case where p equals

¹The method used follows J. Johnston, Econometric Methods (New York: McGraw-Hill, Inc., 1963), pp. 193-94.

one, the regression equation would be based on variables in fully second difference form.

The constant term is suppressed in tests of the model. The variables are in difference form, and there is no basis on which to assume a constant minimum rate of growth in margin credit, as the value of a constant would reflect.

Coefficients of the variables in the model are expected to exhibit the following signs:

- $a_1 > 0$ The rate of increase in the supply of listed stocks is directly related to the rate of change in margin credit.
- $a_2 > 0$ Reflecting expectations of growth in corporate earnings, the change in industrial production is directly related to the change in margin credit.
- $a_3 > 0$ Increases (decreases) in the price level increase (decrease) the demand for stocks and the demand for margin credit; a direct relationship is expected.
- $a_4 > 0$ Margin traders are hypothesized to be destabilizing. Therefore, they add buying pressure, increasing their borrowing, when prices are rising; and they add selling pressure, decreasing their borrowing when prices fall. A direct relationship is expected.
- $a_5 > 0$ Increases in the purchasing (and borrowing) power of margin traders in the previous period will increase their demand for margin credit in the current period.
- $a_6 > 0$ The greater (less) the rate of change in net reserves, the greater (less) the availability of funds to brokers, encouraging (discouraging) growth in customer borrowing.
- $a_7 < 0$ If the return on alternative investment increases, brokers have an incentive to divert funds from margin credit, and, conversely, to divert funds to margin credit if alternative rates of return decline; an inverse relationship is expected.
- $a_8 < 0$ The removal of bonds, and the debt associated with them, from margin accounts in March, 1968 reduced the rate of change in margin credit for that month.

- $a_9 > 0$ The addition of a firm to the sample in July, 1965 increased the rate of change in margin credit for that month.
- $a_{10} > 0$ The addition of a firm to the sample in November, 1965 increased the rate of change in margin credit for that month.

Performance of the Model

Results of the regression test of the model are summarized in Table 1.¹ All of the coefficients have the expected sign, although several of the coefficients are not reliably different from zero. In particular, although the coefficient of DLR_t , the proxy variable for the supply of listed stocks, is positive, its t-value (.028), indicates that the coefficient is statistically different from zero with a probability of less than one-tenth. The lack of significance of this variable may be an indication that the supply of stocks to which margin credit demand responds is not total supply of listed stocks but rather that which "confronts" the market at any point in time. That is, the relevant supply of stocks is that which is available for trading, excluding shares which are held as relatively permanent investments.

The dummy variable CD_t , introduced to account for the removal of bonds from margin accounts in March, 1968, is also insignificant. Lack of significance could indicate that the amount of bond trading in margin accounts was very small. It is more likely, however, that the removal of bonds from accounts was accomplished gradually over the several months preceding the effective date of the regulation, since

¹ A table of simple correlation coefficients between the variables in the model after autoregressive transformation is presented in Appendix B.

Va

D

I

C

N

S

F

T

C

D

E

TABLE 1

DEMAND FOR MARGIN CREDIT AT BROKERS

<u>Variable</u>	<u>Coefficient</u>	<u>t-value</u>	<u>Probability Level of Significance</u>
DLR_t	$a_1 = .001817$	.027924	--
IPR_t	$a_2 = .875967$	2.603517	.02
CPR_t	$a_3 = 4.507426$	3.724649	.001
NYR_t	$a_4 = .440615$	6.246636	.001
$SMAR_{t-1}$	$a_5 = .128452$	1.782107	.1
FRD_t	$a_6 = .002242$	1.035755	.4
TYD_{t-1}	$a_7 = -3.124370$	-2.580508	.02
CD_t	$a_8 = .389401$	.322425	.8
DD_t	$a_9 = 2.186216$	2.027535	.1
ED_t	$a_{10} = 5.630749$	5.325229	.001
	Adjusted R^2	0.646	
	Durbin-Watson Statistic	2.29	
	Degrees of Freedom	29	
	N	41	
	p	0.729	

the proposed regulation was released on October 20, 1967, and required loans made subsequent to that date to conform with the regulation when it became effective.¹

The model was rerun without DLR_t and CD_t as variables. Although $SMAR_{t-1}$, the customer borrowing power variable, FRD_t , the net reserves variable, and DD_t , one of the dummy variables representing the addition of firms to the sample, were only marginally significant in the test described in Table 1, they remained in the model. The results of a regression test of the abridged model are presented in Table 2.²

¹U.S., Board of Governors of the Federal Reserve System, Press Release, October 20, 1967, p.3.

²The two tests described here were not the only regression tests of the model. Earlier tests were conducted to determine the most successful formulations of variables to represent the model. For example, the NYSE Composite Average was chosen over the Standard and Poor 500 Stock Average, and monthly averages of daily closing prices provided better results than month-end closing prices. In addition, the seasonally adjusted production index provided superior results to the non-seasonally adjusted index, and SMA balances were found to be a stronger indicator of margin customer buying power than were free credit balances reported by New York Stock Exchange member firms. The money supply was tested as an indicator of monetary policy but rejected in favor of net reserves of commercial banks; even if money supply is a relevant indicator, limitations on degrees of freedom in the model preclude testing it with the lagged response which its proponents have found to exist. For the sake of clarity, these alternative tests are not described in detail.

The results of one additional class of tests are presented in Appendix C and deserve some comment here. The model presented in Table 2 assumes that those using margin accounts for purposes of investment rather than speculative activity will form their expectations about future earnings and inflation by reference to current changes in these variables. The basis for this assumption is the belief that because of the risk of debt assumed by these investors, they will be primarily interested in near-term growth and therefore will not form their expectations based on longer term performance. This assumption is supported by the results of tests in which both IPR_t , the earnings proxy, and CPR_t , the inflation variable, were tested with six month, two month, and one month distributed lags. In these tests, weights assigned by the Almon polynomial interpolation technique were statistically insignificant in all lagged periods and of the wrong sign in most lagged periods. Only the current period was significant in each of the three cases. The

TABLE 2

DEMAND FOR MARGIN CREDIT AT BROKERS -- REVISED MODEL

<u>Variable</u>	<u>Coefficient</u>	<u>t-value</u>	<u>Probability Level of Significance</u>
IPR_t	$a_2 = .882201$	2.775183	.01
CPR_t	$a_3 = 4.518621$	3.879911	.001
NYR_t	$a_4 = .437745$	6.615105	.001
$SMAR_{t-1}$	$a_5 = .132450$	1.949455	.1
FRD_t	$a_6 = .001930$	1.026129	.4
TYD_{t-1}	$a_7 = -3.206770$	-2.888572	.01
DD_t	$a_9 = 2.173197$	2.083583	.05
ED_t	$a_{10} = 5.642888$	5.524553	.001
	Adjusted R^2	0.667	
	Durbin-Watson Statistic	2.29	
	Degrees of Freedom	31	
	N	41	
	P	0.724	

The revised model also conforms to expectations regarding the signs of coefficients. In addition, all variables with the exception of net bank reserves (FRD_t) and customer borrowing power ($SMAR_{t-1}$) are significantly different from zero at better than the .05 probability level. Two-thirds of the variation in the dependent variable is explained by the model.

FRD_t , while it is still only marginally reliable, is now significant at the .4 probability level. The poor performance of this variable in the model is not inconsistent with broker borrowing behavior. Because of the nature of financing arrangements between brokerage firms and banks, the supply of bank credit to support customer margin trading is very nearly perfectly elastic in the relevant range at the existing prime loan rate. Brokerage firms obtain "day" or "street" loans from banks under flexible loan agreements on the basis of cash needs and the availability of pledgable security collateral. And financing is done as a result of a day's security transactions, not in anticipation of them. Thus the loan arrangement of brokers with banks is considerably more flexible than the typical commercial loan which specifies a binding line of credit. Because of this flexibility, brokers' loans are less likely to be affected by changes in monetary policy and general credit availability.

introduction of these lagged variables reduced the significance of some other variables in the model, but it did not alter the expected signs. For a description of the Almon technique, see Shirley Almon, "The Distributed Lag Between Capital Appropriations and Expenditures," Econometrica, 33 (January, 1965), 178-196.

The Durbin-Watson statistic of 2.29 in the revised test of the model indicates that the hypothesis that residuals are independent of one another cannot be rejected.¹ However, in achieving this result, the variables in the model were subjected to autoregressive transformations. An approximation of the transformation needed to eliminate autocorrelation among the variables was made by using input data in first difference (rate of change) form. There is, however, nothing inherent in the first difference transformation which assures independence of the residuals. In fact, the value of p in Table 2 (.724) indicates that correlation was not removed from the residuals until the variables had been substantially transformed into second differences. The final form of the variable input to the model described in Table 2 is:

$$T_t = \frac{(V_t - V_{t-1}) \times 100}{V_{t-1}} - 0.724 \times \frac{(V_{t-1} - V_{t-2}) \times 100}{V_{t-2}}$$

where T represents a transformed variable and V its levels at time t. The only exceptions to this general form are that TYD, the interest rate variable, and FRD, the net reserves variable, are in simple differences rather than of rates of change, and that both TYD and SMAR, the customer buying power variable, are lagged one additional period.

The coefficients of the model must be interpreted in light of these transformations. Table 3 illustrates the relationship between the rate of change in stock prices, the transformed stock price

¹For a description of this statistic, cf. H. Theil, Economic Forecasts and Policy, (Amsterdam: North-Holland Publishing Company, 1961), pp. 222-23. A value of the Durbin-Watson statistic in the neighborhood of 2 is evidence of the absence of either positive or negative serial correlation.

TABLE 3

ILLUSTRATION OF THE IMPACT OF STOCK PRICE
GROWTH ON MARGIN CREDIT GROWTH

<u>Time</u>	<u>Monthly Rate of Stock Price Change (per cent)</u>	<u>Transformed Stock Price Variable (per cent)^a</u>	<u>Impact on Margin Credit Growth (Per cent)^b</u>
t-1	2.00		
t	3.00	1.55	.68
—	—	—	—
t-1	3.00		
t	2.00	-.17	-.07
—	—	—	—
t-1	8.00		
t	9.00	3.21	1.41
—	—	—	—
t-1	9.00		
t	8.00	1.48	.65

^aThe final transformation equals:

$$(\text{rate of change})_t - 0.724 \times (\text{rate of change})_{t-1}$$

^bThe transformed stock price variable multiplied by
 a_4 (= .438), the coefficient of NYR_t in Table 2.

variable, and the impact of this variable on the growth in margin credit. For example, if the rate of change in stock prices increased from 2 per cent in one month to 3 per cent in the following month, the transformed stock price variable would be 1.55 per cent, and the increase in rate of growth in stock prices would predict a .68 per cent increase in the rate of growth of margin credit. An interesting property of this transformation is that the direction of impact of a variable is a function not only of the direction of change in the rate of growth in that variable, but also of the relative magnitude of change. The second example in Table 3 illustrates the point; in the first difference transformation, a decrease in the rate of growth in stock prices from 3 per cent to 2 per cent would have a positive, but lesser, impact on margin credit. In the final transformation, however, a decrease in the rate of growth of this magnitude (33 per cent) results in a negative impact on margin credit (-.07 per cent). On the other hand, a decrease in the rate of growth of the same amount but of a smaller relative magnitude, from 9 per cent to 8 per cent, leads to a continued positive impact (+.65 per cent). A formulation of this sort is appropriate to the model; large percentage decreases in the amount of net reserves held by banks could, for example, easily reduce the supply of credit to brokers and thus to margin traders, even if the rate of growth were still positive. Similarly, a leveling off in the rate of growth in output or price levels reduces expectations regarding future returns and could induce selling of securities and reductions in margin credit demand; it is not necessary for output or price levels to actually decrease in order for expectations to be revised downward.

A large decline in the rate of growth in stock prices, such as would occur just prior to a fall in stock prices, would predict a negative

impact on the transformed margin credit variable. This negative impact would contradict the hypothesized direct relationship between margin credit and stock price changes if margin credit decreased absolutely while stock prices were still rising. However, both margin credit and stock prices may continue to rise, but at a sufficiently reduced rate to cause both transformed variables to become negative. Under these circumstances, the stock price variable should predict a negative impact if it is directly related to the margin credit variable, which would itself be negative. In fact, evidence is presented in the following section which indicates that decreases in the level of margin credit do follow, rather than lead, stock price declines.

Empirical Support of Hypothesized Margin Trading Behavior

The model summarized in Table 2, as well as the timing of margin credit movements, provide evidence that trading done on margin is destabilizing. Having removed from the dependent variable the influence of investors on margin credit through expected real growth and inflation variables, the demand for credit represented in accumulated borrowing power in margin accounts, and the supply of margin credit determined by net reserve and interest rate variables, a highly significant positive relationship nevertheless exists between margin credit and stock prices. Recall that demand for margin credit by investors is not a function of changes in the prices of stocks, but of changes in the discounted value of their future returns. Since the influence of these value changes is accounted for in the model by earnings and inflation expectations variables, the significance of price changes in explaining margin credit change is strong evidence that credit is used at least in part to support speculative trading. Furthermore, the positive sign of the price variable

in the model indicates that margin traders add buying pressure during price upswings, and selling pressure during price downswings.

Whether this direct relationship between margin trading and stock prices is destabilizing or not depends on the timing of margin trading activity. It is assumed that the stock price fluctuations from which margin traders seek to profit are short-term price movements around the mean or central value of these stocks. Margin traders would be a stabilizing influence if they purchased stocks when prices were rising but below this central value, and sold stocks when prices were falling but above this central value. Margin trading would then impose pressure to return the prices of stocks to their mean value levels. The withdrawal of activity when this value was reached would decrease the likelihood that prices of stocks would be forced away from this central value.

A stabilizing influence of this sort would be suggested if it were observed that purchases by margin traders were concentrated in the early stages of market upswings and were curtailed before the peaks of upswings were reached. Similarly, a stabilizing influence in downturns would be suggested if selling by margin traders occurred in the early stages of price declines and subsided when prices were above the trough.¹ On the other hand, if margin traders followed the market by buying throughout price upswings and selling throughout price downswings, they would not perform a stabilizing function.

Margin credit movements and stock price movements are plotted in Figure 1. Comparison of the movement in margin credit with stock

¹There are other cases in which margin trading would be destabilizing, but this case is the only one which is also consistent with the positive price coefficient resulting from tests of the model.

H
H

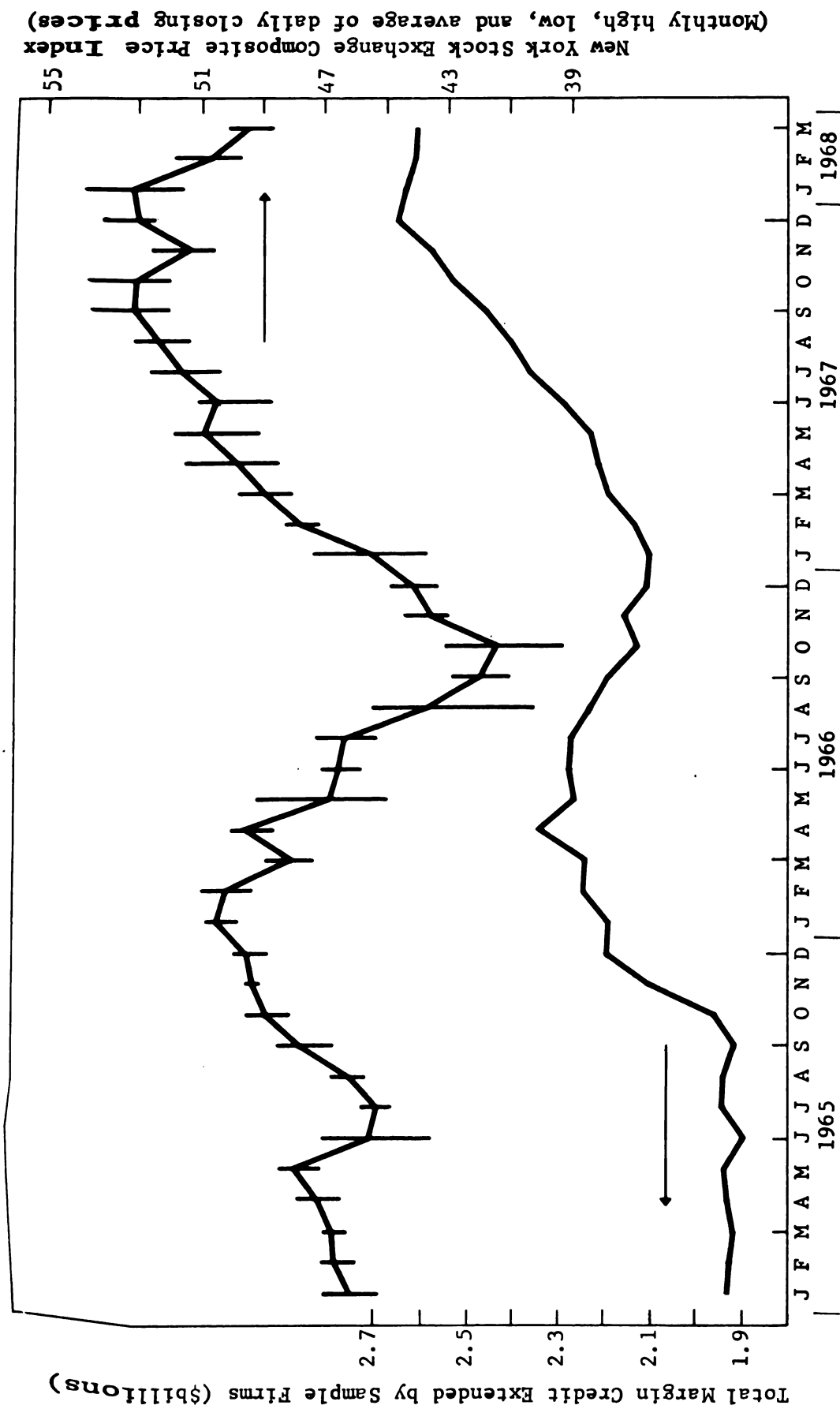


FIGURE 1
MARGIN CREDIT AND STOCK PRICE MOVEMENTS

prices suggests that margin traders do not stabilize the market by concentrating their activity at the beginning of price advances and declines. Instead, margin traders appear to exaggerate fluctuations by following the market throughout cyclical swings. Moreover, margin traders continued to add buying pressure for two months after a peak in prices in April, 1966, and they continued to liquidate holdings for three months after the low in prices was reached in the following December. Such activity, had it not been counteracted by other market activity, would have led to a higher peak and a lower trough in prices and further increased the amplitude of the cyclical price swing. Therefore, contrary to the normal role of speculators (short sellers, for example) in dampening price swings, speculative margin trading destabilizes the market by adding buying pressure beyond price upswings and selling pressure beyond price downswings. And since this speculative, price-oriented influence occurs independently of changes in the discounted earnings potential of securities or changes in the supply of credit, it cannot be justified as an aid to good resource allocation.

Although the existence of speculative activity is indicated by the significance of the stock price coefficient in the model, the prevalence of this activity in margin trading behavior is not so indicated. To identify the extent to which margin credit is used to support speculative, price-oriented trading of stocks, the impact on margin credit of the stock price change variable was analyzed in relation to that of other variables in the model.

The Average Impact of Stock Prices

Over a series of time intervals, the variables in the model will exert influences of differing magnitude and direction on changes in margin credit. In order to examine the relative importance of these variables in explaining margin credit change, they were analyzed in terms of their average impact on margin credit, irrespective of the direction of impact. The results of this analysis are summarized in Table 4. In this table, the impact of the variables is derived by weighting the variable coefficients by the absolute value of each variable, averaged over all time periods studied. For example, TYD_{t-1} , representing changes in rate of return on alternate broker investment opportunities, has an average absolute value of .131 per cent per month over the time period of the study, partially representing both the change in Treasury yields and the change in that change. Multiplying by the coefficient of TYD_{t-1} , the impact of this average monthly change on margin credit growth is .420 per cent. And Treasury yield changes thus contributed 12.8 per cent of the average total impact on margin credit of all variables in the model. The combined effect of TYD_{t-1} and FRD_t , the change in net bank reserves, represents the supply of funds for margin credit by brokers, and these supply factors account for 18.4 per cent of the total impact on margin credit change by the model. The remaining 81.6 per cent of the total impact is provided by factors affecting the demand for margin credit.

Analysis of variable impact provides considerable support for the hypothesis that margin traders are at least in part motivated by speculative goals. Thirty-four per cent of the average total impact on margin credit of all variables is accounted for by changes in the

TABLE 4

IMPACT OF COEFFICIENTS IN REVISED MODEL

<u>Variable</u>	<u>Absolute Value of Coefficient</u>	<u>Average Absolute Change in Variable (per cent)</u>	<u>Average Absolute Impact of Variable (per cent)</u>	<u>Percentage of Total Absolute Impact</u>
IPR_t	$a_2 = .882201$	.656961	.579572	17.7
CPR_t	$a_3 = 4.518621$	.147463	.666331	20.3
NYR_t	$a_4 = .437745$	2.532241	1.108476	33.9
$SMAR_{t-1}$	$a_5 = .132450$	2.394685	.317176	9.7
FRD_t	$a_6 = .001930$	94.663210 ^a	.182700	5.6
TYD_{t-1}	$a_7 = 3.206770$	.131074	.420323	12.8
Total Absolute Impact			3.274578	100.0

^aChange in millions of dollars.

price of stocks, an impact greater than any of the other variables. However, the impact of variables associated with investment goals is also substantial; therefore it cannot be concluded that margin trading is exclusively speculative.

The two variables which reflect the importance of investment goals in the demand for margin credit are IPR_t , the proxy for expectations regarding future corporate earnings, and CPR_t , the expectations variable regarding inflation. The combined impact of these variables on margin credit is 38 per cent of the total impact of all variables in the model, or about the same relative impact as the speculative, price change variable. Margin customer borrowing power ($SMAR_{t-1}$), the only remaining variable in the demand function for margin credit, accounts for 9.7 per cent of the total impact. Since there is no basis on which to assume that this borrowing power is used more by speculators than investors, the strongest conclusion that can be drawn from the analysis of average impact of variables is that margin credit growth appears to be about equally affected by speculative and investment activity.

Stock Price Impact during "Critical Periods" of Stock Market Activity

The provision in the Securities Exchange Act of 1934 for flexible margin requirements implies, however, that there was concern over changes in the influence of speculative activity, not over the existence of it. Similarly, when the Federal Reserve Board based the need for increases in margin requirements on speculative activity, the expressed concern was over the growing influence of speculation with margin credit during periods of rapid stock price movement. If the concern over the speculative use of margin credit is greatest in periods of intense market

activity, the importance of speculative behavior by margin traders may be better judged by identifying cases of extreme impact than through average impact. In fact, the total impact on margin credit accounted for by price changes alone varied considerably over the time period studied.

Monthly predictions by the model indicate that the impact accounted for by stock price changes, plotted in Figure 2, varies between nearly zero per cent and 66 per cent of total impact. In twelve of the thirty-nine periods plotted, more than 40 per cent of the total impact of all variables is the result of the stock price variable, and in each of these cases there is an accompanying sharp stock price movement. It is clear from the performance of the model, therefore, that in periods when margin credit has either risen or fallen substantially, such movement has been primarily in response to stock price movements and not to changes in future expectations nor to changes in the supply of credit. One of the most dramatic examples of the speculative influence of stock prices on changes in margin credit occurred in April and May, 1966. During April, stock prices advanced 2.7 per cent after a drop in March of 4.1 per cent, and margin credit expanded 4.3 per cent. In the following month, stock prices dropped 5.5 per cent and margin credit contracted by 3 per cent. During each of these months, over 55 per cent of the change in margin credit predicted by the model was accounted for by stock price changes. By way of contrast, the average monthly rate of change in margin credit outstanding over the entire period of the study was 1.7 per cent, and the average monthly rate of change in the New York Stock Exchange Index was 2.4 per cent. The model thus suggests that precisely in those critical periods of

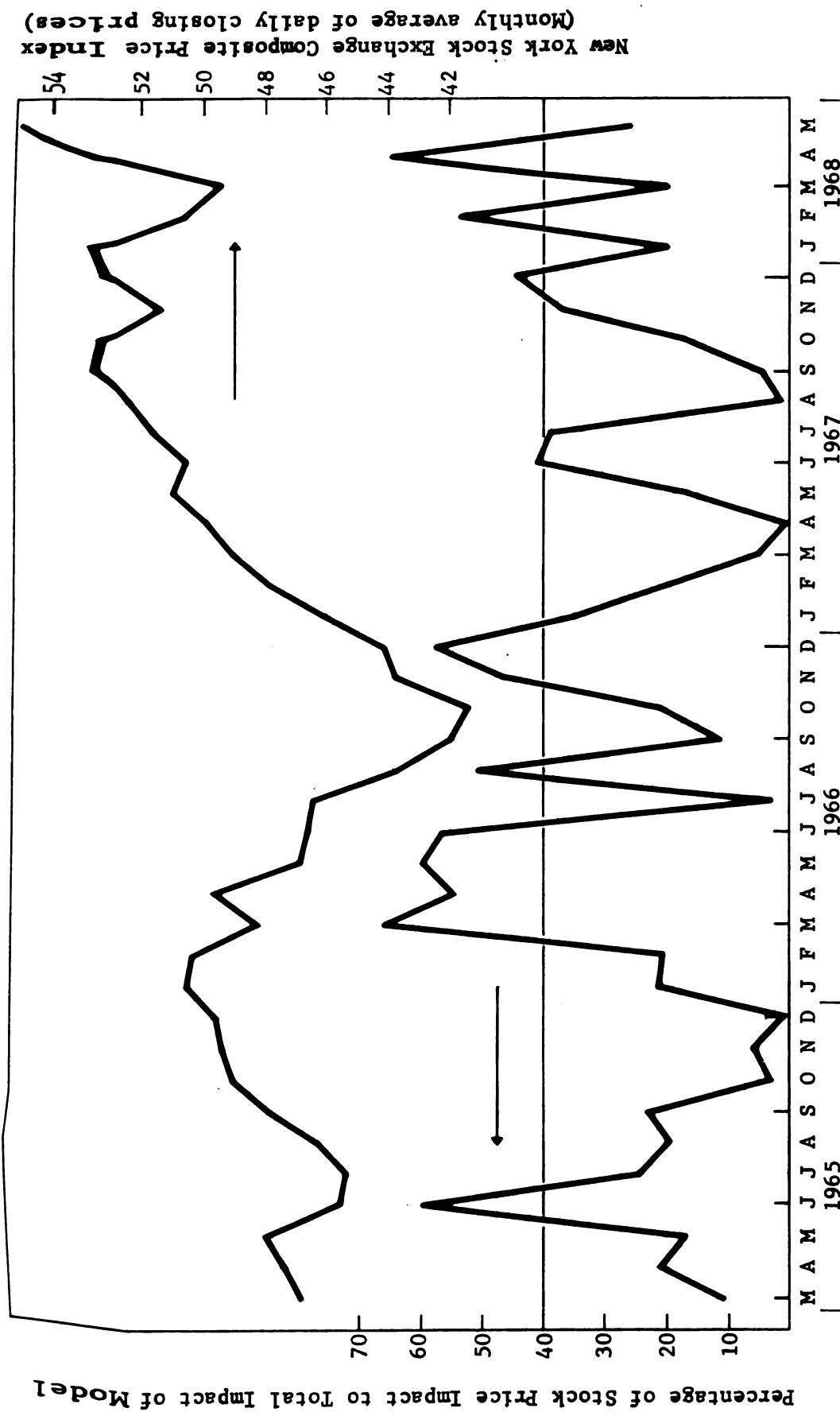


FIGURE 2

VARIATION IN IMPACT OF STOCK PRICES ON MARGIN CREDIT CHANGE IN THE AGGREGATE MODEL

sharp stock price fluctuation when destabilizing speculative activity can be most disruptive, the actions of margin traders are influenced to the greatest extent by speculative, price-oriented strategies.

Summary of Supporting Evidence from Aggregate Model

In summary, tests of an aggregate model of changes in margin credit support the hypothesis that margin trading is influenced by speculators and that their speculative activity is a destabilizing influence on the stock market. Stock price changes accounted for 34 per cent of the average total impact of all variables in the model over the three year time period studied. In periods of sharp stock price fluctuation, the price variable was even more influential in explaining changes in margin credit; in twelve such periods, the impact of stock prices on the model accounted for over 40 per cent of the total impact of all variables. The positive coefficient of the stock price variable is significant at the .001 probability level, and analysis of margin credit changes in relation to stock prices indicates that margin buying and selling persists throughout, respectively price advances and declines. Thus margin traders do not lend stability to the market either by selling in periods of increasing stock prices and buying as prices decline or by adding buying or selling pressure to return stock prices to their mean or central value.

The evidence developed thus far suggests that in periods of intense market activity and rapid stock price change, margin trading is predominately motivated by price-oriented, speculative strategies, and that this speculative activity does not serve an economically useful function because it contributes to, rather than counteracts, price

fluctuations. Fluctuations in margin credit are only a proxy for stock trading, however, and can also be greatly influenced by the pattern of customer deposits and withdrawals of cash from margin accounts. Consequently, in the following chapter, confirmation of the evidence is sought through an analysis of actual stock transactions in a sample of individual margin accounts during one recent "critical period" of rapid stock price fluctuation, March-June, 1966.

CHAPTER III

SECURITY TRADING BEHAVIOR IN A SAMPLE
OF MARGIN ACCOUNTS

As a further test of the hypothesis that margin traders are speculative and destabilizing in their market behavior, the actual purchase and sale transactions in a sample of 418 individual margin accounts were analyzed. Individual accounts were studied to identify the speculative appeal of the specific securities traded in these accounts, the frequency of trading, and the timing of security purchases and sales in relation to movements in stock prices.

Following a description of the sample, aggregate trading activity in the sample is compared with trading on the major stock exchanges in terms of the price variability, investment quality, and rate of turnover of shares. Margin traders are assumed to exhibit their speculative orientation by selecting higher-risk stocks with greater short-run profit potential, and by turning their investment over at a more rapid rate than is the case with all market trading.

The response of sample account trading as a function of stock prices is tested through a regression model in which all other variables affecting the demand for and supply of margined stocks are considered as part of the residual. Through this model, the significance of speculative behavior is assessed by determining the ability of stock price movements to explain both daily and average variations in total share trading of sample accounts.

A positive relationship between stock price changes and sample account trading will indicate that sample accounts do not stabilize stock prices by buying during price downswings and selling during price upswings. Speculative sample account trading could also be stabilizing, however, if purchases in rising markets were made at prices below the mean or central value of stocks and sales were made in falling markets at prices above this mean value. If such were the case, margin traders would profit from short-term cyclical price movements around the mean values of stocks and would at the same time impose pressure to return stock prices to their mean values. Support for the hypothesis that margin trading is destabilizing will be provided by the combination of a positive stock price coefficient in the model of sample account trading and evidence from the timing of sample account trading that net purchase or sale activity does not subside when stock prices approach, respectively, peaks or troughs of cyclical swings.

Description of the Sample

The individual account data used are from a random sample of the accounts maintained by one large, multi-regional brokerage firm on February 28, 1966. In designing the sample, consideration was given to the tradeoff between degree of statistical error and cost of obtaining data, and also to the diversity of margin account activity. Obtaining data for each month for a single account involved the searching and microfilming of bound copies of both a monthly statement and an historical record for the account, manual conversion to numeric coding of all alphabetic information for each transaction to attain computer compatibility, keypunching of each transaction, and a computerized recreation

of day-by-day account balances from summary month-end information. Because the total cost of this data-gathering process was quite high in terms of both direct expense and man-hours expended, it was necessary to minimize both the size and the time period of the sample. A four month time period, from March 1, 1966 through June 17, 1966, was chosen because it includes two periods of substantial stock price decline (March and May), a period of price recovery (April), and a period of relative stability in prices (June). Thus an exposure to margin trading activity in a variety of market conditions was made possible. Finally, observation of the population of accounts maintained by the firm indicated that much of the margin trading activity originated in a small number of active accounts. Sample size was reduced, without losing substantial trading data, by stratifying the population of accounts into active accounts and inactive accounts, and a separate random sample was taken from each subpopulation. Sample size was determined by the decision to accept a sampling error of as great as 50 per cent in a 10 per cent sample cell, at the .95 probability level. Thus a sample statistic which indicated that, for example, 10 per cent of margin accounts had credit balances would mean that the probability is .95 that between 5 per cent and 15 per cent of the universe of margin accounts had credit balances. Especially since expansion of sample balances to universe totals was not contemplated, this level of sampling error was considered acceptable.

The sample consisted of 500 accounts. Two hundred of these were "active" accounts chosen at random from a population of 875 accounts in which either \$1,000 in commissions were generated and/or

more than 10 transactions occurred during the month of February, 1966.¹ A sample of 150 accounts from this subpopulation would have been sufficient to meet the acceptable level of sampling error; sample size was increased, however, in order to allow for the likelihood that some accounts would have to be dropped because of incomplete data. The remaining 300 accounts were chosen at random from the subpopulation of "inactive" accounts, which are by definition all those accounts maintained by the firm on March 1, 1966 which did not meet the criteria for active accounts. A sample from this population consisting of 200 accounts would have been sufficient to meet the criterion for sampling error; the inactive sample was also expanded, however, to allow for the eventuality of incomplete information in some accounts.

The final sample on which the analysis of this chapter is based consists of data from 418 margin accounts, of which 154 are active accounts and 264 are inactive accounts. The active sample represents 17.6 per cent of the total active subpopulation, and the inactive sample represents less than one per cent of all remaining accounts.² Of the accounts dropped from the sample, 36 were incomplete because of missing or unreadable records, and 46 had unreconcilable accounting inconsistencies. There was no evidence that missing records were a matter of design rather than carelessness, or that accounting errors were not equally probable for all transactions, so the deletion of

¹The selection of these standards was based on the availability of a monthly list of active accounts meeting these standards which is produced by the brokerage firm.

²The exact sample proportion cannot be revealed without disclosing the number of accounts maintained by the firm, a figure which is confidential.

sample accounts is unlikely to have destroyed the randomness of the sample.¹

Differences Between Active and Inactive Samples

Although the analysis of trading in sample accounts deals with active and inactive account samples combined, some differences between active and inactive sample accounts should be noted. While active accounts number only 37 per cent of the total sample, they account for 77 per cent of the average daily debit balance, 71 per cent of the average market value, and 78 per cent of the average daily change in market value in the sample resulting from purchase and sale transactions. As is indicated in Table 5, the difference in average size between active and inactive accounts is substantial. The average debit balance in active accounts is over \$73,000, more than six times the average for inactive accounts. Similarly, the average market value of securities in active margin accounts of \$233,903 is more than four times the average market value in inactive accounts. There is much less difference in purchasing power between active and inactive accounts, however, as measured by the special miscellaneous account balance. The SMA balance in active accounts, \$11,555, is only 50 per cent higher than that in inactive accounts. This smaller difference might be attributed to more aggressive purchase and sale activity in the active sample. Rather than allowing their purchasing power to build up, active accounts appear to utilize purchasing power as it is generated by increases in the market value of stocks held in these accounts.

¹A proportionately greater number of active accounts than inactive accounts were dropped, but this is a result of the fact that the number of transactions in active accounts was greater, not that the type of trading in these accounts is unique.

TABLE 5

SIZE COMPARISONS: ACTIVE VS. INACTIVE ACCOUNTS

<u>Daily Average of Sample in Total</u>	<u>Active Accounts</u>	<u>Per cent of Total</u>	<u>Inactive Accounts</u>	<u>Per cent of Total</u>	<u>Total All Accounts</u>
Number of Accounts:					
with debit balances	148.30	36.8	257.40	63.2	405.70 ^a
with credit balances	102.80	34.0	195.20	66.0	298.00
which executed market transactions	45.50	42.0	62.20	58.0	107.70
Credit Balances	37.00	74.0	13.00	26.0	50.00
Debit Balances	\$ 1,591,900.00	79.1	\$ 421,629.00	20.9	\$ 2,013,529.00
Special Miscellaneous Account	\$ 7,563,687.00	77.3	\$ 2,224,722.00	22.7	\$ 9,788,409.00
Balances	\$ 3,704,342.00	61.9	\$ 2,284,269.00	38.1	\$ 5,988,611.00
Market Value of Securities Held	\$27,296,720.00	70.8	\$11,275,152.00	29.2	\$38,571,872.00

77

Daily Average Per Sample Account

Credit Balance Accounts:		
credit balance	\$ 34,908.11	\$ 6,781.43
market value of securities	71,670.19	24,725.52
special miscellaneous account bal.	55,146.48	14,386.16
Debit Balance Accounts:		
debit balance	\$ 73,701.81	\$ 11,388.82
market value of securities	233,903.06	49,860.00
special miscellaneous account bal.	11,555.20	7,116.20

^aThere are 418 accounts in the sample, but because some accounts were closed out during the period of study, the average number is slightly less.

Representativeness of the Sample

The purpose of studying individual account data is to isolate the market activity of margin traders. It is not proposed to expand debit balances or any other totals to approximate universe figures, because the sample is too small to be reliable for such purposes. In order to be able to conclude that the behavior of margin traders in the sample is indicative of the behavior of margin traders generally, the sample should, however, be representative. Even though the sample is drawn at random from the population of accounts maintained by the firm which cooperated with this study, there is reason to suspect that bias is nevertheless present because this one firm is not necessarily representative of all firms which carry margin accounts for their customers. Concern over bias is only partly mitigated by the fact that the sample data is provided by one of the largest national brokerage firms.

In Table 6, the geographical distribution of accounts in the sample is compared with that of total share ownership. This comparison suggests that the Midwest and Northeast are somewhat under-represented in the sample, and that the South is over-represented. The greater representation of foreign accounts in the sample than in the distribution of total shareownership may be misleading, since the sample includes accounts of foreign nationals and the distribution of total shareownership does not. There is no available benchmark which provides a geographic distribution of all margin accounts, and the distribution of total shareownership may not be entirely comparable. For example, it is likely that margin accounts are even more heavily concentrated in New York City, where a greater proportion of shareowners than elsewhere are traders, rather than investors. Consequently, margin accounts in

TABLE 6
GEOGRAPHIC DISTRIBUTION OF SAMPLE ACCOUNTS
AND TOTAL SHAREOWNERSHIP

<u>Geographic Area</u>	<u>Number of Sample Accounts</u>	<u>Per cent of Sample Accounts</u>	<u>Number of Shareowners^a (thousands)</u>	<u>Per cent of Shareowners</u>
Northeast	117	27.99	6,629	33.03
South	136	32.54	4,326	21.55
Midwest	68	16.27	5,214	25.98
West	76	18.18	3,746	18.66
Foreign	3	5.02	157	.78
	<u>418</u>	<u>100.00</u>	<u>20,072</u>	<u>100.00</u>

^aSource: New York Stock Exchange, 1965 Census of Shareownership
(New York: New York Stock Exchange, 1966).

the Northeast may be more poorly represented than is indicated in Table 6.

Sample totals and universe estimates of margin credit, market value of securities in margin accounts, and special miscellaneous account balances are compared in Table 7, as of the end of each of the four months studied. The relationship between the sample and estimated universe totals is quite stable for both debit balances in margin accounts and the market value of securities contained in margin accounts; sample accounts reflect the same direction and approximate magnitude of change in margin credit and market value as do the universe totals. Furthermore, the average sample proportions for debt (.186 per cent) and market value (.198 per cent) are very close, indicating that the "quality" of margin credit in the sample, measured by the loan to collateral ratio, is very close to that of the estimated universe. The direction of the difference of sample proportions indicates that sample accounts tend to borrow somewhat more heavily relative to market value than the average customer in the universe.

There is less stability in the relationship of sample SMA balances to universe SMA balances; in April the change in SMA for the sample is in the opposite direction from the change in the universe total. The sample percentage remains fairly stable, however, so this divergent movement is not a strong indication of divergent trading behavior. The average sample proportion for SMA balances is substantially lower than that of either debit balances or market value, and this difference does suggest some dissimilarity in the trading behavior in the sample and the average trading behavior in the universe. Combined with the fact that the percentage of debt to market value is

TABLE 7

RELATIONSHIP OF SAMPLE ACCOUNT BALANCES TO ESTIMATED BALANCE IN ALL MARGIN ACCOUNTS

End of	Debit Balances in Margin Accounts		Market Value of Margined Securities		Special Miscellaneous Account Balances	
	Sample ^a (\$thous.)	Per cent of Estimated Total ^b (\$mill.)	Sample (\$thous.)	Per cent of Estimated Total (\$mill.)	Sample (\$thous.)	Per cent of Estimated Total (\$mill.)
March	9,237	0.180	39,690	0.200	6,363	0.133
April	10,034	0.190	41,545	0.197	6,272	0.127
May	9,681	0.191	36,745	0.198	6,184	0.130
June	9,747	0.184	38,403	0.198	n.a.	--
Average	9,675	0.186	39,096	0.198	6,273	0.128

^aCombined total of active and inactive samples is used for sample columns.

^bUniverse estimates reported by the New York Stock Exchange. See Supra, p. 43 for a discussion of the development of this statistic.

slightly higher in sample accounts, this lower average SMA balance is evidence either that sample customers withdraw idle funds from their accounts to a greater extent than "average" customers, or that sample customers make more active use, through additional borrowing, of excess loan values generated by increases in the market value of stocks held in their accounts. In either case, sample customers are evidently slightly more aggressive than the broad average of customers whose activity is implied by estimated universe totals. The heavy influence of active customers in the sample is very probably the cause of this greater aggressiveness.

In summary, there is evidence that the sample of customer accounts contains some geographical bias, and some bias toward greater assumption of debt. Since the relationship between the sample and the universe of debt, market value and SMA balances is quite stable over time, however, the relative importance of these biases is small, and the behavior of the sample appears largely representative of aggregate margin trading.

Characteristics of the Account Sample

It was suggested at the end of the last chapter that changes in margin credit are at best a proxy for the trading activity in margin accounts, because of the effect of other transactions on customers' margin account debits. Evidence supporting this assertion is provided by the percentage distribution of the absolute impact of various transactions on changes in sample account debit balances, presented in Table 8. Only 20 per cent of the total absolute impact of all transactions on the average daily change in margin credit in the sample

TABLE 8

ABSOLUTE IMPACT OF VARIOUS TRANSACTIONS ON
SAMPLE ACCOUNT MARGIN DEBT CHANGE

<u>Transaction</u>	<u>Per cent of Total Absolute Impact^a</u>
Purchases and Sales in the Market:	
Long, listed stocks and bonds	20.04
Long, unlisted stocks and bonds	3.53
Short	4.03
Government and Municipal Bonds	1.80
Subscriptions to New Stock and U.S. Treasury Bills	19.67
Redemption of Bonds and Stocks	11.50
Receipt of Securities from Customers	9.37
Delivery of Securities to Customers	7.43
Deposits, Withdrawals and Transfers of Cash	10.66
Dividends and Bond Interest	6.75
Interest Charged on Debit Balance	3.52
Cancelled Transactions	1.26
Other	.45
TOTAL	100.01

^aTotal absolute impact is the absolute sum of average daily percentage changes in sample debt caused by the transactions listed above.

resulted from long purchases and sales of listed stocks and bonds. An equal percentage of the impact on change in margin credit was the result of subscriptions to new issues of stock, which also represent purchases, but which are not regular market transactions. The net effect of deposits and withdrawals of cash by customers was nearly 11 per cent of the impact on the average change in margin credit.

Similarly, changes in the market value of securities in margin accounts can arise from a number of transactions, the average impact of which is summarized in Table 9. While long purchases and sales of listed stock provided the greatest percentage of total impact (20.6 per cent) on the average change in market value over the period studied, an almost equal impact was provided by changes in the market value of stocks already held in margin accounts. And transfers of securities into and out of margin accounts (the sum of receipts, deliveries, and transfers) accounted for a total of 33.14 per cent. Such transfers do not necessarily represent purchase and sale activity, since most are the result of movements of securities already held by customers to and from cash accounts, bank loan accounts, or even safety deposit boxes.¹

If, over a series of time periods, the impact on margin credit changes of transactions other than purchases and sales of stock were quite stable, the amount of change in margin credit would be misstated, but actual market activity would not be obscured. There is, however, reason to believe that the effect of non-market transactions varies

¹Short transactions had a very small impact on sample account margin credit changes (4.03 per cent of total) and market value changes (2.89 per cent of total). Because of this slight impact, short selling was ignored entirely in the analysis.

TABLE 9

ABSOLUTE IMPACT OF VARIOUS TRANSACTIONS ON
SAMPLE MARKET VALUE CHANGES

<u>Transaction</u>	<u>Per cent of Total Absolute Impact^a</u>
Change in Market Value of Securities Held ^b in Accounts	21.79
Purchases and Sales in the Market:	
Long, listed stocks and bonds	20.58
Short, listed stocks	2.89
Government and municipal bonds	.77
Transfers of Securities to Other Accounts	13.37
Receipt of Securities from Customers	11.52
Delivery of Securities to Customers	8.25
Subscriptions to New Stock and U.S. Treasury Bills	12.43
Redemptions of Bonds and Stocks	6.59
Stock Splits and Stock Dividends	.69
Other	1.12
TOTAL	100.00

^aTotal absolute impact is the absolute sum of average daily percentage changes in market value caused by the transactions listed above.

^bUnlisted stocks and bonds are given no market value in margin accounts in the sample.

considerably over time. For example, the proceeds of sales from margin accounts may be left on deposit with brokers if market purchases are planned, but withdrawn if market conditions make trading unattractive in the near future. An increase in the rate of withdrawals, however, would increase margin credit as well, and thus give the impression that net market purchases were being made when in fact funds were being withdrawn in greater amounts because such purchases were not made.

Similarly, in periods of sharp stock price decline, margin account equity may decline sufficiently to result in a call for additional margin. In cases such as this, an increased rate of cash deposits would reduce margin credit and give the false appearance of net selling of shares in the market.

In any event, it is the actual market trading activity originating in margin accounts which is potentially destabilizing; therefore, the study of sample accounts is limited to actual purchases and sales of securities by margin traders. Sample accounts provide data on over 8,000 purchase and sale transactions on 78 trading days from February 28, 1966 through June 17, 1966. These transactions involved more than 1,650,000 shares of stock with an aggregate market value of over \$75 million. The major characteristics of security trading in the sample of accounts are summarized in Table 10. On each day studied, an average of 50 accounts made over 100 combined purchase and sale transactions. These transactions involved over 21,000 shares of stock with an aggregate market value of more than \$950,000. The average margin transaction involved over 200 shares of stock at an average price of approximately \$45 per share.

TABLE 10

SUMMARY OF STATISTICS ON TRADING OF
SECURITIES IN SAMPLE ACCOUNTS

All Accounts, Average per Day:

Number of Accounts Executing Market Transactions	50
Number of Transactions Executed	
Purchase	52.10
Sale	50.66
Number of Shares Traded	
Total	
Bought	10,714.56
Sold	10,564.09
Average per Transaction	
Bought	205.64
Sold	208.52
Dollar Value of Shares Traded	
Total	
Bought	\$468,875.44
Sold	\$488,676.06
Average per Transaction	
Bought	\$8,997.93
Sold	\$9,535.61
Price per Share Traded	
Bought	\$43.76
Sold	\$45.73

All Days, Average per Account:

Number of Transactions Executed	
Bought	14.20
Sold	14.40
Number of Shares Traded	
Bought	2,775.50
Sold	2,860.60
Dollar Value of Shares Traded	
Bought	\$121,580.31
Sold	\$132,100.06

The average account in the sample executed 29 purchase or sale transactions in the 78 day study period. These transactions involved the trading of more than 5,600 shares of stock with an aggregate market value exceeding \$250,000. The distribution of account activity is highly skewed, however; trading in 111 largest accounts in the sample, classified as such if either the number or dollar value of shares traded exceeded the total sample average, accounted for 85 per cent of the total number of shares traded by all sample accounts and 87 per cent of the market value of these shares.

The stocks which are eligible for loan value in broker margin accounts include all issues listed on national securities exchanges, of which the 2,639 issues listed at the time of the study on the New York Stock Exchange and the American Stock Exchange are the majority. As is indicated in Table 11, however, only 858, or 32.5 per cent, of these issues were traded by sample accounts. Issues listed on the New York Stock Exchange represented 71 per cent of the total number of issues traded and 81.1 per cent of the market value of stocks traded in the sample. Furthermore, there was considerable concentration of trading in a relatively few issues. Over 50 per cent of the dollar value of securities traded in sample accounts is accounted for by purchases and sales of the twenty-six stocks described in Table 12.

The possibility exists that the issues traded in these accounts are more characteristic of the brokerage firm than of margin trading in general. For example, it is reasonable that the research departments of brokerage firms have "favorite" stocks, which are in turn recommended to customers either in published literature or by registered representatives. In fact, however, this same group of twenty-six stocks accounted

TABLE 11

STOCKS ELIGIBLE FOR MARGIN TRADED BY SAMPLE ACCOUNTS

	<u>New York Stock Exchange</u>	<u>American Stock Exchange</u>	<u>Total</u>
Listed Stock Issues	1608	1031	2639
Stock Issues Traded by Sample	608	250	858
Percentage of Total Listed Issues Traded by Sample	37.8	24.2	32.5
Percentage of Total Stocks Traded by Sample	71.0	29.0	100.0
Percentage of Market Value of Stocks Traded by Sample	81.1	18.9	100.0

TABLE 12

STOCK ISSUES MOST TRADED BY SAMPLE ACCOUNTS

--- Traded by Sample Accounts ^a ---				
<u>Common Stock of</u>	<u>Number of Shares</u>	<u>Dollar Value of Shares</u>	<u>Per cent of Dollar Value Traded</u>	<u>Per cent of Total Trading by Market^b</u>
Fairchild Camera	18,165	\$3,174,162.00	4.21	1.77
S. C. M.	14,106	2,976,961.00	3.95	1.93
National Video (ASE)	33,230	2,975,122.00	3.95	1.79
Admiral	24,410	2,684,595.00	3.56	.73
I B M	4,750	2,538,368.00	3.37	.87
Syntex (ASE)	24,730	2,529,974.00	3.36	2.01
Collins Radio	30,177	2,137,057.00	2.84	.78
Trans World Airlines	22,440	1,868,463.00	2.48	1.08
Magnavox	22,065	1,866,830.00	2.48	.87
Boeing	9,503	1,425,334.00	1.89	.96
Commercial Solvents	21,200	1,338,604.00	1.78	.53
Eastern Airlines	14,400	1,300,155.00	1.73	1.69
Pan Am Airways	17,450	1,119,812.00	1.49	1.19
Motorola	5,210	1,045,146.25	1.39	.99
KLM Royal Dutch	8,850	986,925.00	1.31	.55
Solitron Devices (ASE)	6,665	876,983.75	1.16	.75
Texas Gulf Sulphur	7,706	865,121.87	1.15	1.55
Burroughs	12,725	809,237.50	1.07	.69
General Dynamics	13,760	787,468.75	1.04	.32
Raytheon	16,330	784,758.75	1.04	.48
R C A	12,955	697,965.62	.93	.92
Gulf and Western Industries	6,458	662,702.50	.88	.19
U.S. Smelting and Refining	9,375	630,178.12	.84	.49
Occidental Petroleum	13,024	618,482.00	.82	.32
Northwest Airlines	3,515	564,016.87	.75	.28
Roan Selection Trust	42,235	548,595.37	.73	.16
TOTAL	442,034	\$37,803,648.00	50.20	23.89

^aPurchases and sales combined.

^bDollar value of all shares of each stock traded on the exchange, as a percentage of the dollar value of trading of all 2,639 issues on the combined New York and American stock exchanges. Trading figures are for May, 1966, and average price is the simple average of low and high prices for the first half of 1966. Source: Standard & Poor, Stock Guide.

for a substantial amount of total stock market activity during May, 1966, one of the four months studied. The total share volume of this group of stocks, weighted by the average of high and low prices between January and June, 1966, was 23.89 per cent of total average dollar share volume in all stocks listed on the New York and American Stock Exchanges. Only ten stocks contributed more than one per cent of total average dollar volume on these exchanges during May, 1966. Eight of these stocks are among the twenty-six most active sample account stocks, and the remaining two (General Motors and Xerox) are respectively 45th and 38th in the ranking of stocks from sample accounts by dollar volume of trading. Thus, while it is not possible to assert that there are no "favorable" stocks in the sample, it is nevertheless clear that the majority of sample account trading is in stocks which are generally the most popular in the market as a whole.¹

Evidence of Speculative Destabilizing Behavior
in Sample Account Trading of Stocks

In order to test the hypothesis that margin trading is speculative and destabilizing to stock market price fluctuations, two analytical approaches are utilized. First, the trading of stocks in the sample is compared with the trading of stocks in the market as a whole, in order to identify differing investment quality, price availability, and turnover of securities traded on margin. Second, the

¹One of the most common arguments for the value of readily available credit for security trading is that credit provides liquidity which if absent would endanger the breadth of the market in some stocks. The general popularity of stocks most traded by sample accounts indicates that this liquidity is largely concentrated in trading of stocks for which the market is already quite liquid.

importance of stock price changes in explaining margin trading activity is tested through an analysis of daily aggregate purchase and sale activity in sample accounts.

Speculative Selection and Trading of Securities

The goal of speculative trading is to gain from short-term price movements in securities. In pursuing this goal, the speculator is unlikely to choose securities whose growth patterns are traditionally predictable and stable; the price fluctuations in such securities will be small, reflecting fairly uniform appraisals by investors of the discounted value of future returns through dividends and capital gains. With proper timing, the speculator can achieve greater gain, in a shorter time period, by selecting securities of companies whose earnings are less stable or less predictable; lesser certainty about future returns leads to a greater range of expectations on the part of traders and investors, and to greater price fluctuations as either predictions or expectations change. If margin trading is speculative, then there should be confirming evidence that the stocks traded in margin accounts are more highly price variable issues of companies with earnings growth which is either unestablished or less stable than stocks traded by the market as a whole. Furthermore, the short-term orientation of the speculator should be evident in a higher turnover of shares in margin accounts than in the market.

In order to compare price variability of sample account trading to market trading, each stock listed on the New York Stock Exchange or the American Stock Exchange was first assigned a percentage price variation equal to the difference between its high and low prices in the

period January through June, 1966, divided by the average of its high and low prices in this period. Each stock was then weighted by its sales for the month of May, 1966 and its high-low average price for the first six months of 1966, and an average price variation of stocks traded on the exchanges during May of 39 per cent was derived.¹

Similarly, the price variations of stocks traded in sample accounts were weighted by the dollar value of shares bought and sold in these accounts over the four month period studied in deriving an average price variation for sample accounts of 47.5 per cent. The weighted average price variability of stocks traded in sampled margin accounts was eight percentage points (over 20 per cent) higher than that of all stocks traded on the New York and American Stock Exchanges.²

To test the assumption that margin traders, as speculators, prefer stocks with less stable earnings and dividends, similar averages weighted by dollar value of trading on exchanges and in sample accounts were calculated, utilizing the Standard & Poor Rankings for stocks. This ranking is objectively determined for stocks on the basis of the stability and growth in both earnings and dividends in past years. The

¹The month of May, 1966 was selected for trading volume data because trading volume was greater in that month than in any of the other months studied.

²The price variations for the "market" and for stocks in sample accounts are both surprisingly high. One factor influencing their magnitude was the general trend of market prices during the period studied, the NYSE index reached a high of 51.06 (February 9, 1966) and subsequently shrank 11.75 per cent to a low of 45.06 (May 17, 1966). Second, the variation for each stock is calculated as a percentage of the average of the year's high and low closing prices from January through June, 1966, not the decline from the high. Consequently, the absolute price variance is high, but it is nevertheless a good relative measure of price performance among stocks and groups of stocks.

highest rankings are assigned to those stocks with the greatest stability in earnings and dividends, combined with sustained rates of growth. Stocks offering the greatest potential gain to speculators through price fluctuations are those with either a high but unstable rate of growth, or unseasoned stocks which have not yet developed a pattern of growth. The former group of stocks would be rated lower on the ranking scale of seven to one, and the latter group would not be ranked by Standard & Poor and therefore assigned a ranking of zero.¹ Based on this scale of zero (lowest ranking) to seven (highest ranking), the dollar weighted average of all stocks traded on the exchanges was 3.35, and the dollar weighted average of stocks traded in sample margin accounts was 2.72. The average stability/growth ranking of stocks traded in sample accounts was nearly 20 per cent lower than that of all listed stocks traded.

Comparison of turnover of shares in sample accounts with turnover of shares listed on the New York Stock Exchange provides striking evidence of the short term orientation of margin account trading. The average dollar value of shares traded on the Exchange, as a percentage of the total dollar value of shares listed, was 1.83 per cent per month (21.96 per cent per year) in the period of March through June, 1966. Over the same period, the dollar value of shares traded monthly in sample accounts averaged 27 per cent of the market value of securities held in these accounts, an annual turnover of 324 per cent.

¹For a description of these rankings, see Standard & Poor, Stock Guide, Monthly issues. The rankings used were those contained in the March, 1966 issue. Letter rankings were converted to numbers, from 7 (A+ for common stocks and AAA for preferred stocks) to 0 (not ranked).

The 26 stocks most actively traded by sample accounts, described in Table 12, reflect a somewhat greater price variability and a somewhat lesser investment quality ranking than the average stock traded in the sample. The average price variability of these active stocks was 54 per cent, as compared with 47.5 per cent for all stocks traded by the sample. The average investment quality ranking for active stocks was 2.63, and for all stocks traded by the sample it was 2.72. While this group of active stocks is more speculative when judged by these measures than the group of all stocks traded in listed markets, it does not include many of the highly speculative margin traders. For example, only three issues listed on the volatile American Stock Exchange are included in the most active list, and there is no representation of newly listed issues of companies with high but unproven potential. The speculative orientation of the accounts sampled may be a conservative one because of the absence of these types of stocks from the actively traded list. But however conservative is the selection of stocks, the turnover comparison between sample accounts and the market indicates that trading activity in sample accounts is nonetheless conducted at a vigorous pace. Comparative measures of speculative activity thus suggest that sample margin traders seek to profit from frequent trading on short-term price fluctuations in volatile stocks which are also well known and actively traded.

The results of the three comparative tests of speculation, summarized in Table 13, indicate that margin traders apply speculative strategies in their selection of securities and particularly in their frequency of trading. Furthermore, the concentration of margin trading in stocks of greater price variability increases the likelihood that margin traders will sell stocks in the event of market price declines.

TABLE 13

SECURITY SELECTION AND TURNOVER: A COMPARISON
BETWEEN SAMPLE AND MARKET TRADING

	Trading by Sample March-June 1966	Trading in Market ^a May, 1966
Average Price Variation ^b	47.50 per cent	39.00 per cent
Average Growth/Stability Ranking ^c	2.72	3.35
Average Monthly Dollar ^d Turnover of Shares	27.00 per cent	1.83 per cent

^aBased on total trading in all stocks on the New York Stock Exchange. Source: Standard & Poor's, Stock Guide, June, 1966.

^bAverage of the ratio to average price of the range between the high and low price of each stock in the period January-June, 1966. The average is weighted by dollar value of trading in each stock.

^cAverage ranking of stability and growth in dividends and earnings of each stock, weighted by the dollar value of trading in each stock. Source of rankings: Standard & Poor's, Stock Guide, March, 1966. The scale of rankings assigned by Standard & Poor ranges from zero (not ranked) to seven (A+).

^dDollar value of shares traded as a percentage of average market value of securities held in sample accounts for the "sample" column, and as a percentage of the dollar value of shares listed on the New York Stock Exchange for the "market" column.

If margin traders intentionally select highly price-variable stocks, they may be expected to be as sensitive to the potential loss in price declines as to the potential gain in price advances, and to react to a price decline by selling to minimize this loss. In the following section, the timing of security trades in sample accounts is examined in an attempt to determine the extent to which the decision to buy or sell margined securities is influenced by price changes.

Response of Sample Account Trading to Market Prices

In Chapter II, it was determined that changes in stock prices were the most important single variable in explaining changes in the amount of margin credit outstanding. The amount of margin credit, however, is also influenced by transactions other than regular market purchases and sales of securities; as is indicated in Table 8, only 20 per cent of the total impact of all transactions on margin credit in sample accounts results from market transactions. Thus it is conceivable that observed fluctuations in margin credit during periods of rapid stock price movement are largely the result of customer deposits and withdrawals of either cash or securities, rather than of market activity. And deposits or withdrawals of this sort need not be destabilizing nor speculative in a market trading sense.

For example, consider an account with \$100,000 in market value and \$30,000 in debt, with a special miscellaneous account balance of zero. If the market value of securities in the account increases to \$120,000 because of rapidly advancing security prices, the SMA will be credited with excess loan value of \$6,000 at margin requirements of 70 per cent. The customer may, if he chooses, withdraw this amount in cash, whereupon his debit balance will increase to \$36,000, exactly

equal to the borrowing capability in the account at 70 per cent margin requirements. The customer has in part realized his profit from increasing market values by borrowing from his broker the amount of this increased value which Regulation T permits. And if the return on alternate investment opportunities exceeds the interest cost of margin credit, such withdrawals are profitable to the investor. In the event of a market decline, the account in this example will become restricted; if the decline were severe enough, the account might fall sufficiently in market value to require the addition of margin by the customer. In such a case, the deposit of cash by the customer would reduce his debit balance with the broker. Both the withdrawal of cash and subsequent deposit in this example would affect aggregate margin credit in such a way as to suggest that credit had been used to support destabilizing market purchase and sale activity. In fact, the activity in this account would be destabilizing only if the customer were unable to supply additional margin when called for by the broker to support declining collateral values, for in that event, securities would be sold from the account by the broker in order to reduce the debt balance.

The hypothesized role of stock prices in causing destabilizing transactions is tested in a simple model of the daily dollar amount of net purchase or sale of shares (ΔS) in sample accounts:

$$\Delta S = a_0 + a_1 \Delta P + u$$

where ΔP are changes in the market price of stocks. Whatever other influences determine share purchases will be reflected in the error term and the constant. Non-market transactions, which can influence margin debt change, are eliminated entirely. The model is designed to test the significance of price changes, both through the value of the

coefficient a_1 and through the proportion of variation in share purchases explained by this simple formulation. The greater the magnitude of the coefficient, the greater is the apparent sensitivity of sample trading to changes in market prices. And the greater the proportion of total variance in trading explained by prices, the greater is the relative importance of prices, as opposed to other influences, in determining share trading patterns.

Although the small size of the sample does not permit great flexibility in testing the sensitivity of various account and stock subclassifications, several formulations of the dependent variable were developed. These are:

1. Trading in all stocks by all accounts,
2. Trading in the 26 most active stocks by all accounts,
3. Trading in all stocks by large accounts,
4. Trading in high price variance stocks by all accounts,
5. Trading in stocks ranked low in earnings-growth stability by all accounts.

Although the twenty-six most active stocks accounted for only 26.4 per cent of total shares traded by the sample, over 50 per cent of the dollar value of trades was concentrated in this group. The effect of these few issues on changes in sample account margin credit was thus substantial, and a separate test of the timing of trades in these securities is warranted. Large accounts are tested separately on the assumption that their activity may be destabilizing and price-oriented, but could be dampened by activity in the remaining accounts. A total of 665 stocks were traded by the 111 largest accounts in the sample, which accounted in total for 85 per cent of all shares traded and 87 per cent of the dollar value of these shares. Trading in groups of

stocks with high price variation and stocks with unstable earnings were tested separately because of the likelihood that the greater risk associated with them would attract the interest of the most speculatively oriented sample accounts. Purchases and sales in 281 stocks with greater than average price variation accounted for 55.5 per cent of all shares traded and 59.8 per cent of the dollar value of trades. Stocks of lower than average ranking in growth and stability of earnings numbered 525, and involved 77.2 per cent of shares and 65.2 per cent of dollar value traded by all sample accounts.¹

The results of regression tests of the daily model of net share purchases are presented in Table 14. In these tests, stock price changes are represented by the average of relative price changes in the twenty-six stocks most actively traded in sample accounts. This formulation of price changes was considered preferable to changes in a broader price index, such as the NYSE Index, because it is more closely related to the actual trading which was done in sample accounts and consequently represents the price changes to which sample margin traders are hypothesized to be most sensitive. The dependent variable is the dollar value of shares bought less shares sold in all transactions and

¹Subclassifications of trading in volatile stocks, such as stocks listed on the American exchange or newly listed and unseasoned issues, would have been useful in further testing the model for price-sensitive trading. Subclassifications of these sorts were not possible because the volume of sample trading within these groups is too small to be statistically meaningful. For example, only 29 per cent of the issues traded by the sample were listed on the American Stock Exchange, and trading in these issues represents only 19 per cent of the total dollar value of sample trading.

TABLE 14

REGRESSION TESTS OF THE MODEL OF AGGREGATE
DAILY SHARE PURCHASES IN SAMPLE ACCOUNTS^a

	$\Delta S = a_0 + a_1 \Delta P + u$			
<u>Dependent Variable</u> ^b	<u>Stock Price Coefficient</u>	<u>t-value of Coefficient</u> ^c	<u>Adjusted R²</u>	<u>Durbin- Watson Statistic</u>
(1) All Stocks	34148.01	4.221	0.181	2.111
(2) 26 Active Stocks	17296.37	2.447	0.062	2.148
(3) Trades in Large Accounts	31744.17	4.238	0.182	2.121
(4) Stocks Ranked Low in Growth/Stability of Earnings	20612.46	3.515	0.130	2.092
(5) High Price Variance Stocks	21387.93	3.129	0.104	2.074

^aThe constant term, a_0 , was insignificant in all tests and is not presented in the table.

^bNumber of observations: 77; Degrees of freedom: 75.

^cThe coefficients in all tests are significantly different from zero at better than the .02 level, the critical value for which is 2.39 with sixty degrees of freedom.

in four subclassifications.¹ The stock price coefficient is significant at better than the .02 probability level in all of the tests, and the Durbin-Watson statistic of nearly two in each of the tests indicates that serial correlation is absent from the residual term.

In evaluating the results of this model in terms of hypothesized margin trading behavior, four questions must be answered. First, is sample trading behavior destabilizing? Second, is the sensitivity of the model to price changes substantial? Third, what is the importance of price changes in the model relative to other influences on market trading decisions? Finally, do the tests of the model indicate that speculative, destabilizing market activity is attributable to the activity in selected types of accounts or stocks? Positive answers to the first two questions would lend support to the hypothesis that margin trading is speculative and destabilizing. The last two questions seek to identify the significance and source of speculative activity.

The sign of the stock price coefficient in all tests of the model indicates that margin trading activity in the sample is destabilizing. In test (1), where the dependent variable is the dollar amount of net daily purchase or sale activity in all accounts, an increase of one per cent in the average price of the twenty-six most actively traded stocks, is related to purchases of \$34,148.01 in market value of

¹Dollar values of transactions are used because price differences among issues prevent share units from being comparable. The unavoidable appearance of some form of stock prices on both sides of the model equation is unlikely to lead to spurious results, however, since the prices applied to the dependent variable are those of the actual stocks bought and sold by sample accounts and not the average price of a uniform group of shares, which forms the independent variable.

stocks by sample accounts.¹ A decline of one per cent in the 26-stock price average, leads to sales of stock in the corresponding amount. In each of the other tests of the model, the stock price coefficient is also significantly greater than zero.

The significantly positive sign of the stock price variable in all of these cases indicates that margin traders in the sample are net purchasers of stock when stock prices are rising and net sellers of stock when prices are falling. Such trading activity will be destabilizing only if, in addition, transactions are not timed in a way which adds pressure on prices to return to or remain at their mean value. That is, sample margin trading will be destabilizing if it amplifies rather than dampens the fluctuations of stock prices about their mean value.

The timing of sample account trading can be compared with movements in stock prices by referring to Figure 3. The lower panel in this figure is the cumulative net dollar amount of shares purchased and sold in sample accounts. The upper panel in Figure 3 is an index of average prices of the 26 stocks most actively traded in sample accounts. The figure covers the entire period sampled, from February 28, 1966 to June 17, 1966. This time period can be divided into seven periods of differing stock price behavior, as follows:

¹Percentage increases in the average price of these twenty-six stocks are measured relative to the price on February 28, 1966, the first day of the sample study, and not to the previous day's change.

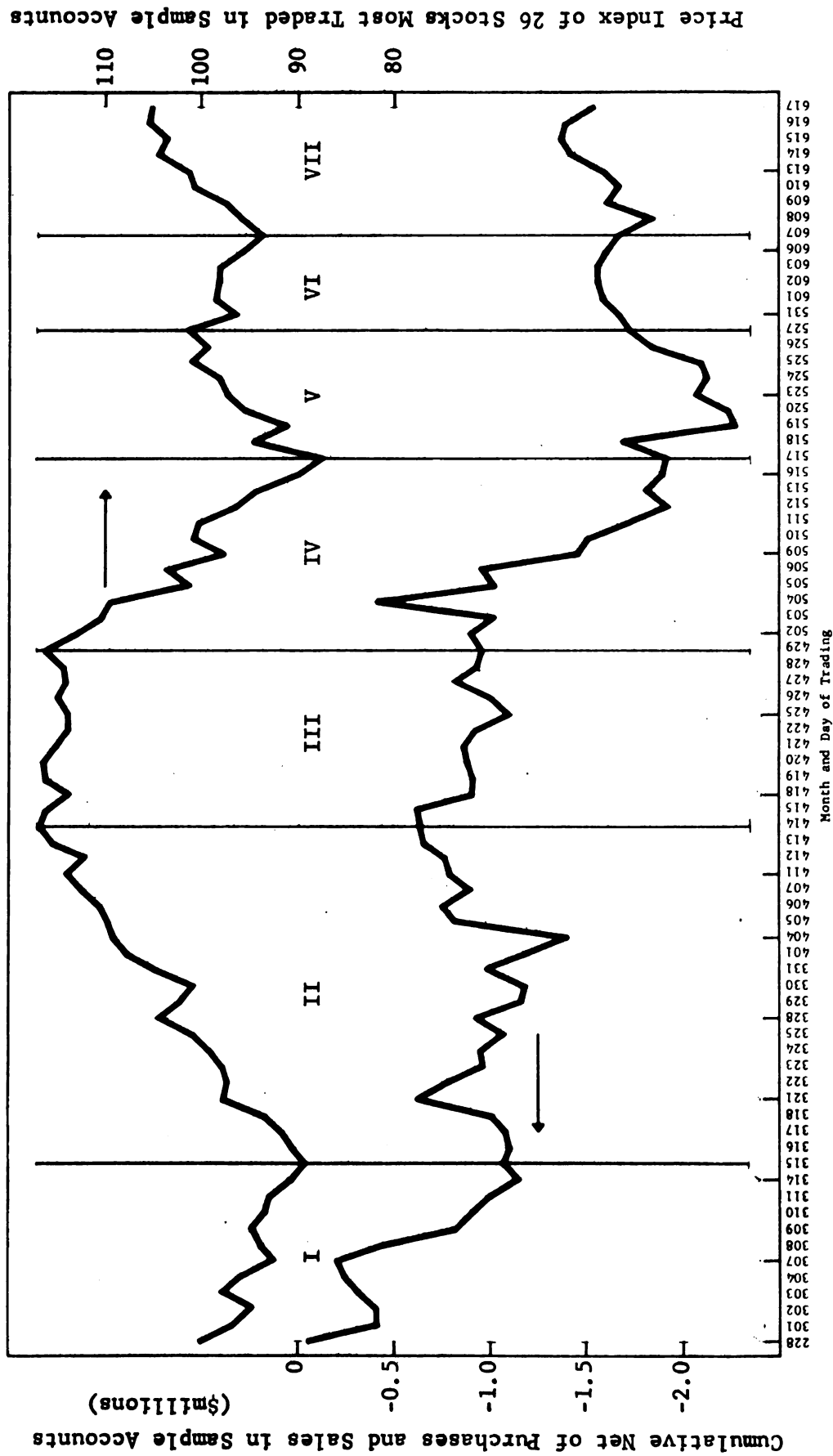


FIGURE 3
CUMULATIVE DAILY PURCHASES AND SALES IN SAMPLE ACCOUNTS AND STOCK PRICE MOVEMENTS

<u>Period</u>	<u>From</u>	<u>To</u>	<u>Prices</u>
I	Feb. 28	March 15	declining
II	March 15	April 14	rising
III	April 14	April 29	stable
IV	April 29	May 17	declining
V	May 17	May 27	rising
VI	May 27	June 7	declining
VII	June 7	June 17	rising

During each of the three periods of declining prices, sample accounts were substantial net sellers and, with some day-to-day fluctuation, continued their selling throughout the period of stock price decline. Furthermore, in the two latter periods of rising stock prices (periods V and VII) sampled margin accounts were substantial net buyers of stock throughout. In all of these cases, sample accounts destabilized stock prices by following the market and thereby amplifying the fluctuation of stock prices around their mean value.

In period II, during which prices rose in four weeks from 89 per cent to 117 per cent of their February 28th level, patterns of both buying and selling activity are evident in sample accounts. In order to have stabilized prices during this upswing, sample accounts would have had to behave in either of two ways. First, they could have been net sellers of stock, thereby dampening the price rise. Second, they could have bought stocks at the beginning of the upswing, adding pressure to return prices from the previous trough to their mean value level, and then either sold stocks or remained inactive as prices approached peak levels, adding pressure on prices not to rise above their mean value levels. In fact, sample account trading during period II followed neither of these patterns. Over the period of the price rise, sample accounts were not net sellers of stock, but net purchasers in the amount of about \$500,000. And the timing of alternate buying and

selling patterns which occurred during this period was the reverse of that required to stabilize prices at their mean levels; selling occurred near the beginning of the upswing and buying pressure was added as prices rose toward their peak. If the mean value of stocks is presumed to be the average price around which prices fluctuate, sample account trading during this period of rising prices was destabilizing, because it added pressure initially to prevent prices from rising to this average level, and, once the average level was reached, sample account trading added pressure on prices to rise above the average level. Consequently, in each of these five periods of distinct stock price trend, margin traders in the sample exerted a destabilizing influence on stock prices.

In order to judge the sensitivity of the model to stock price changes, the average impact of stock prices on share trading was calculated; the results are presented in Table 15. On the average over the 77 day time period covered by the model, the 26-stock price average either increased or decreased 2.07 per cent, and the resulting average daily net purchase or sale of all stocks in the sample was \$70,681.92. This average absolute dollar value of daily market transactions is 50.8 per cent of the absolute average dollar value each day of stocks actually traded by the accounts in the sample. In other words, the average impact of stock price changes in the model represents over half of the average daily trading activity in sample accounts. Daily variations in the impact of other variables, conceptually represented by the error term in the model, are ignored in this average relationship, so it is not proper to conclude that stock price changes explain over half of sample margin trading activity. The impact of the stock price

TABLE 15

IMPACT OF STOCK PRICE CHANGES ON DAILY
SHARE PURCHASES IN SAMPLE ACCOUNTS

<u>Dependent Variable</u>	<u>Stock Price Coefficient</u>	<u>Average Absolute Impact of Price Predicted by Model^a</u>	<u>Per cent of Price Impact to Average Account Trading^b</u>
(1) All Stocks	34148.01	\$70681.92	50.8
(2) 26 Active Stocks	17296.37	35800.47	32.1
(3) Trades in Large Accounts	31744.17	65705.95	49.5
(4) Stocks Ranked Low in Growth/Stability of Earnings	20612.46	42644.16	40.9
(5) High Price Variance Stocks	21387.93	44268.31	33.7

^aStock price coefficient multiplied by the average absolute daily change in the 26-stock price average: 2.070.

^bDaily average impact of stock prices as a percentage of the average absolute daily dollar value of shares purchased or sold by the portion of the sample defined by the dependent variable.

variable in the model relative to actual trading in the sample is substantial, however, and indicates that market activity is highly sensitive to price changes per se.

The value of the multiple correlation coefficient (R^2) in tests of the model gives some guidance as to the ability of stock price changes to explain daily variations in sample purchase and sale activity. The test of the model including trades of all stocks in all accounts, as indicated in Table 14, explains 18.1 per cent of the total of squared deviations about the mean of sample account trading. The remaining 81.9 per cent of variation is the combined result of "true" estimation error and remaining factors influencing the demand for and supply of margin credit which are not directly specified in the simple daily model. It is not possible to determine what the "true" estimation error would be if the model of aggregate margin credit developed in Chapter II were applied to sample account security trading, because no variables other than stock prices are available on a daily basis. Nor is it possible to determine the precise contribution to the complete model which stock prices would make. It is apparent from the simple model, however, that the contribution of stock prices to the explanation of trading activity is not negligible, and that, consequently, speculative behavior does significantly influence the trading of securities in sample accounts.

Subclassifications of aggregate purchase and sale activity were tested in an attempt to determine the source of speculative activity in sample margin accounts. In each of the alternate tests of the dependent variable described in Table 14, the stock price coefficient is significantly positive. However the R^2 of these tests does not indicate that

stock prices explain a greater proportion of the variation than in the test of the dependent variable including all trades in all accounts. In fact, with the exception of large account activity ($R^2 = .182$), the model explains less of the total variation in the alternate dependent variables. The failure of the R^2 to indicate an expected higher percentage of explained variation in these tests may be a result of the inclusion of fewer sample trades and fewer accounts in the subclassified dependent variables. For example, in the test of the dependent variable including only trades in the twenty-six most active stocks, the R^2 drops to 6.2 per cent, even though this is the subclassification most closely related to the stock price index used as the independent variable. Despite this close relationship, the poor performance is understandable, for while this variable includes over 50 per cent of the dollar value of stocks traded, it excludes nearly 75 per cent of the shares traded by sample accounts.

Similarly, the average percentage impact of stock prices on the alternate dependent variables (equations (2) through (5) in Table 15) does not indicate that active stocks, low stability-of-growth stocks, highprice variance stocks, or stocks traded in large accounts are more sensitive to stock price changes than the total sample. Failure of this test to confirm the expectation of a higher sensitivity of these groups may also be attributable to the statistical effects of sample diminution.

Analysis of the simple model of sample account stock purchase activity provides evidence that purchases and sales of securities are sensitive to the impact of speculative, price-oriented strategies, and that these strategies are destabilizing to stock price movements. Stock price changes also explain a significant portion of the total variation

in net share purchases in the model. No conclusive evidence is provided by this model that speculative activity is more influential in the trading of either more popular or more risky stocks or of large accounts.

The model through which the sensitivity of sample account trading to stock prices was tested is extremely naive. By including only stock price changes as a distinct explanatory variable, the possibility exists that the stock price coefficient is biased. Bias will be absent only if stock price changes are totally uncorrelated with the many other influences affecting the demand and supply of margin credit, and the likelihood of this lack of correlation is very small. On the other hand, the statistical significance and the positive sign of the stock price variable in the aggregate monthly model tested in Chapter II suggest that comparable results in the daily model are unlikely to be altered drastically by the addition of other variables to the model. Consequently, although the impact of stock price movement on margin trading may be greater or less than that identified from the model, it is reasonable to conclude that a statistically significant positive impact of stock price changes on margin trading does exist.

Summary of Evidence of Speculative Destabilizing

Behavior in Sample Accounts

By comparing the trading in sample margin accounts with all trading on the major stock exchanges, it was determined that sample accounts display security selection and trading characteristics which are more speculatively oriented than those of the market as a whole. On the basis of the price variation of shares traded, sample margin accounts traded stocks with an average variation of 47.5 per cent, twenty per cent greater than the 39 per cent average variation of all

shares traded on exchanges. When securities were ranked according to the rate and stability of earnings growth, sample accounts traded stocks ranked twenty per cent lower than the market. Both of these tests indicate a preference of margin traders in the sample for riskier stocks with greater potential for short-term gain. The short-term orientation of sample margin accounts was even further substantiated through calculation of dollar turnovers; the average monthly turnover of dollar value in sample accounts was 27 per cent, while the turnover of the dollar value of all listed shares in the market was only 1.83 per cent, on the average, over the time period studied.

Confirmation of the speculative orientation of sample margin traders is provided by tests of a simple model in which daily stock purchases are a function of changes in market prices. The stock price variable was significant in all tests, exerting an impact on share purchases equal to over half the average absolute daily market activity in the sample, and explaining a significant portion of the total variation in daily trading. The positive sign of the price variable in the model of daily purchase and sale activity suggests that sample accounts are net purchasers of stock in price upswings and net sellers in downswings. Analysis of the timing of daily transactions provides evidence that this purchase and sale activity is destabilizing because it does not serve to dampen stock price fluctuations around their mean value level. In all except one of five periods of distinct stock price trend identified in the sample period, purchases and sales in sample accounts continued throughout price advances and declines. In one period of price rise, when sustained intervals of both buying and selling occurred, the timing of these intervals added pressure on prices to

move away from their mean value level, not toward it. The combined evidence of these analyses supports the hypothesis that margin trading is destabilizing to stock prices. Thus contrary to the normal role of the speculator in dampening price swings, margin traders in the sample amplified them through the timing of their trading activity.

The sample of accounts studied in this chapter represent less than two-tenths of one per cent of the average margin credit and market value estimated for all margin accounts between March, 1966 and June, 1966. However, because the sample is on the whole quite stable over time in its relationship to aggregate margin account statistics, there is substantial justification for concluding that the sample is representative of margin accounts in general, and that the behavior of margin traders identified through the sample reflects characteristics common to margin trading.

CHAPTER IV

SUMMARY AND IMPLICATIONS OF STUDY

Margin requirements are the only existing selective control over the demand for credit in the economy. Since the Federal Reserve Board maintains regulatory authority over the supply of credit to finance security transactions, through both general monetary controls and specific controls over the stock-secured loan activities of bank and non-bank lenders, margin requirements cannot be justified as a means to prevent the excessive use of stock market credit relative to the resources of the banking system. Instead, this selective control is rooted in the concern that excessive use of credit is disruptive to the stock market per se. On the one hand, higher required margins than were common prior to the 1929 stock market crash are justifiable in order to reduce the disruptive influence of wholesale liquidations of securities from margin accounts which occurs when declining market prices eliminate customers' equity. On the other hand, changes in margin requirements are justifiable as a response to rapid growth in outstanding margin credit if such growth is evidence that bank credit is being used to finance speculative stock market activity which amplifies, rather than stabilizes, stock price swings. The results of this study support the hypothesis that margin trading evidences speculative, price-oriented strategies which destabilize stock prices by adding buying pressure throughout market upswings and selling pressure throughout market declines.

Two approaches were utilized in testing the hypothesis. First, a model of the demand for margin credit was developed to explain changes in the aggregate amount of credit extended to margin customers by brokers. Second, the purchase and sale transactions in a sample of individual margin accounts were analyzed in terms of the riskiness of securities traded, the frequency of trading, and the response of trading to stock price changes.

Evidence of Speculative Behavior in Margin Trading

Contrary to investors, whose demand for stocks is based on the value of stocks reflected in discounted expected future returns, speculators base their demand on expected near-term price movements in stocks. Consequently, the degree of speculative influence on margin trading can be measured by the extent to which activity in margin accounts is explained by movements in stock prices.

An aggregate monthly model of the demand for margin credit was tested with data on credit extended by large brokerage firms between January, 1965 and May, 1968, in order to identify the relative influence of stock prices on margin credit change. The stock price variable was significant at the .001 probability level and was the most influential variable in the model, accounting for 34 per cent of the average absolute impact of all variables. An almost equal percentage of the average impact of all variables was provided by expectations regarding future earnings and inflation, that is, the value of securities. The remainder of the impact was provided by changes in purchasing power in margin accounts (10 per cent), interest rates (13 per cent), and credit availability (6 per cent).

Calculated on a monthly rather than an average basis, the impact of stock prices in the model varied considerably. In twelve of the thirty-nine periods studied, stock price movements accounted for more than 40 per cent of the impact of all variables, and each of these cases occurred during or near a period of sharp stock price movement. Margin credit changes thus reflected a substantial speculative sensitivity to stock price changes, on the average, over the period studied. And in periods of rapid price movement, the influence of speculative, price-oriented behavior on margin credit was highly significant.

Evidence of substantial speculative margin trading activity is confirmed through analysis of actual purchase and sale transactions in a sample of individual margin accounts. The sample includes 418 accounts selected at random from the accounts of one of the largest national brokerage firms, and it covers one period of sharp stock price fluctuations, from February 28, 1966 through June 17, 1966. A simple model was tested in which the net dollar value of stocks traded in the sample each day was regressed on stock price changes, with all other influences on the demand for stocks implied in an error term. It was found that on the average over the 78 day period tested, 50.8 per cent of the dollar value of market activity was accounted for by stock price changes. On a daily basis, stock prices alone explained 18.1 per cent of the total variation in net stock purchase activity. Moreover, study of the sample accounts provided evidence of a speculative orientation through characteristics of the stocks traded and the frequency of trading. Sample accounts traded only 858 different stock issues, or 32.5 per cent of the total number of issues listed on the New York Stock Exchange or the American Stock Exchange. These stocks, weighted by the dollar

amount of trading, varied 47.5 per cent from their average price during the first six months of 1966, compared with a variation of 39 per cent for the weighted average of all trading in listed stocks. Similarly, when stocks were ranked according to the stability and growth in their earnings and dividends, stocks traded by the sample had an average ranking of 2.72, on a scale of zero through seven, some twenty per cent lower than the ranking of 3.35 for all trading in listed stocks. And the rate of turnover of dollar value of shares was 27 per cent per month in sample accounts, but only 1.83 per cent in all listed stocks. Each of these three comparisons is consistent with the finding that margin trading is speculatively oriented. Speculators would be expected to concentrate their purchase and sale activity in issues likely to provide the greatest short-term capital gain, including those stocks which are subject to the greatest price variability as well as those whose earnings are subject to wide fluctuation and thus to considerable variability in both expectations and market prices. And the short-term orientation of the speculator should be evident in a higher turnover of shares than would be the case with long-term investors.

Evidence of Destabilizing Behavior in Margin Trading

If margin traders functioned in the normal economic role of the speculator, there would be little cause for concern over the use of credit to support speculative margin activity. In such a case, margin speculators would stabilize the stock market by reducing the amplitude of stock price swings. To perform such a stabilizing function profitably, margin traders could adopt either of two patterns in their long trading of stocks. First, they could buy stocks when prices are falling but

below their mean value level and sell them when prices rose above this level. Second, they could buy stocks when prices are rising but below their mean level and sell them when prices began to fall but were above the mean.

In order for the first of these stabilizing patterns to be confirmed, stock price changes would necessarily have to bear an inverse relationship to margin trading activity. Both of the models tested in this study, however, indicate that stock price changes are directly related to margin trading activity. In the test of both the aggregate monthly model of margin credit change and the daily model of the dollar value of sample account stock purchases, the coefficient of stock price change was positive and significantly different from zero at better than the .001 probability level. Thus both margin credit and market purchases of stock increase with increasing stock prices and decrease with declining stock prices.

Given that margin traders do respond directly to stock price changes, they could still be a stabilizing influence if they ceased buying stocks when prices exceeded their mean value level and ceased selling stocks when prices fell below this level. In other words, margin trading would be stabilizing if concentrated in the early stages of either price advances or declines. It is evident, however, from a graphical analysis of both monthly aggregate margin credit movements and daily sample purchases and sales, that margin trading adds buying pressure throughout price upswings and selling pressure throughout price downswings. Consequently, the evidence developed in the study indicates that margin trading is destabilizing because it amplifies fluctuations of stock prices around their mean value levels.

Limitations of the Study

This study has not attempted to determine the effectiveness of changes in margin requirements, insofar as the level of bank credit supporting destabilizing speculative activity by margin traders is concerned. Since an increase in margin requirements reduces the amount which can be borrowed from banks and brokers to support any market transaction, it is clear that the rate of growth in reported margin credit will be reduced if margin requirements are raised. It is equally clear that the higher are margin requirements, the greater is the incentive for speculative traders particularly to seek credit from lenders other than brokers or banks at lower margin requirements. Until more experience is gained with the control of these other lenders under Regulation G, reliable judgments of the effectiveness of margin requirement changes in slowing the growth in speculatively applied bank credit are not possible.

Coverage of the study has been limited to analysis of margin credit extended by large brokerage firms representing about 40 per cent of the total credit extended by brokers. In addition to some brokerage credit, the study ignores margin credit extended by banks, which accounts for approximately 25 per cent of the total of reported margin credit outstanding. It is likely that considerably less speculative activity is conducted in loan accounts carried by banks because of the inconvenience of executing frequent transactions with a bank as an additional party to each transaction. Furthermore, the less frequent revaluation by banks than by brokers of securities in loan accounts reduces the ability of margin traders to borrow from banks on increasing collateral values. The study has thus sought to identify speculative

activity where it is most likely to occur. It does not presume to attribute the same strength of speculative behavior to bank lending on securities, but to determine whether margin credit is used for destabilizing speculative activity, irrespective of the source of such credit.

Through tests of both aggregate credit statistics and activity in sample margin accounts, a destabilizing effect of margin trading on stock prices has been identified. These tests, however, have dealt with trading on a monthly and daily basis, and it is not possible to determine from them whether or not margin trading is destabilizing within smaller time intervals. Although tests of the relative profitability of security trades in sample accounts could provide some evidence of the effects of margin trading in shorter time intervals, no tests of this sort were attempted in the study.

Implications of the Study for Margin Regulation

The test results of models of both margin credit change and margin transactions in sample accounts imply that rapid growth in the amount of security credit outstanding is substantially the result of destabilizing speculative activity by margin traders. It can be inferred from these results that a high rate of growth in margin credit outstanding is evidence that credit is increasingly being used to support destabilizing speculative activity and that the use of credit for these purposes can be discouraged by increasing margin requirements. Conversely, stability or gradual growth in the level of margin credit is an indication that value considerations are relatively more important to margin trading decisions (and price factors less so), and that high margin requirements are not needed to discourage an excessive speculative use of credit.

Regulatory authority granted the Federal Reserve by Congress does not empower the Board of Governors to prevent speculative activity. Congress' mandate to the Federal Reserve was to control the availability of margin credit to support speculative trading, based on the concern that such trading is destabilizing to stock prices. The system of flexible margin requirements permits this control to be applied. Furthermore, this study indicates that informational content about the extent of speculative activity by margin traders is provided by movements in the amount of outstanding margin credit. The Federal Reserve Board can thus determine the need for changes in margin requirements through margin credit movements and need not presume to judge the appropriate level of either stock prices or aggregate stock market activity. The Board need not place itself in the position of "arbiter" of stock market conditions, for which it has at times been criticized in the past, but can properly limit both its concern and its attention to the amount of credit used to support stock market activity.

BIBLIOGRAPHY

BIBLIOGRAPHY

Books and Dissertations

- Bernheim, Alfred L., and Others, eds. The Security Markets. (Findings and Recommendations of a Special Staff of the Twentieth Century Fund) New York: Twentieth Century Fund, Inc., 1935.
- Bogen, Jules I., and Krooss, Herman E. Security Credit. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1960.
- Bolster, Richard L. The Relationship of Monetary Policy to the Stock Market: The Experience with Margin Requirements. The American University, Ph.D. dissertation, 1966.
- Haney, Lewis H.; Logan, Lyman S.; and Gavens, Henry S. Brokers' Loans. New York: Harper & Brothers, 1932.
- Harris, Robert E. Federal Margin Requirements: A Selective Instrument of Monetary Policy. University of Pennsylvania, Ph.D. dissertation, 1958.
- Johnston, J. Econometric Methods. New York: McGraw-Hill, Inc., 1963.
- Simpson, Kemper. The Margin Trader. New York: Harper & Brothers, 1938.
- Theil, H. Economic Forecasts and Policy. Amsterdam: North-Holland Publishing Company, 1961.

Articles

- Almon, Shirley. "The Distributed Lag Between Capital Appropriations and Expenditures." Econometrica, 33 (January, 1965), 178-96.
- Cohen, Jacob. "Federal Reserve Margin Requirements and the Stock Market." Journal of Financial and Quantitative Analysis, I (September, 1966), 30-54.

Miller, Merton H., and Modigliani, Franco. "Dividend Policy, Growth, and the Valuation of Shares." Journal of Business, XXXIV (October, 1961), 411-33.

Moore, Thomas Gale. "Stock Market Margin Requirements." Journal of Political Economy, LXXIV (April, 1966), 158-67.

Ulrey, Ann P. "Margin Account Credit." Federal Reserve Bulletin, LIV (June, 1968), 470-81.

Government Documents and Publications

State of New York. Report of Governor Hughes Committee on Speculation in Securities and Commodities. 1909.

U.S. Board of Governors of the Federal Reserve System. Annual Report. Washington, Annual issues.

U.S. Board of Governors of the Federal Reserve System. Federal Reserve Bulletin, Monthly issues.

U.S. Board of Governors of the Federal Reserve System. Press Release, October 20, 1967.

U.S. Board of Governors of the Federal Reserve System. Regulation G, Effective March 11, 1968. Washington, 1968.

U.S. Congress. Senate. Agricultural Inquiry. Hearings before the Joint Commission of Agricultural Inquiry, under S. Concurrent Res. 4, 4 Vols. 67th Cong., 1st Sess., 1921.

U.S. Congress. Senate. Committee on Banking and Currency. Banking and Currency. 3 Pts. S. Rept. 133, 63rd Cong., 1st Sess., 1913.

U.S. Congress. Senate. Committee on Banking and Currency. Stock Exchange Practices. Hearings before the Committee on Banking and Currency, Senate, on S. Res. 84, 3 Pts. 72nd Cong., 1st Sess., 1932.

U.S. Congress. Senate. Committee on Banking and Currency. Stock Market Study. Hearings before the Committee on Banking and Currency, Senate, 3 Pts. 84th Cong., 1st Sess., 1955.

U.S. Congress. Senate. Committee on Finance. National Monetary Commission. S. Doc. 243, 62nd Cong., 2nd Sess., 1912.

U.S. Securities and Exchange Commission. Securities Exchange Act of 1934 as Amended to August 20, 1964. Washington: U.S. Government Printing Office, 1965.

Other Publications

New York Stock Exchange. Historical Data on NYSE Common Stock Index.
New York: Research Department, New York Stock Exchange, 1966.

New York Stock Exchange. 1965 Census of Shareownership. New York:
New York Stock Exchange, 1966.

New York Stock Exchange. NYSE Common Stock Closing Indexes, Monthly
releases.

New York Stock Exchange. Monthly Report, Monthly issues.

New York Stock Exchange. Public Transaction Study, 1966. New York:
New York Stock Exchange, 1967.

New York Stock Exchange. Research Report, Monthly issues.

Standard & Poor. Stock Guide, Monthly issues.

General References Not Cited

"Bank Loans Secured by Stocks and Bonds." Federal Reserve Bulletin,
IL (July, 1963), 904-21.

Barnes, Leo. "'Pseudo Margin' and 'Pseudo Leverage' -- The Grand
Illusions of the Affluent Investor." Financial Analysts
Journal, XX (July-August, 1964), 89-95.

Cochran, William G. Sampling Techniques. 2d edn. New York: John Wiley
& Sons, 1963.

Deming, W. Edwards. Sample Design in Business Research. New York:
John Wiley & Sons, 1960.

Farrell, M. J. "On the Structure of the Capital Market." Economic
Journal, LXXII (December, 1962), 830-44.

Funston, G. Keith. "Stock Market Margins Must Be Brought Up to Date."
Commercial and Financial Chronicle, 193 (February 16, 1961),
770 ff.

Hazlitt, Henry. "Keynes on Speculation and the Stock Market." Commercial
and Financial Chronicle, 188 (September 4, 1958), 907.

Holbik, Karel. "Margin Requirements -- Their Role Assessed." The Banker,
CXIII (December, 1963), 833-38.

- Johnson, Harry L. "Margin Requirements and Stock Market Credit." University of Missouri, Business and Government Review, VI (November-December, 1965), 5-10.
- Lyons, John F. "Unregulated Lenders Provide More Money for Stock Speculation." Wall Street Journal, September 28, 1967, pp. 1 f.
- "Margin Requirements." Federal Reserve Bank of Minneapolis, Monthly Review, October, 1963, pp. 2 ff.
- Martin, William McChesney, Jr. "Industry's Responsibility in Stock Market Credit Policing." Commercial and Financial Chronicle, 199 (January 16, 1964), 1513.
- Martin, William McChesney, Jr. Statement before the Ways and Means Committee of the House of Representatives, January 22, 1968.
- Merjos, Anna. "Margins and the Market." Barron's, VLIII (January 28, 1963), 5.
- Spiegelglas, Stephen. "Margin Requirements and Stock Market Prices." Financial Analysts Journal, XVI (November, 1960), 35-37.
- Stigler, George J. "Public Regulation of the Securities Markets." Journal of Business, XXXVII (April, 1964), 117-42.
- U.S. Board of Governors of the Federal Reserve System. Regulation T, as Amended Effective August 7, 1961. Washington, 1961.
- U.S. Board of Governors of the Federal Reserve System. Regulation U, as Amended Effective August 7, 1961. Washington, 1961.
- U.S. Congress. House. Committee on Banking and Currency. Money Trust Investigation. Investigation before a Subcommittee of the Committee on Banking and Currency, House. 29 Pts. 62nd Cong., 2nd Sess., 1912.
- U.S. Congress. House. Committee on Banking and Currency. Report of the Committee Appointed Pursuant to House Resolutions 429 and 504 to Investigate the Concentration of Money and Credit. H. Rept. 1593, 62nd Cong., 3rd Sess., 1913. [The Pujo Report]
- U.S. Congress. House. Committee on Interstate and Foreign Commerce. Report of Special Study of Securities Markets of the Securities and Exchange Commission. 5 Pts. H. Doc. 95, 88th Cong., 1st Sess., 1963.
- U.S. Congress. House. Committee on Interstate and Foreign Commerce. Stock Exchange Regulation. Hearings before the Committee on Interstate and Foreign Commerce, House, on H.R. 7852 and H.R. 8720. 73rd Cong., 2nd Sess., 1934.

U.S. Congress. Senate. Committee on Banking and Currency. Factors Affecting the Stock Market. S. Rept. 1280, 84th Cong., 1st Sess., 1955.

U.S. Securities and Exchange Commission. General Rules and Regulations Under the Securities Exchange Act of 1934 As In Effect April 1, 1967. Washington: U.S. Government Printing Office, 1967.

APPENDICES

APPENDIX A

THE INADEQUACY OF HISTORICAL MARGIN CREDIT DATA SERIES

Previous studies of margin credit have relied upon data series which indicate the aggregate level of various components of margin credit, and which are available over a considerable historical period. These data series suffer from two significant deficiencies. First, they are affected by influences other than those resulting from the market activity of margin traders; these influences cannot be isolated or removed from the data in any reliable fashion. Second, the data are incomplete in that they take no account of financing of security purchases not specifically governed by regulations.

Distortions in Historical Data

There are four historical series of data on the amount of credit extended for stock market activity, including two series on money borrowed by brokers and dealers from banks, a series on bank loans to individuals for the purpose of purchasing and carrying securities, and a series indicating the amount owed by customers to brokerage firms. The distortions in each of these series are discussed below:

Customer Net Debit Balances [CNDB]. This series has been published since 1932 in the Federal Reserve Bulletin. It includes the netted amount owed by all customers (cash, commodity, and margin) of all brokerage firms which both hold membership in the New York Stock Exchange and maintain margin accounts for their customers. The most important characteristic of these data, which makes them of questionable value in measuring margin credit, is that they are designed to measure the total

amount of customer credit and not the credit extended solely to margin customers. Consequently, the series is affected by temporary debit or credit balances which occur in cash accounts.

For a variety of reasons, some customers have not deposited the payment for securities purchased within the four-day settlement period after a transaction. Whenever a delay of this sort occurs, temporary "cash account debt" is created and added to CNDB. One cause of cash account debt which has grown to critical proportions in the heavy trading volume of the past two years is the failure to deliver securities. A "fail" occurs when a brokerage firm is unable to deliver securities into or out of an account within the required settlement period. Some customers, particularly banks administering trusts, will make payment for securities only when they are physically delivered. If a fail occurs, and payment is not made, cash account debt exists until delivery is accomplished. The presence of cash account debt in CNDB overstates the level of margin credit.

In addition to distortion through cash account debt, two common types of transactions conducted through margin accounts obscure the effect of actual margin trading activity on CNDB. The first of these is the execution of a short sale by the broker, involving the sale of borrowed shares of stock to be returned in the future through a market purchase. Regulations require that the customer selling short deposit the current margin on the selling price of the stock; the equity requirement for selling short is the same as it would be for a regular "long" purchase of the same shares of stock. No actual debt arises from a short sale, however, since the broker retains the entire proceeds of the shares sold. In fact, the debit balance in the account is reduced by the net

proceeds of sale of these borrowed securities, even though these proceeds are fully offset by the future liability for payment which is certain to arise when the short position is "covered." Therefore, the reduction in credit extended to customers which results from such transactions is apparent rather than real. At any point in time, short sale proceeds understate the actual amount of margin credit which is extended to customers by brokers.

A second and similar distortion in the CNDB series occurs when a customer subscribes to a new issue of stock. The customer is not charged for the cost of a new issue until it becomes available. But the currently required 25 per cent cash deposit by the customer is treated as a reduction in the customer's debit balance and gives the appearance of a reduction in margin credit. In reality, this deposit is committed to the certain liability which arises when shares are delivered and is not therefore comparable to an actual reduction in margin credit such as would occur when securities are sold from accounts. The end result of including subscription deposits is an understatement in the amount of margin credit outstanding.

Given the continuous and unpredictable variation in the extent of short sale and subscription transactions, as well as in the size of cash account debt, it is not clear that changes in CNDB accurately reflect changes in the amount of margin credit outstanding. In particular, there is no assurance that the relative importance of these influences is stable over time, and thus little confidence can be placed in the assumption that under- or over-statement in the series is consistent.

Loans to Others Than Brokers by Banks. This series is developed from data of large commercial banks reported weekly to the Federal Reserve Board. Distortion is introduced into this series because banks, unlike brokers, are permitted to extend credit on good faith loan values of stocks traded over-the-counter. Such loans are not subject to margin requirements but are nevertheless included in the bank loan data. As a result, the series is not comparable to regulated credit on listed securities, such as that extended by brokers to their customers. In fact, during periods of margin requirement changes, the bank loan series may considerably understate movements in regulated security credit, since extensions of unregulated credit may react in an opposite manner.

Loans to Brokers and Dealers. Two series are available which measure the level of broker loans. One is the total of such loans for large commercial banks reporting weekly, and the other is borrowing reported from all sources by members of the New York Stock Exchange. The main deficiency of broker/dealer borrowing as a measure of margin debt is that an unknown volume of this borrowing at any point in time is used to finance dealer inventories of securities, new issue underwriting activities, cash account debt, and transactions between brokerage firms. Furthermore, bank loans are by no means the only source of funds for brokers. Free credit balances in customer accounts are available to them as are loans from U.S. offices of foreign banks. Again, the level of actual margin credit is uncertain within this statistic, and the change in loans to brokers and dealers cannot be assumed to be a reliable indicator of the change in margin credit since other influences cannot be isolated.

Incomplete Coverage of Historical Data

In addition to the distortions present in historical data series, these series fail to include information on non-regulated security loans by banks and on all loans made to individuals by other than brokers or banks.

The bank series on loans to others than brokers and dealers includes only those loans which are subject to margin requirements under the Federal Reserve Board's Regulation U. As a result, the series includes only those loans which are both for the purpose of purchasing and carrying a security and collateralized by a stock or bond listed on a national securities exchange. There are two groups of loans which are not included in the series, but which are conceptually equivalent to regulated security loans. One group is loans which include listed stocks as collateral but are used for purposes other than the purchase or carrying of securities. Such loans can be used by individuals or companies who purchase listed stocks with funds needed for other purposes and subsequently pledge these stocks for a loan to provide these needed funds. For example, a company might buy stock with working capital and then borrow on the good faith loan value of that stock to obtain the working capital it needed to begin with. Another category of bank loans which is equivalent to regulated security loans is that of loans to buy stock which are collateralized other than by listed securities. These loans provide credit for activity in the stock market irrespective of the fact that the collateral for the loan may be a house, a car, or in some cases, only a signature.

In addition to borrowing from banks and brokers, individuals have access to non-regulated loans made by factors, finance companies,

and private parties. Until recently, margin requirements did not apply to these lenders, and no data has been available on the volume of such lending. The failure of existing series to take this source of funds into account understates the amount of margin credit outstanding.

Uncertain Effects of Margin Requirement Changes

The problem introduced by the absence of information on these sources of margin credit is most acute when historical margin credit series are used to investigate the effect of changes in margin requirements. Changes in margin requirements are almost certain to lead to substitution between regulated sources of credit, on which data are available, and unregulated sources of credit, on which data are not available. Thus it cannot be determined to what extent the change in reported margin credit in response to a change in margin requirements is dampened or exaggerated by a transfer of credit between regulated and unregulated sources.

APPENDIX B

SIMPLE CORRELATIONS BETWEEN TRANSFORMED VARIABLES
IN THE AGGREGATE MARGIN CREDIT MODEL^a

	<u>MR</u>	<u>DLR</u>	<u>IPR</u>	<u>CPR</u>	<u>NYR</u>
DLR	-.130008				
IPR	-.026728	.257088			
SPR	.219647	.004838	.173650		
NYR	.519946	-.293457	-.414178	-.099259	
SMAR	.085739	-.066068	.115139	-.242342	-.187900
FRD	.217760	-.176537	-.173491	-.170060	.172184
TYD	-.231582	-.147988	.354096	.065401	-.128332
CD	-.041902	.113031	.130954	.106653	-.215457
DD	.292742	.102830	.145431	-.065469	.063828
ED	.390270	-.100331	-.128586	-.111003	-.030782
	<u>SMAR</u>	<u>FRD</u>	<u>TYD</u>	<u>CD</u>	<u>DD</u>
FRD	.370470				
TYD	-.015922	-.057757			
CD	.028793	-.425679	-.129163		
DD	.071300	-.009206	-.089142	-.001315	
ED	-.025603	-.049928	.031897	-.001315	-.001315

^aThe variables are in their finally transformed state: current period change less .724 times the previous period change.

APPENDIX C

TEST RESULTS OF AGGREGATE MARGIN CREDIT MODEL FOR DISTRIBUTED LAG
FORMULATIONS OF EARNINGS AND INFLATION EXPECTATION VARIABLES

Independent variable	6 month lag		3 month lag		2 month lag	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
IPR_t	0.606055	1.689626	0.612239	1.689584	0.857811	2.547602
IPR_{t-1}	0.131102	0.479016	-0.091989	0.300335	-0.148500	0.450282
IPR_{t-2}	-0.143260	0.590122	-0.296068	1.116873	0	0
IPR_{t-3}	-0.255291	1.374878	0	0	0	0
IPR_{t-4}	-0.243251	1.171417	0	0	0	0
IPR_{t-5}	-0.145401	0.717922	0	0	0	0
CPR_t	4.841454	3.743183	3.959851	3.010097	3.997771	3.496541
CPR_{t-1}	0.377618	0.426550	0.038870	0.043878	-1.182718	0.941747
CPR_{t-2}	-1.442547	1.639302	-1.280990	1.206736	0	0
CPR_{t-3}	-1.504715	2.364212	0	0	0	0
CPR_{t-4}	-0.694563	0.824827	0	0	0	0
CPR_{t-5}	0.102233	0.113595	0	0	0	0
NYR_t	0.405624	5.478068	0.426721	5.589794	0.430421	5.904860
$SMAR_{t-1}$	0.195144	2.413810	0.146775	1.858231	0.122609	1.717654
FRD_t	-0.000217	0.093925	0.000899	0.400012	0.002053	1.032804
TYD_{t-1}	-1.502160	1.170508	-2.045830	1.579614	-2.965230	2.554765
DD_t	1.979341	1.482764	2.112600	1.683636	2.472224	2.141054
ED_t	5.183267	4.142724	5.430544	4.422585	5.732807	5.116614
Adjusted R^2	.645		.617		.659	
N	41		41		41	
Degrees of Freedom	29		29		29	
p	.296		.477		.628	
Degree of Polynomial ^a	3 rd		2 nd		2 nd	

^aThe distributed lag weights were assigned by the Almon technique, in which a polynomial is fitted to the lagged observations. The tail of the polynomial was constrained to zero in the most distant period.

MICHIGAN STATE UNIVERSITY LIBRARIES



3 1293 03146 0532