THE

KEIZAI BUNSEKI

(THE ECONOMIC ANALYSIS)

No.136 October 1994

☆ *Asset Markets and Business Fluctuations in Japan*

Kazuo Ogawa
Shin-ichi Kitasaka
Toshio Watanabe
Tatsuya Maruyama
Hiroshi Yamaoka
Yasuharu Iwata

Economic Research Institute
Economic Planning Agency
Tokyo, Japan

The Keizai Bunseki (The Economic Analysis) is a series of studies issued by the Economic Research Institute of the Economic Planning Agency and contains results of research works by the staff members of the Institute.

The purpose of the publication is to develop the understanding of the general public about current research works and ideas in the Institute and to ask for any comment on the results in order to enhance a quality of the research activities in the Institute while the works are still not completed. Thus, the views expressed are those of the authors and do not necessarily reflect those of the Institute.

THE ECONOMIC ANALYSIS

No. 136

October 1994

Economic Research Institute
Economic Planning Agency
Tokyo, Japan

Asset Markets and Business Fluctuations in Japan

Contents

Preface 4

要旨（Summary in Japanese） 6

コメント（Comments at the Workshop in Japanese） 14

Chapter. 1
Asset Markets and Capital Investment in Japan（**資産市場と設備投資**） 16

Chapter. 2
Borrowing Constraints and Role of Land Asset in Japanese Corporate Investment Decision（**法人企業の投資決定における借入制約と土地資産の役割**） 113

Data Appendix for an Analysis of Firm's Investment Demand in Japan 151

Chapter. 3
An Empirical Re-evaluation of Wealth Effect in Japanese Household Behavior
（**家計における資産効果の実証的再評価**） 171

Asset Markets and Business Fluctuations in Japan

Kazuo Ogawa
Shin-ichi Kitasaka
Toshio Watanabe
Tatsuya Maruyama
Hiroshi Yamaoka
Yasuharu Iwata

---

*) Kazuo Ogawa (Associate Professor of Kobe University, Department of Economics), Shin-ichi Kitasaka (Associate Professor of Nagoya City University, Department of Economics), Toshio Watanabe (Toho Mutual Life Insurance Company, Former Researcher of Economic Research Institute, Economic Planning Agency), Tatsuya Maruyama (National Land Agency, Former Researcher of Economic Research Institute, Economic Planning Agency), Hiroshi Yamaoka (The Daiwa Bank, Ltd., Researcher of Economic Research Institute, Economic Planning Agency), Yasuharu Iwata (Researcher of Economic Research Institute, Economic Planning Agency)

**) Early version of the papers on this research project was presented at the Tenth International Symposium held at the Economic Research Institute, Economic Planning Agency on March 24-25, 1993, 1993 annual meeting of the Japan Association of Economics and Econometrics at Hosei University, Finance Forum, 1994 meeting of the Macroeconometric Modelling, and the workshops at the Japan Development Bank, Kobe University, NLI Research Institute, and Osaka University. We thank Kanemi Ban and Kazuyuki Suzuki for reading the whole manuscript and giving extremely helpful comments and suggestions. We are also grateful to Hideyuki Adachi, Kazumi Asako, Atsuo Fukuda, Fumimasa Hamada, Shigeyuki Hamori, Tatsuo Hatta, Charles Yuji Horioka, Shinsuke Ikeda, Tatsuya Ishikawa, Kazumasa Iwata, Kazuya Kamiya, Soshichi Kinoshita, Kiyoshi Kuga, Morio Kuninori, Tsutomu Miyagawa, Hajime Miyazaki, Chikashi Moriguchi, Syuji Nishijima, Yoshiyasu Ono, Fumio Otake, Nobuo Shoji, Toshiaki Tachibanaki, Yosuke Takeda, Yoshiro Tsutsui, Shigeru Wakita, Nobuyoshi Yamori, Hiroshi Yoshikawa and the participants at seminars for helpful comments and suggestions. All remaining errors are, of course, our own.

Preface

The second longest booms in the post-war period in Japan, which started from November in 1986 and lasted for almost four years and a half, were followed by deep recessions. Characteristics common to these phases of business cycles are volatile fluctuations of asset prices typically observed in the stock and land markets. It has stimulated discussion on the role of the asset markets in the business cycles. What attracts economists are the following question: do the conditions in the asset markets amplify the magnitude of the business fluctuations?

This study is on the same track and examines empirically the relationship of the asset markets with the business cycles. In particular we focus on the demand side of the real economy and analyze how the conditions in the asset markets affect the level of effective demand.

Investment is the most volatile component of the effective demand and many economists have argued that it is the main driving force of the business cycles. The first two papers deal with the relationship of the asset market with business investment. Our aim is twofold.

First of all we examine the role of stock market in the business investment of the corporations. It has been a common understanding among many economists that the stock price summarizes all the relevant information on the future profitability of investment; efficiency hypothesis of the stock market. Recently, however, doubt has been cast upon this hypothesis since the stock price might be contaminated by the volatile noise such as bubble or fads. We examine this hypothesis from the viewpoint of investment. In the investment literature Tobin's average q is a well-known measure of future profitability of investment in the asset market. We scrutinize whether the Tobin's average q at all reflects the future profitability of investment by comparing the average q with the marginal q ; discounted value of expected marginal profitability in the future. If the average q deviates from the marginal q, then it might hint that the stock price contains the bubble or fads components. Furthermore, we examine how the corporate investment responds to the stock price when it does not reflect the profitability of investment.

Secondly, we analyze the relationship of the land market with investment. It has been often asserted in both academic articles and non-academic papers that land asset works as a collateral in borrowing. We examine this assertion quantitatively and analyze the role of land asset in investment decision. In particular we see whether the firm faces borrowing constraints at all and if it does so, it is mitigated by an increase of the market value of land asset held by the firm. This can be done by two approaches. One is by estimating the traditional types of investment functions. The other is a direct estimation and test of the first order condition of investment facing the firm. To sum up, we pay attention to the association of the stock market and the land market with business investment.

Next we re-examine the so-called wealth effect on consumption and residential investment. The last paper pinpoint the magnitude of wealth effect by pooling the prefectural cross-section data

for several years. We classify the assets and consumption expenditure into several categories and then examine which component of wealth is most relevant for changing the level of consumption expenditure and which component of consumption spending is most affected by wealth change.

We hope that this study stimulates the discussions on the channel through which the asset markets affect the real economy and that understanding of the relationship of the asset markets with the real economy is further deepened.

要旨（Summary in Japanese）

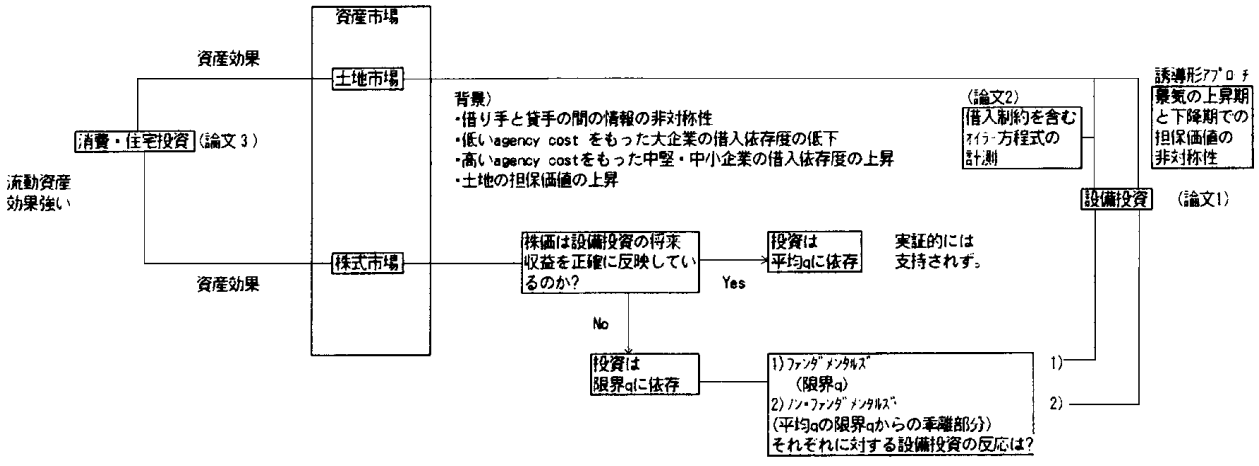
１．研究の目的

わが国では、1980年代中頃から株式や土地に代表される資産価格の高騰が観察され，同時に戦後で２番目に長い好況期（平成景気）を迎えた。しかし，90年代に入り，資産価格の大幅な低下とともに，景気は後退局面を迎えることになり，現在に至っている。今回の景気変動の大きな特徴は，景気の振幅が大きく，しかも好況期，不況期ほ期間がこれまでの景気循環に比べて長いことがあげられる。このような景気変動の特徴が，資産市場とどのように関連しているのか，実証的に明らかにするのが本研究の目的である。特に，資産価格の変動が実物経済にどのように伝播し，景気循環にどのような影響を及ぼすのかを解明することに力点を置く。具体的にいえば，有効需要の主要な構成要素である設備投資，住宅投資，消費に焦点を絞り，これらの需要項目が資産市場とどのようなに係わりあっているのか，実証的に検討を加える。設備投資，住宅投資は国民総支出のうちで最も変動の大きい需要項目であるし，消費は最も大きな構成要素である。したがって，これらの項目の分析を通じて，資産市場と総需要の変動との関連が，ある程度実証的に解明されることが期待できる。

２．研究の構成

本研究は「Asset Markets and Business Fluctuations in Japan.」（資産市場と景気変動）を主題として，「Chapter. 1 Asset Markets and Capital Investment in Japan.」（「資産市場と設備投資」以下，論文１と呼ぶ），「Chapter. 2 Borrowing Constraints and Role of Land Asset in Japanese Corporate Investment Decision.」（「法人企業の投資決定における借入制約と土地資産の役割」以下，論文２と呼ぶ），「Chapter. 3 An Empirical Re-evaluation of Wealth Effect in Japanese Household Behavior.」（「資産効果の実証的再評価」以下，論文３と呼ぶ）の３つの論文と，論文１と論文２で使用したデータの詳細な作成方法について論文の形でまとめた「Data Appendix for an Analysis of Firm's Investment Demand in Japan.」（「企業の設備投資需要分析のためのデータ作成方法」）から構成されている。この研究の構成をフローチャートにすると次のようになる。

資産市場と実物経済のリンク



３．論文１（Chapter. 1）

(1) 戦後の景気循環と比較した今回の景気循環の特徴

今回の景気循環の特徴としては，好況・不況期において，投資（設備投資，住宅投資）の大きな変動が見られること，資産価格が大きく変動したにもかかわらず，財・サービス価格は比較的安定していたこと，上昇局面において大幅な金融緩和があり，下降局面においてはマネーサプライが伸び悩んだことなどが挙げられる。

表1，2　景気循環の特徴（成長率　%）

	NO.	年代	GNP	最終消費	粗投資	住宅投資	GNPデフレーター	TOPIX	６大都市地価指数	M2+CD
好況期	1	1958. 1-1961.12	10.50	9.34	23.80	17.20	5.82	28.70	40.10	20.50
	2	1962.10-1964.10	9.92	9.83	15.60	22.20	5.60	0.01	17.00	21.80
	3	1965.10-1970. 7	10.50	8.95	17.50	16.40	5.50	14.40	9.53	16.70
	4	1971.12-1973.11	8.08	9.06	10.70	16.70	9.29	48.40	24.30	23.40
	5	1975. 3-1977. 1	4.38	3.55	2.09	7.81	7.07	9.06	-1.93	14.30
	6	1977.10-1980. 2	5.25	5.61	6.20	1.61	3.70	8.48	6.58	11.60
	7	1983. 2-1985. 6	3.91	2.87	5.34	-3.22	1.89	23.40	5.72	7.66
	8	1986.11-1990.10	5.05	4.51	11.70	10.10	1.12	19.30	26.30	10.80
不況期	1	1961.12-1962.10	8.99	7.61	8.95	15.50	4.77	-14.10	32.10	17.80
	2	1964.10-1965.10	8.68	8.30	11.60	23.60	5.33	-6.54	6.90	16.30
	3	1970. 7-1971.12	4.70	5.45	1.34	5.14	6.12	6.73	23.80	19.80
	4	1973.11-1975. 3	0.56	1.97	-5.77	-7.00	18.70	-13.90	4.70	12.90
	5	1977. 1-1977.10	4.76	4.07	-0.29	0.97	6.01	9.40	2.60	11.40
	6	1980. 2-1983. 2	3.30	2.51	1.37	-3.28	3.29	7.23	8.70	8.76
	7	1985. 6-1986.11	3.56	3.60	7.02	5.87	1.64	28.20	14.70	8.49
	8	1990.10-1993. 9	2.23	1.72	-1.30	-4.22	1.65	-13.50	-12.00	2.48

(2) 80年代中頃から90年にかけての非金融法人企業の財務行動の特徴

この期間，大企業は株高を背景に，エクイティ・ファイナンスを積極的に行った結果，自己資本比率が

図２－１　自己資本比率の推移（資本金／総資産）；全産業

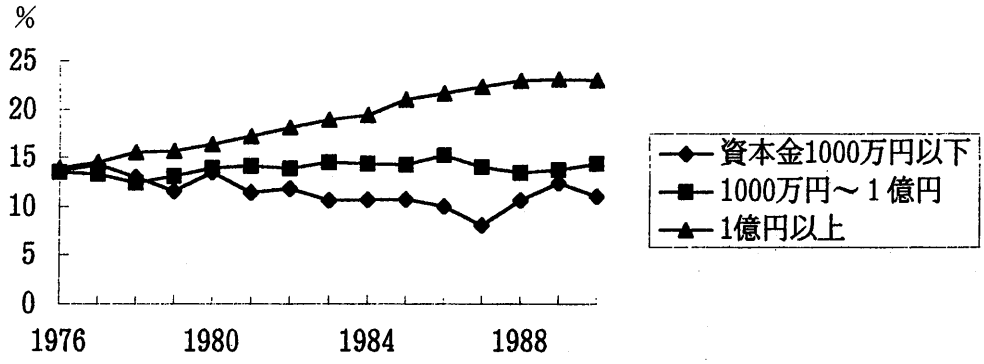


図４－２　借入依存度の推移；製造業

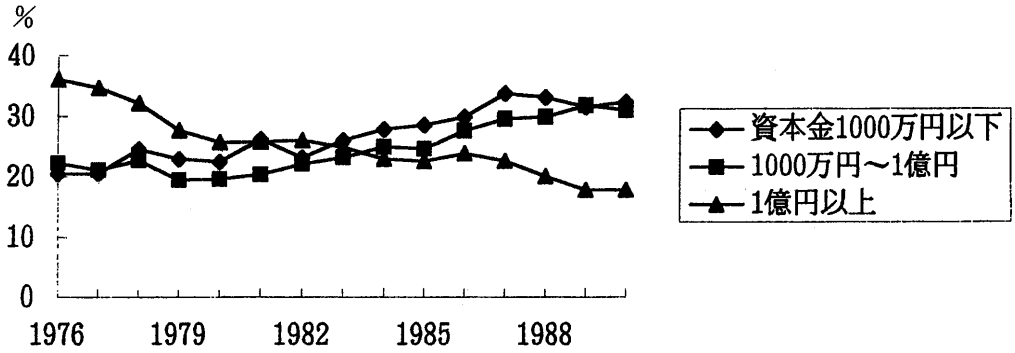
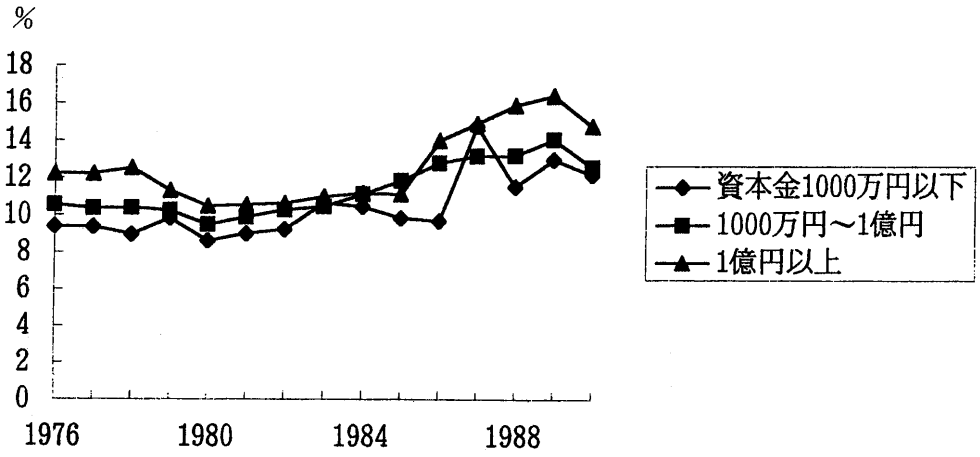


図７－１　手許流動性の推移（手許流動性／売上高）；全産業



高まり，借入依存度が低下したこと，一方，中堅・中小企業を中心に借入依存度が上昇した（図２－１，４－２）。また，企業規模を問わず流動資産の保有比率が上昇していること（図７－７）も，この時期の企業の財務内容の特徴として挙げられる。

(3)　土地市場と設備投資行動

企業の資金調達について，借手と貸手の間に発生する情報の非対称性を仮定したエージェンシー・コスト理論が近年注目されてきている。従来，日本の大企業は借入依存度が高かったが，メインバンク制の下で情報の非対称性が生じる余地は少なかった。ところが，資本市場の整備や株価高騰にともなって，大企業の借入依存度が低下し，自己資本比率が上昇してきた。したがって，銀行はこれまでの大企業から中堅・中小企業へと融資先をシフトさせ，貸出を伸ばしてきた。これら中堅・中小企業と銀行の間には長期的な顧客関係が培われていない場合が多く，情報の非対称性が問題となってくる。しかし，同時期，資産価格の高騰が観察されており，担保価値の上昇が情報の非対称性を軽減することに寄与したことがうかがえる。この結果，中小企業への貸出の上昇と担保貸付の割合の高まりが同時に生じた（図８－１，９－１）。

図８－１　中小企業への貸付割合；全産業

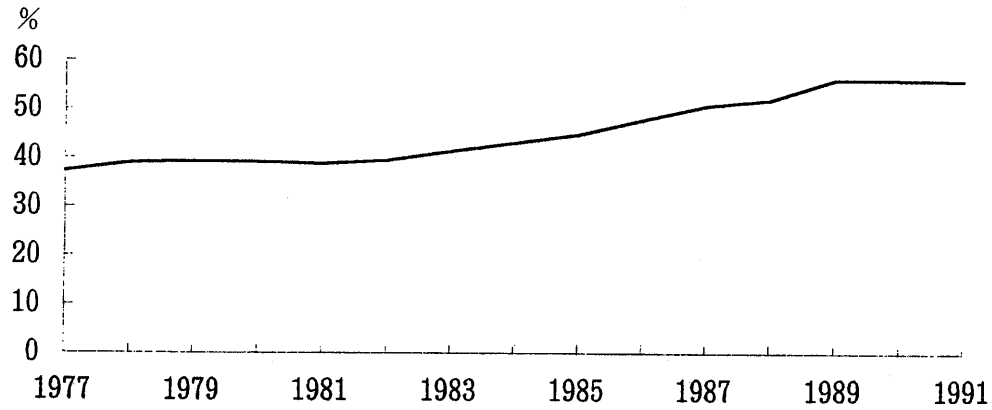
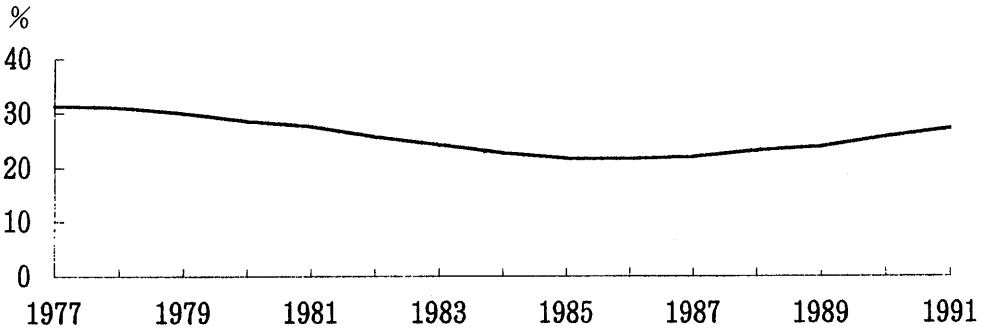


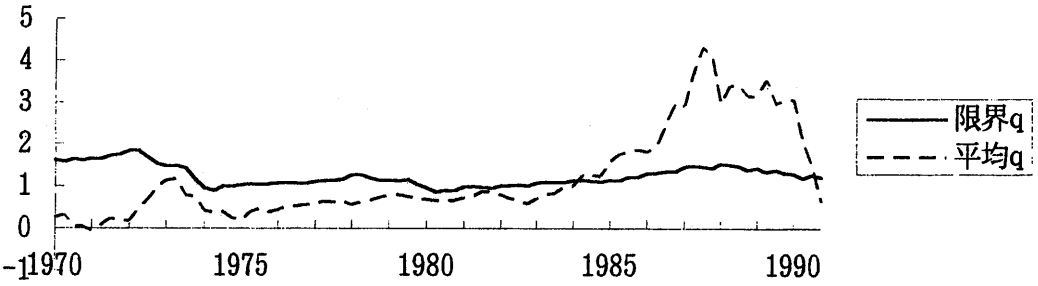
図９－１　不動産担保貸付の割合



(4) 株式市場と設備投資行動

株式市場が効率的であれば株価は企業の設備投資から得られる将来の収益を正確に反映しており，設備投資と株価に基づく設備投資の収益性指標（トービンの平均ｑ）の間には高い相関が観測されるはずである。しかしながら，その前提には，株価に収益性以外のノイズが存在しないことが必要となる。そこで，生産技術の情報に基づいて，投資から得られる将来の収益の割引現在価値（限界ｑ）と平均ｑを比較したところ，両者の乖離は大きく，とりわけ80年代中頃から平均ｑが限界ｑを大幅に上回っていることがわかった（図10－１）。このことは，株価にバブルやファッズなどのノイズが混入していることを示唆している。また，この乖離部分が企業の保有している土地資産と関連していることも明らかになった。

図10－１　平均ｑと限界ｑの推移（全産業）



(5) 法人企業の設備投資・土地需要・借入行動の計量分析

上記の結果を受けて，法人企業の設備投資・土地需要・借入需要関数の計測を行ったところ，以下の結果を得た。

１）平均ｑは，いくつかの業種（建設，繊維，金属製品，一般機械，電気機械，卸売・小売）を除いて設備投資に対して有意な負の影響を及ぼした。また，上記の６つの業種において，正の効果が認められたものの，概して決定係数は低く，説明力は決して高くなかった（表11－１）。

２）平均ｑは土地の純購入・借入に対しても全般的に有意な負の効果を有した。

３）すべての業種について，限界ｑは設備投資に対して有意な正の効果を持った（表12－１）。

４）限界ｑは，土地購入，借入に対しても全般的に有意な正の効果を有した。

５）土地価値，キャッシュ・フロー（現預金＋経常利益＋減価償却）も多くの業種について設備投資に対して有意な正の効果を有した（表11－１，12－１）。また，キャッシュ・フロー変数は，建設，不動産業において，土地購入，借入に対して特に大きな正の効果を有した。

６）企業のファンダメンタルズ（限界ｑ）とノン・ファンダメンタルズ（平均ｑのうち限界ｑからの乖離部分）は設備投資行動に対して異なった影響を及ぼした。前者は正の効果を有するものの，後者は全般

に負の効果を有する場合が多かった（表13－１）。

７）１)～６)を総合すると，企業の投資はおおむね限界ｑに基づいて行われ，その際土地価格やキャッシュ・フローも影響を及ぼした。一方，株価上昇に基づくノン・ファンダメンタルズの拡大は土地価格の上昇やキャッシュ・フローの上昇を通じて設備投資の上昇にまわった部分もあるが，のこりは企業の手許流動性の上昇に結果し，全体としては設備投資とはマイナスの相関をもっていた。

８）土地の資産価値が設備投資に対して及ぼす効果は，多くの産業において景気の上昇局面と下降局面で異なることも明らかになった。土地の担保価値が設備投資に及ぼす効果は景気の下降局面でより大きいことが観測された（表14－１）。この土地担保効果の景気局面における非対称性が，平成不況を長期化させた原因の１つと考えられる。

表11－１，12－１，13－１，14－１　設備投資関数の計測（被説明変数；Ｉ／Ｋ）；全産業

NO.	定数項	AVQ	MAQ	NF	LAND	D1*LAND	CF	R-sq./D.W.
	-0.0019	-0.0035			0.0144		0.6693	0.7803
表11-1	-0.41	-6.23			5.82		10.15	1.3511
	0.0331		0.0162		0.00054		0.2639	0.7301
表12-1	4.30		4.16		0.24		2.20	0.8848
	0.0159		0.0077	-0.003	0.0105		0.4075	0.8017
表13-1	2.17		2.07	-5.37	3.94		3.84	1.3198
	0.0142		0.008	-0.0029	0.0113	0.0035	0.4042	0.8158
表14-1	2.00		2.25	-5.33	4.36	2.61	3.95	1.4821

AVQ：平均q
MAQ：限界q
NF：AVQ-MAQ
LAND：土地資産
D1：ダミー変数（不況期に１その他0）
CF：手許流動性

Ｉ：設備投資
Ｋ：資本ストック
R-sq.：決定係数
D.W.：ダーヴィン・ワトソン比
上段：係数
下段：ｔ値

４．論文２（Chapter. 2）

(1) 借入制約，担保と投資行動

投資水準の決定にあたって企業の借入制約が存在したかどうか，また，その際借入制約が土地資産の価値やキャッシュ・フローに依存するかどうかを検討することがこの論文の目的である。企業が株価最大化を行う新古典派的な企業モデルにしたがって，投資に関する最適化の一階の条件（オイラー方程式）を導出し，それをGMM法によって産業別に計測した。計測においては，借入制約が明示的に考慮され，借入制約に対応するラグランジェ乗数が土地の時価，キャッシュ・フローといった担保価値によって影響を受けるのかどうかの検討を行った。借入制約がきいているかどうかは，ラグランジェ乗数の大きさで表され，きいていない場合はラグランジェ乗数はゼロになる。

(2) オイラー方程式の計測と借入制約のテスト

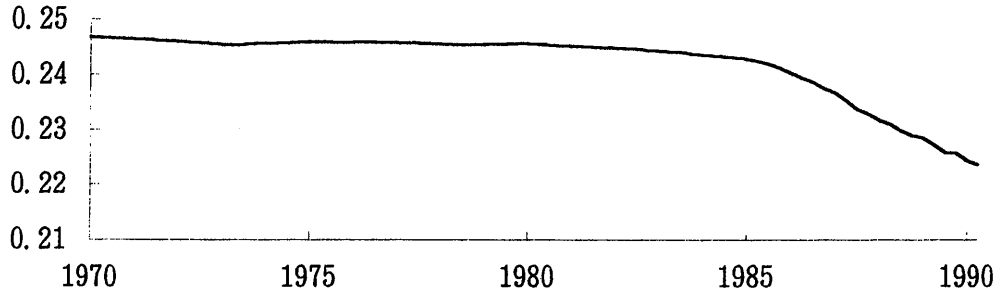
計測結果をまとめると，以下の８つの業種において借入制約が観測された。また，括弧内は借入制約を緩和する変数である。

・全産業（土地，キャッシュ・フロー）　　・化学　　（土地，キャッシュ・フロー）
・建設　（土地，キャッシュ・フロー）　　・鉄鋼　　（土地　　）
・製造業（土地，キャッシュ・フロー）　　・卸売，小売（土地，キャッシュ・フロー）
・食料品（　　キャッシュ・フロー）　　・不動産　　（　　キャッシュ・フロー）

また，ラグランジェ乗数の時系列的な動きは，図１－１に示されている。ラグランジェ乗数は，借入制

約の強さを示すものであり，これによると，借入制約は，多くの業種（建設，製造業，鉄鋼，卸売・小売，不動産）について86年あたりから大幅に緩和されてきており，それが，設備投資の増大につながったと考えられる。とりわけ，その効果が大きかった業種は，建設，鉄鋼，卸売・小売，不動産である。鉄鋼を除けば，これらの業種は雇用，売上について中小企業の占める割合が大きく，担保価値としての土地やキャッシュ・フローが重要な役割を果たしたと考えられる。これらの結果は，論文１において得られたものと整合的である。

図１－１　ラグランジェ乗数の推移（全企業）



５．論文３（Chapter. 3）

(1) 家計行動と資産効果

1980年代半ば以降の景気循環における民間最終消費支出の変動は，資産市場と密接に結びついていると考えられており，実証研究も盛んに行われている。ライフサイクル・恒常所得仮説では，金融資産・実物資産・人的資産を包含した総資産を問題としているが本論文では流動資産仮説や流動性制約を重視して，資産の構成に着目した。

流動性制約の下では，より流動性の高い資産がより消費に結びつきやすくなり，流動性の大小という意味で，資産の構成が消費行動に影響を及ぼす重要な要因であると考えられる。

(2) 消費関数の計測

資産構成を考慮した消費関数を計測する方法として，資産をブレイクダウンして，それぞれの資産項目を説明変数に加え資産効果の大きさについて検討を加えた。ここでは，以下の６つのパターンで計測を試みた。

１．総資産（金融資産＋実物資産（土地））
２．純金融資産（金融資産－負債），実物資産
３．流動資産（金融資産－生命保険），実物資産
４．有価証券，有価証券以外の流動資産，実物資産
５．流動資産
６．有価証券，有価証券以外の流動資産

さらに，総消費を５費目（飲食費，光熱費，被服費，住居費，雑費）に分解し，費目別の消費関数を上記のそれぞれのパターンで計測し，費目ごとの資産効果の大きさも合わせて検討した。

総消費について，流動資産の資産効果は実物資産よりはるかに大きかった（表１）。また費目別の消費関数で資産効果が観測されたのは，被服費，住居費，雑費で，流動資産が有意な正の効果を持っていた。さらに，住居費については実物資産も有意な正の効果を持っていた。住居費には，家具，家庭用耐久財，自動車の購入が含まれており，雑費には，娯楽用耐久財，サービスへの支出が含まれていることから，妥当

な結果と言えよう。

表１　消費関数の計測（被説明変数；Ｃ／ＤＹ）

No.	定数項	TW	FW	LW	SEC	OLS	RW	I/DY	SETAI	AGE	FARM	R-sq./S.E.
	0.2143	0.0105						1893000	0.0484	0.0089	-0.002	0.5354
1	1.54	3.58						7.80	1.86	4.75	-2.79	0.0412
	0.1981		0.0275				0.0099	1928000	0.0513	0.0079	-0.0019	0.5335
2	1.40		1.25				3.41	7.59	1.94	3.27	-2.54	0.0413
	0.1637			0.0657			0.0066	1930000	0.0543	0.0068	-0.0015	0.5443
3	1.17			2.27			2.13	7.85	2.09	2.82	-1.88	0.0408
	0.1553				0.0751	0.0576	0.0064	1952000	0.0559	0.007	-0.0015	0.5408
4	1.02				1.43	1.13	2.04	7.09	1.96	2.49	-1.84	0.041
	0.1952			0.0873				1874000	0.0489	0.0059	-0.0015	0.5387
5	1.38			3.34				7.58	1.85	2.50	-1.90	0.041
	0.1603				0.1183	0.0551		1963000	0.0554	0.007	-0.0016	0.5368
6	1.05				2.65	1.07		7.22	1.93	2.46	-1.91	0.0411

TW：総資産　　ＤＹ：可処分所得　　上段：係数
FW：純金融資産　　SETAI：世帯人員　　下段：t値
LW：流動資産　　AGE：60才以上の人口/全人口*100
SEC：有価証券　　FARM：農家世帯数/全世帯数*100
OLS：有価証券以外の流動資産　　R-sq.：決定係数（上段）
RW：実物資産　　S.E.：標準偏差（下段）
C：家計最終消費支出

(3) 住宅投資の計測

住宅投資についても同様の方法で計測を行ったが，やはり流動資産・実物資産が有意な説明変数となった（表３）。

表３　住宅投資関数の計測（被説明変数；ＩＪ／ＤＹ）

No.	定数項	TW	FW	LW	SEC	OLS	RW	CCOST	I/DY	SETAI	AGE	FARM	R-sq./S.E.
	0.0241	0.0056						-0.0043	30610	0.0212	-0.0005	-0.00005	0.454
1	0.52	4.52						-8.27	0.35	2.55	-0.73	-0.23	0.0122
	0.0147		0.0145				0.0052	-0.0042	51550	0.0227	-0.0011	0.00002	0.4558
2	0.32		1.95				4.14	-8.42	0.60	2.73	-1.51	0.07	0.0122
	0.0069			0.0248			0.0041	-0.0043	41020	0.023	-0.0012	0.00014	0.4689
3	0.15			2.41			2.86	-8.44	0.48	2.80	-1.82	0.60	0.0121
	0.0269				0.0034	0.0427	0.0047	-0.0044	-11938	0.0195	-0.0018	0.00018	0.4726
4	0.61				0.20	2.51	3.19	-8.53	-0.13	2.44	-2.37	0.74	0.012
	0.0242			0.0383				-0.004	11160	0.0197	-0.0018	0.00012	0.4278
5	0.53			4.08				-6.82	0.13	2.36	-2.55	0.47	0.0125
	0.0261				0.0366	0.04		-0.0041	6129	0.0193	-0.0018	0.00012	0.4233
6	0.52				2.34	2.15		-6.59	0.06	2.12	-2.31	0.47	0.0126

TW：総資産　　ＩＪ：民間住宅投資　　上段：係数
FW：純金融資産　　ＤＹ：可処分所得　　下段：t値
LW：流動資産　　SETAI：世帯人員
SEC：有価証券　　AGE：60才以上の人口/全人口*100
OLS：有価証券以外の流動資産　　FARM：農家世帯数/全世帯数*100
RW：実物資産　　R-sq.：決定係数（上段）
CCOST：レンタルコスト　　S.E.：標準偏差（下段）

(4) 消費の変動要因分析

平成景気とそれ以前の消費変動のうち資産変動によってもたらされた部分を計測したところ，最近になればなるほど，資産変動の寄与部分が高くなっていることがわかった（表４）。平成景気において，消費変動のうち資産変動の寄与部分は，58%にも達し，その82%が流動資産の変動によるものであった。また，同時期，資産変動によってもたらされた消費変動の内訳は，住居費と雑費が共に48%程度で大半を占めている（表５）。

表４　消費に対する寄与度（単位%）

時期	総資産	金融資産	実物資産	合計	流動資産	実物資産	合計
1970-75	5.98	3.98	4.19	8.18	11.62	2.81	14.43
1975-80	5.66	6.89	2.85	9.74	23.30	1.91	25.21
1980-85	10.97	11.00	6.37	17.36	30.96	4.27	35.23
1985-90	24.41	19.51	15.94	35.45	47.71	10.70	58.41
1990-92	-10.84	-9.38	-6.82	-16.20	-17.55	-4.58	-22.13

表５　資産効果による消費変動の費目別内訳（単位%）

時期	被服費	住居費	雑費
1970-75	8.35	49.56	46.52
1975-80	9.59	43.66	53.40
1980-85	9.12	45.91	50.78
1985-90	8.47	48.97	47.20
1990-92	8.23	50.14	45.84

コメント（Comments at the Workshop in Japanese）

本研究プロジェクトでは，研究報告を発表するにあたり，平成6年8月24日，大阪大学経済学部教授　伴金美氏，日本開発銀行設備投資研究所主任研究員　鈴木和志氏をコメンテーターに迎え，ワークショップを開催した。そこで出された主な意見は以下の通りである。（括弧内はそれぞれの意見に対する，本研究プロジェクト側からの回答である）

論文１（Chapter 1）

・景気の状況局面についてはうまく説明がなされているが，残念ながら計量分析におけるデータの計測期間が1991年第一四半期迄となっており，今回の景気後退局面の全てをカヴァーしていない。これはこの研究プロジェクトがスタートした時期が1992年5月であることを考えるとやむを得ないことであるとも言えるが，投資が1991年以降大幅に落ち込んでいることに鑑みるに，計測期間は是非とも延長して欲しかった。（回答：今回計測に使用した「法人企業統計」においては，１年ごとに標本企業の洗い替えが行われるために，データの不連続性が生じるという問題が存在する。そのため，本研究プロジェクトでは研究のスタート時にこの問題を解決すべく，データに処理を施し，その処理済みのデータを用いて研究を進めたために，その後の統計発表の成果を即時に取り入れることが出来なかった。この点に関しては我々も残念に思っており，機会があれば是非とも計測期間を延長して分析を行いたいと考えている。）

・土地の担保価値上昇が中小企業のエージェンシー・コストを軽減させ，設備投資行動に影響を及ぼしたことを明示的に主張するならば，計量分析は産業別だけでなく企業規模別にも行った方が良かったのではないか。（回答：企業規模別の計量分析については，我々も行いたいと考えていたが，先に述べたようなデータの処理作業に多くの時間を割いてしまったこと，また，企業規模別に計測を行った場合，データ不連続性の調整に支障を来す恐れがあったこと等から，今回は見送ることとした。）

・推定期間を統一的にするのではなく，金融自由化以降のみの計測も行って，その影響を見ても良かったのではないか。

・限界ｑの作成において利潤率の確率過程を単純に置いて計算しているが，利潤率については70年代前半と80年代の間に構造変化があった筈であり，この事についてどう考えているのか。また，最近の研究では，投資関数の説明変数としては限界ｑよりも単純な利潤率の方が優れているとの指摘もある。この事は確認したのか。（回答：第２論文におけるオイラー方程式の計測において，業種によっては70年代以降の計測のみが収束したものがあった。確かにこの時期に構造変化があったと考えられる。）

・従来もキャッシュ・フローは投資関数の説明変数として効くことが知られていたが，これは平均ｑを用いた投資関数での議論であったために，平均ｑで把握出来ない情報がキャッシュ・フローによって提供されたためかもしれない，と考えられていた。しかし本研究において，限界ｑを作成し，これを説明変数とした投資関数においてもキャッシュ・フローが効くということが厳密に証明された。これはこの研究分野における大きな貢献である。

・本研究では，資産価値の変動が企業価値に影響を与え，それが信用市場を通じて企業の設備投資行動に影響を与える，という資産市場と実物経済のリンクが実証された訳であるが，これはまさに近年注目を集めているフィナンシャル・アクセラレーターの理論（実物経済での企業に対するイニシャル・ショックは金融市場を通じて増幅され，再び実物経済にフィード・バックされる）を実証的に明らかにしたものと言える。（回答：我々の問題意識は確かにフィナンシャル・アクセラレーターの理論と重なるものであり，

このような位置付けを与えられることは，我々としても歓迎の意を表したい。）

論文２（Chapter 2）

・第１論文と同様に景気の上昇局面と後退局面とに分けてその非対称性を分析しても良かったのではないか。（回答：第２論文において，資産効果の景気局面による非対称性の分析を行い，第１論文の結果をサポートするという観点に我々は気付いていなかった。指摘通り，この分析は取り入れられるべきものであった。）

・中小企業において借入れ制約が存在したことを検証しているが，新株発行に関する制約が存在したことを検証することもオルタナティブな分析として考えられよう。（回答：我々は，配当に関して非負の制約を置いた場合に，借入れ制約が増幅される効果があることを確認している。）

論文３（Chapter 3）

・資産効果を含む消費関数の計測において，流動性資産のデータ上の制約のために「全国消費実態調査」と「県民経済計算年報」の２つのデータ・ソースを用い，プーリング法を採らざるを得なかったことは理解できるが，何らかの代理変数を考えることによってデータの出所を統一することは出来なかったか。また，「県民経済計算年報」を用いたのであれば，地域効果を示す地域差指標のようなものも出せれば面白かったのではないか。（回答：本研究報告書中に述べてあるように，家計の預金残高を把握するために「全国消費実態調査」を使用せざるを得ず，また多重共線性の問題を避けるために「県民経済計算年報」を併用してプーリング法を採用したことは止むを得なかった。地域効果については，我々の消費関数においては地域ダミーという形で考慮されている。）

・資産をブレークダウンして資産構成を考慮した消費関数を計測し資産構成の違いによる資産効果の違いを，さらに費目別消費関数を計測し消費費目別の資産効果を計測しており，興味深い結果が得られている。

Chapter. 1
（論文１）

Asset Markets and Capital Investment in Japan

（資産市場と設備投資）

Kazuo Ogawa
Shin-ichi Kitasaka
Toshio Watanabe
Tatsuya Maruyama
Hiroshi Yamaoka
Yasuharu Iwata

1. Introduction

The Japanese economy has plunged into deep recession around April in 1991 after a long period of booms, which is recorded as the second longest booms in the postwar period in Japan.

The real GNP growth rates hovered around 5 % during the years of 1987-1991, while it was only 1.4 % in 1992 and 0.1 % in 1993. Among the demand components, slowdown of growth is observed most notably for the private residential investment and business investment. The growth rate of the former was -8.2 % and -6.7 % in 1991 and 1992, while that of the latter was -4.0 % and -8.5 % in 1992 and 1993.

However, the most notable characteristics in the current recession can be seen in the asset markets, especially in the stock market and the land market. The Tokyo Stock Exchange Price Index (TOPIX) precipitated in January of 1990 after a long spell of price soaring in the preceding boom periods. The TOPIX declined by 57.8 % from December of 1989, peak of the stock price, to August of 1992. The land price exhibited a similar pattern. The land price index of six largest cities rose at the rate of 24.5 % per annum from September of 1985 to September of 1990 , which was followed by a sharp decline. Many corporations which were given loans by the financial institutions on the security of land and stocks during the boom periods have become insolvent and some argue that it will lead to an instability of the financial system in Japan.

Thus there seems to be financial factors in addition to real factors such insufficient level of effective demand underlying the current recession. That is why the current recession is often called “complex ” depression.[1)]

The purpose of this paper is to investigate the roles played by the asset markets in the recent business cycle. As is stated above, the asset prices, in particular the stock price and the land price, showed an excessive fluctuations during the current business cycle. In the first place we will analyze whether the stock price fluctuations during the mid-80’s to the early 90’s were caused by a change of the fundamentals underlying the Japanese economy. If the answer to that question is no, then we pose the question: how did the divergence of the prices from the fundamentals affected the behavior of the economic agents? We tackle this problem by investigating the portfolio behavior of the corporate sector.

Secondly we will examine the effects of the market value of land held by the corporate sector on the business fluctuations. In particular we are interested in the role of land asset as a collateral. This aspect is analyzed by including the market value of land as one of the explanatory variables in the portfolio equations of the firm.

Let us summarize our main findings: 1) The stock prices diverged from the fundamentals to a large extent from the mid-80’s to the early 90’s. That is to say, it is highly likely that there existed bubbles or fads in the stock market. Another finding is that the corporations responded differently to the change in the fundamentals and the bubbles. The bubbles turned out to exert a negative effect on

the portfolio behavior of the corporations such as real investment, land purchase, and borrowings.

2) The land stock played an active role as a collateral in the portfolio behavior of the corporations. We obtained some evidence that a rise in land prices increased the value of land as a collateral and hence led to an increase of the real investment and borrowings of the corporations.

The importance of land stock as a collateral was reinforced by two factors: the financial liberalization under way in the early to the middle of 80's and a rise in the stock prices. These factors enabled large companies to raise the funds directly from the capital market by issuing equity or bonds, which in turn prompted the financial institutions to lend to the corporations that did not have direct access to the capital markets. The banks had not established the long-term, stable relationship with these corporations. Therefore the land asset held by the corporations, which was increasing in value at that time, played a collateral role and eased the agency costs arising from the information asymmetries between creditors and debtors. The loans received were then channeled toward the real investment and the financial investment.

3) The dependence of real activities such as investment on the asset prices works as amplifying the magnitude of the business cycle, since the asset prices move procyclically. The severity of the recession the Japanese economy has experienced results from this very dependence of real activities on the asset markets. The precipitation of the asset prices in the early 90's stripped off the collateral value of the assets held by the corporations and the deteriorating loans made the financial institutions quite cautious in further lending and it choked off the investment to a large extent.

The paper is organized as follows. Section 2 detects the characteristics intrinsic to the current recession and the preceding booms by comparing the current business cycles with those in the past. Section 3 and 4 analyze the roles played by the asset markets in the current business cycles. The effect of the asset prices on the portfolio behavior of the corporations are examined quantitatively in Section 5. Section 6 gives concluding remarks.

2. Characteristics of the Contemporary Business Cycles

In this section we first identify the macroeconomic characteristics pertinent to the current recession and the preceding booms by comparing the current business cycles with those in the past. Then light is shed on the micro aspects of the business cycles: changes in the financial structure of the corporations.

The key statistics characterizing the business cycles since 1958 are summarized in Table 1 and 2 for boom periods and recession periods, respectively. From Table 1 we can pick up several points characterizing the second longest booms starting from November in 1986. First, the growth rate of private fixed and residential investment was quite high. The growth rate of both types of investment exceeded 10 %, which almost equaled that in the galloping growth period in the 60's.

Second the asset prices such as land and stocks increased rapidly at the rate of around 20 % per

annum during this boom, while the prices of goods and services represented by the GNP deflator were quite stable. In the boom periods in the 60's the asset prices also soared, but the prices of goods and services also increased at the rate of more than 5 %. The high level of asset prices generated the expectation of further increase of asset prices in the future and it led to an increase of the demand for assets. Figure 1-1 and 1-2 show the purchases of the share and the land by the different sectors, respectively. The demand for shares increased during 1985-1989 mainly among the financial institutions, while the demand for land by the nonfinancial corporations increased from 1986 to 1990.

The third point, which is related to the second, is that the credit conditions were quite eased. The growth rate of M2+CD exceeded 10 % per annum and the historically low levels of the interest rates emerged. The discount rate was cut stepwise from the level of 4.5 % in January of 1986 to 2.5 % in February of 1987, lowest level in the postwar period.

Next we turn to the characteristics of the recessions the Japanese economy is in the middle of. From Table 2 we point out the following characteristics, most of which are related to the conditions in the financial markets. First the growth rate of investment was reduced to a large extent. Second the asset prices declined by 13.5 % (shares) to 12.0 % (land). Third the growth rate of money supply was lowest (2.48 %) in the postwar recessions. The conditions in the financial or asset markets during the current recession are quite contrasted with those in the preceding booms. The easy credit conditions in the booms are completely reversed to the tight conditions as the asset prices started to decline.

The financial structure of the nonfinancial corporations also changed in the course of the financial liberalization under way. First the issue of the bonds with warrants was approved in 1981. During the period of 1986 to 1989, the corporations raised the funds to a large extent by issuing the bonds with warrants and the convertible bonds under the expectations that the share prices will rise. During this time the equity issue also increased due to high stock prices. The average annual growth rate of the amount raised by the warrant bonds, convertible bonds, and equity for the corporations listed in all the stock exchanges in Japan are 64.8 %, 38.8 %, and 116 %, respectively. However, the bond-financing or equity-financing was not uniformly prevalent across all the corporations. It was restricted only to the large corporations which could have direct access to the capital markets. Figure 2-1 to 2-6 show the time-series pattern of the ratio of equity capital to liabilities plus equity capital for the corporations with different sizes in six industries: all industries, manufacturing, construction, wholesale and retail trade, services, and real estate. The ratio of equity capital increased steadily over time for all industries, manufacturings, and wholesale and retail trade. However the increasing trend is only observed for the corporations in the category of the largest size. This is typically seen for the large corporations whose capital stock is larger than one billion yen. Figure 3 shows the time-series pattern of the ratio of equity capital to liabilities plus equity capital for the corporations whose capital stock is larger than one billion yen for all industries and manufacturing. The ratio increased steadily from 16.8 % (19.9 %) in 1974 to 26.4 % (36.4 %) in 1990 for all

industries (manufacturing).

The second feature, which is related to the first, is less dependence on borrowings for the large corporations on one hand, and the more dependence on borrowings for the medium or small-sized corporations on the other hand. Figure 4-1 to 4-6 show the time-series paths of the dependence on borrowings of the corporations measured by the ratio of outstanding loans payable to sales.
The dependence on borrowings are mitigating over time for the largest corporations in manufacturing and construction industries. This tendency is especially notable for manufacturing. This is also seen in Figure 5, where the ratio of outstanding loans to sales are depicted for the corporations whose capital stock is larger than one billion yen. This ratio declined from 32.6 % (42.7 %) in 1975 to 22.7 % (15.2 %) in 1990 for all industries (manufacturing). Figure 6 shows that this change in the structure of the corporate finance is also observed in flow terms. In Figure 6-1 to 6-3 the proportions of equity issue, borrowings, and corporate bonds in the total demand for credit of the corporations whose capital stock is larger than one billion yen are depicted over time. The proportion of borrowings are constantly declining. For manufacturing the ratios are even negative during 1983-1989. On the other hand the proportion of equity issue and bonds are notably high during 1985-1989.

Figure 4 also shows that the dependence on borrowings has increased over time for the rest of the corporations. The dependence has increased even for the largest corporations in wholesale and retail trade, services, and real estate. We will examine below how a shift of financing from borrowing to equity or bond issuing among the large corporations affects the pattern of business fluctuations.

The third feature of a change in the financial structure of the corporations is an increase of the holdings of liquid assets such as cash, time deposits and short-term securities in the late 80's. This is demonstrated in Figure 7-1 to 7-6, where the movements of the ratio of liquid assets to sales are given. It can be seen from the figures that this liquidity ratio increased during 1986 to 1989 for all the industries but real estates, irrespective of the size of the corporations. For real estates the ratio started to rise in 1984, reaching its peak in 1986.

There existed two underlying conditions leading to a rise in the liquidity ratios. One is deregulations on the level of the interest rates on time deposits, which was initiated in March of 1985 as an approval of money market certificate(MMC) and followed by a sequence of the liberalization of the interest rates earned on the time deposits of a large lot. The stock of time deposits including certificates of deposits held by the corporations increased at the rate of 16.0 % per annum from 1984 to 1989, while that of the households increased only at the rate of 7.8 % per annum. The other is the low interest rates charged on loans during this period. It enabled the corporations to earn large margins by depositing the money borrowed from the banks. A simultaneous operation of borrowing and depositing by the corporations contributed to a creation of credits by raising the magnitude of the credit multiplier.

3. Role of Asset Markets in Business Cycles: (1) Collateral Role of Assets

We discuss the roles played by the asset markets in business cycles. In particular our interest lies in whether the increasing weight given on the asset market in the economy magnifies the business fluctuations or not. In general the asset prices fluctuate more than the real variables, as is typically observed in the current recession and the preceding booms. The problem is whether the volatility of asset markets is propagated to the real economy. If the answer is yes, then much of the current business fluctuations are attributed to those in the asset prices. We discuss this problem from two viewpoints. One is the collateral role played by the asset values, especially land value. The other is a signaling role played by the stock market. In this section we discuss the first problem and the second one will be dealt with in the next section.

According to the celebrated Modigliani-Miller theorem, There exists no difference in cost between the internal funds and the external funds and therefore the level of investment is independent of the financing method.[2)] However Doubt has been cast on the validity of the fundamental assumptions underlying the theorem since the theorem came into being. The assumption of perfect information has been often criticized as unrealistic and growing attention has been paid to an alternative assumption of the asymmetric information between creditors and debtors. It is quite natural to assume that the corporations as a borrower has superior information on the investment projects to be undertaken to lenders. Furthermore the lenders cannot monitor the behavior of the borrowers perfectly without incurring additional costs. Then there arises the well-known principal-agent problem. In those situations the optimal financial arrangements will be made between the lenders and the borrowers that include the clauses that prevent the borrowers from taking actions disadvantageous to the lenders. However it is demonstrated that the level of investment by the corporations becomes inefficient compared to that without any informational friction due to the costs arising from the financial arrangements.

This cost drives the wedge between the cost of internal funds and that of the external funds. The upshot is that the investment decision is no longer independent of the method of raising funds. The cost of internal funds is cheap relative to that of external funds. Therefore the abundance of internal funds induces the corporations to undertake more investment projects. Recently this argument is further elaborated and it is shown that what reduces the agency costs is the collateralizable net worth of the borrowers. In other words the information regarding the balance sheets of the debtors plays a vital role in determining the level of investment.[3)] The larger the collateralizable net worth is, the higher the level of investment is. Emphasis on the net worth in investment decision has important implications to the business fluctuations. Combining the fact that the asset prices move procyclically with the positive dependence of investment on the level of collateralizable net worth, it can be deduced that the fluctuations of investment will be magnified and thus the volatility of business cycles will be amplified.

Hoshi,Kashyap, and Scharfstein(1990,1991), Asako, Kuninori, Inoue, and Murase(1990), and Okazaki and Horiuchi(1992) investigated the validity of this theory for Japan based on the firm data. It is well-known in Japan that there are industry groups called *keiretsu*. The corporations belonging to industry groups can mitigate the agency costs for several reasons. First group corporations have close ties with affiliated banks and those banks are shareholders as well as bondholders, which reduces the conflicts among investors. Second group corporations have a long-term stable relationship with the affiliated banks and former bank employees are often placed in management positions of the corporations, which narrows the informational gaps between the bank and the corporations. Therefore it is expected that the agency cost is lower for the corporations in the industry groups than unaffiliated corporations. Hoshi et al. (1990,1991) obtain evidence supporting this conjecture, while the evidence given by Asako et al. (1990) and Okazaki and Horiuchi(1992) is not so decisive.

If the assertions made above are correct, then we have strong implications on the role of assets as a collateral in business cycles. In the preceding section we gave some evidence that financial liberalization together with a rise of share prices in the middle of 80's shifted the source of financing for the large corporations from borrowing to equity or bonds and that the dependence on borrowings was strengthened for medium and small corporations which cannot have direct access to the capital market. In general the corporations of medium or small size do not belong to industry groups and hence the banks have not accumulated the enough information of those corporations on which judgment is made as to the decision of lending loans. However the asset values held by the corporations increased to a large extent in the middle of 80's due to a sharp rise in asset prices. It is conjectured that appreciating assets played a collateral role in borrowing and that it eased the agency costs. If it is the case, then the improvement of the balance sheet positions of medium or small corporations were indispensable to credit expansions and high growth rate of the investment during this period.

Now we turn to the evidence on our assertions. First we demonstrate from the statistics of the supplier of funds that the loans made for the small corporations indeed had the tendency to increase in the 80's. Figure 8-1 and 8-2 depict the share of the small enterprises in the total outstandings of loans and discounts of all banks in Japan. The share is increasing over time and it accelerated from the middle of 80's to 1989. Figure 9-1 and 9-2 show the proportions of the loans outstandings that are on the security of real estates and securities, respectively. The proportion of loans on the security of real estates declined rapidly from the middle of 70's to the middle of 80's and switched to an increasing trend. The proportion of loans the collateral of which is securities exhibits a similar pattern. It showed a continuous decline from the middle of 60's to the middle of 80's and the declining trend was reversed to an increasing one. Note that the increasing trend of both proportions coincide with the period of sharp rise in land and share prices.

To establish empirically the relationship between the proportions of collateral loans and the share

of small enterprises in loan outstandings, the following regressions were run.[4)]

(1) $SCOL = a_0 + (a_1 + a_2 TOPIXHAT_{-1}) \times SMALL_{-1} + a_3 SCOL_{-1}$

(2) $LCOL = b_0 + (b_1 + b_2 PLANDHAT_{-1}) \times SMALL_{-1} + b_3 LCOL_{-1}$

where $SCOL$: proportion of loan outstandings of all banks secured on securities
$LCOL$: proportion of loan outstandings of all banks on the security of land
$TOPIXHAT$: rate of increase of Tokyo Stock Exchange price indexes($TOPIX$), computed as $(TOPIX/TOPIX_{-1} - 1)$
$PLANDHAT$: rate of increase of land price indexes of six largest cities($PLAND$), computed as $(PLAND/PLAND_{-1} - 1)$
$SMALL$: share of small enterprises in the outstandings of loans

The regressions are run for the period of 1978-1991. The results are shown in Table 3. The $SMALL$ coefficient is positive for both the $SCOL$ and the $LCOL$ equations and that it is significant at the 1 % level for the latter case. The cross term of the $SMALL$ variable with the rate of return is also positive in both equations and it is significant at the 1 % level for the $SCOL$ equations.[5)] Our evidence shows that as the banks shifted the weight of loans to small enterprises, the proportion of loan outstandings on the security of land and securities increased. Furthermore the proportion of loan outstandings on the security of assets becomes more responsive to the share of small enterprises in the total outstandings of loans as the rate of change in asset prices increases.[6)] More detailed analysis of the effects of the land value on investment and borrowings will be made in the next section by using industry data.

4. Role of Asset Markets in Business Cycles: (2) Valuation in the Stock Market and Business Fluctuations

One of the fundamental functions of the stock market is to reflect a high quality of information of the corporation on the stock price. In addition to this basic property of the stock market, if the marginal prospects of corporate investment is equal to the average profitability of the existing capital stock, then the average q ratio, defined as the ratio of the firm value evaluated at the financial market to the replacement value of the physical capital, is a sufficient statistics of investment.[7)] The upshot is a high positive correlation of investment with the average q and the investment is as volatile as the average q, which reflects the fluctuations in the stock market.

As is seen in the previous sections, the stock market in the Japanese economy soared in the middle of 80's and precipitated in 1990. Some argue that there existed some components of bubbles or

fads which forced the stock prices to deviate from the fundamental parts, and it burst in 1990. If it is the case, then the question to be posed is : does the manager still pay attention to the signals from the stock market even if the stock price deviates from the fundamentals that reflect the prospects of the investment perceived by the managers? [8] If it turns out that the managers do not care about the valuations in the stock market, then the investment will be less volatile than the stock price.[9] Therefore the answer to this question is very crucial in assessing the role of asset markets in business fluctuations.

We tackle this tough, but important problem empirically. First we construct the proxy of the marginal profitability of investment, fundamental parts of the stock price and compare that proxy with the market valuation of the corporation, that is, average q. Then if the evidence is against the efficiency hypothesis that the stock price does not deviate from the fundamentals, we will examine how the response of the managers to the fundamentals and to the non-fundamentals differs.

Now explanations are in order for the data set employed. Based on the Quarterly Report of Financial Statements of Incorporated Business compiled by the Ministry of Finance, we construct the consistent quarterly series of the major items in the balance sheet of the corporations for each industry. The industries covered in our sample are 14 industries in total. They are all industries, construction, manufacturing, food and beverages, textiles, pulp, paper and paper products, chemicals, steel, non-ferrous metals, fabricated metal products, machinery, electrical machinery, wholesale and retail trade, and real estate. The sample period covers from the third quarter of 1968 to the third quarter of 1992. The detailed explanations on the procedures of the data construction are provided in Data Appendix.

First we compute the tax-adjusted average q, average profitability of the capital. As for the definition of capital, we include only depreciable assets in the definition of capital. This definition excludes financial assets, inventories, and land from capital.[10] Specifically, our average *q* is defined as follows:[11]

$$(3)\quad \frac{V_t + B_{t-1} - p_t^L L_{t-1} - A_t}{(1-d)(1-z_t)p_t^I K_{t-1}}$$

where V_t : market value of equity

B_{t-1} : net financial liability at the end of period t-1

A_t : expected present value of tax savings on the depreciation allowances on investment made before period t

p_t^L : land price

L_{t-1} : real stock of land at the end of period t-1

d : physical depreciation rate

p_t^I : investment goods price

K_{t-1} : real capital stock at the end of period t-1

z_t : expected present value of current and future investment allowances on a unit of investment expenditure in period t

The fundamental part of the stock price is proxied by the present discounted value of marginal profitability of investment divided by the investment goods deflator. This is tax-adjusted marginal *q* and it is defined as:

$$(4)\quad MAQ_t = \frac{1}{(1-z_t)p_t^I} E_t\left[\sum_{j=0}^{\infty} b_{t+j}(1-d)^j (1-t_{t+j}) p_{t+j}\right]$$

where $b_{t+j} \equiv \prod_{i=1}^{j}(1+r_{t+i})^{-1} \quad (j=1,2,\cdots) \quad , b_t \equiv 1$

r_{t+1} : one-period nominal discount rate in period t

t_t : corporate tax rate

p_t : before-tax profits divided by the real capital stock

$E_t[\bullet]$: mathematical expectation operator conditional upon the information available in period t

In deriving eq.(4) we assume the technology of constant returns to scale. Then the use of average profit rates as the marginal profits can be justified. The marginal *q* is not directly observable since it includes the unobservables: future stream of discount rates and profit rates. Therefore to make eq.(4) operational we have to know the stochastic structure underlying the discount factor and profit rates.[12] As a first step to pinpoint the stochastic process we test whether the discount factor $d_t (= (1-d)/(1+r_t))$ and profit rates p_t have unit roots. Two types of unit root tests are conducted. One is the Augmented Dickey Fuller test(ADF test) and the other is Phillips-Perron test.[13] The null hypothesis is chosen as one unit root without trend for the discount factor and one unit root with trend for the profit rates. Technical progress may have some effect on the level of profit rates, which will justify our allowance for trend in the case of profit rates. The lag length is chosen to be 4 in both types of tests. The results of unit root tests are presented in Table 4. As for the discount factors, we cannot reject the null hypothesis for any industries, while the unit root test is decisively rejected at the 5 % significance level for all the industries by the Phillips-Perron test. It implies that the movement of profit rates are better characterized by trend stationary process.

Based on the test results, we specify the stochastic process of the discount factors and the profit rates as follows:[14]

(5) $\Delta d_t = m_{10} + \sum_{k=1}^{p} m_{1k}\Delta d_{t-k} + e_{1t}$

(6) $p_t = m_{20} + \sum_{k=1}^{q} m_{2k} p_{t-k} + n_2 t + e_{2t}$

where t : time trend

e_{1t}, e_{2t} : white noise

The lag lengths of eqs.(5) and (6) are determined on the basis of Schwarz Information Criterion, which are shown in Table 5. The lag length of one is chosen for the discount factors in all the industries but construction and machinery. On the other hand the lag length is equal or longer for the profit rates than the discount factors. Table 6 shows the estimation results of eqs.(5) and (6) based on the lag length chosen above.

When the stochastic process of d_t and p_t is characterized by eqs.(5) and (6), it can be shown that the tax-adjusted marginal q is written as:[15)]

$$(7)\ MAQ_t = \left[\frac{p_{t-1}}{(1-d_{t-1})^2}\mathbf{c}'(\mathbf{I}-d_{t-1}\mathbf{M_1})^{-1}\mathbf{M_1}\mathbf{a_{t-1}} + \frac{p_{t-1}}{(1-d_{t-1})^3}\mathbf{c}'(\mathbf{I}-d_{t-1}\mathbf{M_1})^{-1}q_1\right.$$
$$+\mathbf{c}'(\mathbf{I}-d_{t-1}\mathbf{M_2})^{-1}\mathbf{M_2}\mathbf{b_{t-1}} + \frac{1}{(1-d_{t-1})}\mathbf{c}'(\mathbf{I}-d_{t-1}\mathbf{M_2})^{-1}q_2$$
$$\left.+\left\{\frac{d_{t-1}}{(1-d_{t-1})^2} + \frac{t}{(1-d_{t-1})}\right\}\mathbf{c}'(\mathbf{I}-d_{t-1}\mathbf{M_2})^{-1}\mathbf{n}\right]\frac{(1-t_t)}{(1-z_t)p_t^I}$$

where $\mathbf{c}' = (1,0,\cdots,0)$

$\mathbf{a}_{t-1} = (\Delta d_t, \Delta d_{t-1}, \cdots, \Delta d_{t-p+1})$

$q_1 = (m_{10},0,\cdots,0)$

$\mathbf{b}_{t-1} = (p_t, p_{t-1}, \cdots, 0)$

$q_2 = (m_{20},0,\cdots,0)$

$\mathbf{n}' = (n_2,0,\cdots,0)$

$$\mathbf{M_1} = \begin{bmatrix} m_{11} & m_{12} & \cdots & m_{1,p-1} & m_{1p} \\ 1 & 0 & \cdots & 0 & 0 \\ 0 & 1 & \cdots & 0 & 0 \\ \vdots & \vdots & \ddots & \vdots & \vdots \\ 0 & 0 & \cdots & 1 & 0 \end{bmatrix}$$

$$\mathbf{M_2} = \begin{bmatrix} m_{21} & m_{22} & \cdots & m_{2,q-1} & m_{2q} \\ 1 & 0 & \cdots & 0 & 0 \\ 0 & 1 & \cdots & 0 & 0 \\ \vdots & \vdots & \ddots & \vdots & \vdots \\ 0 & 0 & \cdots & 1 & 0 \end{bmatrix}$$

We use the ratio of operating profits to the real capital stock as a proxy of *p*. Before examining the relationship between the market valuation and the fundamentals, we give some summary statistics on the *AVQ* and the *MAQ* variables. The mean and standard deviation are computed for the period of the first quarter of 1970 to the fourth quarter of 1990. They are shown in Table 7. The magnitude of the AVQ variable is around unity for all industries(1.2135), construction(1.8020), manufacturing (1.5899), food and beverages(1.3981), and textiles(0.9151), while that of the *MAQ* variable hovers around unity for all industries(1.2493), manufacturing(1.1631), food and beverages(1.3952), textiles(1.1069), and real estate(1.5040). The average *q* is negative for pulp, paper and paper products(-0.0849) and real estate(-0.1896). Both the *AVQ* and the *MAQ* variables are well above unity for chemistry (2.5548, 2.0450), steel (3.3800, 2.0541), machinery(2.7670, 3.6088), electrical machinery (7.6279, 4.3456), and wholesale and retail trade (5.1149, 9.8541).

It should be noted that the *AVQ* variables are more volatile than the *MAQ* variables across all the industries but pulp, paper, and paper products in the sample. In fact the standard deviation of the former is 1.71 to 5.56 times as large as the latter(third column of Table 7).

Now we examine the relationship of the fundamentals with the market valuations. If the stock price reflects all the relevant information on the future profitability of investment projects undertaken by the firm, then the *AVQ* variable will be equal to the *MAQ* variable. Once both series of the *AVQ* and the *MAQ* variables are constructed, it is easy to test equality between two series. Taking the sampling errors into consideration, the null hypothesis is written as follows:

(8) $AVQ_t = MAQ_t + u_t$

where u_t : sampling error uncorrelated with the *MAQ* variable

Eq.(8) can be tested in several ways.[16] The simplest way to test eq.(8) is estimate the following equation and test the hypothesis that $a_0 = 0$ and $a_1 = 1$.

(9) $AVQ_t = a_0 + a_1 MAQ_t + u_t$

The ordinary least squares (OLS) estimation was conducted for each industry. The regression results

of eq.(9) are given in Table 8 and the test statistics are presented in Table 9. The null hypothesis is rejected at the 1 % significance level for all the industries except all industries, food and beverages, and textiles. Although the null hypothesis is not rejected statistically for all industries, food and beverages, or textiles, it seems to us that the results are as a whole unfavorable to the view that the market valuations reflect the fundamentals for the following reasons.

First the statistical fitness is quite poor. The adjusted coefficient of determination is at most 0.6980 for construction and it is nearly zero or negative for most of the industries.

Second the Durbin-Watson statistics for all the cases are quite low, indicating the possibility of positive serial correlation. This may hint the possibility that the stock price is driven by other factors besides the fundamentals.[17] Drawing the difference between the *AVQ* and the *MAQ* variables ($AVQ_t - MAQ_t$) is useful for searching for the candidates to cause this serial correlation. Our strategy is to see whether there still remains systematic parts in the market valuation even after taking the stock market efficiency into consideration. The difference is depicted in Figure 10-1 to 10-14. There exists a pattern of persistent positive residuals in the middle of 80's for all industries, manufacturing, food and beverages, textiles, chemicals, steel, non-ferrous metal, machinery, and electrical machinery. The divergence of the market valuations from the fundamentals is notably large during the third quarter of 1986 to the first quarter of 1990 for most of the industries. This pattern indicates an overvaluation in the stock market during these periods, which may be identified as the evidence for the bubbles or fads in the stock price.

Then the next question to be posed is: Is this persistent divergence of the stock price from the fundamentals related to any economic factors? To answer this question we estimate the following equation:

$$(10)\quad AVQ2_t = a_0 + a_1 MAQ_t + a_2 \frac{p_t^L L_{t-1}}{(1-d)(1-z_t)p_t^I K_{t-1}} + u_t$$

$$\text{where}\quad AVQ2_t = \frac{V_t + B_{t-1} - A_t}{(1-d)(1-z_t)p_t^I K_{t-1}}$$

Equation (10) is obtained simply by moving the term including the market value of land from the LHS in eq.(9) to the RHS. When the stock price reflects correctly the market value of land held by the firm as well as the prospects of investment projects, then not only a_1 but also a_2 will be unity.
Suppose, however, that u_t is positively correlated with the land value held by the firm. Then application of the OLS to eq.(10) will yield biased estimates. Especially, the parameter estimate of a_2 will be upward biased. Therefore estimates of a_2 in excess of unity may suggest that the non-fundamentals are positively correlated with the market value of land held by the firm. The estimation

results of eq.(10) is given by Table 10. It is clear that the parameter estimates of a_2 is upward biased for all the industries except real estate, supporting the positive association of the bubbles or fads with the land value of the firm.

Now that the divergence of the market valuation from the fundamentals is clear, next task is to investigate the response of investment to the fundamentals and the non-fundamentals. This is the topic to be pursued in the next section.

5. Portfolio Behavior of the Corporation and Business Fluctuations

In the preceding sections we shed light on two aspects of the asset markets which have important implications to the fluctuations of business cycle. One is the role of collateralizable assets of borrowers in loan contract, which is expected to affect the level of investment. The other is the divergence of the stock price from the fundamentals and our conjecture is that the fundamentals and the non-fundamental parts might have different effects on the real economy.

We examine these points empirically. Specifically we confine our attention to the portfolio behavior of the corporations and analyze how the portfolio is affected by an increase of collateral value of assets and quantify the effects of the fundamentals and the non-fundamentals parts in the stock price on the portfolio allocation. The data set is the same as employed in section 3. The sample period used for estimation ranges from the second quarter of 1970 to the fourth quarter of 1990. We use OLS as an estimation method. Based on the industry data, we estimate the portfolio equations of the corporations for three assets: physical investment, land purchase, and borrowings.

To start with, we derive the investment function in the benchmark case based on the neoclassical intertemporal model of the firm. The firm chooses the optimal level of investment as well as the current inputs and production so that the value of firm can be maximized. The value of firm is defined as the discounted sum of future dividends (D_t). In other words,

$$(11)\quad V_t = E_t\left[\sum_{j=0}^{\infty} b_{t+j} D_{t+j}\right]$$

$$\text{where}\quad b_{t+j} = \prod_{i=1}^{j}(1+r_{t+i})^{-1} \quad (j=1,2,\ldots) \quad , b_t \equiv 1$$

$$D_t = (1-t_t)\left[p_t\{F(K_t,N_t)-G(I_t,K_t)\}-w_t N_t - i_t B_{t-1} + i_t^L L_{t-1}\right] + NB_t - (1-z_t)p_t^I I_t - p_t^L IL_t + \tilde{A}_t$$

where r_{t+1} : one-period discount rate in period t

p_t : output price

N_t : labor input

I_t : real investment in plant and equipment

K_t : capital stock at the end of period t

p_t^I : investment goods price in period t

B_{t-1} : net financial liability at the end of period t-1

NB_t : increase of net financial liability in period t

w_t : wage rate

z_t : present value of investment allowances on a unit of investment expenditure in period t

i_t^L : rent on land

i_t : interest rate on B_{t-1}

$\tilde{A}_t$: value of the depreciation allowances on investment made before period t that can be claimed in period t

IL_t : real purchase of land in period t

t_t : corporate tax rate in period t

The production technology of the firm is represented by the production function of $F(K_t, N_t)$. We assume that the firm faces convex adjustment costs, $G(I_t, K_t)$, in changing its capital stock. The relationship between the stock and the flow of assets is written as

(12) $K_t = (1-d)K_{t-1} + I_t$

(13) $L_t = L_{t-1} + IL_t$

(14) $B_t = B_{t-1} + NB_t$

Maximization of eq.(11) subject to eqs.(12), (13), and (14) yields the following investment function:[18)]

(15) $\left(\frac{I_t}{K_{t-1}}\right) = a_0 + a_1(MAQ_t - 1)\frac{(1-z_t)p_t^I}{(1-t_t)p_t}$

Furthermore, when both the production technology and the adjustment costs function have the property of linear homogeneity, the fundamentals are equal to the market valuations, so that eq.(15) is simplified as:

$$(16)\quad \left(\frac{I_t}{K_{t-1}}\right) = a_0 + a_1(AVQ_t - 1)\frac{(1-z_t)p_t^I}{(1-t_t)p_t}$$

Eq.(16) is the investment demand equation frequently estimated in the literature. Investment-capital ratio is an increasing function of the tax-adjusted average *q*. We call this model as Model 1.

This model is extended in two directions. Firstly when the firm faces the liquidity or borrowing constraints, the level of investment is determined by the level of cash flow. Secondly in the formulation above land is treated as an asset yielding rents, not as a production factor. However, as is seen above, it is likely that land plays a vital role as a collateral to easy the credit conditions. If it is the case, then it is expected that the market value of land held by the firm will have a positive effect on investment.[19)]

Taking account of these modifications, Model 1 is rewritten as

$$(17)\quad \left(\frac{I_t}{K_{t-1}}\right) = a_0 + a_1(AVQ_t - 1)\frac{(1-z_t)p_t^I}{(1-t_t)p_t} + a_2\frac{p_t^L L_{t-1}}{p_t^I K_{t-1}} + a_3\frac{CF_t}{p_t^I K_{t-1}}$$

where CF_t : cash flow

The portfolio equations of land purchase and borrowings are similarly specified as:

$$(18)\quad \left(\frac{IL_t}{K_{t-1}}\right) = b_0 + b_1(AVQ_t - 1)\frac{(1-z_t)p_t^I}{(1-t_t)p_t} + b_2\frac{p_t^L L_{t-1}}{p_t^I K_{t-1}} + b_3\frac{CF_t}{p_t^I K_{t-1}}$$

$$(19)\quad \left(\frac{\Delta B_t}{p_t^I K_{t-1}}\right) = g_0 + g_1(AVQ_t - 1)\frac{(1-z_t)p_t^I}{(1-t_t)p_t} + g_2\frac{p_t^L L_{t-1}}{p_t^I K_{t-1}} + g_3\frac{CF_t}{p_t^I K_{t-1}}$$

In an alternative model(Model 2) the *MAQ* variable replaces the *AVQ* variable in eqs.(17) to (19). It should be noted that emphasis is not laid upon the role of stock market to convey the relevant information on the prospects of investment projects in Model 2.

The estimation results of Model 1 and 2 are shown in Table 11 and 12, respectively.[20)] In Table 11 the *AVQ* variable, a key variable in investment equation, exerts a significantly negative effect on physical investment across all the industries except six industries (construction, textiles, fabricated metal products, machinery, electrical machinery, and wholesale and retail trade), which contradicts the verdict of the celebrated Tobin's *q* theory. Moreover, even when the *AVQ* variable exerts a significantly positive effect on investment, the explanatory power is low. The adjusted R-squared ranges from 0.0526 (textiles) to 0.4390 (electrical machinery). The *AVQ* variables also have a

significantly negative effect on the investment in land and net borrowings except construction and real estate.

Contrastively the *MAQ* variable has a significantly positive effect on physical investment across all the industries, which is consistent with the underlying investment theory. Contrasted effect of the *MAQ* variable with the *AVQ* variable can be interpreted as an implication of the findings in the previous section that the market valuation is a noisy signal of the profitability of investment projects.[21] It should be noted that importance of the *MAQ* variable is observed not only in the investment equation, but also in the land purchase and borrowing equations. The *MAQ* variable exerts a significantly positive effect on the land purchase decision in all the industries except non-ferrous metal, fabricated metal products, and electrical machinery, while it affects the demand for borrowing in a significantly positive manner for all industries, construction, manufacturing, pulp, paper and paper products, chemicals, steel, wholesale and retail trade, and real estate.

In addition to the fundamentals, market value of land as well as cash flow exerts a significantly positive effect on investment for some industries. The former is an explanatory variable with significantly positive effect on investment for pulp, paper and paper products, fabricated metal products, wholesale and retail trade and real estate, while the latter for all industries, construction, manufacturing, pulp, paper and paper products, fabricated metal products, machinery, and electrical machinery.[22] Cash flow also affects the land purchase positively for construction, manufacturing, food and beverages, pulp, paper and paper products, machinery, electrical machinery, and real estate and borrowings positively for manufacturing, pulp, paper and paper products, electrical machinery, and real estate. Positive effect of cash flow on borrowing can be interpreted as an active role played by cash flow to reduce the agency costs and mitigate the borrowing conditions.[23]

The effect of cash flow is notably large in real estate. The coefficient estimate of cash flow on land purchase and borrowings exceed unity This implies that a unit increase of cash flow brings forth more than a unit increase of land purchase and borrowings. It is highly likely that this excessive response of land purchase and borrowings to cash flow in real estate is partly responsible for a sharp rise in land prices in the middle to late 80's.

The same story also holds for construction industry. A unit increase of cash flow raises the level of investment, land purchase, and borrowings by 0.50, 0.17, and 0.60, respectively. It should be noted that common characteristics to construction and real estate industries are composition of a large number of small-sized firms in an industry. As discussed in the previous section, small-sized firm in general have not established a long-term relationship with the banks. Therefore the real and financial decisions of the firm will be very much affected by the level of internal funds.

These results obtained so far hint that the fundamental and the non-fundamental components in average q might have different effects on the portfolio behavior of the corporations.[24] To take this possibility into consideration in estimation, we modify our specifications of the portfolio equations in

the following manner.

Suppose that the market value of firm (V_t) is composed of not only the fundamentals but also the non-fundamentals such as bubbles or fads. That is, eq.(l1) is rewritten as:

$$(20)\ V_t = E_t\left[\sum_{j=0}^{\infty} b_{t+j} D_{t+j}\right] + NF_t$$

where NF_t : non-fundamental parts of market valuation

It is easy to show that eq.(15) is still valid even when the market value of firm is contaminated by the non-fundamentals.[25] We add the following non-fundamentals term to eq.(15) in order to examine the possible effects of the non-fundamentals on investment behavior.

$$(21)\ \left(\frac{I_t}{K_{t-1}}\right) = a_0 + a_1(MAQ_t - 1)\frac{(1-z_t)p_t^I}{(1-t_t)p_t} + a_2\frac{NF_t}{(1-d)(1-t_t)p_t K_{t-1}}$$

The coefficients of a_1 and a_2 will measure the different impacts of the fundamentals and the non-fundamentals on investment, respectively. When a_2 is zero, the non-fundamentals will have no effect on capital investment. When a_1 is equal to a_2, the non-fundamentals parts are as important as the fundamental parts. In this case the investment function is boiled down to eq.(16) since the following relationship between the average *q* defined by eq.(3) and the fundamentals is held:

$$(22)\ AVQ_t = MAQ_t + \frac{NF_t}{(1-d)(1-z_t)p_t^I K_{t-1}}$$

In estimation the NF_t variable is constructed from eq.(22).

Eq.(21) is also extended by adding the land value and the cash flow of the firm to the list of explanatory variables. This is Model 3 and is expressed by:

(23)

$$\left(\frac{I_t}{K_{t-1}}\right) = a_0 + a_1(MAQ_t - 1)\frac{(1-z_t)p_t^I}{(1-t_t)p_t} + a_2\frac{p_t^L L_{t-1}}{p_t^I K_{t-1}} + a_3\frac{CF_t}{p_t^I K_{t-1}} + a_4\frac{NF_t}{(1-d)(1-t_t)p_t K_{t-1}}$$

(24)

$$\left(\frac{IL_t}{K_{t-1}}\right) = b_0 + b_1(MAQ_t - 1)\frac{(1-z_t)p_t^I}{(1-t_t)p_t} + b_2\frac{p_t^L L_{t-1}}{p_t^I K_{t-1}} + b_3\frac{CF_t}{p_t^I K_{t-1}} + b_4\frac{NF_t}{(1-d)(1-t_t)p_t K_{t-1}}$$

(25)

$$\left(\frac{\Delta B_t}{p_t^I K_{t-1}}\right) = g_0 + g_1(MAQ_t - 1)\frac{(1-z_t)p_t^I}{(1-t_t)p_t} + g_2\frac{p_t^L L_{t-1}}{p_t^I K_{t-1}} + g_3\frac{CF_t}{p_t^I K_{t-1}} + g_4\frac{NF_t}{(1-d)(1-t_t)p_t K_{t-1}}$$

The estimation results of Model 3 are shown in Table 13. There are interesting findings behind the results. First, the effects of the fundamentals and the non-fundamental parts are clearly different. The fundamentals exert a significantly positive effect on investment except a few cases, as is expected.

The fundamentals also have significantly positive effects on real land purchase and net borrowings for most of the cases. The effects of the non-fundamentals on the portfolio behavior are quite contrasted with those of the fundamentals. The effects of the non-fundamental parts on capital investment are negative for all the industries but textiles, steel, machinery, electrical machinery and wholesale and retail trade. Moreover they are significant at the 1 % level for most of the cases. As was demonstrated in section 4, there persisted a positive overvaluation in the stock market during the middle to the latter half of 80's. If we interpret these positive persistence as the existence of bubbles or fads, then the evidence shows that they have negative effects on the real economy. This is quite reasonable, since the very fixty of the physical production facilities makes the sunk costs very high, which deters the investment behavior.[26)]

Negative effects of the non-fundamentals are also observed for the land purchase and net borrowings for most of the industries. The non-fundamentals exert a significantly positive effect on borrowings for real estate.

Second, compared with Model 2, we find stronger support for a collateral role of land in the portfolio allocation of the corporations. Now the effect of the market value of land on investment is significantly positive at the 5 % level for all industries, manufacturing, food and beverages, pulp, paper, and paper products, fabricated metal products, and wholesale and retail trade, while the effect of the market value of land on borrowings is significantly positive at the 5 % level for all industries, pulp, paper, and paper products, fabricated metal products, electrical machinery, and real estate. These evidence support the view that the land value lessened the agency costs and thus increased the loans from banks and investment. However, the market value of land does not exert a positive effect on land purchase in a significantly manner, the reason being that the positive effect of land as a collateral on land purchase might be wiped out by a negative effect of the stock adjustment type.

As for the nature of collateral, it is often argued that the effects of the collateralizable net worth on investment and borrowings are not symmetric in the phase of business cycles.[27)] In booming periods an increase of the net worth leads to that of investment and borrowings. However once the optimal level of investment without informational friction is attained, then investment will not increase

any longer no matter how large an increase of net worth is. On the other hand, there is no lower limit to the level of investment in recession. The larger a decrease of net worth is, the more deeply the level of investment falls.

To quantify this asymmetry in the collateral role, we add a cross term of land value with the dummy variable(D1) to eqs.(23) to (25). The dummy variable *D1* takes one for the business downturns and zero for otherwise. Thus if the above assertion is correct, then we find that the coefficient of the cross term is positive. The results of estimation are given by Table 14. In capital investment equation the cross term is significantly positive at the 1 % level for all industries, manufacturing, chemicals, and real estate, while it has a significantly positive effect on borrowings for all industries, manufacturing, pulp, paper, and paper products, chemicals, and steel. Therefore it is likely that the collateral role of land varies in the phase of business cycles.

The cash flow is another variable to ease the borrowing constraints. It has a significantly positive effect on investment for all industries, construction, manufacturing, fabricated metal products, machinery, and electrical machinery. Judging from the results above, we can conclude that the firms are under borrowing constraints in nine industries out of fourteen industries in our sample.

Now let us summarize the channels through which the fluctuations in the asset markets propagate to those in the real economy and evaluate their quantitative importance based on the estimation results of the portfolio equations. In making decision on the level of investment to be undertaken the managers rely on the fundamentals rather than the market valuations, which implies that investment is less volatile than the stock price since the fundamentals fluctuate less than the stock price. However this does not deny any effects of a sharp rise of the stock price starting from the middle of 80's. As was seen in section 2, a large volume of equity was issued by large corporations during this period and this partly resulted from low cost of equity. We discussed above that the information transmission role of the stock market functioned very poorly during the period of persistent divergence of the stock price from the fundamentals. Note that the stock market has another important role to determine the cost of equity. This function enabled the corporations to raise a lot of funds from the capital market.[28)]

Our, empirical evidence supports the role of land value as a collateral. Then excessive fluctuations of the land market are propagated directly into the real economy, and accelerate the business fluctuations. This is especially so in the periods of recession since the effect of land value on investment is larger in recession than in booms.

To sum up, the business fluctuations actually observed since the middle of the 80's are affected to a large extent by volatile movement of land prices, while the contribution by the stock market to the fluctuations is less obvious.

6. Concluding Remarks

With a view to analyzing the channel through which the fluctuations in the asset markets propagate to the real economy, we had a close look at the Japanese economy since the 80's. Japan experienced a more volatile movement of the asset prices than ever during this period. Our empirical study showed evidence for the active role of land stock as a collateral. The Japanese economy are now in the middle of deep recession, with the asset prices falling constantly. The collateral value of land has declined sharply, which has a negative effect on the level of investment and borrowings. To make matters worse, the role of collateral is more important for the portfolio allocations in the business downturns. Thus it is no wonder that the current recession is so severe.

Footnotes

1) This naming of the current recession comes from the title of Miyazaki(1992) latest bestseller.

2) See Modigliani and Miller(1958,1963) and Miller and Modigliani(1961) for the original exposition of the Modigliani-Miller theorem.

3) There is a growing body of literature on this issue. For example, see Greenwald and Stiglitz(1988), Gertler and Hubbard(1988), and Bernanke and Gertler(1989) for theoretical developments. For empirical pieces on the effects of internal net worth on investment, see Fazzari, Hubbard, and Petersen(1988), Devereux and Schiantarelli(1990), Hubbard and Kashyap(1992), Whited(1992), and Hubbard, Kashyap, and Whited(1993).

4) Data on the *SCOL*, *LCOL* and *SMALL* variables come from Economic Statistics Annual, Bank of Japan. That on *TOPIX* is from Annual Statistics on Tokyo Stock Exchange, Tokyo Stock Exchange and the data of *PLAND* variable is taken from Land Price Index of Cities, Japan Real Estate Institute.

5) Unfortunately the SMALL variable is not available over the whole sample period, since the definition of small enterprises changed several times in the past. The consistent series is only available since 1977.

6) Miyagawa(1993) and Mitsui and Kawachi(1993) obtain evidence that asymmetry of information is notably observed for small-sized firms in Japan and that investment is much affected by the liquidity position of the firm which eases the borrowing constraints.

7) Hayashi(1982) states the conditions that guarantee the equality of the average *q* with the marginal *q*, present value of the marginal profitability from new investment divided by the price of investment goods. They include perfect competition in the product market and the technology of constant returns to scale.

8) The studies tackling this problem are now numerous, Bosworth(1975) asserts that the managers will neglect what is going on in the stock market and follows the fundamentals. Fischer and Merton(1984) asserts that as long as the value maximization of the current stockholders is the principal objective of the corporations, then the managers will respect the market valuations in making

investment decisions. The empirical studies supporting the managers' obedience to the stock market are Barro(1989) for the U.S. and Iwata(1990) and Takeda(1993) for Japan. Galeotti and Schiantarelli(1990) and Blanchard, Rhee, and Summers(1990) show the evidence that the fundamentals are as important as the non-fundamentals in the investment decision, but that the response of investment to the fundamentals is larger than that to the non-fundamentals. Morck, Shleifer, and Vishny(1990) gives the evidence that the stock prices exert a significant effect on investment, but that the incremental explanatory power is only marginal.

9) We implicitly assume that the fundamentals are not so volatile as the stock price.

10) An alternative approach is to treat land also as the physical capital which has different types of adjustment costs. Under this specification, we can define the partial q for each physical capital, but it is unobservable. For applications of this multiple q, see Wildasin(1984), Chirinko(1986), Asako et al.(1989) and Hayashi and Inoue(1991).

11) Derivation of tax-adjusted average q can be found in many studies analyzing the investment behavior of the firm from the neoclassical viewpoint with adjustment costs. For example, see Blundell et al.(1992).

12) Abel and Blanchard(1986) and Ohtaki and Suzuki(1986) construct the series of marginal *q* based on the VAR model of underlying factors. Our approach is on the same track as them, although we take univariate approaches rather than multivariate ones.

13) See Yamamoto(1988) for the ADF test and Perron(1988) for the Phillips-Perron test.

14) It is assumed here that the error terms do not have MA parts.

15) We assume that the firm forms the static expectations for the future tax rates.

16) For more formal test, see Ogawa and Kitasaka(1994) where the cointegration relationship between the AVQ and the MAQ variables with the cointegration vector of (1,-1) is examined.

17) Low value of Durbin-Watson statistics hint that the AVQ variable is not cointegrated with the MAQ variable.

18) The adjustment cost function is specified as a quadratic form:

$$G(I_t, K_t) = \left[b_0 \left\{ \left(\frac{I}{K} \right)_t - c \right\} + \frac{b_1}{2} \left\{ \left(\frac{I}{K} \right)_t - c \right\}^2 \right] K_t$$

For more detailed derivation of eq.(14), see Blundell et al.(1992).

19) Inclusion of the market value of land in the investment function is justifiable when the adjustment cost function is broadly defined so that it can incorporate the financial distress costs and the value of land as a collateral works as a factor to mitigate the financial distress cost. Similar formulation of the investment function is adopted by Devereux and Schiantarelli(1989) where an inclusion of the variables such as cash flow, liquid asset and debt level is justified.

20) Seasonal dummies are also employed as regressors.

21) Yonezawa(1989) and Iwamoto(1993) also point out that average q is a noisy signal of the future profitability of new investment projects.

22) Once the cash flow variable is included in the investment equation, the MAQ variable loses its significance in construction, machinery, and electrical machinery industries. This is due to high collinearity between the cash flow and the MAQ variable. The cash flow variable can play two roles in the investment equations: one is a proxy of future profitability and the other is a mitigating factor of the borrowing constraints. It is expected that the former role is played by the MAQ variable in our formulation of the investment equation, but multicollinearity between the MAQ and the cash flow variables makes it difficult to disentangle two effects of the cash flow variable in estimation.

23) One channel through which cash flow affects the demand for borrowing is via reduction of the agency cost. Another channel is a substitution of internal funds for borrowing. In general the sign of the cash flow variable in the borrowing equation is indeterminate and depends on the relative importance of the former channel to the latter.

24) In a slightly different context Ueda and Yoshikawa(1986) demonstrate that average *q* cannot be a sufficient statistics of investment. Noting that the profit rates have more permanent components than the discount rates, they show that investment will be less responsive to financial factors such as stock prices.

25) See Iwamoto(1993) for a formal proof.

26) Pindyck(1990) stresses the irreversible nature of investment due to sunk costs. He points out that investment becomes sensitive to the uncertainty with respect to future cash flow or interest rates when irreversibility of investment is taken into consideration.

27) For example see Gertler and Hubbard(1988) and Bernanke and Gertler(1989).

28) Blanchard, Rhee, and Summers(1990) stresses this function of the stock market. They argue that the corporation will issue a large volume of shares when the market overprices the corporation and will invest the proceeds into the financial securities which do not require any additional cost in adjusting its level. Our conjecture is that this is the case for Japan in the middle to the latter half of 80's. They also argue that in the case where the fundamentals differ from the market valuations the reaction of the managers will hinge on what kind of shareholders the managers value most. If the managers act for the interests of short-term shareholders, then they will respect the market valuations, while if the managers side with the long-term shareholders, then they will act on the basis of their perceived fundamentals. Judging from the mutual holdings of shares among the corporations, it is likely that the latter will hold for Japan.

References

[1] Abel, A.B. and O.Blanchard(1986). “The Present Value of Profits and Cyclical Movements in Investment,” *Econometrica,* Vol.54, No.2, pp.249-273.

[2] Asako,K., Kuninori,M., Inoue,T., and H.Murase(1989). “Tochi Hyoka to Tobin no *q* ; Multiple *q* no Keisoku (Land Evaluation and Tobin's *q* ; A Measurement of Multiple *q*),” *Economics Today*, Vol.10-3, Japan Development Bank, Tokyo.

[3] ――――――――――――――――――――――――――――――(1990). “Setsubi Toshi to Shikin Chotatsu - Renritsu Houteisiki Moderu niyoru Suikei - (Capital Investment and Source of Funding - Estimation Based on a Simultaneous Model) JDB Discussion Paper No.9008, Research Institute of Capital Formation, The Japan Development Bank, Tokyo.

[4] Barro, R.J.(1989). “The Stock Market and Investment,” NBER Working Paper No.2925.

[5] Bernanke,B., and M.Gertler(1989). “Agency Costs, Net Worth, and Business Fluctuations,” *American Economic Review* Vol.79, No.1 pp.14-31.

[6] Blanchard,O., Rhee,C., and L.Summers(1990). “The Stock Market, Profit and Investment,” NBER Working Paper No.3370.

[7] Blundell,R., Bond,S., Devereux,M., and F.Schiantarelli(1992). “Investment and Tobin's *q* Evidence from Company Panel Data,” *Journal of Econometrics* 51, pp.233-257.

[8] Bosworth,B.(1975). “The Stock Market and the Economy,” *Brookings Papers on Economic Activity* 2, pp.257-300.

[9] Chirinko,R.S.(1986). “Investment, Tobin's Q, and Multiple Capital Inputs,” NBER Working Paper No.2033.

[10] Devereux,M. and F.Schiantarelli(1990). “Investment, Financial Factors and Cash Flow: Evidence from U.K. Panel Data,” in Hubbard,R.G.(ed.), *Asymmetric Information, Corporate Finance, and Investment*, University of Chicago Press, Chicago, pp.279-306.

[11] Fazzari,S.M., Hubbard,R.G., and B.C.Petersen(1988). “Financing Constraints and Corporate

Investment," *Brookings Papers on Economic Activity* 1, pp.141-195.

[12] Fischer,S. and R.C.Merton(1984). "Macroeconomics and Finance: The Role of the Stock Market," *Carnegie-Rochester Conference Series on Public Policy* 21, pp.57-108.

[13] Galeotti,M. and F.Schiantarelli(1990). "Stock Market Volatility and Investment: Do only Fundamentals Matter?" Economic Research Reports # 90-15, C.V.Starr Center for Applied Economics, New York University.

[14] Gertler,M. and R.G.Hubbard(1988). "Financial Factors in Business Fluctuations, NBER Working Paper No.2758.

[15] Greewald,B.C. and I.E.Stiglitz(1988). "Financial Market Imperfections and Business Cycles," NBER Working Paper No.2494.

[16] Hayashi,F. (1982). "Tobin's Marginal Q and Average Q: A Neoclassical Interpretation, *Econometrica* 50, pp.213-224.

[17] Hayashi,F.and T.Inoue(1991). "The Relation between Firm Growth and Q with Multiple Capital Goods: Theory and Evidence from Panel Data on Japanese Firms," *Econometrica* 59, pp.731-753.

[18] Honmma,M., Hayashi,F., Atoda,N., and K.Hata(1984). Setsubi Toshi to Kigyo Zeisei (Corporate Investment and Taxes), Monograph 41 , Institute of Economic Research, Economic Planning Agency.

[19] Hoshi,T. and A.K.Kashyap(1990). "Evidence on Q and Investment for Japanese Firms," *Journal of the Japanese and International Economies* 4, pp.371-400.

[20] Hoshi,T., Kashyap,A., and D.Scharfstein(1990). "Bank Monitoring and Investment: Evidence from the Changing Structure of Japanese Corporate Banking Relationships," in Hubbard,R.G.(ed.), *Asymmetric Information, Corporate Finance, and Investment*, University of Chicago Press, Chicago, pp.105-126.

[21]————————————————————(1991). "Corporate Structure, Liquidity, and Investment: Evidence from Japanese Industrial Groups," *Quarterly Journal of Economics*,

Vol.CVI Issue 1, pp.33-60.

[22] Hubbard,R.G. and A.K.Kashyap(1992). “Internal Net Worth and the Investment Process: An Application to U.S. Agriculture,” *Journal of Political Economy*, Vol.100, No.3, pp.506-534.

[23] Hubbard,R.G., Kashyap,A.K., and T.M.Whited(1993). “Internal Finance and Firm Investment,” NBER Working Paper No.4392.

[24] Hulten,C., and F.Wykoff(1979). Economic Depreciation of the U.S. Capital Stock, Report submitted to U.S. Department of Treasury, Office of Tax Analysis, Washington,D.C.

[25]――――――――――――――――(1981), “The Measurement of Economics Depreciation,” C.Hulten (ed.) *Depreciation, Inflation and the Taxation of Income from Capital*, Urban Institute.

[26] Institute for Social Engineering(1976). Houjin Kigyou Toukei no Koudo Riyou ni kansuru Chousa Kenkyu (Research on Advanced Use of Report of Financial Statements of Incorporated Business).

[27] Iwamoto,Y.(1993). “Tokiteki Kabuka to Setsubi Toshi (Speculative Share Price and Business Investment),” *Nippon Keizai Kenkyu* (Nippon Keizai Kenkyu Center) No.26, pp.30-56.

[28] Iwata,K.(1990). “Shisan Kakaku Hendou no Keizai Kouka - Nippon to Beikoku no Hikaku- (Effects of Fluctuations in Asset Prices - Comparison between Japan and the U.S. -),” *Kinyu Kenkyu*(Research on Finance), Vol.9,No.1, pp.9-26.

[29] Miller,M.H. and Modigliani, F.(1961). “Dividend Policy, Growth and the Valuation of Shares,” *Journal of Business* 44, pp.411-433.

[30] Mitsui,K. and S.Kawachi(1993). “Cyushoukigyou no Setsubitoushi to Shikinchoutatsu (Corporate Investment under Financing Constraints and Government Lending),” Institute for Posts and Telecommunications Policy Discussion Paper No.1993-21.

[31] Miyagawa,T.(1993), “Kashishiburi to Shinsa Kinou - Hiseizougyou Chushoukigyou no Setsubitoushi wo Chusin toshite (Reluctance of Lending and Examination Mechanism of the Japanese Banking Sector - Investment of Small-sized Firms in the Non-manufacturing Sectors),”

JDB Discussion Paper No.9305, Research Institute of Capital Formation, The Japan Development Bank, Tokyo.

[32] Miyazaki,Y.(1992). *Fukugo Fukyo* (Complex Depression), Cyuko Shinsho 1078, Cyuou Kouron Sha.

[33] Modigliani,F. and Miller,M.H.(1958). "The Cost of Capital, Corporation Finance, and the Theory of Investment," *American Economic Review* 48, pp.261-297.

[34] Modigliani,F. and Miller,M.H.(1963). "Corporate Income Taxes and the Cost of Capital : A Correction," *American Economic Review* 53, pp.433-443.

[35] Morck,R., Shleifer,A., and R.W.Vishny(1990). "The Stock Market and Investment: Is the Market a Sideshow?", *Brookings Papers on Economic Activity* 2, pp.157-215.

[36] Ogawa,K. and S.Kitasaka(1994). "Shisan Shijou ni okeru Kigyo Hyoka to Setsubi Toshi (Valuation of Corporations in the Asset Market and Business Investment)," a paper presented at the Biwako Conference, July 7-9, 1994.

[37] Ohtaki,M. and K.Suzuki(1986), "Tobin no q to Rijunritsu • Waribikiritsu no Hendou (Tobin's q and the variations of profit rates and discount rates," *Kokumin Keizai* 152.

[38] Okazaki,T. and A.Horiuchi(1992). "Kigyo no Setsubi Toshi to Mein Banku Kankei (Corporate Investment and Main Bank Relationship)," *Kinyu Kenkyu* (Research on Finance), Vol.11, No.1, pp.37-59.

[39] Perron,P.(1988). "Trends and Random Walks in Macroeconomic Time Series: Further Evidence from a New Approach," *Journal of Economic Dynamics and Control* 12, pp.297-332.

[40] Pindyck,R.(1990). "Irreversibility, Uncertainty, and Investment," NBER Working Paper No.3307.

[41] Takeda,Y.(1993). "Setsubi Toshi to Kabushiki Shijyo (Capital Investment and the Stock Market)," *Nippon Keizai Kenkyu* (Nippon Keizai Kenkyu Center) No.24, pp.116-141.

[42] Ueda,K and H.Yoshikawa(1986). "Financial Volatility and the *q* Theory of Investment,"

Economica, 53, pp,11-27.

[43] Wildasin,D.(1984), "The q Theory of Investment with Many Capital Goods," *American Economic Review*, 74, pp.203-210.

[44] Whited,T.M.(1992), "Debt, Liquidity Constraints, and Corporate Investment : Evidence from Panel Data," *Journal of Finance* Vol.XLVII, No.4, pp.1425-1460.

[45] Yamamoto,T.(1988), *Keizai no Jikeiretsu Bunseki* (Time Series Analysis in Economics), Sobunsha.

[46] Yonezawa,Y.(1989), "Shisan Kakaku Hendo to Setsubi Toshi (Fluctuations of Asset Prices and Business Investment)," *Nippon Keizai Kenkyu* (Nippon Keizai Kenkyu Center) No.18, pp.45-59.

Table 1
Characteristics of the Business Cycles in Japan (Boom Periods)

Period	GNP	Private Final Consump-tion	Private Gross Invest-ment	Private Residential Invest-ment	Private Capital Invest-ment	Govern-ment Consump-tion	Exports etc.	Imports etc.	Unemploy-ment Rate	GNP Deflator	TOPIX	Land Price Index of Six Largest Cities	Contracted Interest Rates on Loans	M2 + CD
1. 1958 June - 1961 Dec.	10.5	9.34	23.8	17.2	24.4	5.85	8.54	19.9	1.78	5.82	28.7	40.1	8.14	20.5
2. 1962 Oct. - 1964 Oct.	9.92	9.83	15.6	22.2	12.0	5.29	13.3	17.2	1.23	5.60	0.01	17.0	7.85	21.8
3. 1965 Oct. - 1970 July	10.5	8.95	17.5	16.4	16.6	4.02	18.5	14.6	1.21	5.50	14.4	9.53	7.45	16.7
4. 1971 Dec. - 1973 Nov.	8.08	9.06	10.7	16.7	8.33	5.35	6.28	17.3	1.35	9.29	48.4	24.3	7.08	23.4
5. 1975 March - 1977 Jan.	4.38	3.55	2.09	7.81	0.08	4.97	11.2	3.27	1.93	7.07	9.06	-1.93	8.56	14.3
6. 1977 Oct. - 1980 Feb.	5.25	5.61	6.20	1.61	7.66	4.59	5.84	8.92	2.14	3.70	8.48	6.58	6.48	11.6
7. 1983 Feb. - 1985 June	3.91	2.87	5.34	-3.22	6.24	2.82	9.95	4.08	2.67	1.89	23.4	5.72	6.85	7.66
8. 1986 Nov. - 1990 Oct.	5.05	4.51	11.7	10.1	11.6	1.66	10.3	16.6	2.46	1.12	19.3	26.3	5.51	10.8

Notes: The figures are average rates of change (in percentage terms) against the same quarter of a year earlier except unemployment rate and contracted interest rate on loans. The figures of unemployment rate and contracted interest rate on loans are percent.

The original data come from the data base in Economic Planning Agency.

Table 2
Characteristics of the Business Cycles in Japan (Recession Periods)

Period	GNP	Private Final Consump-tion	Private Gross Invest-ment	Private Residential Invest-ment	Private Capital Invest-ment	Govern-ment Consump-tion	Exports etc.	Imports etc.	Unemploy-ment Rate	GNP Deflator	TOPIX	Land Price Index of Six Largest Cities	Contracted Interest Rates on Loans	M2 + CD
1. 1961 Dec. - 1962 Oct.	8.99	7.61	8.95	15.5	10.4	7.55	16.1	-0.06	1.31	4.77	-14.1	32.1	8.23	17.8
2. 1964 Oct. - 1965 Oct.	8.68	8.30	11.6	23.6	5.98	3.05	22.2	10.2	1.19	5.33	-6.54	6.9	7.86	16.3
3. 1970 July - 1971 Dec.	4.70	5.45	1.34	5.14	1.88	5.37	16.9	9.43	1.20	6.12	6.73	23.8	7.62	19.8
4. 1973 Nov. - 1975 March (First Oil Crisis)	0.56	1.97	-5.77	-7.00	-5.72	5.24	13.3	-0.74	1.50	18.7	-13.9	4.7	9.09	12.9
5. 1977 Jan. - 1977 Oct.	4.76	4.07	-0.29	0.97	0.80	3.95	9.54	2.43	2.01	6.01	9.40	2.6	7.65	11.4
6. 1980 Feb. - 1983 Feb. (Second Oil Crisis)	3.30	2.51	1.37	-3.28	2.75	3.19	9.92	-1.04	2.24	3.29	7.23	8.7	7.84	8.76
7. 1985 June - 1986 Nov.	3.56	3.60	7.02	5.87	5.14	3.47	-2.65	-1.02	2.70	1.64	28.2	14.7	6.24	8.49
8. 1990 Oct. - 1993 Sep.	2.23	1.72	-1.30	-4.22	-0.27	2.40	2.89	-1.89	2.18	1.65	-13.5	-12.0	6.48	2.48

Notes: The figures are average rates of change (in percentage terms) against the same quarter of a year earlier except unemployment rate and contracted interest rate on loans. The figures of unemployment rate and contracted interest rate on loans are percent.

The original data come from the data base in Economic Planning Agency.

Table 3

Relationship between the Proportions of Collateral Loans and the Share of Small Enterprises in Loan Outstandings

Dependent Variables	CONST.	TOPIXHAT$_{-1}$ x SMALL$_{-1}$	PLANDHAT$_{-1}$ x SMALL$_{-1}$	SMALL$_{-1}$	SCOL$_{-1}$	LCOL$_{-1}$	R^2 Durbin's h
SCOL	-0.0043 (-1.69)	0.0153 (2.90)		0.0109 (1.11)	0.9409 (4.28)		0.8843 -1.4806
LCOL	-0.1073 (-4.88)		0.0375 (1.15)	0.1786 (6.73)		1.0868 (20.32)	0.9757 -0.3506

Notes : The values in parentheses are t-values. R^2 is adjusted coefficient of determination.

Table 4

Unit Root Test of Discount Factor and Profit Rate

Industry	Discount Factor		Profit Rates	
	ADF	PP	ADF	PP
all industries	-3.2	-3.3	-12.8	-35.0**
construction	-4.5	-6.7	-11.6	-61.2**
manufacturing	-4.3	-4.0	-13.3	-37.6**
food and beverages	-4.6	-6.9	-36.7**	-98.4**
textiles	-3.2	-7.0	-38.3**	-42.6**
pulp, paper, and paper products	-5.3	-5.2	-130.4**	-26.2*
chemicals	-5.6	-4.1	-11.6	-50.4**
steel	-2.8	-2.9	-28.2**	-38.4**
non-ferrous metal	-5.1	-4.7	-100.5**	-22.5*
fabricated metal products	-2.8	-5.1	-17.6	-38.7**
machinery	-5.0	-6.1	-9.3	-58.0**
electrical machinery	-5.0	-7.3	-11.1	-28.4**
wholesale and retail trade	-4.3	-5.1	-54.3**	-44.6**
real estate	-4.6	-9.0	-52.2**	-34.2**

Notes: (1) The figures in the column of ADF are the Augmented Dickey-Fuller statistics of T(r - 1) type. The figures in the column of PP are the Phillips-Perron statistics of T(r - 1) type.

(2) For a unit root test of discount factor constant term is included as a non-stochastic term, while for the case of profit rate the trend variable is included as well as constant term.

(3) ** means rejection of unit root test at the 1 % significance level.
* means rejection of unit root test at the 5 % significance level.

Table 5

Choice of Lag Length Based On the Schwarz Information Criterion

Industry	Discount Factor	Profit Rates
all industries	1	1
construction	3	4
manufacturing	1	1
food and beverages	1	4
textiles	1	1
pulp, paper, and paper products	1	2
chemicals	1	4
steel	1	1
non-ferrous metal	1	2
fabricated metal products	1	1
machinery	3	4
electrical machinery	1	2
wholesale and retail trade	1	1
real estate	1	1

Notes: The lag length was chosen among the first to fourth order on the basis of the Schwarz Information Criterion.

Table 6

Estimation of the Stochastic Processes

Characterizing the Discount Factor and the Profit Rate

Industry	CONST.	TIME TREND	1st LAGGED	2nd LAGGED	3rd LAGGED	4th LAGGED	R^2/D.W.
All industries							
Discount factor	8.16×10^{-5}		-0.0034				-0.01
	(0.67)		(-0.03)				1.98
Profit rate	0.0180	5.92×10^{-5}	0.5324				0.44
	(4.80)	(2.27)	(5.62)				2.08
Construction							
Discount factor	1.54×10^{-4}		-0.3479	-0.3360	-0.3719		0.19
	(0.95)		(-3.39)	(-3.25)	(-3.64)		1.78
Profit rate	0.0074	2.98×10^{-4}	0.2139	0.0575	-0.0648	0.6202	0.55
	(0.59)	(2.99)	(2.30)	(0.59)	(-0.66)	(6.84)	1.60
Manufacturing							
Discount factor	8.00×10^{-5}		-0.0262				-0.01
	(0.56)		(-0.23)				1.98
Profit rate	0.0225	1.03×10^{-5}	0.4817				0.21
	(4.96)	(0.32)	(4.92)				1.95
Food and beverages							
Discount factor	9.23×10^{-5}		-0.3023				0.07
	(0.49)		(-2.88)				2.02
Profit rate	0.0211	4.22×10^{-5}	0.0594	-0.0215	-0.2181	0.7011	0.49
	(2.39)	(0.78)	(0.70)	(-0.26)	(-2.64)	(8.19)	1.52
Textiles							
Discount factor	1.12×10^{-4}		-0.0022				0.00
	(0.52)		(-1.08)				2.55
Profit rate	0.0170	9.40×10^{-5}	0.4244				0.19
	(3.33)	(1.19)	(4.19)				2.01
Pulp, paper, and paper products							
Discount factor	0.0115		-0.0128				-0.01
	(1.00)		(-0.11)				2.00
Profit rate	0.0128	-1.36×10^{-4}	0.9421	-0.4748			0.55
	(2.89)	(-1.74)	(9.66)	(-4.89)			1.90
Chemicals							
Discount factor	7.09×10^{-5}		0.0106				-0.01
	(0.51)		(0.09)				1.91
Profit rate	0.0276	-9.22×10^{-5}	0.3929	0.2735	-0.2619	0.2541	0.28
	(2.42)	(-1.54)	(3.55)	(2.38)	(-2.25)	(2.22)	2.05
Steel							
Discount factor	8.26×10^{-5}		-0.1054				-0.00
	(0.57)		(-0.96)				1.97
Profit rate	0.0609	-2.03×10^{-4}	0.4718				0.22
	(4.02)	(-1.03)	(4.83)				1.86

Table 6 (Continued)

Estimation of the Stochastic Processes

Characterizing the Discount Factor and the Profit Rate

Industry	CONST.	TIME TREND	1st LAGGED	2nd LAGGED	3rd LAGGED	4th LAGGED	R^2/D.W.
Non-ferrous metal							
Discount factor	8.47×10^{-5}		0.1289				0.00
	(0.48)		(1.19)				1.99
Profit rate	7.75×10^{-4}	3.31×10^{-5}	1.0272	-0.3785			0.62
	(0.53)	(1.17)	(9.98)	(-3.68)			1.93
Fabricated metal products							
Discount factor	1.92×10^{-4}		-0.2594				0.05
	(0.92)		(-2.35)				1.99
Profit rate	0.0024	1.22×10^{-4}	0.5058				0.75
	(2.53)	(4.45)	(5.34)				1.94
Machinery							
Discount factor	1.29×10^{-4}		-0.2046	-0.0432	-0.3346		0.12
	(0.78)		(-1.96)	(-0.41)	(-3.30)		1.87
Profit rate	0.0198	1.83×10^{-4}	0.2796	0.0590	-0.0078	0.4032	0.39
	(1.63)	(1.84)	(2.71)	(0.54)	(-0.07)	(3.88)	1.97
Electrical machinery	9.59×10^{-5}		-0.2372				0.04
Discount factor	(0.47)		(-2.22)				2.03
Profit rate	0.0379	-1.43×10^{-5}	0.5112	0.2256			0.44
	(2.58)	(-0.12)	(4.72)	(2.09)			1.95
Wholesale and retail trade	9.27×10^{-5}		-0.0657				-0.00
Discount factor	(0.55)		(-0.59)				1.99
Profit rate	0.1613	6.78×10^{-4}	0.4370				0.29
	(5.08)	(2.19)	(4.40)				1.94
Real estate							
Discount factor	4.22×10^{-5}		-0.1976				0.02
	(0.25)		(-1.88)				2.03
Profit rate	0.0213	1.43×10^{-6}	0.5854				0.33
	(4.41)	(0.03)	(6.60)				2.09

Notes: For notations, see Table 3. D.W. is Durbin-Watson Statistics.

Table 7

Summary Statistics of Average Q (AVQ) and Fundamentals (MAQ)

Industry	AVQ	MAQ	S.D.(AVQ)/S.D.(MAQ)
all industries	1.2135 (1.0797)	1.2493 (0.2412)	4.4764
construction	1.8020 (2.3842)	3.8475 (0.7805)	3.0547
manufacturing	1.5899 (1.2716)	1.1631 (0.2511)	5.0641
food and beverages	1.3981 (1.4760)	1.3952 (0.2655)	5.5593
textiles	0.9151 (1.0337)	1.1069 (0.2308)	4.4788
pulp, paper, and paper products	-0.0849 (0.0870)	0.1872 (0.2118)	0.4108
chemicals	2.5548 (1.9024)	2.0450 (0.5574)	3.4130
steel	3.3800 (1.6539)	2.0541 (0.5803)	2.8501
non-ferrous metal	0.1902 (0.2611)	0.2412 (0.1029)	2.5374
fabricated metal products	0.0583 (0.2889)	0.5976 (0.1685)	1.7145
machinery	2.7670 (2.2268)	3.6088 (0.6786)	3.2815
electrical machinery	7.6279 (4.5000)	4.3456 (1.0680)	4.2135
wholesale and retail trade	5.1149 (4.7562)	9.8541 (1.8123)	2.6244
real estate	-0.1896 (0.8943)	1.5040 (0.3778)	2.3671

Notes: (1) The values are sample means and those in the parentheses are standard deviations.

(2) S.D.(AVQ)/S.D.(MAQ): ratio of the standard deviation of the AVQ to that of the MAQ.

Table 8

Relationship between Average q (AVQ)
and the Fundamentals (MAQ)

Industry	CONST.	MAQ	R^2/D.W.
All industries	-0.0267 (-0.04)	0.9927 (2.06)	0.0376 0.0776
Construction	-8.0425 (-11.12)	2.5587 (13.89)	0.6980 0.6254
Manufacturing	0.3773 (0.58)	1.0426 (1.91)	0.0307 0.0934
Food and beverages	0.3532 (0.41)	0.7489 (1.23)	0.0062 0.0774
Textiles	-1.0350 (-1.99)	1.7618 (3.83)	0.1442 0.1510
Pulp, paper, and paper products	-0.0468 (-4.22)	-0.2035 (-5.17)	0.2366 0.2326
Chemicals	4.9723 (6.64)	-1.1821 (-3.34)	0.1092 0.0928
Steel	1.9176 (2.95)	0.7120 (2.34)	0.0510 0.1844
Non-ferrous metal	-0.2547 (-5.05)	1.8444 (9.59)	0.5229 0.3381
Fabricated metal products	-0.6052 (-6.75)	1.1101 (7.69)	0.4119 0.3594
Machinery	-2.0847 (-1.72)	1.3444 (4.07)	0.1577 0.2140
Electrical machinery	7.0871 (3.41)	0.1244 (0.27)	-0.0113 0.1040
Wholesale and Retail Trade	3.0680 (1.06)	0.2077 (0.72)	-0.0059 0.2132
Real Estate	0.1693 (0.42)	-0.2387 (-0.92)	-0.0019 0.2348

Notes: For notations see the notes in Table 3 and 6.

Table 9

Test of the Stock Market Efficiency

Industry	Test statistics	P-value
all industries	0.0481	0.9530
construction	138.1243	0.0000
manufacturing	4.8829	0.0099
food and beverages	0.0854	0.9182
textiles	3.0184	0.0545
pulp, paper, and paper products	1005.890	0.0000
chemicals	22.4303	0.0000
steel	28.8918	0.0000
non-ferrous metal	12.9988	0.0000
fabricated metal products	249.1942	0.0000
machinery	7.6683	0.0009
electrical machinery	23.8733	0.0000
wholesale and retail trade	45.2174	0.0000
real estate	161.6834	0.0000

Notes: Under the null hypothesis the test statistics follows the F distribution of degrees 2 and 82.

Table 10

Regression of the Market Valuation on

the Fundamentals and the Market Value of Land

Industry	CONST.	MAQ	LAND VALUE	R^2/D.W.
all industries	-0.2985 (-0.74)	-0.5873 (-1.68)	2.4087 (17.93)	0.8145 0.1709
construction	-4.6209 (-6.34)	0.5731 (1.88)	2.2912 (13.09)	0.9223 0.5231
manufacturing	-0.5501 (-1.28)	-0.1473 (-0.40)	2.8537 (16.50)	0.7791 0.2162
food and beverages	-0.6325 (-1.06)	-0.4914 (-1.13)	2.6923 (15.47)	0.7508 0.1656
textiles	-1.0081 (-3.11)	0.3328 (1.06)	2.2303 (20.49)	0.8657 0.2731
pulp,paper,and paper products	-0.0967 (-3.27)	-0.1893 (-4.78)	1.2164 (10.22)	0.6446 0.2342
chemicals	-0.5526 (-0.85)	-0.9038 (-4.20)	3.7795 (16.25)	0.7822 0.2434
steel	-0.0096 (-0.01)	0.7085 (2.73)	1.7194 (13.58)	0.6959 0.2460
non-ferrous metal	-0.2711 (-8.05)	0.4310 (2.28)	2.6982 (16.13)	0.8931 0.3618
fabricated metal products	-0.1615 (-2.02)	-0.2560 (-1.41)	1.7161 (21.79)	0.9419 0.5606
machinery	1.8814 (2.69)	-0.9972 (-4.19)	2.6340 (23.40)	0.9057 0.6056
electrical machinery	4.0926 (2.77)	-1.2419 (-3.51)	4.9754 (11.80)	0.6269 0.2106
wholesale and retail trade	2.4831 (1.07)	-0.4838 (-1.92)	1.5217 (20.11)	0.8433 0.3236
real estate	1.6951 (3.68)	0.1794 (0.74)	0.6301 (8.74)	0.5197 0.2877

Notes: For notations, see Table 3 and 6.

Table 11-1

Portfolio Equations of the Corporation :

Investment in Plant and Equipment

(Use of Average q as a Proxy of Profitability of Capital Investment)

Industry	CONST.	AVQ	LAND	CF	R-squ./D.W.
All Industries					
1	0.0574	-0.000042			0.2933
	(26.58)	(-0.06)			0.3355
2	0.0374	-0.0034	0.0206		0.4926
	(9.39)	(-3.94)	(5.66)		0.5227
3	0.0056	-0.0013		0.7642	0.6876
	(1.05)	(-2.67)		(10.04)	0.9684
4	-0.0019	-0.0035	0.0144	0.6693	0.7803
	(-0.41)	(-6.23)	(5.82)	(10.15)	1.3511
Construction					
1	0.0653	0.0020			0.0678
	(13.14)	(2.56)			0.4032
2	0.0303	-0.0024	0.0191		0.1636
	(2.52)	(-1.50)	(3.17)		0.4337
3	-0.0251	-0.0013		0.5343	0.6348
	(-2.89)	(-2.19)		(11.12)	1.5058
4	-0.0283	-0.0019	0.0029	0.5210	0.6323
	(-2.86)	(-1.78)	(0.68)	(10.02)	1.4856
Manufacturing					
1	0.0538	-0.0013			0.2071
	(19.13)	(-1.51)			0.1702
2	0.0340	-0.0049	0.0288		0.3747
	(6.96)	(-4.55)	(4.71)		0.2542
3	0.0084	-0.0017		0.6712	0.6180
	(1.59)	(-2.95)		(9.27)	0.8686
4	0.0009	-0.0040	0.0182	0.5970	0.6795
	(0.18)	(-5.11)	(4.00)	(8.67)	0.9207
Food and Beverages					
1	0.0424	-0.0009			0.0025
	(15.50)	(-1.15)			0.3642
2	0.0218	-0.0040	0.0214		0.2438
	(4.67)	(-4.38)	(5.12)		0.5224
3	0.0331	-0.0005		0.1833	0.0915
	(8.04)	(-0.66)		(2.96)	0.4910
4	0.0152	-0.0035	0.0202	0.1527	0.3405
	(3.01)	(-3.89)	(4.99)	(2.80)	0.6443

Table 11-1 (Contd.)

Portfolio Equations of the Corporation :

Investment in Plant and Equipment

(Use of Average q as a Proxy of Profitability of Capital Investment)

Industry	CONST.	AVQ	LAND	CF	R-squ./D.W.
Textiles					
1	0.0375	0.0032			0.0526
	(10.40)	(2.38)			0.4025
2	0.0335	0.0021	0.0049		0.0452
	(4.63)	(0.97)	(0.64)		0.4022
3	0.0326	0.0028		0.0988	0.1335
	(8.50)	(2.17)		(2.86)	0.5472
4	0.0292	0.0019	0.0043	0.0982	0.1258
	(4.12)	(0.90)	(0.58)	(2.83)	0.5461
Pulp, Paper, and Paper Products					
1	-0.0074	-0.0133			0.5255
	(-2.70)	(-7.64)			1.0301
2	-0.0125	-0.0131	0.0373		0.6134
	(-4.56)	(-8.36)	(4.35)		1.2877
3	-0.0060	-0.0107		0.2427	0.5480
	(-2.17)	(-5.27)		(2.22)	1.1342
4	-0.0112	-0.0115	0.0345	0.1546	0.6195
	(-3.92)	(-6.12)	(3.96)	(1.51)	1.3385
Chemicals					
1	0.0838	-0.0040			0.3032
	(16.12)	(-4.61)			0.5852
2	0.0512	-0.0060	0.0333		0.3487
	(3.73)	(-5.21)	(2.55)		0.6743
3	0.0296	-0.0030		0.5140	0.4634
	(2.50)	(-3.82)		(4.96)	0.9797
4	-0.0029	-0.0050	0.0332	0.5137	0.5113
	(-0.18)	(-4.94)	(2.94)	(5.19)	1.1234
Steel					
1	0.1876	0.0031			0.3528
	(8.47)	(0.77)			0.6054
2	0.2435	0.0102	-0.0454		0.4108
	(8.60)	(2.23)	(-2.96)		0.6897
3	0.1230	-0.0036		0.6309	0.4264
	(4.33)	(-0.84)		(3.34)	0.7360
4	0.1777	0.0030	-0.0366	0.5371	0.4608
	(5.00)	(0.60)	(-2.44)	(2.87)	0.7765

Table 11-1 (Contd.)

Portfolio Equations of the Corporation :

Investment in Plant and Equipment

(Use of Average q as a Proxy of Profitability of Capital Investment)

Industry	CONST.	AVQ	LAND	CF	R-squ./D.W.
Non-ferrous Metal					
1	0.0128	-0.00007			0.3954
	(10.89)	(-0.11)			1.2150
2	0.0096	-0.0012	0.0112		0.3999
	(3.53)	(-1.08)	(1.26)		1.2346
3	0.0107	-0.0005		0.1384	0.4068
	(6.21)	(-0.64)		(1.59)	1.2820
4	0.0088	-0.0012	0.0080	0.1168	0.4049
	(3.16)	(-1.08)	(0.87)	(1.29)	1.2827
Fabricated Metal Products					
1	0.0225	0.0058			0.2128
	(12.32)	(4.24)			0.9516
2	0.0022	-0.0062	0.0212		0.4924
	(0.66)	(-2.93)	(6.67)		1.4090
3	0.0211	0.0053		0.0392	0.2500
	(11.11)	(3.93)		(2.22)	0.9783
4	0.0013	-0.0064	0.0209	0.0348	0.5236
	(0.39)	(-3.14)	(6.77)	(2.47)	1.4655
Machinery					
1	0.0823	0.0025			0.2394
	(19.26)	(3.37)			0.8906
2	0.0749	0.0010	0.0062		0.2447
	(10.32)	(0.69)	(1.25)		0.9013
3	0.0156	0.00003		0.4482	0.5333
	(1.56)	(0.04)		(7.12)	1.3508
4	0.0166	0.0005	-0.0020	0.4578	0.5288
	(1.62)	(0.42)	(-0.50)	(6.93)	1.3626
Electrical Machinery	0.1226	0.0039			0.4390
1	(14.34)	(7.24)			0.6362
2	0.1168	0.0036	0.0057		0.4344
	(9.06)	(5.46)	(0.60)		0.6323
3	0.0162	0.0023		0.4654	0.7982
	(1.57)	(6.72)		(11.90)	1.4243
4	0.0218	0.0026	-0.0080	0.4762	0.8005
	(1.98)	(6.49)	(-1.38)	(12.01)	1.4976

Table 11-1 (Contd.)

Portfolio Equations of the Corporation :

Investment in Plant and Equipment

(Use of Average q as a Proxy of Profitability of Capital Investment)

Industry	CONST.	AVQ	LAND	CF	R-squ./D.W.
Wholesale and Retail Trade					
1	0.2138	0.0012			0.2544
	(23.68)	(1.96)			0.4629
2	0.1582	-0.0010	0.0074		0.5126
	(14.11)	(-1.74)	(6.54)		0.7231
3	0.1334	0.0004		0.1983	0.3687
	(6.02)	(0.68)		(3.92)	0.7052
4	0.1019	-0.0014	0.0067	0.1514	0.5771
	(5.41)	(-2.53)	(6.28)	(3.59)	1.0129
Real Estate					
1	0.0506	-0.0039			0.2591
	(10.47)	(-2.75)			1.3486
2	0.0315	-0.0017	0.0079		0.3067
	(3.56)	(-1.06)	(2.53)		1.4541
3	0.0371	-0.0051		0.2238	0.2995
	(5.01)	(-3.45)		(2.36)	1.4723
4	0.0266	-0.0031	0.0060	0.1576	0.3194
	(2.85)	(-1.68)	(1.81)	(1.57)	1.5111

Notes: For notations, see Table 3 and 6.

The coefficients of the seasonal dummies are suppressed.

Table 11-2

Portfolio Equations of the Corporation :

Real Purchase of Land

(Use of Average q as a Proxy of Profitability of Capital Investment)

Industry	CONST.	AVQ	LAND	CF	R-squ./D.W.
All Industries					
1	0.0054	-0.00069			0.2475
	(13.02)	(-4.87)			0.5125
2	0.0036	-0.00098	0.0018		0.2848
	(4.13)	(-5.19)	(2.26)		0.5696
3	-0.0040	-0.00092		0.1380	0.6198
	(-3.62)	(-8.91)		(8.85)	1.2285
4	-0.0043	-0.0010	0.0006	0.1343	0.6193
	(-3.73)	(-7.30)	(0.94)	(8.34)	1.2393
Construction					
1	0.0155	0.0002			-0.0166
	(7.41)	(0.51)			0.5308
2	0.0106	-0.0004	0.0027		-0.0165
	(1.98)	(-0.64)	(1.01)		0.5486
3	-0.0162	-0.0010		0.1873	0.4076
	(-3.62)	(-3.32)		(7.59)	1.1095
4	-0.0123	-0.0003	-0.0036	0.2036	0.4206
	(-2.46)	(-0.48)	(-1.66)	(7.74)	1.1589
Manufacturing					
1	0.0041	-0.0005			0.1934
	(10.13)	(-4.32)			0.3533
2	0.0027	-0.0008	0.0021		0.2287
	(3.45)	(-4.63)	(2.15)		0.3928
3	-0.0016	-0.0006		0.0846	0.5142
	(-1.95)	(-6.16)		(7.29)	1.0001
4	-0.0019	-0.0007	0.0006	0.0821	0.5116
	(-2.09)	(-4.83)	(0.77)	(6.80)	0.9888
Food and Beverages					
1	0.0053	-0.0008			0.1875
	(8.45)	(-4.39)			0.5081
2	0.0026	-0.0012	0.0028		0.2444
	(2.20)	(-5.16)	(2.64)		0.5826
3	0.0018	-0.0006		0.0689	0.3965
	(2.12)	(-4.07)		(5.33)	0.7887
4	-0.0002	-0.0010	0.0023	0.0655	0.4326
	(-0.17)	(-4.76)	(2.44)	(5.18)	0.8551

Table 11-2 (Contd.)

Portfolio Equations of the Corporation :

Real Purchase of Land

(Use of Average q as a Proxy of Profitability of Capital Investment)

Industry	CONST.	AVQ	LAND	CF	R-squ./D.W.
Textiles					
1	0.0021	-0.000069			-0.0399
	(2.62)	(-0.23)			1.3103
2	0.0033	0.0003	-0.0015		-0.0425
	(2.09)	(0.56)	(-0.90)		1.3226
3	0.0017	-0.0001		0.0076	-0.0412
	(1.93)	(-0.33)		(0.95)	1.3558
4	0.0030	0.0002	-0.0016	0.0078	-0.0431
	(1.83)	(0.52)	(-0.93)	(0.98)	1.3708
Pulp, Paper, and Paper Products					
1	-0.0017	-0.0017			0.1621
	(-2.63)	(-4.18)			1.6792
2	-0.0017	-0.0017	0.0002		0.1514
	(-2.41)	(-4.15)	(0.09)		1.6798
3	-0.0014	-0.0012		0.0478	0.1878
	(-2.16)	(-2.48)		(1.87)	1.7543
4	-0.0013	-0.0012	-0.0007	0.0496	0.1783
	(-1.76)	(-2.42)	(-0.31)	(1.89)	1.7570
Chemicals					
1	0.0068	-0.0005			0.2531
	(9.85)	(-4.31)			1.3044
2	0.0061	-0.0005	0.0006		0.2449
	(3.24)	(-3.36)	(0.38)		1.3106
3	0.0016	-0.0004		0.0487	0.3363
	(0.98)	(-3.59)		(3.30)	1.5927
4	0.0010	-0.0004	0.0007	0.0486	0.3290
	(0.42)	(-2.89)	(0.40)	(3.28)	1.5986
Steel					
1	0.0098	0.0003			0.0473
	(3.91)	(0.56)			0.8865
2	0.0151	0.0009	-0.0043		0.1025
	(4.61)	(1.75)	(-2.42)		0.9576
3	0.0032	-0.0004		0.0654	0.1350
	(0.96)	(-0.89)		(3.00)	0.9648
4	0.0082	0.0002	-0.0034	0.0568	0.1639
	(1.97)	(0.29)	(-1.92)	(2.59)	1.0013

Table 11-2 (Contd.)

Portfolio Equations of the Corporation :

Real Purchase of Land

(Use of Average q as a Proxy of Profitability of Capital Investment)

Industry	CONST.	AVQ	LAND	CF	R-squ./D.W.
Non-ferrous Metal					
1	0.0002	-0.0004			0.0685
	(0.67)	(-2.58)			1.8981
2	0.0003	-0.0004	-0.0004		0.0568
	(0.43)	(-1.39)	(-0.16)		1.9001
3	0.0002	-0.0004		-0.0018	0.0566
	(0.51)	(-2.39)		(-0.09)	1.8988
4	0.0003	-0.0004	-0.0003	-0.0010	0.0446
	(0.43)	(-1.38)	(-0.14)	(-0.04)	1.9003
Fabricated Metal Products					
1	0.0007	-0.0003			-0.0227
	(1.56)	(-0.97)			1.5193
2	-0.0007	-0.0011	0.0014		-0.0060
	(-0.68)	(-1.81)	(1.52)		1.6280
3	0.0005	-0.0004		0.0054	-0.0152
	(1.04)	(-1.17)		(1.26)	1.5260
4	-0.0008	-0.0011	0.0014	0.0051	-0.0004
	(-0.82)	(-1.87)	(1.47)	(1.20)	1.6316
Machinery					
1	0.0075	-0.0004			-0.0102
	(5.10)	(-1.75)			0.7026
2	0.0076	-0.0004	-0.0002		-0.0232
	(2.98)	(-0.89)	(-0.01)		0.7024
3	0.0072	-0.0010		0.0987	0.1401
	(-1.76)	(-3.60)		(3.85)	0.8973
4	-0.0062	-0.0006	-0.0019	0.1079	0.1446
	(-1.50)	(-1.24)	(-1.18)	(4.04)	0.9041
Electrical Machinery	0.0070	-0.0001			0.0303
1	(7.39)	(-1.99)			0.7327
2	0.0049	-0.0002	0.0021		0.0667
	(3.51)	(-2.83)	(2.02)		0.7824
3	-0.0016	-0.0002		0.0376	0.3587
	(-1.06)	(-4.68)		(6.44)	1.2843
4	-0.0024	-0.0003	0.0010	0.0362	0.3622
	(-1.43)	(-4.63)	(1.20)	(6.09)	1.3018

Table 11-2 (Contd.)

Portfolio Equations of the Corporation :

Real Purchase of Land

(Use of Average q as a Proxy of Profitability of Capital Investment)

Industry	CONST.	AVQ	LAND	CF	R-squ./D.W.
Wholesale and Retail Trade					
1	0.0561	-0.0015			0.2326
	(12.39)	(-5.07)			0.5978
2	0.0510	-0.0017	0.0007		0.2318
	(7.34)	(-4.71)	(0.96)		0.6170
3	0.0130	-0.0019		0.1061	0.3682
	(1.19)	(-6.69)		(4.24)	0.8720
4	0.0121	-0.0020	0.0002	0.1047	0.3608
	(1.06)	(-5.86)	(0.31)	(4.09)	0.8755
Real Estate					
1	0.0298	0.0015			0.0170
	(1.50)	(0.26)			0.8040
2	-0.0775	0.0139	0.0445		0.1459
	(-2.21)	(2.15)	(3.59)		0.9610
3	-0.0905	-0.0088		1.9941	0.3158
	(-3.46)	(-1.69)		(5.96)	1.3308
4	-0.1318	-0.0009	0.0236	1.7347	0.3419
	(-4.02)	(-0.14)	(2.02)	(4.92)	1.3574

Notes: For notations, see Table 3 and 6.

The coefficients of the seasonal dummies are suppressed.

Table 11-3

Portfolio Equations of the Corporation :

Net Borrowings

(Use of Average q as a Proxy of Profitability of Capital Investment)

Industry	CONST.	AVQ	LAND	CF	R-squ./D.W.
All Industries					
1	0.0270	-0.0007			0.2315
	(5.27)	(-0.38)			0.4966
2	-0.0171	-0.0080	0.0454		0.4173
	(-1.76)	(-3.84)	(5.12)		0.7257
3	-0.0657	-0.0030		1.3688	0.4715
	(-4.15)	(-2.00)		(6.07)	0.8805
4	-0.0839	-0.0083	0.0348	1.1389	0.5743
	(-5.67)	(-4.62)	(4.45)	(5.45)	1.1507
Construction					
1	0.0162	0.0064			0.4091
	(6.43)	(1.58)			0.9839
2	0.1246	0.0016	0.0206		0.4046
	(1.93)	(0.19)	(0.64)		0.9904
3	0.0391	0.0019		0.7285	0.4279
	(0.56)	(0.41)		(1.90)	1.0986
4	0.0416	0.0024	-0.0023	0.7388	0.4205
	(0.53)	(0.28)	(-0.07)	(1.77)	1.0996
Manufacturing					
1	0.0105	-0.0065			0.3631
	(2.16)	(-4.49)			0.5071
2	-0.0110	-0.0105	0.0314		0.4124
	(-1.22)	(-5.24)	(2.76)		0.6015
3	-0.0468	-0.0071		0.8466	0.5368
	(-4.20)	(-5.71)		(5.53)	0.8472
4	-0.0541	-0.0093	0.0176	0.7746	0.5478
	(-4.58)	(-5.24)	(1.70)	(4.93)	0.8745
Food and Beverages					
1	0.0502	0.0002			0.0364
	(2.58)	(0.04)			3.3643
2	0.0450	-0.0005	0.0054		0.0243
	(1.17)	(-0.07)	(0.16)		3.3676
3	0.0492	0.0003		0.0197	0.0240
	(1.60)	(0.05)		(0.04)	3.3630
4	0.0445	-0.0005	0.0053	0.0116	0.0117
	(1.02)	(-0.07)	(0.15)	(0.02)	3.3668

Table 11-3 (Contd.)

Portfolio Equations of the Corporation :

Net Borrowings

(Use of Average q as a Proxy of Profitability of Capital Investment)

Industry	CONST.	AVQ	LAND	CF	R-squ./D.W.
Textiles					
1	-0.0125	-0.0003			0.0746
	(-0.91)	(-0.06)			1.0315
2	0.0159	0.0074	-0.0348		0.0798
	(0.58)	(0.90)	(-1.20)		1.0506
3	-0.0184	-0.0008		0.1201	0.0717
	(-1.20)	(-0.15)		(0.87)	1.0296
4	0.0105	0.0071	-0.0356	0.1252	0.0777
	(0.37)	(0.86)	(-1.23)	(0.91)	1.0495
Pulp, Paper, and Paper Products					
1	-0.0309	-0.0210			0.3957
	(-5.51)	(-5.94)			1.1418
2	-0.0357	-0.0209	0.0355		0.4140
	(-5.85)	(-5.99)	(1.86)		1.1982
3	-0.0282	-0.0163		0.4569	0.4192
	(-4.98)	(-3.89)		(2.05)	1.1760
4	-0.0325	-0.0169	0.0284	0.3844	0.4277
	(-5.13)	(-4.05)	(1.47)	(1.69)	1.2114
Chemicals					
1	0.0126	-0.0063			0.3773
	(1.38)	(-4.18)			1.0813
2	-0.0372	-0.0094	0.0509		0.4061
	(-1.53)	(-4.61)	(2.20)		1.1797
3	-0.0165	-0.0058		0.2766	0.3835
	(-0.70)	(-3.72)		(1.34)	1.0983
4	-0.0663	-0.0089	0.0509	0.2762	0.4126
	(-2.06)	(-4.30)	(2.21)	(1.37)	1.1960
Steel					
1	0.0589	-0.0111			0.0609
	(2.08)	(-2.13)			0.4605
2	0.1241	-0.0029	-0.0530		0.1288
	(3.39)	(-0.50)	(-2.67)		0.5111
3	0.0214	-0.0151		0.3658	0.0733
	(0.56)	(-2.56)		(1.43)	0.5146
4	0.0947	-0.0061	-0.0491	0.2403	0.1277
	(1.97)	(-0.90)	(-2.42)	(0.95)	0.5382

Table 11-3 (Contd.)

Portfolio Equations of the Corporation :

Net Borrowings

(Use of Average q as a Proxy of Profitability of Capital Investment)

Industry	CONST.	AVQ	LAND	CF	R-squ./D.W.
Non-ferrous Metal					
1	-0.0196	-0.0149			0.2827
	(-4.11)	(-5.40)			1.0167
2	-0.0316	-0.0194	0.0431		0.2865
	(-2.83)	(-4.16)	(1.19)		1.0388
3	-0.0106	-0.0132		-0.6133	0.3004
	(-1.51)	(-4.55)		(-1.73)	1.1266
4	-0.0261	-0.0195	0.0650	-0.7888	0.3188
	(-2.33)	(-4.27)	(1.76)	(-2.17)	1.2116
Fabricated Metal Products					
1	-0.0102	-0.0115			0.0519
	(-1.47)	(-2.21)			1.5707
2	-0.0318	-0.0242	0.0226		0.0671
	(-2.01)	(-2.45)	(1.51)		1.6094
3	-0.0119	-0.0121		0.0472	0.0454
	(-1.61)	(-2.28)		(0.68)	1.5780
4	-0.0330	-0.0245	0.0222	0.0427	0.0597
	(-2.06)	(-2.47)	(1.48)	(0.62)	1.6157
Machinery					
1	-0.0131	-0.0064			0.3095
	(-0.70)	(-1.96)			1.2489
2	-0.0093	-0.0056	-0.0032		0.3008
	(-0.29)	(-0.89)	(-0.15)		1.2453
3	-0.1055	-0.0098		0.6204	0.3277
	(-1.90)	(-2.61)		(1.77)	1.3890
4	-0.0978	-0.0064	-0.0156	0.6942	0.3231
	(-1.73)	(-1.02)	(-0.69)	(1.89)	1.3906
Electrical Machinery	-0.0407	-0.0004			0.4094
1	(-1.62)	(-0.23)			2.1801
2	-0.1040	-0.0029	0.0630		0.4401
	(-2.83)	(-1.55)	(2.31)		2.3491
3	0.1532	-0.0020		0.4923	0.4517
	(-3.15)	(-1.22)		(2.66)	2.4129
4	-0.1886	-0.0039	0.0508	0.4239	0.4688
	(-3.66)	(-2.04)	(1.87)	(2.28)	2.5302

Table 11-3 (Contd.)

Portfolio Equations of the Corporation :

Net Borrowings

(Use of Average q as a Proxy of Profitability of Capital Investment)

Industry	CONST.	AVQ	LAND	CF	R-squ./D.W.
Wholesale and Retail Trade					
1	0.2539	-0.0034			0.1774
	(3.67)	(-0.73)			1.6937
2	0.0305	-0.0123	0.0296		0.2479
	(0.30)	(-2.28)	(2.90)		1.8487
3	-0.1601	-0.0074		1.0204	0.2285
	(-0.90)	(-1.56)		(2.50)	1.9331
4	-0.2818	-0.0145	0.0258	0.8398	0.2791
	(-1.57)	(-2.70)	(2.54)	(2.09)	2.0489
Real Estate					
1	0.1354	0.0227			0.0412
	(3.57)	(2.02)			0.9878
2	-0.2066	0.0621	0.1420		0.4133
	(-3.67)	(5.99)	(7.15)		1.6555
3	-0.0262	0.0089		2.6789	0.1791
	(-0.47)	(0.81)		(3.78)	1.3010
4	-0.2470	0.0511	0.1264	1.2908	0.4363
	(-4.21)	(4.45)	(6.05)	(2.05)	1.7891

Notes: For notations, see Table 3 and 6.

The coefficients of the seasonal dummies are suppressed.

Table 12-1

Portfolio Equations of the Corporation :

Investment in Plant and Equipment

(Use of Marginal q as a Proxy of Profitability of Capital Investment)

Industry	CONST.	MAQ	LAND	CF	R-squ./D.W.
All Industries					
1	0.0492	0.0230			0.7203
	(31.82)	(10.98)			0.8761
2	0.0492	0.0231	-0.000032		0.7168
	(20.31)	(9.46)	(-0.01)		0.8762
3	0.0337	0.0166		0.2605	0.7333
	(4.70)	(4.66)		(2.20)	0.8851
4	0.0331	0.0162	0.00054	0.2639	0.7301
	(4.30)	(4.16)	(0.24)	(2.20)	0.8848
Construction					
1	0.0243	0.0113			0.2472
	(2.60)	(5.19)			0.5105
2	0.0239	0.0119	-0.0010		0.2380
	(2.48)	(3.18)	(-0.22)		0.5153
3	-0.0161	-0.0012		0.5033	0.6141
	(-1.98)	(-0.58)		(8.72)	1.3631
4	-0.0189	0.0015	-0.0047	0.5131	0.6186
	(-2.27)	(0.53)	(-1.39)	(8.88)	1.4215
Manufacturing					
1	0.0463	0.0286			0.6490
	(23.71)	(10.23)			0.4095
2	0.0484	0.0296	-0.0031		0.6482
	(15.74)	(9.88)	(-0.91)		0.4167
3	0.0257	0.0198		0.3322	0.7037
	(4.67)	(5.82)		(3.95)	0.5740
4	0.0279	0.0208	-0.0034	0.3342	0.7044
	(4.76)	(5.90)	(-1.08)	(3.98)	0.5875
Food and Beverages					
1	0.0283	0.0277			0.6095
	(13.44)	(11.23)			0.8337
2	0.0270	0.0272	0.0016		0.6066
	(9.28)	(10.43)	(0.66)		0.8390
3	0.0264	0.0268		0.0477	0.6108
	(9.74)	(10.25)		(1.13)	0.8431
4	0.0244	0.0260	0.0020	0.0532	0.6093
	(6.91)	(9.33)	(0.84)	(1.24)	0.8537

Table 12-1 (Contd.)

Portfolio Equations of the Corporation :

Investment in Plant and Equipment

(Use of Marginal q as a Proxy of Profitability of Capital Investment)

Industry	CONST.	MAQ	LAND	CF	R-squ./D.W.
Textiles					
1	0.0317	0.0380			0.4031
	(10.78)	(7.36)			0.7403
2	0.0341	0.0402	-0.0033		0.4000
	(8.11)	(6.82)	(-0.77)		0.7630
3	0.0296	0.0354		0.0514	0.4188
	(9.41)	(6.66)		(1.75)	0.7744
4	0.0318	0.0374	-0.0030	0.0505	0.4150
	(7.29)	(6.19)	(-0.71)	(1.72)	0.7923
Pulp, Paper, and Paper Products	0.0280	0.0141			0.6235
1	(16.30)	(9.71)			1.2560
2	0.0225	0.0141	0.0388		0.7204
	(12.38)	(11.25)	(5.33)		1.7150
3	0.0236	0.0122		0.2319	0.6479
	(9.85)	(7.60)		(2.54)	1.3966
4	0.0201	0.0129	0.0360	0.1442	0.7277
	(9.03)	(9.10)	(4.88)	(1.76)	1.7918
Chemicals					
1	0.0433	0.0200			0.5887
	(8.58)	(9.53)			0.9595
2	0.0630	0.0204	-0.0182		0.6146
	(6.82)	(9.99)	(-2.51)		1.0295
3	0.0459	0.0207		-0.0360	0.5838
	(4.18)	(6.43)		(-0.27)	0.9573
4	0.0783	0.0234	-0.0214	-0.1652	0.6168
	(4.98)	(7.23)	(-2.78)	(-1.21)	1.0525
Steel					
1	0.0941	0.0669			0.6905
	(5.71)	(9.35)			1.3334
2	0.1496	0.0685	-0.0334		0.7353
	(7.08)	(10.33)	(-3.79)		1.5797
3	0.1142	0.0758		-0.2468	0.6964
	(5.53)	(8.41)		(-1.60)	1.4715
4	0.1657	0.0761	-0.0326	-0.2133	0.7394
	(7.02)	(9.11)	(-3.72)	(-1.49)	1.7175

Table 12-1 (Contd.)

Portfolio Equations of the Corporation :

Investment in Plant and Equipment

(Use of Marginal q as a Proxy of Profitability of Capital Investment)

Industry	CONST.	MAQ	LAND	CF	R-squ./D.W.
Non-ferrous Metal					
1	0.0170	0.0031			0.4280
	(8.32)	(2.12)			1.2741
2	0.0188	0.0040	-0.0049		0.4250
	(6.08)	(2.15)	(-0.76)		1.2872
3	0.0159	0.0027		0.0502	0.4229
	(5.53)	(1.61)		(0.55)	1.2848
4	0.0176	0.0036	-0.0059	0.0671	0.4214
	(5.07)	(1.84)	(-0.89)	(0.72)	1.3046
Fabricated Metal Products					
	0.0221	0.0134			0.3781
1	(17.59)	(6.61)			1.0824
2	0.0152	0.0050	0.0097		0.4551
	(6.59)	(1.63)	(3.49)		1.2774
3	0.0210	0.0134		0.0514	0.4537
	(17.18)	(7.09)		(3.45)	1.2165
4	0.0158	0.0068	0.0076	0.0403	0.4962
	(7.08)	(2.26)	(2.75)	(2.71)	1.3435
Machinery					
1	0.0526	0.0111			0.3088
	(6.18)	(4.52)			1.0439
2	0.0539	0.0096	0.0021		0.3031
	(6.11)	(2.65)	(0.59)		1.0342
3	0.0145	0.0017		0.4225	0.5360
	(1.57)	(0.67)		(6.30)	1.3348
4	0.0117	0.0032	-0.0025	0.4365	0.5342
	(1.19)	(1.03)	(-0.83)	(6.30)	1.3598
Electical Machinery	0.0679	0.0230			0.3245
1	(3.85)	(5.48)			0.5421
2	0.0655	0.0274	-0.0103		0.3194
	(3.61)	(3.41)	(-0.64)		0.5679
3	-0.0004	0.0062		0.5130	0.6953
	(-0.03)	(1.89)		(9.86)	0.8951
4	0.0006	0.0031	0.0069	0.5183	0.6929
	(0.04)	(0.53)	(0.63)	(9.79)	0.8936

Table 12-1 (Contd.)

Portfolio Equations of the Corporation :

Investment in Plant and Equipment

(Use of Marginal q as a Proxy of Profitability of Capital Investment)

Industry	CONST.	MAQ	LAND	CF	R-squ./D.W.
Wholesale and Retail Trade					
1	0.1088	0.0090			0.5467
	(6.73)	(7.57)			0.7658
2	0.1072	0.0063	0.0037		0.6123
	(7.17)	(4.89)	(3.79)		0.8813
3	0.1018	0.0084		0.0343	0.5435
	(5.28)	(5.52)		(0.66)	0.7786
4	0.1003	0.0057	0.0037	0.0343	0.6099
	(5.62)	(3.66)	(3.77)	(0.72)	0.8990
Real Estate					
1	0.0464	0.0140			0.2951
	(9.00)	(3.46)			1.4482
2	0.0315	0.0086	0.0066		0.3258
	(3.66)	(1.83)	(2.14)		1.5192
3	0.0509	0.0187		-0.1589	0.3021
	(8.30)	(3.50)		(-1.34)	1.5235
4	0.0353	0.0115	0.0059	-0.0751	0.3201
	(3.28)	(1.70)	(1.75)	(-0.59)	1.5419

Notes: For notations, see Table 3 and 6.

The coefficients of the seasonal dummies are suppressed.

Table 12-2

Portfolio Equations of the Corporation :

Real Purchase of Land

(Use of Marginal q as a Proxy of Profitability of Capital Investment)

Industry	CONST.	MAQ	LAND	CF	R-squ./D.W.
All Industries					
1	0.0040	0.0034			0.2978
	(8.84)	(5.58)			0.5464
2	0.0069	0.0053	-0.0035		0.5423
	(12.07)	(9.27)	(-6.57)		0.8811
3	0.0024	0.0028		0.0266	0.2938
	(1.12)	(2.59)		(0.74)	0.5415
4	0.0066	0.0052	-0.0035	0.0047	0.5365
	(3.53)	(5.48)	(-6.47)	(0.16)	0.8769
Construction					
1	0.0034	0.0032			0.1088
	(0.84)	(3.38)			0.6450
2	0.0008	0.0073	-0.0062		0.2023
	(0.20)	(4.68)	(-3.20)		0.8266
3	-0.0093	-0.0007		0.1587	0.3275
	(-2.15)	(-0.64)		(5.17)	0.8795
4	-0.0138	0.0037	-0.0075	0.1743	0.4691
	(-3.46)	(2.70)	(-4.67)	(6.34)	1.2495
Manufacturing					
1	0.0029	0.0038			0.4155
	(7.97)	(7.47)			0.5096
2	0.0050	0.0048	-0.0030		0.5849
	(10.46)	(10.33)	(-5.76)		0.7497
3	0.0011	0.0031		0.0288	0.4301
	(0.98)	(4.57)		(1.74)	0.5569
4	0.0031	0.0040	-0.0031	0.0307	0.6049
	(3.20)	(6.86)	(-5.96)	(2.22)	0.8425
Food and Beverages					
1	0.0020	0.0062			0.4591
	(3.17)	(8.29)			0.7794
2	0.0044	0.0071	-0.0029		0.5634
	(5.63)	(10.15)	(-4.46)		0.9940
3	-0.00004	0.0051		0.0509	0.5623
	(-0.05)	(7.24)		(4.43)	0.9382
4	0.0023	0.0061	-0.0025	0.0441	0.6395
	(2.66)	(8.93)	(-4.21)	(4.18)	1.1355

Table 12-2 (Contd.)

Portfolio Equations of the Corporation :

Real Purchase of Land

(Use of Marginal q as a Proxy of Profitability of Capital Investment)

Industry	CONST.	MAQ	LAND	CF	R-squ./D.W.
Non-ferrous Metal					
1	-0.0004	-0.0009			0.0565
	(-0.68)	(-2.36)			1.8586
2	0.0002	-0.0006	-0.0015		0.0547
	(0.24)	(-1.32)	(-0.92)		1.8864
3	-0.0004	-0.0009		0.0041	0.0448
	(-0.61)	(-2.16)		(0.18)	1.8584
4	0.00004	-0.0007	-0.0016	0.0087	0.0442
	(0.04)	(-1.36)	(-0.98)	(0.37)	1.8886
Fabricated Metal Products					
1	0.0010	-0.00003			-0.0349
	(3.04)	(-0.06)			1.4847
2	0.0010	-0.00003	0.000002		-0.0482
	(1.54)	(-0.04)	(0.00)		1.4847
3	0.0009	-0.00003		0.0046	-0.0329
	(2.65)	(-0.05)		(1.08)	1.4817
4	0.0011	0.0002	-0.0002	0.0049	-0.0451
	(1.64)	(0.21)	(-0.30)	(1.11)	1.4814
Machinery					
1	0.0042	0.0008			-0.0389
	(1.35)	(0.89)			0.6795
2	0.0018	0.0038	-0.0041		0.0759
	(0.57)	(3.04)	(-3.29)		0.8366
3	-0.0012	-0.0005		0.0597	0.00008
	(-0.28)	(-0.47)		(2.02)	0.6861
4	-0.0067	0.0025	-0.0050	0.0876	0.1712
	(-1.70)	(2.02)	(-4.14)	(3.16)	0.8983
Electical Machinery	0.0053	0.0002			-0.0155
1	(2.91)	(0.46)			0.6904
2	0.0053	0.0002	0.00008		-0.0285
	(2.83)	(0.20)	(0.05)		0.6905
3	0.0006	-0.0010		0.0351	0.2250
	(0.32)	(-2.16)		(5.05)	1.0480
4	0.0008	-0.0015	0.0013	0.0361	0.2226
	(0.42)	(-1.93)	(0.87)	(5.12)	1.0869

Table 12-2 (Contd.)

Portfolio Equations of the Corporation :

Real Purchase of Land

(Use of Marginal q as a Proxy of Profitability of Capital Investment)

Industry	CONST.	MAQ	LAND	CF	R-squ./D.W.
Textiles					
1	0.0017	0.0030			0.0178
	(2.11)	(2.14)			1.3649
2	0.0033	0.0046	-0.0024		0.0586
	(3.00)	(2.92)	(-2.08)		1.4415
3	0.0016	0.0029		0.0029	0.0065
	(1.80)	(1.94)		(0.36)	1.3756
4	0.0032	0.0044	-0.0024	0.0022	0.0470
	(2.75)	(2.72)	(-2.06)	(0.28)	1.4483
Pulp, Paper, and Paper Products					
1	0.0029	0.0019			0.2371
	(6.81)	(5.19)			1.8604
2	0.0028	0.0019	0.0004		0.2277
	(5.42)	(5.16)	(0.19)		1.8618
3	0.0021	0.0015		0.0416	0.2582
	(3.48)	(3.76)		(1.80)	1.9245
4	0.0022	0.0015	-0.0004	0.0426	0.2490
	(3.34)	(3.70)	(-0.20)	(1.79)	1.9255
Chemicals					
1	0.0028	0.0019			0.3254
	(3.34)	(5.39)			1.4254
2	0.0070	0.0019	-0.0039		0.4051
	(4.77)	(5.94)	(-3.40)		1.6178
3	0.0021	0.0017		0.0086	0.3181
	(1.19)	(3.23)		(0.39)	1.4385
4	0.0086	0.0022	-0.0043	-0.0170	0.4020
	(3.42)	(4.33)	(-3.46)	(-0.78)	1.6217
Steel					
1	0.0013	0.0061			0.3646
	(0.57)	(6.32)			1.4436
2	0.0066	0.0062	-0.0032		0.4075
	(2.22)	(6.69)	(-2.59)		1.5738
3	0.0023	0.0065		-0.0131	0.3596
	(0.83)	(5.33)		(-0.62)	1.4985
4	0.0073	0.0066	-0.0032	-0.0098	0.4016
	(2.19)	(5.54)	(-2.54)	(-0.48)	1.6165

Table 12-2 (Contd.)

Portfolio Equations of the Corporation :

Real Purchase of Land

(Use of Marginal q as a Proxy of Profitability of Capital Investment)

Industry	CONST.	MAQ	LAND	CF	R-squ./D.W.
Wholesale and Retail Trade					
1	0.0138	0.0027			0.1032
	(1.23)	(3.26)			0.5041
2	0.0151	0.0050	-0.0032		0.3106
	(1.54)	(5.80)	(-4.98)		0.7062
3	0.0161	0.0029		-0.0113	0.0929
	(1.20)	(2.74)		(-0.31)	0.5139
4	0.0174	0.0052	-0.0032	-0.0113	0.3028
	(1.48)	(5.01)	(-4.95)	(-0.36)	0.7206
Real Estate					
1	-0.0331	0.0771			0.2703
	(-1.77)	(5.24)			1.1069
2	-0.0429	0.0735	0.0044		0.2622
	(-1.34)	(4.20)	(0.38)		1.1076
3	-0.0670	0.0414		1.2011	0.3328
	(-3.13)	(2.22)		(2.90)	1.2505
4	-0.1177	0.0177	0.0191	1.4734	0.3466
	(-3.13)	(0.75)	(1.63)	(3.33)	1.3264

Notes: For notations, see Table 3 and 6.

The coefficients of the seasonal dummies are suppressed.

Table 12-3

Portfolio Equations of the Corporation :

Net Borrowings

(Use of Marginal q as a Proxy of Profitability of Capital Investment)

Industry	CONST.	MAQ	LAND	CF	R-squ./D.W.
All Industries					
1	0.0102	0.0468			0.5707
	(2.35)	(7.92)			0.9827
2	0.0101	0.0467	0.0002		0.5652
	(1.47)	(6.80)	(0.03)		0.9824
3	0.0137	0.0483		-0.0591	0.5654
	(0.66)	(4.66)		(-0.17)	0.9876
4	0.0136	0.0482	0.000082	-0.0586	0.5597
	(0.61)	(4.25)	(0.01)	(-0.17)	0.9874
Construction					
1	0.0670	0.0266			0.4254
	(1.28)	(2.20)			1.0128
2	0.0657	0.0286	-0.0030		0.4181
	(1.22)	(1.36)	(-0.12)		1.0132
3	0.0199	0.0120		0.5869	0.4306
	(0.31)	(0.73)		(1.31)	1.0864
4	0.0155	0.0164	-0.0073	0.6022	0.4238
	(0.24)	(0.72)	(-0.28)	(1.33)	1.0887
Manufacturing					
1	-0.0005	0.0293			0.3332
	(-0.10)	(3.96)			0.4915
2	0.0178	0.0375	-0.0264		0.3970
	(2.30)	(4.98)	(-3.06)		0.5617
3	-0.0328	0.0154		0.5224	0.3644
	(-2.12)	(1.61)		(2.21)	0.5248
4	-0.0153	0.0233	-0.0268	0.5389	0.4320
	(-0.98)	(2.49)	(-3.21)	(2.41)	0.6081
Food and Beverages					
1	0.0409	0.0188			0.0419
	(1.72)	(0.67)			3.3632
2	0.0423	0.0194	-0.0017		0.0296
	(1.28)	(0.66)	(-0.06)		3.3624
3	0.0447	0.0208		-0.0955	0.0301
	(1.45)	(0.70)		(-0.20)	3.3698
4	0.0472	0.0218	-0.0026	-0.1025	0.0176
	(1.16)	(0.68)	(-0.09)	(-0.21)	3.3691

Table 12-3 (Contd.)

Portfolio Equations of the Corporation :

Net Borrowings

(Use of Marginal q as a Proxy of Profitability of Capital Investment)

Industry	CONST.	MAQ	LAND	CF	R-squ./D.W.
Textiles					
1	-0.0168	0.0313			0.0937
	(-1.20)	(1.28)			1.0655
2	0.0059	0.0529	-0.0328		0.1126
	(0.30)	(1.91)	(-1.62)		1.1116
3	-0.0199	0.0275		0.0749	0.0851
	(-1.31)	(1.07)		(0.53)	1.0567
4	0.0030	0.0492	-0.0324	0.0658	0.1034
	(0.14)	(1.71)	(-1.60)	(0.47)	1.1012
Pulp, Paper, and Paper Products					
1	0.0274	0.0243			0.5351
	(7.94)	(8.34)			1.4467
2	0.0220	0.0243	0.0378		0.5588
	(5.34)	(8.56)	(2.29)		1.5495
3	0.0205	0.0212		0.3624	0.5511
	(4.20)	(6.52)		(1.95)	1.4766
4	0.0174	0.0219	0.0323	0.2839	0.5661
	(3.42)	(6.80)	(1.92)	(1.52)	1.5543
Chemicals					
1	-0.0286	0.0174			0.3425
	(-2.40)	(3.51)			1.0064
2	0.0004	0.0178	-0.0269		0.3536
	(0.02)	(3.63)	(-1.54)		1.0413
3	-0.0161	0.0205		-0.1715	0.3366
	(-0.63)	(2.71)		(-0.54)	1.0275
4	0.0356	0.0248	-0.0341	-0.3775	0.3501
	(0.94)	(3.17)	(-1.83)	(-1.14)	1.1124
Steel					
1	-0.0749	0.0627			0.2729
	(-2.79)	(5.37)			0.6489
2	0.0310	0.0656	-0.0636		0.4204
	(0.93)	(6.29)	(-4.59)		0.8188
3	0.0050	0.0978		-0.9771	0.4011
	(0.16)	(7.27)		(-4.23)	0.9561
4	0.1000	0.0984	-0.0601	-0.9153	0.5346
	(2.98)	(8.30)	(-4.84)	(-4.49)	1.2109

Table 12-3 (Contd.)

Portfolio Equations of the Corporation :

Net Borrowings

(Use of Marginal q as a Proxy of Profitability of Capital Investment)

Industry	CONST.	MAQ	LAND	CF	R-squ./D.W.
Non-ferrous Metal					
1	-0.0497	-0.0391			0.3824
	(-6.26)	(-6.83)			1.0368
2	-0.0519	-0.0402	0.0060		0.3750
	(-4.30)	(-5.55)	(0.24)		1.0371
3	-0.0452	-0.0374		-0.2043	0.3771
	(-4.05)	(-5.74)		(-0.57)	1.0622
4	-0.0480	-0.0388	0.0093	-0.2309	0.3701
	(-3.53)	(-5.10)	(0.36)	(-0.63)	1.0663
Fabricated Metal Products					
1	-0.0041	-0.0152			0.0301
	(-0.75)	(-1.73)			1.5625
2	-0.0082	-0.0201	0.0057		0.0200
	(-0.76)	(-1.41)	(0.44)		1.5683
3	-0.0046	-0.0151		0.0207	0.0188
	(-0.80)	(-1.72)		(0.30)	1.5633
4	-0.0080	-0.0195	0.0050	0.0134	0.0078
	(-0.73)	(-1.33)	(0.37)	(0.19)	1.5680
Machinery					
1	0.0080	-0.0107			0.2837
	(0.20)	(-0.92)			1.1816
2	-0.0076	0.0082	-0.0258		0.2959
	(-0.19)	(0.49)	(-1.54)		1.2158
3	-0.0369	-0.0218		0.4980	0.2897
	(-0.70)	(-1.51)		(1.29)	1.2647
4	-0.0735	-0.0018	-0.0330	0.6823	0.3140
	(-1.33)	(-0.10)	(-1.94)	(1.75)	1.3437
Electical Machinery	-0.0705	0.0072			0.4120
1	(-1.49)	(0.64)			2.1744
2	-0.0478	-0.0322	0.0932		0.4398
	(-1.01)	(-1.54)	(2.22)		2.3977
3	-0.1339	-0.0084		0.4765	0.4443
	(-2.52)	(-0.66)		(2.36)	2.3835
4	-0.1182	-0.0585	0.1118	0.5623	0.4873
	(-2.30)	(-2.66)	(2.75)	(2.87)	2.7828

Table 12-3 (Contd.)

Portfolio Equations of the Corporation :

Net Borrowings

(Use of Marginal q as a Proxy of Profitability of Capital Investment)

Industry	CONST.	MAQ	LAND	CF	R-squ./D.W.
Wholesale and Retail Trade					
1	-0.3976	0.0507			0.3687
	(-2.86)	(4.96)			2.2520
2	-0.3952	0.0548	-0.0057		0.3638
	(-2.83)	(4.51)	(-0.63)		2.2689
3	-0.3123	0.0583		-0.4209	0.3679
	(-1.89)	(4.49)		(-0.95)	2.2671
4	-0.3098	0.0624	-0.0057	-0.4210	0.3630
	(-1.86)	(4.28)	(-0.63)	(-0.95)	2.2847
Real Estate					
1	-0.0094	0.1355			0.2012
	(-0.25)	(4.55)			1.2204
2	-0.1065	0.1003	0.0433		0.2264
	(-1.68)	(2.89)	(1.89)		1.2864
3	-0.0538	0.0888		1.5720	0.2239
	(-1.21)	(2.28)		(1.82)	1.3134
4	-0.2362	0.0037	0.0689	2.5521	0.2916
	(-3.11)	(0.08)	(2.91)	(2.86)	1.5562

Notes: For notations, see Table 3 and 6.

The coefficients of the seasonal dummies are suppressed.

Table 13-1

Portfolio Equations of the Corporation :

Investment in Plant and Equipment

(Separate Treatment of the Fundamentals and the Non-fundamentals)

Industry	CONST.	MAQ	LAND	CF	NF	R-squ./D.W.
All Industries						
1	0.0489	0.0232			-0.0014	0.7456
	(33.15)	(11.58)			(-2.97)	1.0068
2	0.0423	0.0191	0.0079		-0.0025	0.7663
	(15.39)	(7.92)	(2.81)		(-4.19)	1.1263
3	0.0311	0.0158		0.3004	-0.0015	0.7644
	(4.58)	(4.69)		(2.69)	(-3.36)	1.0481
4	0.0159	0.0077	0.0105	0.4075	-0.0030	0.8017
	(2.17)	(2.07)	(3.94)	(3.84)	(-5.37)	1.3198
Construction						
1	0.0084	0.0139			-0.0020	0.2683
	(0.66)	(5.36)			(-1.81)	0.5690
2	0.0007	0.0102	0.0087		-0.0034	0.2770
	(0.05)	(2.72)	(1.39)		(-2.28)	0.5726
3	-0.0308	0.0013		0.5008	-0.0019	0.6364
	(-3.08)	(0.57)		(8.94)	(-2.40)	1.4653
4	-0.0319	0.0008	0.0015	0.4974	-0.0021	0.6321
	(-3.02)	(0.27)	(0.33)	(8.68)	(-1.96)	1.4601
Manufacturing						
1	0.0473	0.0286			-0.0025	0.7312
	(27.49)	(11.68)			(-5.01)	0.5617
2	0.0377	0.0240	0.0147		-0.0042	0.7704
	(12.67)	(9.36)	(3.79)		(-6.52)	0.6969
3	0.0281	0.0204		0.3087	-0.0024	0.7793
	(5.89)	(6.94)		(4.24)	(-5.26)	0.7633
4	0.0209	0.0169	0.0133	0.2850	-0.0040	0.8116
	(4.36)	(5.88)	(3.77)	(4.22)	(-6.69)	0.9048
Food and Beverages						
1	0.0285	0.0269			-0.0012	0.6347
	(13.99)	(11.14)			(-2.54)	0.9048
2	0.0201	0.0223	0.0103		-0.0026	0.6814
	(6.63)	(8.60)	(3.53)		(-4.39)	1.0775
3	0.0274	0.0264		0.0272	-0.0011	0.6320
	(10.27)	(10.36)		(0.65)	(-2.34)	0.9028
4	0.0189	0.0218	0.0103	0.0294	-0.0026	0.6796
	(5.47)	(8.03)	(3.53)	(0.75)	(-4.23)	1.0785

Table 13-1 (Contd.)

Portfolio Equations of the Corporation :

Investment in Plant and Equipment

(Separate Treatment of the Fundamentals and the Non-fundamentals)

Industry	CONST.	MAQ	LAND	CF	NF	R-squ./D.W.
Textiles						
1	0.0311	0.0399			-0.0013	0.4031
	(10.34)	(7.25)			(-1.00)	0.7753
2	0.0316	0.0401	-0.0005		-0.0011	0.3953
	(5.47)	(6.77)	(-0.09)		(-0.63)	0.7758
3	0.0291	0.0372		0.0500	-0.0011	0.4177
	(9.10)	(6.56)		(1.70)	(-0.92)	0.8020
4	0.0295	0.0374	-0.0005	0.0500	-0.0010	0.4098
	(5.06)	(6.15)	(-0.08)	(1.69)	(-0.59)	0.8024
Pulp, Paper, and Paper Products						
1	0.0134	0.0034			-0.0070	0.6849
	(3.38)	(1.14)			(-4.05)	1.4020
2	0.0084	0.0037	0.0380		-0.0067	0.7795
	(2.46)	(1.50)	(5.87)		(-4.68)	2.0393
3	0.0131	0.0038		0.1118	-0.0061	0.6866
	(3.32)	(1.28)		(1.19)	(-3.26)	1.4518
4	0.0084	0.0037	0.0379	0.0080	-0.0067	0.7766
	(2.44)	(1.49)	(5.66)	(0.10)	(-4.23)	2.0402
Chemicals						
1	0.0515	0.0156			-0.0022	0.6373
	(9.69)	(6.61)			(-3.40)	1.1093
2	0.0520	0.0157	-0.0006		-0.0022	0.6326
	(5.05)	(5.41)	(-0.06)		(-2.20)	1.1087
3	0.0551	0.0165		-0.0500	-0.0022	0.6334
	(5.18)	(5.06)		(-0.40)	(-3.40)	1.1083
4	0.0593	0.0174	-0.0034	-0.0690	-0.0020	0.6289
	(3.21)	(3.83)	(-0.28)	(-0.48)	(-1.87)	1.1057
Steel						
1	0.1042	0.0656			-0.0046	0.6963
	(5.94)	(9.18)			(-1.59)	1.3817
2	0.1503	0.0689	-0.0352		0.0011	0.7323
	(7.04)	(10.17)	(-3.39)		(0.34)	1.5824
3	0.1159	0.0724		-0.1783	-0.0033	0.6968
	(5.60)	(7.55)		(-1.06)	(-1.05)	1.4631
4	0.1734	0.0800	-0.0386	-0.2837	0.0037	0.7398
	(7.03)	(8.78)	(-3.70)	(-1.79)	(1.06)	1.7888

Table 13-1 (Contd.)

Portfolio Equations of the Corporation :

Investment in Plant and Equipment

(Separate Treatment of the Fundamentals and the Non-fundamentals)

Industry	CONST.	MAQ	LAND	CF	NF	R-squ./D.W.
Non-ferrous Metal						
1	0.0191	0.0050			-0.0027	0.4719
	(9.07)	(3.18)			(-2.75)	1.3984
2	0.0159	0.0038	0.0118		-0.0039	0.4787
	(5.14)	(2.15)	(1.42)		(-3.01)	1.4281
3	0.0181	0.0046		0.0436	-0.0027	0.4667
	(6.29)	(2.62)		(0.50)	(-2.72)	1.4038
4	0.0158	0.0038	0.0116	0.0075	-0.0039	0.4718
	(4.67)	(2.02)	(1.32)	(0.08)	(-2.89)	1.4280
Fabricated Metal Products						
1	0.0225	0.0133			0.0006	0.3712
	(13.80)	(6.50)			(0.37)	1.0897
2	0.0057	-0.0010	0.0176		-0.0063	0.5068
	(1.48)	(-0.28)	(4.74)		(-3.03)	1.4343
3	0.0206	0.0135		0.0528	-0.0006	0.4477
	(12.64)	(7.05)		(3.44)	(-0.40)	1.2150
4	0.0058	0.0006	0.0158	0.0428	-0.0066	0.5553
	(1.60)	(0.18)	(4.43)	(3.07)	(-3.35)	1.5431
Machinery						
1	0.0567	0.0103			0.0013	0.3221
	(6.43)	(4.13)			(1.60)	1.0545
2	0.0568	0.0159	-0.0091		0.0030	0.3301
	(6.48)	(3.38)	(-1.39)		(2.04)	1.1269
3	0.0139	0.0017		0.4255	-0.00009	0.5301
	(1.35)	(0.68)		(5.69)	(-0.13)	1.3382
4	0.0145	0.0061	-0.0071	0.4198	0.0013	0.5343
	(1.42)	(1.45)	(-1.30)	(5.90)	(1.01)	1.3643
Electrical Machinery	0.0988	0.0111			0.0031	0.4490
1	(5.66)	(2.37)			(4.34)	0.6545
2	0.0959	0.0165	-0.0130		0.0031	0.4476
	(5.40)	(2.16)	(-0.89)		(4.37)	0.6818
3	0.0299	-0.0045		0.5013	0.0029	0.8082
	(2.54)	(-1.47)		(12.13)	(6.85)	1.6156
4	0.0304	-0.0062	0.0039	0.5044	0.0029	0.8062
	(2.56)	(-1.26)	(0.45)	(11.98)	(6.78)	1.6266

Table 13-1 (Contd.)

Portfolio Equations of the Corporation :

Investment in Plant and Equipment

(Separate Treatment of the Fundamentals and the Non-fundamentals)

Industry	CONST.	MAQ	LAND	CF	NF	R-squ./D.W.
Wholesale and Retail Trade						
1	0.1093	0.0092			0.0004	0.5452
	(6.75)	(7.59)			(0.86)	0.7676
2	0.1060	0.0054	0.0046		-0.0007	0.6168
	(7.12)	(3.69)	(3.95)		(-1.38)	0.9179
3	0.1043	0.0087		0.0244	0.0004	0.5405
	(5.31)	(5.46)		(0.45)	(0.70)	0.7748
4	0.0933	0.0040	0.0048	0.0609	-0.0009	0.6193
	(5.16)	(2.18)	(4.12)	(1.23)	(-1.71)	0.9776
Real Estate						
1	0.0399	0.0100			-0.0039	0.3552
	(7.38)	(2.43)			(-2.89)	1.6053
2	0.0364	0.0089	0.0020		-0.0033	0.3490
	(4.13)	(1.94)	(0.51)		(-1.94)	1.6028
3	0.0403	0.0104		-0.0107	-0.0038	0.3469
	(5.55)	(1.68)		(-0.08)	(-2.52)	1.6071
4	0.0365	0.0090	0.0020	-0.0018	-0.0033	0.3404
	(3.44)	(1.33)	(0.50)	(-0.01)	(-1.83)	1.6031

Notes: For notations, see Table 3 and 6.

The coefficients of the seasonal dummies are suppressed.

Table 13-2

Portfolio Equations of the Corporation :

Real Purchase of Land

(Separate Treatment of the Fundamentals and the Non-fundamentals)

Industry	CONST.	MAQ	LAND	CF	NF	R-squ./D.W.
All Industries						
1	0.0038	0.0035			-0.0009	0.6802
	(12.54)	(8.48)			(-9.77)	1.3045
2	0.0047	0.0041	-0.0010		-0.0008	0.6884
	(8.03)	(7.90)	(-1.75)		(-6.13)	1.3436
3	0.0008	0.0022		0.0521	-0.0009	0.6953
	(0.53)	(3.17)		(2.21)	(-10.19)	1.3585
4	0.0019	0.0029	-0.0008	0.0444	-0.0008	0.6975
	(1.10)	(3.34)	(-1.25)	(1.82)	(-6.48)	1.3728
Construction						
1	-0.0091	0.0053			-0.0016	0.2153
	(-1.72)	(4.91)			(-3.42)	0.8943
2	-0.0063	0.0067	-0.0032		-0.0010	0.2204
	(-1.10)	(4.29)	(-1.23)		(-1.67)	0.9101
3	-0.0214	0.0014		0.1567	-0.0015	0.4322
	(-4.25)	(1.18)		(5.55)	(-3.92)	1.1933
4	-0.0175	0.0035	-0.0057	0.1689	-0.0006	0.4715
	(-3.43)	(2.52)	(-2.59)	(6.13)	(-1.16)	1.2975
Manufacturing						
1	0.0031	0.0038			-0.0007	0.7434
	(13.12)	(11.25)			(-10.10)	1.2397
2	0.0033	0.0039	-0.0002		-0.0007	0.7405
	(7.24)	(10.02)	(-0.33)		(-6.91)	1.2385
3	0.0018	0.0032		0.0220	-0.0007	0.7531
	(2.46)	(7.33)		(2.01)	(-10.15)	1.3233
4	0.0019	0.0033	-0.0003	0.0226	-0.0007	0.7508
	(2.45)	(7.07)	(-0.52)	(2.04)	(-6.79)	1.3255
Food and Beverages						
1	0.0022	0.0055			-0.0009	0.6894
	(4.51)	(9.74)			(-7.72)	1.4311
2	0.0022	0.0056	-0.000036		-0.0009	0.6853
	(2.84)	(8.42)	(-0.05)		(-5.59)	1.4307
3	0.0007	0.0049		0.0370	-0.0008	0.7417
	(1.16)	(8.90)		(4.10)	(-7.43)	1.6054
4	0.0007	0.0049	0.000009	0.0370	-0.0008	0.7383
	(0.82)	(7.74)	(0.01)	(4.07)	(-5.48)	1.6055

Table 13-2 (Contd.)

Portfolio Equations of the Corporation :

Real Purchase of Land

(Separate Treatment of the Fundamentals and the Non-fundamentals)

Industry	CONST.	MAQ	LAND	CF	NF	R-squ./D.W.
Textiles						
1	0.0014	0.0038			-0.0005	0.0377
	(1.75)	(2.59)			(-1.61)	1.4160
2	0.0031	0.0046	-0.0021		-0.0001	0.0466
	(2.04)	(2.89)	(-1.31)		(-0.20)	1.4429
3	0.0013	0.0037		0.0022	-0.0005	0.0258
	(1.52)	(2.39)		(0.28)	(-1.58)	1.4227
4	0.0030	0.0044	-0.0021	0.0022	-0.00009	0.0346
	(1.92)	(2.70)	(-1.30)	(0.27)	(-0.19)	1.4495
Pulp, Paper, and Paper Products						
1	0.0012	0.0006			-0.0008	0.2564
	(1.14)	(0.80)			(-1.75)	1.8997
2	0.0012	0.0006	0.0003		-0.0008	0.2470
	(1.07)	(0.80)	(0.15)		(-1.73)	1.9008
3	0.0011	0.0007		0.0304	-0.0006	0.2609
	(1.08)	(0.94)		(1.21)	(-1.13)	1.9323
4	0.0012	0.0007	-0.0003	0.0312	-0.0006	0.2514
	(1.07)	(0.93)	(-0.13)	(1.21)	(-1.11)	1.9326
Chemicals						
1	0.0040	0.0012			-0.0003	0.3953
	(4.59)	(3.01)			(-3.18)	1.6029
2	0.0062	0.0016	0.0026		-0.0002	0.4050
	(3.69)	(3.35)	(-1.51)		(-1.00)	1.6383
3	0.0036	0.0011		0.0065	-0.0003	0.3882
	(2.02)	(1.96)		(0.31)	(-3.15)	1.6126
4	0.0073	0.0018	-0.0031	-0.0107	-0.0001	0.3988
	(2.43)	(2.49)	(-1.54)	(-0.45)	(-0.76)	1.6347
Steel						
1	0.0022	0.0059			-0.0004	0.3669
	(0.94)	(6.15)			(-1.14)	1.4827
2	0.0067	0.0063	-0.0034		0.0001	0.4002
	(2.22)	(6.58)	(-2.31)		(0.22)	1.5723
3	0.0025	0.0061		-0.0045	-0.0004	0.3590
	(0.90)	(4.68)		(-0.20)	(-0.96)	1.4978
4	0.0078	0.0068	-0.0035	-0.0142	0.0002	0.3954
	(2.21)	(5.23)	(-2.37)	(-0.63)	(0.46)	1.6340

Table 13-2 (Contd.)

Portfolio Equations of the Corporation :

Real Purchase of Land

(Separate Treatment of the Fundamentals and the Non-fundamentals)

Industry	CONST.	MAQ	LAND	CF	NF	R-squ./D.W.
Non-ferrous Metal						
1	-0.0001	-0.0007			-0.0003	0.0377
	(-0.20)	(-1.63)			(-1.19)	1.4160
2	-0.00001	-0.0006	-0.0004		-0.0003	0.0496
	(-0.24)	(-1.34)	(-0.17)		(-0.76)	1.8977
3	-0.0002	-0.0007		0.0033	-0.0003	0.0495
	(-0.24)	(-1.51)		(0.14)	(-1.18)	1.8947
4	-0.00001	-0.0007	-0.0005	0.0049	-0.0002	0.0377
	(-0.09)	(2.70)	(-1.30)	(0.27)	(-0.19)	1.8974
Fabricated Metal Products						
1	0.0007	0.00004			-0.0006	-0.0269
	(1.56)	(0.08)			(-1.27)	1.5487
2	-0.0007	-0.0011	0.0014		-0.0011	-0.0191
	(-0.58)	(-1.04)	(1.26)		(-1.80)	1.6280
3	0.0011	0.0007		0.0304	-0.0006	0.2609
	(0.99)	(0.13)		(1.42)	(-1.57)	1.5687
4	-0.0006	-0.0009	0.0012	0.0054	-0.0012	-0.0124
	(-0.57)	(-0.84)	(1.05)	(1.23)	(-1.87)	1.6325
Machinery						
1	0.0019	0.0013			-0.0007	0.0270
	(0.59)	(1.43)			(-2.52)	0.7830
2	0.0019	0.0042	-0.0048		0.0002	0.0653
	(0.62)	(2.51)	(-2.05)		(0.35)	0.8392
3	-0.0075	-0.0006		0.0936	-0.0010	0.1306
	(-1.79)	(-0.60)		(3.21)	(-3.56)	0.8942
4	-0.0071	0.0021	-0.0043	0.0901	-0.0002	0.1618
	(-1.73)	(1.22)	(-1.97)	(3.14)	(-0.37)	0.9059
Electical Machinery	0.0028	0.0011			-0.0002	0.0926
1	(1.50)	(2.29)			(-3.23)	0.8225
2	0.0029	0.0100	0.0003		-0.0002	0.0812
	(1.50)	(1.24)	(0.19)		(-3.21)	0.8210
3	-0.0022	0.00002		0.0362	-0.0003	0.3530
	(-1.20)	(0.05)		(5.69)	(-4.05)	1.2775
4	-0.0020	-0.0007	0.0015	0.0374	-0.0003	0.3559
	(-1.10)	(-0.88)	(1.16)	(5.82)	(-4.12)	1.3225

Table 13-2 (Contd.)

Portfolio Equations of the Corporation :

Real Purchase of Land

(Separate Treatment of the Fundamentals and the Non-fundamentals)

Industry	CONST.	MAQ	LAND	CF	NF	R-squ./D.W.
Wholesale and Retail Trade						
1	0.0116	0.0019			-0.0019	0.4459
	(1.31)	(2.83)			(-7.06)	0.9197
2	0.0126	0.0030	-0.0014		-0.0015	0.4677
	(1.45)	(3.53)	(-2.05)		(-4.90)	0.9579
3	0.0026	0.0010		0.0438	-0.0020	0.4550
	(0.24)	(1.20)		(1.52)	(-7.27)	0.9507
4	0.0054	0.0022	-0.0012	0.0344	-0.0016	0.4706
	(0.51)	(2.07)	(-1.81)	(1.19)	(-5.04)	0.9689
Real Estate						
1	-0.0299	0.0791			0.0019	0.2623
	(-1.45)	(5.04)			(0.38)	1.1095
2	-0.0504	0.0730	0.0115		0.0051	0.2585
	(-1.50)	(4.16)	(0.78)		(0.78)	1.1175
3	-0.0827	0.0290		1.4209	-0.0056	0.3334
	(-3.16)	(1.31)		(3.05)	(-1.04)	1.2915
4	-0.1173	0.0168	0.0177	1.5009	-0.0012	0.3383
	(-3.09)	(0.70)	(1.25)	(3.21)	(-0.19)	1.3298

Notes: For notations, see Table 3 and 6.

The coefficients of the seasonal dummies are suppressed.

Table 13-3

Portfolio Equations of the Corporation :

Net Borrowings

(Separate Treatment of the Fundamentals and the Non-fundamentals)

Industry	CONST.	MAQ	LAND	CF	NF	R-squ./D.W.
All Industries						
1	0.0096	0.0472			-0.0034	0.5995
	(2.29)	(8.25)			(-2.58)	1.1108
2	-0.0073	0.0367	0.0201		-0.0062	0.6245
	(-0.92)	(5.28)	(2.49)		(-3.65)	1.2093
3	0.0077	0.0464		0.0319	-0.0034	0.5944
	(0.38)	(4.62)		(0.10)	(-2.56)	1.1085
4	-0.0237	0.0296	0.0217	0.2532	-0.0065	0.6224
	(-1.03)	(2.55)	(2.59)	(0.76)	(-3.71)	1.2059
Construction						
1	0.0606	0.0277			-0.0008	0.4181
	(0.84)	(1.87)			(-0.13)	1.0140
2	0.0618	0.0283	-0.0014		-0.0006	0.4106
	(0.78)	(1.31)	(-0.04)		(-0.07)	1.0138
3	0.0147	0.0129		0.5861	-0.0006	0.4233
	(0.18)	(0.69)		(1.30)	(-0.10)	1.0869
4	0.0218	0.0167	-0.0103	0.6098	0.0010	0.4163
	(0.26)	(0.72)	(-0.28)	(1.32)	(0.12)	1.0890
Manufacturing						
1	0.0026	0.0292			-0.0080	0.5625
	(0.63)	(4.87)			(-6.51)	0.8347
2	-0.0066	0.0248	0.0143		-0.0097	0.5677
	(-0.84)	(3.67)	(1.39)		(-5.64)	0.8749
3	-0.0250	0.0174		0.4456	-0.0078	0.5860
	(-1.99)	(2.25)		(2.33)	(-6.54)	0.8727
4	-0.0316	0.0142	0.0122	0.4239	-0.0093	0.5886
	(-2.32)	(1.74)	(1.22)	(2.21)	(-5.50)	0.9033
Food and Beverages						
1	0.0409	0.0189			-0.00004	0.0296
	(1.70)	(0.66)			(-0.01)	3.3632
2	0.0436	0.0204	-0.0034		0.0005	0.0171
	(1.13)	(0.62)	(-0.09)		(0.07)	3.3611
3	0.0449	0.0207		-0.0990	-0.0002	0.0175
	(1.43)	(0.69)		(-0.20)	(-0.03)	3.3702
4	0.0478	0.0223	-0.0035	-0.0998	0.0003	0.0047
	(1.08)	(0.65)	(-0.09)	(-0.20)	(0.04)	3.3681

Table 13-3 (Contd.)

Portfolio Equations of the Corporation :

Net Borrowings

(Separate Treatment of the Fundamentals and the Non-fundamentals)

Industry	CONST.	MAQ	LAND	CF	NF	R-squ./D.W.
Textiles						
1	-0.0194	0.0391			-0.0051	0.0905
	(-1.35)	(1.49)			(-0.85)	1.0822
2	0.0136	0.0531	-0.0413		0.0035	0.1028
	(0.50)	(1.91)	(-1.43)		(0.42)	1.1126
3	-0.0221	0.0354		0.0688	-0.0049	0.0812
	(-1.43)	(1.29)		(0.48)	(-0.82)	1.0724
4	0.0108	0.0494	-0.0413	0.0678	0.0036	0.0935
	(0.39)	(1.70)	(-1.42)	(0.48)	(0.43)	1.1023
Pulp, Paper, and Paper Products						
1	0.0079	0.0101			-0.0093	0.5650
	(0.94)	(1.60)			(-2.54)	1.5084
2	0.0031	0.0104	0.0367		-0.0090	0.5877
	(0.37)	(1.70)	(2.30)		(-2.54)	1.6196
3	0.0074	0.0108		0.2129	-0.0076	0.5659
	(0.88)	(1.72)		(1.07)	(-1.91)	1.5104
4	0.0031	0.0108	0.0345	0.1183	-0.0081	0.5842
	(0.37)	(1.75)	(2.09)	(0.59)	(-2.09)	1.6109
Chemicals						
1	-0.0097	0.0072			-0.0051	0.4165
	(-0.77)	(1.29)			(-3.32)	1.1766
2	-0.0368	0.0020	0.0330		-0.0074	0.4220
	(-1.53)	(0.30)	(1.32)		(-3.20)	1.2187
3	0.0052	0.0108		-0.2039	-0.0052	0.4125
	(0.21)	(1.41)		(-0.69)	(-3.33)	1.2101
4	0.0342	0.0026	0.0320	-0.0244	-0.0074	0.4144
	(-0.79)	(0.25)	(1.12)	(-0.07)	(-2.94)	1.2207
Steel						
1	-0.0321	0.0569			-0.0196	0.4192
	(-1.25)	(5.42)			(-4.57)	0.8060
2	0.0228	0.0609	-0.0419		-0.0128	0.4617
	(0.71)	(5.96)	(-2.68)		(-2.64)	0.8724
3	0.0122	0.0827		-0.6746	-0.0147	0.4680
	(0.42)	(6.13)		(-2.86)	(-3.29)	0.9645
4	0.0089	0.0929	-0.0516	-0.8156	-0.0053	0.5353
	(2.54)	(7.17)	(-3.49)	(-3.63)	(-1.06)	1.1717

Table 13-3 (Contd.)

Portfolio Equations of the Corporation :

Net Borrowings

(Separate Treatment of the Fundamentals and the Non-fundamentals)

Industry	CONST.	MAQ	LAND	CF	NF	R-squ./D.W.
Non-ferrous Metal						
1	-0.0466	-0.0364			-0.0039	0.3822
	(-5.46)	(-5.74)			(-0.99)	1.0561
2	-0.0579	-0.0405	0.0409		-0.0082	0.3859
	(-4.61)	(-5.65)	(1.22)		(-1.55)	1.0817
3	-0.0419	-0.0346		-0.2140	-0.0039	0.3771
	(-3.59)	(-4.86)		(-0.60)	(-1.00)	1.0856
4	-0.0524	-0.0383	0.0516	-0.3755	-0.0094	0.3862
	(-3.84)	(-5.10)	(1.46)	(-1.01)	(-1.74)	1.1484
Fabricated Metal Products						
	-0.0102	-0.0139			-0.0099	0.0411
1	(-1.46)	(-1.58)			(-1.38)	1.5755
2	-0.0443	-0.0428	0.0357		-0.0238	0.0777
	(-2.44)	(-2.57)	(2.02)		(-2.42)	1.6531
3	-0.0118	-0.0137		0.0446	-0.0109	0.0337
	(-1.58)	(-1.55)		(0.63)	(-1.48)	1.5812
4	-0.0443	-0.0420	0.0347	0.0228	-0.0240	0.0669
	(-2.42)	(-2.47)	(1.93)	(0.32)	(-2.42)	1.6531
Machinery						
1	-0.0128	-0.0065			-0.0064	0.3007
	(-0.31)	(-0.55)			(-1.71)	1.2488
2	-0.0127	-0.0028	-0.0061		-0.0052	0.2919
	(-0.30)	(-0.12)	(-0.20)		(-0.75)	1.2441
3	-0.0928	-0.0226		0.7951	-0.0089	0.3267
	(-1.63)	(-1.61)		(2.01)	(-2.30)	1.4369
4	-0.0925	-0.0211	-0.0024	0.7932	-0.0085	0.3179
	(-1.61)	(-0.89)	(-0.08)	(1.98)	(-1.20)	1.4334
Electical Machinery	-0.0893	0.0145			-0.0019	0.4106
	(-1.73)	(1.04)			(-0.90)	2.1965
2	-0.0683	-0.0249	0.0950		-0.0021	0.4401
	(-1.33)	(-1.13)	(2.26)		(-1.02)	2.4221
3	-0.1560	-0.0006		0.4850	-0.0021	0.4447
	(-2.72)	(-0.04)		(2.41)	(-1.02)	2.4101
4	-0.1428	-0.0508	0.1142	0.5739	-0.0024	0.4904
	(-2.59)	(-2.22)	(2.81)	(2.93)	(-1.21)	2.8182

Table 13-3 (Contd.)

Portfolio Equations of the Corporation :

Net Borrowings

(Separate Treatment of the Fundamentals and the Non-fundamentals)

Industry	CONST.	MAQ	LAND	CF	NF	R-squ./D.W.
Wholesale and Retail Trade	-0.4074	0.0470			-0.0083	0.3926
	(-2.99)	(4.62)			(-2.03)	2.3416
2	-0.4117	0.0421	0.0060		-0.0097	0.3872
	(-3.00)	(3.13)	(0.56)		(-1.99)	2.3416
3	-0.3655	0.0510		-0.2040	-0.0077	0.3863
	(-2.21)	(3.80)		(-0.45)	(-1.83)	2.3397
4	-0.3774	0.0459	0.0053	-0.1643	-0.0092	0.3801
	(-2.24)	(2.68)	(0.48)	(-0.36)	(-1.77)	2.3392
Real Estate						
1	0.0299	0.1599			0.0234	0.2446
	(0.74)	(5.20)			(2.35)	1.2561
2	-0.1918	0.0945	0.1239		0.0573	0.4156
	(-3.32)	(3.13)	(4.88)		(5.12)	1.6663
3	-0.0010	0.1306		0.8304	0.0190	0.2421
	(-0.02)	(2.86)		(0.87)	(1.70)	1.2909
4	-0.2549	0.0414	0.1297	1.4183	0.0513	0.4293
	(-3.74)	(0.96)	(5.12)	(1.69)	(4.42)	1.8033

Notes: For notations, see Table 3 and 6.

The coefficients of the seasonal dummies are suppressed.

Table 14-1

Portfolio Equations of the Corporation :

Investment in Plant and Equipment

(Asymmetric Effect of the Collateral Value in the Phase of Business Cycles)

Industry	CONST.	MAQ	LAND	D1*LAND	CF	NF	R-squ./D.W.
All Industries							
1	0.0403	0.0193	0.0087	0.0036		-0.0024	0.7805
	(14.51)	(8.28)	(3.18)	(2.44)		(-4.10)	1.2627
2	0.0142	0.0080	0.0113	0.0035	0.4042	-0.0029	0.8158
	(2.00)	(2.25)	(4.36)	(2.61)	(3.95)	(-5.33)	1.4821
Construction							
1	0.0007	0.0102	0.0087	0.0004		-0.0034	0.2677
	(0.05)	(2.70)	(1.38)	(0.13)		(-2.17)	0.5742
2	-0.0326	0.0004	0.0015	-0.0027	0.5114	-0.0024	0.6363
	(-3.11)	(0.16)	(0.34)	(-1.37)	(8.83)	(-2.22)	1.4911
Manufacturing							
1	0.0357	0.0243	0.0157	0.0052		-0.0041	0.7814
	(11.71)	(9.70)	(4.11)	(2.20)		(-6.42)	0.7549
2	0.0204	0.0176	0.0142	0.0040	0.2674	-0.0039	0.8170
	(4.31)	(6.15)	(4.03)	(1.81)	(3.98)	(-6.61)	0.9259
Food and Beverages	0.0191	0.0224	0.0107	0.0020		-0.0026	0.6820
1	(6.02)	(8.62)	(3.64)	(1.07)		(-4.27)	1.0677
2	0.0181	0.0219	0.0107	0.0019	0.0261	-0.0025	0.6796
	(5.09)	(8.06)	(3.63)	(1.01)	(0.66)	(-4.12)	1.0672
Textiles							
1	0.0289	0.0405	0.0011	0.0053		-0.0014	0.3988
	(4.70)	(6.85)	(0.17)	(1.20)		(-0.80)	0.7793
2	0.0275	0.0379	0.0009	0.0044	0.0460	-0.0013	0.4097
	(4.45)	(6.22)	(0.14)	(0.99)	(1.54)	(-0.73)	0.8038
Pulp, Paper, and Paper Products	0.0092	0.0042	0.0370	-0.0036		-0.0067	0.7783
1	(2.57)	(1.63)	(5.57)	(-0.78)		(-4.62)	2.0349
2	0.0092	0.0042	0.0369	-0.0036	0.0022	-0.0067	0.7754
	(2.56)	(1.62)	(5.41)	(-0.77)	(0.03)	(-4.20)	2.0352
Chemicals							
1	0.0454	0.0163	0.0019	0.0080		-0.0020	0.6495
	(4.32)	(5.73)	(0.18)	(2.17)		(-2.04)	1.2034
2	0.0554	0.0187	-0.0019	0.0082	-0.0963	-0.0017	0.6470
	(3.06)	(4.19)	(-0.16)	(2.21)	(-0.68)	(-1.64)	1.2018
Steel							
1	0.1434	0.0692	-0.0338	0.0064		0.0014	0.7310
	(6.20)	(10.17)	(-3.19)	(0.79)		(0.44)	1.5930
2	0.1681	0.0797	-0.0376	0.0038	-0.2693	0.0038	0.7371
	(6.17)	(8.67)	(-3.51)	(0.47)	(-1.66)	(1.08)	1.7868

Table 14-1 (Contd.)

Portfolio Equations of the Corporation :

Investment in Plant and Equipment

(Asymmetric Effect of the Collateral Value in the Phase of Business Cycles)

Industry	CONST.	MAQ	LAND	D1*LAND	CF	NF	R-squ./D.W.
Non-ferrous Metal							
1	0.0154	0.0039	0.0137	0.0071		-0.0040	0.4817
	(4.98)	(2.19)	(1.63)	(1.20)		(-3.10)	1.4023
2	0.0148	0.0036	0.0128	0.0078	0.0402	-0.0039	0.4760
	(4.30)	(1.96)	(1.46)	(1.27)	(0.42)	(-2.93)	1.4020
Fabricated Metal Products							
1	0.0043	-0.0019	0.0189	0.0033		-0.0068	0.5074
	(1.04)	(-0.53)	(4.82)	(1.04)		(-3.19)	1.4584
2	0.0050	0.00008	0.0166	0.0018	0.0414	-0.0069	0.5514
	(1.29)	(0.02)	(4.34)	(0.58)	(2.91)	(-3.38)	1.5463
Machinery							
1	0.0562	0.0160	-0.0092	0.0007		0.0031	0.3219
	(6.17)	(3.36)	(-1.39)	(0.25)		(2.04)	1.1364
2	0.0150	0.0058	-0.0070	-0.0011	0.4235	0.0012	0.5292
	(1.45)	(1.35)	(-1.27)	(-0.42)	(5.87)	(0.91)	1.3617
Electical Machinery							
1	0.0885	0.0174	-0.0135	0.0099		0.0033	0.4567
	(4.84)	(2.29)	(-0.94)	(1.51)		(4.61)	0.7371
2	0.0268	-0.0054	0.0034	0.0057	0.4988	0.0030	0.8090
	(2.23)	(-1.11)	(0.40)	(1.45)	(11.88)	(6.98)	1.6567
Wholesale and Retail Trade							
1	0.1019	0.0056	0.0047	0.0006		-0.0007	0.6143
	(6.37)	(3.74)	(3.99)	(0.70)		(-1.27)	0.9238
2	0.0873	0.0041	0.0050	0.0007	0.0660	-0.0009	0.6180
	(4.49)	(2.22)	(4.18)	(0.86)	(1.32)	(-1.62)	0.9915
Real Estate							
1	0.0284	0.0071	0.0046	0.0039		-0.0027	0.3921
	(3.12)	(1.57)	(1.19)	(2.54)		(-1.61)	1.7796
2	0.0239	0.0037	0.0052	0.0042	0.0873	-0.0030	0.3876
	(2.11)	(0.54)	(1.30)	(2.62)	(0.67)	(-1.72)	1.7865

Notes: For notations, see Table 3 and 6.

The coefficients of the seasonal dummies are suppressed.

Table 14-2

Portfolio Equations of the Corporation :

Real Purchase of Land

(Asymmetric Effect of the Collateral Value in the Phase of Business Cycles)

Industry	CONST.	MAQ	LAND	D1*LAND	CF	NF	R-squ./D.W.
All Industries							
1	0.0044	0.0041	-0.0009	0.0006		-0.0008	0.7000
	(7.27)	(8.14)	(-1.52)	(2.00)		(-6.05)	1.4554
2	0.0016	0.0029	-0.0006	0.0006	0.0438	-0.0008	0.7091
	(0.94)	(3.48)	(-1.03)	(2.00)	(1.83)	(-6.41)	1.4839
Construction							
1	-0.0064	0.0067	-0.0033	0.0008		-0.0009	0.2148
	(-1.10)	(4.28)	(-1.25)	(0.67)		(-1.46)	0.9202
2	-0.0175	0.0035	-0.0057	-0.0002	0.1711	-0.0006	0.4649
	(-3.42)	(2.48)	(-2.57)	(-0.26)	(6.04)	(-1.18)	1.2970
Manufacturing							
1	0.0030	0.0039	-0.000078	0.0006		-0.0007	0.7463
	(6.47)	(10.21)	(-0.13)	(1.67)		(-6.78)	1.2993
2	0.0019	0.0034	-0.0002	0.0005	0.0203	-0.0006	0.7539
	(2.38)	(7.24)	(-0.34)	(1.41)	(1.83)	(-6.68)	1.3623
Food and Beverages	0.0018	0.0056	0.0001	0.0009		-0.0008	0.6946
1	(2.22)	(8.57)	(0.19)	(1.82)		(-5.46)	1.5083
2	0.0004	0.0049	0.0002	0.0007	0.0357	-0.0008	0.7441
	(0.43)	(7.88)	(0.23)	(1.66)	(3.97)	(-5.38)	1.6665
Textiles							
1	0.0033	0.0045	-0.0022	-0.0003		-0.00008	0.0345
	(1.98)	(2.86)	(-1.32)	(-0.25)		(-0.17)	1.4409
2	0.0032	0.0044	-0.0022	-0.0003	0.0025	-0.00007	0.0225
	(1.90)	(2.65)	(-1.32)	(-0.29)	(0.30)	(-0.15)	1.4480
Pulp, Paper, and Paper Products	0.0012	0.0007	0.0002	-0.0002		-0.0008	0.2372
1	(1.05)	(0.80)	(0.12)	(-0.12)		(-1.71)	1.8997
2	0.0012	0.0007	-0.0003	-0.00002	0.0311	-0.0006	0.2414
	(1.02)	(0.90)	(-0.13)	(-0.01)	(1.19)	(-1.11)	1.9324
Chemicals							
1	0.0055	0.0016	-0.0024	0.0008		-0.0001	0.4105
	(3.17)	(3.48)	(-1.36)	(1.31)		(-0.87)	1.6675
2	0.0069	0.0020	-0.0029	0.0008	-0.0134	-0.0001	0.4052
	(2.30)	(2.66)	(-1.47)	(1.35)	(-0.57)	(-0.60)	1.6639
Steel							
1	0.0047	0.0064	-0.0030	0.0018		0.0002	0.4119
	(1.48)	(6.74)	(-2.02)	(1.59)		(0.44)	1.5714
2	0.0054	0.0067	-0.0031	0.0017	-0.0077	0.0003	0.4050
	(1.41)	(5.13)	(-2.04)	(1.49)	(-0.34)	(0.53)	1.6069

Table 14-2 (Cantd.)

Portfolio Equations of the Corporation :

Real Purchase of Land

(Asymmetric Effect of the Collateral Value in the Phase of Business Cycles)

Industry	CONST.	MAQ	LAND	D1*LAND	CF	NF	R-squ./D.W.
Non-ferrous Metal							
1	0.0001	-0.0006	-0.0009	-0.0020		-0.0002	0.0569
	(0.14)	(-1.39)	(-0.41)	(-1.26)		(-0.66)	1.9310
2	0.0002	-0.0006	-0.0008	-0.0020	-0.0036	-0.0002	0.0446
	(0.19)	(-1.27)	(-0.36)	(-1.25)	(-0.14)	(-0.67)	1.9332
Fabricated Metal Products							
1	-0.0007	-0.0011	0.0015	0.0002		-0.0011	-0.0322
	(-0.60)	(-1.04)	(1.24)	(0.16)		(-1.77)	1.6302
2	-0.0006	-0.0009	0.0012	-0.00005	0.0054	-0.0011	-0.0259
	(-0.51)	(-0.79)	(0.96)	(-0.05)	(1.21)	(-1.80)	1.6321
Machinery							
1	0.0019	0.0042	-0.0048	0.00003		0.0002	0.0530
	(0.59)	(2.48)	(-2.04)	(0.03)		(0.34)	0.8394
2	-0.0070	0.0020	-0.0043	-0.0004	0.0914	-0.0002	0.1521
	(-1.68)	(1.14)	(-1.93)	(-0.36)	(3.14)	(-0.43)	0.9104
Electical Machinery	0.0025	0.0011	0.0003	0.0004		-0.0002	0.0737
1	(1.27)	(1.28)	(0.17)	(0.61)		(-3.04)	0.8194
2	-0.0021	-0.0006	0.0015	0.0001	0.0373	-0.0003	0.3477
	(-1.11)	(-0.84)	(1.14)	(0.20)	(5.74)	(-3.98)	1.3153
Wholesale and Retail Trade	0.0133	0.0030	-0.0014	-0.0001		-0.0015	0.4610
1	(1.43)	(3.42)	(-2.05)	(-0.22)		(-4.86)	0.9567
2	0.0057	0.0022	-0.0012	-0.00004	0.0341	-0.0016	0.4636
	(0.50)	(2.05)	(-1.79)	(-0.08)	(1.17)	(-4.99)	0.9682
Real Estate							
1	-0.0665	0.0694	0.0168	0.0078		0.0063	0.2650
	(-1.86)	(3.91)	(1.10)	(1.30)		(0.97)	1.1357
2	-0.1579	-0.0003	0.0280	0.0134	1.7883	-0.0003	0.3753
	(-3.87)	(-0.01)	(1.95)	(2.35)	(3.80)	(-0.04)	1.4714

Notes: For notations, see Table 3 and 6.

The coefficients of the seasonal dummies are suppressed.

Table 14-3

Portfolio Equations of the Corporation :

Net Borrowings

(Asymmetric Effect of the Collateral Value in the Phase of Business Cycles)

Industry	CONST.	MAQ	LAND	D1*LAND	CF	NF	R-squ./D.W.
All Industries							
1	-0.0126	0.0374	0.0223	0.0097		-0.0059	0.6442
	(-1.56)	(5.53)	(2.82)	(2.29)		(-3.54)	1.2453
2	-0.0284	0.0306	0.0239	0.0097	0.2440	-0.0062	0.6421
	(-1.26)	(2.70)	(2.91)	(2.28)	(0.75)	(-3.61)	1.2394
Construction							
1	0.0615	0.0284	-0.0020	0.0061		0.0003	0.4041
	(0.77)	(1.31)	(-0.05)	(0.39)		(0.03)	1.0139
2	0.0226	0.0171	-0.0103	0.0026	0.5961	0.0013	0.4087
	(0.26)	(0.73)	(-0.28)	(0.17)	(1.27)	(0.15)	1.0873
Manufacturing							
1	-0.0154	0.0261	0.0186	0.0226		-0.0091	0.6334
	(-2.03)	(4.18)	(1.96)	(3.84)		(-5.70)	1.0020
2	-0.0342	0.0177	0.0167	0.0210	0.3303	-0.0088	0.6444
	(-2.70)	(2.32)	(1.77)	(3.60)	(1.84)	(-5.59)	0.9988
Food and Beverages	0.0401	0.0205	-0.0019	0.0072		0.0008	0.0053
1	(0.99)	(0.62)	(-0.05)	(0.30)		(0.10)	3.3652
2	0.0446	0.0227	-0.0020	0.0077	-0.1130	0.0005	-0.0073
	(0.98)	(0.65)	(-0.05)	(0.31)	(-0.22)	(0.07)	3.3736
Textiles							
1	-0.0035	0.0556	-0.0307	0.0346		0.0015	0.1237
	(-0.12)	(2.02)	(-1.05)	(1.67)		(0.18)	1.1037
2	-0.0047	0.0535	-0.0309	0.0338	0.0374	0.0016	0.1126
	(-0.16)	(1.85)	(-1.05)	(1.61)	(0.27)	(0.19)	1.0981
Pulp, Paper, and Paper Products	-0.0053	0.0057	0.0475	0.0368		-0.0097	0.6386
1	(-0.65)	(0.97)	(3.11)	(3.44)		(-2.91)	1.9267
2	-0.0056	0.0062	0.0445	0.0378	0.1788	-0.0083	0.6382
	(-0.67)	(1.06)	(2.85)	(3.51)	(0.96)	(-2.29)	1.9296
Chemicals							
1	-0.0566	0.0039	0.0406	0.0239		-0.0068	0.4702
	(-2.35)	(0.60)	(1.68)	(2.83)		(-3.06)	1.3684
2	-0.0457	0.0064	0.0364	0.0241	-0.1044	-0.0065	0.4639
	(-1.10)	(0.63)	(1.33)	(2.83)	(-0.32)	(-2.72)	1.3795
Steel							
1	-0.0145	0.0628	-0.0341	0.0349		-0.0109	0.5121
	(-0.44)	(6.45)	(-2.25)	(2.99)		(-2.34)	0.8670
2	0.0505	0.0903	-0.0441	0.0281	-0.7109	-0.0047	0.5656
	(1.36)	(7.19)	(-3.01)	(2.51)	(-3.22)	(-0.97)	1.1640

Table 14-3 (Contd.)

Portfolio Equations of the Corporation :

Net Borrowings

(Asymmetric Effect of the Collateral Value in the Phase of Business Cycles)

Industry	CONST.	MAQ	LAND	D1*LAND	CF	NF	R-squ./D.W.
Non-ferrous Metal							
1	-0.0589	-0.0404	0.0456	0.0167		-0.0085	0.3818
	(-4.64)	(5.60)	(1.32)	(0.69)		(-1.60)	1.0999
2	-0.0538	-0.0385	0.0533	0.0109	-0.3299	-0.0095	0.3795
	(-3.82)	(-5.09)	(1.49)	(0.43)	(-0.85)	(-1.74)	1.1506
Fabricated Metal Products							
1	-0.0427	-0.0418	0.0342	-0.0037		-0.0232	0.0663
	(-2.19)	(-2.41)	(1.82)	(-0.25)		(-2.29)	1.6520
2	0.0422	-0.0405	0.0327	-0.0047	0.0265	-0.0233	0.0556
	(-2.15)	(-2.28)	(1.70)	(-0.30)	(0.37)	(-2.28)	1.6523
Machinery							
1	-0.0258	0.0005	-0.0079	0.0171		-0.0038	0.2962
	(-0.60)	(0.02)	(-0.25)	(1.21)		(-0.53)	1.2640
2	-0.0982	-0.0173	-0.0041	0.0139	0.7441	-0.0071	0.3178
	(-1.70)	(-0.72)	(-0.13)	(1.00)	(1.85)	(-0.98)	1.4304
Electical Machinery							
1	-0.0910	-0.0221	0.0934	0.0305		-0.0015	0.4514
	(-1.73)	(-1.01)	(2.25)	(1.61)		(-0.72)	2.5498
2	-0.1588	-0.0472	0.1121	0.0258	0.5485	-0.0019	0.4970
	(-2.84)	(-2.07)	(2.77)	(1.42)	(2.81)	(-0.94)	2.9125
Wholesale and Retail Trade							
1	-0.4028	0.0418	0.0058	-0.0013		-0.0099	0.3793
	(-2.72)	(3.04)	(0.53)	(-0.17)		(-1.98)	2.3453
2	-0.3637	0.0457	0.0050	-0.0016	-0.1759	-0.0093	0.3722
	(-2.00)	(2.65)	(0.45)	(-0.21)	(-0.38)	(-1.77)	2.3438
Real Estate							
1	-0.1875	0.0955	0.1225	-0.0021		0.0569	0.4082
	(-3.03)	(3.11)	(4.62)	(-0.20)		(5.01)	1.6695
2	-0.2628	0.0381	0.1317	0.0026	1.4741	0.0515	0.4221
	(-3.47)	(0.83)	(4.92)	(0.24)	(1.68)	(4.40)	1.8066

Notes: For notations, see Table 3 and 6.

The coefficients of the seasonal dummies are suppressed.