INVESTMENT BEHAVIOUR IN INDIAN SUGAR INDUSTRY: AN ECONOMETRIC STUDY

A Thesis submitted to the University of Hyderabad for the award of the degree of

DOCTOR OF PHILOSOPHY

By

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This is to certify that I, P S SURESH, have carried out the research embodied in the present thesis entitled, INVESTMENT BEHAVIOUR IN INDIAN SUGAR INDUSTRY : AN ECONOMETRIC STUDY, for the full period prescribed under Ph.D ordinances of the University.

I declare to the best of my knowledge that no part of this thesis was earlier submitted for the award of research degree of any University.

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ACKNOWLEDGEMENTS

I express my deep sense of gratitude to my research supervisor Prof V V N SOMAYAJULU for his effective guidance, affectionate encouragement and timely help throughout the period of my research work.

I am deeply indebted to Dr B KAMAIAH, who is my friend, philosopher and guide, without whose constant encouragement, I would not have completed my thesis work.

My thanks are due to the Head, Faculty Members and Staff of the Department.

I thank the UGC for providing me financial assistance for my research work. My thanks are also due to the RBI, for providing the necessary data for my dissertation.

Thanks are also due to my Co-research Scholars, Amanulla, Mallaiah and Mohsin for their unstinted help all through my course of study.

I am thankful to Mr Gangaji, Mr Pradeep, Mr A R Reddy, Mr Srinivas and the staff of Computer Centre for their assistance in computer work.

I am grateful to my numerous friends and hostel mates for making my stay at R S Hostel a memorable one.

Last, but not the least, I express my indebtedness to my Mother Smt. BHAGYALAKSHMI, my Father Sri KOTESWARA RAO and my brothers, Ravichandra and Sasdher, without whose active interest and help, I would not have come to this stage in life.

P. Srinivasa Suresh

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CHAPTER 1

THEME, FOCUS AND PROBLEM SETTING

1.1 INTRODUCTION :

Investment is a highly volatile component of aggregate demand and an investigation into its determinants holds the key to demand management decisions regarding investment, dividends and external finance, which may interact with one another. In so far as they do, the three decisions are mutually independent. There is, therefore a need to identify simultaneously the determinants of investment, the factors that govern the disposition of profits between dividends and savings, and the forces that influence external financing. Investment behaviour is an important part of the economic process viz., in the discussion of analysis of cycles, trend development, environmental improvement or restoration. In this backdrop, the current study attempts an econometric investigation into the investment behaviour of Indian sugar industry, its response to markets and public policy instruments.

Sugar Industry is one of the largest agro-based industries in India, next only to cotton textiles' in terms of employment and production. With a capital investment of over Rs. 3000 crores , it provides total employment to about 30 lakh people and supports many more in ancillary industries like sugar machinery manufacturing, distilleries, confectionery etc. which are dependent on sugar industry. The industry contributes huge amounts to the revenue of the central and state governments in the form of excise, cess and taxes, which come to more than Rs.100 crores per annum. In 1992-93, there were 448 licenced sugar factories in India. Of these, 258 units were functioning in the co-operative sector, contributing around 60% of the national sugar output, 128 units were functioning in the private sector, with a share of 30%. There were 62 units in the public sector, whose share was 10% of the output.

Sugar industry in India is mostly confined to a few states, which are mainly sugarcane producers. The states of Uttar Pradesh, Bihar, Maharashtra, Tamil Nadu, Karnataka and Andhra Pradesh account for more than 90% of the sugar produced in India.

In 1992-93, the total production of sugar in India was around, 12.4 million tonnes while the total domestic demand was about 12.0 million tonnes. In 1991-92, sugar production has reached an all time record figure of 13.4 million tonnes. India is not only the largest producer of sugar in the world, but also the largest consumer. The total domestic consumption in 1991-92 was estimated at 11.2 million tonnes. The Demand for sugar is increasing at the rate of about 5% per annum. Normally, with higher production and increasing demand, the sugar industry would be expected to fare well, but, surprisingly, for the third consecutive year the industry is suffering from an abnormal syndrome of 'produce and perish'. In 1990-91, the losses were computed at over Rs. 700 crores. Table I.1 gives production and related figures of Indian sugar industry.

Sugar has made a significant contribution to the foreign exchange earnings of the country over the years. The export earnings of the industry steadily rose from 12 crores in 1957 to a peak level of Rs. 472 crores in 1975-76. Thereafter, for less than a decade there was decline in the earnings, and after a lapse of 7 years, India began sugar export in the year 1991. During the financial year ending March, 1992, about 5 lakh tonnes of sugar was exported, earning foreign exchange to the tune of Rs.380 crores. Since the procurement of sugar in the domestic market is higher than the foreign sales realisation, the sugar industry, on whose account exports are being undertaken by Indian Sugar and General Industry Export Import Corporation Limited incurs sizeable loss on this operations. Exports are undertaken under the provisions of the Sugar Export Promotion Act, 1958. The industry undertook sugar export at a loss, keeping in view various relevant considerations including the wholesome impact of reduction of inventory on the overall sugar situation.

1.2 GOVERNMENT'S SUGAR POLICY :

Since the grant of tariff protection in 1932, the Indian sugar industry had experienced regimes of total decontrol and partial decontrol. Partial decontrol implies that a part of the total output is sold in the free market at prices determined by market forces, while the rest of the output is sold at controlled prices through public distribution system. There were two objectives before the government that motivated price and distribution controls on sugar. One was to make sugar available at reasonable price to consumer and the other was to protect the interests of the mills and of sugarcane growers dependent on them. The government declares support prices for sugarcane every year in consultation with the Agricultural Prices Commission, with a view to provide reasonable return to the cane-growers.

Under the regime of partial decontrol, the domestic sale of sugar is divided into two distinct categories, viz., levy and free-sale. The ratio of levy to free-sale varied over time. The levy free ratio of 45:55 has been maintained unchanged since 1988-89. The levy price of sugar is determined on the basis of the ex-factory value of sugar as assessed by government for the various sugar producing regions. The price of free-sale sugar is also not completely free, since the monthly and weekly releases of sugar into the open market are regulated by the government.

A comparative analysis of production and consumption trends of sugar over the recent decade indicates that more sugar has to be produced to meet the growing needs of the population. Further, the importance of sugar as a foreign exchange earner could not be ignored. Given the above, backdrop, its importance and its potential to make a significant contribution to national income, employment absorption, regional spread across states etc., there is a need to develop the industry on modern lines to gear it up to the growing needs at home and to earn more foreign exchange. This task necessitated to analyse the role of determinants of fixed capital and inventory investments, dividends and external finances of sugar industry and their likely interdependence or otherwise, or likely competitive or complementary nature.

The present study attempts to analyse the industry, with the help of econometric methods and accordingly investigate empirically, testing the relevant hypotheses. The analysis is carried out for fixed investment, inventory investment, dividends behaviour and external financing behaviour of corporate firms or companies of sugar industry in India.

1.3 OBJECTIVES OF THE STUDY :

The main objectives of the present study are as follows:

1. To hypothesise and estimate the investment functions for fixed capital and inventory investment of sugar industry.

2. To examine the nature of the relationship competitive or complementary - that might prevail between fixed and inventory investment and to highlight the industry's growth prospects.

3. To examine the interdependence or otherwise of investment, dividends and external financing decisions at the industry level.

1.4 HYPOTHESES :

There are several alternative theories of fixed capital investment behaviour viz., the accelerator theory, the profits theory, the liquidity theory, the neo-classical theory and theories relating to external sources of financing, and of dividends behaviour and monetary and public policy instruments of planning. Most of these theories/hypotheses are incorporated in the neo-classical theory of optimal accumulation propounded by Modigliani and Miller (1958). Further, some other hypotheses indicating other determinants of investment are also tested for a comprehensive analysis and policy purposes. These theories, in brief, are presented below, a detailed discussion of which is taken up in chapter 2.

Of the various theories that have been dealt with in the literature on fixed investment, the most important ones are the accelerator theory, the profits theory, the liquidity theory and neo-classical I and neo-classical II theories.

, The naive accelerator theory assumes that the optimum capital stock is some constant proportion of output. Thus, for any change in the level of output, the capital stock also changes in a fixed relationship. One of the drawbacks of this theory is that it assumes an instantaneous investment reaction for any change in output, which is unrealistic.

The flexible accelerator theory, developed by Chenery (1952) and Koyck (1954) is an improvement over the naive accelerator hypothesis. The flexible accelerator takes care of the drawbacks of naive accelerator. It assumes that there is a lag in the adjustment process. The flexible accelerator has been used by several authors to depict the adjustment response in a behavioural equation of the actual capital stock to an optimal level.

The profits theory of investment behaviour postulates that the optimal capital stock is some function of the level of profits. An alternative version of the theory supposes a functional relationship between optimal capital stock and expected profits. Thus, the expected profits theory and the accelerator theory were tested in many countries for many years with the utmost attention from economists. But, both the theories are subject to imperfections in financial and physical markets of factors of production and of goods and services including stocks.

The liquidity theory can be termed as another version of the profits theory. Here, it is assumed that the financial capital market is imperfect and that it is cheaper to use internally generated liquid funds (cash flow) rather than externally borrowed funds.

The demand for external sources of finance arises mainly on account of constraints on the availability of internal finance. So, the demand for external finance is positively related with investment needs. In economic investigations, external finance is treated as a function of profits and dividends or alternatively of retained earnings, investment expenditures, working capital requirements and outstanding debt.

The dividends theory of investment behaviour is based on Lintner's hypothesis (1962) which states that dividends represent primary and active decision variable, while retained earnings are largely a by - product of dividend action taken in terms of well established practices and policies. Dividend behaviour of any firm depends upon the outcome of various considerations of management and share holder's preferences.

The neo-classical theory of investment behaviour is based on Modigliani and Miller's optimal theory of capital accumulation. It includes the theory of the user cost of capital. It was later on developed by Joregenson (1968). Under this theory, the appropriate cost of capital for investment decision is a weighted average of the expected return to equity and the return to debt. There are two ways of measuring return to equity. In the first one, which is known as neo-classical I, return to equity is measured excluding capital gains. In the second one, called neo-classical II, return to equity includes capital gains.

Tax incentives are also known to stimulate capital expenditures and hence form another determinant of investment. Tax incentives increase the after-tax rate of return on capital, by changing the timing of the tax payment in favour of the future. Also, by reducing the tax liabilities, tax incentives increase a firm's cash flow. The former one is called the 'rate of return effect' and the latter one is called the 'cash - flow effect'. Rate of return effect is implicit in the sense that tax incentives make the user cost of capital less expensive to enable more capital goods to be purchased, while cash flow effect is explicitly found as the tax inventives are similar to liquid assets.

In the theories on inventory investment, the accelerator theories found more attention of the economists. The naive accelerator model developed by Metzler (1941) explains the transactions demand for inventory stocks. In this model, the simple transactions demand for inventory stocks is treated as a stock adjustment model in which investment in any given period is equal to the total difference between desired and actual stocks. The main limitation of this model is that firms are assumed to adjust their inventory requirements completely within a given quarter.

The liquidity and profit variables also influence the inventory investment behaviour. The profit variable affects the inventory investment through the user cost of capital and the liquidity variable affects the investment level positively as cash flow.

1.5 REVIEW OF EMPIRICAL STUDIES :

In this section, a brief review of the empirical studies done on fixed investment, inventory investment, external financing behaviour and dividends behaviour are presented. A detailed review is presented in chapter 2.

1.5.1 Review of Studies on Fixed Investment :

The major determinants of fixed investment in the studies carried out by different authors are capital, profit, internal and external funds, sales, size of the market and desired productive capacity etc. Many of these determinants constitute relevant hypotheses of causal relationships directly and / or indirectly to be tested off and on.

The role of interest rate as a determinant of investment was first considered by Keynes (1936). The Keynesian observation that a rise in the interest rate slows down the investment activity was empirically verified by Anderson (1964), Resek

(1966), Jameson (1975) and Krishnamurthy (1964). However, the studies by Ebersole (1938), Mack (1967), Gort (1951), Tinbergen (1939), Meyer and Kuh (1957), Sarkar (1970) and others showed that the cost of funds had relatively less impact on investment.

The importance of profits as a determinant, has been empirically confirmed by the studies of Roos (1948), Tinbergen (1938, 1939), Klein (1951), Meyer and Kuh (1957), Kisselgoff and Modigliani (1957) and Grunfeld (1960). Among the Indian studies which stressed the importance of profit variable, Bagchi (1962), Krishnamurthy (1964), Sastry (1966), Sarkar (1970), Divatia and Athawalae (1972), Siddharthan (1976) and Somayajulu (1977) are prominent.

The accelerator theory proponents include Cannon (1966) and Koyck (1954). Koyck used distributed lag structure to explain investment lags in the adjustment process. Meyer and Glauber (1964) found that lagged output better explained investment than sales change variable. They found that naive accelerator model was insufficient in explaining the desired level of investment. The flexible accelerator model was used by a number of economists to explain investment. The proponents of flexible accelerator include Chenery (1952), Bourneuf (1964), Anderson (1964), Resek (1966), Kuh (1963), Evans (1967), Dhrymes and Kurz (1967), Eisner and Nadiri (1968) and Eliott (1973). The' Indian studies in this category include, Sastry (1966), Rama Rao and Anjaneyulu (1975), Krishna and Krishna Murthy (1974), Swamy and Rao (1975), Krishnamurthy and Sastry (1975), Somayajulu (1977), Rao and Misra (1976) and Sarma and Venkatachalam (1977). Most of the above authors found that flexible accelerator and some financial variables had significant impact on investment expenditures.

Some studies incorporated tax policy variables such as corporation tax rates and tax incentives explicitly in the models. These studies are Eisner (1969), Bischoff (1969), Boatwright (1972), Hall and Jorgenson (1967, 1971), Coen (1969), King (1972), Miller and Modigliani (1966), Mathew (1972), Jameson (1975), Somayajulu (1975, 1977), Swamy and Rao (1975) and Dixit (1976).

Many of these studies gave guidelines, though distinctly different from one another, in specifying and investigating the role or quantitative basis of tax incentives along with the other determinants in influencing fixed investment. Lag structure for all the determinants in the model, including tax incentives is adopted by Somayajulu (1975, 1977), while many other authors used lag structure on sales change variables but not on financial variables. The present study takes care of these limitations by specifying a lag structure for the tax incentive variable also, namely investment allowance reserve, along with other explanatory variables.

1.5.2 Review of Studies on Inventory Investment :

The important determinants of inventory investment in different empirical studies are stock of inventories, cost of capital, wholesale price index of inventories, sales, availability of funds, desired stock-sales ratio and flow of net debt etc. Business behaviour in respect of inventory investment remains so volatile and exploratory in nature that theories and hypotheses explaining the economic mechanisms and fundamental relationships governing the deteminants of inventory investment are yet to be formed.

The studies of Krishnamurthy (1964), Sen (1964), Trivedi (1970), Krishnamurthy and Sastry (1970) and Hilton (1976), brought out the importance of rate of interest in deciding the desired level of inventories. They used rate of interest as a proxy for the opportunity cost of carrying stocks. Sales as a determinant of inventories was confirmed by the studies of Sen (1964), Krishnamurthy (1964), Swamy and Rao (1975), Sastry (1966), Krishnamurthy and Sastry (1970) and Hilton (1976).

Abramovitz (1950), Modigliani (1957), Swamy and Rao (1975) and Agarwal (1987) used capacity utilisation as another independent variable in the inventory investment equation. These studies brought out the importance of capacity utilisation in influencing investment expenditures. Inventory - turn over ratio was included as a determinant of inventory investment by Metzler (1941), Darling (1959), Lovell (1964) and Vinod Prakash (1970). They found that this variable had positive impact on investment.

Among the studies which considered financial variables as determinants are Eisner (1978), Dhrymes and Kurz (1967), George (1972), Swamy and Rao (1975), Krishnamurthy and Sastry (1975) and Sarma and Venkatachalam (1977). Eisner found that liquidity and cash flow variables were the important determinants of inventory investment. In all the other studies mentioned above the flow of external funds was also found to be significant in influencing inventory investment.

Fixed investment as another determinant of desired level of inventories was included in the model, in the studies of Sastry (1966), Swamy and Rao (1975), Krishnamurthy and Sastry (1975) and Dhameja (1978).

1.5.3 Review of Studies on Demand for External Funds Theory :

Fixed investment, inventory investment, retained earnings, sales change variable, cost of funds, existing stock of funds etc are found to be the chief determinants of the demand for external sources of financing in the major studies carried out by Meyer and Kuh (1957), Sastry (1966), Swamy and Rao (1975), Krishnamurthy and Sastry (1975), Sarma and Venkatachalam (1977), Dhrymes and Kurz (1967) and others.

1.5.4 Review of Studies on Dividend Behaviour :

Lintner's (1956, 1962) pioneering model has formed the basis of all the studies on dividends behaviour. Profits, sales change variable, lagged dividend, liquidity, fixed investment, share prices, depreciation allowance and flow of external fundsare the determinants of dividend behaviour in the studies carried out by Brittain (1966), Darling (1957), Swamy and Rao (1975), Khurana (1980), Krishnamurthy and Sastry (1975), Dhrymes and Kurz (1967), Dobrovolsky (1951), Kuh (1963), Purannandam and Hanumantha Rao (1966), Dhameja (1978), Sastry (1966) and others.

1.6 RESEARCH GAPS IDENTIFIED :

The studies in the area of investment behaviour whether be of a firm or industry have by and large examined the accelerator theory apart from identifying the importance of expectational profits theory, while other financial variables such as cash flow (liquidity), role of market imperfections and external funds formed part of various determinants of investment. The research carried out so far in the field of corporate investment in India has been limited, and sporadic. The contribution of these studies to the literature has been meagre and insignificant to the industry. Many studies did not fully explain the theoretical and analytical framework and empirical justification for the specification of investment functions estimated. The specification of lag structure for explanatory variables was vague and not uniform. Some macro studies ignored the variations in the investment behaviour of distinct industries. The results of econometric investigations of investment behaviour models in case of some specifications, were providing either economically meaningless or statistically insignificant determinants, particularly in the case of lagged explanatory variables. The problem lies in specifications and in estimation methods too. The specifications were ambiguous, without any theoretical justification. As a result, in many studies the findings and conclusions were not definitive and not uniformly valid for policy guidelines and for predictive purposes.

As said earlier, studies on inventory investment behaviour, are also limited and inadequate. In some studies, financial variables are included in the equations for raw material investment and total investment. The rationale for the exclusion of financial variables in the finished goods inventories is not brought out. Financial variables are as relevant for finished goods inventories as for raw materials. The cross-section studies ignore inter - temporal variations and inter-industry interactions. Among the financial variables, bank finance which is only one component of external finance received some attention, while internal funds which could be an important source of funds in financing inventory holdings was ignored in some studies. Other sources of external finance, such as trade credit, that could support inventories could not be included in some inventory investment equations estimated.

Studies on external financing and dividends behaviour are extremely limited in Indian context. Most of the studies ignored the lagged effect of dividends on the current variable. The treatment of these two aspects in the literature has been scarce and cursory as compared to the treatment of fixed investment and inventory investment. Earlier studies did not include the relationship between dividends and external finance on the ground that its impact is felt through retained profits, which needed further research investigations.

Similarly, the studies which included tax incentives or other policy instrument variables as explicit explanatory variables in the model of investment behaviour, are again limited. Thus, a few studies specified the role or quantitative basis of tax incentives in influencing investment expenditures or their other significant determinants and their lag structure in Indian industries.

To sum it up, most of the studies did not assume the correct lag structure for the investment process. The actual form of the distributed lags is very sensitive to note the exact specification, but in general a rational lag seems to perform better than a geometric lag. Also, the estimation methods vary across different investigations of investment functions estimated by ordinary least squares, while some others were estimated by maximum likelihood methods or by two-stage least squares.

1.7 NEED FOR FURTHER RESEARCH :

Many studies in this field hitherto, are based on estimation of single equation models. Since in reality, investment decisions in different industries, financial flows among the industries and between financial institutions are all so inter-related, more studies should be conducted in the framework of simultaneous equation models. While demand for total inventory investment in an industry is analysed, the demand for a commodity-wise inventory investment in each of many industries has not been analysed. Studies comparing the optimum and actual levels of inventories with the desired incentives, and analysis of the factors that affect this divergence between the optimum and the actual should be undertaken.

Further, studies on Indian sugar industry are very few. The current analysis of investment behaviour of the Indian sugar industry is an indepth study, particularly taking into account all the precautions of research gaps identified above. Further research in this major field of specification and estimation of investment behaviour models particularly for sugar industry is needed for its policy analysis and guidelines.

1.8 DATA AND THE VARIABLES :

The objectives mentioned in section 2 are pursued with the aid of annual time series as well as cross section data obtained from the Reserve Bank of India. The data relating to annual reports/balance sheets of public limited companies have been collected and compiled by the company finance division of RBI. The present study makes use of this information. The company-wise data obtained covers the period 1965-66 to 1986-87, the latest year upto which comparable data are available. The data relates to variables such as assets, liabilities, income and expenditure of large public limited sugar companies which are non-governmental, with a paid-up capital of Rs. 5 lakhs or more. The names of the public limited companies were not disclosed so as not to identify any particular company and instead code numbers were given for each company.

1.9 MODEL SPECIFICATIONS :

The following specifications of the investment models are estimated for the cases r=0; r=0,l; r=0,l,2; r=0,l,2,3 and r=0,l,2,3,4 covering all the theories discussed above.

1. $$\frac{I_t}{k(t-1)} = a + \sum^{4} b_r \frac{\Delta\, S(t-r)}{S(t-r-1)} + \sum^{4} c_r \frac{RENT(t-r)}{k(t-r-1)} + \sum^{4} d_r \frac{FNDE(t-r)}{k(t-r-1)}$$

$$2.\quad \frac{I_t}{k(t-1)} = a + \sum_{r=0}^{4} b_r \frac{\Delta\, S(t-r)}{S(t-r-1)} + \sum_{r=0}^{4} c_r \frac{PAT\ (t-r)}{k(t-r-1)} + \sum_{r=0}^{4} d_r \frac{FNDE(t-r)}{k(t-r-1)}$$

$$3.\quad \frac{I_t}{k(t-1)} = a + \sum_{r=0}^{4} b_r \frac{\Delta\, S(t-r)}{S(t-r-1)} + \sum_{r=0}^{4} c_r \frac{RENT(t-r)}{k(t-r-1)} + \sum_{r=0}^{4} d_r \frac{FNDE(t-r)}{k(t-r-1)} + \sum_{r=0}^{2} e_r \frac{IAR(t-r)}{k(t-r-1)}$$

$$4.\quad \frac{I_t}{k(t-1)} = a + \sum_{r=0}^{4} b_r \frac{\Delta\, S(t-r)}{S(t-r-1)} + \sum_{r=0}^{4} c_r \frac{PAT(t-r)}{k(t-r-1)} + \sum_{r=0}^{4} d_r \frac{FNDE(t-r)}{k(t-r-1)} + \sum_{r=0}^{2} e_r \frac{IAR(t-r)}{k(t-r-1)}$$

$$5.\quad \frac{IN_t}{k(t-1)} = a + \sum_{r=0}^{2} b_r \frac{\Delta\, S(t-r)}{S(t-r-1)} + \sum_{r=0}^{2} c_r \frac{PAT(t-r)}{k(t-r-1)} + \sum_{r=0}^{2} d_r \frac{FNDE(t-r)}{k(t-r-1)} + e\ \frac{I(t)}{k(t-1)}$$

$$6.\quad \frac{IN(t)}{k(t-1)} = a + \sum_{r=0}^{2} b_r \frac{\Delta\, S(t-r)}{S(t-r-1)} + \sum_{r=0}^{2} c_r \frac{RENT(t-r)}{k(t-r-1)} + \sum_{r=0}^{2} d_r \frac{FNDE(t-r)}{k(t-r-1)} + e\ \frac{I(t)}{k(t-1)} + f\ \frac{INS(t-1)}{k(t-1)} + g\ \frac{INS(t)}{s(t)} + h\ ACF$$

$$7.\quad \frac{IN(t)}{k(t-1)} = a + \sum_{r=0}^{2} b_r \frac{\Delta\, S(t-r)}{S(t-r-1)} + \sum_{r=0}^{2} c_r \frac{PAT(t-r)}{k(t-r-1)} + \sum_{r=0}^{2} d_r \frac{FNDE(t-r)}{k(t-r-1)} + e\ \frac{I(t)}{k(t-1} + f\ \frac{INS(t\ 1)}{k(t-\ )} + g\ \frac{INS(t)}{S(t)} + h\ ACF$$

$$8.\quad \frac{IN(t)}{k(t-1)} = a + \sum_{r=0}^{2} b_r \frac{\Delta S(t-r)}{S(t-r-1)} + \sum_{r=0}^{2} c_r \frac{RENT(t-r)}{k(t-r-1)} + \sum_{r=0}^{2} d_r \frac{FNDE(t-r)}{k(t-r-1)} + e\frac{I(t)}{k(t-1)}$$

$$9.\quad \frac{FNDE(t)}{k(t-1)} = a + b\frac{RENT(t)}{k(t-1)} + c\frac{I(t)}{k(t-1)} + d\frac{IN(t)}{k(t-1)} + e\frac{NDE(t-1)}{k(t-1)}$$

$$10.\quad \frac{FNDE(t)}{k(t-1)} = a + b\frac{PAT(t)}{k(t-1)} + c\frac{I(t)}{k(t-1)} + d\frac{IN(t)}{k(t-1)} + e\frac{NDE(t-1)}{k(t-1)}$$

$$11.\quad \frac{DIV(t)}{k(t-1)} = a + b\frac{PAT(t-1)}{k(t-1)} + c\frac{FNDE(t-1)}{k(t-1)} + d\frac{I(t)+IN(t)}{k(t-1)} + e\frac{PAT(t)-PAT(t-1)}{k(t-1)} + f\frac{DIV(t-1)}{k(t-1)}$$

Where

I	=	Gross fixed investment
K	=	Gross fixed assets
AS		Sales Change
IN		Inventory investment
RENT	=	Gross retained earnings
FNDE	=	Flow of net debt(external finance)
PAT	=	Profits net of taxes
IAR	=	Investment allowance Reserve
INS	=	Stock of inventories
ACF	=	Average cost of funds

NDE = Net debt

DIV = Dividends

t = time subscript

To study the simultaneous interdependence of investment, dividends and external financing decisions, the estimation of a simultaneous equation model is appropriate. The simultaneous equation model given below has four behavioural equations, one each for fixed investment, inventory investment, dividends and external finance. Also different variations of these specifications, as listed above are included in this system, for the purposes of estimating the better fit.

The simultaneous equations of the system are

1. $$\frac{I(t)}{k(t-1)} = a + \sum_{r=0}^{4} b_r \frac{\Delta S(t-r)}{S(t-r-1)} + \sum_{r=0}^{4} c_r \frac{RENT(t-r)}{k(t-r-1)} + \sum_{r=0}^{4} d_r \frac{FNDE(t-r)}{k(t-r-1)}$$

2. $$\frac{IN(t)}{k(t-1)} = a + \sum_{r=0}^{4} b_r \frac{\Delta S(t-r)}{S(t-r-1)} + \sum_{r=0}^{4} c_r \frac{RENT(t-r)}{k(t-r-1)} + \sum_{r=0}^{4} d_r \frac{FNDE(t-r)}{k(t-r-1)} + e \frac{I(t)}{k(t-1)}$$

3. $$\frac{FNDE(t)}{k(t-1)} = a + b \frac{RENT(t)}{k(t-1)} + c \frac{IN(t)}{k(t-1)} + d \frac{I(t)}{k(t-1)} + e \frac{NDE(t-1)}{k(t-1)}$$

$$4.\ \frac{DIV(t)}{k(t-1)} = a + b\ \frac{PAT(t)}{k(t-1)} + c\ \frac{FNDE(t)}{k(t-1)} + d\ \frac{IN(t)+I(t)}{k(t-1)} + e\ \frac{DIV(t-1)}{k(t-1)}$$

The system of equations is estimated for alternative specifications, substituting profits after taxes (PAT) for retained earnings (RENT). Another system that was estimated includes the tax policy variable, namely investment allowance reserve (IAR).

1.10 ESTIMATION PROCEDURES :

All the variables, except the sales change variable are deflated by capital stock variable. Sales Change variable is deflated by past level of sales variable. This deflation is done to correct for heteroscedasticity, which is a common feature in cross-section analysis.

All the variables are in current prices. The analysis is carried out for three cases, namely, cross-section data, time-series data and pooled data. It involves both flow and stock variables, both current and lagged. There is also need for price deflation, i.e. converting the variables from current prices to constant prices. The estimation of multiple regressions posed many problems, because (i) available data are for 21 years; (ii) when price deflation was done, the variables became too small to be included in the regression analysis. Any deflation procedure causes more problems of inaccurate data at constant prices and a larger departure from reality; and it also results in unknown inaccuracies in the regression results. Most of the analysis and estimation of models are based on cross section data and on ratio variables. The use of ratio variables nullifies the impact of relative price variations in the estimation of investment behaviour models.

The analysis is done for both linear and log-linear forms for time-series and cross-section data. In the case of pooled data, only linear models were estimated.

The estimation method adopted is the ordinary least squares (OLS) for single equations. In the case of simultaneous equation system the method of two stage least squares (2SLS) is used.

1.11 LIMITATIONS OF THE STUDY :

In the case of time series data, the variables could not be converted into constant prices. This may give rise to the problems of multi - col linearity and serial correlation in estimation of the models. Replacement investment could not be included in the model explicitly, for lack of available data. However, this is included in fixed investment variable. Another important limitation is that, technological change is taken as constant for the sample period. Estimation of models might be tried with other methods too, like maximum likelihood, which ever applies as an appropriate method. If results are sensitive to methods of estimation then it needs an analysis for the most appropriate choice. In respect of specifications also, there are a number of ways as there is no apriori knowledge to attain the best ones without trials of empirical econometric investigations. Hence the dissertion work of this kind is a limited effort with some sound principles.

1.12 ORGANISATION OF THE STUDY :

The study is organised into 6 chapters.

In the first chapter, introduction of the problem and related issues are dealt with.

The second chapter deals with theoretical issues and a detailed review of past studies.

In the third chapter fixed investment aspect of investment behaviour is examined.

Inventory investment behaviour is discussed in the fourth chapter.

In the fifth chapter, the determinants of external finance and dividend behaviour are examined.

The sixth chapter deals with the simultaneous determination of the three decisions.

1 All the figures quoted in this chapter, pertaining to sugar industry are from various issues of *Indian Sugar,* published by Indian Sugar Mills Association, New Delhi.

CHAPTER 2

THEORETICAL ISSUES AND EVIDENCES : A REVIEW

This chapter presents the theoretical issues on investment behaviour and a review of studies on investment behaviour both in India and abroad.

2.1 THEORETICAL ISSUES :

In this section, the theoretical developments in the field of investment behaviour are traced and presented.

2.1.1 The Keynesian Approach :

The time honoured approach to the demand for investment following Keynes and Fisher, runs in terms of their conceptual frame - the Marginal Efficiency of Capital (MEC), Marginal Efficiency of Investment (MEI) and the like. MEC is defined as the rate of discount that equates the cost of capital asset to the present value of its expected returns during its life. MEI is the rate of return expected from a given investment on a capital asset after covering all its costs, except the rate of interest. Keynes emphasized the role of interest rate in determining investment demand by incorporating the expectations concept in it. Keynes argued that an increase in the rate of interest makes investment less attractive by narrowing the gap between MEC and the rate of interest.

2.1.2 The Post-Keynesian Approach :

In the post-Keynesian theories of investment behaviour, the emphasis was given to demand factors as represented by output or sales. **The rate** of interest, which was earlier given importance was almost ignored in the post-Keynesian era. These theories also incorporate expectations with varying degrees of sophistication.

2.1.2.1 The Naive Accelerator :

Although the naive accelerator was proposed before Keynes (1936) it received attention only after Keynes. Later on it was developed by Clark (1917). The naive accelerator hypothesis rests on the technical relationship between output and capital stock. The naive accelerator assumes that the optimum capital stock is some proportion of output. It specifies the stock of capital necessary to produce a given level of output i.e.

$$K_t^* = \gamma Y_t , \qquad (2.1)$$

where K^*_t is the optimal capital stock and Y_t, is the current output and γ is a positive constant indicating the technical relationship between K_t and Y_t . If there is any change in output, the desired capital stock must also change in fixed relationship to satisfy the equation (2.1) and it results in :

$$K_t^* - K_{t-1}^* = \gamma \, (Y_t - Y_{t-1}) \qquad .(2.2)$$

If it is assumed in (2.2) that capital is instantaneously and optimally adjusted in each period, so that $K_t = K_t$ for all t then

$$\begin{aligned} It &= K_t^* - K_{t-1}^* \\ &= K_t - K_{t-1} \\ &= \gamma \, \Delta \, Y_{t-1} \\ &= Y_t - Y_{t-1} \qquad (2.3) \end{aligned}$$

and It is net investment.

The naive accelerator assumes that there is an instantaneous investment reaction for increases or decreases in output. An underlying assumption is that, firms are always in equilibrium and that the supply of capital goods is infinitely elastic such that adjustment is instantaneous without lags.

The naive accelerator principle does not operate when excess capacity exists, implying instantaneous adjustments of constant capital-output ratio to be unrealistic.

2.1.2.2 The Flexible Accelerator :

The flexible accelerator is a generalization of the naive accelerator. The flexible accelerator models were propounded by Chenery (1952) and Koyck (1954). In this model, the focus is on the time structure of investment process.

The flexible accelerator overcomes one of the major short comings of the naive accelerator namely, that capital stock is instantaneously and optimally adjusted. The flexible accelerator considers some optimal relationship between capital stock and output with time lags in the adjustment process. The adjustment mechanism between K. and K. is given by,

$$I_t = K_t^* - K_{t-1} = (1 - \lambda) \left[K_t^* - K_{t-1} \right], \quad 0 \leq \lambda \leq 1 \quad \ldots (2.4)$$

The actual capital stock may alternatively be represented by a weighted average of all past levels of desired capital plus replacement investment as

$$K_t = [\, 1 - \lambda \,] \sum_{r=0} \lambda^r \; K_{t-r}^* + \delta \, K_{t-1} \qquad (2.5)$$

In the flexible accelerator model of Chenery (1952) and Koyck (1954), the time structure of the investment process is characterized by a geometric lag distribution. Actual capital is a distributed lag function of desired capital with geometrically declining weights. This can be interpreted as saying that capital stock depends on expected future output, where the latter is predicted from past levels of output. Equation (2.4) is also known as stock adjustment model, suggested by Chenery.

The accelerator model presents one of the simplified variants of the investment process. According to this model, a firm raises expectations about its future output on the basis of the past output of the firm itself, the industry to which it belongs, or both. In this context, a capital adjustment process is applied because, the firm faces uncertain future demand and there are additional costs that the firm would incur if it tries to make a very rapid adjustment. This necessitates an additional hypothesis that replacement investment is proportional to existing capital stock or to the previous years stock.

2.1.2.3 The Profits Theory and Expectational Profits Hypothesis :

Profits theory, as a theory of investment behaviour was first proposed by Tinbergen (1938, 1939) and later on developed by Klein (1950, 1951). The profits theory of Tinbergen postulates that the optimum capital stock is a function of the level of profits. Klein obtained an investment function which depended on the level of profits. He assumed that entrepreneurs get profits by increasing the size of their establishment. But this version is not consistent with profit maximization, since the larger the profits, the more the firm expands and accepts lower profits.

Another version of the theory is that the optimal capital stock is some function of the expected profits. But, expected profits in turn are a function of actual profits in the past.

Thus,

$$K_t^* = f\ (\pi_{t-i}),\quad i = 1,2,3, \tag{2.6}$$

and $\pi_t = g(Y_t)$ where π_t are actual profits.

Thus

$$K_t - K_{t-1} = (1-\lambda) \left\{ f\ (\pi_{t-i}) - K_{t-1} \right\} \tag{2.7}$$

2.1.2.4 The Liquidity Theory ;

Another version of the profits theory of investment behaviour is the liquidity theory, wherein liquidity is cash flow or retained earnings net of not merely tax provision but also the dividends distributed or to be so distributed to share holders. Reserves of retained earnings are the internal source of capital financing and such liquidity of the firm reflects stock market value of the firm to push up the share prices and to increase share capital. It assumes that the financial capital market is imperfect and that it is cheaper to use internally generated funds rather than externally borrowed funds. Thus the higher the profits are, the higher will be the liquidity, consequently the lower is the cost of capital and hence the larger is the optimal capital stock. In this theory, desired capital and liquidity are positively associated in a functional relation between the two.

2.1.2.5 External Finance Theory :

Loanable funds from external sources of financing such as long-term debt, new issues of share capital, sale of debentures and bonds etc., also serve as determinants of investment. The demand for external source of finance arises mainly on account of constraints on the availability of internal finance. Hence, the demand for external finance is positively related with investment needs. The cost of raising funds is also a determinant of the demand for external finance. In econometric investigations, external finance has been made a function of profits and dividends or alternatively retained earnings, investment expenditures, working capital requirements and outstanding debt.

2.1.2.6 The Dividends Theory :

The theory that dividends also determine the level of investment expenditures has been based on Lintner's (1956) hypothesis, which states that dividends represent primary and active decision variable, while retained earnings are largely a by product of dividend action taken in terms of well established practices and policies. Dividend behaviour of any firm depends upon the outcome of various considerations of management and share holder's preferences. The Lintner's model is given by,

$$D_t - D_{t-1} = C\,(D_t^* - D_{t-1}) + a, \qquad (2.8)$$

Where D_t^* represents desired dividends, D_t is the current dividends and C is a reaction coefficient bound between 0 and 1.

In empirical investigations of dividend behaviour, investment, external finance and liquidity have been incorporated in the Lintner's model.

2.1.3 **The** Neo-classical Approach :

Dale Jorgenson (1968, 1969) had developed and applied several closely related models of investment behaviour based on his version of the neo-classical theory of optimal capital accumulation. His theory of investment behaviour also includes the theory of user cost of capital. Another version of this theory was developed by Modigliani and Miller (1958). The theory of optimal capital accumulation is based on the idea that optimal factor proportions are determined by the relative prices of factors of production. In the Modigliani and Miller version of the theory, under certain conditions albeit highly restrictive investment decisions are independent of the capital structure.

The appropriate cost of capital for investment decisions is a weighed average of the expected return to equity and return to debt. Return to equity can be measured in two alternative ways. In the first one, capital gains on assets held by the firm may be regarded as transitory, so that return to equity and the price of capital services should be measured excluding capital gains. In the second way, capital gains on assets may be regarded as part of the return to investment, so that return to equity and the price of capital services should include capital gains. Jorgenson named the theory incorporating capital gains as neo-classical - I and the theory excluding capital gains as neo-classical - II.

The neo-classical - I relationship is given by,

$$K_t^* = \alpha P_t Q_t C_t^{-1}, \quad (2.9)$$

Where C_t is the user cost of capital given by,

$$C_t = qt\ (1- U_t)^{-1} \left\{ (1 - U_t W_t)\ \delta + r_t - (\Delta q_t q_t^{-1}) \right\} \quad (2.10)$$

Where a is the elasticity of output with respect to capital input, it is the investment goods price index, p_t is the whole sale price index, Q_t is the value of output in constant prices, 5 is the rate of replacement, r_t is the cost of capital, u_t is the rate of taxation of corporate income and W_t is the proportion of depreciation at replacement cost deductible from income for tax purposes.

In this version of the neo-classical theory, capital gains are assumed to be taken into account in investment decisions and desired capital is proportional to the value of output divided by the price of capital services including capital gains. The neo-classical - II relationship is given by,

$$K_t^* = \alpha P_t Q_t C_t^{-1} ,$$

where

$$C_t = q_t (1 - U_t)^{-1} \left\{ (1 - U_t W_t) \delta + r_t \right\} \qquad (2.11)$$

The price of capital services and cost of capital are measured with capital gains set to zero.

The neo-classical formulation of the investment function is an improvement over the accelerator model, in that it assumes that the desired capital stock depends not only on planned output, but also on the ratio of output price to the implicit rental price of services of capital goods. This formulation gains importance as it includes the cost of capital, which depends on price of investment goods, influenced by features of the tax system. It enables one to study the effect of changes in corporate tax rates, development rebate and other tax exemptions.

2.1.4 Theory Incorporating Tax Policy Effects :

Tax incentives are known to stimulate capital expenditures by making the entrepreneurs to invest more in capital goods. This is done in two ways; first, by reducing the amount of taxes that must be paid on income from assets, or by changing the timing of the tax payments in favour of the future, tax incentives increase the after-tax rate of return on capital. Second, by reducing tax liabilities, tax incentives increase a firm's cash flow, which is one measure of internal funds available for investment expenditures. The rate of return effect is incorporated in 'user cost of capital' variable, in an implicit rental price of capital, which enters the investment function as a determinant of the demand for capital. The 'internal funds effect' is captured by the inclusion of cash flow as a determinant of the speed at which firms eliminate any gap between their desired and actual stock of capital.

In the literature, two specifications of the investment function are used in investigating the importance of tax incentives. The first specification is a capital stock adjustment model with a constant adjustment speed given by

$$I_t = \beta \ (K_t^* - K_{t-1}) + \delta \ K_{t-1} , \qquad (2.12)$$

where β is the adjustment rate.

In the second specification, cash flow is included as a determinant of the adjustment speed, and is given by

$$I_t = [\beta_1 + \beta_2 F_{t-1}(K_t^* - (1-\delta) K_{t-1})^{-1}] [K_t^* - (1-\delta) K_{t-1}^*], \quad (2.13)$$

where F_{t-1} is the cash flow during the period t-1. The expression K_t^*- (1- 6) K. is the amount of gross investment needed during period t to attain stock K. .

Similar specifications are needed to trace the implicit and explicit effects of tax rate changes or of subsidiaries or expenditure of goods. One may also note the specification alternatives for tracing the implicit and explicit effects of monetary instruments such as bank rate or loan rate of scheduled banks or of selective credit controls.

2.1.5 Inventory Investment Models :

The naive accelerator model of Metzler (1941) for inventory investment is given by

$$IN = b_0 + b_1 S_t - b_2 H_{t-1}, \quad ..(2.14)$$

where H. is the inventory stock in the period t-1, S_t is the level of sales, IN is inventory investment.

Here, given the ratio of inventory to sales, inventory investment may be adjusted to the expected sales. This formulation depends on the adjustment relation adopted to explain adjustment of actual inventory sales ratio to the desired level. The adjustment mechanism is given by,

$$\Delta H_t = a\,(H_t^* - H_{t-1}), \quad 0 \le a \le 1, \qquad (2.15)$$

where, H_t^* is the desired level of inventory stock and can be expressed as $H_t^* = C\,S_t$. Thus b1 = ac and b2 = a in the inventory investment equation. If these changes are incorporated into the naive accelerator model, it becomes the flexible accelerator model of inventory investment. A better explanation of the inventory investment behaviour incorporating the uncertainty is to define desired inventory stock as a function of the level of sales and prices. The modified accelerator may be given by,

$$IN_t = b_0 + b_1 S_t + b_2 P_t + b_3 H_{t-1}, \qquad (2.16)$$

where P is the current price level. The liquidity and profit variables also influence the inventory investment behaviour. The profit variable affects the inventory investment through cost of capital and the liquidity variable affects the investment level positively.

Hilton (1976) distinguished between intended and unintended inventory investment and obtained the estimating equations for intended investment as

$$INS^e_t - INS_{t-1} = \delta\ (INS^*_t - INS_{t-1}) + \epsilon_t, \qquad (2.17)$$

where 5 is the speed of adjustment of existing stock to the desired stock. Eisner (1978) has further dealt with the concept of intended and unintended inventory investment and derives his inventory equations as the aggregate to these two components. His model is given by,

$$\Delta\ H_t = \alpha + \beta\ (K_t\ S^e_{t+1} - H_{t-1}) + \gamma\ (S_t - S^e_t) + \varepsilon_t, \qquad (2.18)$$

where A H. = H. - H. and K is the ratio of desired inventory stock to sales, S^e_t represents sales anticipated for period t+1.

2.2 REVIEW OF PAST STUDIES :

Econometric analysis of the investment behaviour at the levels of firm, industry and the economy as a whole, received wide attention, both in India and abroad. The studies in this field have focussed on the following aspects:

(i) The validity of the acceleration principle in explaining the investment behaviour

(ii) Identifying the importance of various determinants of investment and

(iii) Analysing the factors affecting the level of capacity utilisation.

The studies have also tested some hypotheses relating to the above aspects viz., the acceleration principle, the profit theory and the liquidity theory (cash flow hypotheses) and the role of other financial variables, particularly dealing with external sources of financing for long term growth of firms. Some have tested the role of tax-policy variables implicitly affecting the user cost of capital and explicitly influencing the net investment.

2.2.1 Review of Studies on Fixed Investment Behaviour :

The survey of literature relating to fixed investment behaviour is attempted below in two sections, Section I containing studies for other countries and Section II containing studies for India.

2.2.1.1 Some Significant Trends in the Literature of Investment Behaviour in USA, UK and Other Developed Countries :

Econometric studies in the field of investment behaviour at the level of firm or industry involve several alternative theories. For instance (i) profit theories (Tingbergen, 1938; Kalecki, 1937; and Klein, 1951) and (ii) capacity utilisation-accelerator theories (Clark, 1917; Chenery, 1952; Koyck, 1954).

The profit theories propounded by Tingbergen (1938) and later on developed by Kalecki (1937) and Klein (1951) contend that the level of investment is determined by the present profit accruing to the firm or industry. The accelerator theory propounded by Clark argues that the rate of change of capital stock is proportional to the positive change of output. This theory was modified by Chenery and Koyck in two related ways. One of the modifications is towards making investment a function of the level of output rather than rate of change of output. Another is, by introducing the concept of desired capital stock and adjustment of the actual to the desired level with the given speed of adjustment.

The literature relating to the theory of investment behaviour was enriched by Grunfeld (1960), Kuh (1963), Eisner and others (1962, 1963, 1965, 1967), Jorgenson and others (1965, 1968, 1969, 1971), Hall and Jorgenson (1971) and Bischoff (1971) by making detailed comparison of, the different variants of profit and accelerator theories such as cash flow and other internal and external sources of financing concepts in explaining the observed investment behaviour. Dobrovolsky (1951) and Lintner (1956) examined the effect of financial variables like dividend policy, internal financing etc., on investment. Hall and Jorgenson (1971) studied the fiscal and monetary policy variables influencing investment implicitly, through user cost of capital and through effective rates of return over capital.

Detailed surveys of the works on investment behaviour were carried out by Meyer and Kuh (1957), Eisner and Strotz (1963), Evans (1967), Lund (1971) and Jorgenson (1965, 1971).

The studies on investment behaviour can be grouped under the profit theory and the accelerator theory, for purposes of a review. Another classification is by the type of data used in the analysis viz., time series and cross-section data. The studies may also be classified on the basis of whether the unit of analysis is a single firm or industry as a whole. However, the present review adopts a two-fold categorization, namely investment by individual firms and investment by an industry.

2.2.1.2 Investment by Individual Firms :

Time series studies of investment by individual firms were carried out by Eisner (1962, 1963, 1965, 1968), Grunfeld (1960), Jorgenson and Siebert (1968) and Kuh (1963). Cross section studies were done by Dhrymes and Kurz (1967), Diamond (1962), Eisner (1960, 1962, 1963, 1964 and 1967), Kuh (1963), Meyer and Glauber (1964) and Mueller (1967).

2.2.1.2.1 Grunfeld's Study (1960) :

Grunfeld rejects the theory that profits are a determinant of desired level of capital. In Grunfeld's analysis, desired capital is proportional to the value of firm's outstanding securities. The determinants of the desired capital are value of the firms, deflated by the implicit price deflator for gross national product and the corporate bond rate. The time structure of investment process is similar to that of Kuh. He assumes that replacement investment is proportional to capital stock or that the mortality distribution for investment goods is geometric. The data are on gross additions to plant and equipment plus maintenance and repairs, deflated by an implicit price for producer's durable equipment, 1935 through 1954. He rejects the hypothesis that profits are a good measure of the expected profits that include investment expenditures.

2.2.1.2.2 Kuh's Study (1963) :

Kuh's time series study of investment by individual firms deals with two models of investment behaviour. The first one is the flexible accelerator model of Chenery and Koyck, slightly modified in its version with desired capital proportional to sales. The second model is similar to the flexible accelerator with desired capital proportional to profits. Another model incorporating desired capital as a function of both sales and profits was compared with the other two. Kuh concludes that the accelerator model with desired capital proportional to sales was superior to the profit model. The important variables included in Kuh's profit model are net income after tax and gross operating profits. In the sales model, weights associated with desired capital decline geometrically. The results suggest that, sales rather than internal funds determine the level of desired capital.

In the model for gross investment, replacement investment is proportional to capital stock. The capital stock is measured as accumulated gross investment less retirement, each deflated by an appropriate investment index. Kuh did not take into effect the decline in efficiency of existing capital goods in measuring capital stock. Adjustments to this factor could not be done for want of prior knowledge and related deflators, which is a serious gap with the use of time series data in these studies.

2.2.1.2.3 Eisner's Study (1967) :

Eisner's permanent income model of investment employs the ratio of investment to gross fixed assets as a dependent variable and the rate of growth of sales, the ratio of profits to gross fixed assets, and the ratio of depreciation to gross fixed assets for a single year as independent variables. Time series data covering the years 1955 to 1962 are employed. Results show that profits and the rate of growth of sales are both significant determinants of the desired level of capital. Eisner constructed an alternative model for the period 1960-1962, which includes two additional independent variables representing the market value of the firms and the rate of return over capital. In this model only profits and the rate of return are the significant determinants. Further, the results of the two alternative models contradict each other.

Eisner employs finite distributed lag function in the time structure of investment process. The distributed lag function consists of weighted average of past rates of growth of sales, profits, rates of return, and market values of the firm. Replacement investment is treated as proportional to gross capital stock and book values of gross capital stock were not corrected for variations in the acquisition cost of investment goods. Eisner inconsistently used the gross capital stock with the geometric mortality distribution for investment goods.

2.2.1.2.4 Jorgenson and Siebert's Study (1968) :

Jorgenson and Siebert construct two models based on the optimal accumulation theory of capital. In this theory, the cost of capital is shown to be independent of the financial structure of the firm or of divided policy. The first model studied by Jorgenson and Siebert known as neo-classical I, includes capital gains, while the second model referred to as neo-classical II excludes capital gains.

In both the models desired capital is proportional to the ratio of the value of output to the price of capital services. It treats net investment as a distributed lag function of changes in desired capital. Jorgenson and Siebert have compared the models based on optimal capital accumulation with corresponding models based on the acceleration principle and ranked them as (i) Neo-classical I, (ii) Neo-classical II, (iii) Expected Profit model, (iv) Accelerator, (v) Liguidity model with respect to statistical goodness of fit and their performance for predictive purpose.

2.2.1.3 Investment by Industry Groups :

Under this section, the review of earlier studies of investment behaviour of one or more industry groups is attempted. The studies on investment behaviour by industry groups were made by Anderson (1964), Eisner (1962, 1965), Evans (1967), Jorgenson and Stephenson (1967, 1969), Hall and Jorgenson (1971), Meyer and Glauber (1964) and Resek (1966). Studies using annual data were carried out by Bourneuf (1964) and Hickman (1965).

2.2.1.3.1 Anderson's Study (1964) :

Anderson's model includes three relatively standard elements of desired level of capital namely, pressure on capacity, profits and interest rates, and two novel ones namely, stocks of government securities held at the beginning of the period, and long term debt capacity as the independent variables. Anderson omits replacement investment from the model. The time structure of the investment process includes four quarterly moving averages of each of the determinants used as independent variables. Time trend is included to represent lag in expectations, and decision lag is taken to be fixed.

$$Q_{At} \quad A_t = \beta_o + \beta_{1t} + \beta_2 \overline{(S - S_{max})}_{t-3} + \beta_3 \overline{RED}_{t-3} + \beta_4 \bar{G}_{t-3} + \beta_5 T_{a,t-3} + \beta_6 \bar{K}_{DL,t-3} + \beta_7 \bar{I}'_{t-3} + \beta_8 Q_1 + \beta_9 Q_2 + \beta_{10} Q_3 + \varepsilon_t , \qquad \ldots(2.19)$$

where

q_{At}	=	price of investment goods
A.	=	quantity of investment expenditure
q_{At} A.	=	investment in current prices
$S - S_{max}$	=	pressure on capacity
S	=	sales
S_{max}	=	previous maximum value of S

RED	=	Gross retained profits
i'	=	Treasury bill yield
G	=	Stock of Government securities
T_a	=	Accrued tax liability at the end of the period
K_{DC}	=	Long term debt capacity
$Q_1, Q_2, \& Q_3$	=	Seasoned dummy variables and
t	=	time trend

A bar over the variable (ex.RED) indicates a moving average *for* four quarters beginning with the quarter indicated. The determinants of investment expenditures are tested for significance by means of Scheffe's S-method . The results suggest that, capacity utilization, $S - S_{max}$ and the interest rate i' are significant determinants of investment. The explanatory variables, viz., debt capacity, government securities, and tax liability are barely significant. None of the results is out of line with the null hypothesis that the corresponding coefficients are equal to zero.

2.2.1.3.2 Meyer and Galuber's Study (1964) :

Meyer and Glauber's model includes capacity utilization, profits, interest rates, and the percentage change in the price of common stocks as the main determinants of the stock of desired capital . Replacement investment is omitted in the model . The time structure of the model includes a geometric lag function.

The model of Meyer and Glauber is given by,

$$A_t = \beta_0 + \beta_t (T - V)_{t-1} + \beta_2 C^M_{t-1} + \beta_3 \gamma_{t-3} + \beta_4 (\Delta SP/SP)_{t-1}$$

$$+ \beta_5 A_{t-2} + \beta_6 Q_1 + \beta_7 Q2 + \beta_8 Q_3 + \epsilon_t, \quad \ldots(2.20)$$

where

A_t	=	Investment in constant prices
$T - V$	=	Net profit plus depreciation
C^M	=	Ratio of production capacity
V	=	Corporate bond rate
SP	=	Standard and poor's index of the prices of 425 industrials
$(\Delta SP/SP)$	=	percentage rate of change of the above price index
Q_1, Q_2, Q_3	=	Seasoned dummy variables

The results were tested by Scheffe's S-method for significance. Net profits plus depreciation less dividend variable (T-V) is the only clearly significant determinant of investment. Capacity utilisation and the interest rate are barely significant. These results are contrary to those obtained by Anderson.

2.2.1.3.3 Bourneuf's Model (1964) :

Bourneuf's model includes output and capacity as determinants of the investment behaviour. The data includes plant and equipment expenditures, deflated by an implicit price deflator for producer's durable equipment and non-residential construction, and the period of coverage is 1950-61.

The time structure of investment process in the model is taken as arbitrary for the first value of output where as the remaining weights decline geometrically. Here, the replacement investment is proportional to capacity. The specification tested by Bourneuf is given by

$$\Delta K_t = \beta_0 + \beta_3 \ Y_t - (\beta_1 + \beta_3) \ Y_{t-1} + \beta_1 \ \alpha^{-1} \ K_{t-1}, \quad \ldots(2.21)$$

where

ΔK_t = $A_t - \beta_2 C_{bt}$

A_t = Net Investment

Y_t = Output

K_t = Capital stock

α = K/C

t = time suffix

Here also, Scheffe's S-method is employed to appraise the results. The difference between capacity and output is a highly significant determinant of investment expenditures. Capacity at the beginning of the period, representing replacement requirement generated by existing capital stock is also significant. The change in output is barely significant. These results substantiate the conclusion of Anderson, Resek, Evans, Eisner and Hickman, and show that capacity utilization is an important determinant of investment expenditures.

2.2.1.3.4 Eisner's Study (1965) :

Eisner's model of investment behaviour by industry groups, includes changes in sales, changes in profits, replacement investment and capital stock. The time structure of the investment process includes a modified version of Koyck's distributed lag function, with weights determined arbitrarily for the first lagged values of profits and sales and then declining geometrically. Eisner's model is given by,

$$A_t = \beta_0 + \beta_1 \Delta S_{t-1} + \beta_2 \Delta S_{t-2} + \beta_3 P_{t-1} + \beta_4 \Delta P_{t-2}$$

$$+ \beta_5 A_{t-1} + \beta_6 K_t + \varepsilon_t, \qquad (2.22)$$

where

K_t Gross investment

ΔS Change in sales

ΔP = Change in profits

ΔK = change in capital stock at the beginning of the time period

An overall appraisal can not be made because Eisner fitted the model only for realization of investment expenditures and only for the totals of durable and non-durable manufacturing industries. Coefficients associated with change in profits only exceed their standard error.

2.2.1.3.5 Hickman's Study (1965) :

The determinants of desired capital in Hickman's model include output, capital stock, wage rate, rental price of capital, price of output and time trend. In the time structure of investment behaviour, weights of the first two values of output and price ratio are chosen arbitrarily and the remaining weights decline geometrically. Hickman uses a logarithmic form of the flexible accelerator, similar to that used by Koyck. The model fitted by Hickman is given by,

$$\begin{aligned}\Delta \ln K_t = \; & \beta_0 + \beta_1 T + \beta_2 (\ln Y_t - \ln K_{t-1}) \\ & + \beta_3 (\ln Y_{t-1} - \ln K_{t-1}) \\ & + \beta_4 (\ln Y_{t-2} - \ln K_{t-1})\end{aligned}$$

$$+ \beta_5 \ln P_t + \beta_6 \ln P_{t-1} + \beta_7 \ln P_{t-2} + \varepsilon_t, \qquad (2.23)$$

where Y = output, K = capital stock, P = Price ratio, t = Time trend.

The data used by Hickman (1965) relates to plant and equipment expenditures deflated by a suitable construction index for plant, and wholesale price index for producer's finished goods for equipment, and covers the period 1949 to 1960. After comparison of possible alternative specifications, Hickman's model reduces to the flexible accelerator model of Chenery and Koyck.

2.2.1.3.6 Robert Resek's Study (1960) :

Robert Resek's model includes the determinants - output, change in output, rate of interest, a measure of debt capacity, and an index of stock prices. Gross investment, which is the dependent variable is deflated by a price index for investment goods divided by capital stock. Output and the change in output are also divided by capital stock, while other variables are directly included. Replacement investment is proportional to capital stock and is incorporated into the constant term. The time structure of investment process employed by Resek, includes the finite distributed lag function and weights are determined from regression of expenditures on capital appropriations.

The best fitting model of Resek is given by,

$$\frac{A_t}{K_t} = \beta_0 + \beta_1 Q_1 + \beta_2 Q_2 + \beta_3 Q_3 + \frac{\beta_4 (\Delta O)_{L,t}}{K_t} + \beta_5 \gamma_{L,t}$$

$$+ \beta_6 \left(M - \frac{D-F}{A}\right)^{-1}_{L,t} + \beta_7 SP_{L,t} + \varepsilon_t \quad \ldots(2.24)$$

where

A_t = gross investment

K_t = capital stock

Q_1, Q_2, Q_3 = seasoned dummy variables

ΔO = change in output over 4 guarters

γ = interest rate

$(D - F)/A$ = debt capacity

M = constant

SP = SEC stock price index for the industry and

L = Moving average of the corresponding variable with Almon weights

Scheffe's method is used to test the results as in the case of Anderson and Meyer and Glauber's models. The interest rate γ and stock price SP are the clearly significant determinants of investment. Change in output AO is less significant, but the null hypothesis that the corresponding coefficients are equal to zero is rejected. Rate of interest, price of corporate securities, associated with the cost of external funds are also significant determinants of investment.

2.2.1.3.7 Jorgenson and Stephenson's Model (1967) :

This model includes gross value added in current prices, price of investment goods, depreciation rate of return and tax structure as independent variables. The data are quarterly and relates to plant and equipment expenditures, deflated by an implicit deflator for producer's durable equipment and non-residential structures, and adjusted for seasonal variations. The data are from 1949:1 to 1960:4. The time structure of the investment process employed by Jorgenson and Stephenson includes rational distributed lag function. Replacement investment is proportional to net capital stock. The model is given by

$$A_t = \beta_0 + \beta_1 \Delta\left(\frac{PQ}{C}\right)_{t-4} + \beta_2 \Delta\left(\frac{PQ}{C}\right)_{t-5} + \beta_3 \Delta\left(\frac{PQ}{C}\right)_{t-6} + \beta_4 \Delta\left(\frac{PQ}{C}\right)_{t-7} + \beta_5 (A - \delta K)_{t-1} + \beta_6 (A - \delta K)_{t-2} + \beta_7 K_t + \varepsilon_t, \qquad (2.25)$$

where

A = Gross investment

PQ = Gross value added in current prices

C = Price of the capital services

$$C = q \left\{ (1-uv)(1-u)^{-1} + (1-uw)(1-u)^{-1} r \right\}$$

q = price of investment goods

s = rate of replacement

r = cost of capital

U = tax rate

V = proportion of depreciation deductible from income for tax purposes

w = proportion of the cost of capital deductible from income

and K = capital stock

Jorgenson, Hunter and Nadiri (1970) compare the performance of the model of Jorgenson and Siebert with the models of Anderson (1964), Eisner (1965) and Meyer and Glauber (1964). Among the models compared, the best explanation of investment behaviour for individual industry groups is provided by Jorgenson and Stephenson's model.

2.2.1.3.8 Evan's Study (1967) :

The determinants in Evan's model are capacity utilization, capital stock, sales, cash flow, and the interest rate. Capacity utilization is measured as the Wharton School capacity index, where as cash flow is measured as profits after tax plus depreciation less dividends. Replacement investment is taken as proportional to the average of capital stock, lagged by five and six quarters. The treatment of replacement investment is internally inconsistent. The time structure of investment is a three-parameter rational distributed lag function. Evan's model is given by,

$$A_t = \beta_0 + \beta_1 Cp_1 + \beta_2 S_{56} + \beta_3 K_{56} + \beta_4 L_{56} + i_{56}, \quad \ldots(2.26)$$

where A_t = Gross investment

Cp_1 = Capacity utilization lagged once

S_{56} = Sum of sales lagged five and six periods

L_{56} = Sum of lagged cash flow

i_{56} = Sum of lagged interest rates.

The model is tested using the Scheffe's S-method. The results show that sales and capacity utilization are significant determinants of desired capital. Capital stock is significant for four industries while the cash flow and the interest rate are barely significant.

2.2.1.3.9 Hall and Jorgenson's Study (1971) :

This study examines the effect of tax policy in altering investment expenditures. For this purpose, they utilize an econometric model of investment behaviour based on the neo-classical theory of optimal capital accumulation. First, an econometric model is fitted to the data on investment expenditures covering 1935-40 and 1954-65. Estimates of the impact of the adoption of accelerated depreciation in 1954 and of new life times for depreciation of equipment and the investment tax-credit in 1962, the tax cut of 1964 were presented.

The explanatory variables of the model include lagged values of net investment and current and lagged changes in the desired level of capital, tax rate, depreciation formulae, tax credit, and depreciation life time, while net investment is the dependent variable. The numerical estimates of the unknown parameters of the model reflect the alteration in the statistical technique used by the same authors in their earlier studies. The results are in agreement, with evidence on the lag structure from sample surveys and from econometric models of investment fitted to data for industry groups. They conclude that tax policy can be highly effective in changing the level and timing of investment expenditures. Quantitatively, a change in tax policy that reduces the rental price of capital services will increase the desired level of the capital stock.

They conclude, further, that, the investment tax credit, which is essentially a subsidy to the purchase of equipment, had a greater impact than any of the other changes in tax policy during the post-War period.

2.2.1.4 Section II : Studies for India :

There have been some attempts in recent years to study the determinants of investment in the Indian corporate sector. Important studies on Indian industry are those of Bagchi (1962), Krishnamurthy (1964), Krishna and Krishnamurthy (1974), Krishnamurthy and Sastry (1971, 1975, 1976), Divatia and Athawale (1972), Somayajulu (1975, 1977), Dixit (1976), Mathew (1972), Jameson (1975), Swamy and Rao (1975) and Siddharthan (1976).

The main issues that received attention in these studies are:

1. The search for appropriate determinants of investment - both fixed and inventory, with special reference to the verification of the acceleration principle.
2. The role and quantitative significance of tax policy and tax incentives and monetary instruments.

There have been some attempts in recent years to study the determinants of fixed investment for India. Most of the studies relate to private sector. Some studies are based on time series and some are based on cross-section data, whereas some recent studies in this field make use of pooled time series cross-section data.

The investigations that have been carried out are classified into macro or sectoral studies, individual studies, studies incorporating tax policy variables and studies based on utility maximisation approach.

2.2.1.4.1 Macro Studies :

2.2.1.4.1.A Bagchi's Study (1962) :

One of the earliest studies in the field of corporate investment behaviour in India is that of Bagchi. His study has covered 27 diverse industries like tea plantations, electricity supply and shipping. The unit of analysis is industry. The study examines whether the acceleration principle provides a good explanation of the movements in private industrial investment or the level of past profits is a more important determinant of investment. The consolidated balance sheet data of public limited companies published by Reserve Bank of India have been used. Investment equations, one with sales changes and another with profits separately, have been estimated using yearly averages for the two periods, 1952-55 and 1957-59. The broad conclusion of the study is that profits after tax have a more powerful influence on the head of investment than changes in sales.

Bagchi's specifications are :

$$\left.\begin{aligned} I_t &= \beta_1 \, \Delta Y_{t-1} + \beta_2 \, \Delta Y_{t-2} \\ I_t &= \beta_1 \, Z_{t-1} + \beta_2 \, Z_{t-2} \end{aligned}\right\} \qquad (2.27)$$

where I_t = investment , ΔY_{t-1} = change in income in period t-1 and Z_{t-1} = profit in period t-1.

2.2.1.4.1.B Krishnamurthy's Study (1964) :

Krishnamurthy made a detailed analysis of the investment behaviour of the entire private sector for the period 1948-1961. The data were taken from the Central Statistical Organisation's study on capital formation. The explanatory variables in investment equation include, index of industrial profits (π), percentage yield on government securities (L) , private disposable income at 1948-49 prices (Y"), price index number of machinery and other equipment. 1948-49 = 100 (P_{me}) is used as a deflator for the profit series. Thirteen linear models were estimated to explain private gross investment in machinery and other equipment (IP^{me}) in terms of index of industrial utilization of capacity (U) and index of industrial profits (π) or both. The study concluded that neither profits nor the capacity version of the accelerator, if taken separately, can explain investment completely. However, both these variables along with interest rate, explain investment in the private sector.

2.2.1.4.l.C Divatia and Athawale's Study (1972) :

This study examined the basic hypotheses of the theory of investment behaviour viz., 'accelerator principle' and the 'profit principle'. The study covers the private corporate sector over the period 1955-56 to 1969-70. The independent variables in the model are sales deflated by wholesale price index of non-food articles (S_{t1}), sales deflated by investment goods price index (S_{t2}) ' profits before tax deflated by investment goods price index (P.), capital stock (K_t) at the end of the year at constant prices. The study concluded that a combination of accelerator and profits can explain gross capital formation adequately. The lagged effect of the accelerator was also taken into consideration.

2.2.1.4.1.D Krishna and Krishnamurthy's Study (1974) :

Krishna and Krishnamurthy made a time series analysis of the corporate fixed capital formation in India for the period 1950-51 to 1965-66. A specific feature of this study is that the impact of government capital outlays on corporate fixed investment was examined. The explanatory variables of the model are gross capital formation in machinery, equipment and construction by the corporate sector (I .) and by the government (I .); Yield on government bonds (R^g) and corporate debentures (R) used as proxy variables for rate of interest; profits after tax plus depreciation provision (P), net worth (NW) equalling total assets minus total liabilities; Gross retained earnings (GRE); and capacity utilization index for the manufacturing industries (U).

The results show that government investment and long term interest rate are the important determinants of the corporate fixed investment. I was found to be an important explanatory variable to explain I . This study is an improvement over the earlier studies because it incorporates I instead of disposable income (Y") and another set of liquidity variables.

From the foregoing discussion, it can be seen that is almost all the studies on the private corporate sector, accelerator along with the profit variable were found to be important determinants of investment, whereas the liquidity variables revealed little or no importance, except for corporate debentures.

2.2.1.4.2 Individual Industry Studies :

2.2.1.4.2 A Krishanmurthy and Sastry's Study (1971) :

Krishanmurthy and Sastry in their study examined the investment behaviour of the chemical industry in India. They studied the role of accelerator and other financial factors in determining the level of investment and also the interaction between the determinants of dividends, external finances and investment. The dependent variable was gross investment deflated by capital stock at the beginning of the period I(t)/K(t-1), through a linear function of five lagged sales changes, retained earnings and flow of net debt, both deflated by capital stock at the beginning of the period. In the second model, inventory investment also was incorporated along with the other explanatory variables.

The specification of Krishnamurthy and Sastry is given by,

$$\frac{I_t}{K_{t-1}} = \alpha + \beta_1 \Delta S_t (S_{t-1})^{-1} + \beta_2 \Delta S_{t-1}(S_{t-2})^{-1} + \beta_3 \Delta S_{t-2}(S_{t-3})^{-1}$$

$$+ \beta_4 \Delta S_{t-3}(S_{t-4})^{-1} + \beta_5 \Delta S_{t-4}(S_{t-5})^{-1} + \beta_6 R_t (K_{t-1})^{-1}$$

$$+ \beta_7 \ FNDE(NW_{t-1})^{-1}, \qquad \ldots(2.28)$$

Where

FNDE = Flow of net debt

NE = Net Worth

ΔS = Sales change

R_t = Gross Retained earnings

K_t = Capital stock

I_t = Gross fixed investment

From results of their model, they concluded that the accelerator influenced the investment, and in the year when it did not influence investment, there were special macro economic reasons. They also concluded that the financial flow variables, internal as well as external, were of importance.

2.2.1.4.2.C Sastry's Study (1975) :

Sastry's study refers to the investment behaviour in the capital goods industry in the private corporate sector in India, and was based on time series data, covering the period 1957-67. The explanatory variables of the model include sales change, retained earnings and net debt while the explained variable was gross investment. The results of the cross-sectional analysis show that the financial variables play an important role in investment decision while that of the time series analysis show that the financial variables are important explanatory variables.

2.2.1.4.2.D Misra's Study (1975) :

Misra's time series study analysed fixed investment and examines the role of financial variables. Misra formulated five equations including two for investment, and one for earnings. The results (both OLS and 2SLS) show that accelerator is a significant determinant of fixed investment and that the financial variables appear to be more important.

2.2.1.4.2.C Krishnamurthy and Sastry's Study (1975) :

Krishnamurthy and Sastry analysed the investment behaviour of seven major industries viz, cotton textiles, jute, chemicals, engineering, paper and paperboards, sugar and cement. The specification of the model is

$$\frac{I_t}{K_t} = \alpha + \sum_{J=2}^{4} b_J Q_{Jt} + \sum_{t=2}^{4} C_t Y_t + \sum_{r=o}^{4} dr\, \Delta S_{t-r} (K_{t-1})^{-1} + e\, IN_t (K_{t-1})^{-1} + f\, RENT_t (K_{t-1})^{-1} + g\, FNDE_t (K_{t-1})^{-1} + h\, DR_{t-1} (K_{t-1})^{-1}, \quad (2.29)$$

where I = gross fixed investment

K = gross fixed assets

= dummy variable for accounts closing quarter

Y_t = dummy variable for year t

ΔS = Sales change

IN = Inventory investment

RENT = Gross Retained earnings

FNDE = Flow of net debt

DR = Depreciation reserves

Heteroscedasticity is corrected using a uniform deflator. They concluded that accelerator was an important determinant in all the industries considered for analysis, except in sugar and cement, where extreme forms of price and distribution controls exist.

2.2.1.4.3 Studies Incorporating Tax Policy Variables :

This section surveys some of the important contributions to the study of investment behaviour wherein the role of tax policy variables such as corporation tax rates, and tax incentives is examined. Tax policy variables are incorporated to measure their implicit as well as explicit effects in the single equation models of Mathew (1972), Jameson (1975), Somayajulu (1975), Swamy and Rao (1975) and Dixit (1976).

2.2.1.4.3.A Mathev's Study (1972) :

Mathew studied tax policy and investment behaviour by calculating the effect of tax incentives on rental prices of capital and estimated Jorgenson's model in the following form,

$$G_t = \beta_o + \beta_1 \Delta K_t^{\bullet} + \beta_2 \Delta K_{t-1}^{*} + \delta K_{t-1} + c_t, \qquad (2.30)$$

Where $G_t = N_t + \delta K_{t-1}$

and $(K_t \ \alpha \ p_t Q_t)/C$ and α is the exponent of capital input in the Cobb-Douglas form of production function. The results show that tax policy variables are not significant determinants of investment.

2.2.1.4.3.B Jameson's Study (1975) :

Jameson studied the impact of different policy variables such as tax rate, development rebate, rate of interest and the depreciation rate on fixed investment through the user cost of capital. The results show that even a relatively small change in the user cost of capital could have a significant impact on the rate of investment in most of the industries. The author concludes that fiscal policy measures are more important than the interest rate mechanism.

2.2.1.4.3.C Somayajulu's Study (1975) :

Somayajulu examined the role of tax incentives in determining the level of investment. He made pooled cross section study from 1965-66 to 1970-71 of sugar, cotton textiles, paper and paper products and motor vehicles. A distinctive feature of this study is that it incorporates tax policy variables defined as the sum of tax exemptions and development rebate, as one explanatory variable in the specification and estimation of single equation linear model of investment. On the basis of the empirical results, the author ranked the explanatory variables according to their contribution, as follows (i) Profit after tax (ii) Long-term borrowings (iii) All tax incentives (iv) Changes in sales. The author maintained that the gestation lags are guided by not only market forces but also institutional and other extraneous factors, all simultaneously influencing the investment decisions in a given period of time.

2.2.1.4.3.D **Swamy and Rao's Study (1975)** :

Swamy and Rao examined the quantitative effects of monetary and fiscal policy variables on fixed investment, internal and external sources of funds etc. The results showed the importance of the accelerator, external finances and that of consumption allowances reflecting the age of equipment, unlike the earlier finding by Krishnamurthy and Sastry.

2.2.1.4.3.E **Dixit Study (1976)** :

Dixit studied the effect of corporate tax policy on fixed investment behaviour of large private corporations in India. Both neo-classical and financial approaches were adopted in the analysis. The Two versions of the neo-classical theory have been examined. The results showed that direct negative influence of tax policy on the fixed asset investment behaviour is absent. Tax resources like depreciation allowances, and development rebate play a positive role in the fixed asset investment decisions. Fixed asset investment decisions are independent of financial decisions. Hence, tax policy changes do not influence investment decisions via financial decisions.

2.2.1.4.4 Studies Based on Utility Maximisation Approach :

Economists like Baumol (1959, 1962) and Williamson (1970) have objected to the profit maximisation principle and, instead, have propagated maximisation of objective function incorporating market share, non-production expenditure, profit etc., as its determinants. This section surveys the studies in the area of utility maximisation hypothesis relating to the firm's investment behaviour.

2.2.1.4.4.A Siddhardhan's Study (1976) :

Siddhardhan studied the investment behaviour of a conglomerate firm. A conglomerate firm is a multi-firm organisation with an apex authority at the centre. For the purpose of estimation, profits are considered as a percentage of total net assets (π), and annual average compound rates of growth are considered of, total net assets (g^{Ai}), sales revenue (g^{Si}) and non-production expenditure (g^{Ei}). Four linear models were estimated by considering TT . or 6 n/n and g or g /g along with the other variables. The author concluded that profit was not an important determinant of investment in the long run whereas it was significant for non-monopoly firms in the medium run. Siddhardhan's study differs from the earlier studies in that the selection of the sample of firms does not refer to any particular industry, but to different industries.

2.2.2 REVIEW OF STUDIES ON INVENTORY INVESTMENT :

Most of the studies on inventory behaviour were based on Metzler's acceleration principle. The first attempt to categorise inventories systematically was done by Abramovitz (1950). The important studies in this area are Hilton (1976), Modigliani (1957), Zarnovitz (1962), Darling (1959), Lovell (1964), Eisner (1978) and Dhrymes and Kurz (1967). Notable studies in India on inventory investment behaviour are Krishnamurthy (1964), Sen (1964), Trivedi (1970), Krishnamurthy and Sastry (1970), Vinod Prakash (1970), Sastry (1966), Swamy and Rao (1975), Agarwal (1987), George (1972), Sarma and Venkatachalam (1977) and Dhameja (1977).

The important determinants of inventory investment in different studies are stock of inventories, cost of capital, whole sale price index of inventories, degree of capacity utilisation, sales, desired stock-sales ratio, flow of net debt, availability of funds etc. Some of the studies are outlined below.

2.2.2.1 Sen's Study (1964) :

A.K.Sen's study is aggregative and covers the entire economy. For the manufacturing sector he has estimated marginal inventory coefficients for the period 1946-59, component wise, i.e., raw materials, goods-in-process and finished goods inventories. This study suggests the importance of accelerator.

2.2.2.2 Krishnamurthy and Sastry's Study (1970) :

Krishnamurthy and Sastry studied the inventory investment behaviour of 21 individual industries for each of the major components for the period 1946-62. The study was based on the data of C.M.I. The role of output/sales, utilization of productive capacity, interest rate, bank finance and price anticipation that have a bearing on inventory holdings were analyzed. Accelerator, bank finance and the interest rate are found to be important determinants.

2.2.2.3 **Swamy and** Rao's **Study (1975)** :

Swamy and Rao constructed an equation for aggregate inventory investment in their analysis of the flow of funds of public limited companies for the period 1954-70. The preferred equation contains accelerator and bank finance only and these variables were found to be significant.

2.2.2.4 Vinod Prakash's Study' (1970) :

Vinod Prakash examined the influence of structural changes in manufacturing activity on the relative size and composition of inventory holdings in the large scale manufacturing sector in India. The study covered the period from 1946 to 1963. Analysis was carried out both for total inventories and for its components. Three different models for major industry groups and for six important individual industries were tried. Sales, capacity utilization, unit size, short-term rate of interest and price index were the important explanatory variables. The naive accelerator model gave better results than the flexible accelerator.

2.2.2.5 Summary :

Sen (1964), Krishanmurthy (1964), Trivedi (1970), Krishnamurthy and Sastry (1970) and Hilton (1976) found that rate of interest, which was used as a proxy for the opportunity cost of carrying stocks was significant in determining the desired level of inventories.

Sales variable is postulated to have positive relationship with inventory investment. This variable and its variants have been used in several earlier studies and were found to be important determinants. Swamy and Rao (1975) used sales, while change in sales was used as a determinant in the studies of Sastry (1967), Krishnamurthy and Sastry (1970) and Hilton (1976). Most of the studies found that changes in wholesale price index of stock of inventories have influenced the desired level of inventories.

The studies of Abramovitz (1950), Modigliani (1957), Zarnovitz (1962), Swamy and Rao (1975), Agarwal (1987) highlighted the importance of capacity utilisation as another determinant. These studies obtained a positive coefficient for this variable.

Existing stock of inventories was found to have a negative coefficient in most of the studies cited above. Inventory-turn over ratio was found to be an important determinant in the studies of Metzler (1941), Darling (1959), Vinod Prakash (1970), Lovell (1964) and Hilton (1976).

The studies of Eisner (1978), Dhrymes and Kurz (1967), George (1972), Swamy and Rao (1975), Krishnamurthy and Sastry (1975) and Sarma and Venkatachalam (1977) brought out the importance of financial variables like retained earnings and flow of external finance in determining the desired level of inventories. Eisner found only liquidity and cash flow variables to be important determinants.

Sastry (1966) , Swamy and Rao (1975), Krishnamurthy and Sastry (1970) , Dhameja (1978) and Agarwal (1987) included fixed investment as another determinant in the model of inventory investment. They found that this variable had a negative impact on inventory investment expenditures. Vinod Prakash considered the effect of time trend on inventories and obtained a positive coefficient for it.

2.2.3 **REVIEW OF STUDIES ON EXTERNAL FINANCE** :

The notable studies in this area are Meyer and Kuh (1957), Sastry (1966), Swamy and Rao (1975), Krishnamurthy and Sastry (1975), Sarma and Venkatachalam (1977), Dhrymes and Kurz (1967) etc.

The important determinants of the demand for external funds in most of the studies cited above, were fixed investment, inventory investment, retained earnings, sales, cost of funds and existing stock of funds.

2.2.3.1 Sastry's Study (1966) :

Sastry studied the demand for external funds for sample of public limited companies across industries. He used balance sheet data for the years 1955 through 1960. The OLS estimates showed that flow of external finance was negatively related to net debt equity ratio and to gross retained earnings, while there was a positive relationship between investment outlays and flow of net debt.

2.2.3.2 Swamy **and** Rao's Study (1975) :

Swamy and Rao included the major components of external finance in their model to study the flow of funds. Bank borrowings, long-term loans and accounts payable were the major components of external finance. Macro monetary policy variables like net liquidity ratio were included in the equation for accounts payable. The analysis was done in the framework of partial adjustment model. The OLS estimates showed that both fixed and inventory investment had same influence on external finance.

Summing up the studies in this section, Sastry established a negative relationship between internal and external funds. Swamy and Rao, Krishnamurthy and Sastry, Sarma and Venkatachalam also confirmed the results of Sastry. Meyer and Kuh found that there was dependence between investment and internal funds. Krishnamurthy and Sastry examined that dividends and external finance had a weak relationship between the two. Sastry, Dhrymes and Kurz etc., concluded that fixed investment was a significant variable in determining the demand for external funds.

2.2.4 REVIEW OF STUDIES ON DIVIDEND BEHAVIOUR :

Lintner's (1956) pioneering model has formed the basis of almost all the studies on dividend behaviour. The studies in this category are Brittain (1966), Darling (1957), Dhrymes and Kurz (1967), Dobrovolsky (1951), Kuh (1963) etc. The Indian studies include those of Sastry (1966), Swamy and Rao (1975), Khurana (1980) , Krishnamurthy and Sastry (1975), Purannandam and Hanumantha Rao (1970), Dhameja (1978), Agarwal (1987) Rao and Sarma (1971) and Appavadhanulu (1973). The determinants of dividend behaviour in these studies constitute profits, sales, lagged dividend, liquidity, fixed investment, share prices, depreciation allowance and flow of external finance.

2.2.4.1 Rao and Sarma's Study (1971) :

Rao and Sarma carried out a time series analysis based on RBI data for the period 1955-66. They tried three variation of the Lintner's model, one with net profits, another with cash flow and the third with net profits and depreciation separately. The study was done at three levels of aggregation. First for all public and private limited companies, second for all four major industry groups and third, for ten important individual industries. The study concluded that Lintner (1956) model with profit variable explained the corporate dividend behaviour.

2.2.4.2 Purannandam and Hanumantha Rao's Study (1966) :

Purannandam and Hanumantha Rao analysed fifty companies in the cotton textile industry for the period 1946-63. They studied the dividend-payout ratios and reaction coefficients in the light of the Lintner model. The Lintner model was found to be explaining the dividend behaviour of the companies.

2.2.4.3 Sastry's Study (1966) :

Sastry tried several alternative hypotheses of dividend behaviour for the period 1955-60, for public limited companies. He introduced finite distributed lags in his model. The results showed that current profits were a significant factor affecting disposition of profits between savings and retained earnings. Gross profit after tax showed a significant impact on dividends than net profits.

Summing up all the studies, Darling and Brittain found that depreciation allowance was statistically significant in explaining dividend behaviour. Swamy and Rao and Khurana established that lagged dividend was an important determinant in the model. The importance of sales as a determinant was played down by Krishnamurthy and Sastry in the Indian context. Flow of external funds was found to be an important determinant in the studies of Sastry, Dhrymes and Kurz, Krishnamurthy and Sastry and Swamy and **Rao.**

2.3 **CONCLUDING REMARKS** :

The models of investment behaviour reviewed above differ substantially in the determinants of desired capital, the time structure of investment process and replacement investment. The determinants of desired level of capital in the above studies constitute capacity utilisation, internal finance and external finance. Capacity utilisation was found to be an important determinant of desired capital in most of the studies. The variables associated with internal finance were not found to be significant determinants of desired capital in the studies of Anderson (1964) and Evans (1967) , while they were significant in Meyer - Glauber (1964) model. Resek's (1966) measure of debt capacity was also not significant. Of the variables of external finance, interest rate was found to be a significant determinant of desired capital in Anderson (1964) and Resek (1967), while it was barely significant in Meyer - Glauber models (1964).

The time structure of investment process was represented by finite [Eisner (1965) and Resek (1966)], geometric [Grunfeld (1960) and Kuh (1963)] and rational [Koyck (1954), Bourneuf (1964) and Hickman (1957)] distributed lag functions by different authors. All these studies, except those of Anderson

(1964) and Meyer and Glauber (1964) included replacement investment as a determinant of desired capital explicitly in the models.

In the case of Indian studies, sales change variable reflecting the accelerator mechanism was found to be a significant determinant in most of the studies in the case of fixed investment as well as inventory investment. Among the financial variables, profits and flow of net debt were the significant determinants of both fixed and inventory investment. The fiscal policy variables were found to have an impact on investment through rental price of capital. Rate of interest as a monetary policy variable was found to have significant influence on fixed investment.

Most of the studies on external financing activity brought out the significance of investment expenditures - both fixed as well as inventory - as important determinant of the external finance variable. However, all the studies established a negative relationship between internal and external funds.

The studies on dividends behaviour of the firms were carried out in the framework of Lintner's (1956) model. Lagged dividends and profits after tax were the major determinants of dividend behaviour in these studies. Lintner's model was found to be explaining the dividend behaviour in many of the studies.

CHAPTER 3

DETERMINANTS OF FIXED INVESTMENT BEHAVIOUR

In this chapter, the determinants of fixed investment behaviour are examined. The chapter is divided into four sections, section one dealing with introduction of the basic concepts and section two containing the analytical framework. In section three, discussion of results is presented and in the last section conclusions are incorporated. All the tables of this chapter are presented in appendix II.

3.1 INTRODUCTION :

The value of that part of the economy's output at any time, held in the form of (i) new structures, new durable equipment, and (ii) change in inventories together, is called investment, while component (i) is fixed capital and component (ii) is working capital. Investment is further expressed either in gross or net terms. The amount of gross investment that is made up of new structures and new producer's durable equipment is called gross fixed investment. Net investment is the difference between gross investment and depreciation. Gross fixed investment consists of non-residential investment and residential investment. Non-residential investment essentially consists of fixed business investment. Investment undertaken to replace worn-out and obsolete assets by new ones is known as replacement investment, which is normally drawn from depreciation reserve.

Investment is a flow variable, while capital stock is a stock variable. In other words, fixed investment can be expressed as the addition to capital stock. Thus, if we denote capital stock by K_t, gross investment including depreciation is given by,

$$I_t = K_t - K_{t-1} + \lambda K_{t-1} \qquad (3.1)$$

where $0 < \lambda \leq 1$.

3.2 METHODOLOGY :

In the present study the determinants of fixed investment are analysed in the framework of the flexible accelerator model with uniform lag structure for all the relevant variables. The time structure of the investment process is represented by a finite distributed lag function.

The accelerator hypothesis assumes technical relationship between output and capital stock. The flexible accelerator mechanism assumes that, firms achieve desired level of capital stock over a period of time. That is, there will be time lags between changes in demand and adjustment of capital stock to the desired level. These lags arise on account of technological, institutional and expectational factors. Due to the presence of various kinds of lags, current changes in sales induce investment in future. Similarly, current investment is induced by past changes in sales.

The financial variables, both internal and external finance are important determinants of fixed investment expenditures. Internal finance is represented by profits or retained earnings. The cost of using internal finance is lower than that of external funds. Internal finance is preferred, because of the fear of loosing control through external equity, loan financing and delusion of return on such capital. Also, an amount of risk is involved with borrowed funds. Hence, firms prefer internal finance to external sources of finance.

Thus, in econometric investigations, sales change variable, flow of net debt, retained earnings and alternatively profit after tax and investment allowance reserve are incorporated in the model. Uniform lag structure for four years is assumed for all the variables, except in the case of investment allowance reserve for which only two years lags are considered, as the variable may not influence fixed investment beyond a period of two years. All the variables are in current prices. All the variables except sales change are deflated by capital stock of previous year, to correct for heteroscedasticity. Sales change variables **are** deflated by sales of the previous year. Both linear and log-linear forms of the models are estimated. Since, the results in both the cases are similar, only the results of linear forms of the models are being reported.

The models are estimated for cross section, time series and pooled cross section time series data. In the case of cross section analysis, cross sections for each year are estimated. The estimated regressions with R more than 0.3 only are being reported. In the case of time series study, the data are organised into four cases. In case one, there are 23 companies with data 1965-66 to 1986-87. In case two, 27 companies are there, having data from 1965-66 to 1985-86. There are 34 companies in case three, with data ranging from 1965-66 to 1982-83. In case four, 45 companies are there and the data runs from 1965-66 to 1980-81. The model specifications are given below.

$$\frac{I(t)}{k(t-1)} = a + \sum_{r=0}^{4} b_r \frac{\Delta S(t-r)}{S(t-r-1)} + \sum_{r=0}^{4} c_r \frac{RENT(t-r)}{k(t-r-1)} + \sum_{r=0}^{4} d_r \frac{FNDE(t-r)}{k(t-r-1)} \qquad (3.2)$$

$$\frac{I(t)}{k(t-1)} = a + \sum_{r=0}^{4} b_r \frac{\Delta\ S(t-r)}{S(t-r-1)} + \sum_{r=0}^{4} c_r \frac{PAT\ (t-r)}{k(t-r-1)} + \sum_{r=0}^{4} d_r \frac{FNDE(t-r)}{k(t-r-1)} \quad (3.3)$$

$$\frac{I(t)}{k(t-1)} = a + \sum_{r=0}^{4} b_r \frac{\Delta\ S(t-r)}{S(t-r-1)} + \sum_{r=0}^{4} c_r \frac{RENT(t-r)}{k(t-r-1)} + \sum_{r=0}^{4} d_r \frac{FNDE(t-r)}{k(t-r-1)} + \sum_{r=0}^{2} e_r \frac{IAR(t-r)}{k(t-r-1)} \quad (3.4)$$

$$\frac{I(t)}{k(t-1)} = a + \sum_{r=0}^{4} b_r \frac{\Delta\ S(t-r)}{S(t-r-1)} + \sum_{r=0}^{4} c_r \frac{PAT(t-r)}{k(t-r-1)} + \sum_{r=0}^{4} d_r \frac{FNDE(t-r)}{k(t-r-1)} + \sum_{r=0}^{2} e_r \frac{IAR(t-r)}{k(t-r-1)} \quad (3.5)$$

$$\frac{I(t)}{k(t-1)} = a + \sum_{r=0}^{4} b_r \frac{\Delta\ S(t-r)}{S(t-r-1)} + \sum_{r=0}^{4} c_r \frac{PAT(t-r)}{k(t-r-1)} + \sum_{r=0}^{4} d_r \frac{FNDE(t-r)}{k(t-r-1)} + e \frac{IN(t)}{k(t-1)} \quad (3.6)$$

here r = 0,1,2,3 and 4 are time periods of one year lag for each subsequent ones and a,b,c,d and e are regression coefficients of the concerned explanatory variables.

And I = Gross fixed investment
K = Gross fixed assets
AS = Sales Change
IN = Inventory investment
RENT = Gross retained earnings
FNDE = Flow of net debt(external finance)
PAT = Profits net of taxes
IAR = Investment allowance Reserve
t = Time subscript

3.3 EMPIRICAL ISSUES AND RESULTS :

3.3.1 Cross Section Analysis :

The estimated equation of the specification (3.1) for the year 1982-83 for r = 0 is given by

$$\frac{I(t)}{K(t-1)} = \underset{(-2.8811)}{-0.2375^{*}} + \underset{(1.4267)}{0.0461} \frac{\Delta S(t)}{S(t-1)} + \underset{(5.4651)}{0.3529} \frac{FNDE(t)}{K(t-1)}^{*}$$

$$\underset{(-7.2623)}{-1.2501} \frac{RENT(t)}{K(t-1)}^{*}, \; R^2 = 0.8659, \; F = 88.2574$$

The estimated equation for the year 1986-87 is given by

$$\frac{I(t)}{K(t-1)} = \underset{(2.0366)}{0.1042} + \underset{(3.5902)}{0.4367} \frac{\Delta S(t)}{S(t-1)} - \underset{(-0.0503)}{0.0028} \frac{FNDE(t)}{K(t-1)}^{*}$$

$$\underset{(-0.9092)}{-0.2607} \frac{RENT(t)}{K(t-1)}^{*}, \; R^2 = 0.3850, \; F = 5.2170$$

In this case, flow of net debt is statistically significant while retained earnings is also significant but has a negative sign.

Results of the specification (3.1) for r = 0,1 are presented in table II.1. The R^2 values range from 0.26 to 0.87, the highest value being in the year 1982 - 83. Flow of net debt is statistically significant in more than half of the regressions. Flow of **net debt** with one year lag is significant in five of the estimated regression equations. Retained earnings is not statistically significant. Sales change variable with one year lag has shown to be significant in three of the regressions.

Table II.2 presents the results of the same specification for r = 0,1,2. The R^2 values centre around 0.4, the highest value being 0.88 in 1982-83. In 1986-87 also, the R is high (0.83). Lagged variables in this model have not shown to be statistically significant in this model with the result that the flow of net debt and sales change variables alone depicted statistically significant results to influence the fixed capital investment.

The results of the same specification for r = 0,1,2,3 are shown in table II. 3 The R^2 values have not improved significantly over the pervious case. In 1982-83, the R^2 value is very high (0.90). Here also, similar inferences of earlier two specifications of investment behaviour models would apply. This shows that no improvement took place by extending the lag structure beyond two years.

To sum up, in the specification (3.1), flow of net debt variables - both current and lagged by two years - have proved to be influencing fixed investment. Retained earnings is not significant in many of the regressions. Lagged retained earnings variables also have shown no impact on the explanatory variable.

The estimated regression equation of specification (2) for r = 0 for the year 1982-83, is given by,

$$\frac{I(t)}{K(t-1)} = -\underset{(-2.6781)}{0.2256^{*}} + \underset{(1.3797)}{0.0450}\ \frac{\Delta\ S(t)}{K(t-1)} + \underset{(5.5233)}{0.3583}\ \frac{FNDE(t)^{*}}{K(t-1)}$$

$$-\underset{(-7.1461)}{1.226}\ \frac{PAT(t)}{K(t-1)}^{*},$$

$$R^2 = 0.8635,\ F = 86.4360$$

The estimated regression equation of specification (2) for r = o,l for the year 1986-87,is given by,

$$\frac{I(t)}{K(t-1)} = \underset{(2.1551)}{0.1137^{*}} + \underset{(3.6101)}{0.4341}\ \frac{\Delta\ S(t)^{*}}{K(t-1)} - \underset{(-0.0829)}{0.0104}\ \frac{FNDE(t)}{K(t-1)}^{*}$$

$$-\underset{(-1.1201)}{0.3053}\ \frac{PAT(t)}{K(t-1)}^{*}$$

$$R^2 = 0.3950,\quad F = 5.4415$$

* indicates that the coefficient is significant at 5% level

The results of the specification (3.2) for r = 0,1 are presented in table II. 4., wherein the R s range from 0.31 to 0.87. Flow of net debt is significant in most of the years. The same variable with one year lag is significant in four of the regressions. Sales change variable with one year lag is significant in three regressions. The profit variable has not proved to be statistically significant as was the retained earnings variable in specification (3.1).

Table II. 5 gives the results of specification (3.2) for r=0,l,2. R^2 values here range from 0.33 to 0.88. Flow of net debt, both current and with one year lag have proved to be significant, while all the other variables have not been found to be statistically significant.

The table II. 6 gives the results of specification (3.2) for r = 0,1,2,3. R^2 values here range from 0.39 to 0.90, but there are no significant changes in statistical significance of the explanatory variables in this case, compared to the earlier cases.

In table II.7 results of specification (3.2) for r=0,1,2,3,4 are presented. The R^2 values in this case range from 0.42 to 0.93. Flow of net debt did influence the fixed capital investment and is statistically significant. This variable with one year lag and two years lag is statistically significant in a few regressions, indicating the influence of external financing activity of previous two years on fixed investment.

Summing up, specification (3. 2) has not shown any significant improvement over the specification (3.1). Profits after tax variable which is included in specification (3.2) in place of retained earnings has not proved to be statistically significant in almost all the cases. Flow of net debt is influencing investment positively as in the earlier specifications. Sales change variable has not registered any influence on fixed investment.

Table II. 8 gives the results of the specification (3.3) for r = 0. In this specification, investment allowance reserve is incorporated, which includes the tax incentives. Inclusion of this variable has improved the efficiency of the model in terms of R^2 values and statistical significance of explanatory variables. R^2 values in this case range from 0.32 to 0.89. Investment allowance reserve and flow of net debt are statistically significant in the estimated regressions of the model. This shows that tax incentives induce investment in fixed assets.

The results of the same specification for r = 0,1 are given in table II. 9. R^2 values in this case range from 0.31 to 0.91. Flow of net debt and investment allowance reserve, both current and lagged by one year have turned out to be statistically significant and there by showing their effectiveness in influencing fixed investment.

Table II.10 presents the results of the specification (3.3) for r = 0,1,2 . R^2 values range from 0.40 to 0.94. Both investment allowance reserve and flow of net debt with two years lags exerted negative influence on fixed capital investment, while retained earnings is not statistically significant.

The results of the specification (3.3) for r = 0,1,2,3 are given in table II.11. R^2 values, in this case range from 0.42 to 0.95. But the explanatory variables of fixed capital investment with and without lags gave similar results as in the above case, suggesting no improvement due to additional lagged variables.

Table II.12 gives the results of the specification (3.3) for r = 0,1,2,3,4. The R^2 values range from 0.54 to 0.96. Flow of net debt and investment allowance reserve are statistically significant compared to the earlier two cases. Sales change variables, both current and lagged have failed to show any effect on the fixed capital investment.

Summarizing, the specification (3.3), by the inclusion of investment allowance reserve, has improved significantly over the earlier two specifications, in terms of R^2 values and *significance of the explanatory variables. Investment allowance reserve both current and lagged by one and two years are influencing fixed capital investment. Flow of net debt continues to be statistically significant as in the earlier cases.*

The estimated results of specification (3.4), which includes profits in place of retained earnings, for r = 0 are presented in table II.13. The R^2 values in this case range from 0.32 to 0.89. The FNDE and IAR variables are statistically significant, while sales change and profit variables have not proved to be signficant.

Table II.14 gives results of specification (3.4) for r=0,l. R^2 values here range from 0.31 to 0.91. Estimated regression equation of the year 1982 - 83 has the highest R^2 value (0.91). Lagged FNDE and IAR variables are also significant in some of the years.

In table II.15 results of the same specification for r = 0,1,2 are given. The lowest R^2 value is in the year 1984-85 (0.31)and the highest value is in the year 1982-83 (0.94). Flow of net debt is significant in a few of the regressions. Though, this variable with two year lag is also significant in a few years, its coefficients are negative depicting the contrary results.

Results of specification (3.4) for the case r = 0,1,2,3 are presented in table II.16. In this case, the R values range from 0.41 to 0.95. Investment allowance reserve and flow of net debt are significant in few regressions. Flow of net debt with three years lag and investment allowance reserve with two years lag are not statistically significant.

Table II.17 gives results of the same specification for r = 0,1,2,3,4. The R^2 values range from 0.58 to 0.96. Flow of net debt is the only variable, which influences the fixed capital investment and is statistically significant.

Summing up, this specification has fared well, with flow of net debt and investment allowance reserve variables having shown to be significant in many of the cases, as in the earlier specification. Profits variable has not shown any influence on fixed investment.

Specification (3.5) was estimated to examine the interdependence or otherwise of fixed investment and inventory investment decisions. The results of this specification are given in table II.18. The R^2 values in this case, ranged from 0.46 to 0.94. Inventory investment as an explanatory variable has negative signs for its coefficients in all but one of the estimated regressions. This shows that fixed and inventory investment have an inverse relationship between them, which means that the more the fixed investment is, the less will be the inventory investment. It may be concluded that fixed and inventory investment are competitive in nature.

3.3.2 Time Series Study :

The time series results of specification (3.1) for the cases r = 0,1; r =0,1,2; r= 0,1,2,3 and r = 0,1,2,3,4 are presented in table II.19. The R^2 values range from a high of 0.71 to a low of 0.05. None of the explanatory variables are statistically significant.

Table II.20 contains the results pertaining to specification (3.2) for all the cases. The highest R value is 0.90 and the lowest is 0.12. This specification, with inclusion of profits after tax in lieu of retained earnings proved to be statistically significant compared to specification (3.1). But profits after tax and flow of net debt have not shown to be significant.

The time series results of specification (3.3) for the cases r = 0; r = 0,1; r=0,l,2; r=0,l,2,3 and r = 0,1,2,3,4 are presented in table II.21. The highest R^2 value in this case is 0.99 and the lowest value is 0.24. Here case 4, with the lag structure increasing 3 to 4 years, could not be estimated for want of more degrees of freedom. Retained earnings and flow of net debt variables are significant in some cases, involving lagged variables of two years. Investment allowance reserve variable also is significant in a few regressions. These three variables with one and two lags are statistically significant in a few of the regressions.

Results of specification (3.4) are presented in table II.22. The highest R value is 0.99 and the lowest is 0.23. This specification gave good results compared to the one containing retained earnings. Investment allowance reserve is statistically significant in many cases. Flow of net debt is significant in some regressions. Sales change variable is not significant. Profits after tax is significant only in case 4, involving 47 companies.

To sum up, none of the specifications have fared well in time series study. However the specification with investment allowance reserve gave good results compared to others, which exclude this variables. Flow of net debt, profits after tax and retained earnings are also statistically significant in a few of the regressions. Sales change variables both current and lagged have not shown any influence over fixed investment expenditures. The lagged variables of financial variables also did not perform well.

3.3.3 **Pooled time series** cross sections **study** :

Pooled time series cross section results for all specifications are given in table II.23. R^2 values in these cases are very low. Flow of net debt variable has proved to be significant in all the estimated regressions. Current sales change variable and investment allowance reserve are also significant in many of the regressions. Profits after tax and retained earnings are significant in almost all the equations, a result contrary to the cross section and time series cases.

The R^2 values of these equations are very poor. This may be due to the special features of the industry, like price controls on sugarcane and sugar. Another reason for the poor performance of the equations may be due to the deflation of all variables.

Summing up cross section, time series and pooled analysis, flow of net debt and investment allowance reserve are statistically significant and their coefficients have a positive sign. This implies that external finance and investment allowance reserve have great impact on fixed capital investment expenditures in the sugar industry. The lagged variables of these variables are also statistically significant in some of the years. Current sales change variable seems to have a positive influence on fixed investment and is found to be significant in some of the regressions. The second lag of sales change variable is *found to be significant in a few of the regressions. Profits after tax and retained earnings variables are significant but their coeffeicents are negative.*

3.4 CONCLUDING REMARKS :

1. External finance is found to be the most important determinant of fixed investment expenditures, followed by investment allowance reserves.

2. Fixed investment and inventory investment are found to be competitive in the short run because of scarce flow of funds.

3. The effect of accelerator and the effects of internal funds and profits or liquidity are weak in explaining fixed investment in Indian sugar industry. This may be due to the extreme form of controls inclusive of price and distribution of sugar.

4. In the cross section analysis, though the R values have increased with the increase in the lag structure, the specifications have not fared well after two lags, with no significant improvement in the explanatory power of the independent variable.

5. In the time series study, though the R values are high compared to cross section results, the explanatory variables have not shown significant improvement over the cross section

results. In pooled analysis also, no significant improvement occurred in the explanatory power of the independent variables.

6. Compared to the time series and pooled analysis, cross section study has given good results in terms of statistical significance of the explanatory variables.

7. The OLS results have shown to be reliable, with no multicollinearity and auto-correlation problem as the D.W statistics in time series analysis are around 2.1 in all the cases.

CHAPTER 4

DETERMINANTS OF INVENTORY INVESTMENT BEHAVIOUR

In this chapter, the determinants of inventory investment behaviour are examined in four sections. In section one, conceptual framework is presented and in section two framework of the analysis is incorporated. Section three deals with results and discussion and in the last section conclusions are presented.

4.1 RELEVANT CONCEPTS :

Inventory, which forms a part of current assets, comprises of three components, viz (i) raw materials, (ii) goods in process, semi-finished, secondary and joint products and (iii) finished products. Raw material and goods in process constitute two thirds of the aggregate inventory holding for the sugar industry in India . Inventory investment is defined as a change in the stock of inventories, or the net addition to stock of invetories. Inventory investment is usually perceived as a sum of intended and unintended investment[2] .

Intended investment is the difference between intended or desired stock of inventories and the current stock of inventories. Unintended inventory investment results from unanticipated timing in the receipt of material used in production as well as from unanticipated sales or output. Firms hold inventories for mainly four reasons. They are (i) Transaction motive (ii) Speculative motive(iii) to maintain buffer stocks and (iv) to meet the backlog of demand.

In a growing economy like India, inventory investment is also required to grow so as to sustain and maintain the flow of production process on a continuing basis, and for fuller utilization of existing capacity. It becomes highly important for analysis of fluctuations in economic activity because of its considerable volatile nature. The standard deviation of inventory investment over time, as opposed to its mean, is comparable to that of capital expenditures[3].

4.2 FORMULATION OF MODEL :

Inventory investment behaviour is analysed in the present study, in the framework of flexible accelerator model, since, the naive accelerator model is unrealistic, as it assumes no lags in the adjustment process. But in reality, there will be procurement lags between orders and deliveries and their length depends on the source of supply and availability. Another factor influencing the speed of adjustment is uncertainty in the market for raw material, and in the demand for final product.

The sales change variables both current and lagged ones are included in the model to represent the accelerator effects.

Lagged sales change variable accounts partly for expectations of net sales changes (proxy to expectational-accelerator hypothesis) and partly for partial adjustment process (proxy to flexible accelerator hypothesis). Stock of inventories at the beginning of the period is included to represent the lag in achieving desired level of inventories.

The financial variables considered in the model are flow of net debt and retained earnings or alternatively profits. Flow of net debt represents external finance and, retained earnings or profits represent the internal source of finance. The flow of net debt is one of the major external finance variables, which serves for both short term and long term funding. There will be lags in inventories of imported, domestic materials and components due to procurement procedures and delivery lags etc. Since, retained earnings or alternatively profits are an important source of internal funds for inventory investment, they are included in the model. In order to get a correct appraisal of the effect of flow of funds, both internal and external, there is a practice to include fixed investment also in the model of inventory investment. The other variables considered are cost of funds and stock-sale ratio.

A distinguishing feature of this study is that, a finite distributed lag structure is considered for the financial variables also in addition to the sales change variables. Three sales change variables including one current and two lagged ones are considered as explanatory variables in specifications of step-wise regressions.

All the variables are in current prices. Three cases viz., time series, cross section and pooled are considered. All the financial variables are deflated by capital stock of previous year, except the sales change variables, which are deflated by sales of previous year. These ratio measures of variables are independent of units of measurements and of scale and it helps to correct for heteroscedasticity.

In the case of cross section study, cross section regressions for every year are computed. But, results of the estimated regressions with R^2 more than 0.3 only are being reported. Time series estimation was carried out for four cases. In case one , there are 23 companies and the data runs from 1965-66 to 1986-87. There are 27 companies with data from 1965-66 to 1985-86, in case two. In case three, there are 34 companies, having data from 1965-66 to 1982-83. In case four, 45 companies have data ranging from 1965-66 to 1980-81.

Both linear and log-linar forms of the models are estimated for time series and cross section study. Since the results obtained for linear and log-linear forms of the models are similar in almost all cases, only results of the linear forms are being reported, to avoid repetition. All the tables of this chapter are presented in appendix III.

The method of estimation was ordinary least squres. The model specifications are as follows.

$$\frac{IN(t)}{k(t-1)} = a + \sum_{r=0}^{2} b_r \frac{\Delta S(t-r)}{S(t-r-1)} + \sum_{r=0}^{2} c_r \frac{RENT(t-r)}{k(t-r-1)} + \sum_{r=0}^{2} d_r \frac{FNDE(t-r-1)}{k(t-r-1)} + e \frac{I(t)}{k(t-1)} \qquad (4.1)$$

$$\frac{IN(t)}{k(t-1)} = a + \sum_{r=0} b_r \frac{\Delta S(t-r)}{S(t-r-1)} + \sum_{r=0} c_r \frac{RENT(t-r)}{k(t-r-1)} + \sum_{r=0} d_r \frac{FNDE(t-r)}{k(t-r-1)} + e \frac{I(t)}{k(t-1)} + f \frac{INS(t-1)}{k(t-1)} + g \frac{INS(t)}{s(t)} + h\ ACF \qquad (4.2)$$

$$\frac{IN(t)}{k(t-1)} = a + \sum_{r=}^{2} b_r \frac{\Delta S(t-r)}{S(t-r-1)} + \sum_{r=0}^{2} c_r \frac{PAT(t-r)}{k(t-r-1)} + \sum_{r=0}^{2} d_r \frac{FNDE(t-r)}{k(t-r-1)} + e \frac{I(t)}{k(t-1)} \qquad (4.3)$$

$$\frac{IN(t)}{k(t-1)} = a + \sum_{r=0}^{2} b_r \frac{\Delta S(t-r)}{S(t-r-1)} + \sum_{r=0}^{2} c_r \frac{PAT\ (t-r)}{k(t-r-1)} + \sum_{r=0}^{2} d_r \frac{FNDE(t-r)}{k(t-r-1)} + e \frac{I(t)}{k(t-1)} + f \frac{INS(t-1)}{k(t-1)} + g \frac{INS(t)}{S(t)} + h\ ACF \qquad (4.4)$$

Where $r = 0,1,2$ are one year lags and a,b,c,d,e,f,g and h are regression coefficients of the concerned variables, and

I	=	Gross fixed investment
K	=	Gross fixed assets
ΔS	=	Sales Change
IN	=	Inventory investment
RENT	=	Gross retained earnings
FNDE	=	Flow of net debt(external finance)
PAT	=	Profits net of taxes
IAR	=	Investment allowance Reserve
INS	=	Stock of inventories
ACF	=	Average cost of funds
t	=	Time subscript

4.3 DISCUSSION OF RESULTS :

4.3.1 Cross Section Study:

The estimated results of inventory investment model (4.1) are presented in table III.l for r = 0. The R^2s range from 0.53 to 0.91. Flow of net debt and retained earnings are statistically significant in all the years. Fixed investment is negatively related to inventory investment, since its coefficients have negative signs. The sales change variable is not statistically significant and its coeffcients have negative signs in most of the cross sections.

In table III.2, there is a slight improvement in R^2s when lagged variables are included in the model. The R^2s range from 0.56 to 0.88. Only the current financial variables, both flow of net debt and retained earnings are significant. The lagged flow of net debt variable is even negative in some cases. Similarly, the lagged retained earnings and lagged sales change variables have not been statistically significant.

The results for r = 0,1,2 are presented in table III. 3. The R^2s range from 0.64 to 0.91. Here also, the current variables of flow of net debt and retained earnings are statistically significant. The lagged variables have not shown any influence on inventory investment. The sales change variables both lagged and current are not statistically significant and bear negative signs in many regressions. Fixed investment is negatively related to inventory investment in many regressions.

Summing up, the specification (4.1) has performed well with high R^2s and many significant explanatory variables. Flow of net debt and retained earnings are statistically significant in all the cases viz., r = 0; r= 0,1 and r = 0,1,2. Lagged flow of net debt and lagged retained earnings variables have not established any impact on inventory investment. Similarly, sales change variables - both current and lagged - have not registered any influence over inventories. Fixed investment has an inverse relationship with inventory investment.

The results of the specification (4.2) are presented in table III. 4. Here r = 0, which means that the regressions were run for current variables. The R^2s range from 0.52 to 0.90. The financial variables FNDE and RENT are statistically significant in many regressions. The current stock of inventories and lagged stock of inventories variables are also statistically significant. Fixed investment is negatively elated to inventory investment, here also.

In table III. 5 the results of specification (4.2) for the case r= 0,1 are presented. The R^2s here range from 0.64 to 0.91. Here also, as in the previous specification, the financial variables FNDE and RENT are statistically significant in most of the regressions. The lagged variables of FNDE and RENT are not statistically significant and many of their coefficients have negative signs also. Fixed investment is statistically significant in half of the regressions and has negative signs. The sales change variables are not significant and some have negative sings also. The current stock of inventories variable is statistically significant in half of the regressions. This means that there is a direct relationship between stock of inventories and inventory investment.

In table III.6, the results of specification (4.2) for the case r = 0,1,2 are given. The R^2s in this case range from 0.66 to 0.93. The results are the same as in the previous case.

To sum up the three cases, there is no significant improvement in the results of this specification over the previous one, even by the addition of stock to sales ratio, average cost of funds and lagged stock of inventories variables.

Only current stock of inventories is significant in some of the regressions.

The estimated results of specification (4.3) are given in table III.7 for the case r= 0. The R^2s in this case range from 0.67 to 0.92. The variables FNDE and PAT are statistically significant. Sales change variable does not seem to show any influence on inventory investment. Fixed investment is inversely related to inventory investment.

Table III.8 gives results for the case r = 0,1. R^2 values here are more than 0.52. The highest value of R^2 is 0.92. Lagged variables are not statistically significant. The conclusions in this case are similar to the earlier cases.

The results for the case r = 0,1,2 for specification (4.3) are presented in table III.9. R^2 values range from 0.62 to 0.92. Lagged variables have not shown any influence over inventory investment, here also. All other findings are similar to earlier cases.

Summarizing all the three cases, the results of this model specification are similar to that of specification (4.1), in which retained earnings was used in lieu of profits. Here profits variable has proved to be statistically significant as was retained earnings in specification (4.1).

The estimated results for specification (4.4) for r = 0, are given in table III. 10. The R^2 values range from 0.52 to 0.97. FNDE, PAT and INS variables are statistically significant in many regressions. Fixed investment is inversely related to inventory investment.

Table III.11 presents results for specification (4.4) for case r= 0,1. R^2 values here range from 0.65 to 0.88. The lagged variables are not statistically significant. Sales change variables have no effect on inventory investment. Other findings are similar as in earlier cases.

The results of specification (4.4) for the case r = 0,1,2 are presented in table II.12. FNDE, PAT and INS variables are significant in most of the regressions. Current stock of inventories is also statistically significant. The ACF variable is not significant. Lagged stock of inventories is also not significant and has little effect on inventory investment. Lagged variables, both of sales change and financial variables, are not statistically significant.

Summing up, in all the four specifications the financial variables, flow of net debt and retained earnings and alternatively profits have turned out to be statistically significant in determinating the inventory investment expenditures. The sales change variables, both current and lagged have no influence on inventories. Fixed investment is *inversely related to inventory investment and is statistically significant too. Thus, the interdependence of inventory and fixed investment is indicated.*

4.3.2 Time Series Study :

The time series results of specification (4.1) for cases 1 to 4 are presented in table III. 13. The R^2s in all the cases are well above 0.9, except in case 1, for r = 0 and r = 0,1. The FNDE variable is statistically significant in all the cases. The RENT variable is significant in some, but not in all the regressions. Fixed investment is inversely related to inventory investment but is not significant.

The time series results of specification (4.2) are presented in table III.14 for all the cases 1 to 4, for r = 0, r = 0,1 and r = 0,1,2. The R^2 values for all the regressions are more than 0.90. The FNDE variable is statistically significant in many regressions. RENT and INS variables are statistically significant in some cases only. Lagged variables are not statistically significant with little quantitative effect on inventory investment.

Table III.15 presents time series results of specification (4.3) for all the cases 1 to 4, for r = 0, r = 0,1 and r = 0,1,2. The R values are well over 0.9 in all the cases. FNDE is statistically significant in almost all the regressions. PAT variable is statistically significant in only some of the regressions. Fixed investment is inversely related to inventory investment and is not significant.

Time series results of specification (4.4) are given in table III.16 for all the cases for r = 0, r = 0,1 and r = 0,1,2. The R^2 values are well over 0.95 in all the cases. The same conclusions drawn in the previous case hold good here also.

To sum up, in time series analysis, the R^2s are very high, well over 0.9 in almost all cases, with a few exceptions, indicating the better fit of the models. The financial variable FNDE, is statistically significant in all the estimated regressions. The other financial variables, RENT and PAT are also significant in some cases. Fixed investment is inversely related to inventory investment and is statistically significant in some regressions. The sales change variables, both current and lagged have not shown any effect on inventory investment. The variables, cost of funds and lagged stock of inventories are not significant. Current stock of inventories variable has exerted some influence over inventory expenditures.

4.3.3 Pooled Analysis :

The estimated pooled time series cross section results are presented in table III.17. The R^2s in this case are centered around 0.5. The financial variables FNDE, RENT and PAT are statistically significant in all the regressions. The lagged variables of these, are negatively and statistically significant in some regressions. Fixed investment is negatively significant in many cases. The sales change variables have not established any influence on inventory investment. Current stock of inventories is significant in many cases, while cost of funds is significant in a few regressions. Lagged stock of inventories is not significant and its coefficients are minute.

4.4. MAIN FINDINGS :

1. External sources of financing have more influence on inventory investment than internal funds.

2. The financial flows, both internal and external have proved to be very important determinants of inventory investment and are statistically significant too.

3. Accelerator has not proved to be an important determinant of inventory investment in Indian sugar industry.

4. Fixed investment has an inverse relationship with inventory investment, suggesting the presence of interdependence between the two.

5. Lagged variables have not established any influence on inventory investment. This implies that there are no long term lags in orders and deliveries of inventories in the sugar industry.

6. cost of funds variable has not exerted any influence on inventories.

7, The results are free from auto-correlation and other econometric problems, as the D.W. statistics in time series analysis are all around 2.1.

[1]Krishnamurthy, K and D U Sastry (1975) , Investment *and financing in the corporate sector in India,* Tata McGraw Hill, Bombay.

2 Eisner, R (1974), "Factors in Inventory Investment", in *Factors in Business Investment*, National Bureau of Economic Research, Princeton University Press, Princeton.

[3]Ibid.

CHAPTER 5

DETERMINANTS OF EXTERNAL FINANCE AND DIVIDEND BEHAVIOUR

In this chapter, the determinants of external financing activity and dividends behaviour are analysed.

5.1 EXTERNAL FINANCE : POSSIBLE DETERMINANTS

5.1.1 BASIC ISSUES :

The demand for external finance arises mainly due to the constraints on the availability of internal sources of financing. Internal source of finance comprises of dividends paid to share holders and retained earnings of the firms. Firms depend on external sources of financing, to achieve a higher rate of growth than is possible with retained earnings. So, higher amount of dividend paid to share holders induce higher demand for external finance. Hence, the demand for external finance is positively related to the investment needs. This hypothesis may not be true in the case of firms which are either not growing or have no growth opportunities.

External sources of finance comprise of borrowings from banks and other financial institutions, borrowings from government and semi-government bodies, equity and preference shares, deposits, debentures, bonds and paid-up capital.

5.1.2 Analytical Framework :

Kalecki's (1937) principle of increasing risk is incorporated in the model of external finance. According to this principle, the extent to which a firm can or will borrow is governed by the amount of its indebtedness, as the marginal risk rises with the increase in outstanding debt in relation to its own capital. Risk is considered to be an increasing function of outstanding debt, since in the event of failure of business, borrower is endangered. Increasing risk constrains borrowing to some portions of its own capital. Hence, the flow of credit is negatively related to outstanding debt.

In the empirical investigations, the risk factor is represented by the stock of net debt. The analysis is done to examine the linkage between financial and investment decisions. The other explanatory variables included in the model in step-wise regressions of alternative specifications are fixed investment, inventory investment, profits or alternatively retained earnings and flow of net debt. Much discussion on the choice of variables was done in earlier chapters. Two specifications of the model are considered with profits in one, and alternatively retained earnings in the other.

The analysis is carried out for three cases viz, cross section, time series and pooled time series cross section. Both linear and log-linear forms of the specifications are estimated for time series and cross sections data. Since the results are similar for both linear and log-linear forms, only the results of the former are presented here.

Time series estimation is done for 5 cases. Case 1, has 23 companies in it having data from 1965-66 to 1986-87. in case 2, there are 27 companies with data ranging from 1965-66 to 1985-86. There are 34 companies, with data ranging from 1965-66 to 1982-83. Case 4 has 45 companies, with data from 1965-66 to 1980-81. In case 5, there are 56 companies. The data in this case are from 1965-66 to 1975-76.

All the variables are at current prices. Cross sections for each year, involving 21 years are estimated. But results of alternate years and where ever the R^2 values are more than 0.3 are only reported. All the variables are deflated by the capital stock of the preceding year as a correcting measure for heteroscedasticity. The results are obtained by the method of ordinary least squares. All the tables of this chapter are presented in appendix IV.

The specifications of the model are given by :

$$\frac{FNDE(t)}{K\ (t-1)} = a + b \frac{I(t)}{K(t-1)} + c \frac{IN(t)}{K(t-1)} + d \frac{NDE(t-1)}{K\ (t-1)} + e \frac{RENT(t)}{K(t-1)} \qquad (5.1)$$

$$\frac{FNDE(t)}{K(t-1)} = a + b\,\frac{I(t)}{K\ (t-1)} + c\,\frac{IN(t)}{K\ (t-1)} + d\,\frac{NDE(t-1)}{K\ (t-1)} + e\,\frac{PAT(t)}{K\ (t-1)} \qquad (5.2)$$

5.1.3 **DISCUSSION OF RESULTS** :

5.1.3.1 Cross Section Analysis :

The estimated results of the specification (5.1) are presented in table IV.1. The R^2s here, range from 0.50 to 0.87. In all the regressions, inventory investment variable is statistically significant, with a positive coefficient. In all the years, the retained earnings variable is negatively significant, except in 1969-70, wherein it is not significant. This shows that the larger the retained earnings, the lesser will be the demand for external funds. This finding is consistent with the theory and empirical findings of earlier studies.

The fixed investment variable is positively related to the demand for external funds, except in one or two years. In more than half of the cross sections, this variable turned out to be significant. Stock of net debt is positively related to external finance in half of the regressions.

The results of the specification (5.2) in which profit variable is included in lieu of retained earnings are given in table IV.2. The R^2s range from 0.51 to 0.93. The inventory investment variable is significant in all the years and is positive also. Profits are negatively related to external finance. Stock of net debt is positively related to external finance variable in half of the cross sections. These results confirm the findings of specification (5.1).

5.1.3.2 **Time Series Analysis** :

The time series results of specifications (5.1) and (5.2) are presented in tables IV.3 and IV.4 respectively. The model has performed well in terms of the explanatory power and statistical significance of the variables. The R^2s are well over 0.9 in almost all the cases . Here also, inventory investment, retained earnings and profits after tax are statistically significant. The latter two internal sources of finance are negatively related to external finance.

5.1.3.3 Pooled Analysis :

The **estimated** model specifications for pooled cross section time series are as follows :

$$\frac{FNDE(t)}{K(t-1)} = \underset{(1.5741)}{0.0272} - \underset{(-16.6438)}{0.8271} \frac{PAT(t)}{K(t-1)}^{*} + \underset{(10.4618)}{0.3777} \frac{I(t)}{K(t-1)}^{*}$$

$$+ \underset{(63.0845)}{1.2130} \frac{IN(t)}{K(t-1)}^{*} + \underset{(2.5458)}{0.02421} \frac{NDE(t-1)}{K(t-1)}^{*}$$

$$R^2 = 0.8155 , F = 1019.37$$

$$\frac{FNDE(t)}{K(t-1)} = \underset{(0.6331)}{0.0105} - \underset{(-18.6651)}{1.0127} \frac{RENT(t)}{K(t-1)}^{*} + \underset{(10.0771)}{0.3561} \frac{I(t)}{K(t-1)}^{*}$$

$$+ \underset{(64.8381)}{1.2147} \frac{IN(t)}{K(t-1)} + \underset{(2.4284)}{0.0223} \frac{NDE(t-1)}{K(t-1)}^{*}$$

$$R^2 = 0.8245 , F = 1099.33$$

In this case too, the R^2 s are good. Inventory investment, fixed investment and stock of net debt are statistically significant and positively related to external finance. The retained earnings and profits variables are negatively related and significant. These results are in conformity with the cross section and time series results.

5.2. **DETERMINANTS OF DIVIDENDS BEHAVIOUR** :

5.2.1 **BACKGROUND** :

Dividends refer to that portion of a firm's net earnings which are paid out to share holders. Since dividends are distributed out of profits, the alternative to the payment of dividends is the retention of earnings or profits. There is a reciprocal relationship between retained earnings and cash dividends, the larger the retentions, the lesser will be the dividends and vice versa. A major financial decision of a firm, is the dividend decision, in the sense that the firm has to choose between either distributing profits to induce the share holders to invest in share capital or retaining the profits net of tax provision as retained earnings or cash flow or liquidity of the firm. This helps to raise the stock market value of the firm so that the internal funds are ploughed back for reinvestment.

There are conflicting opinions regarding the impact of dividends on the share prices and valuation of the firm. According to one school of thought (Modigliani and Miller (1961)) dividends are irrelevant so that the amount of dividends paid has no effect on the valuation of the firm. The second school of thought considers that dividend decisions are relevant to the value of the firm measured in terms of the market price of the share unit of the firm. The theories that support the relevance of dividends in market valuation of firms are that of Walter (1963) and Gordon (1960). Yet, there is another conceptual and analytical framework of Lintner (1956) presented in the following section.

5.2.2 **MATERIALS AND METHODS** :

In the present study, empirical investigations of the dividend behaviour have been carried out in the framework of the Lintner's (1956) model.

The Lintner hypothesis is a major and well established proposition on dividend behaviour. This hypothesis states that dividends represent primary and active decision variable, while retained earnings are largely a by-product of dividend decision taken in terms of well established practices and policies.

The capacity of the firm to pay dividends is inversely represented by cash flow variable i.e., profit net of taxes but gross of depreciation. Liguidity is implicitly considered in the model by including flow of net debt variable which is again inversely related to Liguidity. Lagged dividend is included as the previous year's dividends can have a bearing on the present dividend decision of the firm. Another variable incorporated in the model is total investment expenditure, which includes fixed as well as inventory investment. Profits after tax is another important determinant considered in the model. In empirical investigations of the dividend behaviour, many of the above explanatory variables, viz., investment, external finance, liquidity and profits after tax have been incorporated in the model.

The specification of the model is given by,

$$\frac{DIV(t)}{K(t-1)} = a + b\,\frac{PAT(t-1)}{K(t-1)} + c\,\frac{FNDE(t-1)}{K(t-1)} + d\,\frac{I(t) + IN(t)}{K(t-1)} + e\,\frac{DIV(t-1)}{K(t-1)} \qquad (5.3)$$

All the variables are at current prices. All the variables are deflated by capital stock of previous year to correct for heteroscedasticity, which is common in cross-section analysis. The analysis is done for three cases, time series, cross-section and Pooled. Both linear and log-linear forms of the model are estimated, but results of the linear form only are being reported, since they are similar in both the forms.

In the case of time series analysis, different cases were formed by increasing the number of companies in each case. Thus in case I, there are 23 companies, case II 27 companies, case III 34 companies and case IV 45 companies. This is done mainly because of lack of data for all the companies for all the years. Hence, in case I, the 23 companies data are from 1965-66 to 1986-87, where as in case 2, the data are from 1965-66 to 1985-86 for 27 companies. That is, in case II 4 more companies could be included if we were to loose the last observation ie data for 1986-87. The results are obtained by the method of ordinary least squares(OLS).

5.2.3 ANALYSIS OF RESULTS :

5.2.3.1 Cross Section Analysis :

The cross section results of dividends behaviour are presented in table IV.5. An overall view of this table suggests that the estimated regression equation has R values ranging from 0.44 to 0.87. Another striking feature is that in all the years except in 1976-77, the lagged dived ends variable is statistically significant with a positive sign. This shows the influence of lagged dividends on current dividends. Profits after tax variable is the next better explanator of dividends. Flow of net debt variable and total investment expenditure variable show relatively poor explanatory power, and are not statistically significant. In some years the coefficients bear negative sign.

5.2.3.2 Time Series Analysis :

The estimated linear time series model for case I involving 23 companies is given by,

$$\frac{DIV(t)}{K(t-1)} = \underset{(1.3495)}{0.0109} - \underset{(-0.1907)}{0.0192}\frac{PAT(t)}{K(t-1)} + \underset{(0.7010)}{0.3138}\frac{PAT(t)-PAT(t-1)}{K(t-1)}$$

$$+ \underset{(0.9035)}{0.0252}\frac{FNDE(t)}{K(t-1)} - \underset{(-1.1700)}{0.0413}\frac{I(t)+IN(t)}{K(t-1)}$$

$$+ \underset{(2.1348)}{0.8346}\frac{DIV(t-1)}{K(t-1)}^{*}, \quad R^2 = 0.3122, \quad F = 1.3624, \quad D.W = 2.1025$$

The estimated linear model for case 2, involving 27 companies is given by,

$$\frac{DIV(t)}{K(t-1)} = \underset{(0.3834)}{0.0019} + \underset{(1.5712)}{0.1517}\frac{PAT(t)}{K(t-1)} - \underset{(-3.6216)}{1.2171}\frac{PAT(t)-PAT(t-1)}{K(t-1)}^{*}$$

$$+ \underset{(1.5685)}{0.0396} \frac{FNDE(t)}{K(t-1)} - \underset{(-1.2268)}{0.0409} \frac{I(t) + IN(t)}{K(t-1)}$$

$$+ \underset{(17.2530)}{0.8847} \frac{DIV(t-1)}{K(t-1)}^{*}, \quad R^2 = 0.9603, \quad F = 68.6071, \quad D.W = 2.2641$$

The estimated linear model for case 3, including 34 companies is given by,

$$\frac{DIV(t)}{K(t-1)} = \underset{(2.5251)}{0.0099^{*}} + \underset{(4.0517)}{0.2312} \frac{PAT(t)}{K(t-1)} - \underset{(-0.6282)}{0.0814} \frac{PAT(t)-PAT(t-1)}{K(t-1)}^{*}$$

$$+ \underset{(1.5994)}{0.0422} \frac{FNDE(t)}{K(t-1)} - \underset{(-1.3580)}{0.0427} \frac{I(t)+IN(t)}{K(t-1)}$$

$$+ \underset{(1.2414)}{0.2099} \frac{DIV(t-1)}{K(t-1)}^{*}, \quad R^2 = 0.7560, \quad F = 6.8108, \quad D.W = 2.1814$$

The estimated linear formofcase 4, involving 42 companies is given by,

$$\frac{DIV(t)}{K(t-1)} = \underset{(1.7432)}{0.0074} + \underset{(1.2994)}{0.0629} \frac{PAT(t)}{K(t-1)} - \underset{(1.5898)}{0.2808} \frac{PAT(t)-PAT(t-1)}{K(t-1)}$$

$$+ \underset{(-0.3652)}{0.0082} \frac{FNDE(t)}{K(t-1)} + \underset{(0.0036)}{0.0001} \frac{I(t) + IN(t)}{K(t-1)}$$

$$+ \underset{(2.3607)}{0.5807} \frac{DIV(t-1)}{K(t-1)}^{*}, \quad R^2 = 0.8664, \quad F = 1.2991, \quad D.W = 2.2934$$

The estimated linear form of the model for case 5, involving 56 companies is given by,

$$\frac{DIV(t)}{K(t-1)} = \underset{(1.1561)}{0.0252} + \underset{(1.7353)}{0.5670} \frac{PAT(t)}{K(t-1)} - \underset{(-1.1684)}{0.5887} \frac{PAT(t)-PAT(t-1)}{K(t-1)}$$

$$+ \underset{(0.4559)}{0.0423} \frac{FNDE(t)}{K(t-1)} - \underset{(-0.0266)}{0.0027} \frac{I(t) + IN(t)}{K(t-1)}$$

$$- \underset{(-1.5574)}{1.8346} \frac{DIV(t-1)}{K(t-1)}^{*} , \quad R^2 = 0.6101$$

$$F = 1.2513$$

$$D.W = 2.2017$$

From the analysis of the above five estimated linear equations, it becomes amply clear that lagged dividend variable is consistently and statistically significant across the alternative specifications throughout. On the whole, the R^2 values are well above 0.6, indicating the goodness of fit of the model. In all the cases, the lagged dividend variable is having positive sign.

5.2.3.3 Pooled Analysis :

The estimated pooled time series cross section model is as follows :

$$\frac{DIV(t)}{K(t-1)} = \underset{(8.2448)}{0.0046^{*}} + \underset{(2.8951)}{0.0092} \frac{PAT(t)}{K(t-1)}^{*} + \underset{(4.6664)}{0.0161} \frac{PAT(t)-PAT(t-1)}{K(t-1)}^{*}$$

$$+ \underset{(1.6342)}{0.0023} \frac{I(t) + IN(t)}{K(t-1)} - \underset{(-2.3246)}{0.0028} \frac{FNDE(t)}{K(t-1)}$$

$$+ \underset{(33.5364)}{0.7354} \frac{DIV(t-1)}{K(t-1)} , \quad R^2 = 0.5740, \quad F = 310.2702$$

Here R value is above 0.5 and all the variables except flow of net debt have a positive sign for their coefficients. Lagged dividends is significant here also as in the case of cross section study. Total investment expenditure and profit after tax variable are statistically significant.

5.3 CONCLUSIONS :

1. In terms of the R^2 values and explanatory power of the variables, inventory investment is the most important determinant of external finance. The other determinants in the order of importance are retained earnings and alternatively profits, fixed investment and stock of net debt variables.

2. The demand for external finance is negatively related to internal sources of finance. This means the lower the profits, the higher will be the demand for external funds.

3. Investment expenditures, both fixed and inventory influence external financing activity significantly. More particularly, inventory investment has greater impact on external finance.

4. The principle of increasing risk, constraining the flow of external finance is substantiated in many of the cases.

5. Dividend decisions are largely autonomous of investment and external financing decisions and therefore retained earnings are residual in character.

6. The profit variable is not statistically significant in determining the dividends in sugar industry.

7. Other variables such as the flow of net debt, investment expenditures and the liquidity position of firm have not established any influence on the dividend policy.

+ This trend emerges in log-linear form also.

CHAPTER 6

INVESTMENT, DIVIDENDS AND EXTERNAL FINANCE : A SIMULTANEOUS DETERMINATION

In this chapter, the problem of simultaneous determination of investment, dividends and external financing decisions is examined in the framework of simultaneous equation model.

6.1 THE LOGIC OF INTERDEPENDENCE :

The first attempt to study the three decisions of investment, dividends and external finance was done by Dhrymes and Kurz (1967). The preceding chapters traced the determinants of fixed investment, inventory investment, dividends and external finance and the quantitative significance of those determinants to each separately, in the framework of single linear multiple regression models, estimated by ordinary least squres method. The OLS results brought out the inverse relationship between fixed capital investment and inventory investment, quantitatively each serving as an explanatory variable to the other in their estimated regressions. Further, dividend decisions were autonomous with respect to its determinants in the sense that estimated regressions of dividends did not exhibit any explanatory variable to be statistically significant. Since these explanatory variables form part of investment and external financing decisions, we require to examine whether external financing and investment decisions and dividends are so mutually dependent or otherwise in estimation of simultaneous linear equation models. Estimation of such simultaneous relationships by ordinary least squares method leads to simultaneous equation bias. Since, it is necessary to make reliable, stable and a correct appraisal of the interdependence among the three decisions and the statistical significance of their determinants, it is appropriate to approach the problem in a simultaneous equation framework. For this purpose, the Two stage least sqares method is used.

The simultaneous equation model has four behavioural equations, one each for fixed investment, inventory investment, dividends and external finance. The four endogenous variables of the system are fixed investment (I(t)), Inventory Investment (IN(t)), Dividends (DIV(t)) and External Finance (FNDE(t)). The exogenous variables are sales changes (Δst), retained earnings (RENT(t)), and profits after tax (PAT(t)), stock of net debt (NDE(t-l)), lagged dividends (DIV(t-l)), total investment expenditures (I(t) + IN(t)) and investment allowance reserve (IAR(t)).

All the variables are at current prices. All the variables except sales change are deflated by capital stock of the previous year. Sales change variables are deflated by sales of previous year.

The equations of the system are :

$$\frac{I(t)}{K(t-1)} = a + \sum_{r=0}^{3} b_r \frac{\Delta S(t-r)}{S(t-r-1)} + \sum_{r=0}^{3} c_r \frac{RENT(t-r)}{K(t-r-1)} + \sum_{r=0}^{3} d_r \frac{FNDE(t-r)}{K(t-r-1)} + \sum_{r=0}^{2} e_r \frac{IAR(t}{K(t-r-1)}. \quad (6.1)$$

$$\frac{IN(t)}{K(t-1)} = a + \sum_{r=0}^{2} b_r \frac{\Delta S(t-r)}{S(t-r-1)} + \sum_{r=0}^{2} c_r \frac{RENT(t-r)}{K(t-r-1)} + \sum_{r=0}^{2} d_r \frac{FNDE(t-r)}{K(t-r-1)} + e \frac{I(t)}{K(t-1)} + f \frac{INS(t)}{S(t)} + g \frac{INS(t-1)}{K(t-1)} \quad (6.2)$$

$$\frac{FNDE(t)}{K(t-1)} = a + b \frac{RENT(t)}{K(t-1)} + c \frac{IN(t)}{K(t-1)} + d \frac{I(t)}{K(t-1)} + e \frac{NDE(t-1)}{K(t-1)} \quad (6.3)$$

$$\frac{DIV(t)}{K(t-1)} = a + b \frac{PAT(t)}{K(t-1)} + c \frac{FNDE(t)}{K(t-1)} + d \frac{I(t)+IN(t)}{K(t-1)} + e \frac{DIV(t-1)}{K(t-1)} \quad (6.4)$$

$$PAT(t) = DIV(t) + RENT(t) \quad ...(6.5)$$

This system of equations fulfils the rank and order conditions of identification and is over-identified, and hence it is estimated by the method of two -stage least squares (2SLS). Equation (6.5) is an identity representing the division of profits **between dividends and retained earnings.**

6.2 PRESENTATION OF RESULTS :

6.2.1 Cross Section Analysis :

Cross section results estimated by the method of two stage least squares for specification (6.1) are given in the table V.1 for r = 0. The R values in this case range from 0.37 to 0.82. The variables flow of net debt and investment allowance reserve are significant in all the regressions. Retained earnings is not significant. The sales change variable is significant in a few of the regressions.

The results of specification (6.1) for r = 0,1 are presented in table V.2. The R s here range from 0.65 to 0.94. The same conclusions, drawn in the previous case apply here also. The lagged variables are not statistically significant.

Table V.3 presents results of the same specification for r = 0,1,2. The R values in this case range from 0.50 to 0.93. The current sales change variable is significant in some years. The lagged sales change variables also are significant in a few equations. Investment allowance reserve is significant in more than half of the regressions, while flow of net debt is significant throughout, in all the equations. The lagged variables of the variables concerned are not statistically significant.

The results of specification (6.1) for the case r = 0,1,2,3 are given in table V.4. The R^2s here range from 0.58 to 0.94. The conclusions drawn in the earlier case apply here also.

To sum up, in the estimated specification (6.1), of simultaneous system, flow of net debt and investment allowance reserve have performed very well followed by sales change variables both current and lagged ones.

The cross section results of specification (6.2) for r= 0 are presented in table V.5. The R^2 values in this case have fared extremely well, with more than 0.99 in all the regressions. The reason for this is that the included explanatory variables are adequate, representative and are statistically significant. Retained earnings, sales change and flow of net debt show positive impact on inventory investment. Fixed investment shows negative influence on inventories. Inventory stocks to sales ratio is negatively significant. Stock of inventories at the beginning of the period shows positive influence. The cost of funds variable has not proved to be significant.

The results of the same specification for r = 0,1 and r=0,l,2 are presented in tables V.6 and V.7 respectively. The R values in these two cases are well over 0.99 in all the regressions. The conclusions drawn from table V.5 apply here also. The lagged variables are also significant. The lagged variables of retained earnings are negatively significant. The cross section results of specification (6.3) are presented in table V.8. The R^2 values in this case are well over 0.99 in all the regressions. Fixed investment, inventory investment and stock of net debt at the end of period t-1 are positively significant to influence external finance. Retained earnings is negatively significant. Sales change variable has not exerted any influence on external finance. This suggests that the demand for external finance depends on the level of fixed and inventory investment expenditures and net debt of earlier years. The larger the retained earnings the firm has, the lesser will be the demand for external funds.

The cross section results of the specification (6.4) are presented in table V.9. The R values here range from 0.45 to 0.79. Dividends at the end of period t-1 is statistically significant, while profit variable is significant in some of the regressions. Flow of net debt and total investment expenditure variables are not significant. This shows that dividend decisions are autonomous of investment decisions.

6.2.2 Pooled Cross Section Analysis :

The pooled cross section results of specifications (6.1), estimated by the method of 2 SLS are as follows :

$$\frac{I(t)}{K(t-1)} = -\underset{(-3.1743)}{0.0217^*} + \underset{(8.1548)}{0.0655}\frac{\Delta S(t)}{S(t-1)}^* + \underset{(7.5106)}{0.0880}\frac{\Delta S(t-1)}{S(t-2)}^*$$

$$+ \underset{(9.7437)}{0.1017}\frac{\Delta S(t-2)}{S(k-3)}^* - \underset{(-2.6999)}{0.0643}\frac{RENT(t)}{K(t-1)}^*$$

$$+ \underset{(1.0011)}{0.0292}\frac{RENT(t-1)}{K(t-2)} - \underset{(-5.9203)}{0.1669}\frac{RENT(t-2)}{K(t-3)}^*$$

$$+ \underset{(34.2797)}{0.2244}\frac{FNDE(t)}{K(t-1)}^* - \underset{(-0.2675)}{0.0014}\frac{FNDE(t-1)}{K(t-2)}$$

$$+ \underset{(0.0882)}{0.0005}\frac{FNDE(t-2)}{K(t-3)} + \underset{(9.8120)}{1.5272}\frac{IAR(t)}{K(t-1)}^*$$

$$- \underset{(-6.6563)}{1.2894}\frac{IAR(t-1)}{K(t-2)} + \underset{(2.6928)}{0.4177}\frac{IAR(t-2)}{K(t-3)}^*$$

[for r = 0,1,2] $R^2 = 0.6949$
$F = 180.9375$

The estimated specification (6.2) is given by,

$$\frac{IN(t)}{K(t-1)} = \underset{(19.1517)}{0.0757^*} + \underset{(27.6133)}{0.0669}\frac{\Delta S(t)}{S(t-1)} + \underset{(25.4824)}{0.0778}\frac{\Delta S(t-1)}{S(t-2)}$$

$$+ \underset{(40.3054)}{0.1404}\frac{\Delta S(t-2)}{S(t-3)}^* + \underset{(175.4533)}{1.0558}\frac{RENT(t)}{K(t-1)}^*$$

$$- \underset{(-44.7380)}{0.3168}\frac{RENT(t-1)}{K(t-2)} - \underset{(-57.1001)}{0.4843}\frac{RENT(t-2)}{K(t-3)}^*$$

$$+ \underset{(134.6856)}{1.2099}\frac{FNDE(t)}{K(t-1)}^* - \underset{(-4.6747)}{0.0062}\frac{FNDE(t-1)}{K(t-2)}^*$$

$$+ \underset{(0.4769)}{0.0007} \frac{FNDE(t-2)}{K(t-3)} - \underset{(-56.9907)}{1.3345} \frac{I(t)}{K(t-1)}^{*}$$

$$+ \underset{(16.5510)}{0.0138} ACF^{*} + \underset{(49.7673)}{0.0001} \frac{INS(t-1)}{K(t-1)}^{*}$$

$$- \underset{(37.7354)}{0.3884} \frac{INS(t)}{S(t)}^{*}, \quad R^2 = 0.9971,$$

$$F = 25566.66$$

$$(\text{for } r = 0, 1, 2)$$

The estimated specification (6.3) is given by,

$$\frac{FNDE(t)}{K(t-1)} = \underset{(7.5517)}{0.0104^{*}} - \underset{(-216.8440)}{1.0010} \frac{RENT(t)}{K(t-1)} + \underset{(51.6003)}{0.3651} \frac{I(t)}{K(t-1)}^{*}$$

$$+ \underset{(475.5929)}{1.2119} \frac{IN(t)}{K(t-1)}^{*} + \underset{(27.8312)}{0.0221} \frac{NDE(t-1)}{K(t-1)}^{*},$$

$$R^2 = 0.9984, \quad F=. \ 378.1818$$

The specification (6.4) estimated for pooled cross section data is given by,

$$\frac{DIV(t)}{K(t-1)} = \underset{(8.5358)}{0.0049^{*}} - \underset{(-2.5589)}{0.0122} \frac{FNDE(t)}{K(t-1)}^{*} + \underset{(2.2728)}{0.0111} \frac{I(t)+IN(t)}{K(t-1)}^{*}$$

$$+ \underset{(2.6695)}{0.0114} \frac{PAT(t)}{K(t-1)}^{*} + \underset{(33.5118)}{0.7023} \frac{DIV(t-1)}{K(t-1)}^{*},$$

$$R^2 = 0.5671, \quad F =.373.1579$$

In the above estimated equations, the financial variables flow of net debt, profits after tax and retained earnings are significantly influencing fixed investment and inventory investment, while sales change variables are weak in influencing them.

6.3 **INTERDEPENDENCE OF THE THREE DECISIONS** :

The complete interdependence among the three decision variables, investment, retained earnings and external finance is not observed. However, a two-way interaction is observed between fixed and inventory investment decisions. These two decisions are found to be having an inverse relationship. Interdependence between external financing decision and investment decisions is observed. The two-way interaction between dividend policies and investment decisions is absent. Dividend policies are found to be independent of investment decisions and the availability of external finance. The influence of profits on dividend policies is not observed.

6.4 **COMPARISON OF 2** SLS **RESULTS WITH** OLS RESULTS :

A comparison of the 2 SLS results, with the OLS results analysed in the previous chapters shows that more or less both results are concurrent.

The finding, that the effect of accelerator is absent in Indian sugar industry holds good in the case of 2SLS results also. The importance of financial flow variable, external finance in explaining fixed and inventory investment is observed in both OLS and 2SLS results. Investment allowance reserve is found to be an important determinant of fixed investment in both OLS and 2 SLS cases. Retained earnings and profit after tax have weak statistical significance and poor impact on fixed investment, where as they have more influence on inventory investment. This finding is also true with both 2 SLS and OLS results.

The finding that fixed and inventory investment are inversely related is also true in both 2 SLS and OLS cases. The observation that dividend decisions are autonomous of fixed and inventory investment is also true in both the cases.

6.5 CONCLUSIONS :

1. The simultaneous equation model is over-identified and hence 2 SLS method of estimation was adopted.
2. Complete interdependence among all the three decisions variables, investment, dividends and external finance is found to be absent, mostly on account of autonomous dividend decisions , independent of all of its explanatory variables which influence the other dependent variables.

3. Inverse relationship between fixed and inventory investment is present in the sugar industry.

4. Interdependence between investment and external financing decisions is observed.

5. Investment and dividend policies are not directly dependent but are so, as a residual of profits minus retained earnings.

6. The effects of accelerators in explaining both fixed and inventory investment are not serious in sugar industry in terms of their statistical significance.

7. The results are free from econometric estimation problems like multicollinearity, heteroscedasticity and auto-correlation.

Order Condition for Identification :

In a model of M simultaneous equations, in order for an equation to be identified, the number of pre-determined variables excluded from the equations must not be less than the number of endogenous variables included in that equation, less one.

Rank Condition :

In a model containing M equations in M endogenous variables, an equation is identified if and only if there exists at least one non-zero determinant of order M-l, from the coefficients of the variables excluded in one particular equation but included in the other equations of the model.

SUMMARY AND CONCLUSIONS

In the present study three important aspects of investment behaviour of Indian sugar industry namely investment, dividends and external finance are analysed in the framework of flexible accelerator model. The study is conducted for time series, cross section and pooled time series cross section data of public limited sugar companies which are non-governmental with a paid-up capital of Rs. 5 lakhs or more. The data coverage is from 1965-66 to 1986-87. In the models on fixed investment and inventory investment, the lag structure is extended to the financial variables also. Linear as well as log-linear specifications of the models are estimated, though only results of linear forms are presented. The equations are estimated by the method of ordinary least squares. The simultaneous equations system constructed for examining the interdependence of the three decisions is estimated by two - stage least squares.

In the analysis of fixed and inventory investment, importance is given to the role of demand factors. The role of dividend policies and investment outlays on external finance is also examined . The interaction between fixed and inventory investment expenditures is examined. Similarly, the interdependence among investment, dividends and external finance is also studied.

The study reveals that demand considerations in the long run have the least importance in the fixed investment decisions. Also, financial considerations far outweigh demand factors in fixed investment decisions. The results show that external finance is preferred to internal finance in Indian sugar industry. In inventory investment decisions, financial flows prove to be very important determinants.

The results indicate that firms do not follow stable dividend policies in respect of fixed capital investment decision in the long run. The reason is that investment and external financing decisions are not influenced by and at the same time do not influence dividend policies. Thus, in the disposition of profits, dividend decisions seem to be autonomous and therefore business savings remain residual in character.

The analysis of external finance reveals that fixed and inventory investment expenditures exert demand pull influence on external financing activity. Dividend policies however, have not shown any effect on external finance.

The effects of accelerators in the analysis of fixed investment have not been significant. The reason for this may be due to the extreme form of controls on price and distribution of sugar, imposed by the government from time to time. In the case of fixed investment, the lag structure is extended to four periods. The results, however, show that the lags of different variables do not produce significant effects on fixed investment beyond a period of two years. The other financial variables - profits and retained earnings have not exerted any influence on fixed investment. Of the three cases studied viz., cross section, time series and pooled, the first one showed better results in terms of summary statistics.

In inventory investment analysis also, the accelerator has not exerted any influence on inventory investment. Unlike in the case of fixed investment, the financial flows both internal and external, prove to be very important determinants of inventory investment. However, the lagged variables had not registered any influence on inventory investment. This implies that there are no long term lags or delays in orders and deliveries of inventories in Indian sugar industry.

In the analysis of external finance, the results establish that demand for external finance is inversely related to internal sources of finance. Both fixed and inventory investment expenditures have significantly influenced external financing activity. This has been more so in the case of inventory investment. The principle of increasing risk enunciated by Kalecki, found support in the analysis of external finance.

The simultaneous equation model constructed to examine the inter-dependence of the three decisions, viz., investment, dividends and external finance, has been estimated using the 2SLS method. The results show the absence of a complete inter-dependence among all the three decision variables investment, dividends and external finance. However, interdependence between pairs of these variables (not involving dividends) is observed. Analysis of both OLS and 2SLS results show that fixed and inventory investment bear an inverse relationship between them. Similarly, inter-dependence between investment and external financing decisions is observed. However, there is no direct dependence between investment and dividend policies. Dividend policies are found to be autonomous of fixed and inventory investment decisions. The effects of accelerators in explaining fixed and inventory investment have not been observed in Indian sugar industry.

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APPENDIX I

SUGAR INDUSTRY : A STATISTICAL PROFILE

TABLE I.1

NUMBER OF FACTORIES, PRODUCTION AND CONSUMPTION OF SUGAR IN INDIA, FROM 1970-71 TO 1992-93

Year	Number of Factories	Production (lakh tonnes)	Consumption (lakh tonnes)
1970-71	216	37.40	40.25
1971-72	221	31.08	37.80
1972-73	229	38.73	35.11
1973-74	229	39.49	35.18
1974-75	247	47.95	34.76
1975-76	253	42.61	36.89
1976-77	271	48.40	37.57
1977-78	286	64.57	44.82
1978-79	299	58.41	62.14
1979-80	299	38.58	52.08
1980-81	314	51.47	49.80
1981-82	319	84.36	57.11
1982-83	320	82.30	64.61
1983-84	325	59.17	75.70
1984-85	338	61.44	80.20
1985-86	341	70.16	83.13
1986-87	351	85.01	86.87
1987-88	356	91.10	93.85
1988-89	366	87.52	99.36
1989-90	377	109.88	102.15
1990-91	385	120.46	107.14
1991-92	420	134.21	112.75
1992-93	448	124.49	120.00

Source : Indian Sugar, Annual Number, 1993

APPENDIX II

RESULTS RELATING TO FIXED INVESTMENT BEHAVIOUR

TABLE II.1

FIXED INVESTMENT: CROSS SECTION RESULTS (OLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$ (r=0,1)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{RENT(t)}{k(t-1)}$	$\frac{RENT(t-1)}{k(t-2)}$	R^2	F
67-68	0.0913*	-0.0116	0.0081	0.1413*	0.1023*	0.0317	0.0763	0.3335	5.2550
	(6.5446)	(-0.2823)	(0.4026)	(5.0141)	(2.8491)	(0.2074)	(0.4644)		
69-70	-0.0271	0.1204	0.0049	0.1427*	0.2549*	0.2140	0.2386	0.2650	3.7867
	(-0.5467)	(1.2345)	(0.0538)	(2.2945)	(2.5129)	(0.9725)	(1.0816)		
70-71	-0.0221	-0.1052	-0.0149	0.0905*	0.0904*	0.0395	0.1398	0.3770	6.3565
	(-1.0015)	(-1.6227)	(-0.3627)	(3.5023)	(2.9352)	(0.3783)	(1.0594)		
72-73	0.0720*	0.0368	0.0612*	0.0740*	0.0532	0.1777	-0.0413	0.3243	4.3204
	(3.2589)	(0.5596)	(2.2931)	(4.3954)	(1.3526)	(1.3950)	(-0.2435)		
75-76	0.0393	0.0931	0.1591*	-0.0038	-0.0530	0.2097	0.3325	0.3419	4.6771
	(1.3416)	(1.4890)	(2.0265)	(-0.1155)	(-1.1978)	(1.2612)	(1.3114)		
77-78	0.0383	-0.0043	-0.0265	0.1823*	-0.0149	0.3809*	-0.1069	0.3036	3.3420
	(1.4037)	(-0.0403)	(-0.4098)	(3.2619)	(-0.3729)	(2.0448)	(-0.5429)		
79-80	-0.0312	-0.0352	-0.0840	0.1976*	0.1919*	-0.0257	0.2665*	0.4451	6.1507
	(-0.7743)	(-0.4441)	(-0.9786)	(3.8370)	(4.1601)	(-0.1850)	(2.1808)		
82-83	-0.2725*	0.0606	0.1385	0.3628*	0.0218	-1.2578*	0.1488	0.8734	43.6824
	(-3.1461)	(1.6275)	(1.1222)	(5.006)	(0.2534)	(-6.6428)	(0.2741)		
83-84	0.0017	0.1758	0.0337	0.0785*	-0.0049	-0.1466	0.2313	0.3297	2.2138
	(0.0393)	(1.7104)	(0.4845)	(2.2148)	(-0.1214)	(-0.7530)	(0.8137)		
86-87	0.0411	0.6930*	0.3717*	-0.0880	-0.3065*	0.1690	-1.1513*	0.7685	12.1704
	(1.0971)	(7.3464)	(2.7802)	(-1.0364)	(-5.0847)	(0.6114)	(-3.8019)		

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE II.2

FIXED INVESTMENT: CROSS SECTION RESULTS (OLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$

(r=0,1,2)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$	$\frac{RENT(t)}{k(t-1)}$	$\frac{RENT(t-1)}{k(t-2)}$	$\frac{RENT(t-2)}{k(t-3)}$	R^2	F
68-69	0.0518* (3.2030)	0.0546 (1.6552)	0.0530 (1.3042)	-0.0077 (-0.4110)	0.0985* (2.7207)	0.0252 (0.8303)	0.0121 (0.3663)	0.0116 (0.1274)	0.3572* (2.2958)	-0.2920 (-1.7650)	0.3712	3.9356
70-71	-0.0568* (-2.0844)	-0.0438 (-0.6080)	0.0299 (0.6233)	0.0871 (1.6957)	0.1028* (3.9132)	0.0905* (2.8629)	0.0120 (0.2450)	0.9051 (0.8876)	0.0032 (0.0203)	0.0951 (0.8768)	0.4240	4.9077
72-73	0.0669* (2.8143)	0.0005 (0.0072)	0.0367 (1.2776)	0.0571 (0.7675)	0.0993* (4.3297)	0.0691 (1.6943)	0.0486 (1.6352)	0.1794 (1.2972)	0.0384 (0.2200)	0.0111 (0.1226)	0.4015	3.4295
74-75	0.0708* (2.7669)	0.0622 (0.8721)	0.1051 (1.0703)	0.1154 (1.8917)	0.0705* (2.2016)	0.0928 (1.9447)	0.1077* (3.5124)	0.1503 (0.6654)	-0.0178 (-0.0886)	0.2469 (1.3648)	0.4415	4.4799
77-78	0.0154 (0.3450)	-0.0129 (-0.0859)	-0.0397 (-0.4714)	0.0419 (0.6775)	0.2290* (3.4059)	0.0157 (0.2866)	0.0539 (0.9266)	0.3587 (1.5528)	-0.2432 (-0.9754)	0.0276 (0.1444)	0.3741	2.4575
79-80	-0.0478 (-1.1051)	-0.0203 (-0.2155)	-0.1230 (-1.3150)	-0.0132 (-0.1033)	0.2019* (3.5105)	0.1755* (3.6120)	0.0987 (1.5005)	0.0108 (0.0759)	0.2720* (2.0046)	-0.0115 (-0.0504)	0.4728	4.2843
82-83	-0.2685* (-2.6867)	0.1027 (1.9592)	0.0395 (0.2375)	0.0167 (0.0882)	0.4085* (5.1803)	0.0847 (0.8155)	0.1291 (1.1249)	-1.2180* (-6.3620)	0.5046 (0.7401)	-0.2761 (-0.6980)	0.8886	29.2553
86-87	-0.0060 (-0.1057)	0.6345* (6.4760)	0.4581* (3.2882)	-0.0404 (-0.3202)	-0.1350 (-1.6045)	-0.3358* (-5.0097)	-0.0995 (-1.9747)	-0.0562 (-0.1908)	-1.0987* (-3.2918)	-0.5207* (-2.3168)	0.8300	10.3101

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE II.3

FIXED INVESTMENT: CROSS SECTION RESULTS (OLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$ (r=0,1,2,3)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{\Delta S(t-3)}{S(t-4)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$
70-71	-0.0650*	-0.0199	0.0732	0.1422*	0.3671	0.0945*	0.0655	-0.0055
	(-2.1671)	(-0.2613)	(1.2948)	(2.2181)	(0.6726)	(3.2811)	(1.7809)	(-0.1105)
72-73	0.0808*	0.0242	0.0866	0.0248	0.0634	0.1016*	0.0657	0.0599
	(2.8440)	(0.3304)	(0.2763)	(0.3297)	(1.2564)	(4.4666)	(1.5373)	(1.8736)
74-75	0.0527	0.1007	0.0719	0.1057	0.0426	0.0642	0.0865	0.1143*
	(1.6611)	(1.3914)	(0.7306)	(1.2396)	(1.2379)	(1.9986)	(1.8191)	(3.6775)
77-78	0.0202	0.0088	0.0010	0.0246	-0.0881	0.2291*	0.0218	0.0461
	(0.3489)	(0.0577)	(0.0098)	(0.3086)	(-1.0215)	(3.1146)	(0.3576)	(0.7522)
79-80	-0.0166	-0.0876	-0.1639	0.0030	-0.0377	0.1993*	0.1833*	0.0608
	(-0.3625)	(-0.8559)	(-1.6726)	(0.0208)	(-0.4762)	(3.4873)	(3.5796)	(0.8808)
81-82	0.0211	0.0633	-0.0603	-0.1119	-0.4634	0.3229*	0.0452	0.3217
	(0.1561)	(0.2995)	(-0.2453)	(-0.4899)	(-1.7573)	(2.6886)	(0.3109)	(1.4614)
82-83	-0.4084*	0.1210*	0.1205	-0.0412	0.3856	0.4558*	0.0203	0.1279
	(-3.3624)	(2.1191)	(0.6686)	(-0.1682)	(1.9543)	(5.2234)	(0.1895)	(1.0741)
86-87	0.0203	0.5788*	0.4190*	-0.0451	-0.0265	-0.1322	-0.3255*	-0.0912
	(0.2677)	(5.0162)	(2.9768)	(-0.2613)	(-0.2151)	(-1.5061)	(-3.8526)	(-1.6619)

Table contd...

Table II.3 contd...

Year	FNDE(t-3)/k(t-4)	RENT(t)/k(t-1)	RENT(t-1)/k(t-2)	RENT(t-2)/k(t-3)	RENT(t-3)/k(t-4)	R^2	F
70-71	-0.0423 (-0.8269)	0.0389 (0.3391)	-0.0209 (-0.1292)	-0.0129 (-0.0957)	0.2659 (1.4030)	0.4527	3.9289
72-73	-0.0311 (-0.8606)	0.2263 (1.5934)	-0.0719 (-0.3701)	0.2049 (1.5722)	-0.1826 (-1.2795)	0.4618	3.0747
74-75	0.0152 (0.2932)	0.0509 (0.2201)	-0.0279 (-0.1405)	0.2900 (1.5897)	0.3644 (1.5352)	0.4922	3.8778
77-78	0.0482 (0.9167)	0.4439 (1.8338)	-0.3581 (-1.3255)	-0.0266 (-0.1132)	0.2351 (0.5822)	0.4092	1.9621
79-80	-0.0727 (-1.4295)	0.0905 (0.6089)	0.3067* (2.1342)	-0.0390 (-0.1674)	-0.3683 (-1.5580)	0.5282	3.7321
81-82	0.2610 (1.5185)	1.0152 (1.2066)	0.3328 (0.806)	0.2620 (0.5608)	0.5136 (1.2518)	0.4190	1.8031
82-83	0.1728 (1.2261)	-1.2345* (-6.4440)	0.4803 (0.6435)	-0.2341 (-0.6024)	-0.0172 (-0.0399)	0.9030	23.2798
86-87	-0.0377 (-0.4844)	-0.0904 (-0.2716)	-0.8878* (-2.2368)	-0.2784 (-0.8550)	-0.4794 (-1.6492)	0.8599	8.1867

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE II.4

FIXED INVESTMENT : CROSS-SECTION RESULTS (OLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$ (r=0,1)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{PAT(t)}{k(t-1)}$	$\frac{PAT(t-1)}{k(t-2)}$	R^2	F
67-68	0.0871* (6.3313)	-0.0111 (-0.2821)	0.0062 (0.3169)	0.1371* (4.9409)	0.0982* (2.9254)	0.0006 (0.0144)	0.1331 (1.4475)	0.3469	5.5786
68-69	0.0295* (2.1748)	0.0742* (2.4498)	0.0527 (1.5820)	0.0730* (2.2258)	0.0126 (0.4723)	0.0332 (0.5513)	0.4324 (1.0610)	0.3111	4.7422
70-71	-0.0288 (-1.2846)	-0.0162 (-1.6257)	-0.0134 (-0.3275)	0.0917* (3.5151)	0.0907* (2.9335)	-0.0350 (-0.5044)	0.1847 (1.8080)	0.3679	6.1104
72-73	0.0673* (2.9693)	0.0339 (0.5044)	0.0617* (2.3785)	0.0718* (4.4036)	0.0552 (1.4096)	0.1633 (1.3302)	-0.0141 (-0.1895)	0.3223	4.2813
75-76	0.0334 (1.1276)	0.0905 (1.5665)	0.1596* (2.0465)	-0.0012 (-0.0378)	-0.0541 (-1.2509)	0.2114 (1.3840)	0.3008 (1.3525)	0.3425	4.6875
79-80	-0.0335 (-0.8289	-0.0294 (-0.3717)	-0.0838 (-0.9721)	0.1989* (3.8458)	0.1885* (4.1213)	-0.0309 (-0.2242)	0.2521* (2.1069)	0.4416	6.0643
82-83	-0.2638* (-2.9658)	0.0571 (1.5327)	0.1283 (1.0400)	0.3640* (5.0393)	0.0219 (0.2527)	-1.2461* (-6.6205)	0.2633 (0.5187)	0.8709	43.7245
86-87	0.0637 (1.5045)	0.6574* (6.4884)	0.3157* (2.2072)	-0.0867 (-0.9375)	-0.2906* (-4.4681)	0.0136 (0.0455)	-0.8478* (-2.7450)	0.7247	9.6541

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE II.5

FIXED INVESTMENT : CROSS-SECTION RESULTS (OLS)

Dependent Variables : $\frac{I(t)}{k(t-1)}$ (r=0,1,2)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$	$\frac{PAT(t)}{k(t-1)}$	$\frac{PAT(t-1)}{k(t-2)}$	$\frac{PAT(t-2)}{k(t-3)}$	R^2	F
68-69	0.0390* (2.5061)	0.0683* (2.0320)	0.0635 (1.5092)	-0.0152 (-0.7971)	0.0860* (2.3203)	0.0041 (0.1378)	-0.0317 (-0.9587)	0.0507 (0.5858)	0.0458 (1.0900)	-0.0349 (-0.2996)	0.3312	3.3013
70-71	-0.0609* (-2.1760)	-0.0518 (-0.7067)	0.0279 (0.5738)	0.0774 (1.4442)	0.1025* (3.8563)	0.0889* (2.7975)	0.0180 (0.3642)	0.0053 (0.0733)	0.0665 (0.5246)	0.0900 (0.8695)	0.4081	4.5973
72-73	0.0614* (2.5378)	-0.0156 (-0.2239)	0.0412 (1.4811)	0.0538 (0.7308)	0.0996* (4.5268)	0.0779 (1.9365)	0.0484 (1.6547)	0.2147 (1.5136)	0.0023 (0.0317)	0.0618 (0.9780)	0.4093	3.5413
73-74	-0.0744 (-1.3976)	-0.0004 (-0.0003)	0.3844* (2.1342)	0.1741* (2.9333)	0.3395* (4.1138)	0.1052* (2.0044)	-0.2266* (-2.4595)	0.2407 (0.8544)	-0.3661 (-1.1742)	0.1235 (0.7249)	0.4171	3.0548
74-75	0.0595* (2.2240)	0.0560 (0.8283)	0.0964 (1.0250)	0.1103 (1.8086)	0.6073* (2.1420)	0.0972* (2.0547)	0.1043* (3.4920)	0.1713 (0.8052)	-0.0234 (-0.1192)	0.2619 (1.4692)	0.4532	4.6960
75-76	0.0344 (0.9606)	0.0913 (1.4536)	0.1637 (1.6977)	0.0124 (0.1146)	0.0006 (0.0019)	-0.0549 (-1.1884)	0.0008 (0.0135)	0.2176 (1.2720)	0.3042 (1.0366)	-0.0352 (-0.1340)	0.3429	2.9570
77-78	0.0178 (0.3706)	-0.0011 (-0.0070)	-0.0407 (-0.4547)	0.0378 (0.6522)	0.2254* (3.3320)	0.0129 (0.2245)	0.0565 (0.9422)	0.3090 (1.3373)	-0.2434 (-1.0186)	0.0635 (0.3496)	0.3696	2.4103
79-80	-0.0478 (-1.0755)	-0.0203 (-0.2143)	-0.1288 (-1.3618)	-0.0049 (-0.0374)	0.2055* (3.5266)	0.1740* (3.6021)	0.1016 (1.5377)	0.0104 (0.0738)	0.2699* (2.0074)	-0.0565 (-0.2518)	0.4712	4.2582
81-82	0.0119 (0.0961)	-0.0561 (-0.2784)	-0.0979 (-0.4081)	0.0547 (0.2411)	0.3412* (2.8158)	-0.0453 (-0.3671)	0.1579 (1.0982)	0.1964 (1.5569)	-0.2200 (-0.5003)	0.1226 (0.2582)	0.3022	1.5877
82-83	-0.2647* (-2.6346)	0.0989 (1.9283)	0.0123 (0.0740)	-0.0006 (-0.0032)	0.4112* (5.2199)	0.0960 (0.9127)	0.1215 (1.0491)	-1.2024* (-6.3419)	0.6672 (1.0251)	-0.3398 (-0.8792)	0.8874	28.9097
83-84	0.0756 (0.1420)	0.1446 (1.2266)	0.0025 (0.0284)	-0.0576 (-0.7394)	0.0806* (2.1286)	-0.0203 (-0.4713)	0.0447 (1.0806)	-0.1547 (-0.7583)	0.2763 (0.9822)	0.1838 (0.7168)	0.3769	1.6129
86-87	0.0180 (0.2738)	0.6216* (5.7147)	0.4358* (2.7837)	-0.0286 (-0.1924)	-0.1426 (-1.4734)	-0.3057* (-4.0818)	-0.1154 (-1.9626)	-0.2013 (-0.6097)	-0.8064* (-2.1548)	-0.4613 (-1.8904)	0.7845	7.6838

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE II.6

FIXED INVESTMENT : CROSS-SECTION RESULTS (OLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$ (r=0,1,2,3)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{\Delta S(t-3)}{S(t-4)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
70-71	-0.0746*	-0.0160	0.0380	0.1229	0.0121	0.0864*	0.0662	0.0008
	(-2.4461)	(-0.2054)	(0.7138)	(1.9154)	(0.2213)	(2.8924)	(1.7512)	(0.0154)
72-73	0.0642*	0.0162	0.0077	0.0441	0.0604	0.1018*	0.0682	0.0505
	(2.4186)	(0.2248)	(0.2507)	(0.5983)	(1.2385)	(4.7009)	(1.6234)	(1.6686)
74-75	0.0523	0.0855	0.0892	0.09[illegible]	0.0520	0.0677*	0.0865	0.1147*
	(1.6008)	(1.1834)	(0.9279)	(1.0554)	(1.487[illegible]	(2.0425)	(1.7702)	(3.6928)
75-76	-0.0194	0.1572*	0.2304*	0.1964	0.1611	-0.0053	-0.0981	-0.0410
	(-0.4678)	(2.3708)	(2.3789)	(1.4543)	(1.9450)	(-0.1494)	(-1.9944)	(-0.6451)
77-78	0.0275	0.0113	-0.0204	0.0032	-0.0797	0.2176*	0.0231	0.0573
	(0.4609)	(0.0670)	(-0.1970)	(0.0467)	(-0.9201)	(2.9780)	(0.3620)	(0.9235)
79-80	-0.0069	-0.0975	-0.1731	0.0230	-0.0346	0.2038*	0.1856*	0.0595
	(-0.1438)	(-0.9479)	(-1.7602)	(0.1556)	(-0.4452)	(3.5619)	(3.6725)	(0.8641)
81-82	-0.0092	0.088[illegible]	-0.0202	-0.0651	-0.4381	0.3094*	0.0281	0.2973
	(-0.0677)	(0.4235)	(-0.0822)	(-0.2851)	(-1.6196)	(2.5308)	(0.1928)	(1.3339)
82-83	-0.4063*	0.1143*	0.0935	-0.0761	0.3912	0.4586*	0.0307	0.1181
	(-3.3892)	(2.0461)	(0.5375)	(-0.3239)	(1.9896)	(5.2676)	(0.2850)	(0.9851)
83-84	-0.0266	0.0777	0.0466	-0.0282	0.1183	0.0714	0.0192	0.0420
	(-0.3897)	(0.[illegible]986)	(0.4405)	(-0.2546)	(1.0121)	(1.5794)	(0.2911)	(0.7750)
86-87	0.0425	0.5412*	0.3846*	-0.0540	0.0159	-0.1282	-0.2583*	-0.8883
	(0.4906)	(4.1257)	(2.4491)	(-0.2689)	(0.1184)	(-1.2948)	(-2.7735)	(-1.3254)

Table contd

Table II.6 contd...

Year	$\frac{FNDE(t-3)}{(k-4)}$	$\frac{PAT(t)}{k(t-1)}$	$\frac{PAT(t-1)}{k(t-2)}$	$\frac{PAT(t-2)}{k(t-3)}$	$\frac{PAT(t-3)}{k(t-4)}$	R^2	F
	(9)	(10)	(11)	(12)	(13)	(14)	(15)
70-71	-0.0770 (-1.3563)	-0.0330 (-0.3812)	0.0607 (0.4700)	0.1254 (1.1049)	-0.0337 (-0.5316)	0.4312	3.6017
72-73	-0.0206 (-0.6498)	0.2947* (2.0501)	0.0191 (0.2646)	0.1513* (2.0658)	-0.1584 (-1.3907)	0.4976	3.5497
74-75	0.0366 (0.6979)	0.0895 (0.3856)	0.0114 (0.0574)	0.2303 (1.5145)	0.0241 (0.2277)	0.4781	3.6651
75-76	-0.0714 (-1.5860)	0.2663 (1.5711)	0.2878 (1.0127)	-0.2060 (-0.7509)	0.0542 (0.2328)	0.4225	2.9267
77-78	0.0622 (0.9772)	0.3909 (1.5942)	-0.3131 (-1.2057)	0.0608 (0.2942)	0.0646 (0.2030)	0.3988	1.8792
79-80	-0.0754 (-1.5014)	0.0915 (0.6190)	0.3231* (2.2561)	-0.0911 (-0.3958)	-0.3673 (-1.6950)	0.5328	3.8009
81-82	0.2316 (1.3658)	0.7746 (0.9825)	0.2732 (0.5655)	0.1427 (0.3074)	0.1422 (1.0501)	0.4017	1.6788
82-83	0.1904 (1.3913)	-1.2215* (-6.4287)	0.6696 (0.9954)	-0.2944 (-0.7737)	-0.0501 (-0.1174)	0.9026	23.1710
83-84	0.2220 (0.3135)	-0.0345 (-0.1342)	0.2442 (0.7242)	0.0496 (0.1290)	0.0334 (0.1635)	0.4074	1.0884
86-87	-0.0056 (-0.0626)	-0.3188 (-0.8824)	-0.4858 (-1.1461)	-0.0688 (-0.1825)	-0.5958 (-1.8782)	0.8240	6.2422

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE II.7

FIXED INVESTMENT : CROSS-SECTION RESULTS (OLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$ (r=0,1,2,3,4)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{\Delta S(t-3)}{S(t-4)}$	$\frac{\Delta S(t-4)}{S(t-5)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$	$\frac{FNDE(t-3)}{k(t-4)}$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
70-71	-0.0840*	0.0039	0.0431	0.1304	-0.0452	-0.0162	0.0732*	0.0484	-0.0298	-0.0620
	(-2.5971)	(0.0490)	(0.7823)	(1.9007)	(-0.6173)	(-0.5801)	(2.3988)	(1.2524)	(-0.5245)	(-1.0488)
72-73	0.0601*	-0.0158	0.0077	0.0319	0.0164	-0.0570	0.1014*	0.0841*	0.0644*	-0.0087
	(2.0579)	(-0.2205)	(0.2559)	(0.4334)	(0.3026)	(-1.2844)	(4.8149)	(2.0446)	(2.1373)	(-0.2701)
73-74	-0.0527	-0.1029	0.3211	0.1539	-0.1512	0.1023	0.3713*	0.1311	-0.2281*	0.1070
	(-0.7867)	(-0.5043)	(1.7773)	(1.9927)	(-0.7653)	(0.7665)	(4.0590)	(1.5412)	(-2.0756)	(1.2409)
74-75	0.0511	0.0838	0.0809	0.0689	0.0342	0.0139	0.0538	0.0925	0.1281*	0.4022
	(1.3597)	(0.8511)	(0.6169)	(0.6541)	(0.7765)	(0.1158)	(1.3364)	(1.6584)	(2.6461)	(0.6113)
75-76	-0.0240	0.1534*	0.2236*	0.1958	0.1844	0.0059	-0.0057	-0.0960	-0.0401	-0.0714
	(-0.4826)	(2.0959)	(2.1970)	(1.3616)	(1.5306)	(0.1178)	(-0.1513)	(-1.7213)	(-0.6009)	(-1.4922)
76-77	0.0604	-0.0724	0.1320	0.4204	0.2088	0.2734*	0.1294	0.0706	-0.0378	-0.0568
	(0.7408)	(-0.5499)	(1.3190)	(0.2967)	(1.0152)	(2.2957)	(1.8857)	(0.9189)	(-0.4708)	(-0.6243)
77-78	-0.0181	-0.1639	0.0068	0.3472	0.0135	0.1672	0.2246*	0.0380	0.0668	0.0722
	(-0.2570)	(-0.8689)	(0.0627)	(0.4768)	(0.1223)	(1.2402)	(3.0066)	(0.5701)	(1.0724)	(1.1245)
79-80	0.0224	-0.0733	-0.2618	0.0191	0.0236	-0.0047	0.2093*	0.1942*	0.0642	-0.1074
	(0.3244)	(-0.6147)	(-1.8641)	(0.0844)	(0.1926)	(-0.0628)	(2.6596)	(2.7655)	(0.6967)	(-1.2854)
81-82	0.0238	0.0982	0.1282	-0.0892	-0.2804	0.0548	0.2625*	0.0238	0.2410	0.2808
	(0.1478)	(0.4671)	(0.4751)	(-0.3158)	(-0.9541)	(0.1449)	(2.0513)	(0.1428)	(0.9715)	(1.5545)
82-83	-0.4583*	0.2598*	0.3164	0.3227	0.3688*	0.1550	0.4613*	0.0215	0.0804	-0.2517
	(-3.8123)	(3.6979)	(1.8183)	(1.3850)	(2.1738)	(0.7561)	(6.0433)	(0.2148)	(0.6167)	(-1.3626)
83-84	-0.0088	0.0450	-0.0178	-0.1144	0.0208	0.0028	0.0889	0.0439	0.0279	0.0249
	(-0.0958)	(0.2555)	(-0.1434)	(-0.0981)	(0.1475)	(0.0214)	(1.6974)	(0.6216)	(0.5030)	(0.2895)
86-87	0.0984	0.5960*	0.4719*	-0.2391	-0.1175	0.0292	-0.2394*	-0.3171*	-0.0307	0.0631
	(1.0830)	(4.5453)	(2.4393)	(-1.1327)	(-0.7771)	(0.2194)	(-2.1885)	(-3.1193)	(-0.4317)	(0.6895)

Table contd.

X

Table II.7 contd.

Year	FNDE(t-4)/k(t-5)	PAT(t)/k(t-1)	PAT(t-1)/k(t-2)	PAT(t-2)/k(t-3)	PAT(t-3)/k(t-4)	PAT(t-4)/k(t-5)	R^2	F
	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
70-71	0.1027 (1.7313)	-0.0526 (-0.6155)	0.1555 (1.0739)	0.0616 (0.4592)	-0.0469 (-0.7367)	0.0717 (0.3558)	0.4802	3.3255
72-73	0.0755 (1.7439)	0.2829* (2.0341)	0.0367 (0.5170)	0.1143 (1.5737)	-0.3111* (-2.3786)	0.2375* (2.3441)	0.5568	3.3508
73-74	-0.1154 (-1.4290)	0.0998 (0.2174)	-0.5983 (-1.4019)	0.1462 (0.8192)	-0.3092 (-1.6573)	0.1497 (0.4895)	0.5284	2.9879
74-75	0.0366 (0.7201)	0.1246 (0.4237)	-0.0189 (-0.0618)	0.2775 (1.0770)	0.0242 (0.2062)	-0.0117 (-0.1168)	0.4419	2.1118
75-76	-0.0150 (-0.2103)	0.2618 (1.4562)	0.2909 (0.9345)	-0.2096 (-0.7319)	0.0396 (0.1600)	-0.0160 (-0.1098)	0.4239	2.2074
76-77	-0.1985* (-2.9158)	-0.3499 (-1.1628)	0.3609 (1.3720)	0.2303 (0.5509)	-0.3979 (-1.1075)	-0.4860 (-1.4942)	0.4247	1.5257
77-78	-0.1016 (-1.4171)	0.5579* (2.1281)	-0.2154 (-0.8169)	-0.1847 (-0.7659)	-0.2625 (-0.7155)	0.2948 (0.9447)	0.4651	1.7985
79-80	-0.0986 (-1.3099)	0.1077 (0.6116)	0.4200 (1.9472)	-0.1246 (-0.4460)	-0.5136 (-1.7178)	-0.3238 (-0.9992)	0.5762	2.8098
81-82	-0.4603 (-1.7495)	0.6393 (0.7866)	0.3294 (0.6782)	-0.3027 (-0.5297)	0.2249 (0.4274)	0.1445 (0.1695)	0.4628	1.5508
82-83	0.1225 (0.7479)	-1.3373* (-7.5156)	-0.0524 (-0.0847)	-0.1963 (-0.5474)	0.3483 (0.8915)	1.3473* (3.5040)	0.9363	26.4681
83-84	0.1433 (1.3107)	-0.0040 (-0.0133)	0.3954 (0.9490)	-0.0641 (-0.1515)	0.1161 (0.5258)	0.2073 (0.8487)	0.4920	1.0330
86-87	0.0772 (1.2934)	-0.5741 (-1.5374)	-0.3933 (-0.9434)	0.4876 (1.0562)	-0.2352 (-0.6550)	-1.1296 (-1.6347)	0.8724	5.9238

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE II.8

FIXED INVESTMENT: CROSS SECTION RESULTS (OLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$ (r=0)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{RENT(t)}{k(t-1)}$	$\frac{IAR(t)}{k(t-1)}$	R^2	F
68-69	0.0028	0.0602*	0.0688*	0.0887	0.4890*	0.3254	7.8374
	(0.1808)	(2.3247)	(2.2443)	(1.6763)	(2.3320)		
69-70	-0.1562*	0.0605	0.1241*	0.2091	2.7349*	0.4117	11.3728
	(-3.3229)	(0.8135)	(2.3754)	(1.3903)	(5.1569)		
70-71	-0.0451	-0.0628	0.0937*	0.1190	1.1437*	0.3730	9.6683
	(-1.8287)	(-0.9610)	(3.8154)	(1.9120)	(3.4232)		
74-75	-0.0221	-0.0096	0.0301	0.1022	1.9072*	0.3496	7.5245
	(-0.7389)	(-0.1562)	(1.0214)	(0.6225)	(4.5133)		
82-83	-0.3268*	0.0503	0.2819*	-1.4522*	2.8469*	0.8967	86.8474
	(-4.2071)	(1.7481)	(4.6260)	(-8.8695)	(3.4560)		
83-84	-0.0453	0.1047	0.0566*	-0.0886	1.4429*	0.5019	7.3046
	(-1.4963)	(1.3311)	(2.0161)	(-0.7462)	(3.4892)		
86-87	0.0094	0.3007*	-0.0220	-0.4552	2.2934*	0.5011	6.0272
	(0.1523)	(2.3913)	(-0.1890)	(-1.6487)	(2.3636)		

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE II.9

FIXED INVESTMENT: CROSS SECTION RESULTS (OLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$ (r=0,1)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{RENT(t)}{k(t-1)}$	$\frac{RENT(t-1)}{k(t-2)}$	$\frac{IAR(t)}{k(t-1)}$	$\frac{IAR(t-1)}{k(t-2)}$	R^2	F
67-68	0.0532*	-0.0040	0.0166	0.1427*	0.1121*	0.0743	0.0243	0.1045	0.4718	0.3867	4.8072
	(2.4796)	(-0.1002)	(0.8296)	(5.1902)	(3.1629)	(0.4734)	(0.1391)	(0.1059)	(0.4809)		
69-70	-0.0755	0.0473	-0.0188	0.0683	0.1852*	0.0701	0.1772	6.4663*	-4.9125*	0.6758	15.8919
	(-1.8265)	(0.6984)	(-0.2947)	(1.5956)	(2.6588)	(0.4586)	(1.1738)	(8.4570)	(-5.7911)		
72-73	0.0554	0.0314	0.0638*	0.0665*	0.0507	0.1305	-0.0960	0.5720	-0.3216	0.3391	3.3351
	(1.7827)	(0.4613)	(2.3637)	(3.6155)	(1.2712)	(0.9609)	(-0.5377)	(0.9964)	(-0.5384)		
74-75	-0.0068	0.0465	0.1640	0.0325	0.0325	-0.0196	-0.0084	3.3036*	-1.8406*	0.4489	5.2922
	(-0.2178)	(0.6765)	(1.9930)	(1.0883)	(0.8029)	(-0.0875)	(-0.0441)	(3.9389)	(-2.2461)		
77-78	0.0174	0.0032	-0.0126	0.1930*	-0.0223	0.3714	-0.1384	-0.6790	0.9350	0.3165	2.5474
	(0.3593)	(0.0296)	(-0.1863)	(3.3123)	(-0.5338)	(1.9221)	(-0.6790)	(-0.6134)	(0.8943)		
79-80	-0.0757	-0.0412	-0.1049	0.2078*	0.1979*	-0.0528	0.2352	-1.5012	2.3630	0.4879	5.2409
	(-1.4208)	(-0.5235)	(-1.2307)	(4.0847)	(4.3500)	(-0.3823)	(1.9054)	(-1.1586)	(1.8252)		
82-83	-0.3163*	0.0758*	0.2486*	0.2666*	0.0549*	-1.5046*	0.0575	4.4388*	-2.4628	0.9171	49.7987
	(-3.3047)	(2.3901)	(2.3473)	(3.9358)	(0.6741)	(-8.8726)	(0.1175)	(3.9557)	(-1.4197)		
86-87	-0.0079	0.5831*	0.2900	-0.0972	-0.2832*	-0.0445	-0.9545*	1.9048	-0.6031	0.8010	10.0631
	(-0.1689)	(5.2484)	(1.9819)	(-1.1219)	(-4.4647)	(-0.1492)	(-2.9727)	(0.9649)	(-0.3471)		

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TBLE II.10

FIXED INVESTMENT: CROSS SECTION RESULTS (OLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$ (r=0,1,2)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDT(t-2)}{k(t-3)}$	$\frac{RENT(t)}{k(t-1)}$
69-70	-0.0948*	0.0440	-0.0568	-0.0035	0.0758	0.2317*	0.0242	0.0579
	(-2.0689)	(0.5776)	(-0.7422)	(-0.0732)	(1.5412)	(3.2495)	(0.3853)	(0.3415)
72-73	0.0584	0.0030	0.0496	0.0505	0.0978*	0.0770	0.0660*	0.1750
	(1.9702)	(0.0457)	(1.8031)	(0.6871)	(4.2355)	(1.9839)	(2.1410)	(1.2458)
74-75	0.0392	0.0479	0.0804	0.1037	0.0645*	0.0867	0.0910*	0.0416
	(1.1476)	(0.7290)	(0.8829)	(1.7557)	(2.0604)	(1.9414)	(2.9155)	(0.1980)
77-78	-0.0272	-0.0290	-0.0098	-0.0647	0.2470*	0.0340	0.0565	0.3912
	(-0.3858)	(-0.1876)	(-0.1086)	(-0.9811)	(3.5029)	(0.5700)	(0.9474)	(1.6441)
79-80	-0.1185	-0.0630	-0.1594	-0.0453	0.2112*	0.1876*	0.1178	0.0119
	(-1.9850)	(-0.6542)	(-1.7286)	(-0.3307)	(3.7366)	(3.9731)	(1.8322)	(0.0847)
81-82	-0.0400	-0.0889	-0.2383	-0.1017	0.4446*	-0.0262	0.1239	1.4045
	(-0.2434)	(-0.4521)	(-1.0248)	(-0.4686)	(3.5069)	(-0.2102)	(0.8830)	(1.6084)
82-83	-0.2910*	-0.1344*	0.1248	-0.0938	0.3163*	0.1548	0.2430*	-1.5166*
	(-2.7040)	(-3.3645)	(0.9938)	(-0.6600)	(4.9888)	(1.8124)	(2.6547)	(-9.8583)
86-87	-0.0756	0.5791*	0.4456*	-0.0481	-0.1010	-0.3064*	-0.1121	-0.3587
	(-0.9978)	(4.8409)	(2.5829)	(-0.3563)	(-1.0871)	(-3.9980)	(-1.9041)	(-0.9464)

Table II.10 contd...

Year	RENT(t-1)/k(t-2)	RENT(t-2)/k(t-3)	IAR(t)/k(t-1)	IAR(t-1)/k(t-2)	IAR(t-2)/k(t-3)	R^2	F
69-70	0.3384 (1.7294)	-0.1438 (-0.5455)	6.5083* (8.6039)	-6.5725* (-5.9438)	2.1030* (2.3218)	0.7077	11.5000
72-73	-0.0408 (-0.2399)	0.0314 (0.3517)	1.0428 (1.6441)	0.8220 (0.7930)	-1.7611* (-2.3626)	0.5016	3.6068
74-75	0.0285 (0.1532)	0.1944 (1.1529)	2.8930* (3.5512)	-1.7119 (-1.5627)	-0.5427 (-0.5400)	0.5584	5.0580
77-78	-0.1979 (-0.7678)	-0.0548 (-0.2571)	-0.7249 (-0.5320)	-0.6519 (-0.3234)	1.6844 (0.9786)	0.4002	1.8909
79-80	0.2459 (1.8585)	-0.0647 (-0.2888)	-1.4207 (-1.0388)	1.0053 (0.5377)	1.7819 (1.2287)	0.5457	4.0049
81-82	-0.0202 (-0.0478)	0.5593 (1.1196)	-5.4122 (-1.9758)	6.1835 (1.4731)	2.8903 (0.7804)	0.4572	2.1055
82-83	0.6187 (1.1410)	-0.1629 (-0.5371)	4.9070* (4.3972)	-5.0708* (-2.6539)	2.8841 (1.3758)	0.9443	42.4247
86-87	-0.8247* (-2.0206)	-0.4278 (-1.7778)	0.9829 (0.4892)	-0.7334 (-0.3835)	1.3172 (1.0905)	0.8559	7.9230

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE II.11

FIXED INVESTMENT CROSS SECTION RESULTS (OLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$ (r=0,1,2,3)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{\Delta S(t-3)}{S(t-4)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$	$\frac{FNDE(t-3)}{k(t-4)}$
69-70	-0.0726 (-1.5092)	0.0202 (0.2822)	-0.1272 (-1.4787)	-0.0660 (-0.6958)	-0.0214 (-0.4570)	0.0677 (1.3098)	0.3045* (3.7518)	0.0646 (0.8854)	0.0400 (0.4577)
72-73	0.0668* (2.1263)	0.0395 (0.5729)	0.0161 (0.5485)	0.0285 (0.3871)	0.0540 (1.1102)	0.0985* (4.3282)	0.0647 (1.6449)	0.0743* (2.4442)	-0.0255 (-0.6768)
74-75	0.0027 (0.0699)	0.0834 (1.2768)	0.0668 (0.7523)	0.1643* (2.0678)	0.0643* (2.0459)	0.0061* (2.0125)	0.0866 (1.9931)	0.0952* (3.0780)	-0.0234 (-0.4897)
77-78	-0.0096 (-0.1178)	-0.0044 (-0.0278)	0.0261 (0.2436)	0.0481 (0.5664)	-0.0794 (-0.8869)	0.2451* (3.1511)	0.0410 (0.6151)	0.0479 (0.7561)	0.0553 (0.8332)
79-80	-0.1135 (-1.8110)	-0.1161 (-1.1361)	-0.1815 (-1.8985)	-0.0056 (-0.0381)	-0.0086 (-0.1122)	0.1996* (3.5719)	0.1831* (3.7325)	0.0752 (1.1249)	-0.0988 (-1.9507)
82-83	-0.4335* (-3.6864)	0.1408* (3.2789)	0.2581 (1.9441)	-0.0002 (-0.0009)	0.3579* (2.5151)	0.3059* (4.3894)	0.0748 (0.8682)	0.1902* (2.0793)	0.0452 (0.4247)
86-87	-0.0643 (-0.6050)	0.5449* (4.1424)	0.3913* (2.1131)	-0.0144 (-0.0779)	0.0350 (0.2337)	-0.0952 (-0.9366)	-0.2836* (-2.4960)	-0.1098 (-1.6900)	-0.0416 (-0.4902)

Table contd...

Table II. 11 contd...

Year	$\frac{RENT(t)}{k(t-1)}$	$\frac{RENT(t-1)}{k(t-2)}$	$\frac{RENT(t-2)}{k(t-3)}$	$\frac{RENT(t-3)}{k(t-4)}$	$\frac{IAR(t)}{k(t-1)}$	$\frac{IAR(t-1)}{k(t-2)}$	$\frac{IAR(t-2)}{k(t-3)}$	R^2	F
69-70	0.0716 (0.3825)	0.4760* (2.2821)	0.1856 (0.5517)	-0.6053 (-1.6933)	8.5009* (8.5437)	-0.4117* (-4.8341)	2.0835 (1.8630)	0.7252	9.5027
72-73	0.2007 (1.4834)	-0.1818 (-0.9304)	0.2565* (2.1214)	-0.2685 (-1.9393)	1.3575* (2.0302)	0.5622 (0.5305)	-1.7361* (-2.2722)	0.5771	3.6397
74-75	-0.0504 (-0.2410)	0.0358 (0.1936)	0.1803 (1.0655)	0.1899 (0.8587)	3.2445* (3.8346)	-2.1773* (-2.0293)	-0.4115 (-0.4249)	0.6183	4.8599
77-78	0.4698 (1.8696)	-0.3165 (-1.1152)	-0.0904 (-0.3531)	0.2284 (0.5478)	-0.7790 (-0.5587)	-0.7132 (-0.3462)	1.5902 (0.9026)	0.4294	1.5556
79-80	0.1072 (0.7369)	0.2293 (1.6170)	-0.1230 (-0.5364)	-0.3048 (-1.3029)	-0.8860 (-0.6533)	0.8162 (0.4422)	1.7971 (1.2070)	0.6002	3.7034
82-83	-1.5761* (-10.4978)	0.2006 (0.3353)	-0.2084 (-0.7209)	-0.5088 (-1.4163)	5.1223* (4.6080)	-3.9752* (-2.1058)	1.7781 (0.8166)	0.9557	38.8770
86-87	-0.4440 (-0.8653)	-0.5620 (-0.9783)	-0.2366 (-0.6734)	-0.4581 (-1.4059)	1.4655 (0.6414)	-1.3159 (-0.5655)	1.2521 (0.8967)	0.8771	6.1844

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE II.12

FIXED INVESTMENT : CROSS SECTION RESULTS (OLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$ (r=0,1,2,3,4)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{\Delta S(t-3)}{S(t-4)}$	$\frac{\Delta S(t-4)}{S(t-5)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$	$\frac{FNDE(t-3)}{k(t-4)}$	$\frac{FNDE(t-4)}{k(t-5)}$
70-71	-0.0971*	0.0329	0.0741	0.1261	-0.0271	0.0163	0.0751*	0.0490	-0.0371	0.0093	0.1052
	(-3.0452)	(0.4445)	(1.4003)	(1.9983)	(-0.4197)	(0.6192)	(2.7460)	(1.4079)	(-0.6968)	(0.1825)	(1.9653)
72-73	0.0726*	0.0013	0.0050	0.0125	-0.0168	-0.0909*	0.0896*	0.0700	0.0718*	-0.0224	0.0738
	(2.2143)	(0.0184)	(0.1692)	(0.3611)	(-0.2952)	(-2.0531)	(4.0798)	(1.8505)	(2.4421)	(-0.5726)	(1.7858)
74-75	-0.0248	0.1570	0.1521	0.1504	0.0503	0.1327	0.0541	0.0852	0.0861	-0.0195	-0.0230
	(-0.5668)	(1.7626)	(1.3364)	(1.6499)	(1.2776)	(1.2067)	(1.5752)	(1.7591)	(1.9842)	(-0.3250)	(-0.5138)
77-78	-0.0825	-0.2033	0.0945	0.1272	0.0601	0.2262	0.2488*	0.0578	0.0451	0.0684	-0.1115
	(-0.9693)	(-1.2000)	(0.8415)	(1.4363)	(0.5412)	(1.6458)	(3.2477)	(0.8820)	(0.7377)	(1.0766)	(-1.4648)
79-80	-0.1184	-0.0635	-0.0328*	-0.0345	0.0542	-0.0115	0.2162*	0.01684*	0.1011	-0.1374	-0.0903
	(-1.4312)	(-0.5589)	(-2.2974)	(-0.1685)	(0.4938)	(-0.1541)	(2.8568)	(2.5814)	(1.1583)	(-1.7626)	(-1.3334)
82-83	-0.5298*	0.2445*	0.4076*	0.2589	0.3491*	0.1969	0.3249*	0.0239	0.1656	-0.2010	0.1605
	(-4.3542)	(4.3535)	(2.9101)	(1.3874)	(2.6943)	(1.2812)	(4.9155)	(0.2776)	(1.6230)	(-1.4046)	(1.2397)
86-87	-0.0057	0.5394*	0.3345	-0.1060	-0.1008	-0.0372	-0.1743	-0.3096	-0.0527	-0.0366	0.0750
	(-0.0402)	(2.9304)	(1.2235)	(-0.4789)	(-0.5285)	(-0.2542)	(-1.0756)	(-1.9694)	(-0.6349)	(-0.3734)	(1.0391)

Table contd...

Table II.12 contd..

Year	RENT(t)/k(t-1)	RENT(t-1)/k(t-2)	RENT(t-2)/k(t-3)	RENT(t-3)/k(t-4)	RENT(t-4)/k(t-5)	IAR(t)/k(t-1)	IAR(t-1)/k(t-2)	IAR(t-2)/k(t-3)	R^2	F
70-71	-0.0011	0.0846	0.0330	0.2876	-0.1223	1.9268*	-0.3208	-0.8258	0.6036	4.3151
	(-0.0101)	(0.4929)	(0.2390)	(1.3123)	(-0.5191)	(3.4845)	(-0.6055)	(-1.1828)		
72-73	0.2001	-0.0970	0.1648	-0.3690*	0.2056	1.6175*	-0.0575	-1.2285	0.6480	3.7850
	(1.5416)	(-0.4736)	(1.3701)	(-2.4829)	(1.8627)	(2.3590)	(-0.0544)	(-1.5931)		
74-75	-0.2698	0.0792	0.1425	0.2209	-0.1402	3.7616*	-3.0651*	0.4304	0.6240	3.4121
	(-0.9897)	(0.2771)	(0.6383)	(0.8718)	(-1.0698)	(3.9094)	(-2.3051)	(0.3575)		
77-78	0.6522*	-0.2121	-0.5161	-0.1879	0.5442	-1.5063	-0.4431	2.0038	0.5413	1.8358
	(2.5137)	(-0.7673)	(-1.7672)	(-0.4426)	(1.6244)	(-1.0829)	(-0.2092)	(1.1603)		
79-80	0.1402	0.3061	-0.9051	-0.4573	-0.4421	-0.9045	1.2127	1.9390	0.6697	3.1537
	(0.8052)	(1.5128)	(-0.3585)	(-1.4118)	(-1.4300)	(-0.5710)	(0.5600)	(1.1539)		
82-83	-1.6236*	-0.3343	-0.1954	-0.2047	0.9978*	4.2444*	-2.4325	1.0135	0.9682	40.5661
	(-11.0562)	(-0.5835)	(-0.6813)	(-0.5955)	(2.8582)	(3.9904)	(-1.3673)	(0.5132)		
86-87	-0.3547	-0.6691	0.0158	-0.2931	-0.3359	1.7822	-1.1565	0.3996	0.8945	4.7101
	(-0.6123)	(-1.0877)	(0.0298)	(-0.6986)	(-0.2880)	(0.6345)	(-0.4256)	(0.2431)		

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE II.13

FIXED INVESTMENT: CROSS SECTION RESULTS (OLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$ (r=0)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{PAT(t)}{k(t-1)}$	$\frac{IAR(t)}{k(t-1)}$	R^2	F
68-69	0.0006 (0.0367)	0.0579* (2.2170)	0.0696* (2.2780)	0.0893 (1.7961)	0.0489* (2.3410)	0.3295	7.9852
69-70	-0.1626* (-3.4777)	0.0565 (0.7588)	0.1260* (2.4040)	0.1790 (1.2614)	2.7571* (5.1954)	0.4087	11.2318
70-71	-0.0502* (-2.0081)	-0.0663 (-0.9950)	0.0908* (3.6343)	0.0508 (0.9872)	1.1925* (3.5128)	0.3475	8.6561
74-75	-0.0217 (-0.7439)	-0.0123 (-0.2051)	0.0318 (1.0989)	0.1375 (0.9247)	1.8562* (4.4110)	0.3549	7.7029
82-83	-0.3125* (-3.9517)	0.0490 (1.6867)	0.2867* (4.6744)	-1.4251* (-8.7333)	2.8659* (3.4381)	0.8946	84.8914
83-84	-0.0439 (-1.4511)	0.1004 (1.2740)	0.0590* (2.0973)	-0.0660 (-0.5770)	1.4421* (3.4722)	0.4980	7.1944
86-87	0.0199 (0.3257)	0.2947* (2.3964)	-0.0305 (-0.2670)	-0.5008 (-1.9241)	2.3715* (2.4852)	0.5188	6.4702

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

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TABLE II.14

FIXED INVESTMENT : CROSS SECTION RESULTS (OLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$ (r=0.1)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{PAT(t)}{k(t-1)}$	$\frac{PAT(t-1)}{k(t-2)}$	$\frac{IAR(t)}{k(t-1)}$	$\frac{IAR(t-1)}{k(t-2)}$	R^2	F
67-68	0.0505* (2.3692)	-0.0014 (-0.0366)	0.0131 (0.6770)	0.1364* (5.0124)	0.1042* (3.1650)	-0.0032 (-0.0763)	0.1253 (1.3897)	0.2806 (0.3089)	0.2741 (0.3067)	0.3959	4.9967
68-69	0.0021 (0.1134)	0.0656* (2.1970)	0.0567 (1.7529)	0.0716* (2.2054)	0.0145 (0.5606)	0.0271 (0.4460)	0.0415 (1.0639)	0.6604 (1.7020)	-0.2031 (-0.4806)	0.3730	4.5357
69-70	-0.0829* (-2.0037)	0.0469 (0.6945)	-0.0215 (-0.3366)	0.0693 (1.6221)	0.1859* (2.6726)	0.0490 (0.3351)	0.1785 (1.2394)	6.5087* (8.5418)	-4.9417* (-5.8369)	0.6755	15.8718
70-71	-0.0635 (-0.9720)	-0.0869 (-0.3864)	-0.0156 (-0.9141)	-0.0724 (-0.1721)	0.0850 (0.5433)	-0.0560 (-0.2537)	-0.1899 (-0.0061)	1.6318 (1.4327)	-0.7943 (-1.3292)	0.4864	7.2222
74-75	-0.0079 (-0.2533)	0.0321 (0.4838)	0.1451 (1.7989)	0.0362 (1.2321)	0.0340 (0.9707)	0.0565 (0.2655)	0.0328 (0.1781)	3.2894* (3.9565)	-1.8972* (-2.3240)	0.4512	5.3437
75-76	0.0032 (0.0699)	0.0818 (1.3989)	0.1360 (1.6690)	0.0061 (0.1859)	-0.0469 (-1.0140)	0.1436 (0.9026)	0.3545 (1.5062)	2.0388 (1.4104)	-1.3220 (-1.0545)	0.3695	3.8088
77-78	0.0138 (0.2854)	-0.0031 (-0.0276)	-0.0161 (-0.2365)	0.1901* (3.2593)	-0.0221 (-0.5277)	0.3410 (1.8255)	-0.1274 (-0.6857)	-0.5998 (-0.5377)	0.8799 (0.8298)	0.3108	2.4806
79-80	-0.0781 (-1.4671)	-0.0359 (-0.4578)	-0.1050 (-1.2268)	0.2092* (4.0944)	0.1948* (4.3169)	-0.0580 (-0.4226)	0.2214 (1.8315)	-1.4995 (-1.1536)	2.3722 (1.8269)	0.4849	5.1774
81-82	-0.1302 (-1.0942)	0.0322 (0.1894)	-0.0687 (-0.3650)	0.8956* (3.4977)	-0.0541 (-0.4819)	0.8204 (1.1826)	-0.0899 (-0.2268)	-4.4045 (-1.8378)	7.9533* (2.8148)	0.4121	2.9790
82-83	-0.2983* (-3.0891)	0.0720* (2.2512)	0.2373* (2.2217)	0.2688* (3.9589)	0.0550 (0.6647)	-1.4845* (-8.7495)	0.1502 (0.3246)	4.4364* (3.8875)	-2.5429 (-1.4421)	0.9139	47.7701
83-84	-0.0310 (-0.7730)	0.1333 (1.3567)	0.0059 (0.0942)	0.0636 (1.9928)	-0.0328 (-0.8956)	-0.1834 (-1.0626)	0.2181 (0.9059)	1.4409 (1.8754)	0.0205 (0.0330)	0.5334	3.5724
86-87	0.0022 (0.0433)	0.5375* (4.6384)	0.2398 (1.5374)	-0.0923 (-0.9962)	-0.2704* (-3.9995)	-0.2181 (-0.6901)	-0.6563* (-2.0140)	-1.7917 (-0.8404)	-0.2389 (-0.1266)	0.7717	8.4490

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE II.15

FIXED INVESTMENT : CROSS SECTION RESULTS (OLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$ (r=0,1,2)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$	$\frac{PAT(t)}{k(t-1)}$
69-70	-0.0958* (-2.1110)	0.0719 (1.0303)	-0.0442 (-0.6054)	0.0138 (0.1973)	0.0620 (1.2783)	0.2324* (3.3491)	0.0443 (0.6955)	-0.0044 (-0.0288)
72-73	0.0531 (1.8152)	-0.0044 (-0.0665)	0.0502 (1.8904)	0.0548 (0.7484)	0.0962* (4.2591)	0.0812* (2.1314)	0.0644* (2.1220)	0.1884 (1.2958)
74-75	0.0335 (0.9930)	0.0362 (0.5776)	0.0675 (0.7702)	0.1022 (1.7282)	0.0654* (2.1464)	0.0937* (2.1108)	0.0902* (2.9893)	0.0940 (0.4753)
77-78	-0.0253 (-0.3447)	-0.0266 (-0.1562)	-0.0149 (-0.1573)	-0.0548 (-0.8937)	0.2433* (3.4213)	0.0327 (0.5204)	0.0606 (0.9817)	0.3491 (1.4608)
79-80	-0.1166 (-1.9087)	-0.0627 (-0.6501)	-0.1648 (-1.7732)	-0.0341 (-0.2424)	0.2155* (3.7534)	0.1865* (3.9797)	0.1203 (1.8685)	0.0134 (0.0959)
82-83	-0.2893* (-2.7169)	0.1310* (3.3071)	0.1104 (0.8681)	-0.1029 (-0.7104)	0.3224* (5.0511)	0.1600 (1.8358)	0.2324* (2.4850)	-1.4884* (-9.6599)
84-85	0.0961 (0.6060)	0.3485 (0.8456)	-0.1804 (-0.4980)	-0.0302 (-0.1335)	-0.0117 (-0.0843)	-0.1208 (-0.7520)	-0.0383 (-0.2660)	-1.1190 (-1.2359)
86-87	-0.0704 (-0.8315)	0.5605* (4.3122)	0.4308* (2.2635)	-0.0412 (-0.2626)	-0.0968 (-0.9416)	-0.2786* (-3.2870)	-0.1268 (-1.9416)	-0.5448 (-1.3396)

Table contd...

Table II.15 contd...

Year	PAT(t-1)/k(t-2)	PAT(t-2)/k(t-3)	IAR(t)/k(t-1)	IAR(t-1)/k(t-2)	IAR(t-2)/k(t-3)	R^2	F
69-70	0.1989	0.1202	6.9138*	-6.9371*	2.0659*	0.7172	12.0489
	(1.1951)	(1.4334)	(8.9985)	(-6.2847)	(2.2945)		
72-73	-0.3937	0.0575	1.0687	0.7908	-1.7528*	0.5089	3.7133
	(-0.5404)	(0.9243)	(1.6309)	(0.7793)	(-2.4187)		
74-75	0.0423	0.1824	2.8327*	-1.7961	-0.4492	0.5650	5.1954
	(0.2276)	(1.0911)	(3.4980)	(-1.6570)	(-0.4517)		
77-78	-0.2024	-0.0195	-0.6068	-0.8222	1.7338	0.3941	1.8432
	(-0.8192)	(-0.0956)	(-0.4471)	(-0.4092)	(0.9931)		
79-80	0.2450	-0.1022	-1.4896	1.0401	1.7917	0.5455	4.0004
	(1.8656)	(-0.4599)	(-1.0816)	(0.5559)	(1.2362)		
82-83	0.6850	-0.1980	4.7982*	-5.1226*	3.0937	0.9419	40.5642
	(1.3143)	(-0.6590)	(4.2471)	(-2.6063)	(1.4486)		
84-85	0.1402	1.4206	5.1077	-10.7821*	5.8019*	0.3188	0.8190
	(0.2358)	(1.1064)	(1.7981)	(-2.7222)	(2.5567)		
86-87	-0.5208	-0.3460	0.8677	-0.5101	1.6021	0.8286	6.4467
	(-1.1384)	(-1.3720)	(0.3913)	(-0.2378)	(1.2238)		

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE II.18

FIXED INVESTMENT : CROSS SECTION RESULTS (OLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$ (r=0,1,2,3)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{\Delta S(t-3)}{S(t-4)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$	$\frac{FNDE(t-3)}{k(t-4)}$
69-70	-0.0701 (-1.4831)	0.0169 (0.2307)	-0.1389 (-1.6333)	-0.0691 (-0.7370)	-0.0238 (-0.5338)	0.0551 (1.0927)	0.3182* (4.0338)	0.0868 (1.2091)	0.0463 (0.5420)
72-73	0.0508 (1.6631)	0.0344 (0.4996)	0.0167 (0.5637)	0.0534 (0.7099)	0.0501 (1.0388)	0.0988* (4.2550)	0.0662 (1.6642)	0.0615* (2.0754)	-0.0080 (-0.2346)
74-75	-0.0003 (-0.0088)	0.0626 (0.9721)	0.0624 (0.7242)	0.1590 (1.9519)	0.0716* (2.2811)	0.0683* (2.2440)	0.0836 (1.8935)	0.0932* (3.0667)	-0.0095 (-0.1989)
77-78	-0.0059 (-0.0703)	-0.0109 (-0.0618)	0.0043 (0.3924)	0.0229 (0.3162)	-0.0729 (-0.8126)	0.2344* (3.0264)	0.0433 (0.6214)	0.0598 (0.9302)	0.0592 (0.8904)
79-80	-0.1012 (-1.5796)	-0.1227 (-1.2010)	-0.1895 (-1.9782)	0.0192 (0.1271)	-0.0063 (-0.0834)	0.2056* (3.6610)	0.1855* (3.8325)	0.0746 (1.1207)	-0.0999* (-2.0086)
82-83	-0.4118* (-3.6432)	0.1301* (3.0459)	0.2197 (1.7017)	-0.0556 (-0.3223)	0.3625* (2.5131)	0.3121* (4.4019)	0.0896 (1.0355)	0.1837 (1.9717)	0.0790 (0.7611)
86-87	-0.0769 (-0.6861)	0.5170* (3.6310)	0.3732 (1.8704)	-0.0042 (-0.0219)	0.0862 (0.5767)	-0.0716 (-0.6580)	-0.1964 (-1.6343)	-0.1127 (-1.5705)	-0.0039 (-0.0419)

Table contd...

Table II.16 contd...

Year	PAT(t)/k(t-1)	PAT(t-1)/k(t-2)	PAT(t-2)/k(t-3)	PAT(t-3)/k(t-4)	IAR(t)/k(t-1)	IAR(t-1)/k(t-2)	IAR(t-2)/k(t-3)	R^2	F
69-70	0.0900 (0.5167)	0.4214* (2.1764)	0.1564 (1.8433)	-0.5491* (-2.0332)	6.3958* (9.0197)	-6.8316* (-5.2545)	2.1225 (1.9442)	0.7401	10.2529
72-73	0.2579 (1.8019)	-0.0226 (-0.3013)	0.1449* (2.0713)	-0.1816 (-1.6559)	1.1159 (1.6206)	0.7074 (0.6537)	-1.6885* (-2.2163)	0.5746	3.6013
74-75	0.0077 (0.0373)	0.0791 (0.4342)	0.1277 (0.7478)	-0.0414 (-0.4270)	3.3917* (4.0221)	-2.3046* (-2.1516)	-0.3246 (-0.3353)	0.6176	4.8444
77-78	0.4241 (1.6670)	-0.2783 (-1.0260)	-0.0110 (-0.0478)	0.0754 (0.2290)	-0.6388 (-0.4582)	-0.9223 (-0.4451)	1.6917 (0.9411)	0.4191	1.4913
79-80	0.1108 (0.7646)	0.2459 (1.7364)	-0.1676 (-0.7373)	-0.2967 (-1.3838)	-1.0213 (-0.7555)	-0.9224 (-0.5011)	-1.7637 (-1.1863)	0.6045	3.7703
82-83	-1.5519* (-10.2522)	0.4704 (0.8829)	-0.2490 (-0.8647)	-0.5127 (-1.4010)	5.1042* (4.5022)	-4.1251* (-2.1511)	1.7216 (0.7685)	0.9538	37.1971
86-87	-0.0803 (-1.5767)	-0.0313 (-0.0525)	-0.0150 (-0.0389)	-0.5637 (-1.6531)	1.7928 (0.7372)	-1.8796 (-0.7546)	1.9499 (1.3485)	0.8585	5.2597

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE II.17

FIXED INVESTMENT: CROSS SECTION RESULTS (OLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$ (r=0,1,2,3,4)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{\Delta S(t-3)}{S(t-4)}$	$\frac{\Delta S(t-4)}{S(t-5)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$	$\frac{FNDE(t-3)}{k(t-4)}$	$\frac{FNDE(t-4)}{k(t-5)}$
70-71	-0.0179* (-3.3157)	0.0215 (0.2827)	0.0435 (0.8330)	0.1077 (1.6697)	-0.0504 (-0.7483)	0.0070 (0.2661)	0.0695* (2.4306)	0.0497 (1.3723)	-0.0343 (-0.6372)	-0.0311 (-0.5477)	0.1012 (1.8338)
72-73	0.0600 (1.8820)	0.0067 (0.0949)	0.0098 (0.3269)	0.0486 (0.6670)	-0.0176 (-0.3098)	-0.0813 (-1.7533)	0.0892* (3.8880)	0.0715 (1.8274)	0.0625* (2.1290)	-0.0156 (-0.4644)	0.0807 (1.9738)
74-75	-0.0144 (-0.3402)	0.1367 (1.5506)	0.1280 (1.1265)	0.1363 (1.4405)	0.0722 (1.8166)	0.1044 (0.9146)	0.0714 (1.9664)	0.0698 (1.4154)	0.0869 (1.9495)	0.0092 (0.1493)	-0.0206 (-0.4409)
77-78	-0.0732 (-0.7904)	-0.2264 (-1.1621)	0.0481 (0.4151)	0.0725 (0.9237)	0.0492 (0.4293)	0.2217 (1.4853)	0.2462* (3.1890)	0.0703 (0.9934)	0.0725 (1.1367)	0.0704 (1.0732)	-0.1165 (-1.4984)
79-80	-0.1057 (-1.2576)	-0.0637 (-0.5670)	-0.3096* (-2.3248)	0.0067 (0.0306)	0.0767 (0.6651)	-0.0176 (-0.2530)	0.2086* (2.7845)	0.1756* (2.7023)	0.0969 (1.1176)	-0.1521 (-1.9196)	-0.1026 (-1.4821)
82-83	-0.5006* (-4.3291)	0.2364* (4.2941)	0.3481* (2.6194)	0.2239 (1.2322)	0.3597* (2.8042)	0.2046 (1.3226)	0.3265* (4.9801)	0.0426 (0.5014)	0.1492 (1.4761)	-0.1972 (-1.4001)	0.1445 (1.1546)
86-87	0.0128 (0.0802)	0.5614* (3.0425)	0.4260 (1.4231)	-0.1602 (-0.6134)	-0.0521 (-0.2665)	0.0338 (0.2042)	-0.1814 (-1.1897)	-0.2519 (-1.6686)	-0.0523 (-0.5586)	0.0446 (0.3755)	0.0738 (0.9910)

Table contd..

Table II.17 contd..

Year	$\frac{PAT(t)}{k(t-1)}$	$\frac{PAT(t-1)}{k(t-2)}$	$\frac{PAT(t-2)}{k(t-3)}$	$\frac{PAT(t-3)}{k(t-4)}$	$\frac{PAT(t-4)}{k(t-5)}$	$\frac{IAR(t)}{k(t-1)}$	$\frac{IAR(t-1)}{k(t-2)}$	$\frac{IAR(t-2)}{k(t-3)}$	R^2	F
70-71	-0.0598 (-0.7365)	0.1302 (0.9303)	0.1511 (1.1720)	-0.0226 (-0.3637)	-0.0172 (-0.0917)	1.3763* (3.2351)	-0.5025 (-0.9260)	-0.6010 (-0.7900)	0.5865	4.0129
72-73	0.2296 (1.6629)	-0.0293 (-0.3968)	0.0928 (1.2941)	0.2868* (-2.2493)	0.1677 (1.6538)	1.4463 (1.9944)	0.1258 (0.1146)	-1.2921 (-1.6480)	0.6363	3.5961
74-75	-0.1682 (-0.6313)	0.1502 (0.5264)	0.0482 (0.2019)	-0.0734 (-0.6960)	-0.0571 (-0.6216)	3.9642* (4.0846)	-3.1743* (-2.3984)	0.4293 (0.3646)	0.6183	3.3303
77-78	-0.6427* (-2.3748)	-0.1477 (-0.5431)	-0.3490 (-1.3013)	-0.3304 (-0.8812)	-0.3815 (-1.1927)	-1.4465 (-1.0213)	-0.7775 (-0.3573)	2.2778 (1.2426)	0.5092	1.6140
79-80	0.1131 (0.6597)	0.3172 (1.5441)	-0.1460 (-0.5530)	-0.5402 (-1.7584)	-0.3836 (-1.2708)	-0.9967 (-0.6329)	1.7572 (0.8080)	1.6083 (0.9607)	0.6761	3.3472
82-83	-1.6103* (-11.0805)	-0.0248 (-0.0484)	-0.2964 (-1.0665)	-0.2182 (-0.6426)	1.0224* (3.0858)	4.2209* (3.9948)	-2.3386 (-1.3078)	0.7975 (0.3997)	0.9681	40.5189
86-87	-0.7987 (-1.3558)	-0.1316 (-0.2049)	0.4205 (0.7243)	-0.3271 (-0.7731)	-0.8405 (-0.8415)	1.4483 (0.4603)	-1.5138 (-0.5009)	1.0390 (0.5956)	0.8782	4.0071

(* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.)

TABLE II.18

FIXED INVESTMENT : CROSS-SECTION RESULTS (OLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{\Delta S(t-3)}{S(t-4)}$	$\frac{\Delta S(t-4)}{S(t-5)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$	$\frac{FNDE(t-3)}{k(t-4)}$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
70-71	-0.8541* (-2.7088)	0.0101 (0.1287)	0.0574 (1.0592)	0.1535* (2.2631)	-0.0386 (-0.5406)	0.0144 (0.5310)	0.1578* (3.0333)	0.0349 (0.9116)	-0.0382 (-0.6864)	-0.0941 (-1.5735)
72-73	0.0559* (2.0391)	-0.0452 (-0.6622)	0.0201 (0.7025)	-0.0421 (-0.5644)	0.0284 (0.5560)	-0.0574 (-1.3815)	0.2237* (4.3465)	0.0906* (2.3479)	0.0790* (2.7455)	-0.0281 (-0.9062)
73-74	-0.0528 (-0.7866)	-0.0678 (-0.3258)	0.3532 (1.9160)	0.1438 (1.8417)	-0.1392 (-0.7015)	0.1109 (0.8267)	0.4154* (4.0161)	0.0949 (1.0102)	-0.2424* (-2.1798)	0.1129 (1.3035)
74-75	0.0435 (1.2060)	0.1101 (1.1609)	0.0561 (0.4460)	0.0909 (0.8998)	0.0169 (0.3948)	0.0254 (0.2206)	0.2034* (2.6045)	0.0478 (0.8374)	0.1255* (2.7129)	-0.0016 (-0.0238)
75-76	0.0054 (0.1156)	0.1215 (1.7902)	0.1662 (1.7044)	0.1397 (1.0501)	0.2258* (2.0296)	0.0242 (0.5269)	-0.1596* (-2.6359)	-0.0342 (-0.6226)	-0.0535 (-0.8734)	-0.0353 (-0.7772)
76-77	-0.1357 (-1.3633)	-0.0432 (-0.3652)	0.2679* (2.6582)	0.2120 (1.5103)	0.1827 (1.0203)	0.1862 (1.6827)	0.4243* (3.6021)	0.1842* (2.3347)	-0.0924 (-1.2432)	-0.0297 (-0.3623)
77-78	-0.0079 (-0.1055)	-0.1674 (-0.8746)	-0.0064 (-0.0566)	0.0183 (0.2218)	0.0017 (0.0149)	0.1619 (1.1806)	0.2621* (2.2938)	0.0399 (0.5896)	0.0709 (1.1115)	0.0710 (1.0905)
79-80	0.0015 (0.0287)	-0.2536* (-2.5372)	-0.1906 (-1.7385)	-0.2448 (-1.3285)	0.0556 (0.5837)	-0.0313 (-0.5407)	0.4528* (5.6543)	0.1957* (3.6042)	0.0716 (1.0046)	-0.1405* (-2.1618)
81-82	-0.0026 (-0.0172)	0.1617 (0.8074)	0.2911 (1.1381)	0.0844 (0.3149)	-0.1072 (-0.3752)	0.1213 (0.3447)	0.4298* (2.9474)	0.0204 (0.1329)	0.1462 (0.6115)	0.2851 (1.6874)
82-83	-0.4706* (-3.9637)	0.5065* (3.4061)	0.3791* (2.3466)	0.4340* (2.0016)	0.4533* (2.8643)	0.1871 (0.9864)	0.755* (4.7945)	-0.0777 (-0.8001)	0.1197 (0.9938)	-0.3447 (-1.8934)
86-87	0.1217 (1.2613)	0.5332* (3.4664)	0.4356* (2.1658)	-0.3178 (-1.3529)	-0.1477 (-0.9363)	0.0005 (0.0038)	-0.1469 (-0.9235)	-0.3258* (-3.1454)	-0.0678 (-0.7945)	0.0647 (0.6975)

Table contd...

Table II.18 contd...

Year	FNDE(t-4)/k(t-5)	PAT(t)/k(t-1)	PAT(t-1)/k(t-2)	PAT(t-2)/k(t-3)	PAT(t-3)/k(t-4)	PAT(t-4)/k(t-5)	IN(t)/k(t-1)	R^2	F
	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
70-71	0.0940 (1.5736)	-0.0326 (-0.3890)	0.1281 (0.9039)	0.0070 (0.0528)	-0.0541 (-0.8719)	0.1891* (0.9219)	-0.1359 (-1.9811)	0.5160	3.5318
72-73	0.0556 (1.3472)	0.2988* (2.2914)	0.0459 (0.6901)	0.0287 (0.3798)	-0.2161 (-1.6892)	0.2555* (2.6862)	-0.1781* (-2.5730)	0.6211	3.9965
73-74	-0.1353 (-1.6155)	0.2295 (0.4772)	-0.6294 (-1.4673)	0.1087 (0.5925)	-0.3174 (-1.6956)	0.2188 (0.6935)	-0.1902 (-0.9197)	0.5384	2.8432
74-75	0.0372 (0.7655)	0.3688 (1.2214)	0.0231 (0.0788)	0.1315 (0.5158)	0.0233 (0.2079)	-0.0099 (-0.1033)	-0.2767* (-2.2008)	0.5036	2.4727
75-76	-0.0485 (-0.7310)	0.0024 (0.0129)	0.3619 (1.2639)	-0.2383 (-0.9070)	-0.1581 (-0.6715)	-0.0075 (-0.0561)	0.2871* (3.0896)	0.5266	3.0590
76-77	-0.1014 (-1.4628)	0.2956 (0.8513)	0.0880 (0.3476)	-0.1833 (-0.4587)	0.1001 (0.2755)	0.0342 (0.1005)	-0.5843* (-2.9460)	0.5538	2.3272
77-78	-0.0930 (-1.2365)	0.6448 (1.9445)	-0.2413 (-0.8816)	-0.2321 (-0.8684)	-0.2610 (-0.7022)	0.2917 (0.9223)	-0.0874 (-0.4379)	0.4687	1.6542
79-80	-0.1670* (-2.7837)	0.7522* (3.8827)	0.4432* (2.6563)	-0.0992 (-0.4589)	-0.4800* (-2.0752)	-0.1443 (-0.5699)	-0.6830* (-4.6763)	0.7549	5.7742
81-82	-0.3766 (-1.4848)	0.6506 (0.8479)	0.2982* (6.7672)	-0.5728 (-1.2055)	0.3508 (0.6886)	0.2057 (0.2440)	-0.8694* (-2.1721)	0.5378	1.8908
82-83	0.2158 (1.4170)	-1.0554* (-4.0341)	0.0663 (0.1171)	-0.0828 (-0.2468)	0.3371 (0.9436)	1.6220* (4.1979)	-0.5496* (-2.2631)	0.9483	29.8369
86-87	0.0929 (1.4625)	-0.0789 (-0.1098)	-0.6243 (-1.2252)	0.5083 (1.0848)	-0.3237 (-0.8521)	-1.0285 (-1.4459)	-0.3264 (-0.8109)	0.8790	5.4484

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE II.19

FIXED INVESTMENT : TIME SERIES RESULTS (OLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$

Constant	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$	$\frac{FNDE(t-3)}{k(t-4)}$	$\frac{FNDE(t-4)}{k(t-5)}$	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$
				CASE 1				
0.1280 (1.9675)	0.0938 (0.9035)	-	-	-	-	-0.0528 (-0.1751)	-	-
0.0463 (0.3614)	0.2312 (1.1033)	-0.0599 (-0.3161)	-	-	-	0.1257 (0.2159)	0.3895 (0.7745)	-
0.0069 (0.0261)	0.0021 (0.0082)	-0.0257 (-0.1062)	-0.4304 (-1.4049)	-	-	0.3726 (0.5069)	1.1528 (1.1502)	0.1948 (0.2375)
-0.5850 (-1.6288)	0.1588 (0.5267)	0.0298 (0.1058)	-0.4421 (-1.4872)	-0.0390 (-0.1028)	-	0.7278 (0.8684)	2.0768 (1.9985)	1.6407 (0.4011)
-0.3568 (-1.5324)	0.4419 (1.9816)	0.1341 (1.2913)	-0.0336 (-0.2714)	-0.1083 (-0.7904)	0.6483 (1.9762)	1.2331 (1.9774)	1.7278 (1.9730)	0.3851 (1.0204)
				CASE 2				
0.1072* (8.2842)	-0.0025 (-0.1213)	-	-	-	-	-0.0835 (-1.2726)	-	-
0.1038* (3.5911)	0.0134 (0.3056)	-0.0111 (-0.3108)	-	-	-	-0.0694 (-0.5534)	0.0143 (0.1249)	-
0.0698 (1.6297)	-0.0336 (-0.5085)	0.0595 (1.1850)	-0.0696 (-1.0312)	-	-	0.0241 (0.1740)	0.0254 (0.1664)	0.2155 (1.5936)
0.0694 (0.8814)	-0.0248 (-0.2041)	0.0504 (0.5127)	-0.0860 (-0.5758)	0.0159 (0.1493)	-	0.0821 (0.3124)	0.0204 (0.0922)	0.2382 (0.8110)
				CASE 3				
0.0979* (7.0651)	0.0141 (0.5847)	-	-	-	-	-0.0978 (-1.5634)	-	-
0.1044 (1.8481)	-0.0258 (-0.3419)	0.0419 (0.5916)	-0.0607 (-0.8113)	-	-	-0.0455 (-0.2907)	-0.0544 (-0.2279)	-0.0673 (-0.3384)
				CASE 4				
0.0948* (7.5303)	0.0028 (0.1085)	-	-	-	-	-0.0533 (-0.8817)	-	-
0.1088* (4.1321)	0.0091 (0.1953)	-0.0044 (-0.1068)	-	-	-	-0.0925 (-0.7674)	-0.0625 (-0.5759)	-
0.1138* (2.2624)	-0.0263 (-0.4551)	-0.0202 (-0.4328)	-0.0736 (-1.4578)	-	-	-0.0454 (-0.3394)	-0.3345 (-0.1696)	0.1947 (0.1222)

Table contd...

Table II.19 contd.

$\frac{\Delta S(t-3)}{S(t-4)}$	$\frac{\Delta S(t-4)}{S(t-5)}$	$\frac{RENT(t)}{k(t-1)}$	$\frac{RENT(t-1)}{k(t-2)}$	$\frac{RENT(t-2)}{k(t-3)}$	$\frac{RENT(t-3)}{k(t-4)}$	$\frac{RENT(t-4)}{k(t-5)}$	R^2	F	D.W.
				CASE 1					
-	-	0.5674 (0.5052)	-	-	-	-	0.0515	0.3082	2.3209
-	-	0.6525 (0.3551)	-1.0503 (-0.5341)	-	-	-	0.0990	0.2381	2.4398
-	-	-2.2195 (-0.6708)	-0.7740 (-0.3252)	-1.5010 (-0.6672)	-	-	0.3066	0.4428	2.3523
1.3903 (1.7283)	-	-2.7327 (-0.8750)	-4.2184 (-1.2967)	-3.6326 (-1.5646)	0.7507 (0.2596)	-	0.6920	0.9367	2.0909
-1.1425 (-0.4195)	-1.4336* (-2.0408)	-0.3753 (-0.3440)	-2.3517 (-1.6860)	1.3411 (1.2689)	0.5105 (0.6314)	6.2000 (1.9890)	0.9002	0.6018	2.0457
				CASE 2					
-	-	0.1489 (0.7546)	-	-	-	-	0.1089	0.6583	2.1438
-	-	0.2206 (0.6057)	-0.1890 (-0.4515)	-	-	-	0.1101	0.2470	1.9583
-	-	-0.2379 (-0.4521)	0.2986 (0.5404)	-0.9509 (-1.8982)	-	-	0.4158	0.6329	1.9781
-0.0711 (-0.3208)	-	-0.3061 (-0.3142)	0.3106 (0.2980)	-0.9799 (-0.9610)	0.2237 (0.2433)	-	0.4301	0.2514	1.9842
				CASE 3					
-	-	0.4579 (1.7706)	-	-	-	-	0.2984	1.8426	2.2002
-	-	0.1534 (0.1587)	0.3990 (0.6005)	-0.8857 (-1.6089)	-	-	0.5673	0.7283	1.9910
				CASE 4					
-	-	0.0469 (0.2129)	-	-	-	-	0.0722	0.2859	2.1488
-	-	0.2397 (0.5945)	-0.2247 (-0.6556)	-	-	-	0.1730	0.2439	2.6416
-	-	-0.0505 (-0.0790)	0.1447 (0.3211)	-0.7297 (-1.9492)	-	-	0.7061	0.8000	2.0122

(* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.)

TABLE II.20

FIXED INVESTMENT : TIME-SERIES RESULTS (OLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$

Constant	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDET(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$	$\frac{FNDE(t-3)}{k(t-4)}$	$\frac{FNDE(t-4)}{k(t-5)}$	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{\Delta S(t-3)}{S(t-4)}$
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
					CASE 1				
0.1014* (7.3363)	0.0172 (0.9069)	-	-	-	-	-0.0627 (-1.1301)	-	-	-
0.1162* (5.2637)	0.0012 (0.0392)	0.0247 (0.7210)	-	-	-	-0.1133 (-1.0868)	-0.0922 (-1.1271)	-	-
0.0955 (1.8309)	0.0013 (0.0314)	0.0176 (0.3964)	-0.0325 (-0.5365)	-	-	-0.0435 (-0.2375)	-0.0182 (-0.0795)	0.0920 (0.4731)	-
-0.0852 (-0.9175)	0.0172 (0.3852)	-0.0260 (-0.5679)	-0.1037 (-1.5697)	-0.0797 (-1.0720)	-	0.2572 (1.2535)	0.6478 (1.8533)	0.7897* (2.1089)	0.4697* (2.0760)
-0.4262 (-1.2053)	0.3199 (0.7189)	0.0628 (0.4778)	-0.1468 (-1.5539)	-0.0117 (-0.0530)	0.3697 (0.5910)	0.8817 (0.9961)	1.5472 (1.4419)	0.7812 (0.9642)	0.4472 (0.4891)
					CASE 2				
0.1019* (7.7598)	-0.0021 (-0.1028)	-	-	-	-	-0.0675 (-1.0729)	-	-	-
0.0956* (3.8815)	0.0369 (0.9342)	-0.0228 (-0.6614)	-	-	-	-0.0367 (-0.3193)	0.0389 (0.3819)	-	-
0.0675 (1.9226)	-0.0337 (-0.5365)	0.0407 (0.8827)	-0.1045 (-1.5891)	-	-	-0.1011 (-0.8048)	0.1539 (1.1198)	0.2385* (2.0663)	-
0.0322 (0.3754)	-0.0485 (-0.4781)	0.0342 (0.3651)	-0.1998 (-0.9824)	0.0061 (0.0545)	-	0.2681 (0.7935)	0.2267 (0.9669)	0.4254 (1.3497)	-0.0052 (-0.9289)
					CASE 3				
0.0792* (2.9942)	0.0823* (2.0685)	-	-	-	-	-0.0380 (-0.3744)	-	-	-
0.0581 (1.4948)	0.1957* (2.9300)	-0.0338 (-0.6255)	-	-	-	-0.0117 (-0.0726)	0.1259 (0.9411)	-	-
0.0239 (0.4788)	0.1039 (1.0590)	0.0359 (0.4686)	-0.1038 (-1.5299)	-	-	0.2091 (1.2267)	0.2390 (1.1243)	0.2276 (1.2624)	-
0.3172 (0.3463)	0.6268 (0.5227)	-0.5011 (-0.4325)	0.7426 (0.3493)	-0.4636 (-0.4371)	-	-0.8585 (-0.2933)	-0.9791 (-0.3028)	-0.8073 (-0.2407)	-0.5540 (-0.5996)

Table contd ...

Table II.20 contd.

$\Delta S(t-4)/S(t-5)$	$PAT(t)/k(t-1)$	$PAT(t-1)/k(t-2)$	$PAT(t-2)/k(t-3)$	$PAT(t-3)/k(t-4)$	$PAT(t-4)/k(t-5)$	R^2	F.	D.W.
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
				CASE 1				
-	0.1004 (0.5687)	-	-	-	-	0.1254	0.8132	1.9251
-	0.2463 (0.9139)	0.0330 (0.1292)	-	-	-	0.1951	0.5250	1.9892
-	-0.0114 (-0.0191)	-0.0741 (-0.1959)	-0.0585 (-0.1733)	-	-	0.2245	0.2889	1.9946
-	-0.9784 (-1.4982)	-1.4113 (-1.9705)	-0.3431 (-0.8540)	-0.4601 (-1.0988)	-	0.6669	0.8333	1.9014
-0.6825 (-0.4978)	-1.0786 (-1.2940)	-2.6682* (-2.0364)	-0.1057 (-0.0497)	-0.3017 (-0.1794)	2.6841 (0.6620)	0.9042	0.6294	1.9817
				CASE 2				
-	0.0522 (0.3101)	-	-	-	-	0.0717	0.4121	1.8910
-	0.2410 (0.7578)	-0.3869 (-1.1437)	-	-	-	0.1582	0.3766	1.9062
-	-0.3945 (-0.8723)	0.1438 (0.3108)	-0.8039* (-2.0979)	-	-	0.5415	1.0506	1.9919
-	-0.7770 (-0.7857)	0.1726 (0.1983)	-1.4252 (-1.0881)	0.5812 (0.5161)	-	0.5929	0.4660	1.9271
				CASE 3				
-	0.4220 (1.2712)	-	-	-	-	0.2902	1.7711	1.7127
-	1.0227 (1.9212)	-0.9282 (-1.8759)	-	-	-	0.5348	1.7234	1.8762
-	0.1527 (0.1870)	-0.1241 (-0.1742)	-0.9904 (-1.8828)	-	-	0.7894	2.0831	1.9652
-	7.5418 (0.4107)	-6.1234 (-0.4796)	5.1056 (0.3259)	-4.5708 (-0.3650)	-	0.8758	0.5878	2.4241

[* indicates that the coefficient is significant at 5% level.
figures in the parenthesis are t ratios.]

TABLE II.21

FIXED INVESTMENT: TIME SERIES RESULTS (OLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$

Constant	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$	$\frac{FNDE(t-3)}{k(t-4)}$	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{\Delta S(t-3)}{S(t-4)}$
				CASE 1				
0.1612* (3.7119)	0.0287 (1.4956)	-	-	-	-0.0456 (-0.8402)	-	-	-
0.1824* (3.5522)	-0.0211 (-0.5663)	0.0407 (1.1503)	-	-	-0.0724 (-0.6572)	-0.0961 (-1.1706)	-	-
0.2238* (3.1145)	-0.0513 (-0.8287)	0.0065 (0.1344)	-0.0203 (-0.2975)	-	-0.0629 (-0.3118)	0.0260 (0.1106)	0.0213 (0.1118)	-
1.1019 (1.2793)	-0.0895 (-0.8870)	-0.0008 (-0.0012)	-0.1410 (-1.7566)	0.0230 (0.2574)	0.2549 (1.0918)	0.3555 (0.9181)	0.4998 (1.3401)	0.0472 (0.1389)
				CASE 2				
0.1922* (4.1753)	0.0152 (0.7827)	-	-	-	-0.0525 (-0.9011)	-	-	-
0.2220* (4.8680)	-0.0363 (-1.0131)	0.0602 (1.7170)	-	-	-0.0600 (-0.6234)	0.0003 (0.0004)	-	-
0.1806* (2.2794)	-0.0521 (-0.5965)	0.0769 (1.4513)	-0.0580 (-0.8554)	-	0.0395 (0.1825)	0.1325 (0.7808)	0.1769 (1.0083)	-
0.2780* (5.0961)	-0.2264* (-2.7655)	0.1167* (2.8256)	-0.1563* (-4.0605)	0.0856* (2.5508)	-0.0282 (-0.2551)	-0.1164 (-0.7842)	0.1724 (1.7485)	-0.2852* (-2.4040)
				CASE 3				
0.1898* (2.9665)	0.1238* (3.1133)	-	-	-	-0.0006 (-0.0065)	-	-	-
0.2273* (6.1791)	0.0745* (2.1746)	0.1245* (3.8276)	-	-	-0.0401 (-0.4848)	0.0780 (1.2123)	-	-
0.2311* (4.2450)	0.2141* (2.8909)	0.1147* (3.3386)	0.0452 (1.1157)	-	0.0628 (0.6131)	0.1123 (1.1336)	0.0501 (0.6265)	-

Table contd...

Table II.21 contd...

RENT(t)/k(t-1)	RENT(t-1)/k(t-2)	RENT(t-2)/k(t-3)	RENT(t-3)/k(t-4)	IAR(t)/k(t-1)	IAR(t-1)/k(t-2)	IAR(t-2)/k(t-3)	R^2	F	D.W.
				CASE 1					
0.3097 (1.4296)	-	-	-	-1.0591 (-1.4154)	-	-	0.2480	1.3191	0.0252
0.2149 (0.6314)	0.4499 (1.2566)	-	-	0.9589 (0.4306)	-2.0643 (-0.9651)	-	0.3855	0.8620	2.1691
-0.0234 (-0.0308)	0.1625 (0.3624)	0.1635 (1.2958)	-	1.6418 (0.4424)	-1.0733 (-0.2039)	-2.4655 (-0.7960)	0.5826	0.6978	2.3142
-1.4605 (-1.6673)	-0.1686 (-0.1701)	0.2456 (0.4769)	1.1977 (1.0894)	9.7368 (1.2060)	-8.8303 (-1.1161)	-3.3795 (-0.7581)	0.9005	1.2072	2.5390
				CASE 2					
0.3748 (1.7512)	-	-	-	-1.6220 (-1.9879)	-	-	0.2877	1.5137	1.9918
0.1050 (0.3973)	0.5418 (1.4940)	-	-	4.8764* (2.0412)	-6.4558* (-3.0883)	-	0.6360	2.1841	2.0422
-0.2699 (-0.6071)	0.5791 (1.0974)	-0.3195 (-0.4641)	-	3.6290 (0.7798)	-6.4178 (-1.2073)	0.5984 (0.1475)	0.7589	1.3112	2.0887
-1.1937* (-3.0809)	1.6928* (4.3738)	-0.3658 (-1.0578)		12.8443* (4.2660)	-6.2211 (-1.4888)	-8.4416 (-1.7535)	0.9913	7.5962	2.2389
				CASE 3					
1.0517* (2.4899)	-	-	-	-2.0985 (-1.7101)	-	-	0.4809	2.7824	1.9814
0.8796* (3.1043)	0.8145* (2.3772)	-	-	8.3075* (4.3010)	-11.2478* (-5.8823)	-	0.9279	11.2621	2.1056
1.7714* (3.0038)	0.4814 (1.3754)	0.0993 (0.2603)	-	5.4950 (1.6172)	-12.3315* (-2.7360)	2.6000 (0.8154)	0.9894	15.5472	2.3367

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE II.22

FIXED INVESTMENT : TIME SERIES RESULTS (OLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$

Constant	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$	$\frac{FNDE(t-3)}{k(t-4)}$	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{\Delta S(t-3)}{S(t-4)}$
				CASE 1				
0.1683* (3.6775)	0.0303 (1.5009)	-	-	-	-0.0395 (-0.7109)	-	-	-
0.1978* (3.4821)	-0.0146 (-0.3927)	0.0433 (1.1792)	-	-	-0.0667 (-0.6309)	-0.0798 (-0.9775)	-	-
0.2340* (2.3963)	-0.0513 (-0.7449)	0.0140 (0.2780)	-0.0230 (-0.2898)	-	-0.0491 (-0.2554)	0.0518 (0.2057)	0.0616 (0.3103)	-
0.0470 (0.3819)	-0.0609 (-0.5262)	-0.0037 (-0.0436)	-0.1276 (-1.2712)	-0.0075 (-0.0575)	0.2368 (0.9888)	0.4952 (1.3022)	0.6437 (1.6678)	0.2321 (0.6365)
				CASE 2				
0.2066* (4.0299)	0.0203 (0.9593)	-	-	-	-0.0368 (-0.6233)	-	-	-
0.2407* (4.3223)	-0.0249 (-0.6833)	0.0587 (1.5718)	-	-	-0.0477 (-0.5189)	0.0336 (0.4379)	-	-
0.2453* (2.1287)	-0.0892 (-0.9759)	0.0886 (1.4693)	-0.3345 (-0.4054)	-	-0.8923 (-0.4175)	0.1399 (0.8703)	0.0885 (0.5805)	-
0.2969* (9.4506)	-0.1513* (-4.8463)	0.1967* (8.4568)	-0.2054* (-6.7692)	0.1843* (8.3549)	0.2038* (3.4691)	0.1893* (3.3540)	0.2724* (5.5175)	-0.1270* (-3.2685)
				CASE 3				
0.2340* (3.4237)	0.1502* (3.3934)	-	-	-	0.0522 (0.5517)	-	-	-
0.2794* (6.1505)	0.1262* (3.4804)	0.1241* (3.5734)	-	-	0.0368 (0.4651)	0.1420* (2.3269)	-	-
0.3286* (4.0617)	0.3001* (3.0269)	0.1193* (2.7412)	0.0781 (1.5158)	-	0.1687 (1.4378)	0.0921 (0.8240)	-0.0151 (-0.1589)	-

Table contd...

Table II.22 contd

PAT(t)/k(t-1)	PAT(t-1)/k(t-2)	PAT(t-2)/k(t-3)	PAT(t-3)/k(t-4)	IAR(t)/k(t-1)	IAR(t-1)/k(t-2)	IAR(t-2)/k(t-3)	R^2	F	D.W.
				CASE 1					
0.2717 (1.3345)	-	-	-	-1.2847 (-1.5291)	-	-	0.2369	1.2411	2.0141
0.2248 (0.7631)	0.3768 (1.1793)	-	-	0.7648 (0.3333)	-2.3982 (-1.0933)	-	0.3642	0.7872	2.1392
-0.0994 (-0.1304)	0.1895 (0.4781)	0.4819 (1.0888)	-	1.7087 (0.4034)	-1.4433 (-0.2642)	-2.7059 (-0.8018)	0.5512	0.6136	2.2481
-1.2609 (-1.2515)	-0.6264 (-0.5674)	0.1301 (0.2367)	0.5649 (0.4758)	6.9562 (0.6667)	-5.4477 (-0.5310)	-3.2128 (-0.5828)	0.8721	0.9092	2.6241
				CASE - 2					
0.3666 (1.7130)	-	-	-	-2.0610* (-2.0994)	-	-	0.2825	1.4770	1.9910
0.1269 (0.5025)	0.4529 (1.2835)	-	-	3.7341 (1.6602)	-6.4966* (-2.8456)	-	0.6108	1.9614	2.1457
-0.2269 (-0.4825)	0.6294 (1.1922)	0.1822 (0.2681)	-	5.7744 (1.2948)	-7.5473 (-1.3689)	-1.2237 (-0.2859)	0.7537	1.2738	2.2433
-1.0637* (-6.0673)	1.7636* (9.6443)	-0.7688* (-3.6414)	2.0089* (9.3560)	10.7191* (9.5620)	-11.6924* (-5.8125)	-4.6803* (-2.3806)	0.9977	28.9130	2.5120
				CASE 3					
1.1696* (2.7747)	-	-	-	-3.6015* (-2.4001)	-	-	0.5204	3.2606	2.0140
1.1212* (3.9364)	0.6587 (1.9580)	-	-	4.9844* (2.4331)	-10.1244* (-5.0520)	-	0.9295	11.5049	2.0132
2.2694* (2.9435)	0.4805 (1.3236)	0.1066 (0.2965)	-	1.1929 (0.2856)	-11.3070* (-2.2562)	2.5267 (0.7535)	0.9882	13.9491	2.4289

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE II.23

FIXED INVESTMENT : POOLED TIME SERIES CROSS SECTION RESULTS (OLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$

Constant	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$	$\frac{FNDE(t-3)}{k(t-4)}$	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{\Delta S(t-3)}{S(t-4)}$	$\frac{RENT(t)}{k(t-1)}$	$\frac{RENT(t-1)}{k(t-2)}$
					Specification 1					
0.0694* (9.0225)	0.0792* (7.2961)	-	-	-	0.0324 (1.9405)	-	-	-	-0.1809* (-4.0043)	-
0.0670* (7.3770)	0.0715* (6.0648)	0.0018 (1.9405)	-	-	0.0445* (2.3319)	0.0287 (1.1960)	-	-	-0.2763* (-5.1872)	0.2094* (3.3097)
0.0443* (3.9071)	0.0866* (6.1909)	0.0050 (0.3777)	0.0251 (1.6784)	-	0.0582* (2.8759)	0.0315 (1.0669)	0.0890* (3.3872)	-	-0.2794* (-4.9128)	0.2194* (3.0471)
					Specification 2					
0.0726* (9.3824)	0.0816* (7.5365)	-	-	-	0.0305 (1.8239)	-	-	-	-	-
0.0677* (7.4152)	0.0781* (6.7144)	0.0026 (0.2146)	-	-	0.0396* (2.0765)	0.0320 (1.3342)	-	-	-	-
0.0454* (4.0068)	0.0921* (6.6731)	0.0031 (0.2395)	0.0250 (1.6794)	-	0.0545* (2.6950)	0.0373 (1.2683)	0.0866* (3.3087)	-	-	-
0.0139 (0.8982)	0.1146* (7.0686)	0.0061 (0.3345)	0.0346 (1.9516)	0.0802* (4.1572)	0.1340* (3.7818)	0.0517 (1.4805)	0.0705* (2.0457)	0.0284 (0.9537)	-	-
					Specification 3					
0.0106 (0.8199)	0.0713* (6.5972)	-	-	-	0.0302 (1.8293)	-	-	-	-0.2319* (-5.0963)	-
0.0240 (1.6429)	0.0600* (5.1301)	0.0068 (0.5572)	-	-	0.0396* (2.1174)	0.0314 (1.3337)	-	-	-0.3451* (-6.4600)	0.2179* (3.4731)
0.0056 (0.3302)	0.0727* (5.2253)	0.0103 (0.7760)	0.0235 (1.5814)	-	0.0516* (2.5894)	0.0340 (1.1741)	0.0785* (3.0334)	-	-0.3511* (-6.1632)	0.2304* (3.2128)
-0.2254 (-1.1278)	0.0895* (5.4650)	0.0068 (0.3755)	0.0336 (1.9047)	0.0716* (3.7864)	0.1303* (3.7497)	0.0473 (1.3771)	0.0735* (2.1575)	0.0184 (0.6292)	-0.5372* (-7.6336)	0.2620* (2.9252)
					Specification 4					
0.0157 (1.2263)	0.0739* (6.8520)	-	-	-	0.0280 (1.6959)	-	-	-	-	-
0.0259 (1.7873)	0.0675* (5.8545)	0.0074 (0.6008)	-	-	0.0342 (1.8266)	0.0350 (1.3482)	-	-	-	-
0.0076 (0.4587)	0.0789* (5.7487)	0.0076 (0.5836)	0.0230 (1.5795)	-	0.0475* (2.3864)	0.0450 (1.3999)	0.0762* (2.9518)	-	-	-
-0.0189 (-0.9535)	0.0971* (5.9765)	0.0081 (0.4451)	0.0352 (1.9780)	0.0697* (3.6508)	0.1170* (3.3567)	0.0518 (1.5102)	0.0699* (2.0651)	0.0221 (0.7546)	-	-

Table Contd....

Table II.23 contd

RENT(t-2)/k(t-3)	RENT(t-3)/k(t-4)	PAT(t)/k(t-2)	PAT(t-1)/k(t-2)	PAT(t-2)/k(t-3)	PAT(t-3)/k(t-4)	IAR(t)/k(t-1)	IAR(t-1)/k(t-2)	IAR(t-2)/k(t-3)	R^2	F
					Specification 1					
-	-	-	-	-	-	-	-	-	0.0808	33.6250
-	-	-	-	-	-	-	-	-	0.0964	20.1250
-0.0487 (-0.6931)	-	-	-	-	-	-	-	-	0.1104	13.6667
-0.0038 (-0.0413)	0.1109 (1.1808)	-	-	-	-	-	-	-	0.1599	13.3000
					Specification 2					
-	-	-0.1403* (-3.4841)	-	-	-	-	-	-	0.0777	32.3750
-	-	-0.2013* (-4.3718)	0.1362* (2.5801)	-	-	-	-	-	0.1499	11.3636
-	-	-0.2273* (-4.3718)	0.1420* (2.4258)	-0.0256 (-0.4888)	-	-	-	-	0.1051	13.0000
-	-	-0.3610* (-5.6510)	0.1918* (2.3913)	-0.0031 (-0.0421)	0.0889 (1.1900)	-	-	-	0.1499	11.3636
					Specification 3					
-	-	-	-	-	-	1.1063* (5.6066)	-	-	0.1056	33.0000
-	-	-	-	-	-	2.3058* (6.3835)	-1.4507* (-4.0335)	-	1.1333	20.8750
-0.0461 (-0.6607)	-	-	-	-	-	2.3559* (6.1250)	-1.5396* (-3.2230)	-0.0273 (-0.0722)	0.1462	13.5555
0.0066 (0.0720)	0.0855 (0.9263)	-	-	-	-	2.6421* (6.0674)	-1.5525* (-2.9277)	-0.1979 (-0.4639)	0.1988	13.2000
					Specification 4					
-	-	-0.1861* (-4.5819)	-	-	-	1.0909* (5.5112)	-	-	0.1017	31.7500
-	-	-0.2578* (-5.5323)	0.1346* (2.5694)	-	-	2.2264* (6.1402)	-1.3731* (-3.8058)	-	0.1240	19.3750
-	-	-0.2917* (-5.5909)	0.1419* (2.4416)	-0.0202 (-0.3924)	-	2.3116* (5.9884)	-1.4650* (-3.0591)	-0.0030 (-0.0080)	0.1397	12.8889
-	-	-0.4387* (-6.8425)	-1.1904* (-2.3798)	0.0093 (0.1277)	0.0748 (1.0177)	2.5938* (5.9108)	-1.5430* (-2.8848)	-0.1762 (-0.4094)	0.1873	12.5000

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

APPENDIX III

RESULTS RELATING TO INVENTORY INVESTMENT BEHAVIOUR

TABLE III.1

INVENTORY INVESTMENT : CROSS SECTION RESULTS (OIS)

Dependent Variable : $\frac{IN(t)}{k(t-1)}$ (r = 0)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{RENT(t)}{k(t-1)}$	$\frac{I(t)}{k(t-1)}$	R^2	F
67-68	0.0624	0.0975	0.8724*	0.7854*	-1.2345*	0.7192	41.6308
	(1.3309)	(1.0217)	(12.0818)	(3.6473)	(-3.9396)		
72-73	0.0035	-0.0340	0.7708*	0.7086*	-0.8050*	0.9197	160.4093
	(0.0931)	(-0.3786)	(22.5881)	(2.8562)	(-3.2127)		
74.75	-0.0348	0.0481	0.5504*	1.4134*	-0.5639*	0.7790	49.3521
	(-1.1153)	(0.5303)	(12.5501)	(6.0405)	(-3.3084)		
76-77	-0.0671*	0.0757	0.4734*	0.4322	-0.4679*	0.6904	27.7940
	(-2.1565)	(0.8734)	(9.9493)	(1.5984)	(-3.0939)		
78-79	0.0979*	0.0124	0.6161*	0.8237*	-0.1327	0.8145	52.6898
	(2.5934)	(0.1451)	(13.6464)	(7.2714)	(-1.4949)		
80-81	-0.1699*	-0.0625	0.5663*	0.5052*	-0.2198*	0.6600	23.3039
	(-3.5851)	(-0.5713)	(8.7343)	(2.4530)	(-2.6725)		
82-83	0.0914	-0.0292	0.6437*	0.8152*	-0.0645	0.8546	58.7705
	(1.5367)	(-1.3388)	(11.5205)	(4.7588)	(-0.6272)		
84-85	-0.0576	-0.1169	0.5041*	0.8490*	-0.1630	0.5382	8.4494
	(-0.6108)	(-0.6816)	(5.7328)	(2.5679)	(-0.9901)		
86-87	0.0646	-0.1394	0.3912*	1.2867*	0.1823	0.7782	27.0554
	(1.8494)	(-1.4710)	(4.8775)	(6.9757)	(1.4404)		

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE III.2

INVENTORY INVESTMENT : CROSS SECTION RESULTS

Dependent Variable : $\frac{IN(t)}{k(t-1)}$ (r= 0,1)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{RENT(t)}{k(t-1)}$	$\frac{RENT(t-1)}{k(t-2)}$	$\frac{I(t)}{k(t-1)}$	R^2	F
67-68	0.0705 (1.4730)	0.1369 (1.2587)	0.0106 (0.1995)	0.8294* (9.4012)	-0.1015 (-1.0061)	1.2697* (3.2420)	-0.6997 (-1.6057)	-1.0053* (-3.0155)	0.7405	25.2846
69-70	0.1533* (3.8366)	-0.0648 (-0.8164)	-0.1228 (-1.6744)	0.5604* (10.7671)	0.1435 (1.6777)	0.6491* (3.6421)	-0.5076* (-2.8361)	-0.3234* (-3.1932)	0.7432	25.0341
71-72	-0.0105 (-0.3557)	0.1218* (2.6318)	0.3719* (3.1861)	0.7388* (17.1933)	-0.0574 (-1.5328)	1.2910* (4.7023)	0.1036 (0.7453)	-0.5527* (-2.2496)	0.8881	54.4002
73-74	0.0048 (0.1535)	0.1287 (1.1069)	0.0855* (3.3418)	0.2299* (3.9160)	-0.1621* (-3.6171)	0.8366* (3.8170)	-0.0985 (-0.4032)	-0.0450 (-0.4871)	0.6251	12.8245
75-76	-0.0411 (-0.9365)	-0.1125 (-1.1963)	0.0226 (0.1881)	0.5670* (11.7514)	-0.0757 (-1.1441)	0.6902* (2.7741)	-0.2955 (-0.7779)	0.6522* (3.2494)	0.7563	23.4907
77-78	0.0860* (2.5246)	0.0261 (0.2006)	0.0170 (0.2145)	0.5674* (7.4732)	-0.0121 (-0.2471)	0.8635* (3.6251)	-0.4387 (-1.8138)	-0.1662 (-0.9209)	0.6744	13.3188
79-80	-0.0391 (-0.9234)	-0.0770 (-0.9275)	0.0025 (0.0273)	0.5825* (9.4063)	0.0277 (0.4902)	0.8317* (5.7197)	0.0892 (0.6644)	-0.4593* (-2.9774)	0.8398	33.4145
81-82	0.0831* (2.2324)	-0.0298 (-0.4004)	0.1097 (1.3662)	0.2848* (5.5666)	0.0233 (0.4886)	0.7211* (2.3298)	-0.0963 (-0.5605)	-0.1964* (-2.9056)	0.5690	6.5999
83-84	0.0234 (0.2763)	-0.1814 (-0.8672)	-0.1217 (-0.9022)	0.5241* (7.0349)	0.0624 (0.8022)	0.8129* (2.1372)	0.2830 (0.5086)	0.2467 (0.6631)	0.7688	12.3546
86-87	0.0633 (1.8332)	-0.2389 (-1.5186)	-0.2402 (-1.7227)	0.3715* (4.7604)	0.0317 (0.3973)	1.5660* (6.2615)	-0.1589 (-0.4545)	0.2259 (1.1809)	0.8330	14.9650

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE III.3

INVENTORY INVESTMENT : CROSS SECTION RESULTS (OLS)

Dependent Variable : $\frac{IN(t)}{k(t-1)}$ (r=0,1,2)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$
69-70	0.1554* (3.5984)	-0.1234 (-1.3949)	-0.1328 (-1.4892)	-0.1881* (-2.1917)	0.5305* (8.9437)	0.1403 (1.6368)	-0.1009 (-1.3693)
71-72	-0.0431 (-1.0605)	0.1302* (2.5314)	0.3894* (3.1545)	0.0066 (0.0787)	0.7364* (16.1203)	-0.0862 (-1.9106)	0.0692 (1.1903)
73-74	-0.0353 (-0.8701)	0.1913 (1.5830)	0.2645* (2.1499)	-0.0411 (-0.8241)	0.2708* (3.7305)	-0.1760* (-4.2064)	-0.1582* (-2.1243)
76-77	-0.1403* (-3.4432)	-0.1178 (-1.2212)	0.2602* (3.4249)	0.1736* (2.0433)	0.5592* (10.2203)	0.1986* (3.0084)	0.1302* (-2.0312)
78-79	0.0837 (1.9834)	0.0245 (0.2502)	0.0125 (0.0902)	0.1163 (1.3937)	0.6081* (12.2100)	-0.0055 (-0.0715)	-0.0312 (-0.6035)
80-81	0.0157 (0.2469)	-0.2238* (-2.0319)	-0.2391 (-1.9638)	-0.1362 (-1.0232)	0.5448* (8.8696)	0.1493 (1.7381)	-0.1184 (-1.6005)
82-83	0.1235 (1.7510)	-0.0366 (-1.0345)	-0.1092 (-1.0260)	-0.1988 (-1.6396)	0.6645* (9.7884)	-0.0267 (-0.3981)	0.0059 (0.0785)
84-85	-0.1815 (-1.3998)	0.3252 (1.1351)	0.4602 (1.6354)	0.2328 (1.5055)	0.3703* (3.3534)	-0.1791 (-1.4216)	-0.1281 (-1.1218)
86-87	0.0488 (1.1534)	-0.1045 (-0.7980)	-0.0401 (-0.3078)	-0.1617 (-1.7116)	0.2774* (4.1438)	-0.0767 (-1.0086)	-0.1454* (-3.5215)

Table Contd..

Table III.3 contd..

Year	RENT(t)/k(t-1)	RENT(t-1)/k(t-2)	RENT(t-2)/k(t-3)	I(t)/k(t-1)	R^2	F
69-70	0.5977*	-0.3745	-0.0457	-0.3273*	0.7667	19.3947
	(3.0733)	(-1.6845)	(-0.1462)	(-3.2737)		
71-72	1.4511*	0.0299	0.0561	-0.5092*	0.8915	36.9961
	(4.6425)	(0.1439)	(0.2560)	(-2.0060)		
73-74	0.8314*	-0.1883	-0.1385	-0.0915	0.6626	9.8183
	(3.6485)	(-0.7628)	(-0.4431)	(-0.8471)		
76-77	0.9676*	0.1392	-0.4472	-0.5787*	0.8454	19.6852
	(3.5913)	(0.5868)	(-1.1238)	(-4.4990)		
78-79	0.7966*	0.0153	-0.2394	-0.1533	0.8249	19.7829
	(5.9531)	(0.0605)	(-0.9582)	(-1.5824)		
80-81	0.6298*	0.3566	-0.0912	-0.2193*	0.7856	15.3917
	(3.3873)	(1.6512)	(-0.4755)	(-3.0085)		
82-83	0.7648*	0.6073	-0.1712	-0.0926	0.8851	24.6525
	(4.1878)	(1.3821)	(-0.6723)	(-0.8318)		
84-85	0.4253	-0.1887	-0.5238	-0.1494	0.6477	4.2283
	(0.6645)	(-0.3674)	(-0.5778)	(-0.9123)		
86-87	1.4678*	-0.6978*	-0.1456	-0.0133	0.9158	19.5768
	(6.6631)	(-2.2347)	(-0.7660)	(-0.0780)		

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE III.4

INVENTORY INVESTMENT : CROSS SECTION RESULTS (OLS)

Dependent Variable : $\frac{IN(t)}{k(t-1)}$ (r=0)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{RENT(t)}{k(t-1)}$	$\frac{I(t)}{k(t-1)}$	$\frac{INS(t)}{S(t)}$	ACF	$\frac{INS(t-1)}{k(t-1)}$	R^2	F
67-68	-0.0628 (-0.5996)	0.0635 (0.6566)	0.8668* (12.5873)	0.5945* (2.6962)	1.2508* (4.0383)	0.5027* (2.6036)	-1.0717 (-1.5059)	-0.0002 (-0.6217)	0.7575	27.6709
69-70	0.0726 (0.9262)	0.0407 (0.5663)	0.5927* (10.5672)	0.2050 (1.2466)	-0.2727* (-2.6289)	0.2157* (2.1371)	-2.3909 (-1.9041)	-0.0001 (-1.2192)	0.7149	22.2159
71-72	-0.2097* (-3.2992)	0.0776 (1.7546)	0.6005* (12.0105)	1.4943* (6.1950)	-0.3503 (-1.6101)	0.3015* (4.1138)	0.1889 (0.8906)	-0.0001 (-1.3883)	0.9013	69.1635
73-74	0.0181 (0.2427)	-0.0661 (-0.5409)	0.3741* (5.9327)	0.9689* (3.9402)	-0.1356 (-1.3542)	0.1949 (1.1026)	-0.1775 (-0.5119)	-0.0001 (-0.8733)	0.5284	8.4823
75-76	-0.2493* (-2.9398)	-0.0895 (-1.2612)	0.4347* (8.1176)	0.5686* (3.4484)	0.6258* (3.5818)	0.5249* (3.7969)	0.1396 (0.2746)	-0.0001 (-0.6035)	0.7999	30.2853
77-78	0.0125 (0.1923)	0.2175 (1.5991)	0.4947* (6.1894)	0.6027* (2.6265)	-0.1014 (-0.5801)	0.2920 (1.9131)	0.0455 (0.0827)	-0.0001 (-1.8794)	0.6946	14.6244
79-80	-0.1498* (-2.6911)	-0.0673 (-0.9522)	0.5233* (11.2251)	0.7840* (6.2269)	-0.4397* (-3.7165)	0.2966* (3.3584)	-0.6679 (-1.3802)	0.0001 (0.7338)	0.8740	44.5959
81-82	-0.0469 (-0.9149)	0.0034 (0.0566)	0.2816* (6.1356)	0.9415* (4.1804)	-0.1861* (-2.9801)	0.4627* (3.2905)	-0.2254* (-3.9981)	-0.0001 (-0.6775)	0.7506	15.9077
83-84	-0.0153 (-0.1250)	-0.1443 (-0.9311)	0.3680* (4.9280)	0.6297* (2.3656)	0.1787 (0.5773)	0.4966* (3.6574)	-1.6981* (-2.3826)	-0.0001 (-1.1636)	0.8487	20.8348
86-87	0.0462 (0.6400)	-0.1108 (-1.1186)	0.3467* (3.7273)	1.2263* (3.9950)	0.1798 (1.3456)	0.1626 (0.9297)	-0.0579 (-0.0942)	-0.0001 (-1.1667)	0.7977	11.8278

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE III.5

INVENTORY INVESTMENT : CROSS SECTION RESULTS (OLS)

Dependent Variable : $\frac{iN(t)}{k(t-1)}$ (r=0,1)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{RENT(t)}{k(t-1)}$	$\frac{RENT(t-1)}{k(t-2)}$
67-68	-0.0864	0.0701	0.0454	0.8627*	-0.0272	1.1725*	-0.7863
	(-0.8306)	(0.6213)	(0.8588)	(10.0034)	(-0.2683)	(3.0684)	(-1.8660)
69-70	0.1382	-0.0206	-0.0073	0.5248*	0.1820*	0.5770*	-0.5498*
	(1.5494)	(-0.2612)	(-0.0836)	(10.0423)	(2.0303)	(3.1789)	(-3.1789)
71-72	-0.1894*	0.0637	0.2951*	0.6205*	-0.0567	1.4531*	0.0896
	(-2.9095)	(1.3854)	(2.7028)	(12.3282)	(-1.6886)	(5.8079)	(0.7232)
73-74	-0.1012	0.1845	0.0529	0.2052*	-0.1810*	0.8087*	-0.0797
	(-1.3714)	(1.4421)	(0.6037)	(2.9122)	(-3.9972)	(3.4782)	(-0.3243)
75-76	-0.2535*	-0.0409	0.0067	0.4360*	-0.1025	0.4433	-0.1011
	(-2.9231)	(-0.4709)	(0.0613)	(7.6768)	(-1.6528)	(1.8922)	(-0.2774)
77-78	0.0575	0.1547	-0.0212	0.5055*	-0.0002	0.7334*	-0.2647
	(0.7447)	(0.9696)	(-0.2515)	(5.7096)	(-0.0048)	(2.7551)	(-1.0264)
79-80	-0.1545*	-0.0337	0.0738	0.4685*	-0.0565	0.7456*	-0.0655
	(-2.2323)	(-0.4268)	(0.8531)	(6.8742)	(-0.9371)	(5.4046)	(-0.4691)
82-83	0.0841	-0.0214	0.0585	0.6189*	-0.0914	0.7481*	0.2141
	(0.7150)	(-0.7844)	(0.6241)	(8.7032)	(-1.4525)	(3.6632)	(0.5881)
86-87	0.0960	-0.2546	-0.2509	0.3488*	0.0417	1.4900*	-0.2150
	(1.1221)	(-1.4428)	(-1.4441)	(3.7066)	(0.4821)	(4.0282)	(-0.5364)

Table contd

Table III.5 contd.

Year	$\frac{I(t)}{k(t-1)}$	$\frac{INS(t)}{S(t)}$	ACF	$\frac{INS(t-1)}{k(t-1)}$	R^2	F
67-68	-1.1273* (-3.4015)	0.5323* (2.7529)	-0.9018 (-1.1783)	-0.0001 (-0.4842)	0.7755	20.3848
69-70	-0.2912* (-3.0439)	0.2127 (1.8794)	-2.5922* (-2.2887)	-0.0001* (-2.1746)	0.7862	21.7005
71-72	-0.4316 (-1.9133)	0.2781* (3.7399)	0.2646 (1.2440)	-0.0001 (-0.6209)	0.9169	49.6937
73-74	-0.0390 (-0.4194)	0.2265 (1.4179)	0.1216 (0.3818)	0.0001 (0.1945)	0.6456	9.1099
75-76	0.6251* (3.3957)	0.5337* (3.7984)	0.1031 (0.2019)	0.0001 (0.0459)	0.8132	21.7672
77-78	-0.1416 (-0.7832)	0.2433 (1.4807)	-0.2111 (-0.3391)	-0.0001 (-1.7437)	0.7056	10.0674
79-80	-0.3371* (-2.3093)	0.3572* (3.5127)	-0.8811 (-1.5216)	-0.0001 (-0.7154)	0.8791	30.5411
82-83	-0.0527 (-0.4885)	0.1234 (0.9312)	-0.7732 (-0.5727)	0.0001 (0.0502)	0.8746	23.7239
86-87	0.2506 (1.1935)	0.0319 (0.1755)	-0.3467 (-0.6918)	-0.0001 (-0.1312)	0.8374	9.2724

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE III.6

INVENTORY INVESTMENT : CROSS SECTION RESULTS (OLS)

Dependent Variable : $\frac{IN(t)}{k(t-1)}$ (r=0,1,2)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$	$\frac{RENT(t)}{k(t-1)}$
70-71	-0.0293 (-0.3219)	0.0600 (0.4353)	0.0588 (0.6360)	0.1045 (0.9639)	0.6265* (9.8951)	0.0036 (0.0587)	0.0873 (0.8712)	0.5039* (2.4682)
72-73	-0.1329 (-1.1528)	0.1096 (0.7093)	0.0642 (0.9894)	-0.2013 (-1.2648)	0.7680* (10.4563)	-0.0580 (-0.5772)	0.0413 (0.5652)	0.4585 (1.5741)
74-75	-0.0727 (-1.0308)	-0.0232 (-0.2515)	-0.1376 (-1.0278)	-0.0710 (-0.8717)	0.4970* (9.8669)	-0.1551* (-2.4793)	0.0265 (0.5772)	1.4512* (5.0103)
76-77	-0.1439 (-1.4666)	-0.1384 (-1.4082)	0.2594* (3.4041)	0.1391 (1.5364)	0.5389* (9.4235)	0.1720* (2.4475)	-0.1192 (-1.7700)	0.9386* (2.9780)
78-79	0.0029 (0.0341)	0.1713 (1.6575)	0.2555 (1.6374)	0.0151 (0.1998)	0.5211* (10.2856)	-0.0104 (-0.1524)	0.0288 (0.0643)	0.5828* (4.2555)
80-81	-0.1028 (-0.8305)	-0.2193 (-1.9415)	-0.2262 (-1.8491)	-0.1024 (-0.7003)	0.5058* (7.6379)	0.1308 (1.4842)	-0.1242 (-1.5875)	0.5985* (2.9404)
82-83	0.0789 (0.6529)	-0.0354 (-0.9352)	-0.0713 (-0.6064)	-0.2393 (-1.8763)	0.6323* (8.0984)	-0.0136 (-0.1891)	0.0134 (0.1731)	0.6916* (3.3008)
84-85	-0.1946 (-1.0103)	-0.2388 (-0.6748)	-0.4739 (-1.4433)	0.2659 (1.2596)	0.3727* (3.1632)	-0.1645 (-1.1992)	-0.1523 (-1.2481)	0.3580 (0.4583)
86-87	-0.1321 (-1.3116)	-0.0643 (-0.4932)	-0.0063 (-0.0461)	-0.1679 (-1.8726)	0.2841* (3.9312)	-0.0537 (-0.7358)	-0.1689* (-4.1551)	1.0440* (3.5823)

Table Contd..

Table III.6 contd..

Year	RENT(t-1)/k(t-2)	RENT(t-2)/k(t-3)	I(t)/k(t-1)	INS(t)/S(t)	ACF	INS(t-1)/k(t-1)	R^2	F
70-71	-0.1489	-0.1903	-0.3759	0.1518	-0.1217	-0.0001	0.8416	22.8881
	(-0.4785)	(-0.8860)	(-1.5576)	(1.9220)	(-0.3557)	(-1.5357)		
72-73	0.0400	0.4013*	-0.9599*	0.1051	0.3735'	0.0001	0.9302	43.0802
	(0.1062)	(-2.1248)	(-2.9470)	(0.4618)	(0.9358)	(0.9670)		
74-75	-0.2544	0.0226	-0.4262*	0.4313*	0.0105	-0.0001*	0.8764	25.6487
	(-1.0074)	(0.0112)	(-2.4280)	(3.3682)	(0.0361)	(-2.1636)		
76-77	0.1122	-0.2481	-0.5365*	0.1863	-0.1216	-0.0001	0.8579	15.3215
	(0.4246)	(-0.5932)	(-3.9951)	(0.6700)	(-0.1937)	(-1.6632)		
78-79	-0.0629	-0.0465	-0.1235	0.4097*	-1.2972	-0.0001*	0.8863	23.3892
	(-0.2908)	(-0.2038)	(-1.5134)	(3.9359)	(-1.8172)	(-2.3079)		
80-81	0.3416	-0.1366	-0.2225*	0.5177	-0.3210	-0.0001	0.8004	12.0316
	(1.5143)	(-0.6483)	(-3.0021)	(1.6111)	(-0.7354)	(-0.2687)		
82-83	0.6058	-0.0837	-0.0969	0.1441	-0.7608	0.0001	0.8920	18.4181
	(1.3485)	(-0.3064)	(-0.8411)	(1.0122)	(-0.5410)	(0.5426)		
84-85	-0.2514	-0.6204	-0.1894	0.0987	0.0228	-0.0001	0.6655	3.0606
	(-0.4577)	(-0.6257)	(-1.0721)	(0.2362)	(0.8396)	(-0.1988)		
86-87	-0.4062	0.2421	0.1416	0.3611*	0.3658	-0.0001	0.9372	17.2096
	(-1.2293)	(0.9120)	(0.8225)	(2.1837)	(0.6897)	(-0.0121)		

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE III.7

INVENTORY INVESTMENT : CROSS-SECTION RESULTS (OLS)

Dependent Variable : $\frac{IN(t)}{k(t-1)}$ (r = 0)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{PAT(t)}{k(t-1)}$	$\frac{I(t)}{k(t-1)}$	R^2	F
67-68	0.0348 (0.6967)	0.1309 (1.2732)	0.8847* (11.1858)	0.1508 (1.3690)	-1.1609* (-3.4281)	0.6713	33.1828
69-70	0.0801* (2.1148)	0.0491 (0.6545)	0.6272* (11.3914)	0.2884 (1.7996)	-0.3141* (-2.9901)	0.6703	33.0394
71-72	-0.0508 (-1.9053)	0.1990* (4.3500)	0.7518* (15.8998)	0.3491* (2.6183)	-0.3223 (-1.1978)	0.8809	68.7947
72-73	-0.0205 (-0.5177)	-0.0428 (-0.4760)	0.7624* (22.5358)	0.7009* (2.9909)	-0.7908* (-3.1892)	0.9207	162.5506
74-75	-0.0540 (-1.7501)	0.0747 (0.8384)	0.5437* (12.5519)	1.3067* (6.1099)	-0.6003* (-3.5022)	0.7810	49.9303
76-77	-0.0748* (-2.4072)	0.0642 (0.7572)	0.4750* (10.2695)	0.4653 (1.9819)	-0.4602* (-3.0935)	0.7064	28.8797
78-79	0.0938* (2.4277)	0.0138 (0.1591)	0.8103* (13.3389)	0.7915* (7.0236)	-0.1300 (-1.4391)	0.8077	150.4189
79-80	-0.0366 (-1.2676)	-0.0658 (-0.8775)	0.5849* (13.5095)	0.8436* (6.5152)	-0.4175* (-3.4228)	0.8445	65.1966
80-81	-0.1744* (-3.6506)	-0.0571 (-0.5148)	0.5600* (8.5298)	0.4496* (2.2089)	-0.2215* (-2.6611)	0.6728	22.5601
82-83	0.0805 (1.3715)	-0.0286 (-1.3321)	0.6429* (11.6727)	0.8154* (4.9466)	-0.0614 (-0.6118)	0.8587	60.7774
83-84	0.0176 (0.3044)	-0.0735 (-0.4035)	0.5606* (8.2380)	0.8669* (3.3626)	0.1908 (0.5424)	0.7557	22.4303
86-87	0.0378 (0.9859)	-0.1647 (-1.6621)	0.4176* (4.9860)	1.2128* (6.4978)	0.2142 (1.6026)	0.7567	18.6578

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE III.8

INVENTORY INVESTMENT : CROSS-SECTION RESULTS (OLS)

Dependent Variable : $\frac{IN(t)}{k(t-1)}$ (r=0,1)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{PAT(t)}{k(t-1)}$	$\frac{PAT(t-1)}{k(t-2)}$	$\frac{I(t)}{k(t-1)}$	R^2	F
67-68	0.0390 (0.7724)	0.2193 (1.9353)	-0.0220 (-0.3921)	0.7698* (8.2025)	-0.2004 (-1.9513)	0.0409 (0.3339)	0.4501 (1.6776)	-1.0322* (-2.8538)	0.7008	20.7475
69-70	0.1503* (3.7178)	-0.0742 (-0.9353)	-0.1259 (-1.7068)	0.5658* (10.8740)	0.1450 (1.6937)	0.6155* (3.6071)	-0.4800* (-2.8036)	-0.3207* (-3.1787)	0.7420	25.4753
71-72	-0.0169 (-0.4839)	0.1660* (3.1466)	0.3223* (2.3600)	0.7568* (15.1749)	-0.0636 (-1.4587)	0.2947* (2.1482)	0.0810 (0.7659)	-0.4106 (-1.4419)	0.8477	38.1734
72-73	-0.0149 (-0.3096)	-0.0708 (-0.5346)	0.0381 (0.7099)	0.7734* (20.6794)	0.0438 (0.5578)	0.7208* (2.9359)	0.0181 (0.1235)	-0.8576* (-3.2034)	0.9216	89.0747
74-75	0.0043 (0.1253)	0.0197 (0.2069)	-0.1548 (-1.3163)	0.5680* (13.6386)	-0.1897* (-3.1958)	1.2604* (4.1436)	-0.2245 (-0.8632)	-0.4839* (-2.8649)	0.8234	35.3163
76-77	-0.1590* (-4.8291)	-0.0569 (-0.6446)	0.2085* (3.3705)	0.5860* (11.6901)	0.1959* (3.0008)	0.8348* (3.3470)	-0.0417 (-0.2186)	-0.5747* (-4.3312)	0.8182	25.0834
78-79	0.0860 (1.9236)	0.0102 (0.1054)	-0.0640 (-0.5136)	0.6123* (12.7116)	-0.0033 (-0.0466)	0.7879* (6.1312)	0.0244 (0.1076)	-0.1337 (-1.3877)	0.8090	27.2274
79-80	-0.0416 (-0.9990)	-0.0768 (-0.9468)	0.0017 (0.0190)	0.5856* (9.8110)	0.0224 (0.4095)	0.8437* (5.9641)	0.0606 (0.4718)	-0.4514* (-2.9887)	0.8454	35.1619
80-81	-0.0570 (-1.0423)	-0.2344* (-2.0797)	-0.2886* (-2.4779)	0.5612* (9.6802)	0.1715* (2.4075)	0.5873* (3.2323)	0.4229* (2.0584)	-0.2395* (-3.2909)	0.7539	19.6968
82-83	0.0897 (1.4472)	-0.0224 (-0.9306)	0.0409 (0.5207)	0.6568* (11.2144)	-0.1070 (-1.9595)	0.8294* (4.7845)	0.0217 (0.0679)	-0.0503 (-0.4944)	0.8729	36.3057
83-84	0.0116 (0.1371)	-0.1767 (-0.8498)	-0.1242 (-0.9010)	0.5267* (7.0905)	0.0636 (0.8209)	0.7894* (2.1100)	0.2519 (0.4742)	0.2042 (0.5484)	0.7711	12.5147
86-87	0.0385 (1.0163)	-0.2402 (-1.6331)	-0.2134 (-1.5867)	0.3888* (4.8449)	0.0189 (0.2470)	1.5931* (6.2494)	-0.3189 (-1.0477)	0.2249 (1.2399)	0.8216	13.8188

[* Indicates that the coefficient is significant at 5% level.
Figures in the parentheses indicate t ratios].

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TABLE III.9

INVENTORY INVESTMENT : CROSS-SECTION RESULTS (OLS)

Dependent Variable : $\frac{IN(t)}{k(t-1)}$ (r=0,1,2)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
68-69	0.0253 (0.6664)	-0.0441 (-0.5454)	-0.1661 (-1.6681)	-0.0161 (-0.3610)	0.6953* (7.7367)	0.2117* (3.0670)	0.2530* (3.2669)
70-71	0.0209 (0.3731)	0.0505 (0.3555)	0.0394 (0.4192)	0.0339 (0.3218)	0.6779* (11.8246)	-0.0127 (-0.1950)	0.0737 (0.7706)
72-73	-0.0287 (-0.5519)	0.0361 (0.2575)	0.0623 (1.0864)	-0.2940 (-1.9700)	0.7719* (14.4950)	-0.0049 (-0.0577)	0.0606 (0.9997)
74-75	0.0271 (0.6705)	-0.0003 (-0.0034)	-0.2278 (-1.6625)	-0.0785 (-0.8648)	0.5830* (12.3251)	-0.1571* (-2.2121)	0.0302 (0.6287)
76-77	-0.1555* (-3.8991)	-0.1256 (-1.3502)	0.2673* (4.1676)	0.1533 (1.8175)	0.5628* (10.4535)	0.1972* (3.1506)	-0.1353* (-2.2042)
78-79	0.0904 (1.9307)	0.0202 (0.2037)	0.0217 (0.1493)	0.1237 (1.4693)	0.6029* (12.0603)	-0.0032 (-0.0410)	-0.0372 (-0.7177)
79-80	-0.0827* (-2.0083)	0.1600 (-1.8462)	-0.0607 (-0.6873)	-0.3827* (-3.2057)	0.5319* (8.7916)	0.0274 (0.5433)	0.1241 (1.9996)
80-81	0.0119 (0.1840)	-0.2110 (-1.8797)	-0.2271 (-1.8338)	-0.1378 (-1.0105)	0.5424* (8.5862)	0.1484 (1.6767)	-0.1392 (-1.8790)
83-84	0.0369 (0.3652)	-0.1795 (-0.7779)	-0.1962 (-1.1839)	-0.0468 (-0.3124)	0.5396* (6.8789)	0.0836 (1.0163)	0.0083 (0.1028)
85-86	0.0378 (0.4298)	-0.2928 (-1.2858)	-0.0936 (-0.4489)	-0.2940 (-1.5148)	0.4131* (3.8107)	0.1689 (1.9951)	-0.0379 (-0.3588)
86-87	0.0509 (1.1872)	-0.1224 (-1.0528)	-0.0049 (-0.0405)	-0.2091* (-2.1689)	0.2632* (4.0489)	-0.0932 (-1.4006)	-0.1620* (-3.8741)

Table contd...

Table III.9 contd...

Year	$\frac{PAT(t)}{k(t-1)}$	$\frac{PAT(t-1)}{k(t-2)}$	$\frac{PAT(t-2)}{k(t-3)}$	$\frac{I(t)}{k(t-1)}$	R^2	F
	(8)	(9)	(10)	(11)	(12)	(13)
68-69	0.8033* (3.9786)	0.0610 (0.6179)	-0.6587* (-2.4314)	-0.7669* (-2.5565)	0.6205	9.6458
70-71	0.2983* (2.1374)	-0.0425 (-0.1733)	-0.1639 (-0.8146)	-0.3162 (-1.2690)	0.8157	26.1062
72-73	0.3080 (1.0528)	0.0634 (0.4341)	-0.2877* (-2.2394)	-0.7449* (-2.5093)	0.9297	59.5194
74-75	1.2531* (4.0563)	-0.1365 (-0.4825)	-0.0848 (-0.3232)	-0.4730* (-2.3418)	0.8292	24.2737
76-77	0.9632* (3.9447)	-0.0184 (-0.0919)	-0.2387 (-0.7683)	-0.5770* (-4.6171)	0.8531	20.9045
78-79	0.7844* (5.7969)	-0.0008 (-0.1638)	-0.2622 (-1.1395)	-0.1534 (-1.5659)	0.8207	19.2279
79-80	0.8865* (6.8493)	0.1498 (1.1652)	0.1464 (0.7131)	-0.5140* (-3.6865)	0.8836	31.8839
80-81	0.5692* (3.0939)	0.2998 (1.3763)	-0.1512 (-0.7970)	-0.2135* (-2.8649)	0.7759	14.5410
83-84	0.9453* (2.4113)	0.3631 (0.6665)	-0.7581 (-1.5408)	0.2647 (0.6830)	0.7937	8.8489
85-86	1.3107* (4.9999)	-0.6181 (-1.5548)	-0.6009 (-1.5038)	-0.1505 (-1.1727)	0.7620	7.3630
86-87	1.5172* (7.0179)	-0.9016* (-3.3307)	-0.1437 (-0.8329)	0.0144 (0.0969)	0.9144	20.5448

[* Indicates that the coefficient is significant at 5% level.
Figures in parentheses are t ratios].

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TABLE III.10

INVENTORY INVESTMENT : CROSS SECTION RESULTS (OLS)

Dependent Variable : $\frac{IN(t)}{k(t-1)}$ (r=0)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{PAT(t)}{k(t-1)}$	$\frac{I(t)}{k(t-1)}$	$\frac{INS(t)}{S(t-1)}$	ACF	$\frac{INS(t-1)}{k(t-1)}$	R^2	F
67-68	-0.0881 (-0.8053)	0.0790 (0.7823)	0.8757* (12.0097)	0.1221 (1.1475)	-1.2011* (-3.7155)	0.5858* (2.9264)	-1.5117* (-2.0967)	-0.0001 (-0.6877)	0.7347	24.5317
69-70	0.0642 (0.7946)	0.0385 (0.5370)	0.5934* (10.5704)	0.1875 (1.1819)	-0.2684* (-2.5965)	0.2197* (2.1631)	-2.3568 (-1.8363)	-0.0001 (-1.2228)	0.7142	22.1391
71-72	-0.2030* (-2.6171)	0.1485* (2.8626)	0.6557* (11.0532)	0.3821* (2.9892)	-0.2247 (-0.8543)	0.2287* (2.6096)	0.2909 (1.1277)	-0.0001 (-0.4797)	0.8544	44.4387
73-74	-0.0158 (-0.2072)	0.0795 (0.6454)	0.3762* (5.9425)	0.9033* (3.9079)	-0.1405 (-1.3990)	0.2103 (1.1878)	-0.1012 (-0.2893)	-0.0001 (-0.8391)	0.5266	8.4229
75-76	-0.2470* (-2.9618)	-0.0663 (-0.9575)	0.4368* (8.3398)	0.5925* (3.7078)	0.6082* (3.5244)	0.5299* (3.9048)	0.1166 (0.2325)	-0.0001 (-0.8639)	0.8056	31.3683
77-78	-0.0087 (-0.1324)	0.2320 (1.6628)	0.4801* (5.9424)	0.4883* (2.2420)	-0.0746 (-0.4219)	0.3279* (2.1437)	0.0366 (0.0642)	-0.0001 (-1.8421)	0.6832	13.8651
79-80	-0.1529* (-2.8048)	-0.0727 (-1.0473)	0.5229* (11.4338)	0.7967* (6.4828)	-0.4341* (-3.7373)	0.2915* (3.3619)	-0.5855 (-1.2273)	0.0001 (0.6591)	0.8787	46.5768
81-82	-0.0597 (-1.0750)	0.0236 (0.3699)	0.2731* (5.6048)	0.7545* (3.3202)	-0.1765* (-2.6534)	0.4958* (3.2296)	-0.2157* (-3.5819)	0.0001 (0.7221)	0.7171	13.3977
83-84	0.0267 (0.2211)	-0.1457 (-0.9574)	0.3731* (5.0715)	0.6464* (2.5474)	0.1693 (0.5574)	0.4982* (3.7316)	-1.6267* (-2.3028)	-0.0001 (-1.2578)	0.8529	21.5289
86-87	-0.0069* (-4.0988)	-0.1282 (-1.0845)	0.3649* (4.1653)	1.1512 (1.8789)	0.2135* (1.0088)	0.2251* (3.7381)	-0.0002* (-2.1557)	-0.0001 (-0.8137)	0.7882	11.1644

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE III.11

INVENTORY INVESTMENT : CROSS SECTION RESULTS (OLS)

Dependent Variable : $\frac{IN(t)}{k(t-1)}$ (r=0,1)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{RENT(t)}{k(t-1)}$	$\frac{RENT(t-1)}{k(t-2)}$
67-68	-0.0894 (-0.8082)	0.1477 (1.2597)	0.0256 (0.4540)	0.8190* (8.9328)	-0.1021 (-0.9490)	0.0828 (0.6931)	0.2140 (0.7950)
69-70	0.1351 (1.5010)	-0.0290 (-0.3670)	-0.0048 (-0.0550)	0.5282* (10.1433)	0.1817* (2.0300)	0.5501* (3.1279)	-0.5300* (-3.2334)
71-72	-0.1866* (-2.2633)	0.1295* (2.2941)	0.2778* (2.0077)	0.6683* (10.6776)	-0.0611 (-1.4448)	0.3221* (2.4255)	0.0609 (0.5912)
73-74	-0.1337 (-1.7778)	0.1755 (1.4018)	0.0508 (0.5839)	0.2038* (2.9476)	-0.1874* (-4.2606)	0.8006* (3.6349)	-0.0835 (-0.3497)
75-76	-0.2397* (-2.7962)	-0.0280 (-0.3570)	0.0050 (0.0467)	0.4450* (8.2806)	-0.0949 (-1.5765)	0.5311* (2.5073)	-0.2348 (-0.7570)
77-78	0.0610 (0.7623)	0.1550 (0.9471)	-0.0115 (-0.1372)	0.4917* (5.5821)	-0.0095 (-0.1929)	0.6559* (2.5699)	-0.3707 (-1.5126)
79-80	-0.1579* (-2.3130)	-0.0397 (-0.5164)	0.0739 (0.8690)	0.4713* (7.0476)	-0.0549 (-0.9392)	0.7625* (5.6640)	-0.0718 (-0.5357)
83-84	-0.0258 (-0.1921)	-0.2127 (-1.2060)	-0.0810 (-0.6485)	0.3642* (4.6864)	0.0429 (0.6454)	0.6878* (2.1197)	0.0758 (0.1548)
86-87	0.0609 (0.6154)	-0.2443 (-1.4669)	-0.2069 (-1.2100)	0.3592* (3.6582)	0.0289 (0.3463)	1.4734* (3.7312)	-0.3307 (-0.8553)

Table contd...

Table III.11 contd...

Year	$\frac{I(t)}{k(t-1)}$	$\frac{INS(t)}{S(t)}$	ACF	$\frac{INS(t-1)}{k(t-1)}$	R^2	F
67-68	-1.1220*	0.5468*	-1.2480	-0.0001	0.7433	17.0884
	(-3.1488)	(2.6341)	(-1.5250)	(-0.8199)		
69-70	-0.2883*	0.2195	-2.6102*	-0.0001*	0.7859	21.6560
	(-3.0295)	(1.9349)	(-2.2528)	(-2.1831)		
71-72	-0.2965	0.2198*	0.3615	0.0001	0.8678	29.5378
	(-1.0445)	(2.3491)	(1.3461)	(0.0136)		
73-74	-0.0410	0.2395	0.1968	0.0001	0.6554	9.5089
	(-0.4470)	(1.5168)	(0.6240)	(0.2774)		
75-76	0.6215*	0.5256*	0.0339	-0.0001	0.8199	22.7526
	(3.4399)	(3.8550)	(0.0670)	(-0.0928)		
77-78	-0.1292	0.2438	-0.3220	-0.0001	0.7025	9.9165
	(-0.7142)	(1.4719)	(-0.5044)	(-1.6495)		
79-80	-0.3345*	0.3512*	-0.8094	0.0001	0.8837	31.9270
	(-2.3480)	(3.5328)	(-1.4055)	(0.6722)		
83-84	0.2297	0.4663*	-1.3937	-0.0001	0.8584	13.9427
	(0.7040)	(3.2119)	(-1.6905)	(-1.3733)		
86-87	0.2491	0.0752	-0.3954	-0.0001	0.8257	8.5283
	(1.2361)	(0.3970)	(-0.5839)	(-0.2986)		

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE III.12

INVENTORY INVESTMENT : CROSS SECTION RESULTS (OLS)

Dependent Variable : $\frac{IN(t)}{k(t-1)}$ (r=0,1,2)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$	$\frac{RENT(t)}{k(t-1)}$
69-70	0.1148 (1.1407)	-0.0734 (-0.8794)	-0.0248 (-0.2381)	-0.1550 (-1.8682)	0.5194* (8.4079)	0.1568 (1.6692)	-0.0671 (-0.8463)	0.5259* (2.9563)
71-72	-0.1862* (-2.1022)	0.1340* (2.1127)	0.2865 (1.9410)	-0.0469 (-0.4787)	0.6570* (9.7829)	-0.0431 (-0.8610)	-0.0396 (-0.6400)	0.2944* (2.1013)
73-74	-0.2298* (-2.6205)	0.2439* (2.0180)	0.3035* (2.3351)	-0.0403 (-0.7899)	0.2470* (3.4908)	-0.2258* (-5.1776)	-0.2191* (-2.7764)	0.7750* (3.7126)
75-76	-0.2863* (-3.2250)	0.0182 (0.2223)	0.0936 (0.7505)	0.1368 (0.9735)	0.4239* (7.8704)	-0.1155 (-1.9094)	0.0632 (0.7574)	0.4142 (1.7864)
77-78	-0.0289 (-0.3926)	0.0041 (0.0240)	-0.1211 (-1.4545)	-0.1215* (-2.3385)	0.4020* (5.0095)	0.0392 (0.7530)	0.0512 (0.9471)	0.9130* (3.9729)
79-80	-0.1358 (-1.9615)	-0.1126 (-1.2813)	-0.0058 (-0.0609)	-0.2580 (-1.9109)	0.4809* (7.1760)	-0.0289 (-0.4894)	0.0835 (1.2944)	0.8081* (6.0142)
81-82	-0.1081 (-1.5944)	0.1758* (2.0793)	0.1793 (1.8660)	0.1389 (1.6849)	0.1849* (3.4527)	-0.0022 (-0.0479)	-0.0544 (-0.9312)	0.1736 (0.6054)
83-84	-0.0993 (-0.5685)	-0.0765 (-0.3932)	-0.0058 (-0.0363)	0.2125 (1.5425)	0.3649* (4.5852)	0.0574 (0.8384)	-0.0361 (-0.4432)	0.6883* (2.0593)
86-87	-0.1184 (-1.0828)	-0.0795 (-0.6658)	0.0114 (0.0877)	-0.1928* (-2.0532)	0.2792* (3.7458)	-0.0697 (-1.0687)	-0.1716* (-4.2105)	1.1000* (3.6252)

Table Contd.

Table III 12 contd.

Year	RENT(t-1)/k(t-2)	RENT(t-2)/k(t-3)	I(t)/k(t-1)	INS(t)/S(t)	ACF	INST(t-1)/k(t-1)	R^2	F
69-70	-0.4275* (-2.3726)	-0.0387 (-0.4127)	-0.3007* (-3.1485)	0.2213 (1.9261)	-2.3374 (-1.9287)	-0.0001 (-1.4738)	0.7990	17.1256
71-72	0.0285 (0.2332)	0.0594 (0.2887)	-0.3438 (-1.1810)	0.2420* (2.4403)	0.3915 (1.3958)	0.0001 (0.0092)	0.8703	21.6715
73-74	-0.2465 (-1.0531)	-0.1077 (-0.8388)	-0.1068 (-1.0109)	0.2523 (1.6487)	0.3991 (1.1615)	0.0001 (1.1867)	0.7125	8.9589
75-76	-0.5315 (-1.3841)	0.5437 (1.6354)	0.6252* (3.5129)	0.5288* (3.7478)	0.0464 (0.0921)	-0.001 (-0.2438)	0.8363	18.4687
77-78	-0.2179 (-0.9430)	-0.7810* (-4.5287)	-0.0638 (-0.4300)	0.3279* (2.2845)	-0.4760 (-0.9113)	0.0001 (0.2264)	0.8546	14.9239
79-80	0.0274 (0.1937)	0.0398 (0.1901)	-0.4243* (-2.9063)	0.2311* (2.0363)	-0.6764 (-1.1526)	0.0001 (0.6992)	0.8970	26.1223
81-82	0.2449 (1.3939)	-0.3613* (-2.0344)	-0.1410* (-2.1489)	0.4405* (2.2807)	-0.1985* (-2.6848)	-0.0001 (-0.8928)	0.7184	5.6914
83-84	-0.0302 (-0.0605)	-0.4170 (-0.9430)	0.2557 (0.7795)	0.5446* (3.1375)	-1.7850* (-2.1265)	-0.0001 (-1.0835)	0.8803	14.3130
86-87	-0.5597 (-1.7493)	0.1811 (0.7474)	0.1283 (0.8275)	0.3421* (2.0732)	0.3083 (0.5786)	0.0001 (0.7039)	0.9376	20.1562

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE III.13

INVENTORY INVESTMENT : TIME SERIES RESULTS (OLS)

Dependent Variable : $\frac{IN(t)}{k(t-1)}$

Constant	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$
					CASE 1	
-0.1512 (-1.2456)	0.7808* (6.6777)	-	-	0.4513* (2.0082)	-	-
-0.0395 (-0.2984)	0.8292 (4.8139)	-0.1322 (-1.0292)	-	0.8319* (2.7338)	-0.3503 (-1.5455)	-
0.0136 (0.0670)	0.6194* (3.1772)	-0.0221 (-0.1387)	-0.2206 (-1.3932)	0.4850 (1.3281)	-0.2932 (-1.0793)	0.0754 (0.2844)
					CASE 2	
0.0230 (0.4627)	0.7402* (21.6860)	-	-	-0.0450 (-0.3990)	-	-
0.0798 (1.3024)	0.7529* (11.1710)	0.0399 (0.7006)	-	-0.2870 (-1.4271)	-0.1869 (-1.1019)	-
0.0222 (0.3014)	0.6977* (7.0498)	0.1111 (1.3264)	-0.1276 (-1.1176)	-0.1196 (-0.5251)	0.0787 (0.3258)	0.4660 (1.8890)
					CASE 3	
0.0010 (0.0275)	0.7995* (14.4579)	-	-	-0.0718 (-0.6239)	-	-
0.0407 (0.7948)	0.8313* (8.1245)	0.0921 (1.2823)	-	-0.3099 (-1.4515)	-0.1273 (-0.7154)	-
-0.0068 (-0.0724)	0.8517* (4.4762)	0.1525 (1.1983)	-0.0144 (-0.0978)	-0.1809 (-0.5494)	-0.0429 (-0.1013)	-0.2792 (-0.7181)
					CASE 4	
0.0059 (0.0983)	0.7934* (16.2646)	-	-	-0.1284 (-1.0625)	-	-
0.0567 (0.6041)	0.7966* (8.9015)	0.0757 (1.0016)	-	-0.3245 (-1.2970)	-0.1506 (-0.7605)	-
0.0413 (0.1189)	0.7641* (3.7385)	0.1015 (0.6127)	-0.0359 (-0.1408)	-0.2604 (-0.4899)	-0.0442 (-0.0638)	0.1443 (0.2451)

Table contd...

Table III.13 contd..

RENT(t)/k(t-1)	RENT(t-1)/k(t-2)	RENT(t-2)/k(t-3)	I(t)/k(t-1)	R^2	F	D.W.
			CASE 1			
1.4252 (1.1991)	-	-	0.1120 (0.0945)	0.8313	19.7905	1.9940
-0.2079 (-0.1455)	1.4051 (1.0314)	-	-0.2030 (-0.1623)	0.8995	15.4819	2.1408
0.0266 (0.0134)	1.0923 (0.7009)	-1.6897 (-1.1580)	-0.3138 (-0.1958)	0.9190	9.0990	1.8860
			CASE 2			
0.8440 (1.8297)	-	-	-0.6564 (-1.5158)	0.9715	127.8421	2.2774
1.3016* (2.2466)	-0.6130 (-0.9136)	-	-0.6798 (-1.5191)	0.9784	69.9000	1.7747
0.4267 (0.5096)	-0.3993 (-0.4637)	-0.9382 (-0.9580)	1.1686* (-2.1227)	0.9857	49.3000	2.5160
			CASE 3			
0.8743 (1.7046)	-	-	-0.5117 (-1.5514)	0.9770	128.5263	1.8586
1.7338* (2.0962)	-0.2792 (-0.3612)	-	-0.5617 (-1.4825)	0.9836	70.2500	1.9667
1.3981 (0.7605)	0.0037 (0.0028)	-0.7759 (-0.5759)	-0.8541 (-1.2875)	0.9852	26.6216	2.0765
			CASE 4			
0.9239* (2.2139)	-	-	-0.5147 (-0.8247)	0.9775	111.0909	1.9313
1.4580 (1.8704)	-0.0599 (-0.0847)	-	-0.6988 (-0.8613)	0.9819	46.7667	1.9433
0.9516 (0.4251)	0.2253 (0.1354)	-0.4316 (-0.1763)	-0.8682 (-0.3184)	0.9812	10.4362	1.9589

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE III.14

INVENTORY INVESTMENT : TIME SERIES RESULTS (OLS)

Dependent Variable : $\frac{IN(t)}{k(t-1)}$

Constant	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{PAT(t)}{k(t-1)}$
			CASE 1				
-0.5242* (-2.4455)	0.5837* (3.3049)	-	-	0.1891 (0.9736)	-	-	1.3630 (1.0247)
-0.5873* (-2.5544)	0.2423 (1.1676)	-0.2999 (-1.8910)	-	0.4111* (2.1526)	-0.1705 (-0.9844)	-	-1.2774 (-0.7563)
-0.6972 (-1.8701)	0.0666 (0.1886)	-0.3384 (-1.2483)	-0.0231 (-0.1322)	0.3841 (1.1616)	-0.0287 (-0.1128)	0.0134 (0.0540)	-2.5332 (-0.8936)
			CASE 2				
-0.1792* (-2.3269)	0.6848* (15.1348)	-	-	-0.1759 (-1.9720)	-	-	1.3055* (3.2202)
-0.1030 (-1.1868)	0.7498* (11.3815)	0.0017 (0.0429)	-	-0.3006* (-2.2621)	-0.0970 (-0.7966)	-	1.8760* (4.0661)
-0.1944 (-1.1361)	0.6877* (5.7306)	-0.0571 (-0.4770)	-0.0015 (-0.0129)	-0.2858 (-1.2854)	0.0269 (0.0968)	-0.0653 (-0.1933)	1.5741 (1.2777)
			CASE 3				
-0.1991 (-1.7702)	0.6674* (8.9483)	-	-	-0.2056 (-1.7206)	-	-	1.0457 (1.9172)
0.0731 (0.5455)	0.7162* (7.7305)	-0.0780 (-1.0924)	-	-0.2424 (-1.7036)	-0.2382 (-1.9768)	-	1.5213* (2.7886)
-1.4383 (-0.6617)	-0.0377 (-0.0345)	-0.9058 (-0.7617)	0.3853 (0.7172)	-1.5288 (-0.8498)	-0.9461 (-0.9071)	-2.0137 (-0.7101)	5.1871 (0.8907)
			CASE 4				
-0.2014 (-1.5574)	0.6735* (8.9533)	-	-	-0.2205 (-1.6515)	-	-	0.9074 (1.7255)
0.4282 (1.5857)	0.7738* (8.4905)	-0.1551 (-1.7318)	-	-0.1386 (-0.8187)	-0.3583* (-2.3483)	-	1.4957* (2.7908)

Table contd...

Table III.14 contd...

PAT(t-1)/k(t-2)	PAT(t-2)/k(t-3)	I(t)/k(t-1)	INS(t)/S(t)	ACF	INS(t-1)/k(t-1)	R^2	F	D.W.
				CASE 1				
-	-	2.1062 (1.8821)	0.5842 (1.7444)	4.1000 (0.8121)	-0.0001 (-1.8920)	0.9223	21.9500	2.3626
-0.1933 (-0.1590)	-	2.7445* (2.0897)	1.1556* (2.8052)	-3.8131 (-0.6546)	0.0001 (0.2255)	0.9618	22.9000	2.1449
-0.0956 (-0.0620)	0.1204 (0.0861)	3.7421 (1.6037)	1.3264* (2.0450)	-4.2978 (-0.5188)	0.0001 (0.1821)	0.9681	11.6406	2.6883
				CASE 2				
-	-	-0.1527 (-0.3867)	0.4026* (3.2215)	-0.1744 (-1.9418)	-0.0001 (-0.6878)	0.9886	150.8889	2.5553
-0.8624 (-1.7449)	-	-0.3161 (-0.8509)	0.3408* (2.5829)	-0.2046* (-2.4518)	-0.0001 (-0.8106)	0.9938	124.2500	2.1778
-1.0346 (-1.3698)	0.7004 (0.5571)	0.1641 (0.1903)	0.4683 (1.6779)	-0.1603 (-0.7605)	-0.0001 (-0.7788)	0.9945	58.8461	2.2310
				CASE 3				
-	-	-0.0747 (-0.2163)	0.3977* (2.3931)	0.0420 (0.3783)	-0.0001 (-0.2104)	0.9869	100.7142	2.2553
-1.6634 (-1.9085)	-	-0.4524 (-1.3218)	0.2956 (1.9973)	-0.2985 (-1.8334)	-0.0001* (-2.1542)	0.9958	124.5000	2.2661
-2.1100 (-1.0633)	10.2844 (0.7115)	5.3385 (0.6592)	2.5530 (0.7959)	0.3479 (0.3529)	0.0001 (0.5032)	0.9972	27.3928	2.1276
				CASE 4				
-	-	0.3077 (0.4216)	0.3508* (2.0830)	0.0560 (0.3954)	-0.0001* (-0.3532)	0.9869	74.2105	1.9431
-3.2146* (-2.2835)	-	-0.3874 (-1.5680)	0.1543 (0.8950)	-0.8027* (-2.2319)	-0.0001* (-2.3953)	0.9965	83.0000	1.9923

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE III.15

INVENTORY INVESTMENT : TIME-SERIES RESULTS (OLS)

Dependent Variable : $\frac{IN(t)}{k(t-1)}$

Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{\Delta S(t-3)}{S(t-4)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$	$\frac{FNDE(t-3)}{k(t-4)}$
				CASE 1				
-0.0884 (-0.9909)	-0.0311 (-0.1710)	-	-	-	0.7112* (11.5362)	-	-	-
0.0276 (0.2426)	-0.3039 (-0.9588)	-0.4669 (-1.8710)	-	-	0.5820* (6.4016)	0.0931 (0.9145)	-	-
0.0223 (0.1278)	-0.3578 (-0.6817)	-0.2817 (-0.4314)	0.0149 (0.0265)	-	0.5498* (4.7178)	0.0795 (0.6214)	-0.0365 (-0.2078)	-
-0.3059 (-0.7925)	0.2967 (0.3277)	1.3760 (0.7883)	1.7507 (0.8841)	·1.2620 (1.0626)	0.5938* (3.4049)	0.0474 (0.2613)	-0.2477 (-0.7977)	-0.1159 (-0.3655)
				CASE 2				
-0.0001 (-0.0001)	-0.0228 (-0.2038)	-	-	-	0.7409* (21.3711)	-	-	-
0.0649 (1.0956)	-0.2196 (-1.1986)	-0.2376 (-1.4635)	-	-	0.7585* (11.6838)	0.0276 (0.4964)	-	-
0.0218 (0.2826)	-0.1845 (-0.7764)	-0.0188 (-0.0701)	0.2727 (1.0489)	-	0.7579* (6.5077)	0.0452 (0.5148)	-0.0243 (-0.1772)	-
				CASE 3				
-0.0219 (-0.5681)	-0.0556 (-0.4865)	-	-	-	0.7954* (15.4866)	-	-	-
0.0202 (0.4174)	-0.2791 (-1.5557)	-0.1379 (-0.8828)	-	-	0.8839* (8.4999)	0.0675 (1.0968)	-	-
0.0007 (0.0085)	-0.2531 (-0.7872)	-0.1599 (-0.4063)	0.0947 (0.2765)	-	0.8926* (4.9701)	0.1217 (0.9394)	0.0294 (0.2163)	-
				CASE 4				
-0.1015 (-1.8138)	-0.0653 (-0.6578)	-	-	-	0.7624* (24.3690)	-	-	-
-0.0795 (-1.0509)	-0.1189 (-0.7020)	-0.0668 (-0.4285)	-	-	0.7818* (12.2362)	0.0008 (0.0143)	-	-
-0.1665 (-0.7647)	-0.1522 (-0.5120)	-0.1567 (-0.4381)	0.0743 (0.2703)	-	0.8117* (7.0217)	0.0513 (0.5068)	0.0985 (0.4947)	-

Table contd...

Table III.15 contd..

$\frac{PAT(t)}{k(t-1)}$	$\frac{PAT(t-1)}{k(t-2)}$	$\frac{PAT(t-2)}{k(t-3)}$	$\frac{PAT(t-3)}{k(t-4)}$	$\frac{I(t)}{k(t-1)}$	R^2	F	D.W.
			CASE 1				
0.2357 (0.4177)	-	-	-	0.5321 (0.6932)	0.9119	41.4545	1.9192
0.3930 (0.4857)	0.8024 (1.0791)	-	-	0.1615 (0.2001)	0.9355	24.7407	1.9928
0.0826 (0.0487)	0.7316 (0.6758)	0.4389 (0.4551)	-	0.1708 (0.1796)	0.9384	12.1818	1.8770
-2.3620 (-0.7811)	-2.5401 (-0.6917)	-0.2256 (-0.1363)	-1.3877 (-0.7732)	-1.4063 (-0.8175)	0.9589	7.1650	1.9897
			CASE 2				
0.5086 (1.7530)	-	-	-	-0.5634 (-1.3116)	0.9711	127.7895	2.2179
1.1716* (2.2699)	-0.6080 (-1.0766)	-	-	-0.6422 (-1.4033)	0.9788	73.5789	1.9914
0.9236 (1.0729)	-0.7764 (-0.9168)	0.0720 (0.0830)	-	-0.8854 (-1.3768)	0.9845	44.7273	2.2580
			CASE 3				
0.7155 (1.8155)	-	-	-	-0.4534 (-1.4602)	0.9776	128.6316	1.9881
1.8130* (2.5752)	-0.7129 (-1.0968)	-	-	-0.6408 (-1.7261)	0.9865	82.8823	1.8462
1.7771 (1.3110)	-0.3613 (-0.3057)	-0.3279 (-0.2882)	-	-0.7001 (-0.9462)	0.9869	29.9091	2.1146
			CASE 4				
0.8269* (3.6142)	-	-	-	0.5362 (0.9828)	0.9855	164.2667	1.9681
1.1715* (2.7141)	-0.4393 (-0.8181)	-	-	0.5292 (0.8077)	0.9881	70.5500	1.9753
1.3039 (1.7553)	-0.1868 (-0.2167)	0.0020 (0.0014)	-	1.2117 (0.5958)	0.9927	27.5833	2.0172

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE III.16

INVENTORY INVESTMENT : TIME SERIES RESULTS (OLS)

Dependent Variable : $\frac{IN(t)}{k(t-1)}$

Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$	$\frac{PAT(t)}{k(t-1)}$
				CASE 1			
-0.4495*	-0.1672	-	-	0.4516*	-	-	0.1981
(-2.6864)	(-1.0725)			(4.8436)			(0.2928)
-0.3582	-0.1100	-0.2663	-	0.3610*	-0.0766	-	-0.2106
(-1.6092)	(-0.4142)	(-1.2716)		(3.4549)	(-0.8288)		(-0.2617)
-0.6956*	0.2934	0.5420	0.4232	0.3102*	-0.0989	-0.1698	-1.7161
(-2.5664)	(0.7955)	(1.1115)	(1.1730)	(2.8689)	(-1.1147)	(-1.4427)	(-1.3821)
				CASE 2			
-0.1832*	-0.1099	-	-	0.6900*	-	-	0.8398*
(-2.0070)	(-1.1280)			(12.8045)			(2.1895)
-0.0816	-0.2039	-0.1489	-	0.7907*	-0.0163	-	1.6951*
(-0.8564)	(-1.5850)	(-1.1827)		(11.1212)	(-0.3800)		(3.7190)
-0.1305	-0.2639	-0.0920	-0.0434	0.7644*	-0.0343	0.0333	1.6141
(-0.9453)	(-1.2351)	(-0.3016)	(-0.1544)	(5.5786)	(-0.4320)	(0.2776)	(1.4408)
				CASE 3			
-0.2156	-0.1774	-	-	0.6806*	-	-	0.8064
(-1.6706)	(-1.4067)			(7.5692)			(1.4624)
0.0917	-0.1622	-0.2621*	-	0.7586*	-0.0914	-	1.4854*
(0.6554)	(-1.1819)	(-2.1858)		(7.3144)	(-1.3735)		(2.7202)
-0.1915	-0.4779	-0.4378	-0.2579	0.5576	-0.2000	0.0993	1.3738
(-0.1038)	(-0.3172)	(-0.7648)	(-0.2452)	(0.3861)	(-0.2883)	(0.3682)	(0.3675)
				CASE 4			
-0.3743*	-0.1908*	-	-	0.7054*	-	-	1.1973*
(-3.2819)	(-2.0070)			(12.7653)			(3.4007)
-0.0743	0.0168	-0.1869	-	0.6744*	-0.1382	-	1.0668*
(-0.2331)	(0.0705)	(-1.0934)		(8.4219)	(-1.1974)		(2.2759)

Table contd...

Table III.16 contd...

PAT(t-1)/k(t-2)	PAT(t-2)/k(t-3)	I(t)/k(t-1)	INS(t)/S(t)	ACF	INS(t-1)/k(t-1)	R^2	F	D.W.
				CASE 1				
-	-	2.1397* (2.6720)	0.7554* (3.7092)	-1.1201 (-0.3398)	-0.0001 (-0.4520)	0.9592	44.1935	2.1168
0.1311 (0.1791)	-	1.9182* (2.0112)	0.8479* (3.3936)	-3.1101 (-0.7502)	0.0001 (0.1816)	0.9719	26.2703	2.2527
0.2259 (0.3148)	-0.2328 (-0.3204)	2.7235* (2.6939)	0.9106* (3.7182)	1.7003 (0.3283)	-0.0001 (-1.2277)	0.9862	27.1071	2.3055
				CASE 2				
-	-	-0.0151 (-0.0336)	0.3369* (2.4100)	-0.1394 (-1.3400)	-0.0001 (-0.7365)	0.9849	112.2500	2.3850
-1.0323* (-2.2956)	-	-0.3828 (-0.9564)	0.2740* (1.9660)	-0.2173* (-2.3752)	-0.0001 (-0.8066)	0.9931	110.3333	2.1207
-1.0795 (-1.6273)	0.4503 (0.6339)	0.0515 (0.0804)	0.3290 (1.7423)	-0.1547 (-0.9090)	-0.0001 (-0.8574)	0.9950	63.7500	2.1251
				CASE 3				
-	-	-0.0419 (-0.1139)	0.3513* (2.0337)	0.0389 (0.3287)	0.0001 (0.1252)	0.9850	82.7647	2.0593
-1.5567* (-2.2696)	-	-0.6281 (-1.6468)	0.2591 (1.7538)	-0.2622* (-2.0011)	-0.0001 (-1.9090)	0.9958	110.6667	2.4337
-1.3699 (-0.6714)	1.5389 (0.1887)	0.6721 (0.0958)	0.5974 (0.2722)	-0.1843 (-0.1790)	-0.0001 (-0.0765)	0.9965	21.8857	2.2248
				CASE 4				
-	-	1.2801* (2.3735)	0.2919* (2.4047)	0.1373 (1.2761)	0.0001 (1.3400)	0.9930	141.800	2.2556
-1.2159 (-1.0312)	-	0.4067 (0.4052)	0.3310 (1.9930)	-0.2722 (-0.7367)	-0.0001 (-0.5063)	0.9956	66.4000	1.8943

[* indicates that the coefficient is significant at 5% level. figures in the parentheses are t ratios.]

TABLE III.17

INVENTORY INVESTMENT : POOLED TIME SERIES CROSS SECTION RESULTS (OLS)

Dependent Variable : $\frac{IN(t)}{k(t-1)}$

Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-3)}{k(t-3)}$	$\frac{RENT(t)}{k(t-1)}$	$\frac{RENT(t-1)}{k(t-2)}$
				Specification 1				
-0.0165* (-2.3110)	-0.0149 (-0.9883)	-	-	0.6579* (65.8577)	-	-	0.6585* (16.0896)	-
-0.0120 (-1.5185)	-0.0187 (-1.1517)	-0.0282 (-1.3869)	-	0.6630* (65.1230)	-0.0147 (-0.4034)	-	0.7201* (15.6734)	-0.1115* (-2.0670)
0.0017 (0.1874)	-0.0294 (-1.7807)	-0.0019 (-0.0807)	-0.0070 (-0.3260)	0.6331* (54.6218)	-0.0020 (-0.1820)	-0.0614* (-5.0478)	0.0687* (14.6823)	-0.0618 (-1.0523)
				Specification 2				
-0.1317* (-8.8521)	-0.0205 (-1.4158)	-	-	0.6021* (54.0888)	-	-	0.6645* (16.8149)	-
-0.1455* (-9.3785)	-0.0112 (-0.7293)	-0.0117 (-0.6013)	-	0.6029* (53.8018)	-0.0382* (-3.6999)	-	0.7007* (16.0020)	-0.1020 (-1.9837)
-0.1443* (-8.9126)	-0.0227 (-1.4626)	0.0350 (1.5438)	-0.0007 (-0.0382)	0.5611* (44.7105)	-0.0287* (-2.7292)	-0.0777* (-6.7045)	0.6556* (14.8916)	-0.0689 (-1.2467)
				Specification 3				
-0.0280* (-3.8020)	-0.0081 (-0.5306)	-	-	0.6517* (64.0607)	-	-	-	-
-0.0220* (-2.7099)	-0.0068 (-0.4109)	-0.0290 (-1.3936)	-	0.6537* (63.5480)	-0.0202 (-1.8980)	-	-	-
-0.0041 (-0.4381)	-0.0254 (-1.5346)	0.0013 (0.0553)	-0.0057 (-0.2645)	0.6264* (54.4261)	-0.0037 (-0.3455)	-0.0617* (-5.0746)	-	-
				Specification 4				
-0.1441* (-9.4455)	-0.0136* (-9.9220)	-	-	0.5966* (52.4220)	-	-	-	-
-0.1586* (-9.9952)	0.0006 (0.0368)	-0.0121 (-0.6080)	-	0.5932* (52.2265)	-0.0444* (-4.2190)	-	-	-
-0.1501* (-9.2697)	-0.0186 (-1.1974)	0.0342 (1.5104)	0.0008 (0.0425)	0.5543* (44.3829)	-0.0301* (-2.8754)	-0.0779* (-6.7337)	-	-

Table contd...

Table III.17 contd...

$\frac{RENT(t-2)}{k(t-1)}$	$\frac{PAT(t)}{k(t-1)}$	$\frac{PAT(t-1)}{k(t-2)}$	$\frac{PAT(t-2)}{k(t-3)}$	$\frac{I(t)}{k(t-1)}$	$\frac{INS(t)}{S(t)}$	ACF	$\frac{INS(t)}{k(t-1)}$	R^2	F
				Specification 1					
-	-	-	-	-0.1993* (-7.4736)	-	-	-	0.7952	994.00
-	-	-	-	-0.1835* (-7.0099)	-	-	-	0.8144	581.50
-0.1524* (-2.6668)	-	-	-	-0.1692* (-6.4686)	-	-	-	0.8176	409.00
-	-	-	-	-0.1649* (-6.3594)	0.2569 (0.9713)	0.0127 (1.7585)	-0.0001 (-1.6081)	0.8120	580.00
-	-	-	-	-0.1516* (-6.0386)	0.2914* (10.8633)	0.0133 (1.9095)	-0.0002 (-0.9797)	0.8333	416.00
-0.1361* (-2.5353)	-	-	-	-0.1336* (-5.3898)	0.3149* (11.7395)	0.0131 (1.9386)	-0.0001 (-0.5305)	0.8405	323.00
				Specification 3					
-	0.5264* (14.1764)	-	-	-0.2103* (-7.7329)	-	-	-	0.7864	983.00
-	0.5583* (13.7093)	-0.0489 (-1.0663)	-	-0.1983* (-7.4246)	-	-	-	0.8051	575.00
-	0.6107* (14.2676)	-0.0407 (-0.8516)	-0.1250* (-2.9315)	-0.1755* (-6.6896)	-	-	-	0.8153	407.50
				Specification 4					
-	0.5292* (14.7521)	-	-	-0.1773* (-6.6925)	0.2550* (9.6663)	0.0155* (2.0988)	-0.0001 (-1.2715)	0.8029	573.50
-	0.5411* (13.9304)	-0.0423 (-0.9695)	-	-0.1668* (-6.4995)	0.2942* (10.6902)	0.0157* (2.2045)	-0.0001 (-0.6250)	0.8244	412.00
-	0.5813* (14.4209)	-0.0437 (-0.9729)	-0.1136* (-2.8413)	-0.1399* (-5.6204)	0.3157* (11.6926)	0.0141* (2.0760)	-0.0001 (-0.5748)	0.8384	322.50

[* Indicates that the coefficient is significant at 5% level.
Figures in the parentheses indicate t ratios].

APPENDIX IV

RESULTS RELATING TO EXTERNAL FINANCE AND DIVIDEND BEHAVIOUR

TABLE IV.1

EXTERNAL FINANCE : CROSS SECTION RESULTS (OLS)

Dependent Variable : $\frac{FNDE(t)}{k(t-1)}$

Year	Constant	$\frac{RENT(t)}{k(t-1)}$	$\frac{I(t)}{k(t-1)}$	$\frac{IN(t)}{k(t-1)}$	$\frac{NDE(t-1)}{k(t-1)}$	R^2	F
67-76	-0.1329* (-3.1112)	-0.6319* (-3.1386)	1.6423* (6.4258)	0.6305* (7.2761)	-0.0841* (-2.7151)	0.7960	49.9334
69-70	0.0565 (1.0844)	-0.2880 (-1.3908)	0.5085* (3.8232)	0.9870* (8.7183)	0.0507 (1.2274)	0.7076	30.9719
71-72	-0.0241 (-1.4569)	-1.2179* (-3.5186)	0.5185 (1.7204)	1.1214* (17.0052)	0.0401 (1.7410)	0.8746	76.7197
73-74	-0.1025 (-1.7189)	-1.2488* (-3.4791)	0.5479* (4.0229)	1.0630* (7.3753)	0.1806* (4.5540)	0.6821	23.6024
75-76	0.1340 (1.4868)	-1.3276* (-4.8511)	-0.6611 (-1.8691)	1.2775* (11.7224)	0.0349 (0.6543)	0.8073	46.0724
77-78	0.0975 (1.3947)	-1.1955* (-3.9842)	0.6014* (2.6799)	1.1025* (7.6342)	-0.0771 (-1.4072)	0.6918	21.1047
79-80	0.1668* (2.4255)	-1.1023* (-4.9999)	0.8120* (4.8073)	1.2154* (10.1532)	-0.0611 (-1.8577)	0.8491	52.8880
81-82	-0.1864 (-1.8770)	-1.8188* (-3.3368)	0.6779* (4.8772)	1.4507* (5.5828)	0.1417 (1.8285)	0.7342	21.5451
83-84	0.1789 (1.1979)	-1.6951* (-4.4238)	0.2411 (0.4391)	1.2643* (8.2015)	-0.0513 (-0.8937)	0.8162	24.8630
86-87	0.0223 (0.2292)	-1.5338* (-3.0822)	-0.2418 (-1.0134)	1.2686* (4.7007)	0.0067 (0.0933)	0.5024	4.6447

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE IV.2

EXTERNAL FINANCE : CROSS-SECTION RESULTS (OLS)

Dependent Variable : $\frac{FNDE(t)}{k(t-1)}$

Year	Constant	$\frac{PAT(t)}{k(t-1)}$	$\frac{I(t)}{k(t-1)}$	$\frac{IN(t)}{k(t-1)}$	$\frac{NDE(t-1)}{k(t-1)}$	R^2	F
67-68	-0.1090* (-2.4681)	-0.2423* (-2.5399)	1.6071* (6.1530)	0.5487* (6.2095)	-0.1007* (-3.1197)	0.7861	47.0458
69-70	0.0651 (1.2408)	-0.2820 (-1.4575)	0.5063* (3.8416)	0.9854* (8.7537)	0.0499 (1.2097)	0.7084	31.0979
71-72	-0.0269 (-0.4742)	-0.3262* (-2.0296)	0.4011 (1.2571)	1.0717* (15.1816)	0.0450 (1.8345)	0.8571	65.9642
72-73	-0.0250 (-0.4493)	-0.7768* (-2.5870)	1.2905* (4.4123)	1.1433* (15.9701)	-0.0264 (-0.7823)	0.9289	143.6341
74-75	-0.1045 (-1.7401)	-1.4253* (-4.5314)	0.9451* (4.2314)	1.3748* (15.0507)	0.1588* (4.8551)	0.8482	61.4619
76-77	0.1897 (1.9159)	-1.2774* (-3.3136)	0.6710* (2.5880)	1.2927* (8.2570)	-0.1256* (-2.0139)	0.7424	27.0986
78-79	0.0334 (0.4089)	-1.4047* (-8.1921)	0.2520 (1.9202)	1.2992* (13.0127)	-0.0243 (-0.4212)	0.8899	76.0162
79-80	0.1701* (2.5225)	-1.1308* (-5.2555)	0.8092* (4.8792)	1.2256* (10.4011)	-0.0625 (-1.9316)	0.8544	55.6662
81-82	-0.1595 (-1.5442)	-1.4898* (-2.8649)	0.6726* (4.6872)	1.4065* (5.2506)	0.1356 (1.7004)	0.7177	19.8320
82-83	0.0684 (0.7620)	-0.8770* (-3.5040)	0.3384* (2.6599)	1.1727* (10.8243)	0.0435 (0.9057)	0.9345	111.3723
83-84	0.2009 (1.3558)	-1.6403* (-4.5218)	0.2924 (0.5417)	1.2642* (8.2758)	-0.0538 (-0.9441)	0.8195	25.4241
86-87	0.0745 (0.7725)	-1.4412* (-3.1692)	-0.2720 (-1.1383)	1.2252* (4.8021)	-0.0094 (-0.1301)	0.5106	4.7994

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE IV.3

EXTERNAL FINANCE : TIME SERIES RESULTS (OLS)

Dependent Variable : $\frac{FNDE(t)}{k(t-1)}$

Constant	$\frac{RENT(t)}{k(t-1)}$	$\frac{I(t)}{k(t-1)}$	$\frac{IN(t)}{k(t-1)}$	$\frac{NDE(t-1)}{k(t-1)}$	R^2	F	D.W.
			CASE 1				
0.1133 (0.7281)	-0.6068 (-0.5315)	-0.2622 (-0.2081)	1.2445* (7.6130)	-0.0283 (-0.2047)	0.9105	31.9474	1.9432
			CASE 2				
0.0501 (0.5964)	-1.6418* (-2.4831)	1.2693* (2.0179)	1.2229* (14.7175)	-0.0969 (-1.4049)	0.9762	114.8235	2.1226
			CASE 3				
0.1432 (1.6340)	-2.3107* (-3.3692)	1.2417* (3.0075)	1.0160* (8.9459)	-0.1635 (-1.9326)	0.9865	164.4167	2.2507
			CASE 4				
0.1246 (1.0401)	-1.8097* (-3.1543)	0.8648 (1.1563)	1.1017* (10.0040)	-0.1174 (-1.3506)	0.9842	115.7647	2.1296
			CASE 5				
0.1138 (0.4424)	-2.2755* (-2.6035)	0.1293 (0.0729)	1.2129* (9.3389)	-0.0309 (-0.2177)	0.9831	46.8095	2.1860

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE IV.4

EXTERNAL FINANCE : TIME-SERIES RESULTS (OLS)

Dependent Variable : $\frac{FNDE(t)}{k(t-1)}$

Constant	$\frac{PAT(t)}{k(t-1)}$	$\frac{I(t)}{k(t-1)}$	$\frac{IN(t)}{k(t-1)}$	$\frac{NDE(t-1)}{k(t-1)}$	R^2	F	D.W.
CASE 1							
0.1747 (1.0548)	-0.9938 (-1.0652)	-0.0852 (-0.0718)	1.1940* (7.5425)	-0.0700 (-0.5428)	0.9152	32.6786	2.0156
CASE 2							
0.1243 (1.2638)	-1.4333* (-2.5291)	1.0803 (1.8166)	1.2040* (13.5425)	-0.1111 (-1.5354)	0.9764	114.8823	2.2061
CASE 3							
3.2359 (1.0786)	-0.1752 (-0.7166)	1.6974 (1.4695)	0.3589 (1.5207)	-0.5173 (-0.2179)	0.3809	1.3535	2.1526
CASE 4							
0.4145* (4.0349)	-1.6809* (-6.0795)	-1.1982* (-2.2245)	1.1590* (20.3209)	-0.1825* (-3.1223)	0.9935	283.8571	2.1997
CASE 5							
0.0589 (0.3474)	-2.5645* (-4.6058)	1.4894 (1.1774)	1.1106* (11.7326)	0.0225 (0.2433)	0.9928	110.3333	2.2146

(* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.)

TABLE IV.5

DIVIDENDS : CROSS-SECTION RESULTS (OLS)

Dependent Variable : $\frac{DIV(t)}{k(t-1)}$

Year	Constant	$\frac{PAT(t)}{k(t-1)}$	$\frac{PAT(t)-PAT(t-1)}{k(t-1)}$	$\frac{I(t)+IN(t)}{k(t-1)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{DIV(t-1)}{k(t-1)}$	R^2	F
67-68	0.0059*	-0.0146*	0.1181*	0.0051	0.0059	0.9224*	0.8600	78.6369
	(2.8011)	(-2.8001)	(6.5085)	(0.8467)	(0.9972)	(17.3583)		
70-71	0.0004	-0.0155	0.0566*	0.0155	-0.0131	0.8348*	0.7157	32.2306
	(0.1311)	(-1.9388)	(3.7370)	(1.9181)	(-1.9689)	(11.6825)		
71-72	0.0005	0.0116	0.0053	-0.0015	-0.0003	0.9653*	0.8789	79.8275
	(0.3715)	(1.4527)	(0.6130)	(-0.2303)	(-0.0597)	(18.1165)		
73-74	0.0023	0.0410	-0.0087	0.0027	0.0023	0.7198*	0.6220	18.1205
	(0.5927)	(1.4670)	(-0.3560)	(0.3394)	(0.3412)	(7.6223)		
74-75	0.0058*	0.0633*	0.0127	-0.0027	0.0048	0.2358*	0.5499	13.4369
	(2.7987)	(3.5053)	(0.6961)	(-0.3443)	(0.9616)	(3.4106)		
75-76	0.0020	-0.0015	0.372	-0.0011	0.0050	0.4285*	0.3121	4.9919
	(0.7777)	(-0.0856)	(1.8263)	(-0.2519)	(1.4446)	(3.0039)		
76-77	0.0103*	0.1241*	-0.0242	0.0025	0.0036	0.5574	0.4496	7.6788
	(2.5781)	(4.5908)	(-1.0353)	(0.1782)	(0.4263)	(1.9286)		
77-78	0.0022	0.0688*	-0.0070	-0.0048	0.1130	0.4913*	0.7030	22.2543
	(0.8483)	(3.7538)	(-0.4001)	(-0.5814)	(1.5463)	(6.2196)		
78-79	0.0027	-0.0148	0.0221	-0.0032	-0.0016	0.6542*	0.6890	20.2285
	(1.4331)	(-1.1307)	(1.8819)	(-0.7403)	(-0.4208)	(8.3150)		
79-80	0.0034*	0.0187*	-0.0049	0.0011	-0.0021	0.5079*	0.6522	17.6243
	(3.2693)	(2.6072)	(-1.0922)	(0.2233)	(-0.5848)	(7.3058)		
81-82	0.0056*	0.0405*	0.0063	-0.0067	-0.0027	0.5886*	0.5878	11.1232
	(2.2545)	(2.0616)	(0.5469)	(-1.0627)	(-0.5941)	(6.3933)		
82-83	0.0051	0.0018	0.0080	0.0100	-0.0092	0.8180*	0.5564	9.7828
	(1.3118)	(0.0796)	(0.3221)	(1.5729)	(-1.3580)	(6.2295)		
84-85	0.0025	0.0244	-0.0250	-0.0010	-0.0056	0.6281*	0.5811	7.7697
	(0.6945)	(1.5233)	(-1.5629)	(-0.1974)	(-1.2612)	(3.3686)		
85-86	0.0002	-0.0104	0.0296	-0.0041	-0.0066	1.2174*	0.7005	13.0959
	(0.0623)	(-0.5796)	(1.3841)	(-0.6425)	(-1.0415)	(6.2578)		
86-87	0.0089*	0.0624*	-0.0666*	0.0013	-0.0088	0.3708*	0.6509	8.5787
	(2.3918)	(3.2586)	(-2.2022)	(0.1489)	(-1.1202)	(2.9050)		

[* indicates that the coefficients are significant at 5% level.
figures in the parentheses are t values.]

APPENDIX V

RESULTS RELATING TO SIMULTANEOUS DETERMINATION OF THE THREE DECISIONS

TABLE V.1

FIXED INVESTMENT : CROSS SECTION RESULTS (2SLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$ (r=0)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{RENT(t)}{k(t-1)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{IAR(t)}{k(t)}$	R^2	F
67-68	-0.0045 (-0.3613)	0.0252 (1.0846)	-0.0383 (-0.7213)	0.2169* (13.1809)	0.6145* (3.6369)	0.7472	47.8974
69-70	-0.0614* (-2.8946)	0.0272 (0.7843)	0.0384 (0.5359)	0.2477* (8.9236)	1.0529* (4.0847)	0.6743	33.7200
71-72	-0.0264 (-1.3900)	-0.0388* (-2.0580)	0.3964* (3.0383)	0.0941* (4.1087)	0.7328* (2.7448)	0.4572	11.7835
73-74	0.0111 (0.9013)	0.1369* (4.8710)	-0.0279 (-0.4324)	0.2685* (14.9017)	0.7340* (4.4508)	0.8217	64.1875
75-76	0.0009 (0.0525)	0.0495* (2.1501)	-0.1280* (-2.8415)	0.1857* (10.7300)	1.1479* (4.3199)	0.7188	35.9400
77-78	0.0672* (3.6086)	0.2659* (6.3163)	-0.1381 (-1.8921)	0.2219* (8.8198)	0.1801 (0.6629)	0.7215	31.1034
79-80	-0.0016 (-0.0710)	0.0137 (0.3268)	-0.0790 (-1.0479)	0.1089* (3.8547)	1.2050* (3.0283)	0.3722	7.0992
81-82	0.0295 (1.6472)	0.1437* (6.4696)	0.1496 (1.3427)	0.2756* (11.4509)	0.8115* (2.6527)	0.8519	57.5608
83-84	0.0512 (1.5265)	0.0138 (0.1557)	0.0042 (0.0320)	0.1475* (3.7791)	0.6610 (1.4058)	0.4645	6.2757
86-87	0.0512* (2.5645)	0.1137* (2.6478)	-0.1331 (-1.4279)	0.1961* (4.5773)	1.1708* (3.3918)	0.7856	22.0674

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE V.2

FIXED INVESTMENT : CROSS SECTION RESULTS (2SLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$ (r=0,1)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{RENT(t)}{k(t-1)}$	$\frac{RENT(t-1)}{k(t-2)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{IAR(t)}{k(t-1)}$	$\frac{IAR(t-1)}{k(t-2)}$	R^2	F
68-69	-0.0077 (-0.5433)	0.1881* (9.0855)	0.0483* (2.0499)	-0.1963* (-3.1790)	0.0465 (0.5861)	0.1537* (6.3652)	-0.0268 (-1.4792)	1.1951* (4.2080)	-0.8322* (-2.7163)	0.7795	27.0555
72-73	0.0146 (1.1310)	0.0001 (0.0052)	0.0057 (0.5004)	0.0497 (0.8572)	0.1391 (1.8352)	0.2164* (21.9874)	-0.0120 (-0.7222)	1.2618* (5.1288)	-0.5772* (-2.2644)	0.9486	118.6000
74-75	0.0212 (1.3775)	0.0632 (1.8845)	0.1372* (3.3742)	-0.0794 (-0.7165)	-0.0063 (-0.0673)	0.1837* (8.7908)	0.0357 (1.8391)	1.7549* (4.2339)	-1.0670* (-2.6384)	0.7457	22.1905
76-77	0.0336 (1.8896)	0.0065 (0.2392)	0.0539* (2.6810)	0.0307 (0.3681)	-0.1088 (-1.6259)	0.2431* (10.3679)	0.0207 (1.2172)	1.7154* (2.8137)	-0.8773 (-1.5418)	0.8594	29.0270
78-79	-0.0499 (-1.4498)	0.1900* (3.6802)	0.3033* (4.4618)	-0.1826* (-2.6769)	-0.0314 (-0.2474)	0.2379* (8.0373)	0.0335 (0.8724)	2.5410* (2.8453)	-1.8885* (-2.2070)	0.8042	22.8407
80-81	0.0988* (5.1957)	0.0521 (1.6112)	0.0417 (1.2391)	0.0274 (0.5113)	-0.0164 (-0.2533)	0.2649* (13.4510)	-0.0276 (-1.3195)	1.2516* (2.6267)	-0.7796 (-1.6154)	0.8609	33.6250
82-83	-0.0998* (-2.4871)	0.0401* (2.8045)	0.1969* (4.1029)	0.0043 (0.0403)	0.0524 (0.2281)	0.3110* (10.2768)	0.0082 (0.2239)	0.6046 (1.1091)	0.4603 (0.5608)	0.9374	68.9412
84-85	0.0899* (2.2528)	-0.1044 (-0.9570)	-0.0901 (-0.9902)	0.4593* (2.4461)	-0.0449 (-0.2672)	0.2337* (5.2379)	0.0316 (0.6798)	2.4671* (3.9630)	-0.7233 (-1.1776)	0.6550	5.9348
86-87	0.0537* (2.4958)	0.1642* (2.8299)	0.1747* (2.4548)	-0.2762 (-1.8081)	0.0560 (0.3275)	0.2329* (3.8034)	-0.0174 (-0.4795)	1.5671 (1.6591)	-0.6628 (-0.8128)	0.8276	12.0232

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE V.3

FIXED INVESTMENT : CROSS SECTION RESULTS (2SLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$ (r=0,1,2)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{RENT(t)}{k(t-1)}$	$\frac{RENT(t-1)}{k(t-2)}$	$\frac{RENT(t-2)}{k(t-3)}$	$\frac{FNDE(t)}{k(t-1)}$
69-70	-0.1356*	0.1339*	0.2570*	0.1013*	0.1096	-0.2404*	-0.1212	0.2556*
	(-5.1880)	(3.1789)	(6.2210)	(2.4892)	(1.1586)	(-2.2740)	(-0.8422)	(7.3529)
71-72	-0.0815*	-0.0158	-0.0165	0.0543	0.3334	-0.0300	-0.0128	0.1094*
	(-2.9897)	(-0.5949)	(-0.2299)	(1.1533)	(1.9409)	(-0.2573)	(-0.0979)	(3.7751)
73-74	-0.0246	0.1636*	-0.0032	0.0653*	-0.0632	0.0793	0.0975	0.3055*
	(-1.5321)	(4.4990)	(-0.0865)	(4.6622)	(-0.9208)	(1.0324)	(1.0095)	(13.0912)
75-76	-0.0308	0.0903*	0.1014*	0.1688*	-0.1187	-0.0530	-0.0827	0.2105*
	(-1.3917)	(2.8544)	(2.1990)	(3.1656)	(-1.3606)	(-0.3516)	(-0.6058)	(9.4157)
77-78	0.0076	0.2781*	0.0374	0.1089*	-0.1006	0.1683	-0.2388*	0.2461*
	(0.2422)	(4.1435)	(0.8791)	(3.4349)	(-0.9246)	(1.3872)	(-2.3860)	(6.7638)
79-80	-0.0628	0.0483	0.1007	0.2093*	-0.0016	0.0455	-0.2283	0.1671*
	(-1.6670)	(0.7531)	(1.7806)	(2.0502)	(-0.0184)	(0.5036)	(-1.5214)	(3.4524)
81-82	-0.0183	0.1817*	0.1437*	0.0866*	-0.0116	-0.0025	-0.1181	0.3354*
	(-0.6578)	(5.9449)	(3.7094)	(2.3464)	(-0.0830)	(-0.0339)	(-1.4484)	(12.7534)
83-84	-0.1366*	0.2412	0.0623	0.1413	-0.0107	0.2639	-0.2682	0.1684*
	(-2.0076)	(1.9136)	(0.7701)	(1.8603)	(-0.0547)	(0.9466)	(-0.8669)	(3.7436)
86-87	-0.0265	0.2460*	0.3200*	0.0485	-0.5165*	0.0617	-0.0666	0.1699*
	(-1.0657)	(5.2245)	(5.0356)	(0.9212)	(-3.6095)	(0.3411)	(-0.7120)	(2.8129)

Table contd..

Table V.3 contd.

Year	FNDE(t-1)/k(t-2)	FNDE(t-2)/k(t-3)	IAR(t)/k(t-1)	IAR(t-1)/k(t-2)	IAR(t-2)/k(t-3)	R^2	F
69-70	0.0042 (0.1030)	-0.0639 (-1.9013)	1.4152* (3.0860)	-1.1315 (-1.7795)	0.3172 (0.6380)	0.8201	22.0322
71-72	0.0460 (1.9483)	0.0257 (0.7993)	2.2433* (2.8385)	-1.5049* (-2.0983)	-0.2155 (-0.6198)	0.5019	3.6034
73-74	-0.0179 (-1.3670)	-0.0008 (-0.0394)	1.5794* (3.6184)	-1.5823* (-3.2060)	0.5254 (1.6810)	0.8913	32.3043
75-76	0.0024 (0.1008)	0.0044 (0.1480)	0.7566 (1.0873)	-0.3209 (-0.4407)	0.3890 (0.7381)	0.7599	12.6600
77-78	0.0124 (0.4792)	0.0096 (0.3500)	0.9007 (1.4934)	-1.1001 (-1.1608)	0.6857 (0.8591)	0.7852	10.3809
79-80	0.0416 (1.3859)	0.0423 (1.0375)	0.5791 (0.6720)	-0.1408 (-0.1204)	0.7952 (0.8673)	0.5345	3.8362
81-82	0.0177 (0.8240)	-0.0885* (-3.6081)	0.7539 (1.7763)	-0.1369 (-0.1932)	0.5660 (0.8722)	0.9338	35.3636
83-84	0.0969* (2.1856)	-0.0318 (-0.7363)	2.1206* (2.5867)	-3.3848* (-4.1683)	2.8532* (2.9702)	0.6993	4.0769
86-87	-0.0207 (-0.5216)	-0.0922* (-3.6025)	1.9819* (2.6834)	-2.1945* (-3.0585)	2.1086* (4.8741)	0.9311	18.0465

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE V.4

FIXED INVESTMENT : CROSS SECTION RESULTS (2SLS)

Dependent Variable : $\frac{I(t)}{k(t-1)}$ (r=0,1,2,3)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{\Delta S(t-3)}{S(t-4)}$	$\frac{RENT(t)}{k(t-1)}$	$\frac{RENT(t-1)}{k(t-2)}$	$\frac{RENT(t-2)}{k(t-3)}$	$\frac{RENT(t-2)}{k(t-3)}$
69-70	-0.1261*	0.1361*	0.1934*	0.0097	-0.0052	0.1830	-0.1453	0.0364	-0.3104
	(-4.5617)	(3.0991)	(4.0414)	(0.1753)	(-0.2025)	(1.8157)	(-1.2847)	(0.2026)	(-1.6227)
71-72	-0.0935*	0.0211	0.0092	0.1639*	0.1282*	0.0931	0.0740	0.0482	-0.0846
	(-3.4245)	(0.8222)	(0.1408)	(3.2202)	(3.3980)	(0.5432)	(0.6645)	(0.3444)	(-0.8958)
73-74	-0.0270	0.2384*	-0.0137	0.0943*	0.0609	-0.1851	0.2050	-0.0040	0.3049*
	(-1.3748)	(5.0734)	(-0.2998)	(5.1764)	(1.1456)	(-1.6461)	(1.8311)	(-0.0337)	(4.9629)
75-76	-0.0418	0.1083*	0.1169*	0.2222*	-0.0296	-0.1708	-0.0908	-0.2116	0.3415*
	(-1.5421)	(2.9519)	(2.2713)	(3.0893)	(-0.6647)	(-1.8180)	(-0.5594)	(-1.3886)	(2.7793)
77-78	0.0253	0.3176*	0.0409	0.1081*	-0.0388	-0.1113	0.1354	-0.2834*	0.0758
	(0.6643)	(4.4481)	(0.7740)	(2.4690)	(-0.8781)	(-0.9368)	(0.9866)	(-2.3631)	(0.3761)
79-80	-0.0727	0.0916	0.1247*	0.2806*	-0.0531	-0.0352	-0.0083	-0.3657*	0.4278*
	(-1.7271)	(1.2417)	(2.0023)	(2.4330)	(-1.0373)	(-0.3593)	(-0.0803)	(-2.2327)	(2.6338)
81-82	-0.0420	0.2119*	0.1342*	0.1028*	0.0012	-0.0358	0.0439	-0.1954*	0.3145*
	(-1.3674)	(6.2298)	(3.1777)	(2.5935)	(0.0247)	(-0.2429)	(0.4884)	(-2.3206)	(3.9395)
83-84	-0.1513*	0.1443	0.0701	0.2569*	0.1153	0.0708	0.3908	-0.8653*	0.3451*
	(-2.0331)	(1.0278)	(0.8065)	(2.7575)	(1.1989)	(0.3167)	(1.2832)	(-2.3296)	(2.0491)
86-87	-0.0461	0.2470*	0.3446*	0.0696	0.0179	-0.7828*	0.2828	-0.0693	0.2833*
	(-1.3921)	(5.2081)	(5.3029)	(1.0363)	(0.3539)	(-4.3101)	(1.2789)	(-0.5577)	(2.1686)

Table contd...

Table V.4 contd...

Year	FNDE(t)/k(t-1)	FNDE(t-1)/k(t-2)	FNDE(t-2)/k(t-3)	FNDE(t-3)/k(t-4)	IAR(t)/k(t-1)	IAR(t-1)/k(t-2)	IAR(t-2)/k(t-3)	R^2	F
69-70	0.2225* (5.9398)	0.0676 (1.4581)	-0.0001 (-0.0029)	0.1546* (3.3380)	1.9461* (4.2095)	-2.1688* (-2.9764)	0.9158 (1.5426)	0.8519	21.0370
71-72	0.1366* (4.8493)	0.0533* (2.4512)	0.0009 (0.0282)	-0.0520 (-1.3862)	2.9934* (4.0509)	-2.3873* (-3.5209)	-0.2565 (-0.8037)	0.6088	4.1428
73-74	0.3257* (11.7936)	-0.0390 (-1.9659)	-0.0082 (-0.2918)	-0.0299 (-1.3788)	1.9960* (3.4858)	-1.9494* (-2.9633)	0.4212 (0.9445)	0.8947	22.9231
75-76	0.2113* (8.2344)	-0.0079 (-0.2778)	-0.0026 (-0.0760)	-0.0165 (-0.6407)	0.8890 (1.1808)	-0.4608 (-0.5828)	0.4608 (0.6429)	0.7846	10.8958
77-78	0.2386* (5.6043)	0.0244 (0.8132)	0.0192 (0.6303)	0.0482 (1.5045)	0.9440 (1.3949)	-1.1667 (-1.1682)	0.5191 (0.6176)	0.8061	8.6613
79-80	0.1903* (3.6303)	0.0391 (1.1844)	0.0274 (0.6095)	-0.0036 (-0.1067)	0.6314 (0.6918)	-0.5196 (-0.4233)	1.0050 (1.0037)	0.5822	3.4425
81-82	0.3327* (11.4400)	0.0421 (1.6044)	-0.0484 (-1.2348)	0.0767* (2.4575)	1.0095* (2.2397)	-0.6169 (-0.7503)	0.7008 (0.9860)	0.9451	31.5000
83-84	0.1882* (4.0437)	0.0903 (1.5495)	-0.0548 (-1.0675)	-0.0571 (-0.9517)	2.2649* (2.7886)	-0.6676* (-4.3541)	3.0726* (3.0509)	0.8129	4.6325
86-87	0.2472* (3.5049)	0.0494 (0.9499)	-0.0855* (-3.3061)	0.0554 (1.8130)	2.2075* (2.7277)	-2.7862* (-3.3729)	2.4351* (5.1828)	0.9444	15.7500

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE V.5

INVENTORY INVESTMENT : CROSS SECTION RESULTS (2SLS)

Dependent Variable : $\frac{IN(t)}{k(t-1)}$ (r=0)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{RENT(t)}{k(t-1)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{I(t)}{k(t-1)}$	ACF	$\frac{INS(t-1)}{k(t-1)}$	$\frac{INS(t)}{S(t)}$	R^2	F
66-67	0.0731*	0.0195*	0.8802*	1.0389*	-0.9514*	0.0153*	0.0001*	-0.2427*	0.9997	28560.00
	(17.2924)	(12.9681)	(132.8659)	(141.3505)	(-46.9533)	(2.6430)	(11.4245)	(-28.6592)		
68-69	0.0767*	0.0223*	0.8743*	1.0433*	-0.9662*	0.0077*	0.0001*	-0.2487*	0.9994	15866.67
	(17.2070)	(6.9870)	(173.8984)	(135.2357)	(-45.7919)	(26.4325)	(11.7637)	(-25.1764)		
70-71	0.0662*	0.0279*	0.8665*	1.0153*	-0.8936*	-0.0057	0.0001*	-0.2200*	0.9997	28560.50
	(12.5579)	(5.9586)	(161.4906)	(100.5019)	(-36.0705)	(-0.4325)	(13.0358)	(-20.0868)		
72-73	0.0820*	0.0197*	0.8695*	1.0472*	-0.9692*	-0.0148	0.0001*	-0.2503*	0.9999	71400.00
	(24.6721)	(7.2032)	(118.6275)	(176.1138)	(-45.9365)	(-1.6305)	(26.4709)	(-36.3308)		
74-75	0.0768*	0.0183*	0.8710*	1.0474*	-0.9677*	-0.0008	0.0001*	-0.2504*	0.9999	71400.00
	(33.0242)	(10.8444)	(197.8141)	(258.0222)	(-86.5176)	(-0.1355)	(41.1009)	(-47.7131)		
76-77	0.0794*	0.0174*	0.8783*	1.0397*	-0.9480*	-0.0511*	0.0001*	-0.2487*	0.9998	35700.00
	(18.2430)	(7.4317)	(133.5068)	(146.2414)	(-42.0955)	(-3.3031)	(33.7067)	(-25.6014)		
78-79	0.0790*	0.0166*	0.8665*	1.0462*	-0.9672*	-0.0196	0.0001*	-0.2517*	0.9999	71400.00
	(24.2452)	(8.6334)	(350.9247)	(166.4530)	(-52.9878)	(-1.5114)	(40.2015)	(-34.2568)		
80-81	0.0720*	0.0189*	0.8684*	1.0370*	-0.9424*	-0.0014	0.0001*	-0.2405*	0.9999	71400.00
	(6.5350)	(9.1831)	(219.8868)	(162.6096)	(-45.2558)	(-0.1761)	(39.9630)	(-23.0240)		
82-83	0.0820*	0.0210*	0.8676*	1.0538*	-0.9889*	-0.0246	0.0001*	-0.2616*	0.9999	47600.00
	(15.9627)	(16.8313)	(133.1556)	(92.4824)	(-32.1628)	(-0.7558)	(22.8154)	(-19.2969)		
84-85	0.0756*	0.0118*	0.8794*	1.0412*	-0.9644*	0.0079*	0.0001*	-0.2429*	0.9999	35700.00
	(20.8236)	(4.9446)	(180.2749)	(206.7816)	(-54.5260)	(26.4127)	(35.7719)	(-35.0617)		
86-87	0.0774*	0.0202*	0.8779*	1.0302*	-0.9432*	-0.0009	0.0001*	-0.2457*	0.9999	28560.00
	(19.3261)	(6.6664)	(125.6017)	(92.4606)	(-31.7587)	(-0.0737)	(27.9972)	(-23.1103)		

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE V.6

INVENTORY INVESTMENT : CROSS SECTION RESULTS (2SLS)

Dependent Variable : $\frac{IN(t)}{k(t-1)}$ (r=0,1)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{RENT(t)}{k(t-1)}$	$\frac{RENT(t-1)}{k(t-2)}$	$\frac{FNDE(t)}{k(t-1)}$	$\frac{FNDE(t-1)}{k(t-2)}$
68-69	0.0818* (4.6652)	0.0257 (1.7493)	0.0559* (4.3474)	1.0426* (35.8825)	-0.4172* (-11.1221)	1.0534* (33.7586)	0.0019 (0.2041)
70-71	0.0743* (5.3686)	0.0530* (4.0585)	0.0489* (5.7268)	0.9702* (33.6292)	-0.3606* (-9.9726)	1.0074* (35.5265)	-0.0244* (-3.1826)
72-73	0.1242* (7.2754)	0.0375* (2.1998)	0.0505* (6.7878)	1.0220* (29.2242)	-0.3305* (-7.4071)	1.1235* (45.8268)	-0.0150 (-1.3674)
74-75	0.1051* (11.9369)	0.0181* (2.2727)	0.0635* (6.2477)	1.0562* (42.1269)	-0.4222* (-20.1310)	1.1462* (67.6945)	-0.0031 (-0.8481)
76-77	0.1088* (5.9567)	0.0204 (1.8417)	0.0647* (7.2969)	1.0021* (27.9724)	-0.3882* (-14.9461)	1.1024* (34.1072)	-0.0121 (-1.8365)
78-79	0.1068* (9.1072)	0.0103 (1.3320)	0.0658* (6.5055)	1.0137* (101.9106)	-0.4233* (-26.0886)	1.1038* (51.3639)	-0.0056 (-1.1813)
80-81	0.0949* (5.1246)	0.0268* (2.3527)	0.0571* (4.9442)	1.0118* (53.6534)	-0.4279* (-18.5045)	1.1196* (39.2256)	0.0033 (0.4948)
82-83	0.0961* (5.9651)	0.0173* (4.5614)	0.0463* (5.8755)	0.9875* (40.4593)	-0.4296* (-13.5339)	1.0789* (32.2508)	-0.0035 (-0.6722)
84-85	0.0907* (8.5361)	0.0139 (1.1459)	0.0831* (7.5597)	1.0244* (43.1569)	-0.4237* (-20.5516)	1.1063* (8.3330)	-0.0058 (-1.0711)
86-87	0.1002* (5.9830)	0.0224 (1.6842)	0.0647* (4.1708)	1.0330* (29.8891)	-0.3634* (-11.2957)	1.0870* (21.5363)	0.0073 (1.0910)

Table contd...

Table V.6 contd...

Year	$\frac{I(t)}{k(t-1)}$	ACF	$\frac{INS(t-1)}{k(t-1)}$	$\frac{INS(t)}{S(t)}$	R^2	F
68-69	-1.0345* (-13.4468)	0.0111* (8.5795)	0.0001* (4.0495)	-0.2602* (-6.5030)	0.9906	991.00
70-71	-0.8887* (-12.5156)	-0.0490 (-1.3111)	0.0001* (4.3136)	-0.2051* (-6.3065)	0.9976	2495.00
72-73	-1.1325* (-13.5450)	-0.1054* (-2.2471)	0.0001* (6.4968)	-0.3204* (-10.3416)	0.9983	3326.67
74-75	-1.1990* (-25.9416)	-0.0094 (-0.3851)	0.0001* (14.5640)	-0.3460* (-15.7543)	0.9987	3330.00
76-77	-1.1273* (-11.8084)	-0.2427* (-3.4178)	0.0001* (9.6769)	-0.2964* (-6.1811)	0.9963	996.00
78-79	-1.1333* (-18.3622)	-0.1259* (-2.6844)	0.0001* (14.7275)	-0.3098* (-11.8755)	0.9993	4995.00
80-81	-1.1850* (-13.4796)	-0.0647 (-1.7831)	0.0001* (11.5407)	-0.3135* (-6.5787)	0.9977	1966.00
82-83	-1.0576* (-12.3763)	-0.2436* (-2.1459)	0.0001* (10.0492)	-0.2790* (-7.0707)	0.9996	9990.00
84-85	-1.1507* (-26.4745)	0.0108* (10.5065)	0.0001* (25.5007)	-0.3275* (-15.3049)	0.9993	3330.00
86-87	-1.0859* (-8.8874)	-0.0096 (-0.1733)	0.0001* (8.3060)	-0.3191* (-6.7718)	0.9987	1427.14

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE V.7

INVENTORY INVESTMENT : CROSS SECTION RESULTS (2SLS)

Dependent Variable : $\frac{IN(t)}{k(t-1)}$ (r=0,1,2)

Year	Constant	$\frac{\Delta S(t)}{S(t-1)}$	$\frac{\Delta S(t-1)}{S(t-2)}$	$\frac{\Delta S(t-2)}{S(t-3)}$	$\frac{RENT(t)}{k(t-1)}$	$\frac{RENT(t-1)}{k(t-2)}$	$\frac{RENT(t-2)}{k(t-3)}$	$\frac{FNDE(t)}{k(t-1)}$
68-69	0.0610*	0.0632*	0.0688*	0.1129*	1.0615*	-0.3839*	-0.3876*	1.1149*
	(2.9716)	(3.1919)	(3.7257)	(6.8549)	(29.8356)	(-6.1267)	(-5.5604)	(22.6374)
70-71	0.0637*	0.1046*	0.0709*	0.1236*	1.0101*	-0.2992*	-0.4388*	1.1131*
	(3.6261)	(5.9916)	(5.9054)	(7.8737)	(28.2497)	(-6.5470)	(-12.0010)	(27.5146)
72-73	0.0861*	0.0916*	0.0599*	0.1683*	1.1674*	-0.1879*	-0.4887*	1.1966*
	(3.1064)	(3.4322)	(4.4030)	(6.1065)	(19.7908)	(-2.8962)	(-13.1369)	(20.8242)
74-75	0.0937*	0.0701*	0.0762*	0.1659*	1.1000*	-0.3338*	-0.5455*	1.2852*
	(9.1046)	(6.5634)	(4.9820)	(15.3494)	(35.8804)	(-12.2570)	(-20.2366)	(50.2146)
76-77	0.0953*	0.0712*	0.0779*	0.1601*	1.0398*	-0.2838*	-0.5254*	1.2346*
	(4.1810)	(4.6449)	(6.7496)	(9.3269)	(22.7489)	(-8.3106)	(-6.9985)	(22.3825)
78-79	0.0690*	0.0524*	0.0674*	0.1150*	1.0412*	-0.3081*	-0.4684*	1.1584*
	(3.9474)	(3.9304)	(3.8503)	(8.1394)	(64.1774)	(-11.8047)	(-14.1887)	(28.7137)
80-81	0.0761*	0.0672*	0.0629*	0.1299*	1.0576*	-0.3177*	-0.4509*	1.2092*
	(3.9852)	(4.7996)	(4.5628)	(7.4134)	(48.6865)	(-13.0538)	(-13.0106)	(29.2736)
82-83	0.0945*	0.0665*	0.0530*	0.1397*	1.0091*	-0.3235*	-0.5494*	1.1927*
	(4.6400)	(7.0108)	(4.1232)	(6.2120)	(28.0595)	(-7.1606)	(-11.7960)	(20.4139)
84-85	0.0997*	0.0861*	0.1372*	0.1509*	1.0799*	-0.3555*	-0.5241*	1.3103*
	(4.8450)	(3.6853)	(6.3445)	(8.6757)	(17.1939)	(-9.8705)	(-5.6921)	(29.6119)
86-87	0.0872*	0.0509*	0.0422	0.1180*	1.1403*	-0.3144*	-0.4673*	1.1732*
	(3.7588)	(2.5004)	(1.8221)	(4.8633)	(20.1155)	(-5.9774)	(-7.8081)	(16.6192)

Table contd...

Table V.7 contd...

Year	$\frac{FNDE(t-1)}{k(t-2)}$	$\frac{FNDE(t-2)}{k(t-3)}$	$\frac{I(t)}{K(t-1)}$	ACF	$\frac{INS(t-1)}{k(t-1)}$	$\frac{INS(t)}{S(t)}$	R^2	F
68-69	-0.0093	-0.0233	-1.1508*	0.0126*	0.0003*	-0.3103*	0.9868	379.50
	(-0.7858)	(-1.5333)	(-9.1811)	(7.7132)	(4.4897)	(-5.1738)		
70-71	-0.0248*	-0.0171	-1.1088*	-0.0649	0.0002*	-0.2959*	0.9969	1534.00
	(-2.8559)	(-1.3429)	(-11.5704)	(-1.4954)	(5.8515)	(-6.5679)		
72-73	-0.0307	-0.0181	-1.2844*	-0.0992	0.0002*	-0.3743*	0.9968	958.75
	(-1.7669)	(-1.4133)	(-7.9444)	(-1.4829)	(5.5009)	(-5.3988)		
74-75	0.0035	0.0080	-1.4950*	0.0242	0.0029*	-0.4595*	0.9981	1920.00
	(0.5155)	(1.8970)	(-22.1867)	(0.7705)	(15.1061)	(-15.1994)		
76-77	-0.0105	0.0067	-1.3968*	-0.1591	0.0002*	-0.4212*	0.9956	766.00
	(-1.2852)	(0.6652)	(-9.8312)	(-1.8564)	(9.2029)	(-5.9884)		
78-79	-0.0133	0.0030	-1.2138*	-0.0860	0.0002*	-0.3348*	0.9984	1920.00
	(-1.6265)	(0.5742)	(-11.3058)	(-1.061)	(10.2762)	(-7.2423)		
80-81	-0.0060	0.0057	-1.3407*	-0.0328	0.0002*	-0.3948*	0.9976	1278.33
	(-0.7577)	(0.7924)	(-11.7907)	(-0.7866)	(10.8281)	(-6.8860)		
82-83	-0.0034	-0.0053	-1.3085*	-0.2907*	0.0002*	-0.3878*	0.9995	3845.00
	(-0.5043)	(-0.7137)	(-9.3203)	(-2.1582)	(9.6408)	(-5.8514)		
84-85	-0.0085	0.0150	-1.5771*	0.0157*	0.0003*	-0.4912*	0.9982	853.33
	(-0.0852)	(1.7199)	(-12.9734)	(6.7688)	(14.0859)	(-10.7634)		
86-87	-0.0021	0.0096	-1.2679*	0.0816	0.0002*	-0.4107*	0.9982	768.00
	(-0.1843)	(1.1782)	(-7.5541)	(0.9610)	(7.6048)	(-5.4809)		

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]

TABLE V.8

EXTERNAL FINANCE : CROSS SECTION RESULTS (2SLS)

Dependent Variable : $\frac{FNDE(t)}{k(t-1)}$

Year	Constant	$\frac{RENT(t)}{k(t-1)}$	$\frac{I(t)}{k(t-1)}$	$\frac{IN(t)}{k(t-1)}$	$\frac{NDE(t-1)}{k(t-1)}$	R^2	F
67-68	0.0142* (4.4734)	-0.9666* (-53.0784)	0.5060* (17.1662)	1.1499* (101.4467)	0.0220* (9.0552)	0.9986	9985.82
69-70	0.0175* (4.7751)	-0.9933* (-69.5263)	0.4841* (22.2054)	1.1940* (126.7506)	0.0161* (5.2953)	0.9984	9985.51
71-72	0.0127* (2.5306)	-1.0480* (-28.6730)	0.4279* (13.5130)	1.2049* (151.1753)	0.0238* (9.9747)	0.9982	6653.65
73-74	0.0037 (0.9951)	-0.9448* (-43.6027)	0.5348* (17.5767)	1.1468* (89.5691)	0.0235* (10.1381)	0.9985	6656.66
75-76	0.0066 (1.7391)	-1.0031* (-73.3399)	0.3886* (14.9067)	1.2000* (151.5723)	0.0237* (10.8706)	0.9981	9990.00
77-78	0.0092 (1.6725)	-1.0217* (-39.2300)	0.3560* (9.3417)	1.2051* (91.4384)	0.0217* (5.4547)	0.9979	3992.00
81-82	0.0007 (0.1425)	-0.9785* (-39.2625)	0.4527* (15.3714)	1.1799* (91.2929)	0.0223* (7.1575)	0.9989	6630.00
83-84	-0.0219 (-1.5704)	-1.0812* (-30.7217)	0.2792* (5.5118)	1.2566* (71.6950)	0.0231* (4.2022)	0.9974	2216.67
86-87	0.0012 (0.1064)	-1.1656* (-26.0270)	0.2711* (4.5759)	1.3300* (44.7171)	0.0106 (1.4571)	0.9952	9950.00

(* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.)

TABLE V.9

DIVIDENDS : CROSS SECTION RESULTS (2SLS)

Dependent Variable : $\frac{DIV(t)}{k(t-1)}$

Year	Constant	$\frac{FNDE(t)}{k(t-1)}$	$\frac{I(t)+IN(t)}{k(t-1)}$	$\frac{PAT(t)}{k(t-1)}$	$\frac{DIV(t-1)}{k(t-1)}$	R^2	F
66-67	-0.0016 (-0.5413)	0.0613* (3.0594)	-0.0747* (-3.6435)	0.0770* (3.6133)	0.8266* (13.0134)	0.7998	51.6129
68-69	0.0081* (3.3088)	0.1238* (2.9167)	-0.1236* (-2.7317)	0.1334* (3.7338)	0.7860* (9.8085)	0.7583	39.9210
70-71	0.0038 (1.1868)	-0.0321* (-2.5577)	0.0291* (2.1693)	-0.0117 (-1.1761)	0.7135* (10.4996)	0.7308	34.8095
74-75	0.0064* (2.9624)	0.0271 (0.8333)	-0.0233 (-0.6838)	0.0849* (2.5149)	0.2102* (3.1755)	0.5450	13.1325
76-77	0.0109* (3.2009)	0.1748* (2.3662)	-0.1666* (-2.2432)	0.2496* (4.0250)	0.8770* (3.4293)	0.4990	9.4151
78-79	0.0046 (1.8534)	-0.0169 (-0.9845)	0.0120 (0.6894)	-0.0061 (-0.4532)	0.5567* (7.7487)	0.6723	19.2143
80-81	0.0039 (0.9069)	0.0539 (1.0313)	-0.0541 (-1.0682)	0.7347 (1.6552)	1.3933* (5.0628)	0.4518	7.7265
82-83	0.0032 (0.8695)	-0.0136 (-0.5022)	0.1526 (0.5756)	-0.0013 (-0.0565)	0.7956* (6.0992)	0.5389	9.1356
84-85	0.0109* (3.1232)	0.0176 (0.9256)	-0.0223 (-1.2184)	0.0558* (2.3914)	0.5839* (3.2785)	0.6350	9.7692
86-87	0.0073* (2.1849)	-0.0330 (-0.9795)	0.0141 (0.4152)	0.0374 (1.2375)	0.4557* (4.1565)	0.7218	11.9339

[* indicates that the coefficient is significant at 5% level.
figures in the parentheses are t ratios.]