AN EMPIRICAL STUDY TO IDENTIFY PARAMETERS WHICH ARE IMPORTANT IN THE DETERMINATION OF DIVIDENDS BY PUBLICLY QUOTED COMPANIES

By

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DECLARATION

This project is my original work and has not been submitted for a degree in any other university.

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Date ---- 3rd Nov 1994 ----

This project has been submitted for examination with my approval as the university supervisor.

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ABSTRACT

Dividends are very important considerations for any individual seriously considering investing in a company. An investor invests in a company in the hope of receiving some form of financial gain, which would be in the form of dividends. It is this factor which makes dividends very important and thus the ultimate objective of any dividend policy pursued by the firm should be the maximization of its shareholder's wealth.

This study investigates the variables that determine dividends with the aim of identifying those which determine dividends among companies quoted on the Nairobi Stock Exchange.

A sample of thirty six companies is used to bring out the relationship between dividends and certain variables namely: profits, liquidity, investments, working capital and cashflows.

A regression of dividends against the five variables indicate that liquidity and working capital are very important variables in the determination of dividends among publicly quoted companies.

Certain companies revealed the presence of multicollinearity which was corrected by dropping collinear variables but the presence of liquidity and working capital was still strong. It is sad to note however that some companies do not take into account any of these five very important factors in the determination of dividends.

1.0 Chapter one: INTRODUCTION

1.1 BACKGROUND

The term dividend when used by itself is generally understood to mean a distribution of cash by a company to its stockholders. Dividends can be viewed as benefits derived from investing in a particular company. They are usually distributed in many other forms. For example:-

1. Property dividends- These are payable in assets or property other than cash. They are usually paid as securities of other companies.
2. Scrip dividends- These are paid in notes of a particular corporation. The notes bear interest and when a definite due date is stated are also negotiable.
3. Bond dividends- These are similar to scrip dividends except that the obligation assumes a longer maturity date.
4. Stock dividends- In relative importance stock dividends rank next to cash dividends.

Dividends are usually stated as a specific amount per share of capital as for example a dividend of Ksh. 1 per share.

Miller (1981) argued that to speak of a firms dividend policy is an incomplete sentence,it's like the old bit about the sound of one hand clapping,or a one sided coin. If a firm pays out a dividend which is a use of funds, something else in the sources and uses statement also has to change. He argued that if one held constant the firms capital budget- its investment spending - then paying out more dividends just means one will have to raise more funds from bank loans or outside flotations of bonds and stocks. Given Miller's argument then a firm's choice of

dividend policy given its investment policy is thus really a choice of financing strategy. The issue addressed here is really whether the firm chooses to finance its growth by relying more heavily on external sources of funds(and paying back some of those funds in higher dividends) or by cutting back those dividends and relying more heavily on internal funds.

A firm's decisions about dividends are often mixed up with other financing and investment decisions. Some firms pay low dividends because management is optimistic about the firms future and wishes to retain earnings for expansion. In this case the dividend is a by-product of the firms capital budgeting decision. Another firm might finance capital expenditures largely by borrowing,this releases cash for dividends. In this case the firm's dividend is a by product of the borrowing decision. The following definition by Brealey and Myers (1988) seeks to isolate dividend policy from other problems of financial management: they define dividend policy as " the trade-off between retained earnings on the one hand and paying out cash and issuing new shares on the other."

Miller and Modigiliani (1961) also caution students of finance not to confuse dividend policy with investment policy or with any other aspects of the firm that can obviously affect market value independently of dividend policy. To avoid this kind of confusion, MM chose to narrowly define dividend policy choice within a given firm as the choice from among alternative (stochastic) cash payout sequences that are consistent with a given (stochastic) sequence of net cash flows for the firm. Since net cash flows are affected by such things as investment policy

and taxes, this generally implies that "alternative" dividend policies in the MM sense are such that the sequence of changes in cash payouts involved in switching from one alternative to another are always financed by an identical sequence of changes in the dollar amount of equity financing.

A firm can also use its earnings to pay dividends to its stockholders, or it can use the funds for other purposes, such as retirement of debt or financing new investments. Management must decide on the amount or proportion of earnings to pay out as dividends and the amount to retain for the internal operations of the firm. The long run dividend policy of the firm can affect its financing program and capital budget and is therefore an important consideration for a financial manager. The importance of dividend policy has been aptly described by Weston and Brigham (1981)".....dividend policy determines the extent of internal financing by the firm. The finance manager decides whether to release corporate earnings from the control of the enterprise or not. Because dividend policy may affect such areas as the finance structure, the flow of liquid funds, corporate liquidity, stock prices and investor satisfaction, it is clearly an important aspect of financial management."

Dividend policy which is the decision to pay out earnings as dividends or to retain and invest them in the firm has three key elements:-

1. The fraction of earnings to be paid out on average over time or the target payout policy decision.
2. The firm has to decide whether it wants to maintain a constant dividend growth or to vary its dividend payments from year to

year depending on its internal needs for the funds on its cash flows.

3. The amount to pay as current dividends.

Several studies have focused on these three elements, for example, John Lintner (1956), where he observed that ".....with the exception of two companies which sought a relatively fixed percentage payout consideration of what dividends should be paid at any given time turned first and fore most in every case, on the question of just how large the change in dividends payments should be only after management had satisfied itself that a change in the existing dividend continued to be a central bench mark for the problem in managements' eyes."

1.2 Statement of the problem

Most of the studies on dividends have centered around the firm. This study seeks to examine dividend behaviour of firms quoted on the Nairobi Stock Exchange in general. The study will also examine the relationship between dividends and other parameters,namely, profits, liquidity, working capital, investment, cashflows, and current net income. A brief definition of the above terms is given below:-

1. Corporate liquidity- Liquidity will be defined in terms of the amount of short-term deposits, cash and bank borrowings.

2. Working capital- This is the excess of current assets over current liabilities. The relative amount of working capital is an indication of short-term financial strength.

3. Investment- Investment will be defined in terms of capital expenditure [New plant and equipment expenditures].

4. Cash flows - Profits minus taxes but including depreciation allowances.

5. Current net income - Gross profits minus taxes and depreciation.

1.3 Objectives of the study

The objective of this study is to identify those factors which are most important in the determination of dividends among kenyan firms.

1.4 Importance of the study

1. Researchers- Researchers who wish to study the area of dividends further will be made aware of the relationship between dividends and the other parameters for example cash-flows and profits.

2. Investors - Investors would be made aware of what actually determines dividends - If they favor high dividends they may wish to analyze the more important factors further and choose those favorable factors identified.

3. The public - The general public may wish to read the study to further their knowledge in the area of dividends.

2.0 Chapter two - Literature review

One of the earliest studies to be done in the area of dividends is a study by John Lintner (1956). After a careful review of both academic and non-academic literature on corporate financial policies, Lintner made a list of fifteen readily observable factors and characteristics that appeared to reflect or might be expected to have an important bearing on dividend payments and policy. He selected twenty eight well established companies for detailed investigation. He found some common features in the dividend policies of the twenty eight companies selected. With the possible exception of two companies which sought a relatively fixed percentage payout, consideration of what dividends should be paid at any given time turned first and foremost, in every case, on the question of whether the existing rate of payment should be changed. He studied companies for a period of seven years that is 1947-1953. There would be serious consideration of the second question of just how large the change in dividend payments should be only after management had satisfied itself that a change in the existing rate would be positively desirable.

The dependent variable in the decision making process according to Lintner's study is the change in the existing rate, not the amount of the newly established rate as such. The belief on the part of many managements that most stockholders prefer a reasonably stable rate and that the market puts a premium on stability or gradual growth rate were strong enough that most managements sought to avoid making changes in their dividends rates that might have to be reversed within a year or so. Thus

any reason which would lead management to decide to change an existing rate would be an important consideration in the determination of the amount of change. Some factors which meet this consideration are current net earnings, liquidity position, growth prospects of a particular industry,debts to be discharged,average cyclical movements of investment opportunities, working capital requirements and speed of adjustments of competitive companies. The most important of these factors was earnings. It was such an important factor that in cases where management lacking a signal from earnings had simply not sought out or brought out other pertinent data which might have favored a dividend change. Lintner developed a model which included only two of the observed factors, that is, past dividends and current earnings. The model is outlined below:-

$D_t = a + b_1 p_t + b_2 D_{t-1} + U_t$.

D_t = net dividends in year t.

p_t = net profits.

U_t = unexplained random error.

a, b_1, b_2..... constants.

The simplest rationale for the above model is that dividends depend directly on current net income but are also constrained by past dividends because of reluctance to cut dividends or to raise them to higher levels which may not be maintained. Lintner's model could explain twenty six out of the twenty eight companies studied.

Although Lintner's findings have been supported by subsequent empirical work by Fama and Babiak (1968), Petit (1972), and Watts (1973), he has also received a lot of criticism.

Most of the critics have stressed the aggregative character of the model and its failure to explain the target payout ratio itself. In his discussion of the model, Tarshis (1956) also commented that the " ability of this relatively simple formulation to "explain" dividends over a very long time span during which everything else in the economy changed was a ground for suspicion of the results rather than satisfaction."

Another study which has examined aggregate dividend behaviour is a study by Brittain (1966). The focus of this study was on two features of the tax structure- depreciation allowances and individual income tax rates and their impact on dividends. Brittain introduced the two tax variables as well as other explanatory variables such as working capital and investments . He suggested the hypothesis that cash flows (net earnings including depreciation) may influence dividends more strongly than either tax returns profits or company estimates based on unchanging depreciation formulas. The rationale for using cash flows is that firms may think of depreciation as a purely accounting charge not affecting their ability to pay, thus cash flows then becomes a source of funds to be allocated between dividends and retentions without taking account of depreciation.

The rationale for including individual tax rates to payout ratios is that the latter variable will tend to vary inversely with differential between tax rates on ordinary income and capital gains. The behavioural rationale underlying this hypothesis is that the payout ratio adopted by a board of directors is subject to either of the following two influences. One is that personal tax-saving possibilities of high income earners may be

recognised and directly pursued by the boards and secondly the preferences of high income (capital gains preferring) shareholders as expressed in the capital market by their relative demand for securities with different payout ratios may move board of directors to let payout lag when tax rates rise. Brittain found that the combined influence of depreciation allowances and tax rates increased the predictive ability of Lintner's model from 0.712 to 0.819.

Brittain then included investment variables such as new plant and equipment expenditures in the model but obtained negative results. The effects of corporate liquidity and working capital were also considered, the latter variable appears to have a positive (but statistically marginal) influence on dividends. One other factor which appears to be correlated with dividends is the change in sales especially the two year change suggested by Darling (1957). His argument was that this variable would give an indication of anticipated working capital needs. The sales change has a negative influence on dividends.

Studies by Fama and Babiak (1968) have applied Lintner's model to data for individual firms. The two researchers used a sample of 412 firms for the period 1947 - 1964. They adjusted Lintner's model to read as follows:-

$$D_{it} = a_1 + \beta_{1i} D_{i,\, t-1} + \beta_{2i} E_{it} + \beta_{3i} A_{it} + U_{it}$$

D_{it} = dividends per share paid by firm i during year t.

E_{it} = profits per share.

A_{it} = depreciation per share.

U_{it} = random disturbance term.

They divided the sample into two and used half the firms to

test their model and the other to validate it. They found lagged dividends and current profits to be important variables in explaining dividend changes. Thus their findings are in total support of Lintner's findings. On the other hand, they found adding depreciation to the net profit variable does not increase the predictive ability of the model, contrary to Brittain's findings.

Several studies have looked at the relationship between dividends and other parameters for example, external financing, investment, retained income, value of the firm etc. For example, the effect of a firm's dividend policy on the current price of its shares is a matter of considerable importance, not only to the corporate officials who must seek the policy but to investors planning portfolios and the economists seeking to understand and appraise the functioning of the capital markets. Miller and Modigiliani (1961) attempted to explain whether companies with generous distribution policies consistently sell out at a premium over those with niggardly payouts and if the reverse is true under what conditions. Assuming an ideal economy characterized by perfect capital markets, rational behaviour and perfect certainity, they found the current value of the firm to be independent of current dividend decision. MM also established that in a perfect capital market optimal investment decisions by a firm are independent of how such decisions are financed. In this case then, there should be no correlation between dividends and investment decisions. They defined perfect markets as a situation where no buyer or seller of securities is large enough for his transactions to have an appreciable impact on the then

ruling price.

Drhymes and Kutz (1967) propose a world in which because of capital markets imperfection, internal funds are a cheaper source of financing of the firm than new security issues and that dividends and investments are competing uses for limited internal funds. Moreover they hypothesize that firms not only allow investment decisions to affect dividend decisions but that the desire to pay reasonable dividends causes investment decisions to be affected by dividend decisions. Thus according to Drhymes and Kutz, there should be a high correlation between dividends and investments.

Drhymes and Kutz (1967) used a sample of 181 firms to examine the relations between investment, dividend and external finance behaviour of firms. They obtained data from balance sheets and income statements of individual firms appearing in various issues of Moody's manual. They stratified the sample through reclassification of firms into several industrial classifications e.g. transport, retail and trade stores, alcohol, tobacco and food, rubber, petroleum and chemical, machine tools, agricultural equipment, electrical equipment and appliances, building materials and equipments, textiles, pulp and paper products, mining and steel. They also classified the firms according to size. They developed three equations and used simultaneous equations technics to solve the equations. The equations are outlined below:-

$$D = g_1 (I, EFI, X_1, X_2 \ldots\ldots X_n) \ldots\ldots 1$$

$$I = g_2 (D, EFI, X_1, X_2 \ldots\ldots X_n) \ldots\ldots 2$$

$$EFI = g_3 (D, I, X_1, X_2 \ldots\ldots\ldots X_n) \ldots\ldots 3$$

Equation one is the dividend equation. EFI represents net external finance obtained by borrowing, I is investment in fixed assets, D is common dividends paid, $X_i \ldots\ldots\ldots X_n$ are predetermined variables may also include profits, depreciation, sales, long-term debt outstanding etc. From the dividend equation it is reasonable to suppose that dividend disbursals will depend on the rate of profit of the firm, its investment plans and external finance. The rationale for this last variable would be that external finance will enable the firm to carry out its planned dividend disbursals even when the rate of profit is low and investment programs extensive.

Equation two is the investment equation. Since dividend disbursals and investment outlays represent competing demands on the resources available to the firm, it would be quite plausible to suppose that the investment activities of the firm will be affected by its dividend activities.

Equation three is the external finance equation. One would expect to have this variable depend positively on investment, negatively on the market interest rate and negatively on depreciation and profits. The relationship of external finance to dividends is not very clear-cut. Thus it is possible to argue that essentially because of budgetary constraint, more dividends other things being equal mean more borrowing.

The main findings of Drhymes and Kutz are as follows:-

1. Strong interdependence is evident between the investment and dividend decisions.
2. There is compelling evidence to suggest that in estimating the

structure one ought to use full information methods.

The other study which has attempted to examine the relationship between dividends and other variables like investments, lagged profits etc. is a study by Fama (1974). He used the argument forwarded by Miller and Modigiliani, Drhymes and Kutz to examine empirically the extent to which the dividend and investment decisions of individual firms are interrelated. Thus using the models based on imperfect capital markets, Fama tested the proposition that there is a complete interdependence between the dividend and investment decisions of individual firms. He used annual financial statement information on 298 major industrial firms for the period 1946-68 as reported on compustat tapes of the standard statistics corporation for a 23 year period. The estimated dividend and investment regressions are of the general form

$$D_{it} = \beta_{1i} D_{i,t-1} + \beta_{2i} P_{it} + \beta_{3i} P_{i,t-1} + \beta_{4i} G_{it} + \beta_{5i} N_t + e_{it} \quad \ldots\ldots 1$$

$$K_{it} = a_{1i} K_{i,t-1} + a_{2i} Q_{it} \text{ (or } a_{21} P_{it} \text{)} + a_{3i} G_{it} + a_{4i} G_{i,t-1} + a_{5i} N_t + n_{it} \quad \ldots\ldots 2$$

$$K_{it} = a_{1i} K_{i,t-1} + a_{2i} Q_{it} + a_{3i} G_{it} + a_{4i} N_t + e_{it} \quad \ldots 3$$

Where the subscripts refer to firm i and year t and the variables are measured as

K_{it} = Net plant and equipment.

Q_{it} = Sales change measured in inventories.

P_{it} = Available for common = Net income - preferred dividends.

G_{it} = Depreciation.

N_t = Gross national product* 10^{-10}

Equation one which is the dividend equation uses the lagged profit term suggested by the results reported by Fama and Babiak (1968). It also includes the depreciation element in line with the "cashflow" dividend model of Brittain and the "internal funds" investment model of Drhymes and Kutz.

The initial task by Fama was to judge the power of various versions of the dividend and investment regressions (1-3) by comparing cross-section distributions of prediction errors. He found out that the two variable Lintner model (1956) does better than all the other dividend models. Thus depreciation, lagged profits and GNP do not in general help to explain the dividend decisions of individual firms. Even in the investment models, GNP and depreciation do not seem to be systematically important in explaining changes in capital stock. He also found no systematic evidence of interdependence in the year by year dividend and investment decisions by firms. This finding is in complete contradiction to the results of Drhymes and Kutz. He also found last period's dividend and last period's capital stock also important in explaining this period's investment.

Higgins (1972) seeked to derive and test a model of the dividend-saving decision for a shareholder of a wealth maximizing firm. He started working from the assumption that capital gains are superior to dividends as a source of shareholder income and that the optimal strategy for the shareholder wealth maximization enterprise is obviously to maximize share price appreciation relative to dividends. The implications of this assumption for the company's dividend, investment and financing policies are several. One of the implications is that a company should

establish a dividend policy which minimizes the use of external equity financing, because a dividend payment financed either directly or indirectly with new equity capital has the effect of substituting dividends for capital gains. In other words,dividends should be treated as a residual to be distributed if and only if, internal funds and accompanying borrowings are sufficient to finance all the firms investment needs. Additionally the maximization of share price appreciation implies that the company's investment decisions should be independent of its dividends and in particular investments promising yields in excess of the company's hurdle rate should not be forgone in favour of dividend payments.

Since, according to Higgins dividend paying firms should not employ external equity financing, the only source of equity capital available to the firm is retained earnings. Consequently a fixed relationship should exist between the optimal amount of net new borrowings per period and the amount of earnings retained. To test the propositions suggested above, Higgins used data for the years 1961, 1963 and 1965 from eight industries. The industries selected for their diversity and size were forest products, brewers, paper, chemicals,cement, steel, aerospace,and department stores.

Higgins used four cross section multiple regression tests and found a negative correlation between investments and dividends. He also found dividends to be independent of size. Industry dummy variables were added to the regression equations and contrary to Drhymes and Kutz (1967), Higgins results suggest that for the most part of the results industry variables are

insignificant. An attempt is made to include the possible effects of current asset and borrowing reserves or deficits on the dividend decision. These reserves or deficits can occur as a result of management errors in forecasting future cash flows. It was found that companies with surpluses, paid higher dividends and those with deficits paid lower dividends as the companies moved to an optimal payout.

The other study which has examined the relationship between dividends and other parameters is a study by Rozeff (1986) where he attempted to find out if there was some identifiable financial characteristics that clearly distinguished companies paying high dividends from those which had chosen to pay out smaller portions of their earnings. If that was the case he sought to find out if there were some distinguishing characteristics which influenced management choice of dividend policy. He used multiple regression to describe the relationship between dividends and three independent variables namely: external financing, financial leverage and agency costs.

As surrogates for transaction costs of a company's required external financing, Rozeff used two variables : the growth rate of the company's revenues over a five year period 1974-79), and value lines forecast of the growth of sales revenue over the next five years (1979-1984). The reasoning behind the choice of these variables is that if a company's past growth has been rapid, the generation of increased sales has probably required substantial new investments. In such a case a company would tend to retain funds in order to avoid external financing with its attendant costs, hence a company's pay- out ratio would be on average

negatively related to both past and predicted growth in revenues.

A natural surrogate for financial leverage is the company's index or "beta co-efficient" (the covariance of a company's total monthly stock returns with market wide returns). Companies with higher operating and financial leverage will also choose lower dividend payouts to reduce costs of external finance and thus a negative correlation between dividends and a company's betas should be expected.

Several studies, for example, Rozeff (1982), have argued that the role of higher dividends is to reduce the implicit loss in value associated with outside shareholder's loss of control over management decision. Therefore the larger the proportion of stock owned by outsiders, the higher the potential agency costs and thus the higher the expected level of dividends. Rozeff (1986) used the percentage of stock held by insiders as a negative surrogate for the level of agency costs of outside ownership. Companies with large proportion of inside ownership would have lower dividend payout ratios and vice-versa.

The results of Rozeff's statistical regressions provide strong support for the hypothesis made earlier, that is, all the proposed variables were strongly correlated (in the predicted direction) with dividend payout ratio. Higher past and forecast growth rates, higher proportional inside ownership,and higher betas were all strongly associated with lower dividend payout ratios.

Several studies have examined the relationship between a company's dividend payout and the industry it is in. Studies mentioned earlier by Rozeff (1986) and Higgins (1972) found no relationship between dividends and the industry. Another study

which shares the same views is a study by Kent, Farelly and Edelman (1985). The authors mentioned did a study across three industries namely: utilities, manufacturing, and wholesale/retail. They used Lintner's (1956) model to interview managers across these twenty firms. They found cash and a firms future earnings to be very important determinants of dividend policy. They failed to find any industry effects contrary to studies by McCabe (1979), Micheal (1979), Drhymes and Kutz (1967) who may have provided evidence that a company's industry may be an important determinant of dividend payout ratio. For example Drhymes and Kutz used a sample of 181 firms between 1947 1960 and they classified the firms according to various industrial classifications. They found out that firms in mining, textile, building and petroleum industries tend to pay higher dividends (per dollar sales) than firms in electrical appliances, agricultural equipment, beverages and retail industrial classifications.

Most of the studies mentioned above have been done in the U.S.A. or in Europe. Very few studies have examined the area of dividends from a Kenyan perspective. One of the most comprehensive studies done in Kenya is a study by Karanja (1987). He collected data through the use of a questionnaire and obtained information about the kind of dividend policies managers in quoted companies pursued. Most relevant to this study is that he obtained data on the major determinants of dividend policy in Kenya. He found three factors to be most important. The first is cash and liquidity position, followed by current and prospective profitability and lastly the company's level of distributable

reserves. He also observed that the foreign controlled company's have more liberal dividend policies than locally controlled ones. This study seeks to statistically ascertain Karanja's findings and conclude for example whether there is any relationship between dividends and liquidity and if there is determine to what extent liquidity determines dividend policy.

Most of the other studies in the area of dividends have examined the relationship between dividends and the price of shares or the value of the firm. There is still a lot of controversy as to whether dividends affect value or not. One very interesting study which has tried to solve this puzzle is a study on the Citizen Utilities company by Long Jnr. (1978). Since 1956 the company has had two classes of common stock which are virtually identical in all respect except dividend payout. One class pays only stock dividends and the other class pays only cash dividends and the corporate charter requires that the dividends per share on the two classes be of equivalent value. Thus the price dividend history of the Citizens Utilities shares provides a view of the effects of alternative payout policies. A close examination of this history implies that if anything, claims to cash dividends have commanded a slight premium in the market over claims to equal amounts of capital gains.

The above finding by Long (1978) is inconsistent with the hypothesis that investors are indifferent to the form (cash or capital gains) of the after tax returns on their investment portfolios. Due to the dominance of cash dividends it is only the relationship between cash dividends and other parameters which will be examined.

3.0 Chapter Three :Research Design

3.1 The population

The population under study was made up of all companies quoted on the Nairobi Stock Exchange as of December 1992. From this population a sample of companies which have been continuously quoted for eight years (1984-1991) was drawn. This left a sample of 36 companies. A period of eight years was chosen because the researcher considers that period to be adequate time for any relationship if it exists between dividends and a certain parameter to be detected. This time period has been used by researchers such as Higgins (1972), Rozeff (1986) and Kent, Farelly and Edel (1985). This study was limited to quoted companies due to lack of readily available data among private companies as well as lack of time to wait for the data to be made available by the private companies. (a list of the companies studied can be found on appendix 1)

3.2 Data collection procedure

Secondary data was utilized for the purpose of this study. Data was extracted from the financial reports of the companies which fall under the chosen sample. The financial reports of the sample companies were obtained from the secretariat of the Nairobi Stock Exchange. The following data was extracted :-

1. liquidity
2. working capital
3. capital expenditure
4 Cash flows
5. current net income

3.3 Data analysis

Regression analysis was used to analyze data for each company . Regression techniques provide means of establishing quantitative associations between variables. It is important to note that regression analysis can not be used to establish a cause and effect relationship between a dependent variable Y and an independent variable X. Confirmation of cause and effect relationship is beyond the power of regression analysis.

In this study, the dependent variable is the dividend and the five independent variables are liquidity, cashflows, profits, investments and working capital which have been clearly defined. Thus the regression analysis will only uncover an association between dividends and the predictor variables. The multiple regression model will take the form:-

$$Y_j = \beta_o + \beta_1 X_{ij} + \ldots\ldots\ldots \beta_k X_{kj} + e_j$$

where :-

Y_j is a typical value of Y, the dependent variable from the population of interest.

β_o, $\beta_1 \ldots\ldots \beta_k$ are the population partial regression coefficients.

X_{1j}, $X_{2j}, \ldots\ldots X_k$ are the observed values of the independent variables X_1, X_2, and X_k respectively.

Once the regression equation has been obtained significance tests have to be conducted so as to identify those parameters which are most important in the regression model. Normally when conducting significance tests the following hypothesis are set :

$$H_0 = \beta_1 = 0$$

$$H_A = \beta_1 = 0$$

The student t-value will be used to determine whether to accept or reject the null hypothesis. If β_1 is equal to zero it indicates that X_1 (which could be any of the independent variables) does not make a significant contribution to the ability to estimate the dependent variable. N-2 degrees of freedom at the 95% level of confidence will be used to obtain the critical t-values.

3.3.1 Model Fitness

Since the objective of regression analysis is for the regression line to account for as much as possible for total variation, the sum of squares done on the regression must be substantial in comparison to the sum of squares due to error. Two methods will be used to determine model fitness in this research:-

1. Co-efficient of determination (R^2)

R^2 is a relative measure of the degree of linear association between predictor variables and response variables. It measures the proportion of variation of observations about their mean that is attributed to the estimated regression line. Normally R^2 is greater than or equal to zero and less than or equal to one ($0 > r^2 < 1$) Ideally we would like to have an R^2 of equal to 1 because then all variations in the observations would have been explained by the regression equation. The closer R^2 is to one the higher is the degree of association between predictor variables and the response variables.

2. Analysis of variance (Anova) or F- test .

Anova provides a method of testing the the following hypothesis:-

$H_0 = \beta_1 = \beta_2 = \beta_3 \ldots\ldots \beta_k = 0$

$H_A = \beta_1 = 0$ for some 1,2,3,.... k.

If $Y = \beta_0 + \beta_1 X_1 + \beta_k X_k \ldots\ldots\ldots + e$

Anova tells us that at least one variable is significant. That is at least one of the variables is different from zero. The calculated value of F has to be large enough to reject the null hypothesis. The F has to be larger than the critical F-values obtained from the tables using n-(k-1) degrees of freedom at the 95% level of significance.

3.3.2 Evaluation of Aptness of the Model

The approach to regression analysis should never be simply to maximize R^2 or perform anova but the underlying assumptions of regression analysis should be checked in establishing the suitability (aptness) of the calculated regression equation. Some of the common problems in regression analysis and which will be addressed in this research include:-

1. Autocorrelation

This problem occurs when observation Y at different points of observation x are correlated with each other. Thus the assumption $cov(Y_i Y_j) = cov(E_i, E_j) = 0$ for all $U_i = j$ is violated. If autocorrelation is present the regression analysis is affected among other things. For example confidence intervals and the test of hypothesis involving either T or F

distributions are no longer valid and the least squares estimators though still unbiased no longer have the minimum variance and thus are not efficient. Autocorrelation can be detected through the analysis of residuals. This can be done through the Durbin Watson statistic.

2. Multicollinearity

The problem of multicollinearity occurs when a high correlation exists between the two or more predictor variables. Multicollinearity severely affect the LS estimators. The inherent instability of multicollinearity is reflected in imprecise regression coefficients that would vary widely from sample to sample. It can be detected by way of a correlation matrix. The problem of multicollinearity can be corrected by adding more observations points to the collinear variables. This tends to lessen the severity of the correlation. The problem with this solution is that more points may not be available. The other solution is to delete one or more collinear variables, thereby reducing the variability of the estimated regression coefficient of the remaining variables.

4.0 Chapter four: Data Analysis and Findings

A summary of regressions on individual companies is shown below :-

Coy Code	Sector	$T_{0.05,\ N-2}$ Significant variables	r^2 adjusted	f ratio	comment
2	Agriculture	All variables are significant	0.996	410.5	good
12	"	All variables are significant	0.898	13	reject low - power
20	"	All variables are significant except profits	0.6188	3.3	reject low power
25	"	All variables are significant except working capital	0.992	177	good
26	"	profits & liquidity are significant	0.949	27.3	good
28	"	profits only are significant	0.974	53.3	good
1	finance & investment	all variables are insignificant	0.784	7.4	bad low power
7	"	all variables are insignificant	0.968	44.5	good
11	"	liquidity only is significant	0.941	23.3	good
23	"	all significant except working capital	0.995	299	good
34	"	all variables are significant	0.9828	81.3	good
35	"	none are significant	0.865	9.97	bad

coy	sector	$T_{0.05,n-2}$ significant variables	R^2 adjust.	f-ratio	comment
36	finance & investment	working capital & liquidity are significant	0.978	64.6	good
3	industrial & allied	all are significant except investments	0.999	6742	good
4	"	liquidity only is significant	0.930	19.7	good
8	"	all variables are significant	0.999	1431	good
9	"	all variables are significant	0.997	674	good
10	"	none of the variables are significant	0.1411	1.2	bad low power
13	"	none of the variables are significant	0	1	bad low power
15	"	working capital, liquidity, investment are significant	0.954	30.2	good
17	"	cash flows, profits, working capital significant	0.944	25	good
19	"	none of the variables are significant	0.811	7.0	reject model
29	"	"	0.506	2.43	"
30	"	"	0.699	4.25	"
31	"	"	0.349	1.75	"
5	"	Liquidity	0.957	32	good
18	"	none of the variables	0	0.6	bad
6	commercial&services.	working capital, liquidity &investment are significant	0.910	15.25	reject
14	"	none of the variables	0.253	1.47	"
16	"	"	0	1	"

coy code	sector	significant variables	r-adjus	f-ratio	comment
21	commercial sevices	none of the variables are significant.	0.275	2	reject
22	"	All are significant except profits.	0.999	1659	Good
24	"	Working capital and Liquidity	0.979	1294	Good
27	"	"	0.92	17.46	Good
32	"	None are significant	0.957	33	"
33	"	all are significant except profits	0.893	13	reject

Coy represents company.

Note: Models termed as good are those with high R^2 percentages and are acceptable given the critical F- value at 19.3. The full results of the analysis can be found in appendix 2.

4.1 Discussion of regression results

The tabulations above bring out several important observations. The data fitting results can be described as good in the sense that the models have high predictive ability with twenty-one out of the thirty six companies under study with a coefficient of determination of above 0.90. This r^2 implies that 90% of the variations have been explained by the variables. Companies with r^2 of over 0.90 present 60% of the companies under study. Twenty-five of the companies have a coefficient of determination of over 0.80. This represents approximately 70% of the companies studied.

The F test as mentioned earlier can also be used to test model fitness. The F-test can be used to confirm the existence

of a relation- ship between the dependent variable and all the independent variables considered collectively. In this case the critical F was found to be 19.30 at 95% level of confidence. Nineteen models were found to be very fit when examined from a general perspective i.e. with all the variables at once.

Tests of significance were carried out for all the variables studied using the student t - test at the 95% level of significance with n - 2 degrees of freedom (2.447). Profits were found to be significant in twelve companies, cashflows in twelve companies, working capital in seventeen companies, liquidity in twenty companies and investments in eleven companies. The companies were grouped into four sectors. The groupings are those used by the daily Newspapers. The following group results were observed:-

Agriculture

This sector has eight main companies without considering the subsidiaries. A total of six companies had models with a coefficient of determination of above 0.850. Four of the companies had F-ratios suggesting overall fitness. The models in this sector perform very well when subjected to the t-test of significance. The two companies with r^2 of over 0.98 had all the variables as being significant and with very high F-values. The other two models with r^2 of over 0.90 did not perform very well. In one of them (company 26) only two variables were significant and in company 28 only profits were significant although the ratios indicate overall fitness. These two companies were identified for further investigation, the results will be discussed in section 4.3.(pg.36). One company with an r^2

of 0.898 and an unacceptable F ratio had all variables as being significant an indication that the variables identified by the researcher play a significant role in the determination of dividends in this sector. Even the company with a low r^2 of 0.6188 had four variables as very significant. Overall, the models in this sector were very impressive with most of the factors playing an important role.

Finance and Investment

This sector currently has thirteen companies listed in the Nairobi Stock Exchange (NSE). A total of seven companies were studied under this sector. Six out of the seven models had a coefficient of determination of over 0.85. Five out of the seven companies passed the F-test for overall model fitness. Of the five fit-models two performed very well when subjected to the t-test of significance. All the variables were found to be significant. The other three models which had passed the F-test performed very poorly with one of them (Company 7) having no variable identified as significant and yet it had an r^2 of 0.968. The other two had two and one variables respectively being significant (Company 36 and 11). These companies together with company 35 were identified for further investigation. Overall liquidity seems to be the most important variable identified in this sector. The other variables identified by the researcher do not seem to be important in this sector although approximately half of the companies were studied.

Industrial and Allied

The above sector currently has a total of seventeen companies listed at the NSE. Fourteen companies were studied by the researcher (82%). Eight of the fourteen companies had r^2 of over 80%. Seven companies passed the F-test. The models with r^2 of over 90% (7 Companies) performed well when subjected to the t-tests. Three of them had all the variables as being very significant in the determination of dividends. Two had three variables as being significant. The other two (5&19) companies did not perform well with only one variable as being significant and they were marked for further investigation. The company which performed very badly was Company 19 which had r^2 of 0.81 and none of the variables as being significant. The other six models had very poor predictive ability with none of the variables identified as being significant an indication that they do not consider these variables in the determination of dividends. The results in this sector can be termed as fair.

Commercial and services

The above sector currently has a total of thirteen companies quoted on the NSE. Nine companies were studied by the researcher (70%). Six companies had models with r^2 of over 85%. Four out of the six companies passed the F-test. Models in this category performed well with most of them having at least three variables as being significant. Two models for company 24 and 32 were identified for further investigation because of the fact that they had r^2 of 0.95 and yet company 32 had no variable identified

as significant . This seemed odd considering the fact that company 33 had an r^2 of 0.894 and yet it had four significant variables. Three companies (14, 16, 21) had models with very poor results with r^2 of less than 30%. In general working capital and liquidity seem very important variables in this category with them being identified as significant in most of the companies. Correction of the results in this sector as will be seen in the next section indicate that the variables performed very well in this sector with most of them identified as significant variables.

4.2 Model Aptness: Analysis of residuals

The approach to regression analysis should never be simply to maximize r^2 or perform anova but the underlying assumptions of regression analysis should be checked in establishing the suitability (aptness) of the calculated regression equation. As was evidenced from the tabulations of the regression results some companies had very high r^2 and yet none of the variables were identified as being significant although the models had passed the F-test. The first step the researcher took in solving this drawback was to analyze the residuals and test for the presence of autocorrelation using the Durbin Watson statistic. A summary of the analysis of the residuals plus the Durbin Watson statistic are shown below:-

Company code	Sector	Coefficient of Skewness	Coefficient of Kurtosis	Durbin Watson Statistic.
2	Agriculture	0.10	2.31	2.474
12	"	0.17	1.71	3.156
20	"	0.41	2.64	1.868
25	"	1.48	4.43	2.249
26	"	-0.75	2.20	1.793
28	"	-0.110	1.71	2.056
	Finance & investment			
1	"	-0.253	2.50	2.43
7	"	-0.553	3.13	1.72
11	"	-0.205	2.17	2.43
23	"	-0.392	1.49	2.36
34	"	0.27	3.5	2.40
35	"	-0.44	2.3	2.31
36	"	-0.48	3.77	3.187
	Industrial and Allied.			
3	"	1.3058	4.07	2.42
4	"	-0.33	2.81	2.45
8	"	0.78	3.87	2.87
9	"	-0.85	3.9	2.04
10	"	-1.24	3.9	2.93
13	"	-0.70	2.26	2.23
15	"	0.12	1.60	2.21
17	"	0.32	3.07	2.53
19	"	0.46	1.85	1.58
29	"	-0.78	2.12	2.41
30	"	0.41	1.85	1.88
31	"	0.09	2.39	2.70
5	"	-1.42	4.05	2.36
18	"	0.86	4.02	2.73
	Commercial and Services			
6	"	-0.957	3.75	2.49
14	"	-0.272	2.41	2.29
16	"	-0.59	3.21	3.173
21	"	0.57	2.10	2.60
22	"	0.10	2.39	3.40
24	"	-0.25	2.39	2.45
27	"	-0.05	2.61	2.38
32	"	-1.005	2.49	2.87
33	"	0.02	1.98	2.40

Full results of the analysis of residuals can be found in appendix 3

From the tabulations above, it can be seen that the residuals closely follow a normal curve. In a normal distribution, the coefficient of skewness is usually 0 and the coefficient of kurtosis is usually 3. The models do not also seem to suffer from autocorrelation. As a rule of the thumb [Gujarati, 1988], if the Durbin Watson statistic is found to be 2 in an application, one may assume that there is no 'first' order autocorrelation, either positive or negative. The closer the durbin watson statistic is to 4, the greater the evidence of negative serial correlation. These two findings confirm that two of the fundamental assumptions of the regression modelling are satisfied. This means that the above mentioned problems are not severely affecting the prediction of the models and are thus ruled out.

Model aptness can also be affected by multicollinearity. In cases of high collinearity between two or more variables, it is possible to find one or more of the partial slope coefficients are individually statistically insignificant on the basis of the t- test. Yet r^2 in such situations may be so high, say in excess of 0.90, that on the basis of the F-test, one can convincingly reject the hypothesis that $\beta_2 = \beta_3 = 0$. Insignificant t - values, with high overall r^2 and F - test is one of the signals of multicollinearity. Solving the problem of multicollinearity is very difficult as there is no statistically proven method to deal with this situation. Most of the solutions are through trial and errors. For example, one of the solutions suggested earlier was to drop one of the collinear variables from the regression model,

yet this might lead to committing a specification bias or error. This kind of error occurs when a researcher drops a variable which had been very significant in explaining a certain parameter as evidenced by the literature. Thus a researcher becomes biased against certain variables. The other solution frequently used is to add more data points to the model which in this case, the researcher was unable to do due to time constraints and other structural issues. Thus the former solution was adopted.

Several companies in the sample exhibited symptoms of multicollinearity and were identified for further investigation. The summary results are tabulated below:-

Coy code	Sector	Significant Var. before Correction	Significant var. after Correction	r^2 a.c	F after a.c
26	Agriculture	Profits and liquidity	Same variables are still significant	0.87	13
28	"	Profits only	Profits &liquidity	0.97	73
4	Indust & All	Liquidity only	Same results	-	-
5	"	Liquidity only	Liquidity&cashflow	0.966	52

NOTE:_ Indust & All represent the Industrial and Allied sector. Significant Var represents Significant variables.

coy code	sector	significant var. before correction	significant var. after correction	r^2 a.c	f-ratio a.c
19	Indus& All	None	Same results		
32	Commer-cial& service	None	Cashflow, working capital and investments	0.92	23
24	"	Working capital & Liquidity.	working capital & liquidity	0.999	16,923
7	Finance invest-ment	None are sign.	Cashflows and liquidity	0.97	75:03
1	"	"	Same results		
11	"	Liquidity only	"		
35	"	none are significant	working capital & investments	0.9	8.6
36	"	working capital & liquidity	Cashflows, working capital & liquidity	0.985	120.8

Note: AC means after correction. Coy represents company. Full results can be found in appendix 4

4.3 Discussion of the corrected results.

Companies in the commercial and services sector performed very well after solving the problem of multicollinearity. From the correlation matrix of company 32 [Appendix 3], it can be seen that profits are very highly correlated with cashflows. Profit was removed from the model and this made three variables significant, yet there were none which were significant earlier. For company 24, profit was highly correlated with all the other variables and when it was not included in the model, three variables were significant.

From the corrected results, it seems that profits was not a significant variable in this sector.

In the agricultural sector, company 26 and 28 were affected. The correlation matrix of company 26 shows that profits and cash flows were highly correlated and when cash flows were dropped from the model, this made liquidity significant.

Models in the Industrial and Allied sector did not improve even after the corrections. One company (number 7) in the finance sector greatly improved when profits were dropped from the model. This made two variables significant where initially there were none which were significant. Working capital and investments were also found to be significant in company 35 after dropping profits from the model.

5.0 Chapter five: Conclusions, Limitations and Recomendations for further research

5.1 Conclusions

With respect to the objectives set out in chapter one this, study has established the following:-

1. An analysis of the residuals, shows that, on the whole, the regression model assumptions are valid. Thus the results are valid within the framework of regression analysis.

2. When the models have been corrected for multicollinearity the following generalizations can be made:-

i). Liquidity seems to be a very important variable among firms quoted on the Nairobi Stock Exchange. Liquidity was found to be significant in 23 firms (64% of the sample). This result is in complete agreement with the study done by Karanja (1987) where he found liquidity topping the list of significant factors identified by managers of firms quoted on the NSE.

ii). Working capital is also a very important variable. It was found significant in 19 firms (53% of the sample). This result is not surprising considering that working capital is a measure of short term financial strength and so is liquidity,so there is a likelihood of the managers considering this factor in unity with liquidity.

iii).Cashflows were found to be significant in fifteen companies. This finding supports an earlier study by Brittain (1966) where he indicated that profits might be overshadowed by cashflows as a determinant of dividends.

iv). Profits were found to be significant in twelve companies . This is not unexpected given the fact that research has shown that managers are reluctant to cut dividends no matter

how low their profits are. Some companies paid dividends even when they made losses. So profits might only be significant when managers are considering increasing dividends.

(V) Investments - This variable was found to be significant in thirteen companies. There is alot of controversy on whether investment is a significant variable as far as determination of dividends is concerned. Researchers like Fama (1974), Miller (1986) have brought forward strong evidence suggesting no relationship between dividends and investments. The number of companies showing investments as a significant variable are not enough for the researcher to make any constructive conclusion.

3. Profits does not seem to be a significant variable in the commercial and services sector. None of the nine companies studied in this sector identified profits as an important variable in the determination of dividends. Working capital and liquidity are very important variables in this sector with them being reported as significant in all the nine companies studied. All the variables identified seem to be significant in the Agriculture sector but they do not seem to be influential explanatory variables in the finance and investment sector where the explanatory power of most of the variables was minimal.

5.2 Limitations of the study

The study was constrained due to difficulty in obtaining more data points. More data points increases the degrees of freedom and thus more flexibility. The data was done over a period of eight years with five variables thus as far as the F-test is concerned there were only two degrees of freedom. This

factor makes it very difficult to include more variables in the model because degrees of freedom will be negative. Thus the more years studied the better the predictive ability of the modal.

Some models especially in the Finance & Investment sector performed very poorly. Data from this sector was very difficult to come by, thus only seven companies out of thirteen companies were included in the sample, may be that could be one of the reasons for the poor performance of the models in this sector.

Studies in the area of dividends indicates general dissatisfaction with the performance of regression models especially in cases where the aim of the study is to identify significant variables like it is in this case. Regression models suffer from various deficiencies and in most cases no satisfactory statistical measures have been identified to correct those deficiencies. For example the models in this study seem to be severely affected by multicollinearity which the researcher tried to eliminate by dropping one of the collinear variables. The poor performance of the other models could be due to heteroskedesticity.

The researcher used a sample of thirty six firms which is quite small to make any generalizations across industries. this sample cannot be used to generalize other companies not quoted on the Nairobi Stock Exchange, thus the variables identified are tentative suggestions of the variables that determine dividends among Kenyan firms.

5.3 Recommendations for further research

For purposes of further research more variables which determine dividends can be identified, The models in the finance and investment sector may be poor due to the lack of one or more influential predictor variables. Thus other variables which determine dividends based on studies done locally should be identified further.

The variables identified in this study can be tested on companies not quoted on the Nairobi Stock Exchange. The additional information thus identified plus the results of this study can comfortably be used to make generalizations for firms in Kenya.

Due to the severe shortcomings of regression models, researchers have recently tried to use other models for example, simultaneous equation technics can be used to explain various relationships between dividends and variables such as investment.

Dividends for other years not used by the researcher can be used to validate the model. That is the identified variables can be obtained and see if they can be used to determine dividends accurately.

List of Appendices

Appendix 1: Company Codes and Classification

Company Code	Company	Sector
2	Brooke Bond	Agriculture
12	Limuru Tea	"
25	George Williams	"
26	OL - Pajeta ranch	"
28	Sasini	"
20	Kapchoria Tea Co.	"
6	A. Baumann & Co.	Commercial Services
14	African Tours & Hotels	"
16	Car and General	"
21	Kenya Hotels	"
22	Consolidated Holdings	"
27	Pearl Drycleaners	"
24	National Printers	"
33	C.M.C Holdings	"
1	Credit Finance Co.	Finance & Investment
7	Kenya Finance Co.	"
11	Diamond Trust	"
23	Pan African Insurance	"
34	Chancery Investments	"
35	Barclays	"
36	ICDC	"

Company Code	Company	Sector
3	BAT	Industrial & Allied
4	Dunlop	"
5	Bamburi	"
8	Kenya Power & Lighting	"
9	Kenya National Mills	"
10	Kenya Oil Co.	"
13	Unga Group	"
15	E. A. Cables	"
17	E. A. Oxygen	"
18	Carbacid Investment	"
19	Kenya Breweries	"
29	E. A. Portland	"
30	Kenya Orchards	"
31	Total Kenya	"

APPENDIX TWO: RESULTS OF REGRESSIONS

MODEL FITTING RESULTS

T = 95

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB. (T)
CONSTANT	1922.999627	572.295624	3.3601	.0121
X11	-0.493771	1.309949	-.3770	.7174
X12	0.379089	1.176197	.3223	.7566
X13	0.000255	0.002635	.0969	.9255
X14	0.000776	0.006626	.1172	.9100

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

X15 not used since it is same for all the years.

Use F10 to Quit. Cursor keys or Page Number: . Page 1.1 of 1.1

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SAT MAY 22 1993 05:51:00 PM VERSION 1.1 REC:OFF

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB. (F)
MODEL	9462532.1	4	2115633.0	7.4	.1
ERROR	862489.40	3	287496.47		
TOTAL (CORR.)	9325021.5	7			

R-SQUARED = 0.907508

R-SQUARED (ADJ. FOR D.F.) = 0.784185

STND. ERROR OF EST. = 536.187

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SAT MAY 22 1993 05:51:00 PM VERSION 1.1 REC:OFF

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	48517.264706	1.080165E4	4.4917	.0028
X21	-3.832684	0.155525	-24.6435	.0000
X22	4.060566	0.153161	26.5119	.0000
X23	0.046252	0.008907	5.1926	.0013
X24	0.533473	0.039534	13.4941	.0000
X25	-10.304786	1.727462	-5.9653	.0006

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor Keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SAT MAY 22 1993 05:54:00 PM VERSION 1.1 RECOFF

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB(>F)
MODEL	1.1901E0011	5	2.3802E0010	4.1051E0002	2.4318E-003
ERROR	1.1596E0009	2	5.7982E0007		
TOTAL (CORR.)	1.1913E0011	7			

R-SQUARED = 0.999027
R-SQUARED (ADJ. FOR D.F.) = 0.996593
STND. ERROR OF EST. = 7614.61

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SAT MAY 22 1993 05:55:00 PM VERSION 1.1 RECOFF

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(|T|)
CONSTANT	3.91438185	2.30884484	16.9539	.0000
X31	13.186941	0.656329	20.0920	.0000
X32	-10.688104	0.540901	-19.7927	.0000
X33	-3.037915	0.118172	-25.7076	.0000
X34	1.261494	0.054302	23.2311	.0000
X35	-0.087123	0.109605	-.8022	.4499

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor Keys or Page Number: Page 1.1 of 1.1

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SAT MAY 22 1993 05:57:00 PM VERSION 1.1 RECTUFY

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB > F
MODEL	5.1733E0010	5	1.0347E0010	6.7429E0003	1.4829E-004
ERROR	3063372.6	2	1534436.3		
TOTAL (CORR.)	5.1736E0010	7			

R-SQUARED = 0.999941
R-SQUARED (ADJ. FOR D.F.) = 0.999792
STND. ERROR OF EST. = 1238.72

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SAT MAY 22 1993 05:57:00 PM VERSION 1.1 RECTUFY

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	71.452513	211.096077	3.6546	.0061
X41	-0.316385	0.270182	-1.1709	.2799
X42	0.320757	0.272809	1.1758	.2791
X43	0.046705	0.013786	3.3880	.0116
X44	-0.00837	0.010287	-.8137	.4426
X45	-0.131554	0.12868	-1.0208	.3413

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit, Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 05:59:00 PM VERSION 1.1 RECORD

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB(>F)
MODEL	909394.08	5	181878.82	19.72	.05
ERROR	18447.917	2	9223.959		
TOTAL (CORR.)	927842.00	7			

R-SQUARED = 0.980117
R-SQUARED (ADJ. FOR D.F.) = 0.930411
STND. ERROR OF EST. = 96.0414

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 06:00:00 PM VERSION 1.1 RECORD

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB. (T>t)
CONSTANT	-940.33385	924.606618	-1.0176	.3428
X1	-0.137541	0.21645	-.6354	.5453
X2	0.790733	0.562191	1.4065	.2024
X3	-0.227607	0.39959	-.5701	.5804
X4	0.277664	0.108723	2.5539	.0379
X5	0.932672	2.220115	.3751	.7182

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F1= to Quit. Cursor Keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 PREVIEW 100UIT
INPUT SAT MAY 22 1993 06:02:00 PM VERSION 1.1 RECORD

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB. (F>f)
MODEL	19226549	5	3845309	32	0
ERROR	237672.14	2	118836.07		
TOTAL (CORR.)	19464215	7			

R-SQUARED = 0.987789
R-SQUARED (ADJ. FOR D.F.) = 0.957262
STND. ERROR OF EST. = 344.726

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 PREVIEW 100UIT
INPUT SAT MAY 22 1993 06:02:00 PM VERSION 1.1 RECORD

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	-57.763741	37.594162	-1.8025	.1145
X61	-0.624206	0.355064	-1.7583	.1221
X62	0.624172	0.354971	1.7584	.1221
X63	-0.019483	0.002559	-7.2224	.0002
X64	0.097603	0.034092	2.8629	.0242
X65	0.459709	0.155418	2.9579	.0212

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor Keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SAT MAY 22 1993 06:03:00 PM VERSION 1.1 REC:OFF

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB(>F)
MODEL	19930.132	5	3986.026	15.250	.063
ERROR	522.74299	2	261.37149		
TOTAL (CORR.)	20452.875	7			

R-SQUARED = 0.974442
R-SQUARED (ADJ. FOR D.F.) = 0.910546
STND. ERROR OF EST. = 16.167

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SAT MAY 22 1993 06:04:00 PM VERSION 1.1 REC:OFF

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB. (T)
CONSTANT	-1.30658124	1.73473684	-.7532	.4759
X71	0.676805	1.430176	.4732	.6594
X72	-1.352396	2.023717	-.6683	.5254
X73	0.039109	0.09589	.3974	.7029
X74	0.167648	0.140588	1.1925	.2719
X75	-0.023054	0.09191	-.2508	.8091

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F1= to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVE 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 06:05:00 PM VERSION 1.1 RECORD

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB. (F)
MODEL	2.1199E0009	5	4.2397E0007	4.4542E0001	2.2102E-002
ERROR	1903663.7	2	951843.3		
TOTAL (CORR.)	2.1399E0009	7			

R-SQUARED = 0.9911
R-SQUARED (ADJ. FOR D.F.) = 0.963849
STND. ERROR OF EST. = 975.625

Press ENTER to continue.

1HELP 2LABEL 3SAVE 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 06:06:00 PM VERSION 1.1 RECORD

```
                        MODEL FITTING RESULTS

VARIABLE                 COEFFICIENT  STND. ERROR    T-VALUE   PROB(|T|)

CONSTANT                -2709.101975   392.071497    -7.0906      .0002
X1                         -0.165394     0.004333   -38.1721      .0000
X2                          0.180112     0.003915    46.0063      .0000
X3                          0.019146     0.000776    24.6628      .0000
X4                         -0.025312     0.001948   -12.9971      .0000
X5                          0.031216     0.001337    23.3551      .0000

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS
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Use F10 to Quit. Cursor keys or Page Numbers:                    Page 1.1 of 1.1
 1HELP   2LABEL  3SAVE  4RECORD 5       6       7       8       9REVIEW 10QUIT
INPUT    SAT MAY 22  1993 06:10:00 PM  VERSION 1.1                      REC:0/0
```

```
                ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE              SUM OF SQUARES     DF  MEAN SQUARE    F-RATIO     PROB(F)
MODEL                1.329580E+009      5 2.659160E+008 1.431180E+003 6.934E-004
ERROR                   371990.431      2   185995.216
TOTAL (CORR.)        1.329952E+009

R-SQUARED = 0.999721
R-SQUARED (ADJ. FOR D.F.) = 0.999022
STND. ERROR OF EST. = 431.297

Press ENTER to continue.
```

```
 1HELP   2LABEL  3SAVE  4RECORD 5       6       7       8       9REVIEW 10QUIT
INPUT    SAT MAY 22  1993 06:11:00 PM  VERSION 1.1                      REC:0/0
```

```
                        * MODEL FITTING RESULTS
-------------------------------------------------------------------------------
VARIABLE                  COEFFICIENT   STND. ERROR     T-VALUE   PROB. > |T| >
-------------------------------------------------------------------------------
CONSTANT                 13011.3e0696   393.82127      33.0995       .0000
X1                           0.471185    0.021239      21.2529       .0000
X2                          -0.140356    0.015216      -9.2242       .0000
X3                          -0.033906    0.001827     -18.5599       .0000
X4                           0.0:5941    0.001776       3.3451       .0123
X5                          -0.003648    0.000552      -6.6056       .0002
-------------------------------------------------------------------------------
0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS
```

```
Use F10 to Quit. Cursor keys or Page Number:                    Page 1.1 of 1.1
 1HELP   2LABEL  3SAVSC  4RECORD 5       6       7       8       9REVIEW 10QUIT
INPUT    SAT MAY 22  1993 06:12:00 PM  VERSION 1.1                    RECOFF
```

```
-------------------------------------------------------------------------------
                ANALISIS OF VARIANCE FOR THE FULL REGRESSION
-------------------------------------------------------------------------------
SOURCE              SUM OF SQUARES     DF  MEAN SQUARE     F-RATIO     PROB> F>
MODEL                 3.7717200009      5 7.5433800007 6.7412E0002 1.48192-003
ERROR                   223796.72       2   111898.36
-------------------------------------------------------------------------------
TOTAL (CORR.)         3.7739800009      7         .

R-SQUARED = 0.999407
R-SQUARED (ADJ. FOR D.F.) = 0.997924
STND. ERROR OF EST. = 334.512

Press ENTER to continue.
```

```
 1HELP   2LABEL  3SAVSC  4RECORD 5       6       7       8       9REVIEW 10QUIT
INPUT    SAT MAY 22  1993 06:13:00 PM  VERSION 1.1                    RECOFF
```

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(|T|)
CONSTANT	-353.615135	1998.505529	-.1672	.8568
X101	-0.529027	0.299364	-1.7672	.1205
X102	0.51776	0.291526	1.7760	.1190
X103	0.072304	0.032115	2.2514	.0591
X104	-0.00017	0.001139	-.1492	.8856
X105	-0.011613	0.122443	-.0948	.9271

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor Keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 9 9REVIEW 10QUIT
INPUT SAT MAY 22 1993 06:15:00 PM VERSION 1.1 REC:OFF

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB(F)
MODEL	7036776.3	5	1407355.3	1.2	.5
ERROR	2288245.2	2	1144122.6		
TOTAL (CORR.)	9325021.5	7			

R-SQUARED = 0.754612
R-SQUARED (ADJ. FOR D.F.) = 0.141143
STND. ERROR OF EST. = 1069.64

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 9 9REVIEW 10QUIT
INPUT SAT MAY 22 1993 06:16:00 PM VERSION 1.1 REC:OFF

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB. (T)
CONSTANT	19910.005485	4062.042408	4.9015	.0018
X11	-1.300629	2.085265	-.6237	.5526
X12	1.444591	2.028345	.7122	.4994
X13	-0.022093	0.006057	-3.8127	.0066
X14	-0.003792	0.02316	-.1637	.8746
X15	-0.050384	0.240904	-.2097	.8399

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 PREVIEW 100UIT

INPUT SAT MAY 22 1993 06:45:00 PM VERSION 1.1 RECORD

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB. (F)
MODEL	1.8823E0008	5	3.7645E0007	2.3394E0001	4.1499E-002
ERROR	3218317.8	2	1609158.8		
TOTAL (CORR.)	1.9144E0008	7			

R-SQUARED = 0.983189
R-SQUARED (ADJ. FOR D.F.) = 0.941152
STND. ERROR OF EST. = 1269.53

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 PREVIEW 100UIT

INPUT SAT MAY 22 1993 06:46:00 PM VERSION 1.1 RECORD

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	5262.008035	757.965235	6.9423	.0002
X121	-8.335427	1.664945	-5.0064	.0016
X122	8.369092	1.668403	5.0162	.0015
X123	-1.99394	0.519	-3.8419	.0064
X124	2.712381	2.161411	1.2549	.2498
X125	-2.355299	0.659233	-3.5728	.0091

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit, Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9RE"IEW 10QUIT
INPUT SAT MAY 22 1993 06:47:00 PM VERSION 1.1 REC:OFF

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB(>F)
MODEL	19106645	5	3821329	13	0
ERROR	573354.90	2	286677.45		
TOTAL (CORR.)	19680000	7			

R-SQUARED = 0.970866
R-SQUARED (ADJ. FOR D.F.) = 0.898031
STND. ERROR OF EST. = 535.423

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9RE"IEW 10QUIT
INPUT SAT MAY 22 1993 06:48:00 PM VERSION 1.1 REC:OFF

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                              MODEL FITTING RESULTS
-------------------------------------------------------------------------------
VARIABLE                  COEFFICIENT  STND. ERROR    T-VALUE     PROB(>|T|)
-------------------------------------------------------------------------------
CONSTANT                  10360.680087  1.87419E4       .5529        .5976
X131                          0.027962    0.03455       .8093        .4450
X132                         -0.066379    0.154947     -.4284        .6812
X134                          0.020391    0.099777      .2044        .8429
X135                         -0.014284    0.089941     -.1588        .8783
X133                          0.027987    0.149176      .1876        .8565
-------------------------------------------------------------------------------
0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS


Use F10 to Quit. Cursor keys or Page Number:                    Page 1.1 of 1.1
 1HELP   2LABEL  3SAVSC  4RECORD 5       6       7       8       9PREVIEW 10QUIT
INPUT    SAT MAY 22  1993 06:49:00 PM  VERSION 1.1                    REC:OFF
-------------------------------------------------------------------------------
                ANALYSIS OF VARIANCE FOR THE FULL REGRESSION
-------------------------------------------------------------------------------
SOURCE              SUM OF SQUARES     DF   MEAN SQUARE    F-RATIO     PROB(>F)
MODEL                     13528945      5      2705789          1            1
ERROR                    9783738.9      2    4891869.4
-------------------------------------------------------------------------------
TOTAL (CORR.)             23312684      7

R-SQUARED = 0.580326
R-SQUARED (ADJ. FOR D.F.) = 0
STND. ERROR OF EST. = 2211.76

Press ENTER to continue.


 1HELP   2LABEL  3SAVSC  4RECORD 5       6       7       8       9PREVIEW 10QUIT
INPUT    SAT MAY 22  1993 06:50:00 PM  VERSION 1.1                    REC:OFF
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MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	401.508484	217.959425	1.9421	.1080
X141	-0.002466	0.001465	-1.6836	.1361
X142	-0.134312	0.070722	-1.8992	.0993
X143	-0.059717	0.029862	-1.9997	.0857
X144	0.000107	0.000064	1.6596	.1410
X145	0.025216	0.012252	2.0580	.0786

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 06:51:00 PM VERSION 1.1 REC:OFF

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB(>F)
MODEL	297.36768	5	59.47354	1.47519	.45109
ERROR	80.632316	2	40.316158		
TOTAL (CORR.)	378.00000	7			

R-SQUARED = 0.786687
R-SQUARED (ADJ. FOR D.F.) = 0.253404
STND. ERROR OF EST. = 6.3495

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 06:52:00 PM VERSION 1.1 REC:OFF

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	2965.103596	4918.275069	.6029	.5656
X151	1.115567	1.627071	.6856	.5150
X152	-1.5129	1.703229	-.8883	.4039
X153	0.260605	0.052204	4.9920	.0016
X154	-0.133043	0.063425	-2.0976	.0741
X155	2.769354	1.132494	2.4453	.0444

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 06:53:00 PM VERSION 1.1 REC:OFF

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB(>F)
MODEL	1.3928E0008	5	2.7856E0007	3.0259E0001	3.2299E-002
ERROR	1841179.6	2	920589.8		
TOTAL (CORR.)	1.4112E0008	7			

R-SQUARED = 0.986953
R-SQUARED (ADJ. FOR D.F.) = 0.954335
STND. ERROR OF EST. = 959.474

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 06:54:00 PM VERSION 1.1 REC:OFF

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB>|T|
CONSTANT	40691.186903	3.397856E4	1.1973	.2702
X161	3.666038	2.973935	1.2327	.2575
X162	-3.619696	3.041164	-1.1903	.2727
X163	-0.254898	0.258921	-.9845	.3577
X164	-0.063258	0.047451	-1.3331	.2242

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SAT MAY 22 1993 06:56:00 PM VERSION 1.1 REC:OFF

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB>F
MODEL	14725946	4	3681336	1	1
ERROR	15265776	3	5088592		
TOTAL (CORR.)	29991122	7			

R-SQUARED = 0.49099
R-SQUARED (ADJ. FOR D.F.) = 0
STND. ERROR OF EST. = 2255.79

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SAT MAY 22 1993 06:57:00 PM VERSION 1.1 REC:OFF

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	24268.148547	4204.115644	5.7725	.0007
X171	-1.236627	0.190268	-6.4994	.0003
X172	0.114654	0.043596	2.6299	.0339
X173	0.467364	0.08817	5.3007	.0011
X174	0.016221	0.024587	.6598	.5305
X175	-0.113576	0.125282	-.9066	.3949

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 9 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 06:59:00 PM VERSION 1.1 REC:OFF

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB(>F)
MODEL	32550396	5	6510077	25	0
ERROR	520344.e3	2	260172.31		
TOTAL (CORR.)	33070731	7			

R-SQUARED = 0.984266
R-SQUARED (ADJ. FOR D.F.) = 0.94493
STND. ERROR OF EST. = 510.071

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 9 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 06:59:00 PM VERSION 1.1 REC:OFF

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	1327.170201	1592.103593	.9336	.4320
X181	0.312947	0.7694	.4067	.6963
X182	-0.089574	0.348484	-.2570	.8045
X183	-0.021601	0.146816	-.1471	.8972
X184	0.003756	0.158006	.0239	.9817
X185	-0.045523	0.096648	-.4710	.6520

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 07:01:00 PM VERSION 1.1 REC:OFF

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB(>F)
MODEL	1223433.7	5	244686.7	.6	.7
ERROR	834811.19	2	417405.60		
TOTAL (CORR.)	2058244.9	7			

R-SQUARED = 0.594406
R-SQUARED (ADJ. FOR D.F.) = 0
STND. ERROR OF EST. = 646.069

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 07:01:00 PM VERSION 1.1 REC:OFF

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	1811.167156	9774.539724	.1853	.8593
X191	0.29582	0.226947	1.3035	.2336
X192	0.121415	0.093351	1.3006	.2346
X193	0.080053	0.070884	1.1294	.2960
X194	-0.247996	0.207098	-1.1975	.2701
X195	-0.048021	0.043476	-1.1045	.3059

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 07:03:00 PM VERSION 1.1 REC:OFF

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB>F
MODEL	3.0252E0009	5	6.0504E0008	7.0397E0000	1.2904E-001
ERROR	1.7190E0008	2	9.5948E0007		
TOTAL (CORR.)	3.1971E0009	7			

R-SQUARED = 0.946234
R-SQUARED (ADJ. FOR D.F.) = 0.811819
STND. ERROR OF EST. = 9270.79

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 07:04:00 PM VERSION 1.1 REC:OFF

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	-5300.461324	2467.330569	-2.1493	.0688
X201	0.557005	0.362708	1.5357	.1685
X202	1.487984	0.465004	3.1999	.0151
X203	0.4838	0.191764	2.5229	.0396
X204	-0.264308	0.097011	-2.7245	.0296
X205	-73.017305	25.250017	-2.8918	.0233

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit, Cursor keys or Page number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 07:05:00 PM VERSION 1.1 REC:OFF

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB(>F)
MODEL	6402365.4	5	1280573.1	3.3	.3
ERROR	782556.60	2	391278.30		
TOTAL (CORR.)	7185422.0	7			

R-SQUARED = 0.891091
R-SQUARED (ADJ. FOR D.F.) = 0.619819
STND. ERROR OF EST. = 625.522

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 07:06:00 PM VERSION 1.1 REC:OFF

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STD. ERROR	T-VALUE	PROB. (T)
CONSTANT	60776.089745	7.5364324	1.80e4	.4465
X211	-3.341625	4.642905	-.7199	.1949
X212	-0.241049	1.033622	-.2340	.9217
X213	-0.239241	0.541997	-.4303	.6799
X214	-0.352929	0.2781e1	-1.2694	.2452
X215	-2.356058	2.679919	-.8792	.4085

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F1= to Quit. Cursor keys or Page number: Page 1.1 of 1.1

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT

INPUT SAT MAY 22 1993 10:21:00 PM VERSION 1.1 RECTOR

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB. > F
MODEL	5917.2419	5	1.1834484	2	.0
ERROR	23259469	2	11629234		
TOTAL (CORR.)	1.1243E0008	7			

R-SQUARED = 0.793193

R-SQUARED (ADJ. FOR D.F.) = 0.275959

STD. ERROR OF EST. = 3410.17

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT

INPUT SAT MAY 22 1993 10:24:00 PM VERSION 1.1 RECTOR

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	3511.631243	100.252174	35.0289	.0000
X221	-0.00033	0.000504	-.6554	.5931
X222	0.124102	0.003477	35.6900	.0000
X223	0.04343	0.002448	17.7441	.0000
X224	0.084729	0.002223	38.1207	.0000
X225	0.150293	0.007243	20.7538	.0000

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor keys or Page number: Page 1.1 of 1.1

1HELP 2LABEL 3SHOSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SAT MAY 22 1993 10:26:00 PM VERSION 1.1 REC:00

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB>F
MODEL	24610487	5	4922097	1659	0
ERROR	5934.0633	2	2967.0317		
TOTAL (CORR.)	24616422	7			

R-SQUARED = 0.999759

R-SQUARED (ADJ. FOR D.F.) = 0.999156

STND. ERROR OF EST. = 54.4705

Press ENTER to continue.

1HELP 2LABEL 3SHOSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SAT MAY 22 1993 10:26:00 PM VERSION 1.1 REC:00

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STD. ERROR	T-VALUE	PROB. (T)
CONSTANT	2017.502389	160.208507	12.5930	.0000
X231	0.137094	0.02235	6.1299	.0005
X232	-0.062215	0.012432	-5.0046	.0016
X233	-0.000097	0.003839	-.0251	.9806
X234	-0.022015	0.007594	-2.8989	.0230
X235	0.000256	0.00005	5.1256	.0014

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit, Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 10:29:00 PM VERSION 1.1 RECORD

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB. (F)
MODEL	36131328	5	7226266	299	0
ERROR	48359.223	2	24179.611		
TOTAL (CORR.)	36179688	7			

R-SQUARED = 0.998663
R-SQUARED (ADJ. FOR D.F.) = 0.995322
STND. ERROR OF EST. = 155.498

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 10:29:00 PM VERSION 1.1 RECORD

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	-17.406476	91.519233	-.1902	.8546
X241	-0.05947	0.063845	-.9315	.3926
X242	0.120336	0.103376	1.1931	.2717
X243	0.089491	0.017363	5.1542	.0013
X244	0.012898	0.0012	10.7401	.0000
X245	0.021433	0.030101	.7120	.4995

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor Keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 10:29:00 PM VERSION 1.1 REGION

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB(>F)
MODEL	1.8905E0009	5	3.7809E0008	1.2941E0005	7.7273E-006
ERROR	5843.3071	2	2921.6536		
TOTAL (CORR.)	1.8905E0009				

R-SQUARED = 0.999997
R-SQUARED (ADJ. FOR D.F.) = 0.999989
STND. ERROR OF EST. = 54.0523

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 10:30:00 PM VERSION 1.1 REGION

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(|T|)
CONSTANT	8499.019961	1352.414075	6.2843	.0024
X251	0.495231	0.12687	3.9035	.0059
X252	-0.380547	0.115435	-3.2966	.0132
X253	0.056696	0.054313	1.0439	.3312
X254	0.193621	0.019638	9.8596	.0002
X255	-0.186597	0.043799	-4.2627	.0037

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 10:31:00 PM VERSION 1.1 REGION

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB(F)
MODEL	25679991	5	5135796	177	0
ERROR	57986.914	2	28993.457		
TOTAL (CORR.)	25736968	7			

R-SQUARED = 0.997747
R-SQUARED (ADJ. FOR D.F.) = 0.992114
STND. ERROR OF EST. = 170.275

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 10:32:00 PM VERSION 1.1 REGION

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	425.937198	120.661103	3.5300	.0096
X261	0.197923	0.085164	2.3240	.0531
X262	-0.162403	0.088677	-1.8314	.1097
X263	0.003437	0.002753	1.2481	.2521
X264	-0.04723	0.009013	-5.2400	.0012
X265	0.000132	0.000963	.1369	.8950

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVE 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 10:33:00 PM VERSION 1.1 REGION

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB>F
MODEL	631912.45	5	126382.49	27.30	.04
ERROR	9259.4299	2	4629.7145		
TOTAL (CORR.)	641171.88	7			

R-SQUARED = 0.985559
R-SQUARED (ADJ. FOR D.F.) = 0.949455
STND. ERROR OF EST. = 68.042

Press ENTER to continue.

1HELP 2LABEL 3SAVE 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 10:34:00 PM VERSION 1.1 REGION

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB. > |T|
CONSTANT	1099.302543	76.361821	14.3960	.0000
X271	0.266633	0.314588	.8476	.4247
X272	-0.23818	0.194276	-1.2260	.2598
X273	0.154099	0.062718	2.4570	.0437
X274	-0.159727	0.04052	-3.9419	.0056
X275	-0.017377	0.00875	-1.9861	.0874

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use PIU to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SHOSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SAT MAY 22 1993 10:35:00 PM VERSION 1.1 REGION

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB > F
MODEL	35041.079	5	7008.216	17.460	.055
ERROR	802.79570	2	401.39785		
TOTAL (CORR.)	35843.875	7			

R-SQUARED = 0.977603
R-SQUARED (ADJ. FOR D.F.) = 0.92161
STND. ERROR OF EST. = 20.0349

Press ENTER to continue.

1HELP 2LABEL 3SHOSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SAT MAY 22 1993 10:36:00 PM VERSION 1.1 REGION

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STD. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	-1.364139E4	7465.438717	-1.8273	.1404
X281	0.544327	0.182497	2.9827	.0204
X282	0.217159	0.253665	.8561	.4209
X283	0.003284	0.005619	.5845	.5772
X284	0.149123	0.183921	.8109	.4442
X285	0.229984	0.223912	1.0275	.3383

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor Keys or Page Number: Page 1.1 of 1.1
 1HELP 2LABEL 3SAVSO 4RECORD 5 6 7 8 PREVIEW QUALIT
INPUT SAT MAY 22 1993 10:37:00 PM VERSION 1.1 RECOR

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB(>F)
MODEL	1.055DE0009	5	2.109992E0008	5.353E0001	1.84395E-002
ERROR	7892979.2	2	3941489.6		
TOTAL (CORR.)	1.062DE0009	7			

R-SQUARED = 0.992583
R-SQUARED (ADJ. FOR D.F.) = 0.974041
STND. ERROR OF EST. = 1985.32

Press ENTER to continue.

 1HELP 2LABEL 3SAVSO 4RECORD 5 6 7 8 PREVIEW QUALIT
INPUT SAT MAY 22 1993 10:37:00 PM VERSION 1.1 RECOR

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB. (T)
CONSTANT	15956.639316	1.6e0022E4	.9612	.3685
X291	-0.740129	0.461148	-1.6050	.1525
X292	0.356595	0.353823	1.0078	.3471
X293	-0.250106	0.102603	-2.4376	.0449
X294	-0.272163	0.307772	-.8843	.4059
X295	215.589047	235.657117	.9148	.3907

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor keys or Page number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVE 4RECORD 5 6 7 8 9 PREVIEW 10QUIT
INPUT SAT MAY 22 1993 10:39:00 PM VERSION 1.1 REGION

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB. (F)
MODEL	1.0e76B0008	5	2.13518D007	2.437280000	3.16098-001
ERROR	17521250	2	8760625		
TOTAL (CORR.)	1.2e28B0008	7			

R-SQUARED = 0.859014
R-SQUARED (ADJ. FOR D.F.) = 0.50655
STND. ERROR OF EST. = 2959.84

Press ENTER to continue.

1HELP 2LABEL 3SAVE 4RECORD 5 6 7 8 9 PREVIEW 10QUIT
INPUT SAT MAY 22 1993 10:39:00 PM VERSION 1.1 REGION

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STD. ERROR	T-VALUE	PROB. (T)
CONSTANT	486.966501	521.729254	.9372	.3799
X301	-0.096607	0.1419	-.6809	.5179
X302	-0.30335	0.431069	-.7037	.5043
X303	-0.041355	0.106969	-.3866	.7105
X304	-0.009237	0.032332	-.2857	.7834
X305	0.092255	0.047226	1.9535	.0917

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1

 1HELP 2LABEL 3SAVE 4RECORD 5 6 7 8 9DELETED 10QUIT

INPUT SAT MAY 22 1993 10:41:00 PM VERSION 1.1 RECORD

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB.(F)
MODEL	9364.3934	5	1872.8787	4.2585	.2010
ERROR	795.66656	2	392.83328		

TOTAL (CORR.) 10160.0000

R-SQUARED = 0.9141135

R-SQUARED (ADJ. FOR D.F.) = 0.693472

STND. ERROR OF EST. = 19.82

Press ENTER to continue.

 1HELP 2LABEL 3SAVE 4RECORD 5 6 7 8 9DELETED 10QUIT

INPUT SAT MAY 22 1993 10:41:00 PM VERSION 1.1 RECORD

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	9870.065972	1.9200384	.5141	.6229
X311	-0.159974	0.123229	-1.2982	.2354
X312	0.155047	0.159861	.9699	.2644
X313	-0.009001	0.031949	-.2817	.7862
X314	0.028913	0.020063	1.4409	.1928
X315	-0.005711	0.022839	-.2500	.8097

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit, Cursor Keys or Page Number: Page 1.1 of 1.1

1HELP 2LABEL 3SHOW 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 10:42:00 PM VERSION 1.1 REGION

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB(>F)
MODEL	1.0779E+008	5	2.1558E+007	1.7521E+000	4.0189E-001
ERROR	24601582	2	12300791		
TOTAL (CORR.)	1.3238E+008	7			

R-SQUARED = 0.814165
R-SQUARED (ADJ. FOR D.F.) = 0.349577
STND. ERROR OF EST. = 3507.25

Press ENTER to continue.

1HELP 2LABEL 3SHOW 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 10:43:00 PM VERSION 1.1 REGION

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	2527.005009	1689.835023	1.4954	.1795
X321	0.614825	0.347296	1.7703	.1200
X322	-0.155421	0.162872	-.9543	.3717
X323	-0.007159	0.013406	-.5340	.6099
X324	0.042948	0.045972	.9560	.3709
X325	-0.066612	0.082026	-.8145	.4422

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SAT MAR 22 1993 10:44:00 PM VERSION 1.1 REGION

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB(>F)
MODEL	65392819	5	13078564	33	0
ERROR	798857.85	2	399428.92		
TOTAL (CORR.)	66191677	7			

R-SQUARED = 0.987931
R-SQUARED (ADJ. FOR D.F.) = 0.957759
STND. ERROR OF EST. = 632.004

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SAT MAR 22 1993 10:44:00 PM VERSION 1.1 REGION

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB. (T)
CONSTANT	-7917.786713	1804.994345	-4.3866	.0032
X331	-0.123394	0.05395	-2.0932	.0746
X332	0.114137	0.030068	3.7959	.0068
X333	0.060497	0.008967	6.7467	.0003
X334	0.006207	0.002228	2.7858	.0271
X335	-0.345307	0.074334	-4.6454	.0024

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SAT MAY 22 1993 10:46:00 PM VERSION 1.1 RECON

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB. F>
MODEL	10288136	5	2057627	33	0
ERROR	619737.87	4	154934.93		
TOTAL (CORR.)	10907874	9			

R-SQUARED = 0.959859

R-SQUARED (ADJ. FOR D.F.) = 0.894505

STND. ERROR OF EST. = 393.63

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SAT MAY 22 1993 10:46:00 PM VERSION 1.1 RECON

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	1130.701456	97.169667	11.6364	.0000
X341	1.039361	0.239989	4.3309	.0034
X342	-0.743024	0.229726	-3.2344	.0144
X343	0.004687	0.001685	2.7818	.0272
X344	0.123126	0.053243	2.3125	.0540
X345	-0.033884	0.003939	-8.6045	.0001

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1

1HELP 2LABEL 3SAVE 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SAT MAY 22 1993 10:47:00 PM VERSION 1.1 EDIT

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB > F
MODEL	537706.95	5	107541.39	81.39	.01
ERROR	2643.0547	2	1321.5274		
TOTAL (CORR.)	540350.00	7			

R-SQUARED = 0.995109
R-SQUARED (ADJ. FOR D.F.) = 0.99288
STND. ERROR OF EST. = 36.3528

Press ENTER to continue.

1HELP 2LABEL 3SAVE 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SAT MAY 22 1993 10:49:00 PM VERSION 1.1 EDIT

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	-4.61546684	6.41304484	-.7197	.4950
X351	0.176919	2.034169	.0870	.9331
X352	0.450988	1.893116	.2382	.8185
X353	-0.211027	0.117841	-1.7908	.1164
X354	-0.005603	0.053652	-.1044	.9198
X355	0.091095	0.045737	1.9917	.0967

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SHOW 4RECORD 5 6 7 9 9REVIEW 10QUIT
INPUT SAT MAY 22 1993 10:50:00 PM VERSION 1.1 RECIPE

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB(>F)
MODEL	1.1446E0010	5	2.2892E0009	9.9789E0000	9.3592E-002
ERROR	4.5381E0009	2	2.2940E0008		
TOTAL (CORR.)	1.1905E0010	7			

R-SQUARED = 0.96186
R-SQUARED (ADJ. FOR D.F.) = 0.86513
STND. ERROR OF EST. = 15146.1

Press ENTER to continue.

1HELP 2LABEL 3SHOW 4RECORD 5 6 7 9 9REVIEW 10QUIT
INPUT SAT MAY 22 1993 10:51:00 PM VERSION 1.1 RECIPE

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	8526.686963	1551.709656	5.4950	.0009
X361	0.010751	0.163168	.0659	.9493
X362	-0.115446	0.150771	-.7657	.4689
X363	0.077607	0.017124	4.5321	.0027
X364	0.220547	0.023645	9.3273	.0000
X365	-0.024223	0.013584	-1.7832	.1177

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 2.1
1HELP 2LABEL 3SAVE 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 10:52:00 PM VERSION 1.1 RECON

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB(>F)
MODEL	3.6036E0008	5	7.2072E0007	6.4619E0001	1.5209E-002
ERROR	2230703.9	2	1115351.9		
TOTAL (CORR.)	3.6259E0008	7			

R-SQUARED = 0.993848
R-SQUARED (ADJ. FOR D.F.) = 0.979468
STND. ERROR OF EST. = 1056.1

Press ENTER to continue.

1HELP 2LABEL 3SAVE 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SAT MAY 22 1993 10:53:00 PM VERSION 1.1

APPENDIX THREE: CORRELATION MATRIX AND ANALYSIS OF RESIDUALS

	1.00000	.99472	-.27033	.76587	.00000
	.99472	1.00000	-.17163	.81925	.00000
	-.27033	-.17163	1.00000	.35940	.00000
	.76587	.81925	.35940	1.00000	.00000
	.00000	.00000	.00000	.00000	.00000

Press ENTER to continue.

CORRELATION MATRIX

	X21	X22	X23	X24	X25
X21	1.00000	.96754	-.43655	.78107	.14359
X22	.96754	1.00000	-.48894	.75568	.31424
X23	-.43655	-.48894	1.00000	-.41616	-.41514
X24	.78107	.75568	-.41616	1.00000	-.02205
X25	.14359	.31424	-.41514	-.02205	1.00000

Use F10 to Quit, Cursor keys or Page Number: Page 1.1 of 1.1

1HELP 2LABEL 3SAVE 4RECORD 5 6 7 8 9 9REVIEW 10QUIT

INPUT SUN MAY 23 1993 05:27:00 PM VERSION 1.1 SELECT

NUMBER OF RESIDUALS = 9

SAMPLE MEAN = 2.546592E-11

SAMPLE VARIANCE = 1.655664E7

SAMPLE STANDARD DEVIATION = 4070.19

COEFF. OF SKEWNESS = 0.18865 STANDARDIZED VALUE = 0.217824

COEFF. OF KURTOSIS = 2.31216 STANDARDIZED VALUE = -0.397126

DURBIN-WATSON STATISTIC = 2.47443

Press ENTER to continue.

1HELP 2LABEL 3SAVE 4RECORD 5 6 7 8 9 9REVIEW 10QUIT

INPUT SUN MAY 23 1993 05:27:00 PM VERSION 1.1 SELECT

CORRELATION MATRIX

	X31	X32	X33	X34	X35
X31	1.00000	.99732	-.82482	.54861	.86596
X32	.99732	1.00000	-.82881	.59017	.87512
X33	-.82482	-.82881	1.00000	-.17625	-.93131
X34	.54861	.59017	-.17625	1.00000	.37673
X35	.86596	.87512	-.93131	.37673	1.00000

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT

INPUT SUN MAY 23 1993 05:38:00 PM VERSION 1.1 REC:OFF

NUMBER OF RESIDUALS = 8
SAMPLE AVERAGE = 2.92857E-10
SAMPLE VARIANCE = 438410
SAMPLE STANDARD DEVIATION = 662.126
COEFF. OF SKEWNESS = -1.30587 STANDARDIZED VALUE = -1.50789
COEFF. OF KURTOSIS = 4.07424 STANDARDIZED VALUE = 0.62021
DURBIN-WATSON STATISTIC = 2.42962

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 9 9REVIEW 10QUIT

INPUT SUN MAY 23 1993 05:49:00 PM VERSION 1.1 REC:OFF

```
NUMBER OF RESIDUALS = 8
SAMPLE AVERAGE = 1.56319E-13
SAMPLE VARIANCE = 2635.42
SAMPLE STANDARD DEVIATION = 51.3363
COEFF. OF SKEWNESS = -0.332131    STANDARDIZED VALUE = -0.383512
COEFF. OF KURTOSIS = 2.81939    STANDARDIZED VALUE = -0.104281
DURBIN-WATSON STATISTIC = 2.45309

Press ENTER to continue.
```

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 1HELP   2LABEL  3SAVSC  4RECORD 5       6       7       8       9REVIEW 10QUIT
!NPUT    SUN MAY 23  1993 05:51:00 PM  VERSION 1.1                    REC:OFF
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CORRELATION MATRIX

	X41	X42	X43	X44	X45
X41	1.00000	.99588	.70735	.30781	.51652
X42	.99588	1.00000	.73007	.27772	.55367
X43	.70735	.73007	1.00000	-.12306	.15380
X44	.30781	.27772	-.12306	1.00000	.51727
X45	.51652	.55367	.15380	.51727	1.00000

```
Use F10 to Quit. Cursor keys or Page Number:                    Page 1.1 of 1.1
 1HELP   2LABEL  3SAVSC  4RECORD 5       6       7       8       9REVIEW 10QUIT
!NPUT    SUN MAY 23  1993 05:52:00 PM  VERSION 1.1                    REC:OFF
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```
NUMBER OF RESIDUALS = 8
SAMPLE AVERAGE = -5.684342E-14
SAMPLE VARIANCE = 33953.2
SAMPLE STANDARD DEVIATION = 184.264
COEFF. OF SKEWNESS = -1.42275    STANDARDIZED VALUE = -1.64286
COEFF. OF KURTOSIS = 4.05153    STANDARDIZED VALUE = 0.607128
DURBIN-WATSON STATISTIC = 2.36407

Press ENTER to continue.
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 1HELP   2LABEL  3SAVSC  4RECORD 5       6       7       8       9REVIEW 10QUIT
INPUT    SUN MAY 23  1993 05:54:00 PM  VERSION 1.1                    REC:OFF
```

CORRELATION MATRIX

	X51	X52	X53	X54	X55
X51	1.00000	.75901	.57182	.63565	.46430
X52	.75901	1.00000	.96228	.87327	.56565
X53	.57182	.96228	1.00000	.82790	.55010
X54	.63565	.87327	.82790	1.00000	.07636
X55	.46430	.56565	.55010	.07636	1.00000

```
Use F10 to Quit, Cursor keys or Page Number:                    Page 1.1 of 1.1
 1HELP   2LABEL  3SAVSC  4RECORD 5       6       7       8       9REVIEW 10QUIT
INPUT    SUN MAY 23  1993 05:55:00 PM  VERSION 1.1                    REC:OFF
```

CORRELATION MATRIX

	X61	X62	X63	X64	X65
X61	1.00000	1.00000	.13966	.07361	-.11501
X62	1.00000	1.00000	.13975	.07320	-.11459
X63	.13966	.13975	1.00000	-.23770	.31619
X64	.07361	.07320	-.23770	1.00000	-.98816
X65	-.11501	-.11459	.31619	-.98816	1.00000

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SUN MAY 23 1993 05:56:00 PM VERSION 1.1 REC:OFF

NUMBER OF RESIDUALS = 8
SAMPLE AVERAGE = -1.55875E-12
SAMPLE VARIANCE = 74.6776
SAMPLE STANDARD DEVIATION = 8.64162
COEFF. OF SKEWNESS = -0.957522 STANDARDIZED VALUE = -1.10565
COEFF. OF KURTOSIS = 3.75291 STANDARDIZED VALUE = 0.434691
DURBIN-WATSON STATISTIC = 2.49852

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SUN MAY 23 1993 05:57:00 PM VERSION 1.1 REC:OFF

CORRELATION MATRIX

	X71	X72	X73	X74	X75
X71	1.00000	.97801	.75786	.71568	.04106
X72	.97801	1.00000	.80372	.76383	-.00051
X73	.75786	.80372	1.00000	.55777	.12821
X74	.71568	.76383	.55777	1.00000	.51141
X75	.04106	-.00051	.12821	.51141	1.00000

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SUN MAY 23 1993 05:58:00 PM VERSION 1.1 REC:OFF

NUMBER OF RESIDUALS = 9
SAMPLE AVERAGE = -6.82121E-13
SAMPLE VARIANCE = 271955
SAMPLE STANDARD DEVIATION = 521.493
COEFF. OF SKEWNESS = -0.553219 STANDARDIZED VALUE = -0.638803
COEFF. OF KURTOSIS = 3.13711 STANDARDIZED VALUE = 0.0791584
DURBIN-WATSON STATISTIC = 1.72321

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SUN MAY 23 1993 05:59:00 PM VERSION 1.1 REC:OFF

CORRELATION MATRIX

	X81	X82	X83	X84	X85
X81	1.00000	.98740	-.83928	-.06952	-.37987
X82	.98740	1.00000	-.87575	-.11713	-.37159
X83	-.83928	-.87575	1.00000	.02334	.28001
X84	-.06952	-.11713	.02334	1.00000	.75341
X85	-.37987	-.37159	.28001	.75341	1.00000

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT

INPUT SUN MAY 23 1993 06:00:00 PM VERSION 1.1 REC:OFF

NUMBER OF RESIDUALS = 8
SAMPLE AVERAGE = -5.45697E-12
SAMPLE VARIANCE = 5284.35
SAMPLE STANDARD DEVIATION = 72.6935
COEFF. OF SKEWNESS = 0.787338 STANDARDIZED VALUE = 0.909139
COEFF. OF KURTOSIS = 3.87213 STANDARDIZED VALUE = 0.303523
DURBIN-WATSON STATISTIC = 2.87576

Press ENTER to continue.

10QUIT
REC:OFF

2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT

SUN MAY 23 1993 06:01:00 PM VERSION 1.1 REC:OFF

CORRELATION MATRIX

	X91	X92	X93	X94	X95
X91	1.00000	.97683	.82663	.47348	-.00849
X92	.97683	1.00000	.86983	.60091	-.04622
X93	.82663	.86983	1.00000	.81743	-.10709
X94	.47348	.60091	.81743	1.00000	-.25069
X95	-.00849	-.04622	-.10709	-.25069	1.00000

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SUN MAY 23 1993 06:02:00 PM VERSION 1.1 REC:OFF

NUMBER OF RESIDUALS = 8
SAMPLE AVERAGE = 3.18323E-12
SAMPLE VARIANCE = 31971
SAMPLE STANDARD DEVIATION = 178.804
COEFF. OF SKEWNESS = -0.857901 STANDARDIZED VALUE = -0.990618
COEFF. OF KURTOSIS = 3.94573 STANDARDIZED VALUE = 0.546018
DURBIN-WATSON STATISTIC = 2.04499

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SUN MAY 23 1993 06:04:00 PM VERSION 1.1 REC:OFF

CORRELATION MATRIX

	X101	X102	X103	X104	X105
X101	1.00000	.93425	.47565	.35124	.04535
X102	.93425	1.00000	.23843	.26891	-.13068
X103	.47565	.23843	1.00000	.15999	.32852
X104	.35124	.26881	.15999	1.00000	-.26898
X105	.04535	-.13068	.32852	-.26898	1.00000

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SUN MAY 23 1993 06:05:00 PM VERSION 1.1 REC:OFF

NUMBER OF RESIDUALS = 8
SAMPLE AVERAGE = -1.98952E-13
SAMPLE VARIANCE = 326892
SAMPLE STANDARD DEVIATION = 571.745
COEFF. OF SKEWNESS = -1.24358 STANDARDIZED VALUE = -1.43596
COEFF. OF KURTOSIS = 3.91543 STANDARDIZED VALUE = 0.528522
DURBIN-WATSON STATISTIC = 2.936

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SUN MAY 23 1993 06:07:00 PM VERSION 1.1 REC:OFF

CORRELATION MATRIX

	X111	X112	X113	X114	X115
X111	1.00000	.99988	-.57447	.38434	.93928
X112	.99988	1.00000	-.57160	.39478	.94208
X113	-.57447	-.57160	1.00000	.07603	-.47026
X114	.38434	.39478	.07603	1.00000	.62925
X115	.93928	.94208	-.47026	.62925	1.00000

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SUN MAY 23 1993 06:09:00 PM VERSION 1.1 REC:OFF

NUMBER OF RESIDUALS = 9
SAMPLE AVERAGE = 4.54747E-13
SAMPLE VARIANCE = 459760
SAMPLE STANDARD DEVIATION = 678.056
COEFF. OF SKEWNESS = -0.205581 STANDARDIZED VALUE = -0.237385
COEFF. OF KURTOSIS = 2.17347 STANDARDIZED VALUE = -0.4772
DURBIN-WATSON STATISTIC = 2.43

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SUN MAY 23 1993 06:10:00 PM VERSION 1.1 REC:OFF

CORRELATION MATRIX

	X121	X123	X122	X124	X125
X121	1.00000	.22500	.99981	-.04564	-.60874
X123	.22500	1.00000	.22656	-.04591	-.23519
X122	.99981	.22656	1.00000	-.05632	-.60641
X124	-.04564	-.04591	-.05632	1.00000	-.34983
X125	-.60874	-.23518	-.60641	-.34983	1.00000

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 9 9PREVIEW 10QUIT
INPUT SUN MAY 23 1993 06:11:00 PM VERSION 1.1 REC:OFF

NUMBER OF RESIDUALS = 8
SAMPLE AVERAGE = 2.67164E-12
SAMPLE VARIANCE = 81907.8
SAMPLE STANDARD DEVIATION = 286.195
COEFF. OF SKEWNESS = 0.166623 STANDARDIZED VALUE = 0.1924
COEFF. OF KURTOSIS = 1.71605 STANDARDIZED VALUE = -0.741287
DURBIN-WATSON STATISTIC = 3.15621

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 9 9PREVIEW 10QUIT
INPUT SUN MAY 23 1993 06:13:00 PM VERSION 1.1 REC:OFF

CORRELATION MATRIX

	X131	X132	X133	X134	X135
X131	1.00000	.45371	.19015	.13259	-.05425
X132	.45371	1.00000	.42247	.17589	-.36060
X133	.19015	.42247	1.00000	.86804	.63205
X134	.13259	.17589	.86804	1.00000	.84024
X135	-.05425	-.36060	.63205	.84024	1.00000

Use F10 to Quit, Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SUN MAY 23 1993 06:13:00 PM VERSION 1.1 REC:OFF

NUMBER OF RESIDUALS = 9
SAMPLE AVERAGE = 7.95808E-13
SAMPLE VARIANCE = 1.2976886
SAMPLE STANDARD DEVIATION = 1182.23
COEFF. OF SKEWNESS = -0.702914 STANDARDIZED VALUE = -0.811656
COEFF. OF KURTOSIS = 2.26035 STANDARDIZED VALUE = -0.427038
DURBIN-WATSON STATISTIC = 2.22612

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SUN MAY 23 1993 06:15:00 PM VERSION 1.1 REC:OFF

CORRELATION MATRIX

	X151	X152	X153	X154	X155
X151	1.00000	.99939	.64611	.51982	.82280
X152	.99939	1.00000	.62751	.49985	.82842
X153	.64611	.62751	1.00000	.91677	.38184
X154	.51982	.49985	.91677	1.00000	.42374
X155	.82280	.82842	.38184	.42374	1.00000

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
 1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SUN MAY 23 1993 06:18:00 PM VERSION 1.1 REC:OFF

NUMBER OF RESIDUALS = 8
SAMPLE AVERAGE = 5.17275E-12
SAMPLE VARIANCE = 263026
SAMPLE STANDARD DEVIATION = 512.86
COEFF. OF SKEWNESS = 0.120588 STANDARDIZED VALUE = 0.139243
COEFF. OF KURTOSIS = 1.6048 STANDARDIZED VALUE = -0.80552
DURBIN-WATSON STATISTIC = 2.21154

Press ENTER to continue.

 1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SUN MAY 23 1993 06:20:00 PM VERSION 1.1 REC:OFF

CORRELATION MATRIX

	X161	X162	X163	X164	X165
X161	1.00000	.93411	.24615	.01300	.00000
X162	.93411	1.00000	-.05321	-.30227	.00000
X163	.24615	-.05321	1.00000	.46879	.00000
X164	.01300	-.30227	.46879	1.00000	.00000
X165	.00000	.00000	.00000	.00000	.00000

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1

1HELP 2LABEL 3SAVSC 4RECOPD 5 6 7 8 9PREVIEW 10QUIT

INPUT SUN MAY 23 1993 06:20:00 PM VERSION 1.1 REC:OFF

NUMBER OF RESIDUALS = 8
SAMPLE AVERAGE = 9.32232E-12
SAMPLE VARIANCE = 2.18083E6
SAMPLE STANDARD DEVIATION = 1476.76
COEFF. OF SKEWNESS = -0.590983 STANDARDIZED VALUE = -0.682403
COEFF. OF KURTOSIS = 3.21653 STANDARDIZED VALUE = 0.125014
DURBIN-WATSON STATISTIC = 3.17392

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECOPD 5 6 7 8 9PREVIEW 10QUIT

INPUT SUN MAY 23 1993 06:22:00 PM VERSION 1.1 REC:OFF

CORRELATION MATRIX

	X171	X172	X173	X174	X175
X171	1.00000	.97562	.98957	.93006	-.24489
X172	.97562	1.00000	.97088	.93067	-.21956
X173	.98957	.97088	1.00000	.92797	-.12383
X174	.93006	.93067	.92797	1.00000	-.15494
X175	-.24489	-.21956	-.12383	-.15494	1.00000

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SUN MAY 23 1993 06:23:00 PM VERSION 1.1 REC:OFF

NUMBER OF RESIDUALS = 8
SAMPLE AVERAGE = 6.82121E-12
SAMPLE VARIANCE = 74334.9
SAMPLE STANDARD DEVIATION = 272.644
COEFF. OF SKEWNESS = 0.327175 STANDARDIZED VALUE = 0.377789
COEFF. OF KURTOSIS = 3.0787 STANDARDIZED VALUE = 0.0454246
DURBIN-WATSON STATISTIC = 2.53471

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SUN MAY 23 1993 06:25:00 PM VERSION 1.1 REC:OFF

CORRELATION MATRIX

	VAR1	VAR2	VAR3	VAR4	VAR5
VAR1	1.00000	.95717	.69306	.43435	.05797
VAR2	.95717	1.00000	.58949	.50709	.02146
VAR3	.69306	.58949	1.00000	.68752	.32997
VAR4	.43435	.50709	.69752	1.00000	.61239
VAR5	.05797	.02146	.32997	.61239	1.00000

Use PAD to Quit. Cursor keys or Page Number: Page 1.1 of 1.1

1HELP 2LABEL 3SAVE 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SUN MAY 23 1993 06:25:00 PM VERSION 1.1 RECORD

NUMBER OF RESIDUALS = 9

SAMPLE AVERAGE = 4.263268E-13

SAMPLE VARIANCE = 119259

SAMPLE STANDARD DEVIATION 345.339

COEFF. OF SKEWNESS = -0.9e0652 STANDARDIZED VALUE = -0.997259

COEFF. OF KURTOSIS = 4.02699 STANDARDIZED VALUE = 0.593876

DURBIN-WATSON STATISTIC = 2.73659

Press ENTER to continue.

1HELP 2LABEL 3SAVE 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SUN MAY 23 1993 06:27:00 PM VERSION 1.1 RECORD

	X1	X192	X193	X194	X195
X191	1.00000	.87682	-.74352	-.06625	.81626
X192	.87682	1.00000	-.66380	.04060	.55515
X193	-.74352	-.66380	1.00000	.42379	-.60960
X194	-.06625	.04060	.42379	1.00000	.04943
X195	.81626	.55515	-.60960	.04943	1.00000

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SUN NOV 23 1993 05:29:00 PM VERSION 1.1 PRC:OFF

NUMBER OF RESIDUALS = 9
SAMPLE AVERAGE = -2.72849E-12
SAMPLE VARIANCE = 2.45565E7
SAMPLE STANDARD DEVIATION = 4955.45
COEFF. OF SKEWNESS = 0.461056 STANDARDIZED VALUE = 0.532892
COEFF. OF KURTOSIS = 1.8502 STANDARDIZED VALUE = -0.663939
DURBIN-WATSON STATISTIC = 1.59327

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SUN NOV 23 1993 05:29:00 PM VERSION 1.1 PRC:OFF

CORRELATION MATRIX

	X201	X202	X203	X204	X205
X201	1.00000	.96523	.12197	-.47591	.92976
X202	.96523	1.00000	.01914	-.55335	.96317
X203	.12197	.01914	1.00000	.64152	.00497
X204	-.47591	-.55335	.64152	1.00000	-.64390
X205	.92976	.96317	.00497	-.64390	1.00000

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SUN MAY 23 1993 06:30:00 PM VERSION 1.1 REC:OFF

NUMBER OF RESIDUALS = 8

SAMPLE AVERAGE = -2.131632E-12

SAMPLE VARIANCE = 111794

SAMPLE STANDARD DEVIATION = 334.356

COEFF. OF SKEWNESS = -0.499979 STANDARDIZED VALUE = -0.577325

COEFF. OF KURTOSIS = 2.64612 STANDARDIZED VALUE = -0.204313

DURBIN-WATSON STATISTIC = 1.96844

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SUN MAY 23 1993 06:32:00 PM VERSION 1.1 REC:OFF

CORRELATION MATRIX

	X211	X212	X213	X214	X215
X211	1.00000	-.39239	.12823	-.33879	-.95977
X212	-.39239	1.00000	-.56153	-.03315	.41771
X213	.12823	-.56153	1.00000	.39739	-.36439
X214	-.33879	-.03315	.39739	1.00000	.15989
X215	-.95977	.41771	-.36439	.15989	1.00000

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT

INPUT SUN MAY 23 1993 06:33:00 PM VERSION 1.1 REC:OFF

NUMBER OF RESIDUALS = 9

SAMPLE AVERAGE = 4.547475E-12

SAMPLE VARIANCE = 3.32264E6

SAMPLE STANDARD DEVIATION = 1822.81

COEFF. OF SKEWNESS = 0.577132 STANDARDIZED VALUE = 0.666415

COEFF. OF KURTOSIS = 2.10572 STANDARDIZED VALUE = -0.516305

DURBIN-WATSON STATISTIC = 3.60378

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT

CORRELATION MATRIX

	X221	X222	X223	X224	X225
X221	1.00000	-.12324	.12291	.20297	-.41514
X222	-.12324	1.00000	.26049	-.54013	.29200
X223	.12291	.26049	1.00000	.39621	.24810
X224	.20297	-.54013	.39621	1.00000	-.37695
X225	-.41514	.29200	.24810	-.37695	1.00000

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1

1HELP 2LABEL 3SORT 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SUN NOV 22 1992 09:35:00 PM VERSION 1.1 PROUTS

NUMBER OF RESIDUALS = 9
SAMPLE AVERAGE = 9.66338E-13
SAMPLE VARIANCE = 947.723
SAMPLE STANDARD DEVIATION = 30.1157
COEFF. OF SKEWNESS = 0.106203 STANDARDIZED VALUE = 0.122639
COEFF. OF KURTOSIS = 2.39195 STANDARDIZED VALUE = -0.351061
DURBIN-WATSON STATISTIC = 3.40918

Press ENTER to continue.

1HELP 2LABEL 3SORT 4RECORD 5 6 7 8 9PREVIEW 10QUIT

CORRELATION MATRIX:

	X231	X232	X234	X235	X233
X231	1.00000	.97282	-.67456	.74982	.96586
X232	.97282	1.00000	-.68912	.72762	.93285
X234	-.67456	-.68912	1.00000	-.44041	-.53743
X235	.74982	.72762	-.44041	1.00000	.67502
X233	.96586	.93285	-.53743	.67502	1.00000

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SUN MAY 23 1993 06:39:00 PM VERSION 1.1 REC:OFF

NUMBER OF RESIDUALS = 8
SAMPLE AVERAGE = -7.28964E-13
SAMPLE VARIANCE = 6908.46
SAMPLE STANDARD DEVIATION = 83.1171
COEFF. OF SKEWNESS = -0.392769 STANDARDIZED VALUE = -0.45353
COEFF. OF KURTOSIS = 1.4956 STANDARDIZED VALUE = -0.868569
DURBIN-WATSON STATISTIC = 2.36006

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SUN MAY 23 1993 06:39:00 PM VERSION 1.1 REC:OFF

	#241	#242	#243	#244	#245
#241	1.00000	.99809	.99576	-.93086	.99389
#242	.99809	1.00000	.99794	-.96601	.99659
#243	.99576	.99794	1.00000	-.95299	.99349
#244	-.93086	-.96601	-.95299	1.00000	-.96918
#245	.99389	.99659	.99349	-.96918	1.00000

Use F10 to Quit, Cursor keys or Page Number: Page 1.1 of 1.1

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SUN MAY 23 1993 06:40:00 PM VERSION 1.1 REC:OFF

NUMBER OF RESIDUALS = 8

SAMPLE AVERAGE = -1.36424E-12

SAMPLE VARIANCE = 934.759

SAMPLE STANDARD DEVIATION = 30.5922

COEFF. OF SKEWNESS = -0.25914 STANDARDIZED VALUE = -0.299329

COEFF. OF KURTOSIS = 2.39327 STANDARDIZED VALUE = 0.250294

DURBIN-WATSON STATISTIC = 2.45675

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SUN MAY 23 1993 06:42:00 PM VERSION 1.1 REC:OFF

CORRELATION MATRIX

	X251	X252	X253	X254	X255
X251	1.00000	.99626	.40951	.72259	.69345
X252	.99626	1.00000	.44952	.74385	.64973
X253	.40951	.44952	1.00000	.35755	-.33961
X254	.72259	.74385	.35755	1.00000	.38604
X255	.69345	.64973	-.33961	.38604	1.00000

Use F10 to Quit, Cursor keys or Page Number: Page 1.1 of 1.1

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SUN MAY 23 1993 06:43:00 PM VERSION 1.1 REC:077

NUMBER OF RESIDUALS = 8
SAMPLE AVERAGE = 2.50111E-12
SAMPLE VARIANCE = 8293.84
SAMPLE STANDARD DEVIATION = 91.0156
COEFF. OF SKEWNESS = 1.47571 STANDARDIZED VALUE = 1.70401
COEFF. OF KURTOSIS = 4.43207 STANDARDIZED VALUE = 0.926809
DURBIN-WATSON STATISTIC = 2.24915

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SUN MAY 23 1993 06:44:00 PM VERSION 1.1 REC:077

CORRELATION MATRIX:

	X261	X262	X263	X264	X265
X261	1.00000	.95319	-.08427	-.18935	-.01348
X262	.95319	1.00000	.17893	-.44840	-.10490
X263	-.08427	.17893	1.00000	-.72308	-.22176
X264	-.18935	-.44840	-.72308	1.00000	.38494
X265	-.01348	-.10490	-.22176	.38494	1.00000

Use F10 to Quit, Cursor keys or Page Number: Page 1.1 of 1.1

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 9 9PREVIEW 10QUIT

INPUT SUN MAY 23 1993 06:45:00 PM VERSION 1.1 PRT:OFF

NUMBER OF RESIDUALS = 9

SAMPLE AVERAGE = 1.065818 E-13

SAMPLE VARIANCE = 1322.79

SAMPLE STANDARD DEVIATION = 36.37

COEFF. OF SKEWNESS = -0.757656 STANDARDIZED VALUE = -0.874865

COEFF. OF KURTOSIS = 2.20644 STANDARDIZED VALUE = -0.459165

DURBIN-WATSON STATISTIC = 1.79365

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 9 9PREVIEW 10QUIT

INPUT SUN MAY 23 1993 06:46:00 PM VERSION 1.1 PRT:OFF

CORRELATION MATRIX

	X271	X272	X273	X274	X275
X271	1.00000	.99241	.98007	.92136	.62854
X272	.99241	1.00000	.95022	.86930	.61053
X273	.98007	.95022	1.00000	.96264	.63536
X274	.92136	.86930	.96264	1.00000	.63695
X275	.62854	.61053	.63536	.63695	1.00000

Use F10 to Quit, Cursor Keys or Page Number: Page 1.1 of 1.1
 1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
!INPUT SUN MAY 23 1993 06:47:00 PM VERSION 1.1 REC:OFF

NUMBER OF RESIDUALS = 8
SAMPLE AVERAGE = -1.42109E-14
SAMPLE VARIANCE = 114.685
SAMPLE STANDARD DEVIATION = 10.7091
COEFF. OF SKEWNESS = -0.0551209 STANDARDIZED VALUE = -0.0636481
COEFF. OF KURTOSIS = 2.61975 STANDARDIZED VALUE = -0.220115
DURBIN-WATSON STATISTIC = 2.38791

Press ENTER to continue.

 1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
!INPUT SUN MAY 23 1993 06:49:00 PM VERSION 1.1 REC:OFF

CORRELATION MATRIX

	X281	X282	X283	X284	X285
X281	1.00000	.92036	.12050	.56188	-.64597
X282	.92036	1.00000	-.05613	.79802	-.52670
X283	.12050	-.05613	1.00000	-.25343	-.41368
X284	.56188	.79802	-.25343	1.00000	-.02944
X285	-.64587	-.52670	-.41368	-.02944	1.00000

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SUN MAY 23 1993 06:49:00 PM VERSION 1.1 REC:OFF

NUMBER OF RESIDUALS = 8

SAMPLE AVERAGE = -1.81999E-12

SAMPLE VARIANCE = 1.1261486

SAMPLE STANDARD DEVIATION = 1061.2

COEFF. OF SKEWNESS = 0.110454 STANDARDIZED VALUE = 0.137541

COEFF. OF KURTOSIS = 1.71643 STANDARDIZED VALUE = -0.741067

DURBIN-WATSON STATISTIC = 2.05659

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SUN MAY 23 1993 06:51:00 PM VERSION 1.1 REC:OFF

CORRELATION MATRIX:

	X291	X292	X293	X294	X295
X291	1.00000	.63636	.14971	.02254	-.30665
X292	.63636	1.00000	.11027	.22899	-.44677
X293	.14971	.11027	1.00000	-.51289	-.38639
X294	.02254	.22899	-.51289	1.00000	.72243
X295	-.30665	-.44677	-.38639	.72243	1.00000

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SUN MAY 23 1993 06:52:00 PM VERSION 1.1 - REC:OFF

NUMBER OF RESIDUALS = 9

SAMPLE AVERAGE = 4.149579E-12

SAMPLE VARIANCE = 2.503048E6

SAMPLE STANDARD DEVIATION = 1582.1,

COEFF. OF SKEWNESS = -0.783853 STANDARDIZED VALUE = -0.904654

COEFF. OF KURTOSIS = 2.12752 STANDARDIZED VALUE = -0.503722

DURBIN-WATSON STATISTIC = 2.41596

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SUN MAY 23 1993 06:53:00 PM VERSION 1.1 REC:OFF

CORRELATION MATRIX

	X301	X302	X303	X304	X305
X301	1.00000	-.97786	.63540	.47409	.31009
X302	-.97786	1.00000	-.74368	-.25057	-.23539
X303	.63540	-.74368	1.00000	-.33811	.41677
X304	.47409	-.25057	-.33811	1.00000	-.17299
X305	.31009	-.23539	.41677	-.17299	1.00000

Page 1.1 of 1.1

Use F10 to Quit, Cursor keys or Page Number:
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SUN MAY 23 1993 06:55:00 PM VERSION 1.1 REC:OFF

NUMBER OF RESIDUALS = 8
SAMPLE AVERAGE = 1.06581E-13
SAMPLE VARIANCE = 112.238
SAMPLE STANDARD DEVIATION = 10.5942
COEFF. OF SKEWNESS = 0.417211 STANDARDIZED VALUE = 0.491754
COEFF. OF KURTOSIS = 1.85134 STANDARDIZED VALUE = -0.669179
DURBIN-WATSON STATISTIC = 1.88574

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SUN MAY 23 1993 06:56:00 PM VERSION 1.1 REC:OFF

```
CORRELATION MATRIX

                X311          X312          X313          X314          X315
X311         1.00000        .97411       -.79302        .10528        .49934
X312          .97411       1.00000       -.88351        .03330        .64455
X313         -.79302       -.88351       1.00000        .16970       -.63819
X314          .10528        .03330        .16970       1.00000       -.04781
X315          .49934        .64455       -.63819       -.04781       1.00000
```

```
Use F10 to Quit, Cursor keys or Page Number:                    Page 1.1 of 1.1
 1HELP   2LABEL  3SAVSC  4RECORD 5      6      7      8        9PREVIEW 10QUIT
INPUT    SUN MAY 23  1993 06:57:00 PM  VERSION 1.1                    2REC:OFF
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```
NUMBER OF RESIDUALS = 9
SAMPLE MEAN = -4.092738E-12
SAMPLE VARIANCE = 3.514518E6
SAMPLE STANDARD DEVIATION = 1874.7
COEFF. OF SKEWNESS = 0.0932622    STANDARDIZED VALUE = 0.10769
COEFF. OF KURTOSIS = 2.39229    STANDARDIZED VALUE = -0.350862
DURBIN-WATSON STATISTIC = 2.70746

Press ENTER to continue.
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 1HELP   2LABEL  3SAVSC  4RECORD 5      6      7      8        9PREVIEW 10QUIT
INPUT    SUN MAY 23  1993 06:58:00 PM  VERSION 1.1                    2REC:OFF
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CORRELATION MATRIX:

	X321	X322	X323	X324	X325
X321	1.00000	.99529	-.35043	-.29942	-.54830
X322	.99529	1.00000	-.25529	-.21132	-.49640
X323	-.35043	-.25529	1.00000	.69329	-.07995
X324	-.29942	-.21132	.69329	1.00000	.39345
X325	-.54830	-.49640	-.07995	.39345	1.00000

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SUN MAY 23 1993 06:59:00 PM VERSION 1.1 REC:OFF

NUMBER OF RESIDUALS = 9

SAMPLE AVERAGE = 5.69434E-13

SAMPLE VARIANCE = 114123

SAMPLE STANDARD DEVIATION = 337.82

COEFF. OF SKEWNESS = -1.53238E-4 STANDARDIZED VALUE = -1.77065E-4

COEFF. OF KURTOSIS = 2.44516 STANDARDIZED VALUE = -0.320335

DURBIN-WATSON STATISTIC = 2.87516

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT

INPUT SUN MAY 23 1993 07:00:00 PM VERSION 1.1 REC:OFF

```
CORRELATION MATRIX

                X331          X332          X333          X334          X335
X331         1.00000       .36125        .05911        .07241       -.13991
X332          .36125      1.00000       -.24859        .61484        .37507
X333          .05911      -.24859       1.00000       -.78722        .60411
X334          .07241       .61484       -.78722       1.00000       -.22180
X335         -.13991       .37507        .60411       -.22180       1.00000
```

```
Use F10 to Quit, Cursor keys or Page Number:                    Page 1.1 of 1.1
 1HELP   2LABEL  3SAVSC  4RECORD 5       6       7       8       9PREVIEW 10QUIT
!INPUT   SUN MAY 23  1993 07:01:00 PM  VERSION 1.1                    REC:OFF
```

```
NUMBER OF RESIDUALS = 8
SAMPLE AVERAGE = -2.046362E-12
SAMPLE VARIANCE = 45676.9
SAMPLE STANDARD DEVIATION = 213.721
COEFF. OF SKEWNESS = 0.0239171    STANDARDIZED VALUE = 0.0275016
COEFF. OF KURTOSIS = 1.98685    STANDARDIZED VALUE = -0.584945
DURBIN-WATSON STATISTIC = 2.40995

Press ENTER to continue.
```

```
 1HELP   2LABEL  3SAVSC  4RECORD 5       6       7       8       9PREVIEW 10QUIT
!INPUT   SUN MAY 23  1993 07:03:00 PM  VERSION 1.1                    REC:OFF
```

CORRELATION MATRIX

	X341	X342	X343	X344	X345
X341	1.00000	.99900	-.25299	-.68855	.72151
X342	.99900	1.00000	-.23335	-.68614	.72515
X343	-.25299	-.23335	1.00000	-.01666	-.40507
X344	-.68855	-.68614	-.01666	1.00000	-.41887
X345	.72151	.72515	-.40507	-.41887	1.00000

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT
INPUT SUN MAY 23 1993 07:04:00 PM VERSION 1.1 REC:OFF

NUMBER OF RESIDUALS = 8
SAMPLE AVERAGE = -1.36424E-12
SAMPLE VARIANCE = 377.379
SAMPLE STANDARD DEVIATION = 19.4314
COEFF. OF SKEWNESS = 0.271886 STANDARDIZED VALUE = 0.313947
COEFF. OF KURTOSIS = 3.50034 STANDARDIZED

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9PREVIEW 10QUIT
PROCESS SUN MAY 23 1993 07:06:00 PM VERSION 1.1 REC:OFF

CORRELATION MATRIX

	X351	X352	X353	X354	X355
X351	1.00000	.99889	.78004	.60661	-.00814
X352	.99889	1.00000	.76046	.62363	-.02626
X353	.78004	.76046	1.00000	-.01148	.48686
X354	.60661	.62363	-.01148	1.00000	-.60763
X355	-.00814	-.02626	.48686	-.60763	1.00000

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT

INPUT SUN MAY 23 1993 07:07:00 PM VERSION 1.1 REC:OFF

NUMBER OF RESIDUALS = 9

SAMPLE AVERAGE = 1.72904E-11

SAMPLE VARIANCE = 6.554487

SAMPLE STANDARD DEVIATION = 8095.92

COEFF. OF SKEWNESS = -0.444372 STANDARDIZED VALUE = -0.513117

COEFF. OF KURTOSIS = 2.30399 STANDARDIZED VALUE = -0.401908

DURBIN-WATSON STATISTIC = 2.31093

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT

INPUT SUN MAY 23 1993 07:08:00 PM VERSION 1.1 REC:OFF

CORRELATION MATRIX

	X361	X362	X363	X364	X365
X361	1.00000	.99612	.76574	-.35892	.17507
X362	.99612	1.00000	.76765	-.32613	.16685
X363	.76574	.76765	1.00000	-.04470	-.03316
X364	-.35892	-.32613	-.04470	1.00000	-.54938
X365	.17507	.16685	-.03316	-.54938	1.00000

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT

INPUT SUN MAY 23 1993 07:10:00 PM VERSION 1.1 REC:OFF

NUMBER OF RESIDUALS = 8

SAMPLE AVERAGE = -2.27374E-13

SAMPLE VARIANCE = 318672

SAMPLE STANDARD DEVIATION = 564.51

COEFF. OF SKEWNESS = -0.448479 STANDARDIZED VALUE = -0.517859

COEFF. OF KURTOSIS = 3.77487 STANDARDIZED VALUE = 0.447371

DURBIN-WATSON STATISTIC = 3.18743

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT

INPUT SUN MAY 23 1993 07:12:00 PM VERSION 1.1 REC:OFF

Appendix Four: Results of Corrected Regressions.

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	169.144333	76.141096	2.2215	.0617
X262	0.042278	0.016235	2.6041	.0352
X263	-0.00075	0.003271	-.2292	.8253
X264	-0.032414	0.010008	-3.2388	.0143
X265	0.00003	0.001511	.0199	.9847

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SUN MAY 30 1993 08:39:00 PM VERSION 1.1 REC:OFF

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB(>F)
MODEL	606906.94	4	151726.74	13.28	.03
ERROR	34264.933	3	11421.644		
TOTAL (CORR.)	641171.88	7			

R-SQUARED = 0.946559
R-SQUARED (ADJ. FOR D.F.) = 0.875304
STND. ERROR OF EST. = 106.872

Press ENTER to continue.

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	-1384.975559	438.410172	-3.1591	.0159
X51	-0.023545	0.072965	-.3227	.7564
X52	0.47519	0.086833	5.4725	.0009
X54	0.247107	0.083276	2.9673	.0209
X55	0.275543	1.754953	.1570	.8797

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit, Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SUN MAY 30 1993 09:07:00 PM VERSION 1.1 REC:OFF

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB(>F)
MODEL	19187917	4	4796979	52	0
ERROR	276297.87	3	92099.29		
TOTAL (CORR.)	19464215	7			

R-SQUARED = 0.985805
R-SQUARED (ADJ. FOR D.F.) = 0.966878
STND. ERROR OF EST. = 303.479

Press ENTER to continue.

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	4196.771742	1.066181E4	.3936	.7056
X192	0.225645	0.053487	4.2187	.0039
X193	0.084059	0.078636	1.0690	.3206
X194	-0.342482	0.215417	-1.5899	.1559
X195	-0.001743	0.027864	-.0625	.9519

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
PRINT TUE JAN 1 1980 02:03:00 AM VERSION 1.1 REC:OFF

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB(>F)
MODEL	2.8792E0009	4	7.1980E0008	6.7921E0000	7.3718E-002
ERROR	3.1792E0008	3	1.0597E0008		
TOTAL (CORR.)	3.1971E0009	7			

R-SQUARED = 0.900559
R-SQUARED (ADJ. FOR D.F.) = 0.76797
STND. ERROR OF EST. = 10294.4

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
PRINT TUE JAN 1 1980 02:06:00 AM VERSION 1.1 REC:OFF

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	4807.657684	1430.596741	3.3606	.0121
X322	0.130482	0.027625	4.7233	.0021
X323	-0.026085	0.010582	-2.4651	.0431
X324	0.086224	0.051388	1.6779	.1373
X325	-0.180107	0.067124	-2.6832	.0314

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SUN MAY 30 1993 08:45:00 PM VERSION 1.1 REC:OFF

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB(>F)
MODEL	64140992	4	16035248	23	0
ERROR	2050684.9	3	683561.6		
TOTAL (CORR.)	66191677	7			

R-SQUARED = 0.969019
R-SQUARED (ADJ. FOR D.F.) = 0.927711
STND. ERROR OF EST. = 826.778

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT

```
NUMBER OF RESIDUALS = 8
SAMPLE AVERAGE = 1.02318E-12
SAMPLE VARIANCE = 292955
SAMPLE STANDARD DEVIATION = 541.253
COEFF. OF SKEWNESS = -0.366682   STANDARDIZED VALUE = -0.423408
COEFF. OF KURTOSIS = 3.48016   STANDARDIZED VALUE = 0.277221
DURBIN-WATSON STATISTIC = 1.36525

Press ENTER to continue.
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 1HELP   2LABEL  3SAVSC  4RECORD 5       6       7       8       9REVIEW 10OUIT
INPUT    SUN MAY 30  1993 08:47:00 PM  VERSION 1.1                  RECHOFF
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MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	-94.377302	38.462686	-2.4537	.0439
X242	0.216669	0.024864	8.7143	.0001
X243	0.073476	0.002367	31.0425	.0000
X244	0.01342	0.001032	13.0063	.0000
X245	0.001501	0.020698	.0725	.9442

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	-4.23393E4	3.826743E4	-1.1064	.3051
X352	0.609592	0.41454	1.4705	.1849
X353	-0.21359	0.093334	-2.2884	.0559
X354	-0.00789	0.038257	-.2062	.8425
X355	0.089803	0.035386	2.5378	.0388

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
PRINT TUE JAN 1 1980 01:46:00 AM VERSION 1.1 REC:OFF

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB(>F)
MODEL	1.1444E0010	4	2.8611E0009	1.8637E0001	1.8581E-002
ERROR	4.6054E0008	3	1.5351E0008		
TOTAL (CORR.)	1.1905E0010	7			

R-SQUARED = 0.961315
R-SQUARED (ADJ. FOR D.F.) = 0.909734
STND. ERROR OF EST. = 12390.1

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
PRINT TUE JAN 1 1980 01:47:00 AM VERSION 1.1 REC:OFF

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	8583.030601	1058.347242	8.1098	.0001
X362	-0.105611	0.017381	-6.0762	.0005
X363	0.077802	0.013786	5.6434	.0008
X364	0.21985	0.017284	12.7198	.0000
X365	-0.024343	0.011002	-2.2125	.0626

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
PRINT ~~TUE JAN 1 1980~~ 01:53:00 AM VERSION 1.1 REC:OFF

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB(>F)
MODEL	3.6035E0008	4	9.0089E0007	1.2089E0002	1.2058E-003
ERROR	2235545.6	3	745181.9		
TOTAL (CORR.)	3.6259E0008	7			

R-SQUARED = 0.993835
R-SQUARED (ADJ. FOR D.F.) = 0.985614
STND. ERROR OF EST. = 863.239

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
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...DED FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB( )T|
CONSTANT	-4928.400653	1972.694261	-2.4983	.0411
X72	-0.395897	0.087098	-4.5454	.0027
X73	-0.006753	0.01244	-.5428	.6041
X74	0.101588	0.014371	7.0688	.0002
X75	0.02013	0.009436	2.1333	.0703

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
.INPUT SUN MAY 30 1993 09:19:00 PM VERSION 1.1 REC:OFF

ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB( )F)
MODEL	2.1177E0008	4	5.2944E0007	7.5032E0001	2.4468E-003
ERROR	2116850.4	3	705616.8		
TOTAL (CORR.)	2.1389E0008	7			

R-SQUARED = 0.990103
R-SQUARED (ADJ. FOR D.F.) = 0.976907
STND. ERROR OF EST. = 840.01

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SUN MAY 30 1993 09:20:00 PM VERSION 1.1 REC:OFF

NUMBER OF RESIDUALS = 8
SAMPLE AVERAGE = -5.68434E-13

MODEL FITTING RESULTS

VARIABLE	COEFFICIENT	STND. ERROR	T-VALUE	PROB(>|T|)
CONSTANT	-8708.672057	4530.624995	-1.9222	.0960
X281	0.679532	0.08728	7.7857	.0001
X283	0.001321	0.004896	.2697	.7951
X284	0.286355	0.086059	3.3274	.0129
X285	0.12204	0.17649	.6915	.5115

0 CASES WITH MISSING VALUES WERE EXCLUDED.

RESIDUALS PLACED IN VARIABLE: RESIDUALS

Use F10 to Quit. Cursor keys or Page Number: Page 1.1 of 1.1
1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
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ANALYSIS OF VARIANCE FOR THE FULL REGRESSION

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F-RATIO	PROB(>F)
MODEL	1.0521E0009	4	2.6302E0008	7.3252E0001	2.5352E-003
ERROR	10771635	3	3590545		
TOTAL (CORR.)	1.0628E0009	7			

R-SQUARED = 0.989865
R-SQUARED (ADJ. FOR D.F.) = 0.976352
STND. ERROR OF EST. = 1894.87

Press ENTER to continue.

1HELP 2LABEL 3SAVSC 4RECORD 5 6 7 8 9REVIEW 10QUIT
INPUT SUN MAY 30 1993 09:13:00 PM VERSION 1.1 REC:OFF

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