The Corporate Sector as a Net Exporter of Funds: Additional Econometric Evidence

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Schwartz and Aronson (1966) documented the role of the corporate sector in generating more funds than it can profitability use. One of the primary issues behind the corporate sector exporting funds was the controversy of dividends. Schwartz and Aronson noted that aggregate dividends far exceeded net new external financing. Let us present additional evidence as the whether the corporate sector continues to be a net exporter of funds. Furthermore, we address additional questions with regard to debt and equity issuances, repurchases, the relationship of dividends and stock prices, and whether significant sector effects are present. We present evidence for the 1971 – 2006 period for all stocks covered by the Compustat tapes, some 200,000 firms. We substantiate the original Schwartz and Aronson hypothesis of the corporate sector as a net exporter of funds, but offer additional evidence as to how the components of the net exporter calculations have evolved over time.

Schwartz and Aronson (1966) documented the role of the corporate sector in generating more funds than it can profitability use over 40 years from 1924 – 1964, using aggregate data. One of the primary issues behind the corporate sector exporting funds was the controversy of dividends. Schwartz and Aronson noted that aggregate dividends far exceeded net new external financing. In this study, we present evidence for the 1971 – 2006 period for all stocks covered by the Compustat tapes, some 200,000 firms (approximately 2300-6000 firms per year). We substantiate the original Schwartz and Aronson hypothesis of the corporate sector as a net exporter of funds, but offer additional evidence as to how the components of the net exporter sector calculations have evolved over time. We address additional questions with regard to debt and equity issuances, repurchases, the relationship of dividends and stock prices, and whether significant sector effects are present.

Schwartz and Aronson (1966) held that a "balanced economic growth model" carried the assumption, that the amount of income from capital equals the total of aggregate savings and real investment and that perforce the rate of return on capital and the growth rate of the economy are

equal[1]. However, the cash flow generated by the operating assets exceeds the amount of possible net real investment, and it necessarily follows that at the end of the fiscal period, the overall corporate sector will have more funds than it can desirably re-invest in the business. In short, the data shows that if in any given year the growth rate is 5.0% and the aggregate after tax earnings on the real value of corporate equity is 10.0%, than the corporate sector one way or another will distribute about 50% of its equity earnings or profits to the rest of the economy. The outflow of cash in the form of dividends, interest paid on debt, buy backs, and repayment of debt has substantially exceeded new funds raised on the capital markets, primary raised by issuing debt. In 1971, the corporate sector exported over $19 billion of funds and by 2003, the corporate sector funds exported to grown to over $ 400 billion.[2] The surplus of funds over any possible reasonable capital investment policy is the rationale behind the cash buy back of shares and the payment of dividends. In short, the corporate sector continues to be a net exporter of funds to the rest of the economy, and has risen almost consistently throughout the 1971-2006 period, except when net equity re-purchases fell and new debt issues rose in the mid to late-1990s. If we define a variable to designate the net export of funds, ES, of the corporate sector, then

ES = Dividends Paid + Interest Paid + Net Equity Repurchased – Net Debt Issued (1)

The reader is referred to Table 1 for annual statistics of the components of ES taken from the Compustat database. A second way to examine the corporate sector net export of funds is to examine the dividends paid less equity repurchased, which also is shown in Table 1. Dividends paid exceeded equity repurchased of the Compustat firms from 1971 – 2004, although equity repurchases have risen relatively to dividends since 1982.

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[1] See E. Schwartz and R.J. Aronson, "The Corporate Sector: A Net Exporter of Funds," *Southern Economic Journal*, October 1966.

[2] We examine the 1971 – 2006 period because Compustat does not maintain debt and equity issuance, and repurchases, prior to 1971.

An inspection of the ES components, shown in Chart 1, reveals that interest paid has risen faster than dividends paid during the 1971 – 2006 time period. Net debt issues have risen at an undiminished rate, with the notable exception of 2001 – 2005. Net equity repurchases, positive in 1988, increase substantially in the 2002 – 2006 time period.[3] In Chart 2, we specifically examine the role of dividends and equity repurchases in corporate exports. As noted previously, dividends increase during the vast majority of the 1971 – 2006 time period (with the exception of 2006). Dividend policies show a high correlation of dividends with earnings, although as earnings rise, there is usually some lag before former payout levels are resumed [Fama and Babiak (1966)]. Buy backs are more difficult to predict. In the past, before the prevalence of buy backs, if a company had a "normal" dividend payout policy, the prospective investor would not be far wrong if he concentrated on the trend of earnings in evaluating the worth of a share of stock. Equity repurchases increased substantially during the 1971 – 2006 time period. Buy backs exceeded dividends in 2005 and 2006 in our database. Why? Equity repurchases, whether privately negotiated or via a tender offer, Tender offers generally specify the number of shares the firm seeks to repurchase, the tender price at which it will repurchase shares, and the expiration date of the tender offer, which the firm may extend [Dann (1981)]. Dann examined 143 cash tender offers to repurchase equity during the 1962 -1976 period, made by 122 different firms, and reported a 22.46% tender offer premium, relative to the previous day of the announcement (20.85% relative to the one month period before the announcement). Firms repurchase equity to enhance stockholder wealth! There were marginal debt effects, and approximately 95% of the enhanced value accrued to stockholders. Lakonishok and Vermaelen (1990) reported excess returns to repurchases continuing through 1986, but at a (slightly)

[3] Stock repurchases rose substantially following the crash of October 1987.

diminished rate [4]The level of current and projected earnings impacts dividend policy and potential buy backs [Bierman (2001)]. A forecast of dividend levels can be obtained by studying past payout rates and attempting to predict future earnings levels. In Chart 3, we specifically examine the post- Schwartz and Aronson (1966) period to address the issues of whether dividends exceeded net new equity issues, which dividends have done throughout the 1971 – 2006 period, and whether dividends have exceed net new capital issues, which dividends have not done throughout the 1971 – 2006 period, primarily because of net new debt issues.

The amount left after common dividends are paid represents retained earnings or earnings reinvested in the firm. Retained earnings add to the equity of the common shareholders, and the amount of correlated funds can be used to finance additions to the operating assets of the corporation or to retire debt. Additional assets, properly employed, should add to the future earnings of the corporation. An increase in assets financed by ownership capital as opposed to debt improves the credit standing of the firm and enables it to acquire debt funds at a relatively lower rate. New debt issues exceed new equity issues by a multiple exceeding 8, a result consistent with Dhrymes and Kurz (1967), and Guerard, Bean, and Andrews (1987). Funds represented in earnings should increase the future profits of the shareholders and eventually result in buy backs or higher dividends. It is not the increment in the book value of the shares, but a hoped-for sequence of increased earnings that makes retained earnings of value to the shareholder.[5] To illustrate the corporate fund generation process, we show the ten largest and

[4] Lakonishok and Vermalen reported premiums of 21.79%, 24.09%, and 18.54% on tender offers during the 1962-1986, 1962-1979, and 1980-1986 periods, respectively. They also reported cumulative abnormal returns of 12.54%, 14.58%, and 9.78% to non-tendering stockholders during the corresponding periods. Smaller firms produced the highest abnormal returns.

[5] If the market re-evaluates a stock favorably, assigning it plus factors for future growth, increased dividends and buy backs and greater stability all at once, the stock can show a rapid rise in price in a brief span of time. However, the market for common stock is notoriously volatile, and a wave of optimism as to the future of the economy and the share of corporate earnings can send the general level of stock prices unsustainably high. Widespread pessimism can have the opposite effect.

smallest corporate exporter firms in 1983, see Table 2, and 2006, see Table 3. AT&T, IBM, and several of the large oil companies dominated positive corporate exports in 1983 as they paid large dividends and interest and generally re-purchased more debt than was issued (which made a great deal of sense given the level of interest rates in 1983). A similar process occurred in 2006 as Microsoft, Pfizer, and the oil companies dominated the largest corporate exporting firm (IBM fell to only the 24th largest exporter in 2006). IBM is a very interesting individual case, as it is generally a large net corporate exporter of funds, except in 1993, its near-bankruptcy year. IBM pays large dividends, repurchases huge amounts of equity, is a net issuer of debt, and issues no new equity after 1995. Indeed, IBM's repurchase of equity far exceeded its dividends paid during the 1995-2006 time period, see Table 4. IBM's dividends exceeded its net new equity issues and net new capital issues in all years except 1993. Guerard and Schwartz (2007) used IBM as one of three firms to illustrate corporate financial policy.

Three constraining factors prevent the growth period from running for an indefinite length. First, it is apparent that no option can keep generating a return that grows forever at a rate that exceeds the growth rate of the economy. A super-growth enterprise that grows at a rate exceeding that of the GDP (Gross Domestic Product) becomes a larger and larger part of the GDP; it becomes a bigger and bigger proportion of the total economy. Taking this proposition to the logical extreme, when the super-growth enterprise becomes the total GDP, it cannot grow faster than the GDP. More realistically, we may note that as the enterprise becomes a larger part of the economy, its rate of growth is constrained by the limits of the system in which it operates.

The second limiting factor involves the relation of the level of the interest rate to available super-growth projects. Theoretically a super-growth investment of infinite duration has an infinite value. However if there were a prevalence of super-growth options, the demand for capital would take a quantum leap. But savings, the supply of capital, is not infinitely elastic. Presumably in any society, people must consume some resources, eat, clothe themselves, and find shelter. They cannot save all income. The price for savings, i.e. the interest rate, must rise, and equilibrium is reached when the interest rate became higher than the rate of growth. Last, we may take a look at the actual financial side of a super-growth process. Presumably, a super growth situation requires an increase in net capital per period which is in excess of the investment in the previous period and which requires that in each period the return on the total capital continues at a rate in excess of the cost of capital. Although given some initial superior advantage in technology or product, an enterprise might enjoy super-growth for a considerable number of years; such growth is not likely to go on indefinitely on an increasing capital base. When in the particular situation, the enterprise begins to evidence a declining marginal return to capital, the period of super-growth must begin to slow and halt.

Why Do Firms Issue Debt?

In the previous section, we discussed the Schwartz and Aronson (1966) hypothesis that the corporate sector was a net exporter of funds. In Chart 1, the reader sees the vast increase of corporate debt, leading to the question of why firms issue debt. The relations among the investment, dividend, and external finance behavior of firms have been studied systematically, but not for a very large sample of firms over a very long period of time. Quite clearly, given the institutional milieu of the modern corporation, there exists at least a presumption that these three aspects of the firm's decision-making process exhibit some interaction. Yet, in the current literature the view is frequently advanced that investment decisions are taken on solely "real" (nonfinancial) considerations, that dividend policies are characterized by a considerable degree of inertia, and that the financing of investment by internal or external funds is a mere detail. Corporations rely on internal funds to finance capital investment and this signifies a strong aversion to the use of the capital market. Thus, it would seem quite reasonable to suppose that the three decisions-to-invest, to pay dividends, and to resort to external funds – are mutually determined. Hence, it is desirable to examine this problem in the context of a simultaneous-equation model. If our conjecture about the *modus operandi* of the system is correct, then we should expect that the coefficients of the jointly determined variables-investment, dividends paid, and external finance-would be significant, at least in several instances, where they serve as explanatory variables.

Dhrymes and Kurz (1967) proposed an explicit link among these three decisions and econometrically implemented using sample consists of 181 industrial and commercial firms for which a continuous record exists over the period 1947-1960. It is the purpose of this paper to study the question of establishing such a link and to elucidate the extent of the interdependence of these decisions for a much larger sample of firms over the 1952-2002 period. The approach

employed makes use of a series of cross sections. In this study we use Compustat balance sheet and income statement data for the 1950-2002 period for firms with assets exceeding $200 million in 2002. Our main findings are the following: (1) a strong interdependence is evident between the investment and dividend decisions; (2) a strong interdependence is evident between the investment and new debt financing decisions; and (3) there is no compelling evidence to suggest that in estimating the structure one ought to use full information methods. That is, we find similar statistically significant relationships using ordinary least squares analysis as using limited information and full information methods.

The three aspects of the firm's behavior on which this study is focused have been studied in the literature with varying degrees of intensity. Thus investment behavior has perhaps been studied most intensively. The integration of investment theory with the neoclassical theory of the firms can be traced to Tinbergen (1938), and Klein (1950). An extensive survey of the work of the last two authors can be found in Meyer and Kuh (1957).[6] It is perhaps accurate to say that the main results of such studies lie in providing tests concerning the empirical relevance of the accelerator, capacity-accelerator, or profits (or rate of profit) theories of investment. The issue is not yet satisfactorily resolved, but it appears that neither the capacity accelerator nor the profits

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[6] In this connection it seems appropriate to cite, in some detail, a very important recent study by Kuh (1963), which is, in some respects, similar to the one we propose to pursue here. Kuh investigates the investment, dividend, and external finance aspects of the firm's behavior in the following context. His basic sample consists of sixty industrial firms for which a continuous satisfactory record exists over the years 1935-55. This sample was arrived at from a larger one by a process of selection which eliminated firms that were merged into others over the sample period, as well as those that were "too large" - owning gross assets over $120 million in 1953. The work is divided in two distinct parts, a theoretical and an empirical one. In the theoretical part the interdependence of the three decisions is quite clearly recognized and an integrated model is presented combining the capacity-accelerator model of investment with the Lintner (1956) and Fama and Babiak (1968) models of dividend behavior. There, investment is given by the usual capacity-accelerator model, so that it depends on the capital stock and sales, as well as on the observed sales-capital ratio, the latter being an approximation to the desired output-capital ratio of the accelerator theory. In this connection models are also tried in which the sales variable is replaced by a profit variable. It is found, however, that the former models are more in accord with the data than the profit ones. They are thus made to depend on profits and past dividends, the model being essentially an adaptation of the usual flexible accelerator model of investment; here the role of the capital coefficient is played by the desired dividend-payout ratio. Finally, external finance behavior is derived residually through the budgetary requirement that investment expenditures must equal retained earnings plus depreciation allowances plus external finance. Thus, in this context there is a certain direction of causality; investment is independent of dividends and external finance; dividends depend only on

theory is alone sufficient, but rather a combination of elements of both is probably necessary to provide a satisfactory account of the empirical behavior of investment. Finally, external finance is more or less residually derived, and hence would depend on investment and dividends. Kuh's estimation is carried out by single-equation methods and his results seem to bear out the capacity accelerator theory of investment and the homogeneous Lintner hypothesis on dividends. In the case of dividend behavior, the main work on the subject, viz., Lintner's views dividend disbursals as totally divorced from investment considerations. Miller and Modigliani (1961) formulated the perfect markets hypothesis in which the dividend decision is independent of the investment decision by deriving that the valuation process of the firm is independent of dividend policy and firm value is dependent upon investment opportunities to produce earnings, dividends, or cash flow. The firm's dividend policy is generally maintained until a permanent change in operations (earnings) has occurred. New capital issues raise funds from which research and development, dividends, and investments are undertaken. It is assumed that dividends and investments increases lead to new capital issues. Modigliani and Miller only allow the interdependence of the investment and new capital issues functions. As an empirical matter Meyer and Kuh (1957) report that 75 per cent of investment in manufacturing is internally "financed." Brealey, Myers, and Allen (2005) and Guerard (2005) report numbers indicating that internal financing may account for as much as 85% of capital investment. The same authors list an impressive catalogue of reasons why such a preference might exist. While this phenomenon may, in some part, be due to the peculiarities of the tax structure of the United States it may also reflect imperfection in the capital market.

The view taken in this paper is rather simply put as follows. Quite generally a firm faces an outflow of funds represented by its variable and fixed costs, tax and dividend payments, as

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profits (and lagged dividends) which may depend on investment although the dependence is not

well as by its investment activities. On the other hand, it can rely on an inflow of funds represented chiefly by its sales and the proceeds through various forms of external finance, viz., by bond or stock flotation. To the extent that a plausible objective for a firm is to grow, provided its operations are profitable, and that the capital market is less than perfect, it would follow that investment and dividend outlays are quite clearly competitive. Dhrymes and Kurz (1967) modeled the interdependence of the dividend, investment, and new debt decisions of 181 industrial and commercial firms during the 1947-1968 period and found: (1) strong interdependence between the investment and dividend decisions; new debt issues result from increased investments and dividends but do not directly affect them; (2) the interdependence among the two-stage least squares residuals compel the use of full information (three-stage least squares regression methods); and (3) the accelerator as well as profit theory is necessary to explain investment.

The Dhrymes and Kurz study generated much interest in testing the perfect markets hypothesis. Mueller (1967) found significant interdependence among the research, advertising, dividend, and investment decisions in 67 manufacturing firms for the 1957-1968 period. Higgins (1972) examined the Dhrymes and Kurz rejection of perfect markets hypothesis arid produced a study showing independence of the investment and dividend decisions. Fama (1974) employed time series methodology and McDonald, Jacquillat, and Nussenbaum (1975) employed cross-sectional analysis of French firms to find little evidence of imperfect markets. McCabe (1979) criticized the Higgins and Fama studies and using firms during the 1961-1970 period found evidence rejecting the perfect markets hypothesis. Studies by Peterson and Benesh (1983), Switzer (1984), and Jalilvand and Harris (1984) found evidence supporting the interdependence of the investment, dividend, and financing decisions. Guerard and McCabe (1992) and Guerard,

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explicit.

Bean, and Andrews (1987) employed a diversified 303-firm sample for the 1975-1982 period and found significant interdependencies among investment and new debt and R&D and dividends. Thus, the evidence on the perfect markets hypothesis is mixed.

The Model

The Structure of the Model

The general (schematic) structure of the model is as follows :

$$I_1 = f_1(I_2, D, EF1, EF2; X_1, X_2, \ldots X_n)$$

$$I_2 = f_2(I_1, D, EF1, EF2; X_1, X_2, \ldots X_n)$$

$$D = f_3(I_2, I_2, EF1, EF2; X_1, X_2, \ldots X_n) \qquad (2)$$

$$EF1 = f_4(I_1, I_2, D,, EF2; X_1, X_2, \ldots X_n)$$

$$EF_2 = f_5(I_1, I_2, D, EF1; X_1, X_2, \ldots X_n)$$

Where I_1 is investment in fixed assets; I_2 is inventory and other short term investments; D is common stock dividends paid; *EFl* is (net) external finance obtained by borrowing; *EF2* is (net) external finance obtained by stock flotation; the X_i are predetermined variables, $i = 1, 2, \ldots n$. The predetermined variables may include profits, depreciation, sales, long-term debt outstanding, etc., and will be introduced explicitly as the occasion arises.

In addition, the firm faces the "budget constraint"

$$I_1 + I_2 = EFl + EF2 + P - D + Dep, \qquad (3)$$

where P and *Dep* denote, respectively, profits and depreciation allowances.

If we use the constraint in (2), we can eliminate one of the (endogenous) variables of the system in (1). We have chosen to eliminate *EF2*; this was done chiefly because data on this variable were very difficult to obtain with any reasonable degree of reliability At any rate stock flotation as a source of external finance, while not negligible, is of minor significance compared

with bond flotation for most years and industries in our analysis. New bond floatations exceeded new equity floatations by a 7:1 margin over the 1950-2002 period [Guerard and Schwartz (2007)] Since our sample will consist largely of manufacturing and retail trade firms with a rather small representation of mining firms, it follows that our selection of bond finance as the principal source of external funds to be studied is not likely to lead to serious deficiencies. Finally, we have chosen to regard short-term investment as a predetermined variable, so that our final system of equations to be estimated is reduced to three, viz., the dividend, the (fixed) investment, and the external finance equations. This last decision carries with it, in principle, serious deficiencies. There is unfortunately no detailed breakdown of the short-term investment series was available, so we have chosen to treat it as a predetermined variable. Thus, the model finally estimated is of the form

$$D = g_1(I, EF1; X_1, X_2, \ldots, X_m)$$
$$I = g_2(D, EF1; X_1, X_2, \ldots, X_m) \qquad (4)$$
$$EF1 = g_3(D, I; X_1, X_2, \ldots, X_m)$$

General Comments on the Form of the Equations

The Dividend Equation. One can look upon dividend disbursals as conveying information to the market on the inherent profitability of the disbursing firm as Modigliani and Miller (1961) *inter alios* have argued. In fact they would contend that the dividend series contains "more information" than the profit series. Hence, it would appear that it is the policy of firms to maintain a steady dividend per share and to adjust it, upward and downward only when a "permanent" change in their economic environment has taken place. As a matter of fact, it is more or less common for firms to maintain a constant dividend per share. But this in no way implies constancy in the dividend-profit ratio. It is reasonable to suppose that dividend disbursals

will depend on the rate of profit of the firm, its investment plans, and the external finance obtained through the bond market; 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 are extensive.

The Investment Equation. The foundations of investment theory in the theory of the firm are too well-known to require repetition here. Clearly from this point of view investment would depend either on changes in the volume of output or on its rate of profit, which may be taken to lead to changes in the expected profitability of new investment. These two considerations are not totally unrelated, especially if the firm is assumed to operate with a neoclassical production function allowing substitution; if no substitution is allowed, then it is not clear that the rate of profit has any place in the investment function.

Our innovation here consists in introducing the other two jointly dependent variables, viz., dividends and external finance. We have already given some indication as to why we consider these variables relevant. Clearly dividend disbursals and investment outlays represent competing demands on the resources available to the firm; thus it would be quite plausible to suppose that the investment activities of the firm will be affected by its dividend activities; postponement or curtailment of investment could conceivably result because of inability of the firm to (carry out a given investment program, "optimally" determined by some "rational" criteria, and at the same time continue to make "satisfactory" dividend payments. It would also be of interest to inquire whether such variables as depreciation, see Meyer and Kuh (1957), are significant determinants of investment; if depreciation is an accurate index of deterioration of the capital stock due to its employment in the productive process, then depreciation would describe accurately that part of investment undertaken for replacement purposes. There are good reasons to believe, however, that depreciation does not accurately measure the wing up of capital, and

hence its introduction in the investment equation would only serve to portray more accurately the resources available to the firm for investment and dividend outlays. In addition, there is the question of the proper lags operating in the investment process; thus it would be of interest to ascertain whether lagged rates of change of sales or past rates of profit significantly affect the decision to invest. The introduction of the bond finance variable here has a motivation best understood in terms of imperfect capital markets. Thus, if in a given universe all firms belong to more or less the same uncertainty class, then market discrimination might be expected to take the form of restricting the amount a firm can borrow without raising the cost of obtaining long-term funds. Hence, we may conjecture, ceteris paribus, that the easier the access to this market – either in the amounts or in the terms on which the loans are granted-the larger the investment program a firm may undertake. Thus, in the investment equation dividends may be expected to have a negative impact, while external finance will have a positive one.

The External Finance Equation. Enough has been said in connection with the other two equations to make the hypothesized form of the external finance equation clear. 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, however, is not very clear-cut. Thus, it is possible to argue that essentially because of a budgetary constraint, more dividends, other things being equal, mean more borrowing. But it is equally plausible to argue that for firms that are no longer growing rapidly more dividends need not induce further borrowing simply because their investment activities are somewhat restricted. Thus, there should not be any feedback from dividends to external finance.

Empirical Estimation of the Equation System

The sample on which our study is based consists of firms with assets exceeding $200 million in 2002, for which a continuous satisfactory record exists between 1952 and 2002. These firms are largely manufacturing and retail trade ones, although several are chiefly engaged in mining activities. The sources of our data are the balance sheets and income statements of individual firms appearing in the Compustat database. Our sample does not weigh very heavily any particular classification, although our fim1s tend to be mostly medium-sized and large ones. The sample begins with 156 companies in 1952 and concludes with 3762 companies in 2002. Our sample in 1952 of 156 firms is very similar to the Dhrymes and Kurz (1967) sample of 181 companies in 1952. Our study is the largest in scope and longest, in time period, analysis of the interdependencies of financial decisions.

At this stage it is desirable to catalog and explain briefly the nature of the variables entering into our investigation. The following basic variables are employed;

S_t = Sales at time t, undeflated.

$(EF1)_t$ – long-term borrowing-external finance-at time t; this is imply the first difference of the book value of long-term debt outstanding and thus represents net current long-term borrowing; it should be remembered that this measure is somewhat biased by the transfer of maturing long-term debt to the short-term category.

D_t = dividends (common) paid at time t.

I_t = gross fixed investment at time t.

K_t = book value of the capital stock at beginning of time t.

Pt = net profits (after taxes) at time t, undeflated.

$(LTD)_t$ = net long-term debt outstanding at time t, in nominal terms.

$(Dep)_t$ = depreciation allowances at time to t

N_t = net current position of the firm at time t, defined as the excess of inventories, cash, short-term securities, and accounts receivable over accounts payable and other short term liabilities.

R_t = interest payments at time t, on long-term debt outstanding. This is admittedly a very poor measure of the relevant interest rate but it is the only one available.

In actually carrying out the empirical implementation of the model, we have chosen to normalize the jointly dependent variables by S_t. This was done for two reasons: first, it tends to reduce heteroscedasticity and hence make the stochastic characteristics of our sample correspond more closely to the standard specification of the simultaneous equation models; second, since our objective is to isolate the determinants of the investment-dividend-external finance-decision process, this procedure prevents our results from being unduly influenced by large firms simply because of sheer size. Another related reason is the fact that one would not expect the relation between investment and the appropriate accelerator variable to be identical in the case of a retail store and an aircraft manufacturer. By relying on "intensive" variables, one tends to overcome such problems.

A list of the predetermined variables actually employed is given below:

N/K enters the model as a consequence of the use of the budget constraint to eliminate one of the equations of the system; the normalization employed here is to some extent motivated by portfolio theory considerations.

Dep/K represents the portion of the book value of the capital stock written off as depreciation charges; its form is related to the following basic variable.

P/K is the rate of profit; it would have been better perhaps to have defined the numerator of this fraction as profits plus depreciation plus interest charges on the ground that, since it

measures the (average) rate of return on the firm's capital resources, this ought to be measured gross of irrelevant bookkeeping items such as depreciation and interest charges.

$S_{-2}^* = (S_t - S_{t-3})/(S_{t-3})$ is the usual accelerator variable except that it is normalized by a lagged value of sales. It was felt, however, that it is the pressure of sustained relative increases in sales that affects investment.

LTD/(K - LTD) is the leverage variable employed to test the principle of increasing risk. It is probably not a very accurate one, the rationale behind it being that businessmen are influenced by book rather than market value considerations.

Main Empirical Results

We present annual cross-section regression for selected years, one per decade, over the 1952-2002 period. We chose to report non-recessionary years, 1955, 1968, 1978, 1986, 1998, as defined by the Conference Board [Zarnowitz (2001) and Montgomery, Zarnowitz, Tsay, and Tiao (1998)]. [7]We will send interested readers the all regression results. Let us address the ordinary least squares regression (OLS) results and the two-stage least squares (2SLS) regression results for the dividend, investment, and external financing equations.

The regression results are shown in Tables 5-7 for the respective equations. The primary, statistically significant, determinants of dividends, shown in Table 5, are profits (positive), net current position (negative), and investments (negative). The external financing variable is statistically significant in about one half of the annual dividend equations. The primary, statistically significant, determinants of dividends, in 2SLSshown in Table 5, are, again, profits (positive), net current position (negative), and investments (negative). The OLS and 2SLS dividend coefficients and their corresponding t-statistics are virtually identical. The external

financing variable is incorrectly negative and statistically significant in many of the annual dividend equations.

The statistically significant investment determinants are the net current position (negative) and new debt issues (positive). The lagged profits, sales accelerator variable, and dividend variables are not statistically significant in the investments equation, shown in Table 6. The statistically significant 2SLS investment determinants are the net current position (negative) and new debt issues (positive). The lagged profits variable is not consistently positive and statistically significant in the investments equation, nor is the sales accelerator variable. Indeed, the sakes accelerator variable is more often negative and statistically significant rather than the presumed positive coefficient. The dividend variable is often negative and statistically significant in the investments equation, shown in Table 6.

The OLS external financing determinants are capital investments. The debt-to-equity ratio, depreciation, profits, and interest payments are not statistically significant in the external financing equation. The reader is referred to Table 7 for the external financing results. Moreover, the dividend variable is not consistently positive or negative in sign in its coefficient. The 2SLS external financing determinants are capital investments. The debt-to-equity ratio, depreciation, profits, and interest payments are not statistically significant in the external financing equation, see Table 7. As was the case in the OLS external financing estimated equation, the dividend variable is not consistently positive or negative in sign in its coefficient. The primary difference in the OLS and 2SLS regression results is the negative, and statistically significant interdependency between investments and dividends. Investments and dividends are alternative uses of funds.

[7] We report 2002 despite its recessionary environment because the 2000-2005 period does not have a non-

Conclusion

Schwartz and Aronson were correct that the corporate sector was, and is, a net exporter of funds. Moreover, as we address the issue of why firms issue debt, we must determine the structure underlying the dividend-investment-external finance triad of decision-making processes. Moreover, we were concerned with demonstrating the simultaneous character of these decision-making processes.

The sample employed was a cross-sectional one involving manufacturing, mining, and retail trade firms with assets exceeding $200 million in 2002, with data during the period 1952-2002. The method of investigation consisted of estimating the structure of our model successively for the years 1952-2002. The main findings are in brief the following:

1. There is a significant degree of interdependence between the investment and dividend decision-making processes, with the implication that if dividend policies are very rigid as some allege, then this rigidity may tend to hamper the investment activity of firms. On the other hand, our results tend to show that the investment requirements of firms tend to have a significant effect on their dividend behavior.

2. The external finance activity of firms seems to be strongly affected by their investment policies, but less so by their dividend policies.

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recessionary year.

Table 1: Funds Exported, 1971-2006

Year	Funds Exported	Dividends	Interest Paid	Net Equity Repurchased	Net Debt Issued	Equity Repurchased	Dividends less Equity Repurchased	Dividends less Net Equity	Dividends less Net New Capital	N of Firms
1971	19403.1	21353.4	18089.1	-6290.9	13747.6	1382.6	19970.8	15062.6	1314.0	2300
1972	25579.6	24334.3	20366.4	-5642.3	13461.8	1976.4	22357.9	18692.0	5230.2	3329
1973	26907.0	26252.7	27245.0	-6604.0	19986.3	3818.5	22434.2	19648.2	-338.1	3911
1974	26782.5	29010.6	36889.9	-5928.3	33189.7	1987.1	27023.5	23082.3	-10107.4	4391
1975	22386.8	30476.1	38493.1	-11649.3	34933.2	1287.5	29188.6	18826.8	-16106.4	4404
1976	39436.4	34861.6	39546.2	-13199.5	21771.9	2309.7	32551.9	21662.1	-109.7	4438
1977	47481.1	40964.9	43718.9	-12900.3	24302.4	4520.9	36444.0	28064.6	3762.2	4435
1978	48638.7	45794.7	50960.9	-13010.8	35106.2	4911.0	40883.7	32784.0	-2322.3	4394
1979	50089.3	53414.5	62522.8	-17512.7	48335.2	6001.9	47412.6	35901.8	-12433.4	4364
1980	52304.5	58801.3	80535.4	-26002.5	61029.5	7201.0	51600.3	32798.6	-28230.9	4449
1981	57820.1	64502.2	99845.3	-33138.6	73388.9	7071.9	57430.3	31363.6	-42025.2	4708
1982	88695.5	68109.3	108184.5	-30061.2	57537.1	11441.3	56668.0	38048.1	-19489.1	4758
1983	111452.8	72620.3	105122.5	-53724.6	12565.5	10951.8	61668.5	18895.8	6330.3	5192
1984	123552.7	77052.6	117791.4	-3041.4	68249.7	33008.8	44043.8	74011.2	5761.5	5298
1985	128281.3	81745.4	126787.6	-4501.9	75749.7	47275.0	34470.4	77243.4	1493.7	5355
1986	110454.1	92347.6	135504.9	-17073.3	100325.2	49245.7	43101.9	75274.3	-25050.9	5625
1987	192420.6	103140.3	150275.8	-5408.0	55587.5	61949.9	41190.4	97732.3	42144.8	5888
1988	227834.7	122067.9	184544.2	21493.6	100271.1	57415.9	64652.0	143561.5	43290.5	5779
1989	219173.3	122976.8	230065.4	-675.7	133193.1	59013.3	63963.5	122301.1	-10892.1	5662
1990	257582.5	129935.7	233759.6	6403.3	112516.1	49706.5	80229.2	136339.0	23822.9	5620
1991	217577.9	132470.6	233711.4	-47775.0	100829.2	31509.8	100960.8	84695.7	-16133.5	5782
1992	241470.8	137089.6	219722.5	-55836.4	59505.0	39625.7	97463.9	81253.3	21748.3	6008
1993	197573.5	144714.0	213924.1	-86354.0	74710.6	46109.5	98604.5	58360.0	-16350.6	7124
1994	251487.8	158750.6	232164.4	-48802.0	90625.2	54060.9	104689.7	109948.6	19323.4	7553
1995	234389.8	186295.4	278433.5	-20756.1	209583.1	86492.7	99802.7	165539.3	-44043.8	7695
1996	251203.4	206642.8	297219.0	-64749.0	187909.6	112268.5	94374.3	141893.8	-46015.8	8213
1997	226000.1	211645.6	333989.3	-5303.3	314330.9	162431.7	49213.9	206342.3	-107988.6	8255
1998	163142.4	254009.5	395905.7	23305.0	510077.9	217806.3	36203.2	277314.5	-232763.3	7894
1999	57423.2	243240.2	431477.8	-53927.8	563367.0	222684.6	20555.6	189312.4	-374054.6	7652
2000	31602.4	253861.1	553350.4	-131271.3	644337.8	223850.6	30010.5	122589.8	-521748.1	7526
2001	200507.4	269390.2	588656.3	-39501.1	618039.0	206198.6	63191.6	229889.1	-388148.9	6935
2002	410245.3	283916.1	506826.6	41666.3	422163.8	201382.9	82533.2	325582.5	-96581.3	6496
2003	487086.9	318087.9	494466.0	36205.2	361672.4	217445.8	100642.1	354293.1	-7379.2	6179
2004	700771.1	400185.9	501615.3	93343.2	294373.3	350611.5	49574.4	493529.1	199155.8	6114
2005	982594.9	484068.2	613358.9	254315.2	369147.4	509698.9	-25630.7	738383.4	369236.0	6000
2006	686557.3	468005.4	716989.4	410001.4	908438.9	680467.6	-212462.2	878006.8	-30432.1	5243

Chart 1: The Corporation as a Net Exporter of Funds, 1971 - 2006

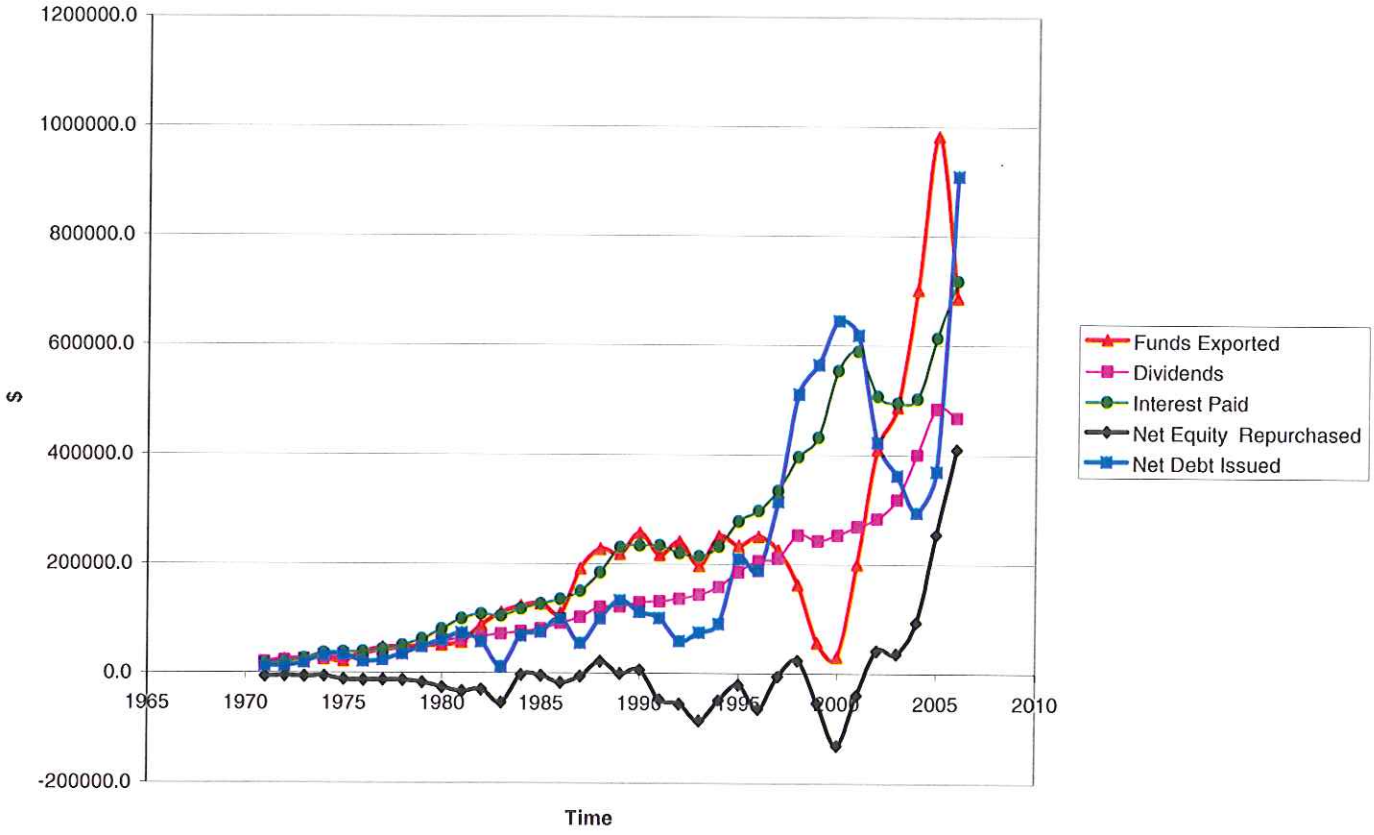

Chart 2: The Corporation as a Net Exporter of Funds: Dividends less Equity Repurchased, 1971- 2006

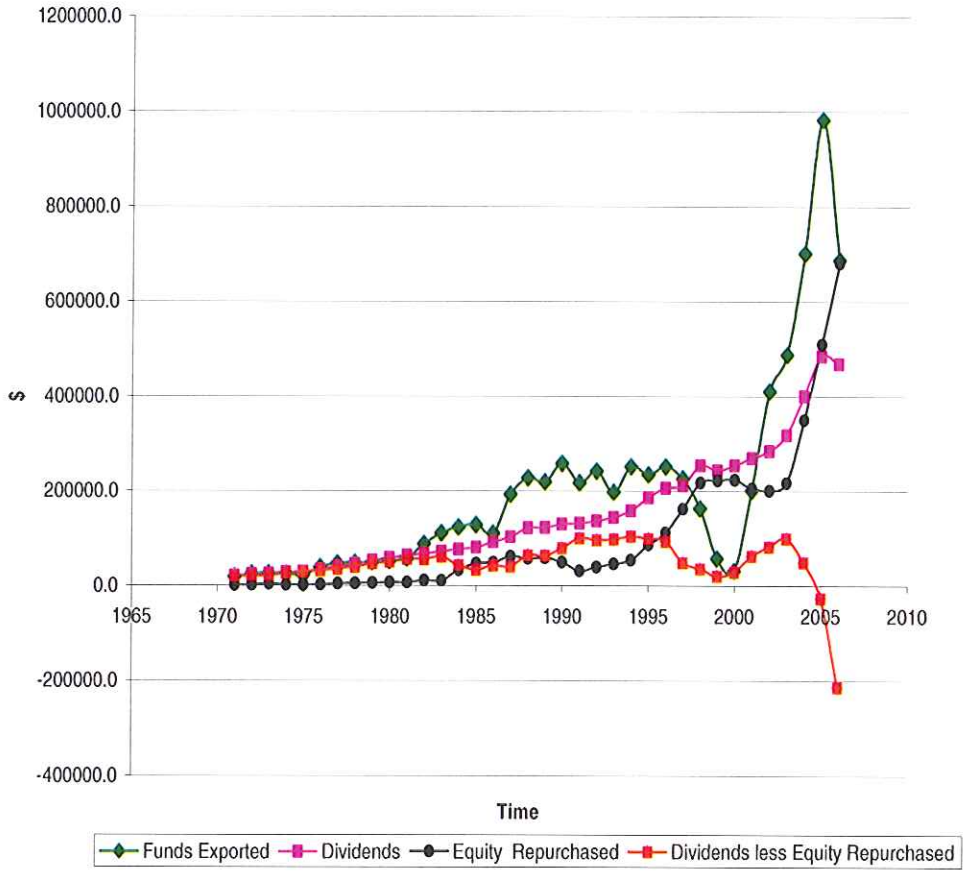

Chart 3: ES and Dividends,
1971 - 2006

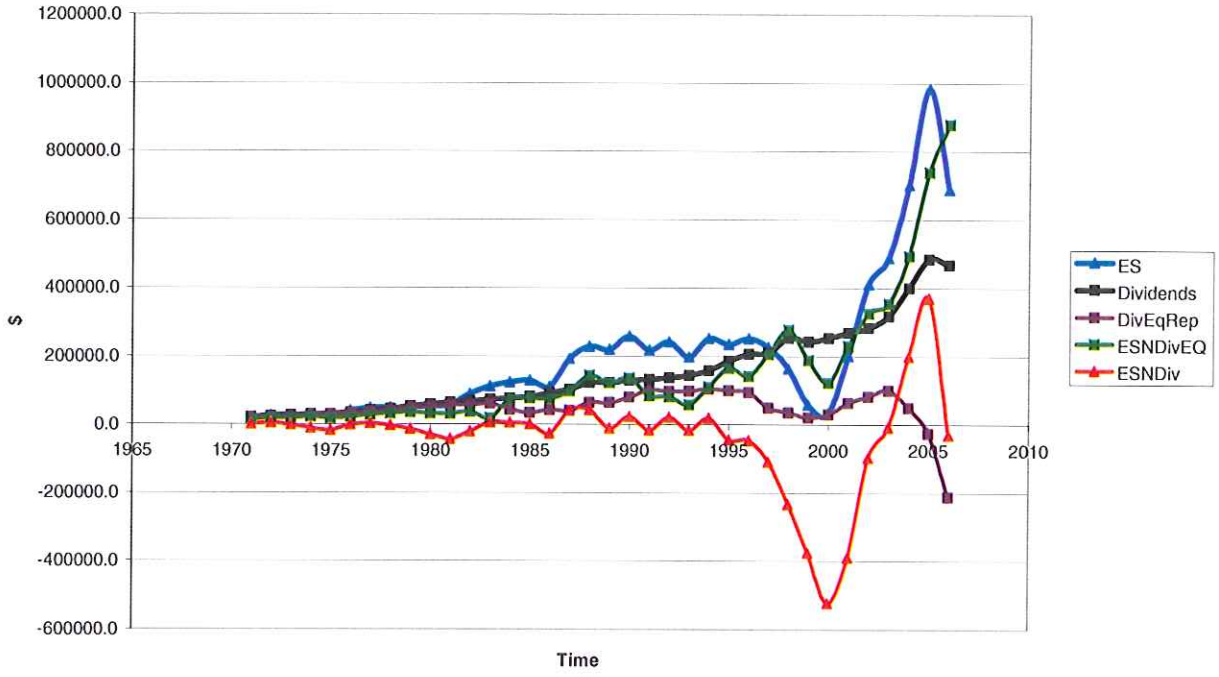

Table 2: 1983 Corporate Sector Exports

CoName	ES	Dividends Paid	Interest Paid	Net Equity Repurchased	Net Debt Issued
SLM CORP	-1742.2	3.0	711.3	-356.5	2100.0
MAXUE ENERGY	-1166.5	134.8	143.3	-1547.4	-93.6
XEROX	-955.8	285.1	190.4	-820.0	611.3
MCI	-826.2	0.0	185.8	-197.1	814.9
7-ELEVEN	-733.4	35.3	78.8	-276.4	571.2
SIGNAL	-625.0	88.0	78.0	-948.0	-157.0
CERIDIAN	-599.4	22.8	471.5	-26.7	1067.0
DELTA AIR	-597.8	40.0	92.9	0.0	730.5
STONE CONTAINER	-515.2	6.5	25.1	-137.2	49.6
COMDISCO	-500.0	4.0	53.7	-53.4	504.4
ROYAL DUTCH PETROLEUM	1973.0	683.0	904.0	0.0	-386.0
ALTRIA	2004.1	365.8	362.7	89.2	-1186.4
IBM	2069.0	2251.0	429.0	-788.0	-177.0
OCCIDENTIAL PETROLEUM	2412.6	240.7	634.5	133.7	-1403.7
DUPONT	2416.0	595.0	792.0	-106.0	-1135.0
FANNIE MAE	3248.7	10.5	7988.7	-7.6	4742.9
GM	3383.9	879.3	1401.8	212.0	-1314.8
BP	3696.0	65.0	913.0	-30.0	-2178.0
EXXON	4342.7	2673.8	1019.7	762.5	113.3
AT&T	5098.8	5495.9	4307.2	-3902.1	802.2

Table 3: 2006 Corporate Sector Exports

CoName	ES	Dividends Paid	Interest Paid	Net Equity Repurchased	Net Debt Issued
AIG	-25992	1690.0	7009.0	-143.0	2100.0
ING	-22488	3538.1	0.0	1377.8	-93.6
ANADARKO PETROLEUM	-15169	167.0	730.0	55.0	611.3
TELEFONICA	-14685	3466.9	5116.5	3096.0	814.9
CAMPHIA VALE	-14510	13.6	5379.9	308.8	571.2
FORD	-12654	468.0	8783.0	-248.0	-157.0
BAYER	-11386	915.9	1838.3	0.0	1067.0
AMERICAN EXPRESS	-9662	692.0	120.0	4093.0	730.5
ARCELOR MITTA	-9452	522.0	1124.0	-8.0	49.6
SLM CORP	-8584	398.4	5122.9	290.3	14395.4
IBM	11019	1683.0	981.0	6399.0	-1956.0
ALTRIA	13458	6954.0	1331.0	768.0	-4405.0
PFIZER	13769	7268.0	517.0	6979.0	995.0
ROYAL DUTCH PETROLEUM	15871	8142.0	1713.0	8047.0	2031.0
VERIZON	16342	4781.0	2785.0	1526.0	-7250.0
FEDERAL HOME LOAN	20516	1310.0	36883.0	480.0	18157.0
MICROSOFT	20700	3594.0	0.0	17106.0	0.0
BP	23857	7686.0	1196.0	15151.0	176.0
GM	30232	563.0	16945.0	0.0	-12724.0
EXXON-MOBIL	36912	7628.0	1184.0	28385.0	285.0
UBS	40995	2635.5	66322.3	2970.9	30933.0

Table 4: IBM Corporate Exports

Year	Funds Exported	Dividends	Interest Paid	Net Equity Repurchased	Net Debt Issued	Equity Repurchased	Dividends less Equity Repurchased
1971	350.4	598.2	70.0	-214.6	103.3	0.0	598.2
1972	337.4	626.2	78.4	-270.4	96.8	0.0	626.2
1973	547.1	654.3	97.1	-325.0	-120.7	0.0	654.3
1974	924.8	819.7	69.1	-280.4	-316.4	0.0	819.7
1975	787.7	987.0	62.6	-284.5	-40.4	0.0	970.0
1976	1129.5	120.8	45.0	-139.2	-20.0	154.7	1049.2
1977	2909.9	1910.7	40.4	939.5	-19.4	1245.2	665.7
1978	2260.9	1763.1	55.2	472.3	29.8	813.4	949.7
1979	380.3	1506.0	140.5	37.7	1303.8	454.0	1052.0
1980	1885.0	2008.0	325.0	62.0	510.0	484.0	1524.0
1981	1510.0	2023.0	480.0	-423.0	570.0	0.0	2023.0
1982	1772.0	2053.0	514.0	-613.0	182.0	0.0	2053.0
1983	2069.0	2251.0	429.0	-788.0	-177.0	0.0	2251.0
1984	2295.0	2507.0	456.0	-73.0	595.0	0.0	2507.0
1985	2416.0	2703.0	532.0	-133.0	686.0	0.0	2703.0
1986	4553.0	2698.0	604.0	1465.0	214.0	1488.0	1210.0
1987	4874.0	2654.0	619.0	1290.0	-311.0	1425.0	1229.0
1988	2881.0	2609.0	802.0	1003.0	1533.0	1003.0	1606.0
1989	1955.0	2752.0	1118.0	1788.0	3703.0	1788.0	964.0
1990	3718.0	2774.0	1446.0	491.0	993.0	491.0	2283.0
1991	2874.0	2771.0	1566.0	129.0	1592.0	196.0	2575.0
1992	5006.0	2765.0	1461.0	90.0	-690.0	90.0	2675.0
1993	-2042.0	905.0	1319.0	-1213.0	3053.0	0.0	905.0
1994	5634.0	585.0	1247.0	-308.0	-4110.0	10.0	575.0
1995	9670.0	572.0	748.0	5526.0	-2824.0	5526.0	-4954.0
1996	3760.0	686.0	747.0	5005.0	2678.0	5005.0	-4319.0
1997	3162.0	763.0	760.0	6251.0	0.0	6251.0	-5488.0
1998	6213.0	814.0	741.0	6283.0	1625.0	6283.0	-5469.0
1999	9631.0	859.0	750.0	6645.0	-1377.0	6645.0	-5786.0
2000	5676.0	909.0	737.0	6073.0	2043.0	6073.0	-5164.0
2001	8496.0	956.0	271.0	3906.0	-3363.0	1573.0	-2950.0
2002	3358.0	1005.0	180.0	3087.0	914.0	2438.0	-2082.0
2003	9238.0	1085.0	663.0	3232.0	-4258.0	3232.0	-2147.0
2004	9263.0	1174.0	571.0	5418.0	-2100.0	5418.0	-4244.0
2005	7676.0	1250.0	761.0	6506.0	841.0	6506.0	-5256.0
2006	11019.0	1683.0	981.0	6399.0	-1956.0	6399.0	-4716.0

Table 5: Dividends
Selected Years

			OLS			
Variable	1955	1968	1978	1986	1998	2006
Intercept	0.036	0.027	0.018	0.012	0.026	0.01
t	(4.18)	(5.69)	(6.74)	(9.82)	(6.34)	(10.17)
PK	0.042	0.073	0.039	0.017	0.001	0.007
	(3.08)	(6.71)	(6.00)	(3.66)	(0.13)	(2.55)
CAK	-0.026	-0.045	-0.019	-0.002	-0.019	-0.002
	(-2.11)	(-6.65)	(-5.16)	(-1.85)	(-3.19)	(-1.76)
IK	-0.059	-0.090	-0.041	-0.030	-0.054	-0.014
	(-3.09)	(-5.62)	(-4.92)	(-.75)	(-2.92)	(-1.72)
FS	0.069	0.120	0.010	-0.009	0.009	0.001
	(1.46)	(7.19)	(3.35)	(-2.61)	(3.43)	(0.09)
Adj.R-Square	0.10	0.25	0.08	0.02	0.01	0.00
F	5.6	33.4	14.5	5.3	6.4	2.7

			2SLS			
Variable	1955	1968	1978	1986	1998	2006
Intercept	0.037	0.024	0.008	0.013	0.016	0.01
t	(3.35)	(3.86)	(1.7)	(9.65)	(10.49)	(4.81)
PK	0.043	0.074	0.033	0.017	0.003	0.012
	(2.90)	(6.72)	(3.80)	(3.64)	(1.43)	(1.81)
CAK	-0.027	-0.043	-0.004	-0.004	-0.004	-0.003
	(-1.89)	(-6.68)	(-.59)	(-2.42)	(-1.79)	(-1.42)
IK	-0.059	-0.091	0.001	0.000	-0.020	-0.034
	(-3.02)	(-5.63)	(0.03)	(-.06)	(-2.20)	(-1.52)
FS	0.057	0.158	-0.050	-0.029	-0.028	-0.090
	(0.46)	(3.28)	(-2.31)	(-2.54)	(-1.82)	(1.25)
Adj.R-Square	0.09	0.19	0.05	0.02	1.00	0.00
F	5.1	22.9	8.2	5.0	4.5	1.1

Table 6: Investment
Selected Years

			OLS			
Variable	1955	1968	1978	1986	1998	2006
Intercept	0.162	0.172	0.178	0.082	0.145	0.074
t	(10.67)	(12.6)	(13.0)	(10.4)	(15.64)	(10.17)
PKL	-0.021	0.011	0.046	0.033	-0.010	-0.002
	(-.72)	(0.28)	(1.24)	(1.84)	(-1.32)	(-.39)
CAK	-0.221	-0.255	-0.247	-0.006	-0.096	-0.012
	(-9.61)	(-11.12)	(-11.74)	(-1.35)	(-5.71)	(-2.93)
D2SALES	0.078	0.006	-0.009	-0.003	-0.063	0.001
	(-3.09)	(-5.62)	(-4.92)	(-.75)	(-2.92)	(-1.72)
DS	-0.039	-0.112	0.178	0.235	-0.094	0.105
	(-.25)	(-.63)	(0.65)	(1.11)	(-1.25)	(1.01)
FS	0.226	0.334	0.141	0.254	0.110	0.019
	(2.13)	(5.10)	(7.27)	(12.15)	(12.91)	(3.44)
Adj.R-Square	0.46	0.33	0.24	0.16	0.11	0.01
F	29.6	38.5	37.2	30.7	44.2	4.3

			2SLS			
Variable	1955	1968	1978	1986	1998	2006
Intercept	0.49	0.157	0.269	0.122	0.218	0.126
t	(2.18)	(3.92)	(5.28)	(2.54)	(2.69)	(0.84)
PKL	0.179	0.212	0.155	0.286	0.022	-0.019
	(1.04)	(2.45)	(1.15)	(3.57)	(0.64)	(-.3)
CAK	-0.513	-0.262	-0.358	-0.004	-0.228	-0.065
	(-2.25)	(-4.69)	(-5.84)	(-3.31)	(-2.73)	(-1.19)
D2SALES	0.560	-0.265	-0.359	-0.096	-0.076	0.014
	(1.46)	(-3.06)	(-3.63)	(-2.19)	(-0.71)	(0.35)
DS	-0.876	-3.941	-0.375	-8.179	-10.485	-7.946
	(-.52)	(-4.52)	(-.12)	(-2.40)	(-3.48)	(-.57)
FS	-0.550	2.138	1.274	1076.000	1.195	2.800
	(-1.27)	(4.03)	(4.62)	(4.17)	(5.1)	(2.12)
Adj.R-Square	0.03	0.15	0.07	0.02	0.02	0.00
F	2.0	14.9	10.0	4.1	7.0	1.0

Table 7: External Financing
Selected Years

			OLS			
Variable	1955	1968	1978	1986	1998	2006
Intercept	0.007	0.042	-0.056	-0.018	0.073	-0.001
t	(0.69)	(3.81)	(-1.80)	(-1.30)	(2.88)	(-.70)
DE	0.000	0.000	0.000	-0.001	-0.001	0.000
	(-.18)	(-.51)	(0.81)	(-.98)	(2.54)	(0.10)
INTE	0.092	-0.001	-0.004	0.000	0.000	-0.001
	(-9.61)	(-11.12)	(-11.74)	(-1.35)	(-5.71)	(-2.93)
DEPK	0.006	-0.145	-0.590	-0.018	-0.454	-0.093
	(-.60)	(-1.22)	(-1.68)	(-.35)	(-1.92)	(-1.04)
PK	0.055	-0.045	0.185	0.048	-0.125	0.009
	(2.31)	(-1.40)	(1.92)	(1.20)	(-2.29)	(0.16)
DS	0.187	0.812	0.185	-0.934	0.623	0.269
	(1.43)	(6.08)	(1.92)	(-2.75)	(3.09)	(0.65)
IS	0.236	0.199	0.490	0.637	0.790	0.301
	(4.74)	(5.37)	(5.83)	(12.28)	(12.8)	(3.4)
Adj.R-Square	0.14	0.19	0.06	0.16	0.01	0.00
F	5.7	15.6	7.0	26.9	34.2	2.3

			2SLS			
Variable	1955	1968	1978	1986	1998	2006
Intercept	-0.029	0.043	0.061	0.040	0.063	0.126
t	(-1.28)	(3.51)	(1.26)	(1.98)	(0.98)	(0.75)
DE	0.000	0.212	0.155	0.286	0.022	-0.019
	(-.09)	(-.55)	(-.24)	(-.93)	(0.53)	(-.11)
INTE	0.399	-0.003	0.007	0.003	0.000	-0.001
	(1.99)	(-.06)	(0.90)	(0.87)	(-.14)	(-.25)
DEPK	0.063	-0.133	-1.367	-0.052	-0.309	-0.177
	(0.46)	(-.94)	(-2.59)	(-.84)	(-1.18)	(1.17)
PK	0.090	-0.048	0.561	0.105	-0.163	0.072
	(0.60)	(-1.29)	(3.71)	(1.88)	(-2.67)	(0.68)
DS	1.218	0.818	-11.674	6.957	4.340	-6.129
	(2.34)	(2.72)	(-4.68)	(-2.62)	(2.22)	(-.71)
IS	0.171	0.188	0.570	0.413	0.566	0.221
	(2.54)	(3.60)	(3.16)	(3.08)	(5.09)	(1.46)
Adj.R-Square	0.06	0.07	0.04	0.02	0.03	0
F	2.9	5.8	4.9	3.8	8.9	1.0

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