

Factors Influencing Corporate Dividend Decision: Evidence from Jordanian Panel Data

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ABSTRACT

This paper examines the determinants of corporate dividend decisions of publicly quoted companies in Jordan as a case study of an emerging market. The analysis is based on 15-year unbalanced panel data with 1137 firm-year observations covering the period between 1989 and 2003. The study develops five research hypotheses and used the general-to-specific modelling approach to choose between the competing hypotheses. We estimate the determinants for a given firm to pay dividends to its shareholders through Probit specifications. The factors that affect dividend policy in developed stock markets seem to apply for this emerging market. For example, factors such as size, profitability, and age increase the likelihood to pay dividends. Financial leverage decreases the probability to pay dividends. Taken together, the findings provide support for the agency costs hypothesis and are broadly consistent with the pecking order hypothesis.

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Keywords: Dividend policy; Agency costs; Panel data; Probit; Amman Stock Exchange

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I. INTRODUCTION

While the argument of the irrelevance of corporate dividend policy in perfect capital markets has been very important in financial theory, there is also much controversy about dividend policy in the real world where market imperfections exist. The presence of information asymmetry, agency problems, taxes, and transaction costs all seem to make dividend policy matter. A large body of theoretical and empirical research has attempted to identify the determinants of corporate dividend policy. To date, however, there is no consensus about what factors affect corporate payout policy. The issue gets even more complicated when it comes to emerging markets. This study attempts to provide an insight into dividend policy in one emerging market, namely the Amman Stock Exchange (ASE), where there is a lack of evidence about the determinants of corporate dividend decisions.

Following Miller and Modigliani's (1961) pioneering dividend irrelevance hypothesis, financial economists have advanced a number of contradicting theories in an attempt to explain why corporate dividend policy does seem to matter in practice. Some theories have developed around the proposition that dividend policy is relevant due to the existence of (differential) taxes (see, for example, Litzenger and Ramaswamy, 1979, Poterba and Summers, 1984, and Barclay, 1987). Others argue that clientele effects matter in dividend policy (see, for example, Pettit, 1977, Scholz, 1992, and Allen et al., 2000). Another dividend policy hypothesis suggests that dividend policy is affected by other market imperfections such as information asymmetries and agency costs. The former, known as signalling theory, predicts that firms can convey information to the market by paying dividends (see, for example, Bhattacharya, 1979, Miller and Rock, 1985, and Bali, 2003). The latter, known as agency theory, argues that dividends can reduce the costs of shareholder-manager (or controlling-minority shareholder) conflict (see, for example, Rozeff, 1982, Easterbrook, 1984, Jensen, 1986, and Alli et al., 1993)¹. Debate between these theoretical models remains unresolved. An important observation to emerge from this literature, however, is that once dividend policy is not irrelevant, there are many possible factors that may act as a determinant of dividend policy. Importantly also, the literature has concentrated mostly on dividend policy in developed capital markets. Both the unresolved nature of the theoretical debate, and relative neglect of dividend policy in developing capital markets motivated a consideration of the potential factors that may affect dividend policy in the case of Jordan.

The patterns of corporate payout policies not only vary over time but also across countries, especially between developed and emerging capital markets. Glen et al. (1995) found that dividend policies in emerging markets differed from those in developed markets. They reported that dividend payout ratios in developing countries were only about two thirds that of developed countries. More recently, Ramcharran (2001) also observed low dividend yields for emerging markets. Aivazian et al. (2003) compared a sample of firms operating in eight emerging markets with a sample of 99 US firms. In contrast to Glen et al. (1995) and Ramcharran (2001), they observed that, in general, payout ratios for emerging market firms were comparable to their US counterparts. It is worth pointing out that Aivazian et al. used the International Finance Corporation's (IFC) database, similar to that used by Glen et al. (1995), where only the

largest firms were included from each emerging market. This may bias their results but underscores the controversial nature of dividend policy.

Emerging markets differ from those in developed countries in many aspects. They are often of more recent origins, have less information efficiency, more volatility, and are smaller in size (Kumar and Tsetsekos, 1999). Emerging markets also differ from those developed markets in other characteristics such as corporate governance, taxation on dividends and capital gains, and ownership structure. Moreover, emerging markets including Jordan are usually characterised by concentrated ownership², and financial systems that are bank rather than market-based. In this case, banks can play an important role in closing the information gap between firm management and the market, rendering the role of dividends as a device for signalling or reducing agency costs less important. In addition, firms in emerging markets are subject to more financial constraints than their counterparts in developed markets, which may have some influence on their dividend policy. These differences, and the peculiarities of the particular markets themselves, raise the question about the extent to which competing dividend policy theories can apply to such markets, in particular to Jordan.

Nevertheless, emerging stock markets also generally have several similar characteristics. In this case, corporate dividend policy in Jordan, to some extent, may share some important similarities with other emerging markets. In some respects, Jordan provides an ideal ground for examining such theories and their implications for developed countries. It is a market that has been guided by international institutions, it has adopted an advanced trading pattern, and it seeks to model itself as a regional stock market. Thus, the findings of this study of firms traded on the Jordanian capital market could provide a fertile ground for future comparative research based on other emerging markets. Such findings may also provide the basis for reflection on empirical research in developed markets.

The study uses a firm-level panel data set of all publicly traded firms on the ASE between 1989 and 2003. The study develops five research hypotheses. A general-to-specific modelling approach is used to choose between the competing hypotheses. We estimate the determinants for a given firm to pay dividends to its shareholders through Probit specifications. The results presented here show that some factors that affect dividend policy in developed stock markets seem to apply for this emerging market, but often in different ways and on a different scale. The results suggest that ownership dispersion and the proportion of stocks held by insiders do not affect the probability that a firm will pay dividends. The results also show that larger, more profitable, and mature firms with few investment opportunities are much more likely to pay dividends. Taken together, the findings, partly, provide support for the agency costs explanation of dividend policy and are broadly consistent with the picking order hypothesis.

The rest of the paper proceeds as follows. Section II discusses the factors influencing firm's dividend decision and substantiating the use of the factors with relevant literature. Section III describes the data. Section IV explains the methodology. Section V reports the results. The last section summarises and concludes the paper.

II. FACTORS INFLUENCING DIVIDEND DECISION AND SELECTION OF PROXIES

This section discusses the various factors that may affect corporate dividend decision, including the selection of the relevant proxy variables. These factors are often suggested by earlier studies to have important influences on dividend policy. The section also shows the research hypotheses to be tested.

A. Agency Costs Variables

The agency hypothesis of dividends posits that dividend payments can be used as a mechanism to alleviate agency problems (see, for example, Rozeff, 1982, Easterbrook, 1984, and Jensen et al., 1992, among others). The distribution of cash resources reduces the size of internally generated funds available to managers forcing them into the capital markets more frequently to obtain external financing, thereby subjecting managers to the scrutiny of the capital markets. In order to secure the needed funds, managers will have incentives to both disclose information and reduce agency costs (Easterbrook, 1984, and Moh'd et al., 1995). Therefore, dividend payments benefit shareholders by reducing the agency costs associated with monitoring managers in expanding this role to the capital market.

The payments of dividends also serve to reduce "free cash flow" from being wasted on unprofitable or negative net present value (NPV) projects. When a firm has exhausted all profitable growth opportunities, positive NPV projects, the agency problems between shareholders and managers will be more severe since the firm has excessive cash flow (Jensen, 1986). The payment of large dividends to shareholders reduces the discretionary funds available to managers, therefore reducing the potential overinvestment problem and minimising shareholder-manager conflict accordingly. However, Jensen (1986) argued that debt could also serve effectively as a substitute mechanism for dividends in reducing the agency costs of free cash flow³. This argument may apply to Jordan since the financial system in Jordan is bank-based and banks play an important role in financing business activities. A high proportion of Jordanian firms' capital structure is short-term debt and the dominant type of credit facilities granted by Jordanian banks is short-term in nature. Consequently firms must subject themselves to bank scrutiny more frequently when they approach banks for financing.

A crucial question is how to obtain a suitable proxy for agency costs. Rozeff (1982) argued that the larger the number of shareholders, the greater the dispersion of ownership, the more difficult and costly is monitoring. That is, agency costs increase with the dispersion of ownership. To control agency costs in firms whose owners are dispersed there will tend to be a greater demand for higher dividend-payout ratios. The variable NOSH, defined as the ratio of the number of shareholders to total shares outstanding at the end of fiscal year, is employed to measure the dispersion of ownership (see, Alli et al., 1993). The hypothesised relation between dividend payouts and the number of shareholders variable is expected to be positive.

The second proxy for agency costs is the percentage of a firm's common stock held by insiders (INSD). This proxy has been widely used in the literature (see, for example, Rozeff, 1982, Lloyd et al., 1985, Jensen, et al., 1992, and Holder et al., 1998)

It has been argued that agency costs may be reduced if insiders (managers, directors, and other executive officers) increase their ownership in the firm, because this can help to align the interests of both managers and shareholders (Jensen and Meckling, 1976). Therefore, the higher the proportion of managers in firm ownership, the less is the need for using dividends as a device to mitigate agency costs. Hence, the proportion of insider ownership (INSD) is expected to bear a negative relation to dividend payouts. Based on the discussion above the following hypothesis can be formulated:

H1: *Ceteris paribus, the probability of paying a dividend increases for firms with more ownership dispersion and less insider ownership.*

B. Size Variable

A large firm typically has better access to capital markets and finds it easier to raise funds with lower cost and fewer constraints compared to a small firm. This suggests that the dependence on internal funding decreases as firm size increases. Therefore, *ceteris paribus*, large firms are more likely to afford paying higher dividends to shareholders. Numerous empirical studies have documented that size is a significant determinant of a firm's dividend policy, and that it is positively related to dividends (see Lloyd et al., 1985, Barclay et al., 1995, Reeding, 1997, Holder et al. 1998, Fama and French, 2001, among others).

In this study, there are two main reasons for testing the relation between firm size and dividend policy. Firstly, consistent with prior research the firm's size should be included in the analysis as a control variable. Secondly, and more importantly, there is lack of research evidence available on the impact of size effects on dividend payouts in Jordan. To the best of the author knowledge, the only study tackled this issue is conducted by Aivazian et al. (2003), who found mixed results.

There are different measures of firm size (e.g. employment, sales, assets, and capitalisation). In this study, the firm's market capitalisation of common equity (SIZE) is used as a measure for size. This measure has frequently been used by earlier research (see, for example, Deshmukh, 2003). Based on the aforesaid discussion and consistent with previous research the size variable is expected to have a positive relationship with dividend payouts. This suggests the following hypothesis:

H2: *Ceteris paribus, the likelihood of paying a dividend increases with firm size.*

C. Profitability Variable

The decision to pay dividends starts with profits. Therefore, it is logical to consider profitability as a threshold factor, and the level of profitability as one of the most important factors that may influence firms' dividend decisions. The theory suggests that dividends are usually paid out of the annual profits, which represents the ability of the firm to pay dividends. Thus, firms incurring losses are unlikely to pay dividends⁴. In his classic study, Lintner (1956) found that a firm's net earnings are the critical determinant of dividend changes. Furthermore, several studies have documented a positive relationship between profitability and dividend payouts (see, for example, Jensen et al, 1992, Han et al., 1999, and Fama and French, 2002). Evidence from emerging markets

also supports the proposition that profitability is one of the most important factors that determines dividend policy (see, for instance, Adaoglu, 2000, Pandey, 2001, and Aivazian et al., 2003)

The pecking order hypothesis suggests that firms finance investments first with the internal finance, and if external financing is necessary, firms prefer to issue debt before issuing equity to reduce the costs of information asymmetry and other transactions costs (Myers 1984, and Myers and Majluf, 1984). This financing hierarchy thesis might also have an effect on the dividend decision. That is, taking into account the costs of issuing debt and equity financing, less profitable firms will not find it optimal to pay dividends, *ceteris paribus*. On the other hand, highly profitable firms are more able to pay dividends and to generate internal funds (retained earnings) to finance investments. Therefore, the pecking order hypothesis may provide an explanation for the relationship between profitability and dividends. Fama and French (2002) used the expected profitability of assets in place for testing the pecking order hypothesis. Fama and French (2001, 2002) interpreted their results of the positive relationship between profitability and dividends as consistent with the pecking order hypothesis.

Based on the above discussion, profitability is expected to be a key determinant of corporate dividend policy in Jordan. To test this hypothesis, the after tax earnings per share is used as a measure of a firm's profitability (PROF). The hypothesised relationship between PROF and dividends is positive. Thus, the following hypothesis is proposed:

H3: *Ceteris paribus, the likelihood of paying a dividend increases for more profitable firms.*

D. Financial Leverage Variable

The financial structure of a firm consists of both debt (liabilities) and equity financing. Long-term financing usually refers to the firm's capital structure, and the extent to which a firm relies on debt financing is called financial leverage. In addition to the tax advantages (interests deduction on income), the use of debt financing can lever-up shareholders' return on equity. However, leverage entails risk; that is, when a firm acquires debt financing it commits itself to fixed financial charges embodied in interest payments and the principal amount, and failure to meet these obligations may lead the firm into liquidation.

The risk associated with high degrees of financial leverage may therefore result in low dividend payments because, *ceteris paribus*, firms need to maintain their internal cash flow to pay their obligations rather than distributing the cash to shareholders. Moreover, Rozeff (1982) points out that, firms with high financial leverage tend to have low payouts ratios to reduce the transaction costs associated with external financing. In addition, some debt covenants have restrictions on dividend payments. Therefore, other things being equal, an inverse relationship between debt and dividend payouts seems plausible. A large body of research has reported a negative association between debt and dividends (see, for instance, Jensen et al., 1992, Agrawal and Jayaraman, 1994, and Gugler and Yurtoglu, 2003).

Furthermore, as argued by Jensen (1986), debt can serve as a substitute device for dividends in reducing the agency costs of free cash flow. That is, when a firm

obtains debt, it makes a fixed commitment to creditors, which reduces the discretionary funds available to managers and subjects them to the scrutiny of debt-suppliers. This suggests that, highly levered firms are expected to have low dividend payouts.

To examine the extent to which debt can influence dividend decision, the study used the financial leverage ratio defined as the ratio of total short-term and long-term debt to total shareholders' equity (FLEVER). Based on the above discussion, a negative association is expected between dividends and financial leverage.

The capital structure of Jordanian companies is generally characterised by a considerably low proportion of long-term debt, and due to the underdeveloped bond market in Jordan the main source of debt financing is banks. This implies that Jordanian companies are subject to more financial constraints. Fazzari et al. (1988) showed that firms facing greater financing constraints retain most of their income. For this reason, in the case of Jordan, debt may play a significant role in determining corporate dividend policy. Aivazian et al. (2003) provide empirical support for this prediction in relation to Jordan. We believe that more tests need to be conducted in order to have conclusive evidence about the relationship between debt and dividend policy in Jordan. Therefore, the following hypothesis is proposed:

H4: *Ceteris paribus, the probability of paying a dividend increases with low financial leverage.*

E. Growth and Investment Opportunities Variables

According to Miller and Modigliani (1961), in perfect capital markets, corporate investment and dividend decisions are independent. However, in the presence of market imperfections such as taxes, flotation costs, and agency costs, both dividend and investment decisions might be closely related or interdependent. The relationship between investment and dividend policies can be seen from two perspectives. Firstly, by paying dividends a firm is forgoing a relatively cheap source of financing, i.e. retained earnings, as compared to debt and new equity issues. Secondly, dividend payments reduce the firm's available funds for investment activities. In other words, dividends and investments are competing for limited and low-cost internal funds (see Elston, 1996).

This suggests that in imperfect capital markets there may be a link between dividends and investments. Intuitively, firms with high growth and investment opportunities will need the internally generated funds to finance those investments, and thus tend to pay little or no dividends. In contrast, firms with slow growth and fewer investment opportunities are likely to pay more dividends. Note that this prediction is consistent with the free cash flow hypothesis. That is, companies with low investment opportunities are likely to have an overinvestment problem, hence by paying dividends companies can limit management's policy of overinvesting (see Jensen, 1986, and Lang and Litzenberger, 1989). Furthermore, the negative relationship between firms' growth opportunities and dividend payouts is consistent with the pecking order theory of Myers and Majluf (1984). Myers and Majluf suggested that firms experiencing high growth opportunities will have low payout ratios.

Researchers such as Rozeff (1982), Jensen et al. (1992), Alli et al., (1993), Deshmukh (2003), and many others, have found a significant negative relationship

between dividends and firms' investment opportunities. Barclay et al. (1995) document that, investment opportunities are a significant determinant of corporate dividend policy. More recently, Fama and French (2001) affirmed that investment opportunities influenced dividend decision. They found that firms with better growth and investments opportunities have lower payouts.

Furthermore, according to the "maturity hypothesis" presented by Grullon et al. (2002), as firms become mature their growth and investment opportunities shrink, resulting in a decline in their capital expenditures. Thus, more free cash flows are available to be paid as dividends. Grullon et al. point out that a dividend increase is a sign of "changes in a firm's life cycle, especially as to a firm's transition from higher growth phase to a lower growth phase" (p.389). Using a large sample of dividend change announcements of US firms for the period 1967 to 1993, Grullon et al. found that, firms that increase dividends experience decline in their systematic risk and profitability. They stated "... according to the maturity hypothesis, an increase in dividends is informative about a shrinking investment opportunity set, declining systematic risk, declining return on assets, and profit growth" (p.423).

A decline in a firm's risk is perceived as good news, while decrease in profitability is bad news. In their study, Grullon et al. showed that the stock market reacts positively to a dividend-increase announcement, which implies that the good news about risk reduction dominates the bad news about declining in profitability. In addition to the good news associated with the decrease in the systematic risk, the market may perceive a dividend increase as helping to reduce the overinvestment problem. Grullon et al. concluded "... an increase in dividends may not only convey information about changes in the firm's fundamentals but also about the management's commitment not to overinvest" (p.423). In sum, Grullon et al.'s findings are consistent with the free cash flow hypothesis but not with the signalling hypothesis.

In order to test whether investment opportunities affect dividend policy, an adequate proxy(s) should be chosen. The first proxy for growth and investment opportunities is the firm's price earnings ratio (PER). Several researchers have used PER as a proxy for growth opportunities (see, for example, Ang and Peterson, 1984, Constand et al., 1991, and Glen et al., 1995) The PER is a good indicator of future growth prospects since it incorporates the market assessment of a firm's future cash flows. Investors are willing to pay a premium for fast growing companies, i.e. those companies that usually retain their earnings to finance future growth. Other things held constant, firms with higher PE ratios have higher growth than firms with low PE ratios (positive relation with growth options). Therefore, a negative relationship between PER and dividend payouts is expected.

Generally speaking, mature companies are likely to be in their low-growth phase with less investment opportunities (see Barclay et al., 1995, Grullon et al., 2002, and Deshmukh, 2003). These companies are relatively older and do not have the incentives to build-up reserves as a result of low growth and few capital expenditures, which enable them to follow a liberal dividend policy. On the contrary, new or young companies need to build-up reserves to face their rapid growth and financing requirements. Hence, they retain most of their earnings and pay low or no dividends. Therefore, the age of the firm (AGE) is used as a proxy for the firm's growth opportunities⁵. Although this proxy is not commonly used in finance literature, several studies have related firm growth to age (see Evans, 1987, Farinas and Moreno, 2000,

and Huergo and Jaumandreu, 2004, among others). Other things held constant, as a firm gets older its investment opportunities decline leading to lower growth rates, consequently reducing the firm's funds requirements for capital expenditures. Therefore, dividend payout should be positively related to the firm's age. Yet, the impact of age is not expected to always be linear. Thus, the effect of age is allowed to be non-linear by including the age squared (AGESQ). If the coefficient on AGESQ appears to be negative, then the assumption of a quadratic relationship between age and dividends is true (see Al-Malkawi, 2005). Based on the foregoing discussion, the following hypothesis is proposed:

H5: *Ceteris paribus, mature firms with less investment opportunities are more likely to pay dividends.*

III. DATA

The data employed is derived from the annual report publications of public shareholding companies held by the Amman Stock Exchange (ASE). The data is available on compact disks (CDs) from the year 1989 onward, and these CDs contain different Guides. Each Guide includes data for all listed companies divided among four economic sectors: industrial, services, insurance, and banking. The financial data used in this study has been constructed mainly from four Guides, 1994, 1997, 2001 and 2003. The study period is from 1989 to 2003, i.e. 15 years of consistent data. This is adequate for conducting this type of dividend study. The analysis is based on annual data, because the data set is annual.

From the available financial data, the database was constructed including all financial figures for all companies. The sample consists of 160 companies of which 75 are industrial companies, 43 service companies, 26 insurance companies, and 16 banks⁶. These companies ranged from old to newly established ones, and some companies were de-listed during the study period. Therefore, the number of observations for each company is different. In order to gain the maximum possible observations, pooled cross-section and time-series data is used. Because the number of observations for each company is not identical, this results in an unbalanced panel.

The present study includes both dividend-paying as well as non-dividend-paying firms. The exclusion of non-dividend-paying firms results in a well-known selection bias problem. As Deshmukh (2003, p.253), for instance, observed "If firms find it optimal to not pay dividends, then their exclusion from any empirical analysis may create a selection bias in the sample, resulting in biased and inconsistent estimates of the underlying parameters" (see also Kim and Maddala, 1992).

IV. METHODOLOGY

A. The General-to-Specific Method

In Section 2 five hypotheses were developed and a set of related proxy variables were identified. The selected variables constitute the general model to be tested in order to determine the factors that may affect dividend policy in the case of Jordan. To choose between the competing hypotheses and to arrive at the best model that fits the data the

general-to-specific method is used. The general-to-specific method is generally referred to as the London School of Economics approach to econometric modelling (Hendry, 1995). The method “involves the formulation of a ‘general’ unrestricted model that is congruent with the data and the application of a ‘testing down’ process, eliminating variables with coefficients that are not statistically significant, leading to a simpler ‘specific’ congruent model that encompasses rival models” (Owen,2003, p.609).

Within the framework of the general-to-specific method, the model specification begins with a general (unrestricted) model incorporating all the variables that have been identified and supported by the theory covering various competing hypotheses. This process takes the following form of Model 1:

$$y_{it} = \alpha_i + \sum_{j=1}^n \beta_j x_{i,j,t} + \varepsilon_{it}, \quad (1)$$

where y_{it} is the dependent variable for firm i in period t , and $x_{i,j,t}$ is explanatory variable j for firm i in period t , α and β are parameters, n is the number of explanatory variables, and ε_{it} is the error term, which is assumed to be iid $N(0, \sigma^2)$.

Next, from the general model a more specific (restricted) model can be obtained by eliminating the variables with insignificant t -statistics. An appropriate test statistic (Wald test) is conducted to test the validity of these restrictions. That is, to ensure that the coefficients of the dropped variables are jointly not different from zero. This step will produce the more parsimonious model, Model 2:

$$y_{it} = \alpha_i + \sum_{j=1}^{n-k} \beta_j x_{i,j,t} + \varepsilon_{it}, \quad (2)$$

where k is the number of restrictions or the variables eliminated from the general model.

The previous step is repeated and other jointly insignificant variables are removed until the model specification contains all variables that are statistically significant. Further, in testing the competing models the likelihood-ratio (LR) test is carried out. The statistic $LR = -2[\text{Log}L_R - \text{Log}L_{UR}]$ follows a $\chi^2(k)$, where k is the number of restrictions and the null model is the restricted model. This test enables us to see whether the additional parameters in the unrestricted model significantly increase the likelihood. In other words, to confirm whether or not the unrestricted model is statistically different from the restricted model.

The general model to be estimated using the Probit specification, for firm i in period t (mathematical signs indicate the hypothesised impact on the probability to pay dividends, PAYDIV) can be written as:

$$\text{PAYDIV} = F \left[\begin{array}{l} \text{NOSH}(+), \text{INSD}(-), \text{AGE}(+), \text{AGESQ}(-), \text{PER}(-), \\ \text{FLEVER}(-), \text{SIZE}(+), \text{PROF}(+), \text{FINST}(\pm) \end{array} \right] \quad (3)$$

where the variables are defined in Table 1 below.

Table 1
Summary of research hypotheses and proxy variables

Hypothesis	Proxy(s)	Expected Sign
H ₁ : Agency costs	NOSH: the ratio of the number of common shareholders to total shares outstanding	Positive
H ₂ : Size	INSD: percentage held by insiders SIZE: natural log of market capitalisation	Negative Positive
H ₃ : Profitability	PROF: earnings per share	Positive
H ₄ : Financial leverage	FLEVER: total debt-to-equity ratio	Negative
H ₅ : Growth and Investment opportunities	PER: price earnings ratio AGE: age of the firm AGESQ: the square of AGE	Negative Positive Negative
Control variable	FINST: is a dummy variable to control for industry effects equals one if a firm belongs to financial sectors, and zero otherwise.	Negative/ Positive
Dependent variable	PAYDIV: equals one if the firm paid dividends in year t, and zero otherwise	Dependent variable

B. Probit Estimation

An important question to be answered in this paper is what are the determinants of the decision to pay dividends for companies listed at the ASE. In other words, what factors affect the probability to pay dividends of those companies? In order to answer such a question the Probit estimation is used. The probability to pay dividends is estimated using the random effects specification on panel data (see Arulampalam, 1999). The model is defined as:

$$y_{it}^* = \beta' x_{it} + u_{it} \quad (4)$$

The dichotomous variable y , observed, is related to the latent variable y_{it}^* by the relation: $y_{it} = \begin{cases} 0 & \text{if } y_{it}^* \leq 0 \\ 1 & \text{if } y_{it}^* > 0 \end{cases}$ with $y_{it} = 1$ if the firm i paid dividends at period t , and $y_{it} = 0$ otherwise, where i indexes individuals (firms) $i=1, \dots, N$, t indexes time periods (years) $t=1, \dots, T$, x_{it} is a vector of explanatory variables, represents the set of the individual exogenous characteristics of the firms that are assumed to condition the firms' decisions on dividend policy, β is a vector of corresponding coefficients, and u is the error term, which is assumed to be iid $N(0, \sigma_u^2)$. To estimate β is the maximum likelihood estimation method (MLE) is used⁷.

V. RESULTS

Table 2 presents the summary statistics of all the independent variables used in the analysis. The table reports the mean, median, standard deviation, coefficient of variation, and the number of observations for each variable. The coefficient of variation indicates that there is a significant variation among the explanatory variables.

Table 2
Descriptive statistics for the independent variables

Variable	Mean	Median	Std. Dev.	Coefficient of Variation*	Obs.
NOSH	0.0009	0.0003	0.0034	3.7778	1256
INSD	0.3224	0.3000	0.2503	0.7764	1330
AGE	18.1031	15	14.1508	0.7817	1271
AGESQ	527.8072	225	797.4997	1.5110	1271
PER	4.6805	9.3041	498.9438	106.6005	1242
FLEVER	1.9624	0.6041	4.5633	2.3254	1248
SIZE	15.7835	15.6152	1.4655	0.0929	1147
PROF	0.2165	0.0480	1.5370	7.0991	1250
FINST	0.2553	0	0.4362	1.7086	1316

Note: Variables are defined in Table 1. * Coefficient of variation = Std. Dev. / Mean

Table 3
Correlation matrix of the explanatory variables

	NOSH	INSD	AGE	AGESQ	PER	FLEVER	SIZE	PROF	FINST
NOSH	1.000								
INSD	-0.129	1.000							
AGE	-0.045	0.095	1.000						
AGESQ	-0.017	0.031	0.944	1.000					
PER	0.010	-0.011	-0.037	-0.033	1.000				
FLEVER	-0.033	0.051	0.285	0.291	-0.027	1.000			
SIZE	-0.049	0.048	0.422	0.484	-0.021	0.324	1.000		
PROF	-0.003	-0.110	0.391	0.460	0.003	0.193	0.352	1.000	
FINST	-0.083	-0.036	0.191	0.147	-0.003	0.423	0.165	0.139	1.000

Table 3 presents the correlation matrix for all explanatory variables used in the analysis. The low intercorrelations among the explanatory variables used in the regressions indicate no reason to suspect serious multicollinearity. The high correlation between AGE and AGESQ does not create a multicollinearity problem since both variables are not linearly related. To confirm, we computed the variance inflation factors (VIF) for the independent variables. The estimated VIF values were small (much less than 10) with an average of 3.82 indicating an absence of multicollinearity between the variables.

The likelihood ratio (LR) test reported at the bottom of table of the results (presented below) provides a formal test for the pooled (Probit) estimator against the

random effects panel estimator. For all estimated regressions, the results of the LR test indicate that the panel-level variance component is important and, therefore, the pooled estimation is different from the panel estimation. The reported coefficient of Rho (ρ), which is the panel-level variance component, provides a similar test. It represents the proportion of the total variance contributed by the panel-level variance component. In the case where $\rho = 0$ the panel-level variance component is not important and the panel (Probit) estimator is not different from the pooled (Probit) estimator (see Stata 8 manual, StataCorp, 2003, p.176). The estimated value of Rho (ρ) in all regressions is significant.

Table 4 presents the results of the maximum likelihood estimation (MLE) of the random effects Probit models for the decision to pay dividends or the probability that a firm will pay dividends. It reports the statistical significance of each variable along with economic significance (marginal effects)⁸. The Wald test statistics reject the null hypothesis that the parameters in the regression equations are jointly equal to zero (models 1-3).

The general model (Model 1) includes nine variables and encompasses all of the models, with 1137 firm-year observations. Of the nine variables included in the model five are statistically different from zero (AGE, AGESQ, FLEVER, SIZE, and PROF), with the hypothesised signs. The general model is tested down to a more parsimonious model (Model 2). In this process two variables (NOSH, INSD) are dropped from the general model since the null hypothesis that those variables are jointly insignificant cannot be rejected [$\chi^2(2) = 1.31$; P-value = 0.520]. In testing Model 2 (restricted) against Model 1 (unrestricted), the null model (Model 2) is not rejected. In this case, the LRT statistic is $LR = -2 [(-397.88) - (-397.05)] = 1.66$, and the critical value from a χ^2 distribution, with 2 degrees of freedom, is 5.991 (P = 0.05). Since the computed value is less than the critical value, the null hypothesis is not rejected i.e. the additional parameters in the general model (unrestricted) do not significantly increase the likelihood. Similarly, two variables (PER, FINST) are dropped from Model 2 [$\chi^2(2) = 0.44$; P-value = 0.802], which produces Model 3 where all the variables are statistically significant. Again, the null model (Model 3) is not rejected when tested against Model 2 [LRT statistic = 0.72, critical value with 2 degrees of freedom, = 5.991 (P = 0.05)].

The variables NOSH and INSD, which are designed to provide direct test for the agency costs hypothesis (H_1) seem to have no influence on the probability to pay dividends. The coefficient on NOSH is negative, inconsistent with the expected sign, and statistically not different from zero, indicating that ownership dispersion is not related to the decision to pay dividends in the case of Jordan. This result may be attributed to the special characteristic of the Jordanian capital market at which firms tend to have high levels of ownership concentration. In such a case, the concentration of ownership may lead to a concentration in control. Therefore, minority shareholders will not be able to exert much influence on dividend policy. Consistent with prediction, the coefficient on INSD, the proportion held by insiders, is negative. However, the coefficient is not statistically significant indicating that insider's holdings do not affect the decision to pay dividends.

From models 1 and 2 the coefficients of FINST is not statistically different from zero, suggesting that industry effects seem to have no influence on the probability to pay dividends. Likewise, the variable price earnings ratio (PER) is not significant. The

variable PER is used as one proxy for growth and investment opportunities. However, the second proxy for growth and investment opportunities (AGE) is positive and highly significant with *t*-statistics of 2.87, 2.94 and 3.05 in models 1, 2 and 3, respectively. The age of the firm is consistently significant at the 1 percent level, suggesting that older firms with less growth options are more likely to pay dividends. This result provides support for the maturity hypothesis proposed by Grullon et al. (2002). That is, when a firm becomes mature its growth opportunities tend to decline resulting in lower capital expenditure needs, and thus increasing the probability to pay dividends. This result is also consistent with the agency costs of free cash flow hypothesis (Easterbrook, 1984, and Jensen, 1986). That is, when a mature firm has little or no investment opportunities, paying dividends will reduce the discretionary funds available to managers that could be wasted in perquisites or unprofitable projects.

As hypothesised, the variable age square (AGESQ) is negative and statistically significant at 5 percent level. This indicates that the age of the firm is quadratically negatively related to dividend decision. That is, when a mature firm finds new investment opportunities or move from lower growth phase to a higher growth phase the probability to pay dividends will decline. This in turn is consistent with the picking order hypothesis of Myers and Majluf (1984).

The results from Table 4 also show that financial leverage is negatively related to dividend decision. The coefficients on debt-to-equity ratio are negative and significant in models 1, 2 and 3 indicating that a higher level of financial leverage reduces the likelihood to pay dividends. From Model 3, for a 10 percentage point increase in leverage (FLEVER) the probability that a firm will pay dividends decreases by about 0.35 percentage points, all other factors being equal. Aivazian et al. (2003) found that debt and dividend payments are negatively related for firms operating in emerging markets, including Jordan.

Another variable found to be a determinant of corporate dividend decision in Jordan is the firm size (H_2). As expected, Table 4 reports that the coefficients on size (SIZE) are positive and statistically significant at the 1 percent level. The effect of firm size on dividend decision is also economically significant. From Model 3, for a 10 percentage point increase in firm size as measured by market capitalisation (SIZE) will increase the probability of paying dividends by approximately 1.66 percentage points, other things being equal. The results presented here are consistent with the findings of Redding (1997) and Fama and French (2001) who found that the likelihood of paying dividends increases with firm size for US firms. The present results, however, are inconsistent with Aivazian et al. (2003) who found mixed results regarding the relationship between size and dividend policy for several emerging markets and especially for Jordan. The positive and significant relationship between dividend decision and size is consistent with the agency costs explanation of dividend policy. The intuition here is that the larger the firm, the more difficult (costly) is the monitoring, i.e. the greatest the agency problem (see Jensen and Meckling, 1976). Thus, dividends could play a role in helping to alleviate the agency problem. Also, the positive relation between the likelihood to pay dividends and size supports the generally accepted view proposed by many finance scholars that larger firms have easier access to capital markets (see, among others, Lloyd et al., 1985, Holder et al., 1998, and Fama and French, 2002), and have lower transaction costs associated with acquiring new financing as compared to small firms (Alli et al., 1993).

Table 4
Random effects of Probit models for dividend decision

Dependent Variable = PYDIV						
Independent Variables	Model (1)		Model (2)		Model (3)	
	Coefficient Estimates	Marginal Effects	Coefficient Estimates	Marginal Effects	Coefficient Estimates	Marginal Effects
Constant	-9.06*** (-5.41)		-7.18*** (-4.59)	—	-7.085*** (-4.50)	—
NOSH	-101.553 (-1.06)	-34.71	—	—	—	—
INSD	-0.221 (-0.59)	-0.076	—	—	—	—
AGE	0.078*** (2.87)	0.026	0.076*** (2.94)	0.026	0.077*** (3.05)	0.026
AGESQ	-0.001** (-2.06)	-0.000	-0.001** (-2.09)	-0.000	-0.001** (-2.16)	-0.000
PER	0.000 (0.67)	0.000	0.000 (0.66)	0.000	—	—
FLEVER	-0.099*** (-3.19)	-0.034	-0.103*** (-3.21)	-0.035	-0.102*** (-3.10)	-0.035
SIZE	0.476*** (4.71)	0.163	0.490*** (4.76)	0.167	0.489*** (4.76)	0.166
PROF	6.567*** (11.53)	2.244	6.519*** (11.49)	2.215	6.531*** (11.63)	2.217
FINST	-0.031 (-0.12)	-0.010	0.019 (0.08)	0.007	—	—
Rho (ρ) *	0.500*** (6.81)	—	0.505*** (7.09)	—	0.501*** (7.10)	—
No. of observations	1137		1137		1137	
Log Likelihood	-397.05		-397.88		-398.24	
Wald-test	χ^2 (9) =337.42		χ^2 (7) =335.77		χ^2 (5) =335.20	
P-value	0.000		0.000		0.000	
L R test**	76.90		80.97		81.18	
P-value	0.000		0.000		0.000	

Notes: *, **, *** Significant at the 10, 5 and 1 percent levels, respectively. First value for each estimate is the coefficient and *t*-statistics are in the parentheses. See Table 1 for variable definitions. * The proportion of the total variance contributed by panel-level variance component ** LR test denotes the likelihood-ratio test, which provides a test for pooled (Probit) estimator against the random effects panel estimator

Like size, profitability (PROF) as measured by earnings per share seems to have a strong influence on the decision to pay dividends. The coefficients of PROF are highly significant for all regressions, with high marginal effects. A 10 percentage point increase in PROF results in an approximately 22 percentage point increase in the

likelihood of paying dividends, *ceteris paribus*. This suggests that more profitable firms are more likely to pay dividends. The significant positive relationship between profitability and dividends is generally consistent with the pecking order theory.

In summary, the firm's decision to pay a dividend is positively correlated with age, size, and profitability. That is, larger, more profitable, and mature firms with few investment opportunities are much more likely to pay dividends. These findings are consistent with prior research including Barclay et al. (1995), Fama and French (2001), among others. The dividend decision is negatively related to the level of financial leverage.

VI. SUMMARY AND CONCLUSION

The main objective of this paper has been to examine corporate dividend decisions of publicly traded companies in an emerging market, namely the ASE. Unlike other studies of dividend policy, the present study included both dividend-paying as well as non-dividend-paying firms. The analysis is based on 15-year unbalanced panel data with 1137 firm-year observations. The paper used Probit specifications to determine the factors influencing corporate dividend decisions in Jordan.

The results showed that the industry effects seems not have impact on corporate dividend decisions. The variables that meant to provide a direct test for agency costs hypothesis found to be not related to corporate dividend decisions. However, this would not rule out the agency costs explanation of dividend policy.

The results revealed that four factors can influence dividend decisions in Jordan. Larger, more profitable, and mature firms with few investment opportunities are much more likely to pay dividends. The firm's financial leverage found to have negative impact on the likelihood to pay dividends. The results also suggested a quadratic relationship between the age of firm and dividend decisions. Taken together, the findings, to some extent, provide support for agency costs explanation of dividend policy and broadly consistent with the picking order hypothesis. The study demonstrated that much of the existing theoretical literature on dividend policy can be applied to an emerging capital market such as Jordan.

ENDNOTES

1. See Lease et al. (2000) and Al-Malkawi (2005) for a comprehensive review of dividend policy theories.
2. The largest ten companies listed on ASE accounted for about 67 percent of total market capitalisation.
3. For further evidence, see, for example, Agrawal and Jayaraman (1994).
4. Of course, this is not strictly true, since firms could pay dividends out of earlier profits (retained earnings).
5. Firm's age is calculated as the difference between the calendar year at t and the establishment date of the firm as reported in the ASE database.
6. The statistical software (Stata 8.0) used in this study, however, has excluded eight companies from the analysis
7. See Butler and Moffit (1982) or Arulampalam (1999) for the likelihood function. The estimation is conducted using STATA (version 8).

8. For computing the marginal effects see, for example, Arulampalam (1999) and Greene (2003).

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