

Asymmetric Effect of Inflation on Dividend Policy of Iran's Stocks Market

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DOI: 10.6007/IJARBSS/v4-i2/652 URL: <http://dx.doi.org/10.6007/IJARBSS/v4-i2/652>

Abstract:

This paper surveys the asymmetric effect of inflation on dividend policy of Iran's stock market since 2005. Reaction of dividend policy maker to hedge shares against double-digit inflation of Iran depends on the company status in making a profit or loss.

We use panel data approach to test the non-symmetric effect of inflation on the companies' decision in decreasing, increasing and maintaining of dividends. The results show that inflation has the positive effect on increasing and maintained dividend decision of companies. But it has the inverse and negative effect on decreasing a dividend. Inflation has significant contribution to the dividend policy maker decision according to the status of companies as making profit or loss.

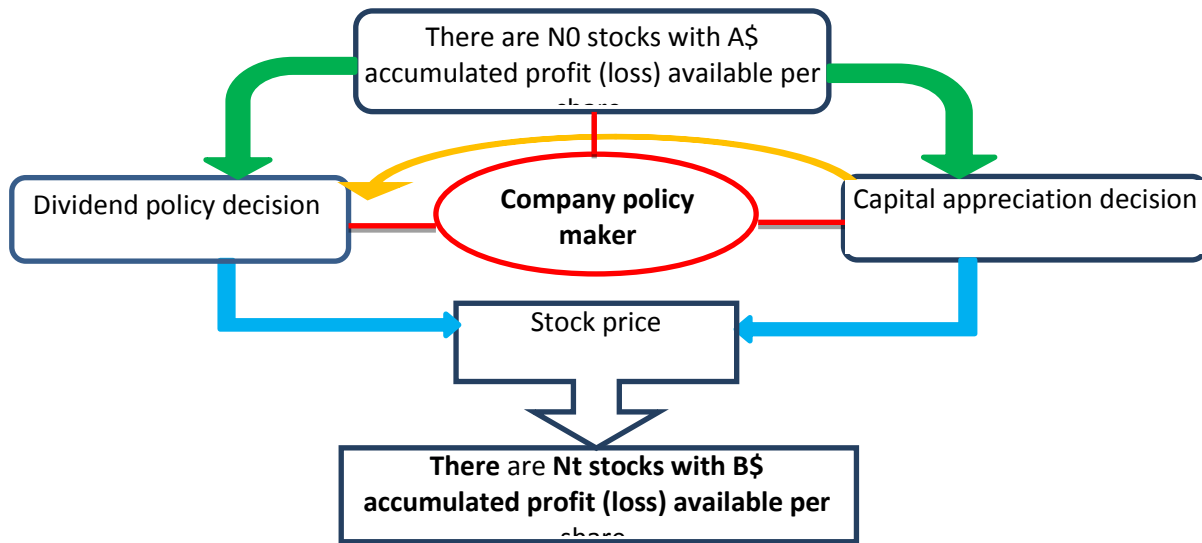
Key words: Asymmetric Effect; Dividend; Inflation; Policy maker; Iran's Stock Market

1. Introduction

Dividend policy is a finance object that is the study widely from the management, shareholders and government's views.

In the management's views, maximizing the wealth of shareholders as a management object is corresponded to dividend policy of company. And finance manager should consider the possible effect of their dividend decisions on share prices. As shown in Figure 1 company policy maker or finance manager has effects on stock price by dividend decision and appreciation stock's decisions. It is important that value of company's stocks has up-ward trend over time; Shrinkage a firm lead to bankrupt it, and then it would be removing. Therefore company policy maker might prevent the firm from shrinkage by considering shareholder's value in their decisions and enact a dividend policy to maximize shareholder's value.

Figure 1: Dividend policy decision of the company policy maker prevents the firm from shrinkage.



In the Shareholders' view, stock returns are the main keys in portfolio selection for shareholders or investors. Stock returns defined as sum of dividend yield (D_{t+1}/P_t) and capital gain ($(P_{t+1}-P_t)/P_t$). The relation between real stock returns and inflation rates, as well as the parameter uncertainty involved in this relation, has substantial influence on optimal asset allocations (Tomek Katzur, Laura Spierdijk, 2010).

In the government's view, dividend policy may change distribution of income, resource allocation and tax revenue of government. Dividend policy may fluctuate by macroeconomic variables such as inflation and real growth (Basse, Tobias ; Reddemann, Sebastian ;, 2011). It also may fluctuate by fiscal and monetary policy of government (Belke, Ansgar ; Polleit, Thorsten, 2006).

This study mainly focuses on the effect of inflation on dividend policy on Iran's stock market, and seeks to answer whether the decision of the dividend policy maker is influenced by the inflation. If it is influenced, is that effect on dividend policy the same and symmetric in statuses of company as making profit or loss?

Large bodies of theoretical and empirical researches have done in dividend policy. (Al-Malkawi, et al. 2010) Criticize existing literature on dividend policy by reviewing the main theories and explanations of dividend policy including dividend irrelevance hypothesis of Miller and Modigliani, bird-in-the-hand, tax-preference, clientele effects, signaling, and agency costs hypotheses. They also try to present the main empirical studies on corporate dividend policy in their paper.

(Basse, Tobias ; Reddemann, Sebastian ;, 2011) Analyze the dividend policy of firms from a macroeconomic perspective. They examine the relationship among dividends, corporate earnings, real growth and inflation in the USA by applying cointegration techniques and find a positive relationship between inflation and dividend payments.

(Landesbank, 2009) Test for cointegration between dividends and inflation in Australia and show the contribution of inflation in dividend growth.

(Pourheydari, 2009) Investigate management views of dividend policy in Iranian firms on 2006. He extracted eight factors from 23 variable influencing dividend policies by using

“varimax rotation method”. In the views of chief financial officers of Iranian firms almost important determinants of a firm's dividend policy are: the stability of cash flow, the availability of profitable investment opportunities, and stability of profitability. Variable expected inflation rate as a contractual constraints component has a significant loading of 67 percent of the variable anticipated inflation, using varimax rotation.

Although numerous studies have examined various issues of dividend policy, only but few of them have focused on the effect of inflation on dividend policy. We believe that the existing discussion neglects at least one important issue: asymmetric impact of inflation on the decision of the dividend policy maker to decreasing, increasing and maintaining a dividend. We use a panel data model that allows the analysis of asymmetric impacts of inflation that depend on the status of the firms making a profit or lost.

Payments of dividends might have been regular or irregular over time. (Yoon, P.S., Starks, L.T., 1995) Document the evidence that there is an asymmetry between dividend increases and dividend decreases at the individual firm level. (Marsh, T.A., Merton, R.C., 1987) Support asymmetric adjustment of dividends. Dividends behavior might being modeled in linear functional form, or not be a linear process. An important feature of dividend behavior is that there is asymmetry in due to, for instance, a reluctance to cut dividends.

(Deshmukh, 2003) examines dividend changes based on asymmetric information. Theory of asymmetric information derived from the literature of dividend signaling. According to the signaling hypothesis, investors can infer information about a firm's future earnings through the signal coming from dividend announcements, both in terms of the stability and changes in, dividends. See (Bhattacharya, 1979), (John & Williams, 1985), and (Miller & Rock, 1985) However there is a vast body of literature that has shown asymmetric adjustment of dividend and content of asymmetric information in dividend policy, - content of "asymmetric effect of inflation" neglects to study in dividend policy.

Dividend policy of a firm from several aspects is noticeable and important. The dividend decision of a company policy maker prevents firm from shrinkage because the only dividend decision of policy maker beside market power has a direct effect on a stock price. Market power defined as the Aggregate decision of stock holders in selling and purchasing of a stock. As shown in figure 4 in appendix, the price of a stock influenced at four levels: level of company activities, the level of policy maker's decision, the level of stock holder's decision and level of government decision¹. Company policy makers cannot control market power directly but their decision about stock appreciation and dividend policy certainly influence a stock price. Therefore someone argues that the policy maker decision supports firm's value. If market power outcome increase the value of a firm then policy maker will not suffer from firm value; but if market power outcome shrinkage the firm, then only the policy makers might prevent firm from shrinkage.

Firms are reluctant to cut or omit dividends in condition of making a loss. Because this decision as signals bad prospects alongside and high inflation rate of the other side, encourages shareholders and potential (risk aversion) investors to exclude money. They change portfolio to hedge their wealth against high inflation rate. Therefore, existing of high inflation prevents to decrease and cut the dividend. The status of making profit sustains dividend policy maker to increase dividend payment even if it doesn't occur over time. Here high inflation might encourage policy maker to increase and initiate dividend. Thus someone claims amount of inflation rate is the critical point of asymmetric decision of the dividend

¹ The government-level didn't demonstrate in Fig-4

policy maker and it provides a convincing argument that inflation has non-symmetric effect on dividends.

It is an important question that someone argued why an investor should prefer a dividend payment instead of stock price appreciation to combat? There are some considerations such as tax of selling and purchasing a stock, the existence of low-limitation and government pressures in the stock market, non-transparency of stock price and market, etc. For instance, in Iran selling and purchasing tax of a stock is about 1.55 and 1.05 percent respectively and it will any law-limitations on stock price changing in Iran. Appreciation or depreciation of stock price only should be maximum 4 percent daily (Tehran Stock Exchange Corporation, 2012).

Despite collecting a dividend payment, signaling the stockholders by the appreciation of stocks certainly decreases the price of stocks and sometimes stockholders are reluctant to reinvest in that firm. It is not rational during the time that inflation rate and consequence of its uncertainty of investing are increasing, stockholders transfer cash money from dividends in uncertain and risky market i.e. Stock Market. Also with a high inflation rate, if stockholders put dividend in stock market again, the company should pay extra money to compensate lost opportunity costs of stockholders.

We expect that inflation has a positive effect on the dividend of increasing and maintaining dividend but negative effect in decreasing. If a company makes a profit, dividend policy maker increases dividend with high inflation to signal clienteles that company hedges shareholder wealth against inflation. In this way company also prevents clienteles investing in non-paying or low-dividend stocks. Dividend policy maker tries to decrease at least or not decrease dividend in status of making a loss. Because of decreasing dividend with high inflation rate it puts the company in a bad situation. Thus inflation has an asymmetric effect of dividend policy.

The contribution of this paper is to provide some evidence supporting that the decision of dividend policymaker may not be symmetric over inflation, and therefore it adds another empirical result to the literature of the asymmetric decision of the dividend policy maker. Testable hypothesis are declared of asymmetric effects of inflation on dividends.

The rest of this paper is as following: Section 2 describes our data and methodology. Section 3 explains estimation results and discussion. Final section concludes the article.

2. Data and Analytical Methods

2.1. Data:

The data which are used in this paper are: inflation rate, dividend and earnings. The Consumer Price Index (CPI) published officially by central bank of Iran is basis of monthly, quarterly and annual. The yearly inflation rate is expressed as a percentage change in annual CPI. All row data on dividend, earnings and capital are accessible from the web site of Tehran Stock Exchange (TSE). The sample of annual pool data is since 2005 to 2011 for 322 companies were listed on the TSE. We exclude companies as these firms have different ending fiscal year with beginning New Year in Iran.

2.2. Analytical Method:

To test the effect of inflation on dividend policy we use a panel data approach and estimate the parameters of a panel data model by quantitative econometric software EViews 7. Our basic, empirical evidence, model is a linear equation: (1)

Where: D_{it} , dependant variable, measures amount of dividend of per share correspond with period t allowed paying by firm i . X_{it} is vector of exogenous variables. Here the amount of earning of per share, inflation rate and lag of dividend per share are explanatory variables of the model. μ_i , λ_t represent the between-cross section and between-time period variances, respectively. V_{it} : Idiosyncratic effect or within-group variance. α : Intercept; N : number of firms, T : number of time periods.

2.3. Panel Data Analysis:

Panel data allow control for variables that cannot observe or measured as manager behavior factors and differences in business practices across companies or variables that change over time but not across entities. Here we focus on two techniques used to analyze panel data: Fixed Effects (FE) and Random Effects (RE). The features of FE models are that they cannot be used to investigate time-invariant causes of the dependent variables. Technically, time-invariant characteristics of the individuals are perfectly collinear with the entity dummies. Substantively, FE models are designed to study the causes of changes within an entity.

When using FE we assume that something within the individual may bias the predictor or outcome variables and we need to control for this. Another important assumption of the FE model is that those time-invariant characteristics are unique to the individual and should not be correlated with other individual characteristics. Because each entity is different therefore the entity's error term and the constant (which captures individual characteristics) should not be correlated with the others. If the error terms are correlated then FE is no suitable since inferences may not be correct and we need to model that relationship (probably using RE). This is the main rationale for the Hausman test (Hausman, 1978).

The rationale behind RE model is that, unlike the FE model, the variation across entities is assumed to be random and uncorrelated with the predictor or independent variables included in the model. (Greene, 2003).

3. Estimation results and Discussion

3.1. Descriptive statistics

Table 1 gives descriptive statistic of change of companies' dividend. Columns (2) and (3) table 1 shows the number of company's increase the dividend per share, accordance of increase or decrease in the earnings per share respectively.

Increasing dividend afterward increasing earnings, presumed as a related incident and like other empirical observations, interpreted as stylized fact of corporate dividend policy. Why firms increase dividend when they make less. We think that high inflation rate in Iran, can contribute this question. It seems that increasing dividend after an increase in the price index, signals the good prospect of the company.

Columns (5) and (6) table 1 present the number of firms decreased dividends respect to increase and decrease in earnings respectively. Number of observations in the column (5) is fewer than column (6) in a period of 7-years. Therefore it might intuitively provide.

(Deshmukh, 2003) Pointed Likelihood of a dividend initiation will be a function of asymmetric information problems and various firms-specific attributes.

Columns (5) and (6) table 1 present the number of firms decreased dividends respect to increase and decrease in earnings respectively. Numbers of observations in the column (5) are less than column (6) in a period of 7-years. Therefore it might intuitively provide (DeAngelo et al., 1996) conclusions that a loss is a necessary condition, but not a sufficient condition, for a dividend reduction.

Column (7) is the number of firms that cut dividend. (Benito & Young, 2003) Explain dividend omissions and cut as a function of financial characteristics including cash flow, leverage, investment opportunities, investment and company size. Two next columns show maintained and zero dividends regardless of change in earnings.

Table 1- Number of dividend increasing, decreasing and maintained firms by year

	increase-initiate			cut-decrease			zero-maintained		Sum of firms
	d+/e+ 0	d+/e- initiate	d-/e+0	d-/e- cut	maintained	zero			
2006	71	20	15	17	69	9	12	60	273
2007	82	14	26	17	81	4	7	57	288
2008	95	18	18	17	69	12	13	50	292
2009	95	9	9	11	79	21	16	22	262
2010	85	26	3	11	73	18	12	34	262
2011	84	16	4	23	64	11	14	39	255
Total	512	103	75	96	435	75	74	262	1632

Note: d+/e+0: $\Delta D > 0, \Delta E \geq 0$; d+/e-: $\Delta D > 0, \Delta E < 0$; initiate: $D_t > 0, D_{t-1} = 0, \Delta E \geq 0$; d-/e+0: $\Delta D < 0, \Delta E \geq 0$; d-/e-: $\Delta D < 0, \Delta E < 0$; cut: $D_t = 0, D_{t-1} > 0, \Delta E > 0$; maintained: $\Delta D = 0, \Delta E \geq 0$; zero: $D_t = D_{t-1} = 0$.

Figure 2 demonstrates frequency of the three classifications of all companies as increase-initiate, cut-decrease and zero-maintained dividends. The number of firms with dividends increasing is greater than the dividend decreasing and dividend maintained. The number of firms of maintaining dividend is at least.

Figure 2: Compare the number of firms with increasing, decreasing and maintained dividend

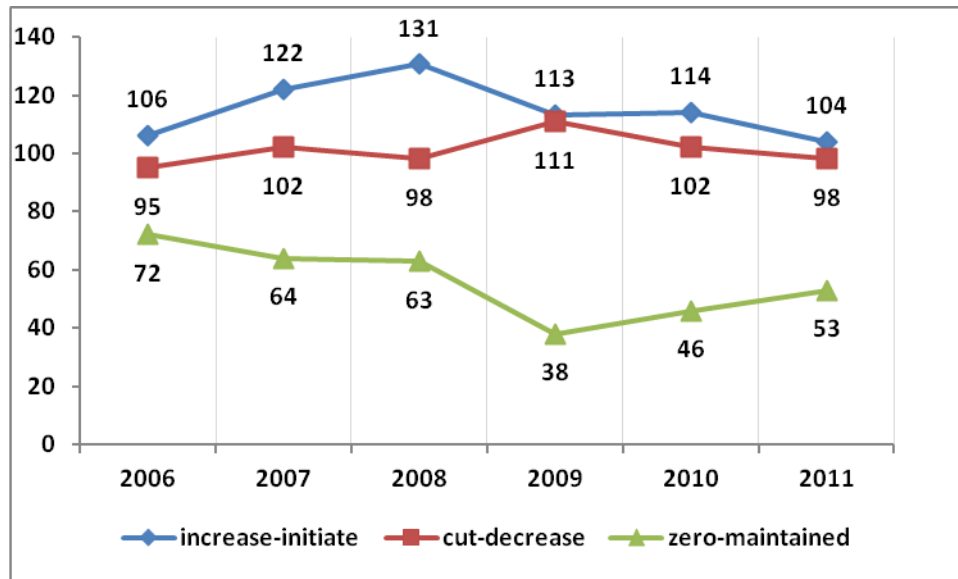
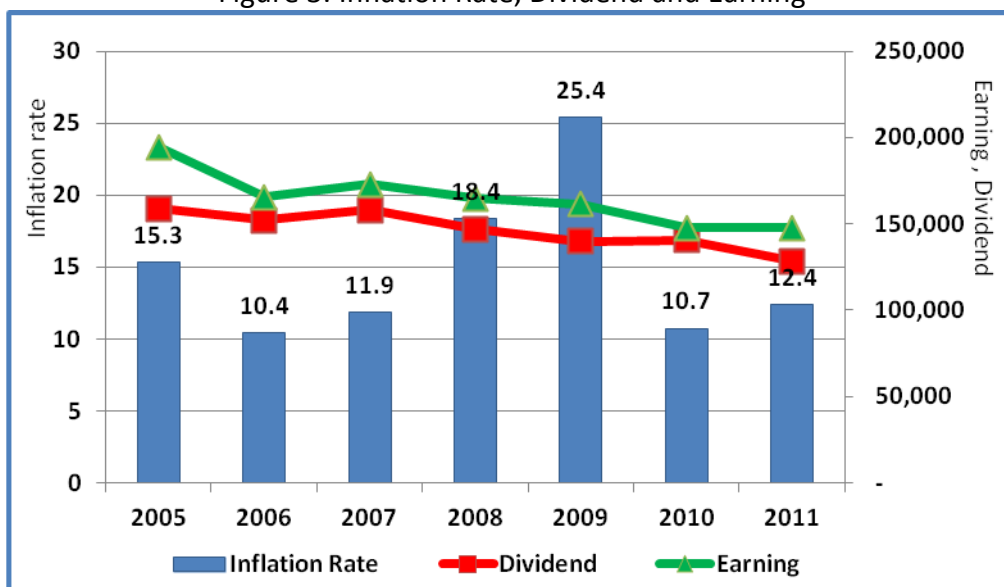


Figure 3 shows yearly inflation rate of Iran, total dividend and total earnings of companies during last years. As Figure 3 illustrates, both total dividend and total earnings have downward trend. It seems positive relative between earnings and dividend of companies as (Lintner, 1956) theory.

Figure 3: Inflation Rate, Dividend and Earning



Before we extend the content of asymmetric effects of inflation on dividend, we review briefly the literature determinant of inflation in Iran and then explain the statistic result of estimation of the model.

Double digit inflation rates in Iran are known as "chronic problem of macroeconomic" since two decades. Numerous papers such as (Hadian & Parsa, 2009) and (Hosseini & Mohtashami, 2008) suggest that the root of inflation is monetary policy of the central bank. They argue that the high inflation rate in Iran related to the excess nominal money growth process (money growth less output growth), as postulated by the quantity theory. (Hosseini Nasab & Rezagholizadeh, 2011) Explain the contribution of the budget deficit and impact of earnings from Oil exporting on inflation. (Abbasi-Nejad & Tshkyny, 2011) Extract "House and

Building" group's price indexes as a chronic base of inflation from consumer price indexes. They concluded that price index of "House and Building" influenced by expectation.

3.2. Estimation of model

The estimation results of the model illustrated in table 2. This study has estimated dividends and its explanatory variables as Eq. 1 on unbalanced panel data for a sample of 322 firms over the period 2005-2011.

The basic panel model in Eq. 1, referring to both intercept and slopes. In the event that there is neither a significant firm specific nor significant temporal effects, we could pool all of the data and run an ordinary least squares (OLS) regression model. Therefore someone can argue that there are significant differences between firms and unobserved firm specific characteristics, such as business practices across companies, investment opportunities or variables that change over time but not across entities that might affect dividend and are not captured by the pooled OLS model.

These firm specific effects may be correlated to the regressors and thus one needs to control those unobserved time-invariant firm specific effects by allowing the error term to include a firm-specific fixed effects. Thus it yields consistent estimators in the presence of company fixed effects provided that the regressors are not correlated with the error term. Furthermore to postulate the hypothesis, we oblige to use fixed effect or random effect techniques.

Column (1) of table 2 contains explanatory variables of the model: dividend of the previous year, current earnings and three dummy variables multiplied by lag of inflation variable (hereinafter we name them dummy variables). First dummy variable indicates the effect of last inflation rate on dividend in a state of increasing dividend. Therefore we put value 1 if the firm increases its dividend or initiates dividend and put zero otherwise in the first dummy variable. Second dummy variable in the same way indicates the effect of inflation in decreasing and cutting the dividend. Third dummy variable by the same way indicates the effect of inflation in status that firm has no change in dividend.

Column (2) and (3) of table 2 show estimated parameters of the model in Fixed Effect (FE) and Random Effect (RE) respectively. The FE model selected as a suitable model according to Hausman's specification test. It tests whether is significant correlation between the unobserved firm-specific RE and the regressors. If there is such correlation, the RE model should be inconsistent estimated and the FE model should be the model of choice. Other statistics of estimation also present in both preferred FE model and RE model.

Table 2: Estimation result of Model

Variable	Fixed Effect	Random Effect
Intercept	134.5888 (0.0000)•	23.57572 (0.3855)•
Dividend t-1	0.139336 (0.0052)	0.383029 (0.0000)
Earnings	0.474001	0.429746

	(0.0000)	(0.0000)
Dummy1*Inflation t-1	813.5032	975.8943
	(0.0000)	(0.0000)
Dummy2*Inflation t-1	-313.1379	-737.0754
	(0.0094)	(0.0000)
Dummy3*Inflation t-1	399.2785	829.5241
	(0.0004)	(0.0000)
F-statistic	24.51112	1152.314
	(0.0000)●●	(0.0000)●●
Adjusted R-squared	0.834961	0.791654
Durbin-Watson stat	2.280070	1.866360
Residual normality test: jarque-bera	14587.34	12006.06
	(0.0000)	(0.0000)
Total panel (unbalanced) observations:	1516	1516
Cross-sections included:	322	322
Redundant Fixed Effects Tests:	715.568642	-
Cross-section Chi-square	(0.0000)	
Hausman Test: Chi-Sq. Statistic	-	505.8322
		(0.0000)
Specifications	FE is suitable	RE is unsuitable

Note: ● P-Value, ●●Probe (F-statistic)

3.3. Empirical results:

The estimated coefficient of the lag of dividend, as shown in table 2, in the preferred model is positive and significant. It provides a somewhat crude measure of the importance of dividend smoothing by Iranian companies and it refers to firms continue dividend about 14 percentage of last year. Dividend smoothing' is the practice by which companies only adjust partially their dividends to changes in current earnings.

The estimated coefficient of earning variable is about 0.47. Therefore the positive relation between dividend and earnings is confirmed in this article. We name this issue as "stylized fact of dividend policy" examined. Because after (Lintner, 1956) propose, "A positive dividend-earnings model", lied foundations of the vast dividend literature.

Positive and significant estimated coefficient of dummy variable 1 approves positive effect of inflation on dividend regardless of increasing or decreasing earnings of the company. Therefore it validates propose of (Basse, Tobias ; Reddemann, Sebastian ;, 2011).

When firms make a profit or even loss, some of them continue dividend payout and increase dividend (see third column of table 1). However, increasing dividend afterward making a profit is an intuitive outcome but in the condition of making a loss it seems ambiguous and conflict by theory. This conflict solved by signaling theory of (Miller & Modigliani, 1961). They suggested that dividend might convey information about future firms' profitability. Substantially in the critical condition of economics as the continued existence of double digit inflation rate, attracting shareholders and potential investors and signaling them to hold and buy shares of the firms are main decisions of the dividend policy maker.

Inflation has also an inverse impact on dividend payout. The estimated coefficient of dummy variable 2 is negative. The negative sign of this coefficient postulates asymmetric behavior of dividend policy maker in decreasing and cutting the dividend. On the condition that a company could not pay out dividends, because of making loss or low profit, decision of dividend policy makers influenced by high inflation rate therefore they are reluctant to cut or decrease dividend as much as without inflation effect.

Cut or decrease dividend drastically with two-digit inflation rate put companies in a bad position and signals the severe undesirable prospect of the future. Stock prices may fall simultaneous cut- decrease dividend and led company bankrupt.

As shown in figure 2, aggregate dividend and aggregate earnings have downward trend. Under consideration of this observation, high inflation rate excludes earnings of companies and therefore excludes dividends from the firm's finance cycle by year.

Inflation has also a positive effect on maintaining dividend decision of companies without concerning about earnings changes. In the preferred estimation model, the coefficient of dummy variable 3 is positive and less than dummy variable 1.

Based on descriptive statistics and estimation results, we find that inflation has a positive effect on increasing, initiate and maintained dividend decision of the dividend policy maker and negative effect on decreasing and cut the dividend. Thus inflation has asymmetrically rolled in dividend policy. The coefficients of first, second and third dummy variables represent the degree of asymmetry with respect to inflation.

4. Conclusion

The article surveys asymmetric effect of inflation on dividend policy on Iran's stock market. We use panel data approach to estimate the parameters of the model. Panel data allow control for variables that cannot measure or observed like firm-specific. In order to examine the hypothesis, we include three dummy variables multiplied by inflation with other explanatory variables in the model. These dummy variables indicate the effect of inflation on the dividend in increasing-initiate, decreasing-cut and maintained status separately.

Both descriptive statistics in table 1 and Figure 2 and Figure 3 and estimation results in table 2 confirm the stylized fact of positive relations between earnings and dividend. Dividends positively relate to its lag and provide somewhat dividend smoothing practice. Coefficient dummy variables corresponding with increasing, cut-decreasing and maintained dividend are

positive, negative and positive respectively. They show non-symmetric effect of inflation rate on dividend.

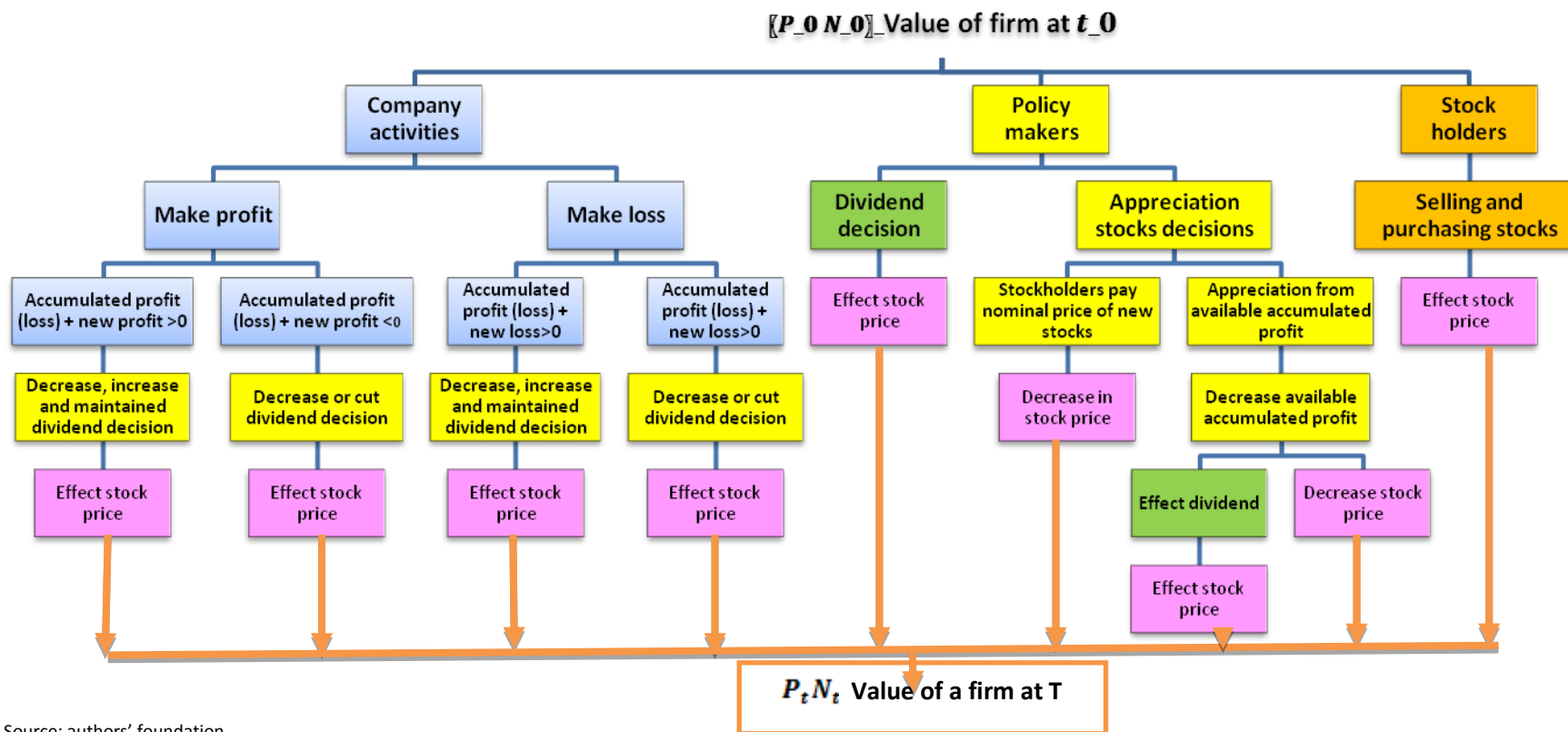
Dividend policy makers are reluctant decrease or cut dividends drastically in bad condition of the economy such as chronic double-digit inflation rate. Cutting or decreasing dividend signals severe bad prospect of the future, as possible as initiate-increasing dividend signal good prospect, and may lead company bankrupt. Indeed, the chronic high inflation rate implies decreasing in earnings of companies and subsequently decreasing or cutting dividends. As shown in Figure 3 aggregate dividend has a downward trend.

The study provides some evidence supporting the asymmetric impact of inflation on dividends. Limitation of sample estimation constrained us to include industry structures in the estimated model. Perhaps the effect of inflation on dividends of firms for individual industries was not the same and the effects of industry-specific characteristics are significant.

Inflation has significant contribution to the decision of the dividend policy maker to change dividend according to the status of companies as making profit or loss. The inflation rate has asymmetric effect on the decision of dividend policy makers.

5. Appendix

Figure 4: Process and activities a stock market briefly.



Source: authors' foundation

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