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Dividend Policy in a Frontier Market and Sector Equity Traded Funds in the United States

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Dividend Policy in a Frontier Market and Sector Equity Traded Funds in the United States

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Dedication

To my parents, who engrained in me the passion for learning and taught me to value knowledge above other things. To my mother, who dedicated all of her time and love to me and the rest of our family. To my father, who expressed his wishes to me that I grow up to be a teacher when I was in first grade.

To my wife, for her support and patience with the big changes that I introduced in our lives. To my children, with whom I could not spend enough time and I hope my work will inspire them to accomplish great achievements in their lives.

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Abstract

In chapter 1, we examine the nature and scale of the relationship between returns on sector Equity Traded Funds (ETFs) and their volatility. We discuss the source and direction of the effect between returns and risk and whether behavioral biases are prominent among sector ETFs. The study has implications for financial sector practitioners and investors, as it provides more information about the risk in sector ETF and whether that risk differs from that of other investment instruments. To this end, we test three hypotheses based on the relevant literature on volatility and returns: the leverage effect hypothesis, feedback hypothesis, and behavioral biases in assets pricing. We employ two measures of volatility in this chapter; specifically, we use the GARCH (1, 1) model and the Range-based autoregressive model.

Chapter 2 presents an examination of the factors that affect payout policy in a frontier market. MSCI classifies the Saudi stock exchange as a large frontier market and proposes to be reclassified as an emerging market by next year. The Saudi market is characterized by the high governmental influence and dominance of individual traders on daily transactions. By studying the 12-year panel data, we assess the effect government, board characteristics, social norms and major shareholder on Saudi firms' decision to distribute dividends. The government presence and investor taste, especially for Islamic-compliant firms, are discussed. This chapter provides valuable information for investors and practitioners by identifying the factors that should be considered when making finance and investment decisions in frontier markets.

Keywords: Equity Traded Fund; Volatility; Corporate Governance; Government Ownership; Board Structure

Chapter 1: The Returns–Volatility Relation in Sector Exchange Traded Funds

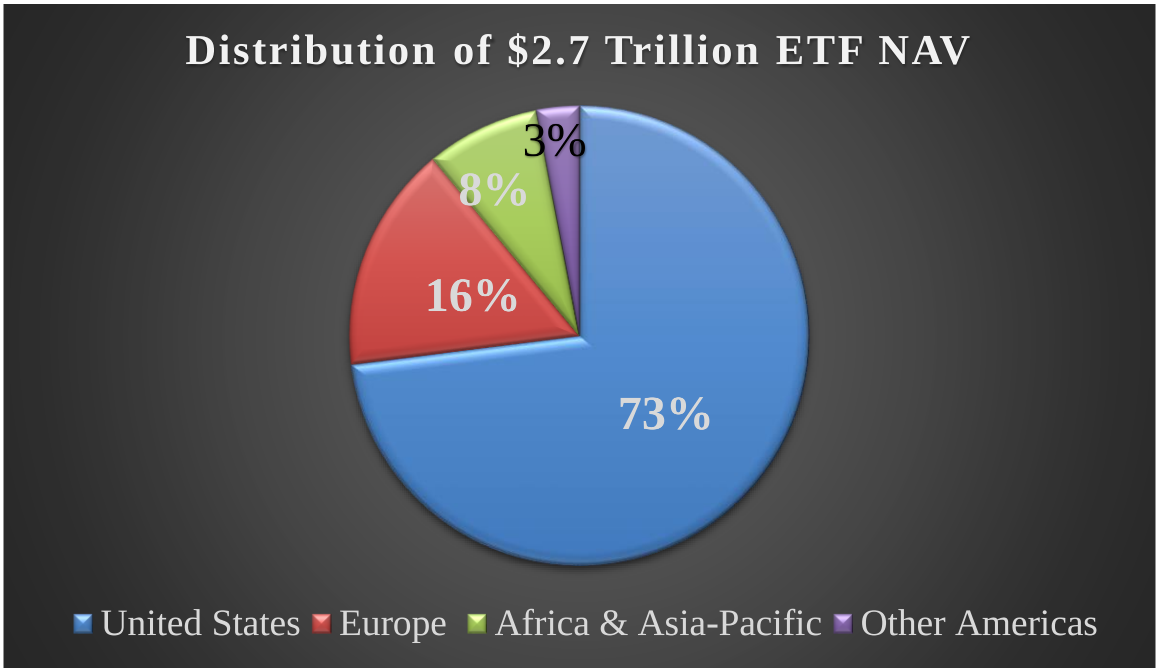
1. Introduction

The returns-risk (volatility as a proxy for risk) relation is one of the core tenets of the finance literature. The basic asset pricing models assume a positive risk-returns relation. However, there is a growing body of literature that challenges these foundations and provides explanations based on time-specific and behavioral biases that shape the risk-return relationship. Therefore, we use a sample of nine sectors' ETFs over the course of sixteen years to determine how much the returns volatility relation in those special funds agrees with the positive risk-returns proposed by the theoretical models.

ETFs represent a choice for individuals and institutions that seek cost-effective investment strategies and prefer to follow board market indices[1]. Within this 2.7 trillion-dollar industry worldwide, there are 1,411 funds in the US, representing 73% of ETF net asset in 2014.[2] The primary objective of the essay is to examine the nature and magnitude of the interrelationship between returns from sector ETFs and their volatility. More specifically, we will investigate how the past and current returns and volatility of sector ETFs affect each other.

[1] Investment Company Institute 2015 Fact Book
[2] Investment Company Institute 2015 Fact Book

Figure 1



The essay contributes to the existing literature by offering fresh evidence regarding the returns–volatility relationship. To the best of our knowledge, this is the first study to examine the

returns–volatility relationship by utilizing the data on popular ETFs representing the industrial mutual funds closely replicating the S&P Select Sector Indices.

In this chapter, we provide a review of the literature regarding risk and return and the explanations of the existence of an asymmetric negative relationship of returns-volatility. Section 3 describes the methodology used in the empirical analysis. Section 4 describes the data used in the empirical models. Section 5 presents the results, and Section 6 concludes the paper.

2. Literature Review

Return and risk are essential components in the finance literature. The Portfolio Selection Theory and Capital Asset Pricing Model (CAPM) assume a positive correlation between risk and return. Nevertheless, CAPM does not differentiate between an asset's response to bullish and bearish market conditions. In other words, assets are exposed to risk factors equally during bull or bear markets, and investors respond to both upside and downside risk in a similar manner. However, there is now a growing body of literature approaching the issues mentioned above, and the resulting findings do not necessary confirm the basic pricing models assumptions. In this section, we review the literature focusing on volatility and the nature of its relation to returns.

Some papers within the extant literature investigate the existence and importance of bull and bear beta (Ang and Chen, 2002; Pedersen and Hwang, 2007; Hong et al., 2007; Galagedera, 2009). For example, Bhaduri and Durai (2006) and Woodward and Anderson (2009) apply a dual beta model in their paper. Both papers employ a simple one-factor market model similar to that used in this paper. Yet other studies that investigate similar issues include Silvapulle et al. (2004) and Huang and Wu (2005). Using the data on the UK equity market, Pedersen and Hwang (2003) examine the significance of bear market beta and find that bear market beta might not be a major factor in determining asset pricing.

Volatility plays an important role in asset pricing and risk management and other areas of finance. The volatility is usually categorized according to the method of calculation into implied and realized. The implied volatility, such as VIX, was introduced by the CBOE in 1993 to measure of market expectations of near-term volatility conveyed by the S&P 500 stock index option prices[3]. Realized volatility, or historical volatility, is a nonparametric ex-post estimate of

[3] CBOE VOLATILITY INDEX (VIX) FUTURES. (n.d.). Retrieved from https://cfe.cboe.com/products/vx_qrg.pdf

the return variation. However, since there are different volatility measures, we chose the volatility measure that affects volatility-returns' nature and strength (Becker et al., 2009). Therefore, two methods are employed in this paper, namely the Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model (1, 1) and the Range-based autoregressive volatility (AV) model. GARCH is most often used method for modeling the time-varying conditional volatility due to its flexible adaptation of the dynamics of volatilities and its ease of estimation when compared to other models.

The AV model, the second method used in this essay, utilizes a range-based volatility measure (Parkinson, 1980) of the difference between the highest and lowest log prices over a fixed sampling interval. The range-based volatility estimators are claimed to be more efficient than other realized volatility measures (Parkinson, 1980; Garman and Klass, 1980). The AV model was introduced by Hsieh (1995), who shows that AV has much less volatility persistence than the GARCH model and AV does not require any distributional assumptions. GARCH requires a specific distributional assumption on the error term. By accurately modeling the range-based volatility, it can provide superior performance in estimating volatility (Chou, 2005). Li and Hong (2011) use two types of volatility models: the return-based GARCH model and the range-based AV model. The results from both the in-sample and out-of-sample forecasts demonstrate that the AV model successfully captures the dynamics of the volatility and offers good performance compared to the GARCH model.

In contrast to the assets pricing models, the asymmetric negative relation between returns and volatility are documented by many empirical papers. Three theories attempt to explain this finding. First, the leverage hypothesis (Black, 1976; Christie, 1982) attributed the negative return to the high debt-to-equity ratio of firms, which makes them riskier and causes greater volatility among their stock prices. Second, volatility feedback hypothesis (Poterba and Summers, 1986; Campbell and Hentschel, 1992) states that the current price to increase (decline) responds to time-varying risk premium (conditional volatility). The third theory is related to behavioral explanations that deal with market participants' cognitive biases and risk aversion behaviors. Several studies attribute the negative asymmetric return-volatility to behavioral explanation such as representation and extrapolation (Badshah, 2013; Low 2004; Hibbert et al., 2008). Hibbert et al. (2008) provide behavioral explanations for this asymmetric relation and conclude that behavioral theory is better than leverage and feedback theories in explaining volatility-returns relations. Low (2004) also finds a symmetric downward-sloping S-curve volatility-return. In general, the behavioral concepts associate a substantial downward movement in asset prices with the fear of risk and a significant upward trend in prices with exuberance.[4]

Lin and Chiang (2005) use a sample of forty-nine Taiwan firms in 2003 and employ the method used by Andersen et al. (2001) and GARCH (1, 1) within their study. They show that the volatility of the underlying stocks of electronic and the financial sector increases after trading ETF, while the opposite occurs in many stocks in other sectors. Trainor (2012) uses the monthly actual return value weighted index from 1926 to 2009 as the market proxy and the 30-day Treasury bill rate as the risk-free rate. He runs a regression of excess returns for each beta portfolio on the actual beta. The result reveals that high beta portfolios underperform those of low beta in a high volatility market during an extended period of time. Dheeriya, Rezayat, and Yavas (2014) perform a study of 223 days of data for daily return country-specific ETFs between 2011 and 2012, employing Multivariate Auto Regressive Moving Average (MARMA). They report a significant co-movement of returns among all ETFs and the existence of transmission

[4] Padungsaksawasdi, C. and Daigler, R. (2014). The Return-implied volatility Relation for commodity ETFs. The Journal of Futures Markets. 34(3). 261–281

and persistence of volatilities within most emerging markets, except for Turkey and Russia. Milonas and Rompotis (2010) examine thirty-six Swiss ETFs from 2001 to 2006 by regressing the raw return of the tracking index portfolio. They find that performance of Swiss ETFs lower than their underlying indexes and their investors are subject to a greater risk.

Daigler, Hibbert, and Pavlova (2014) use the daily return of Euro Exchange ETFs (FXE ETFs) in their study and its implied volatility EVZ and market implied volatility (VIX) from 2007 to 2011. They run regressions on the euro-currency exchange-traded fund (FXE) and its associated option implied volatility index (the EVZ) and find that the euro return-volatility can be asymmetrically positive or have a negative relation. Chen and Huang (2010) employ GARCH-ARMA for the daily samples of nine stock market indexes and nine associated ETFs. They find that a strong negative asymmetric volatility affects all markets and bilateral spillover between returns for stock indexes and ETFs. Whaley (2009) uses VIX from 1986 to 2008 to regress the rate of the change of the S&P 500 portfolio with a dummy if the daily rate of change of the VIX is negative. He concludes that volatility and return has asymmetric negative relation. Padungsaksawasdi and Daigler (2014) use daily and intraday ETFs stock and index VIX data from 2008 to 2012. They employ all four models (Hibbert et al., 2008; Fleming et al., 1995; Low, 2004). They find that the market comovement between the price changes of the commodity ETFs and their option VIX changes is substantially weaker than the corresponding results for stock indexes. Badshah (2013) uses a quantile regression and the heterogeneity-consistent method proposed by Koenker and Bassett (1978) to examine the relation between stock index returns and changes in the implied volatility from 2001 to 2010. He finds a negative and asymmetric volatility relationship between each volatility index and its stock market index. He also shows that the quantile regression outperformed the ordinary least squares (OLS) regression, which underestimates negative and asymmetric volatility relations. Krause (2012) uses daily ETFs and component stock options and associated implied volatility from 2005 to 2011 and find that firm-level options volatility is affected more by industry-level volatility than market volatility. Hassan et al. (2016) find that Islamic ETFs and commodity ETFs in Borsa Istanbul have an asymmetric relation running from positive return shocks to negative volatility shocks.

In summary, the literature has produced results that contradict the underlying volatility-return assumption in CAPM and MPT using different models and methods. Against this background, this study will add to the relevant literature by providing fresh evidence and extended time-series data. Also, this work is unique in the sense that it utilizes the ETF data instead of open-ended mutual funds data. ETFs are traded throughout the day in the market, providing investors a chance to react according to the market conditions.

3. Methodology

The central research question in this essay relates to the existence and nature of the relationship between returns and volatility among the sector ETFs.

3.1 Research Questions

First, do returns and volatility in our sample have a unidirectional or bi-directional relationship?

Second, what is the nature of their relationship – positive or inverse?

Third, do they have a symmetric or asymmetric relationship?

3.2 Hypothesis Development

The hypotheses of this essay are based on the literature review and the research questions listed above. In this paper, we test the following hypotheses based on the review of relevant literature that attempts to explain the volatility returns relation.

3.2.1. The leverage effect hypothesis

Black (1976) and Christie (1982) postulate that returns cause volatility through the leverage effect. According to their argument, a reduction in the market price of a financial asset leads to a decline in the firm value and raises the firm leverage ratio, which increases the leveraged firms' risk and triggers higher changes in volatility. Following this argument, we specify the following hypothesis to test the leverage effect.

H0: Returns do not affect volatility (i.e. there is no leverage effect)

H1: Returns do affect volatility (i.e. there is a leverage effect)

If we reject the null hypothesis, then the returns affect the volatility, which is in line with the work of Black (1976) and Chirstie (1982). If the underlying assets of ETFs are composed of many leveraged firms, then we find evidence in favor of the leverage effect.

3.2.2. The feedback effect hypothesis

According to the CAPM (Sharpe, 1964), volatility determines the returns of the financial assets. As explained in Bekaert and Wu (2000, p.7):

"For firms with high systematic risk, marketwide shocks may significantly increase their conditional covariance with the market. The resulting higher required return then leads to a volatility feedback effect on the conditional volatility, which would be absent or weaker for firms less sensitive to market level shocks."

In line with this argument, we test whether the sector ETFs in our sample face any feedback effect. In particular, we specify the following hypothesis:

H0: Volatility does not affect returns (i.e. no feedback effect)

H1: Volatility does affect returns (i.e. there is a feedback effect)

If the null hypothesis is rejected, we will find support for the feedback hypothesis in our sample.

3.2.3. Behavioral Hypothesis:

Behavioral-based explanations link the existence of the negative asymmetric return-volatility relationship to biases such as representativeness, affect, and the extrapolation (Badshah, 2013; Low, 2004; Giot, 2005; Hibbert et al., 2008). According to Low (2004), the fear of risk causes a considerable downward movement in asset prices following selloffs by irrational investors. At the same time, rational investors attempt to make profits from this downward trend, causing a subsequent rise in prices. This downward and upward movement in prices result in high volatility within the asset prices. To test this possibility in our data, we specify the following hypotheses:

H0: There is no asymmetric relationship between returns and volatility

H1: There is an asymmetric negative relationship between returns and volatility

The rejection of the null hypothesis will provide support in favor of behavioral biases in our sample.

The continuously compounded daily return on each ETF is calculated as

$$R_t = \ln P_t - \ln P_{t-1} \tag{1}$$

where P_t is the daily closing price adjusted for any dividends and splits and P_{t-1} is the adjusted closing price in the previous trading day.

We begin with the following specification for measuring the volatility of returns, which is simply the GARCH (1, 1) process proposed by Bollerslev (1986):

$$R_t = \sigma e_t \qquad e_t \sim i.i.d.(0,1) \tag{2A}$$

$$\sigma_t^2 = \gamma + \alpha\, R_{t-1}^2 + \beta \sigma_{t-1}^2 \tag{2B}$$

where returns R_t is modeled as a zero-mean process and σ_t^2 is a measure of the conditional volatility. A particular problem with the GARCH (1, 1) model is that it generates a measure of volatility that is persistent.

We estimate the volatility of each ETF based on the range of high and low prices within a given day. This measure is simple to construct and has been shown to be very efficient in overcoming market microstructure-related biases of a volatility measure that is based on high-frequency intraday returns (Alizadeh et al., 2002). We also use the following range-based estimator of daily volatility suggested by Parkinson (1980) and used in Li and Hong (2011),

$$\hat{\sigma}_t^2 = \left(\frac{1}{4}\ln 2\right)(\ln H_t - \ln L_t)^2 \tag{3}$$

where H_t and L_t are daily high and low prices, respectively. This measure is static in nature and does not incorporate the dynamic evolution of volatility in the financial markets.

Following Hsieh (1993) and as used in Li and Hong (2011), we specify the dynamic counterpart of the above specification as

$$R_t = \sigma e_t \qquad e_t \sim i.i.d.(0,1) \tag{4A}$$

$$\ln \hat{\sigma}_t^2 = \alpha + \sum_{i=1}^{m} \beta_i \, ln \, \hat{\sigma}_{t-1}^2 + v_t \qquad v_t \sim i.i.d.(0, \sigma_v^2) \tag{4B}$$

Next, we will address the first research question, which inquires regarding the interrelationship between ETF returns and volatility. This issue is handled within the framework of Granger Causality. For each ETF, we specify a trivariate vector autoregression (VAR) in returns, R_t, own volatility, $\hat{\sigma}_t^2$, and the market volatility, $\hat{\sigma}_{M,t}^2$ (which is used as a control variable):

$$\hat{\sigma}_t^2 = \alpha_1 + \sum_{i=1}^{p} \beta_{1i} \, R_{t-i} + \sum_{i=1}^{q} \gamma_{1i} \, \hat{\sigma}_{t-1}^2 + \sum_{i=1}^{s} \delta_{1i} \, \hat{\sigma}_{M,t-1}^2 + e_{1,t} \tag{5}$$

$$R_t = \alpha_2 + \sum_{i=1}^{p} \beta_{2i} \, R_{t-i} + \sum_{i=1}^{q} \gamma_{2i} \, \hat{\sigma}_{t-1}^2 + \sum_{i=1}^{s} \delta_{2i} \, \hat{\sigma}_{M,t-1}^2 + e_{2,t} \tag{6}$$

$$\hat{\sigma}_{M,t}^2 = \alpha_3 + \sum_{i=1}^{p} \beta_{3i} \, R_{t-i} + \sum_{i=1}^{q} \gamma_{3i} \, \hat{\sigma}_{t-1}^2 + \sum_{i=1}^{s} \delta_{3i} \, \hat{\sigma}_{M,t-1}^2 + e_{3,t} \tag{7}$$

where p, q, and s are the optimal lag length of ETF returns, its volatility, and market volatility, respectively. The optimal lag is selected based on the Swartz Bayesian Information Criterion (SBIC). The focus of the essay is in the first two equations in the VAR system, based on which the Granger causality tests will be carried out.

Leverage effect:

In particular, the null hypothesis that past returns do not Granger cause future volatility can be expressed as in Equation 5:

$$H_0: \beta_{11} = \beta_{12} = \cdots = \beta_{1p} = 0$$

A rejection of the null hypothesis will indicate evidence of Granger causality running from returns to volatility, which would support the leverage effects.

On the other hand, the null hypothesis that the past volatility does not Granger cause the future returns can be written as in Equation 6:

$$H_0: \gamma_{21} = \gamma_{22} = \cdots = \gamma_{2q} = 0$$

Again, a rejection of the null hypothesis will provide evidence of the influence of past volatility on the future returns on the ETFs for the feedback effects hypothesis.

The existing literature also documents the presence of an asymmetric relationship between volatility and returns. Following Low (2004) and Padungsakswasdi and Daigler (2014), we specify an asymmetric model to study the presence of an asymmetric relationship between sector ETFs' volatility and contemporaneous returns. The presence of asymmetric relations between these two variables is examined using the following specification:

$$\hat{\sigma}_t^2 = \alpha + \beta\, R_t + \gamma\, R_t^2 + e_{\,t} \qquad (8)$$

where the variables are as defined before, and an additional variable, R_t^2, is added to test the presence of asymmetry. A significant and negative coefficient, γ, provides support in favor of the asymmetric and negative relation between changes in the volatility and contemporaneous returns supporting the behavioral biases.

4. The Data

This essay utilizes the sector ETFs managed by the State Street Global Advisers, commonly known as the SPDRs[5]. These sector ETFs follow the corresponding S&P Select Sector Indexes designed and managed by S&P Dow Jones Indices[6]. The details of the ETFs used in this study are given in Table 1.

Table 1: List of Sector Exchange Traded Funds

Sector Fund Name	Ticker	Benchmark	Inception Date
The Materials Select Sector SPDR Fund	XLB	IXB	12/15/1998
The Energy Select Sector SPDR Fund	XLE	IXE	12/16/1998
The Financial Select Sector SPDR Fund	XLF	IXM	12/16/1998
The Industrial Select Sector SPDR Fund	XLI	IXI	12/15/1998
The Technology Select Sector SPDR Fund	XLK	IXT	12/15/1998
The Consumer Staples Select Sector SPDR Fund	XLP	IXR	12/16/1998
The Utilities Select Sector SPDR Fund	XLU	IXU	12/15/1998
The Health Care Select Sector SPDR Fund	XLV	IXV	12/15/1998
The Consumer Discretionary Select Sector SPDR Fund	XLY	IXY	12/16/1998
The SPDR S&P 500 Fund	SPY	SPTR	1/22/1993

This table shows the official name, the ticker, the benchmark that sector ETF seeks to track inception date of each sector ETF.

The return data on nine select sector SPRD ETFs are obtained from Yahoo Finance. For the overall US equity market representation, we use the ETFs based on the S&P 500, for which the data are collected from Yahoo Finance.

[5]For information on these funds, visit http://www.sectorspdr.com/sectorspdr/

[6] For more information on these sector indices, visit http://us.spindices.com/index-family/us-equity/sector-industry

The period of investigation is from December 1998 to June 2017. The long span of the time series data in our sample enables us to investigate the responses of the sector ETFs and thus to reveal the relation between their returns versus their own volatility and market volatility.

5. Result Discussion

In this section, we explain the results found in this paper. Instead of using each ETF's full official name, we will use the sector name whenever we refer to the ETFs (i.e. energy for the Energy Select Sector SPDR Fund). Figure A.2 in the appendix shows each ETF's market volatility in Panel A and price and the returns in Panel B since 2000.

The descriptive statistics of the daily returns are presented in Table 2. The average returns for the materials, energy, industrial, and consumer discretionary select sector are the highest (0.0003), and the lowest is found in the utilities and health select sector (0.0001). The standard deviation, a measure of volatility in returns, is highest in the health select sector (0.1254), and the smallest was in the consumer staples select sector. None of the sector ETFs has negative average returns.

Table 2: Summary Statistics of Returns

Ticker	Obs.	Mean	Std. Dev.	Minimum	Maximum
XLB	4649	0.0003	0.0155	-0.1325	0.1315
XLE	4649	0.0003	0.0174	-0.1560	0.1525
XLF	4649	0.0002	0.0202	-0.1907	0.2730
XLI	4233	0.0003	0.0141	-0.0986	0.1015
XLK	4649	0.0002	0.0164	-0.0905	0.1493
XLP	4649	0.0002	0.0096	-0.0621	0.0666
XLU	4233	0.0001	0.0122	-0.0891	0.1140
XLV	4236	0.0001	0.1254	-1.2270	1.2589
XLY	4649	0.0003	0.0142	-0.1236	0.0933
SPY	4650	0.0002	0.0123	-0.1036	0.1356

This table shows the summary statistics for each sector ETF. Ticker, observations, mean returns, standard deviation of returns, minimum and maximum returns are shown respectively in the table. The numbers of observations differ because some of the trading day's data were unavailable on June 16th, 2017, for some ETFs according to Yahoo Finance.

The correlation coefficients of daily returns are reported in the Appendix (Table A.1). Focusing on each fund's correlation with the overall market in the daily data, represented by

SPY (the SPDR S&P500 ETF), we find that the industrial and technology select sectors are the highest, at 0.84 and 0.82, respectively. The health care select sector's ETFs have the lowest (0.04) correlation with the overall market returns. The highest correlation between two ETFs is 0.7 between the consumer discretionary and health care select sectors, followed by the correlation between the industrial and financial sectors' ETF. The lowest correlation between two ETFs is that between the consumer staples and healthcare select sectors. The correlation coefficients for daily volatility among ETFs are also reported in the Appendix. The industrial sector ETFs have the highest correlation with the overall market volatility (0.865). We find that the utility ETFs' volatility is negatively correlated with the overall market. It also has a negative correlation regarding volatility among the healthcare, consumer staples, technology, and energy sectors. The highest correlation between two ETFs' volatility is between those of the financial and consumer discretionary sectors (0.835).

Data that exhibit Autoregressive Conditional Heteroscedasticity (ARCH) and volatility clustering can be represented by a GARCH model, provided that it uses stationary data. We run an ARCH effect test on each ETF and conclude that there is an ARCH effect in all sector ETFs. Upon inspecting the time series plot for each sector's ETFs (Figure A.1 in the Appendix), we determine that there is apparent volatility clustering. The GARCH is popular for modeling the volatility clustering that is visible during the high volatility period that are followed by high volatility, and low volatility times that are followed by low volatility. However, the GARCH model suffers from the volatility persistence that at times reaches 0.99, as documented by several papers. The range-based volatility AV model, suggested by Li and Hong (2011), show demonstrates less persistence than GARCH models. The visual inspection can provide a general idea about the data at hand, but it is not sufficient when a specific assessment is needed.

Therefore, these issues and many others are tested, and the findings are reported in this section of the paper.

We test the return and volatility variables for stationarity. For a variable to be stationary, the null hypothesis that the variable contains a unit root must be rejected. We test the return and volatility variables for stationarity. For a variable to be stationary, the null hypothesis that the variable contains a unit root must be rejected. We find that all ETFs' return series are stationary, as are all volatility series.

Table 3: Data Stationarity

Data Stationarity: H_0: The variable contains a unit root								
	Returns				**Volatility**			
ETFs	Test Stat	Crit. Val.	P–Val	Decision	Test Stat	Crit. Val.	P–Val	Decision
XLB	-19.71	-3.43	0.000	Reject	-5.91	-3.43	0.000	Reject
XLE	-19.41	-3.43	0.000	Reject	-6.22	-3.43	0.000	Reject
XLF	-19.88	-3.43	0.000	Reject	-4.69	-3.43	0.000	Reject
XLI	-18.49	-3.43	0.000	Reject	-9.84	-3.43	0.000	Reject
XLK	-18.81	-3.43	0.000	Reject	-4.04	-3.43	0.001	Reject
XLP	-19.28	-3.43	0.000	Reject	-5.09	-3.43	0.000	Reject
XLU	-18.93	-3.43	0.000	Reject	-6.31	-3.43	0.000	Reject
XLV	-26.61	-3.43	0.000	Reject	-6.45	-3.43	0.000	Reject
XLY	-19.15	-3.43	0.000	Reject	-4.61	-3.43	0.001	Reject

All ETFs' returns series and volatility series are stationary. Augmented Dickey–Fuller (ADF) was used to test the existence of unit-root with null hypothesis Random walk without drift, and the alternative is that the variable was generated by a stationary process. The reported P-value is MacKinnon approximate p-value for the test statistics. ADF critical values are -3.43, -2.86, and -2.57 for the 1%, 5%, and 10% significance levels, respectively.

The table below shows a comparison between the two employed methods, the GARCH (1,1) and AV models, in terms of the magnitude of autocorrelation and the joint test of lag significance.

Table 4: Diagnostic Tests of Models

	GARCH (1,1)						
ETFs	ACF(1)	ACF(3)	ACF(6)	*Q(1)*	*Q(3)*	*Q(6)*	β
XLB	0.9855	0.9577	0.9175	4116.3*	12023*	23053*	.907
XLE	0.9736	0.9748	0.9453	3757*	11101*	21597*	.919
XLF	0.9725	0.9036	0.8270	3615*	10091*	18403*	.789
XLI	0.9852	0.9598	0.9171	3711*	10866*	20827*	.917
XLK	0.9888	0.9681	0.9299	3738*	10988*	21338*	.920
XLP	0.9833	0.9469	0.8979	3696*	10697*	20283*	.905
XLU	0.9790	0.9339	0.8716	3664*	10507*	19679*	.890
XLV	0.9731	0.9076	0.7870	3619*	10195*	18052*	.686
XLY	0.9895	0.9712	0.9454	3743*	11025*	21492*	.923
	AV Model						
ETFs	ACF(1)	ACF(3)	ACF(6)	*Q(1)*	*Q(3)*	*Q(6)*	$\sum_{i=1}^{m} \beta$
XLB	0.5372	0.3068	0.4196	1223*	1774.7*	3870.3*	.900
XLE	0.5115	0.3502	0.472	1108.8*	2056.4*	4198.8*	.885
XLF	0.4355	0.2627	0.3061	803.68*	1398.1*	2325.4*	.928
XLI	0.1476	0.0948	0.089	92.276*	208.34*	352.73*	.328
XLK	0.3937	0.19	0.2863	656.99*	1052.3*	1774.8*	.943
XLP	0.4022	0.295	0.3464	685.66*	1323.2*	2401.5*	.912
XLU	0.4531	0.2714	0.2984	870.07*	1453.3*	2425.5*	.861
XLV	0.3975	0.2814	0.2674	669.78*	1220.7*	2073.8*	.880
XLY	0.4778	0.3324	0.4317	967.47*	1831*	3479.6*	.917

The table shows a comparison between the two employed methods, the GARCH (1,1) and AV models, in terms of the magnitude of autocorrelation and the joint test of lag significance. ACF is the autocorrelation function, and under Q is the λ^2 of the test statistics of the Q test of the variable's own lag significance. 1, 3, and 6 indicate lag 1, lag 3, and lag 6, respectively. An asterisk * indicates significance level at 1%.

The above table shows the magnitude of autocorrelation function at the first, third, and sixth lag. The AV's lags are less than that of GARCH (1, 1). In addition, the rate of decay in autocorrelation is faster under the AV model than the GARCH. The null hypothesis of the joint Q test of lags is that there is no autocorrelation. The first, third, and sixth lags' Q statistics are reported, and they are all significant at the 1% level. Figure A.2 in the Appendix shows a graphical representation of ETFs' returns autocorrelation and partial correlation function.

We used one of the common optimum lag methods, which are Schwarz's Bayesian Information Criterion (SBIC). Table 5 shows the optimum lags for each ETF under both models. Most of the sector ETFs' volatilities are affected by their own volatility for about twelve trading days. Energy and consumer stables and healthcare ETFs have the highest number of lags under the GARCH and AV models.

Using each ETF's optimum lag, as discussed in the preceding section, Table 5 presents the result of the Granger causality to test the first hypothesis regarding the returns–volatility relation.

Table 5: Granger Causality Tests for returns

H_0: R_t does not Granger cause $\hat{\sigma}_t^2$								
	GARCH(1,1)				**AV model**			
ETFs	χ^2	Lag	*p*–value	Decision	χ^2	Lag	*p*–value	Decision
XLB	194.88	13	0.000	Reject	209.16	11	0.000	Reject
XLE	412.45	21	0.000	Reject	260.36	11	0.000	Reject
XLF	179.01	12	0.000	Reject	183.81	12	0.000	Reject
XLI	277.85	12	0.000	Reject	909.16	11	0.000	Reject
XLK	299.54	12	0.000	Reject	302.04	12	0.000	Reject
XLP	210.18	15	0.000	Reject	175.44	12	0.000	Reject
XLU	384.37	12	0.000	Reject	152.45	11	0.000	Reject
XLV	343.69	20	0.000	Reject	103.55	13	0.000	Reject
XLY	209.18	13	0.000	Reject	201.91	12	0.000	Reject

The table shows a result of the two models GARCH (1,1) and AV models using the VAR framework and Granger causality to test the direction of the effect between each ETF's returns and its own volatility with market volatility being a control variable. λ^2 is a Granger causality Wald test statistic. Lag is the optimum lag of each ETF based on the SBIC criteria. The decision shows Reject or Fail to indicate whether we reject the null hypothesis in the top row of the table or not.

H_0: Returns do not affect volatility (i.e. there is no leverage effect)

H_1: Returns affect volatility (i.e. there is a leverage effect)

At the 10% significance level, we can reject the null for all ETFs in both models. The above hypothesis reveals important results that the daily returns Granger cause its volatility. This is evidence that the leverage effect in sector ETFs runs from price to volatility.

Table 6: Granger Causality Tests for Volatility

$H_0: \hat{\sigma}_t^2$ *does not Granger cause* R_t								
	GARCH(1,1)				**AV model**			
ETFs	χ^2	Lag	*p*–value	*Decision*	χ^2	Lag	*p*–value	*Decision*
XLB	26.97	13	0.013	Reject	9.61	11	0.565	Fail
XLE	166.13	21	0.000	Reject	13.33	11	0.272	Fail
XLF	26.60	12	0.009	Reject	17.94	12	0.117	Fail
XLI	48.30	12	0.000	Reject	14.55	11	0.204	Fail
XLK	60.15	12	0.000	Reject	23.86	12	0.021	Fail
XLP	45.84	15	0.000	Reject	12.24	12	0.426	Fail
XLU	40.37	12	0.000	Reject	7.35	11	0.770	Fail
XLV	189.45	20	0.000	Reject	12.99	13	0.448	Fail
XLY	91.97	13	0.000	Reject	13.31	12	0.347	Fail

The table shows the result of the two models, GARCH (1,1) and AV models, using a VAR framework and Granger causality to test the direction of effect between each ETF's returns and its own volatility, with market volatility being a control variable. λ^2 is a Granger causality Wald test statistic. Lag is the optimum lag of each ETF based on SBIC criteria. The decision field indicates Reject or Fail to represent whether we reject the null hypothesis in the top row of the table or not.

H_0: Volatility does not affect returns (i.e. there is no feedback effect)

H_1: Volatility does affect returns (i.e. there is a feedback effect)

Here, each model gives us different results. The AV model gives consistent results. With the AV model, we fail to reject the null hypothesis that volatility does not affect returns. Using the AV model, in the preceding section, we also accept that the returns affect volatility. Therefore, the AV model gives evidence for the leverage effect and against the feedback effect. On the other hand, the GARCH results show some inconsistency. It indicates the bidirectional relation between returns volatility. Thus, the result of the GARCH model supports the claim that leverage and feedback effects coexist in sector ETFs. Since the AV model of volatility gives consistent results, it seems more appropriate for our data based on the diagnostic results. Therefore, we rely on the result from the AV model to explain the relationship between returns and volatility.

The main point we can glean from testing the above two hypotheses is that the AV model gives us consistent results, which may indicate its suitability for our data and its superior performance.

Table 7 below shows the results that test the specification (8) for an asymmetric model to study the presence of an asymmetric relationship between sector ETFs volatility and contemporaneous returns.

Table 7: Volatility-Asymmetric Returns Relationship

	GARCH(1,1)				**AV Model**			
ETFs	α	R_t	R_t^2	Adj. R^2	α	R_t	R_t^2	Adj. R^2
XLB	0.0002	-0.0001	0.1790	0.174	0.0000	0.0000	0.0565	0.230
	(0.000)	(0.668)	(0.000)		(0.000)	(0.214)	(0.000)	
XLE	0.0002	0.0014	0.2230	0.226	0.0000	0.0004	0.0598	0.293
	(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)	
XLF	0.0004	-0.0029	0.1680	0.094	0.0000	-0.0002	0.0249	0.127
	(0.000)	(0.001)	(0.000)		(0.000)	(0.000)	(0.000)	
XLI	0.0001	0.0005	0.1680	0.154	0.0000	0.0000	0.0009	0.065
	(0.000)	(0.011)	(0.000)		(0.000)	(0.464)	(0.000)	
XLK	0.0002	-0.0012	0.1870	0.173	0.0000	-0.0002	0.0559	0.226
	(0.000)	(0.000)	(0.000)		(0.000)	(0.002)	(0.000)	
XLP	0.0000	0.0002	0.1530	0.138	-10.961	0.0000	0.0609	0.138
	(0.000)	(0.057)	(0.000)		(0.000)	(0.580)	(0.000)	

XLU	0.0001	-0.0000	0.2000	0.185	-9.736	-0.0001	0.1220	0.135
	(0.000)	(0.901)	(0.000)		(0.000)	(0.457)	(0.000)	
XLV	0.0134	-0.0601	0.3660	0.205	-9.911	-0.0000	-0.0000	0.006
	(0.000)	(0.000)	(0.000)		(0.000)	(0.845)	(0.003)	
XLY	0.0001	0.0008	0.1990	0.188	-10.501	0.0001	0.0670	0.162
	(0.000)	(0.001)	(0.000)		(0.000)	(0.058)	(0.000)	

The table shows the results of returns asymmetric model (8) to test the asymmetric relationship between sector ETFs' volatility and contemporaneous returns. α is the intercept, R_t is the contemporaneous returns, and R_t^2 is the squared returns. A negative and significant R_t^2 coefficient is an indication of behavioral biases in the sector ETFs' trading.

The GARCH result shows that all sector ETFs have a significant contemporaneous returns coefficient, with the exception of the material sector ETF. However, the sign contemporaneous returns are different among the five sector ETFs. Regarding the asymmetric relation between volatility and returns, the GARCH model produces significant R^2s coefficients, but with an opposite sign than what has been documented in the literature.

The AV model produces insignificant contemporaneous returns among the five sector ETFs. R^2's coefficients in the AV model are significant, but only the healthcare sector ETF is negative as expected. The positive asymmetric relation in the sector ETFs provides a puzzle, and, therefore, we tend to believe that there is not enough evidence for behavioral biases in sector ETFs.

We run the same tests on the weekly data of the returns and volatility of sector ETFs. We do not report the tables here to maintain brevity. However, we include the tables in the Appendix for interested readers. Weekly data give the same results as the daily data, with the exception of two changes. First, under the AV model, we do not find support for leverage or feedback hypothesis in the technology sector. Second, the GARCH model results are more consistent with the weekly data than with the daily data, since we find support for the feedback effect after rejecting the leverage effect in the energy, financial, and utility sector ETFs.

The outcome of this section shows that there is support for the leverage effect in our sample. Also, our sample does not support the feedback hypothesis. Additionally, we do not find enough evidence for the behavioral explanation of return and volatility relation among sector ETFs.

6. Conclusion

This chapter summarizes the discussion and the result of the relationship between returns and volatility in a sample of nine sector ETFs that are based on the S&P500 industrial sector indexes. Using daily data for the period from December 1998 to June 2017, we study the nature of the relationship between the returns on these ETFs and their volatility. In this connection, we specify three different hypotheses based on the relevant literature that focuses on the returns volatility relationship. These hypotheses explained in the text in details.

Two measures of volatility are used in this essay. The first measure is based on the popular GARCH (1, 1) specification. A particular problem with this measure of volatility is that it is generally highly persistent, which is evident in our data as well. As an alternative measure of volatility, which is less persistent than that under GARCH (1, 1), we utilize the Autoregressive Volatility (AV) model.

When testing the first two hypotheses, we use the VAR framework and the Grander causality test. The results obtained in our paper support the leverage effect hypothesis regarding both measures of volatility. On the other hand, when testing the feedback hypothesis, we get different results based on the two different measures of volatility. However, as noted in the text, the AV model of volatility is more appropriate for our data based on the diagnostic results. So, for the feedback hypothesis, we rely on the result from the AV model and conclude that there is no feedback effect in our sample.

The third hypothesis of our paper is related to the existence of behavioral biases in our data. To test this hypothesis, we specify an asymmetric model. The results obtained from both measures of volatility are very similar. Although we find the asymmetric terms to be significant, they are not as negative as expected under the behavioral explanations in the literature.

Therefore, we tend to believe that the behavioral biases do not explain the relationship of returns and volatility in the sector ETFs.

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8. APPENDIX A

Table A.1: Correlation Coefficients for Returns

	XLB	XLE	XLF	XLI	XLK	XLP	XLU	XLV	XLY	SPY
XLB	1									
XLE	0.688	1								
XLF	0.636	0.532	1							
XLI	0.735	0.572	0.682	1						
XLK	0.558	0.454	0.586	0.674	1					
XLP	0.530	0.461	0.546	0.563	0.427	1				
XLU	0.506	0.541	0.480	0.517	0.445	0.540	1			
XLV	0.037	0.032	0.038	0.057	0.031	0.022	0.027	1		
XLY	0.698	0.533	0.726	0.762	0.683	0.607	0.501	0.03	1	
SPY	0.758	0.685	0.797	0.820	0.839	0.668	0.629	0.040	0.840	1

Table A.2: Correlation Coefficients for Volatility

	XLB	XLE	XLF	XLI	XLK	XLP	XLU	XLV	XLY	SPY
XLB	1									
XLE	0.758	1								
XLF	0.648	0.590	1							
XLI	0.816	0.732	0.675	1						
XLK	0.563	0.483	0.461	0.634	1					
XLP	0.717	0.714	0.568	0.748	0.616	1				
XLU	0.007	–0.006	0.047	0.019	–0.167	–0.075	1			
XLV	0.723	0.691	0.577	0.768	0.675	0.771	–0.038	1		
XLY	0.790	0.753	0.693	0.835	0.617	0.796	0.001	0.750	1	
SPY	0.824	0.774	0.681	0.865	0.670	0.762	–0.004	0.800	0.821	1

Table A.3: ARCH Effect and Disturbance Term Serial Correlation Tests

	H_0: no ARCH effect				***H_0: no serial correlation***			
ETFs	χ^2	Lag	*p*–value	Decision	χ^2	Lag	*p*–value	Decision
XLB	130.59	1	0.000	Reject	2.65	1	0.103	Fail
XLE	165.00	1	0.000	Reject	14.16	1	0.000	Reject
XLF	293.65	1	0.000	Reject	46.87	1	0.000	Reject

XLI	58.85	1	0.000	Reject	1.822	1	0.177	Fail
XLK	140.78	1	0.000	Reject	5.149	1	0.023	Reject
XLP	193.25	1	0.000	Reject	16.70	1	0.000	Reject
XLU	318.69	1	0.000	Reject	24.08	1	0.000	Reject
XLV	565.01	1	0.000	Reject	543.04	1	0.000	Reject
XLY	159.26	1	0.000	Reject	0.224	1	0.6363	Fail

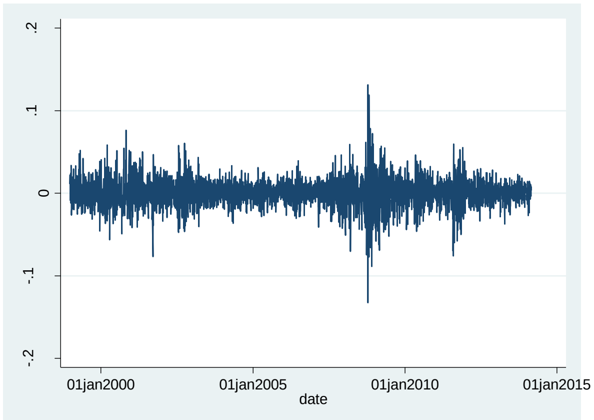
Table A.4: Weekly Data: Granger Causality Tests for Returns

H_0: *Does* R_t *Granger cause* $\hat{\sigma}_t^2$?								
	GARCH(1,1)				**AV model**			
ETFs	χ^2	Lag	*p*–value	Decision	χ^2	Lag	*p*–value	Decision
XLB	114.06	3	0.000	Reject	49.23	3	0.000	Reject
XLE	133.11	3	0.000	Reject	6.15	3	0.013	Reject
XLF	59.53	3	0.000	Reject	12.25	3	0.000	Reject
XLI	136.63	3	0.000	Reject	86.74	3	0.000	Reject
XLK	45.114	3	0.000	Reject	65.50	3	0.000	Reject
XLP	41.44	3	0.000	Reject	34.51	3	0.000	Reject
XLU	113.38	3	0.000	Reject	42.36	3	0.000	Reject
XLV	12.52	3	0.006	Reject	20.23	3	0.000	Reject
XLY	173.62	3	0.000	Reject	35.64	3	0.000	Reject

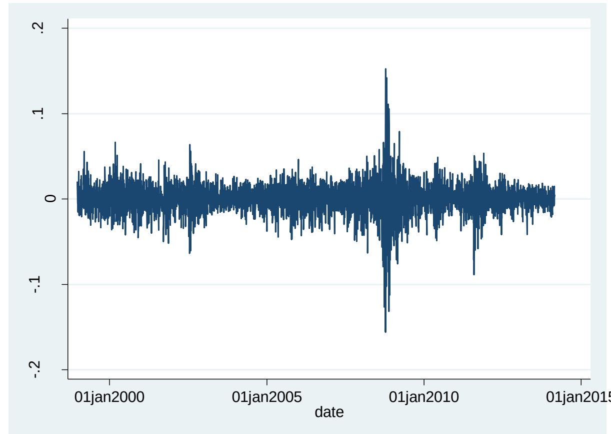
Table A.5: Weekly Data: Granger Causality Tests for Volatility

H_0: *Does* $\hat{\sigma}_t^2$ *Granger cause* R_t?								
	GARCH(1,1)				**AV model**			
ETFs	χ^2	Lag	*p*–value	*Decision*	χ^2	Lag	*p*–value	*Decision*
XLB	14.89	3	0.002	Reject	0.81	3	0.367	Fail
XLE	2.37	3	0.499	Fail	0.40	3	0.527	Fail
XLF	1.93	3	0.586	Fail	0.00	3	0.934	Fail
XLI	4.24	3	0.236	Reject	0.25	3	0.613	Fail
XLK	10.20	3	0.017	Reject	11.251	3	0.001	Reject
XLP	11.42	3	0.010	Reject	0.72	3	0.393	Fail
XLU	2.92	3	0.404	Fail	0.01	3	0.906	Fail
XLV	20.17	3	0.000	Reject	1.96	3	0.161	Fail
XLY	42.30	3	0.004	Reject	0.04	3	0.834	Fail

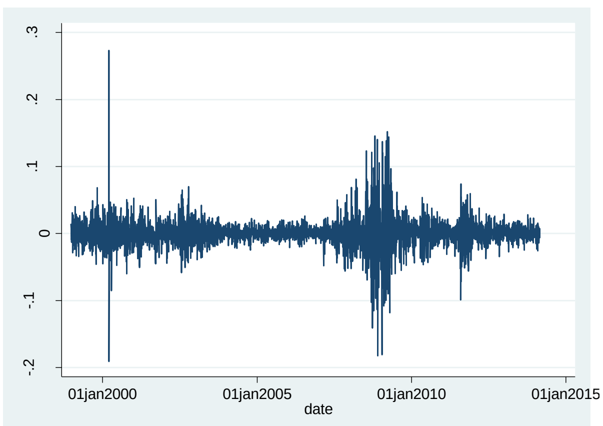
Figure A.1: ETF Time Series Plots (Volatility Clustering)



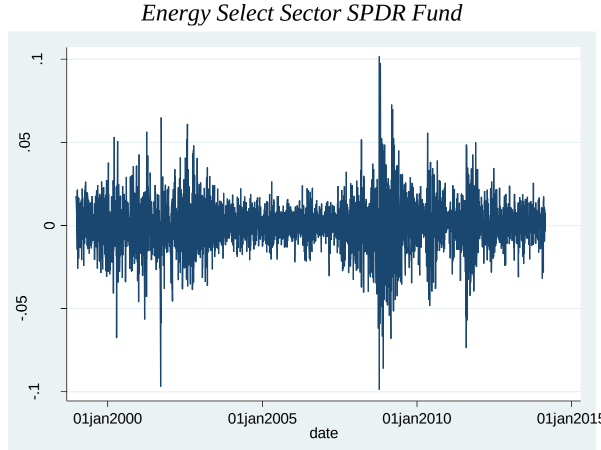
Materials Select Sector SPDR Fund



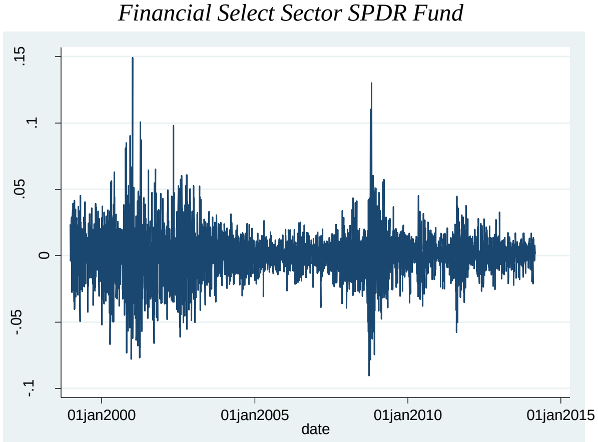
Energy Select Sector SPDR Fund



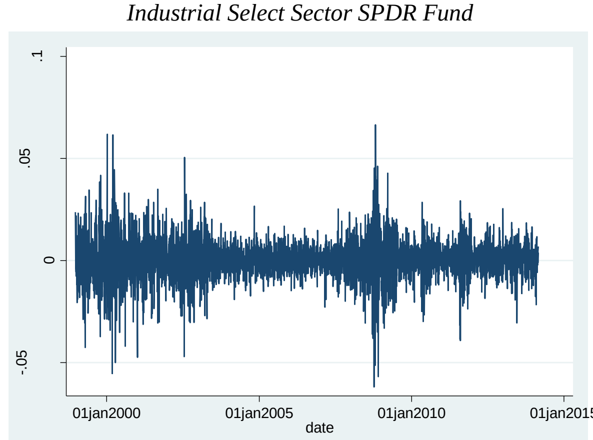
Financial Select Sector SPDR Fund



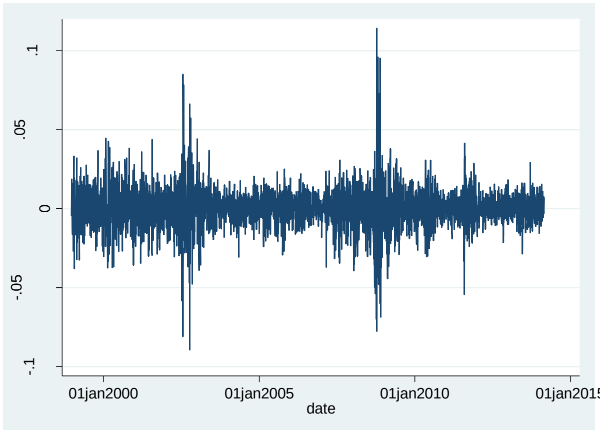
Industrial Select Sector SPDR Fund



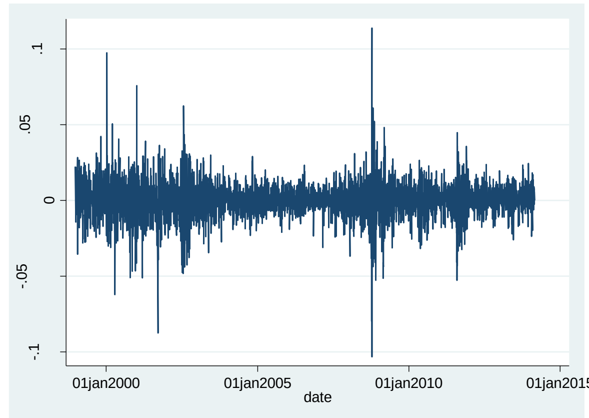
Technology Select Sector SPDR Fund



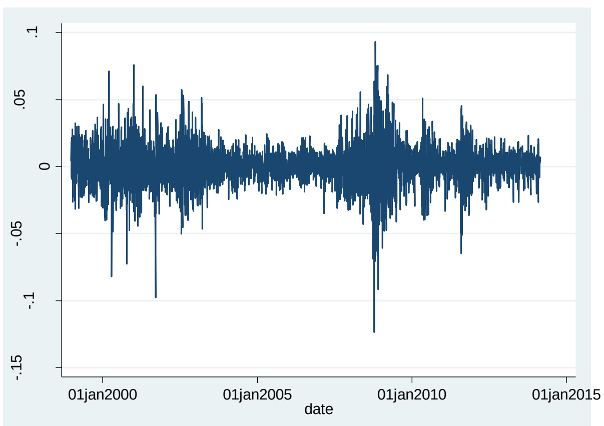
Consumer Staples Select Sector SPDR Fund



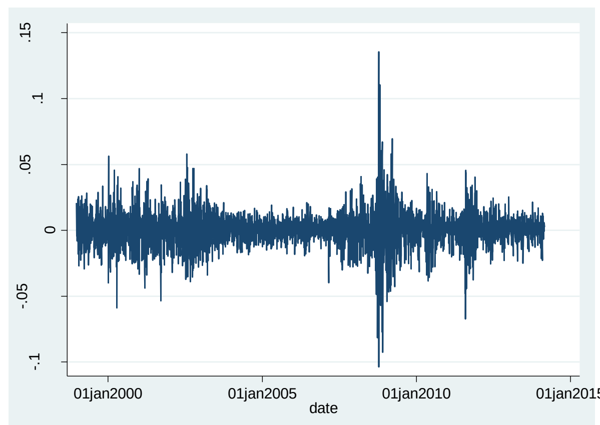
Utilities Select Sector SPDR Fund



Health Care Select Sector SPDR Fund

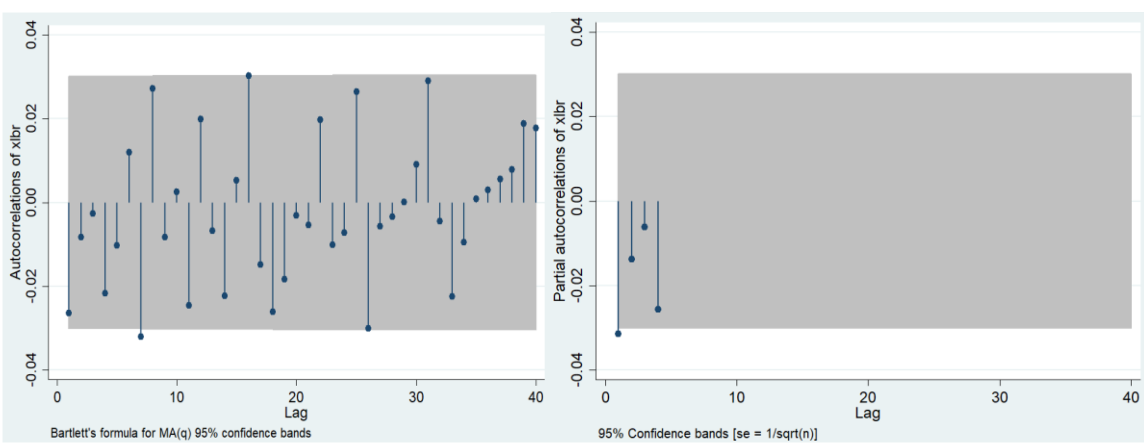


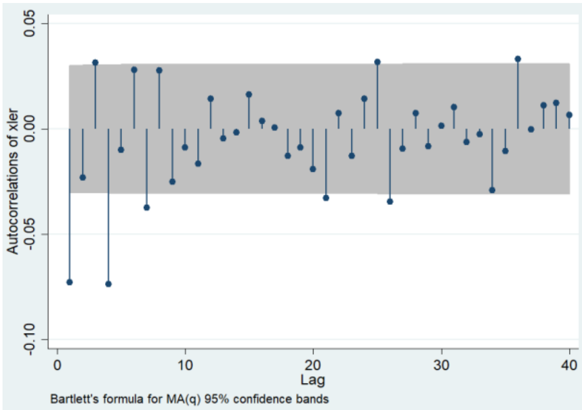
Consumer Discretionary Select Sector SPDR Fund



SPDR S&P 500 Fund

Figure A.2: ETF Returns Autocorrelation and Partial Autocorrelation Function




Autocorrelations of xler
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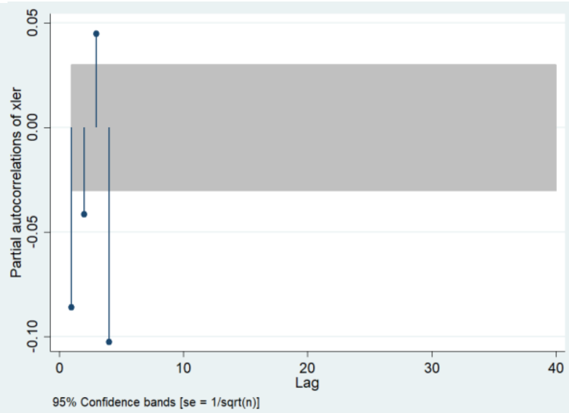
0.00
0.05
0
10
20
30
40
Lag
Bartlett's formula for MA(q) 95% confidence bands


Partial autocorrelations of xler
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-0.05
0.00
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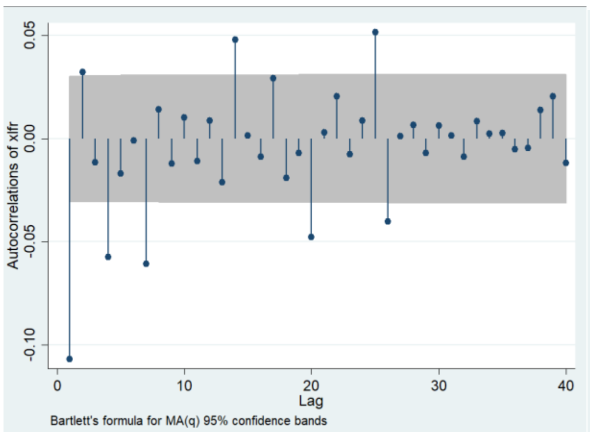
0
10
20
30
40
Lag
95% Confidence bands [se = 1/sqrt(n)]


Autocorrelations of xlfr
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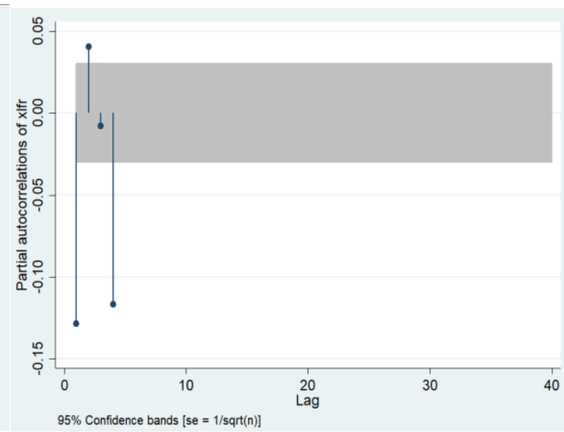
0
10
20
30
40
Lag
Bartlett's formula for MA(q) 95% confidence bands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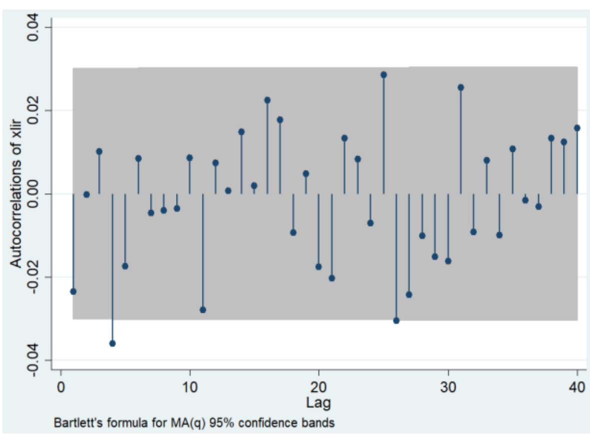
Autocorrelations of xlir
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0
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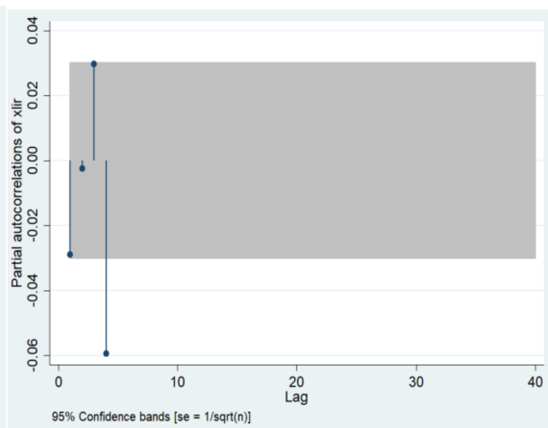
30
40
Lag
Bartlett's formula for MA(q) 95% confidence bands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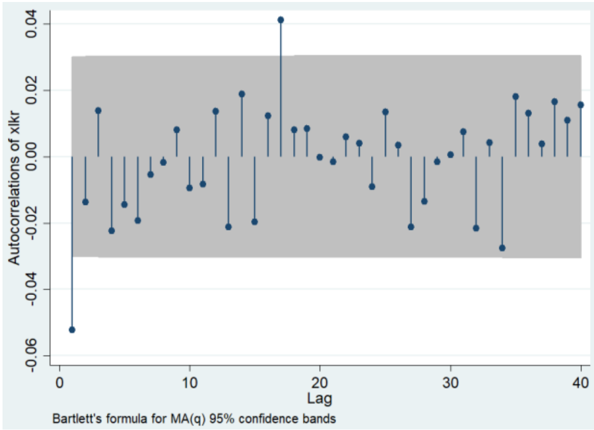
Lag
95% Confidence bands [se = 1/sqrt(n)]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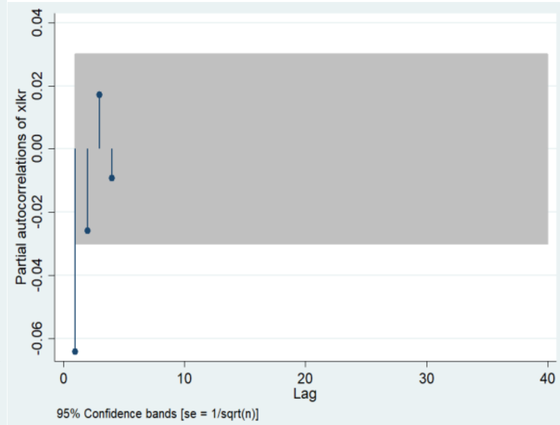
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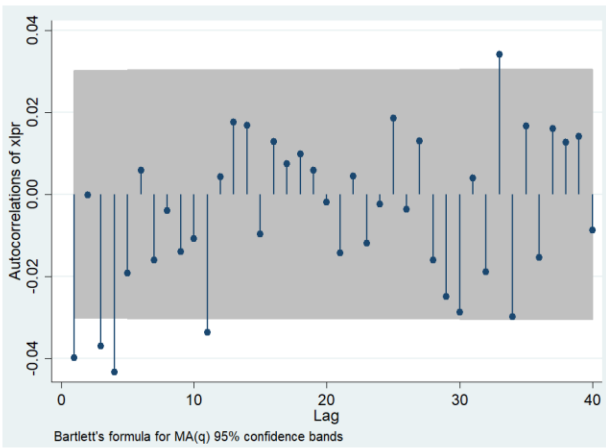
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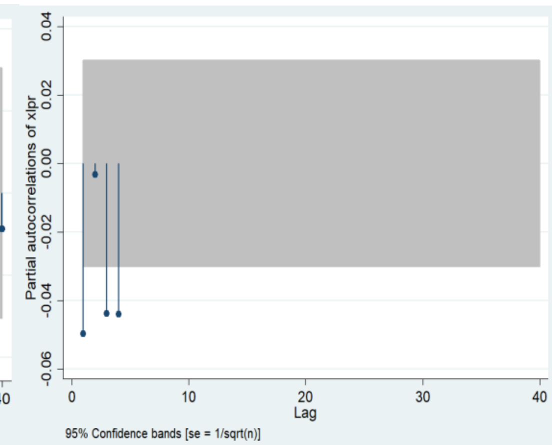
Bartlett's formula for MA(q) 95% confidence bands

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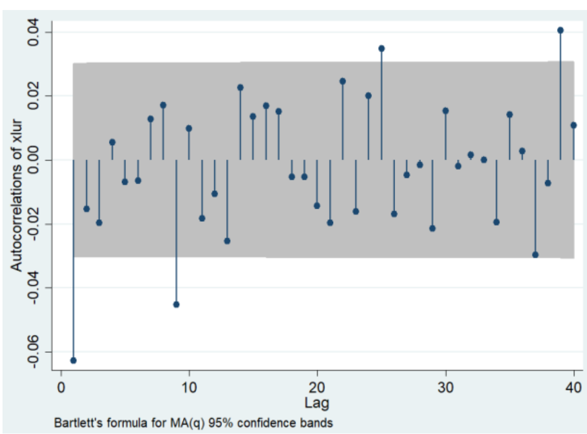
95% Confidence bands [se = 1/sqrt(n)]

Autocorrelations of xlur
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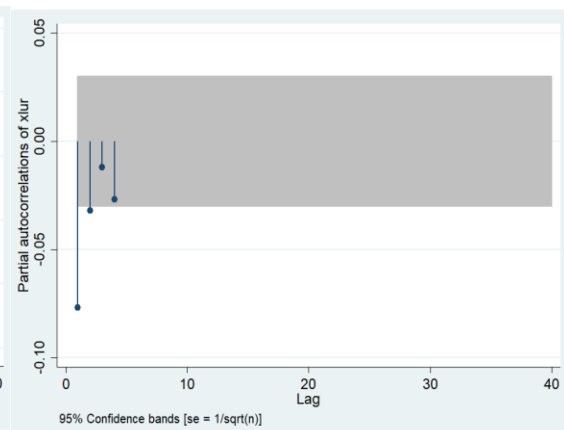
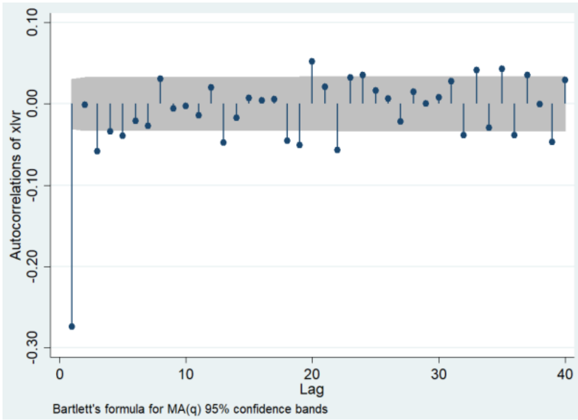
Bartlett's formula for MA(q) 95% confidence bands

Partial autocorrelations of xlur
Lag
95% Confidence bands [se = 1/sqrt(n)]


Autocorrelations of xlvr
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0.00
-0.10
-0.20
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0
10
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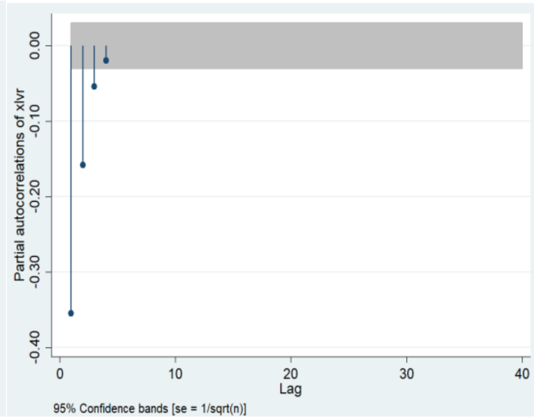
30
40
Lag
Bartlett's formula for MA(q) 95% confidence bands


Partial autocorrelations of xlvr
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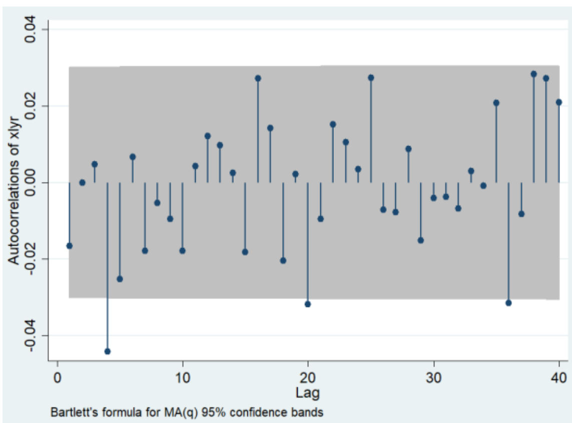
95% Confidence bands [se = 1/sqrt(n)]


Autocorrelations of xlyr
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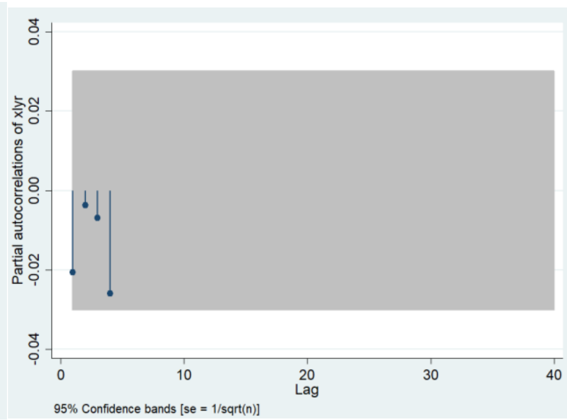
Lag
Bartlett's formula for MA(q) 95% confidence bands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Lag
95% Confidence bands [se = 1/sqrt(n)]

Chapter 2: How Government Ownership, Board Characteristics and Social Norms Influence the Firm's Payout Policy: An Evidence from Saudi Arabian Public Firms

1. Introduction

The firm's payout policy has puzzled researchers since the dividends irrelevance proposition (Miller & Modigliani, 1961) in a frictionless market was presented. Many explanations were provided because of the existence of market frictions. Dividends have been considered to be a means to reduce the agency costs and minimize information asymmetry. It is also influenced by the difference in taxing dividends and capital gains and provides investors a time-varying taste of dividends. The decrease in firms which pay dividends (Fama and French in 2001) versus the increase in the aggregate real dividends (DeAngelo et al., 2004) adds to the complexity, thus explaining the firm payout policy and determining whether it is shaped by market conditions or firm-specific factors.

This essay will identify the determinant of payout policy in a frontier market. The characteristics of the Saudi market make it interesting to study due to its government ownership and the dominance of individual traders within daily transactions. The government not only establishes firms and owns the majority of their stocks but also uses its investment funds to buy and sell stock as if they were institutional investors. The dominance of individual traders, who mostly demand Islamic-compliant firms, raises the question of their ability to make sophisticated investment decisions and monitor firms' managers. The Islamic compliance spans all aspects of firms' operations, from what they invest in to their financing decisions.

Section 2 provides a review of the literature regarding payout policy and corporate governance, with a focus on board characteristics. Section 3 describes the methodology used in the empirical analysis. Section 4 describes the data used in the empirical models. Section 5 presents results, and Section 6 presents a robustness check. Section 7 concludes this chapter.

2. Literature Review

2.1 Payout Policy

The irrelevance proposition by Miller and Modigliani (1961; hereafter MM) states that, in perfect capital markets, dividends policy does not affect firm value. Therefore, payout policy has no effect on either a firm's stock value or its risk, because the firm value is determined by its basic earning power and its business risk. The theory made several important assumptions, including the absence of taxes and brokerage costs, which implies that the shareholders face no cost to construct and change their own dividends policy by selling and buying stocks. If the firms pay lower dividends than the shareholders desire, they can sell a fraction of their ownership to generate the targeted income. Conversely, if the firm pays more than the shareholders want, they can use the extra income to buy more shares. As MM explain, if the firm pays dividends without any change in its investment and financing policy, then it must issue new shares to pay dividends to its current shareholders from the money raised from the new shareholders. However, this action represents an exchange of money from the old to the new shareholders. In this process, the firm value does not change, because the new share value equals the old value minus dividend that were paid by the new shareholders that pay out the policy irrelevance. In contrast to MM's view, firms pay dividends.

Several attempts were made to explain that by relaxing MM's assumptions. Miller (1977), for example, addresses the presence of tax in the market. The capital gain, which refers to the changes in the stock price during the investment period, has a lower tax rate than that of dividends. Therefore, companies that distribute dividends are likely to have a higher cost of equity compared to firms that do not distribute dividends. Because the capital gains are taxed at a lower rate than dividends, investors require a higher return on firms that pay dividends. Moreover, different investors have different tax rates that create clienteles for payout policy. Individuals who have a lower tax rate will prefer dividend-paying firms, while high tax rate investors favor firms that do not pay dividends and are expected to have higher capital gains. The findings by Elton and Gruber (1970) and Graham and Kumar (2006) support this investor preference, which was used to explain why the stock price drop is less than dividends on the ex-dividends day. Litzenberger and Ramaswamy (1979) use the CAPM model that accounts for a progressive tax scheme and find that a higher dividend yield is positively related to the dividends and capital gains tax differential. Brav, Graham, Harvey, and Michaely (2005) survey and interview 407 financial executives and conclude that dividend taxation is not the first concern for managers. Hietala (1990) finds that most of the sellers of Finnish stocks on ex-dividend days are individuals with a high tax rate. Also, Rantapuska (2008) shows that investors who prefer dividend income buy cum-dividend tend to sell stocks ex-dividend, and vice versa. However, the same observation was documented by Frank and Jagannathan (1998) in the Hong Kong market, where dividends and capital gains are not taxed. Poterba and Summers (1984) attribute the ex-dividend day abnormal return in the British market to the changes in the relative taxation of dividends and capital gains. Chetty and Saez (2005) suggest that the 2003 dividend tax cut increased dividend and dividends' initiation, while the firms with high levels of nontaxable institutional ownership did not change payout policies. However, Brav et al. (2008) perform executives' interviews that reveal that maintaining cash flow stability and the previous level of dividends is more important than tax reduction. This finding is also supported by Hasib and Hassan (2017); they find that the firm with financial slack defined as cash in excess of the expected investment requirement and the expected the cost of financial distress is more likely to have a flexible payout policy. They also show that financial slack determines the payout policy in which the firms with the lower (higher) volatility of the slack are more likely to pay dividends (share repurchase).

Poterba (2004) estimates that individuals hold only 57% of equities in 2003 from 90% in the 1950s. Del Guercio (1996) finds that dividend yield has no power to explain mutual funds or banks' portfolio choices. Hotchkiss and Lawrence (2007) find that the institutional investors change the stocks they hold when firms change their dividend policy. Desai and Jin (2011) establish a link between firm payout policy and the clients of intuitional investors' clients. The firm may increase or decrease dividends based on the tax characteristics of institutional investors' clients. Fos et al. (2014) draw attention to the significant special dividend payments at the end of 2012 in anticipation of the dividends tax change.

The irreverence of payout policy assumes that all market participants have the same information. When information asymmetry exists, firms use dividends to signal to the market their confidence in future cash flow (Miller & Rock, 1985). However, bad firms might try to replicate the dividend policy of good firms, but this strategy is not sustainable, as bad firms' cash flow is not enough to pay dividends, and they would have to issue new capital. The additional capital issuance would raise the cost of capital and would send a negative signal to the market. Therefore, the market penalizes bad firms over time, and they are no longer able to pay dividends.

The implications of Lintner (1965) and Fama (2001) in this field suggest that companies try to maintain long-term target dividend payout ratios and that mature firms with stable earnings are likely to have a higher dividend payout ratio than growing firms. Also, managers avoid changing the payout policy and pay more attention to dividend changes rather than the absolute number and change the dividends payout ratio, as there is a long-term improvement in earnings.

Others find different explanations for this “dividend puzzle” in the finance literature, such as Black (1976). Several roles for the dividend policy have been suggested and tested. Some argue that dividend is an outcome of good governance mechanisms, and others believe that it is used as a signal of the strength of the firms’ future cash flow. Among many factors, tax rates, liquidity, risk, and profitability have more influence on the firm payout policy. Dividends may contain agency cost (Jensen, 1986) by aligning manager and shareholders’ interests (Easterbrook, 1984) and raising the payout ratio (Rozeff, 1982), which is a substitute for other forms of monitoring.

Fama and French (2001) find that “the proportion of firms paying cash dividends falls from 66.5% in 1978 to 20.8% in 1999” due to the listing of small, high-growth, and low-profitability firms. They also note that “firms have become less likely to pay dividends,” regardless of their characteristics. DeAngelo et al. (2004) disagree with the disappearing dividends theory. They show that even though the number of dividend-paying firms has decreased, the dollar value of real dividends has increased, thus exhibiting a concentrated dividends supply. Michaely and Roberts (2012) find that public firms smooth dividends because of the scrutiny of public capital markets, and therefore, “ownership structure and incentives play key roles in shaping dividend policies.”

Jensen (1986) expresses the belief that the predominant problem is the conflicts arising from the investment decision of the firm when managers' (the agent) interests are not streamlined with the interests of the shareholders (the principal). Limiting the problem of free cash flow depends on the efficiency of governance mechanisms that would either restrict the manager's access to idle resources or by aligning their interests with those of the shareholders. Several internal and external mechanisms were identified by works of corporate governance research to ensure that the manager acts in the best interests of the shareholders. The internal mechanisms include managerial ownership, the executive compensation scheme, and the independence of the board of directors. The external mechanisms consist of debt financing, a long-term relationship with large creditors, and the market conditions for managerial labor.

The role of debt as a monitoring mechanism in reducing the agency costs and hence the problem of free cash flow is well recognized. The consequences of failure in meeting commitments imposed by debt are colossal, which drive the manager to perform better and dry the free cash flow available to them. Jensen (1986) believes that debt is an effective tool to prevent poor management, because debt directly reduces the free cash flow due to the pre-commitment of interest payment. The excess cash flow and low growth opportunity can be attenuated by using more debt financing (Jensen, 1986). There is extensive research that supports this notion. Harvey et al. (2004) find that debt alleviates the free cash flow problem in emerging markets. Gul and Jaggi (1999) confirm Jensen's view, claiming that debt has a positive effect in controlling free cash flow, especially during times of low investment opportunity. Even though debt solves some managerial shortcomings, it does not improve the investment decision by the manager.

This finding is noted by Hart and Moore (1995), who refer to the phenomenon as the overinvestment problem.

Wu (2004) supports the free cash flow hypothesis through a study of Japanese firms. He concluded, “the sensitivity of ownership structure to leverage depends on growth opportunities and free cash flow.” The issuance of new debt controls the overinvestment, which has a positive impact on equity (D’Mello and Miranda, 2010). However, Jiragporn et al. (2011) find a negative relation between leverage and firm governance quality.

2.2 Corporate Governance and Board Characteristics

Many views and interpretations of the role of payout policy on corporate governance and hence on firm value have surfaced within the industry literature. The literature review highlights the interaction between dividends and specifies whether they are causes or results of corporate governance, whose main objective is to minimize the agency cost by having good monitoring systems to motivate the manager to act in the best interests of the shareholder. Jiraporn et al. (2011) find that firms with better governance are able to pay dividends, and the dividends payer would thus pay higher dividends.

Bris and Cabolis (2008) assess the effect of the importance of governance that protects investors in acquisitions. When a firm acquires a 100% share of another firm in a different country, then the acquired firm is subject to the law of the acquirer firm’s country and thus to its corporate governance system. They find that, if the investor protection and corporate governance are better in the new country, the higher merger premium is in comparison to a similar acquisition within that country. Poor corporate governance is believed to be one of the structural weaknesses responsible for several financial crises and scandals (Johnson et al., 2002, Nam & Nam, 2005, Alen, 2009). While weak corporate governance may not have been a cause of the East Asian crisis from 1997 to 1998, the corporate governance practices have made countries more susceptible to a financial crisis effects that could have been minimized at the beginning of the crisis (Mitton, 2001). Corporate governance is an important factor in the financial market development and firm value (Shleifer & Vishny, 1999). The corporate governance explains not only cross-country but also cross-firm performance within countries during the crisis (Mitton 2001). The failure of several corporate governance mechanisms such as weak protection of outside investors, poor information disclosure, and ownership concentration is documented by several papers as reasons for firm value deterioration (Bowen 2007, Alen 2009).

The dividends may discourage managers from investing in negative net present value projects, getting involved in empire-building behavior that extends that firm beyond its optimal value, or simply exerting less effort and using excessive perks. These are symptoms of a lack of an effective monitoring system which will lead to increased agency costs.

The top managers' decisions seem to be influenced by the board of directors, which itself is an essential element of the firm monitoring system. Therefore, the effectiveness of corporate governance systems is ultimately shaped by the effectiveness of the boards of directors, which is a result of its characteristics. Board characteristics such as independence, board size, board composition, and leadership structure determine the effectiveness of the board to presume its roles and are vital to the success of corporate governance effectiveness. Nam and Nam (2005) question the ability of the board of directors to perform its function, because it is weak in selecting, monitoring, replacing the Chief Executive Officer, and reviewing the remuneration of key executives and directors.

Jensen (1993) and Yermack (1996) argue that the smaller the number of board members, the more cohesive and productive it is, and thus it can better monitor the firm. The same conclusion was drawn by Hermalin and Weisbach (2003), who argue that the larger board members may increase agency problem and the risk of free riders. Likewise, Lipton and Lorch (1992) propose that seven or eight directors for the board would limit the coordination, communication, and decision-making problems that are likely to arise in larger boards. The above arguments were empirically tested, and a negative association between board size and performance was reported. Mak and Kusnadi (2005) conduct a study on a sample of 271 Malaysian and Singaporean firms and report a negative relationship between board size and firm value. Likewise, study of US and Finnish firms shows the same pattern, as observed by Yermack (1996) and Eisenberg et al. (1998).

On the other hand, other papers argued that a larger board would result in a higher monitoring capacity, as it is harder for the manager to dominate the board (Pearce and Zahra, 1989, Dalton and Dalton, 2005). Nam and Nam (2005) study a sample of firms in Asia and find that small board size may lack the right skills and experiences, which prevent members from expressing opinions and providing the needed advice for the manager. Similarly, Pearce and Zahra (1992) find that the board size has a positive relationship with firm performance, and the same conclusion was drawn by Chaganti et al. (1985).

According to agency theory, the CEO and chairperson of the board should be separated, as holding both positions creates a conflict of interest and reduces the efficiency of the director's control mechanisms (Jensen and Meckling, 1976; Jensen, 1993). Nam and Nam (2005) find that the separation of the roles of chair and CEO is a powerful mechanism that can lessen CEO power and enhance the monitoring role of the board's members. Rechner and Dalton (1991) support the agency theory's expectations of poor shareholder returns from CEO duality. The companies with CEO duality have lower returns on equity (ROE), returns on investment (ROI), and profit margins. The strong power concentration of CEO duality increases both managerial opportunism and the probability of withholding information from directors (Forker, 1992).

As an alternative to agency theory, stewardship theory states that managers act as responsible stewards of the assets they control when left on their own. Stewardship theory advocates support the claim that CEO duality has positive effects on firm performance and strategic management (Donaldson, 1990; Barney, 1990). They view the separation of the roles of chair and CEO as a force that depresses strategic planning and triggers power struggles. Davis et al. (1997) and Muth and Donaldson (1998) find that CEO duality increases the depth of knowledge and technical skills of CEOs, which helps them to engage in sustainable growth operations and leads the firms during crises. Likewise, Berg and Smith (1978) show that the CEO duality has a direct relation to the return on equity.

Fama and Jensen (1983) argue that outside directors are more independent and may be better able to place controls on managers than the inside directors because of their specialization. The board's effectiveness increases in part due to the outside directors' ability to reduce the managers' opportunism and provide high-quality advice to the manager (Johnson et al., 1999; Hermalin and Weisbach, 1988). Agrawal and Knoeber (1998) find that gender diversity on the board improves firm performance. The same authors document that firms appoint an independent director with political and governmental work experience when the firm has larger exports or government agency are one of its clients (2000). Also, firms hire independent directors with political and legal backgrounds when their possible lawsuits or regulations are in the process of modification by the government. Baysinger and Butler (1985) and Rosentein and Wyatt (1990) find that boards dominated by independent directors are more likely to behave in the best of shareholders. Nam and Nam (2005) recommend that appointing independent directors in Asian firms as a reform can improve the board's independence and hence boost its ability to fulfill the board duties. It was documented that independent directors are associated with fraud reduction in financial statements (Beasley, 1996), an increase in voluntary disclosure (Haniffa and Cooke, 2002), and improvement in audit quality (O'Sullivan, 2000).

On the other hand, the proponent of stewardship theory justifies having more executives on the board to ensure efficient functioning of the board (Donaldson, 1990; Barney, 1990). The executives are expected to safeguard the contractual relationship between the firm and the board (Williamson, 1985), and their high technical expertise on the firm's operations helps them in their monitoring role (Baysigner and Hoskisson, 1990; Goodstein et al., 1994).

3. Methodology

First, we assess the effects of the control variables regarding whether the relationships that are documented in the literature hold in the sample of Saudi firms. Dividends have a negative relationship on growth opportunities (Rozeff, 1982; Lloyd et al., 1985; Jensen et al., 1992; Holder et al., 1998). This essay uses the return on equity (ROE) as a proxy for firm profitability, as was applied in other papers, such as Gill et al. (2011). The literature shows that the profitability of the firm is a significant and positive factor of dividend policy (Fama & French, 2000; Jensen et al., 1992). Firm size is usually used as a sign of significant internal control systems (Kenney and McDaniel, 1989; Defond and Jiambalvo, 1991). Firm size is also positively correlated with financial performance and negatively with a market risk (Johnson et al., 2000; Mitton, 2002; Sengupta, 1998). Behr and Güttler (2007) report that larger firms are less risky and enjoy greater access to debt markets compared to smaller firms. Smaller firms are often charged a higher interest rate due to their lack of diversification (Lehmann & Neuberger, 2000; D'Auria, Foglia, & Reedtz, 1999). Irani and Oesch (2013) find that brokerage house mergers reduce analyst coverage, thus leading to a deterioration in financial reporting quality. They deduce that "Security analysts monitor managers and entrenched managers adopt less informative disclosure policies in the absence of such scrutiny."

Financial leverage may play a monitoring role as a governance mechanism in reducing the agency costs and may increase dividends. This would formulate the next hypothesis:

Hypothesis 1**:** The dividend is positively associated with financial leverage.

Driffield et al. (2007) find that ownership concentration (major shareholder or block shareholder) has a significantly positive effect on firm value. Large shareholders have a larger stake in the firm. Hence, they are highly motivated and able to monitor the firm and influence managerial decisions. Ownership concentration may imply effective governance, and therefore, major shareholders are able to reduce the free cash flow risk and help in improving company operation that would result in higher dividends. Borisova and Megginson (2011) study the government ownership on credit spread, a proxy for the cost of debt, and find that increased government ownership decreases the credit spread, especially in partially privatized firms. Chemmanur et al. (2009) find that institutional investors receive higher allocations in seasoned equity offerings (SEOs) that have better long-run stock returns. This finding is consistent with the notion that institutions possess private information about SEOs and information production that states that informed investors trade in the same direction as their private information, both before and after the SEO. This formulates the next hypothesis:

Hypothesis 2: The dividend is positively associated with ownership concentration.

In addition to debt, Jensen and Meckling (1976) believe that managers' equity ownership serves as another mechanism for reducing the agency costs. Agrawal and Jayaraman (1994), Warfield et al. (1995), and McConnell and Servaes (1995) find a positive relationship between manager ownership and firm performance. Firms with strong governance have governance mechanisms that align the interests of managers and shareholders and are designed to reduce agency problems that then, in turn, increase dividends. This formulates the following hypothesis:

Hypothesis 3: The dividend is positively associated with managerial ownership.

Independent directors provide a sincere advice, since they enjoy more freedom than the executives and have a great deal of experience (Richardson, 2002; Lasfer, 2002). Belden et al. (2005) find that independent directors tend to reduce the agency costs of the firm. Chhaochharia and Grinstein (2009) find a 17% decrease in CEO pay among firms that were not compliant with the recent NYSE/NASDAQ board independence requirements. However, Guthrie explains that this finding is due to observation outliers and doubts the effectiveness of independent directors in reducing CEO pay. Hwang and Kim (2009) assert that firms whose boards are socially independent pay less but design a performance-sensitive CEO compensation. Schmidt (2014) uses the social ties of board members with CEOs to measure their effect on takeover decision and find that the effect is more important when the value of board advice is high but that CEO-members' social ties have an adverse effect when monitoring is more important. This formulates the next hypothesis:

Hypothesis 4: Dividends are positively associated with board independence.

CEO duality hinders the ability of the CEO who holds a chairperson position to exercise an independent self-evaluation (Rechner and Dalton, 1989). It was found that the firms which revised their policy to prevent CEO duality experienced a significant improvement in performance (Fosberg and Nelson, 1999). Therefore, this formulates the next hypothesis:

Hypothesis 5: Dividends are negatively associated with the chairman-CEO duality.

Modum et al. (2013) find that the board size has a positive and significant impact on firms' performance. Tarak Nath and Apu (2013) study selected firms and conclude that the board size is positively related to firm performance. This formulates the next hypothesis:

Hypothesis 6: The dividend payout ratio is positively associated with board size.

Greco (2011) finds that board meetings increase with management ownership and decrease with independent directors on the audit committee. Tarak Nath and Apu (2013) studied selected firms and concluded that the number of board meetings is positively related to firm performance. Hoque et al. (2013) find that the financial performance of Australian firms has a direct relation to the number of meetings that the audit committee and remuneration committee hold per year.

Hypothesis 7: The dividend is positively associated with board meetings.

The hypotheses are tested using OLS regression with dividends per share as the dependent variable. The independent variables are state ownership, major shareholders, board characteristics, and control variables such firm size and leverage. The dividends may be cash dividends that are usually paid semiannually in Saudi Arabia. In this essay, we make no distinction between regular and special dividends. The regular dividends likely to be constant in the future, but extraordinary or special dividends are not expected to be repeated at least for the foreseeable future. The shareholders may be compensated by stock dividend when they receive additional stock from the company as a form of dividends. As the third form of compensation for its shareholders, the firm may engage in stock repurchases through open-market operation, a tender offer to improve the capital gain of its shareholders. The stock dividends and repurchases are not tested in this essay, because the data are incomplete and scattered in companies' annual reports.

Benartzi, Michaely, and Thaler (1997) find Lintner's (1956) model to be the best to explain dividend decisions. Fama and Babiak (1968) find that Lintner's (1956) explanatory power is as good as other models, if not better. Wang, Manry, and Wandler (2011) base their work on that of Lintner (1956), as follows:

$$DIV_{it}^{*} = r_i EPS_{i,t} \quad (1)$$

Where:

DIV^{*}_{it} is the target dividend per share for firm i at time t

EPS_{it} is the earnings per share for firm i at time t, and

r_i is the target payout ratio.

The actual dividends change is a function of the previous dividends and the current target dividends.

$$DIV_{it} - DIV_{it-1} = \alpha_{0i} + c_i(DIV_{it}^{*} - DIV_{it-1}) + \varepsilon_{it} \quad (2)$$

The intercept is the corporate reluctance to decrease dividends and c_i the management response speed to earnings changes. By substituting model (1) into model (2) and expanding,

$$DIV_{it} - DIV_{it-1} = \alpha_{01} + c_i r_i EPS_{it} - c_i DIV_{it-1} + \varepsilon_{it} \quad (3)$$

By adding prior year dividends to both sides, we have

$$DIV_{it} = \alpha_{01} + c_i r_i EPS_{it} + (1 - c_i) DIV_{it-1} + \varepsilon_{it} \quad (4)$$

And an estimate of the above model yearly and pooled over years as

$$DIV_{it} = \alpha_t + \beta_{1t}EPS_{it} + \beta_{2t}DIV_{it-1} + \varepsilon_{it} \quad (5)$$

Where:

DIV_{it} is the dividend per share for firm i at time t

EPS_{it} is the earnings per share for firm i at time t

B_{1t} is $c_t r_t$,and

B_{2t} is $(1-c_t)$

The interaction between the management speed of the adjustment in dividends and the fraction of earnings usually paid as dividends ($c_t r_t$) determines the target payout ratio. If $c_t=1$, the prior year dividend term disappears, which is an indication that firms do not smooth dividends and change their dividends according to the changes in earnings. If $c_t=0$, the sample firms follow a strict dividends policy and do not like to change their dividends when their earnings change.

$$DIV_{it} = \alpha_t + \beta_{1t}EPS_{it} + \beta_{2t}EPS_{it} * \delta_{3t}GOV_{it} + \beta_{4t}DIV_{it-1} + \beta_{4t}DIV_{it-1} * \delta_{3t}GOV_{it} + \delta_{3t}GOV_{it} + \sum_{k=1}^{K} \beta it\, Controls_{it} + \varepsilon_{it} \quad (6)$$

Model (6) includes the state ownership dummy (GOV) and allows for interaction between state ownership and current earnings (EPS) and prior year dividends to check whether the regression function is different for SOEs versus non-SOEs. We test for the joint significance of the dummy and its interactions with earnings and previous dividends.

$$DIV_{it} = \alpha_t + \beta_{1t} EPS_{it} + \beta_{2t} DIV_{it-1} + \delta_{3t} GOV_{it} + \sum_{n=1}^{N} \beta it\, Board_{it} + \sum_{k=1}^{K} \beta it\, Controls_{it} + \varepsilon_{it} \qquad (7)$$

Where:

GOV_{it} is a dummy variable equal to one if the state holds shares of firm i at time t

$Board_{it}$ is board characteristics for firm i at time t, and

$Controls_{it}$ are control variables that include firm size and leverage

Board characteristics include board size, independent directors, CEO duality, the number of board meetings, and the existence of shares of ownership concentration. Managerial ownership (MOWN) is the percentage of all shares owned by board members and executives and their dependents divided by the total number of shares. Board size (BSIZE) is measured by the number of board members. Outside directors (INDEP) is the ratio of the independent directors to board size. Duality equals 1 when the same person holds the positions of CEO and Chairman, and 0 otherwise. The number of annual board meetings (BMET) represents a proxy for board motivation in planning and monitoring firm operations. The Saudi Stock Exchange requires the company to disclose individuals and entities that hold 5% or more of the common shares. Ownership concentration dummy (CONC) is 1 when the firm has investors who own 5% or more of outstanding common stocks. The control variables include firm size (SIZE), which is the natural log of the total value of assets (LnAssets), and (LEV) is the debt-to-assets ratio. With all regressions, we consider year and economic division to be fixed effects.

$$DIV_{it} = \alpha_t + \beta_{1t}EPS_{it} + \beta_{2t}DIV_{it-1} + \delta_{3t}GOV_{it} + \delta_{3t}\text{SOCIAL}_{it} + \sum_{i=1}^{n} \beta it\, Controls_{it} + \varepsilon_{it} \quad (8)$$

Where:

SOCIAL_{it} is a dummy variable equal to 1 if firm i at time t is considered compliant with the shareholder social norms, specifically with Islamic guidelines in finance and investment.

We need to understand social norms to explain firm decisions and shareholders' behavior. A social norm is the accepted behavior to which an individual is expected to conform, and it represents the purpose and the foundation of correct behaviors. Compliance with Islamic principles may limit a firm's access to the debt market and increase the need to hold more cash. It may also prevent the firm from investing certain businesses or limit its investment opportunity set. However, firm failure to meet Islamic guidelines may deter shareholders, forcing the firm to pay higher dividends compared to complaint firm to attract investors. We consider a firm complaint with shareholders' social norm if the firm is considered to be compliant with at least three out of five well-known Islamic indexes in the Saudi market.

$$CD_{it} = \alpha_t + \beta_{1t}EPS_{it} + \beta_{2t}EPS_{it} * \delta_{3t}GOV_{it} + \beta_{4t}CD_{it-1} + \beta_{4t}CD_{it-1} * \delta_{3t}GOV_{it} + \delta_{3t}GOV_{it} + \sum_{k=1}^{K} \beta it\, Controls_{it} + \varepsilon_{it} \quad (9)$$

Where:

CD_{it} is a dummy variable equal to 1 if the firm paid dividends in the current year

CD_{it-1} is a dummy variable equal to 1 if the firm paid dividends in the previous year

Model (9) is a logistic model used to estimate the likelihood of a company to pay dividends considering the current earnings and whether the dividends had been paid during the previous year. The model adds the effect of the state ownership and its interaction with earnings and the previous year's decision to pay dividends.

The endogeneity problem is a concern regarding measuring the effect of the firm and board characteristics on corporate governance. Following Hermalin and Weisbach (1991), Himmelberg et al. (1999), Coles et al. (2008), Linck et al. (2007), and Mcknight and Wier (2009), we use the lagged values of the endogenous variables (i.e., board characteristics, major shareholders' ownership). All regressions are run with the year and economic sector fixed effect.

4. THE DATA

The Saudi Stock Exchange Company is known as Tadawul. The following information offers a brief history of Tadawul based on the information provided on its website[7]. Saudi joint stock companies began in the 1930s. Forty-five years later, there were about 14 public companies. The rapid economic expansion in the 1970s led the government to embark on forming a regulated market for trading together with the required systems in 1980. The Saudi Arabian Monetary Agency (SAMA) was thus named to regulate and develop the market in 1984. SAMA remained in charge until the Capital Market Authority (CMA) was established in July 2003 under the Capital Market Law (CML). The CMA is the sole regulator and supervisor of capital markets; it issues the required rules and regulations to protect investors and ensure fairness and efficiency in the market. In March 2007, The Council of Ministers approved the formation of the Saudi Stock Exchange (Tadawul) Company. Tadawul is the only stock exchange in Saudi Arabia, with 163 listed firms in 15 different industries and categories. It is located in Riyadh, the capital city of Saudi Arabia. The market index reached its historical peak in February 2006, exceeding 20634[8] points. In 2016, the total market capitalization reached US$ 448.52 billion, and the total value of shares traded during 2014 was US$ 308.53 billion.[9]

The ownership had been limited to Saudi nationals and expatriates who work in Saudi Arabia until recently. A new decision was made to open the market to international

[7] The Saudi Stock Exchange Company (Tadawul) website http://www.tadawul.com.sa/

[8] Tadawul's 2006 annual report retrieved from its website on October 26, 2014

[9] Tadawul's 2016 annual report retrieved from its website on June 29, 2017

investors without restrictions in June 2015[10]. The chairperson is usually one of the principal founders of the firm or major capital provider. In companies in which the government is the primary owner, the chairperson is usually from a public institution responsible for organizing the firm's sector. The board is elected every three years, a period that can be extended every three years for unlimited times. There are no clear rules regarding what determines the firm board size, but any change should be approved by the majority of the shareholders in annual meetings. The Saudi economy depends heavily on oil, which is exclusively explored, refined, and distributed by a firm that is 100% owned by the government, called ARAMCO. This company is not registered with the Saudi Stock market. ARAMCO can hire other companies, public or private, to perform particular jobs for a short time or as part of an extended agreement. The sectors with the largest average traded value in the Saudi stock values are the insurance, petrochemical industries, real estate development, and financial sectors.

The accounting data are taken from Compustat. However, since many data points are missing, we collect the supplementary accounting data from companies' websites or the Tadawul website, the official Saudi Stock Exchange website. The remaining data were collected from the firm's annual reports that were found on the Tadawul website and Argaam.com.

[10] Consultation on a Market Reclassification Proposal for The MSCI Saudi Arabia Index retrieved from MSCI website on June 29, 2017

5. Results Discussion

This section includes an overview of the variables summary statistics. Moreover, this section provides an extensive analysis and a discussion of the results. We start with the influence of state ownership on dividends. Secondly, we explore how social norms affect dividends because of perceived risk, liquidity, or access to the debt market. Thirdly, we discuss the effect of the board characteristics on dividends. Certain board characteristics are believed to improve firm governance. A good governance system ensures that financial resources are spent on the right venues, including paying dividends to its shareholders.

Table 1

Pooled results from estimation model (5), regressing dividends per share on prior dividends, and earnings per share for the year 2004-2015 inclusive.

Model(5): $DPS_{it}=\alpha_t+\beta_{1t}EPS_{it}+\beta_{2t}DPS_{it-1}+\Sigma\beta_{it}controls_{it}+\varepsilon_{it}$		
	Variable	Coefficient
	Intercept	0.3144
		(1.38)
	EPS: Earnings Per Share	0.2477
		(9.51)
	DPSlag: Dividends Per Share lag	0.5400
		(20.89)
	Grow: Assets Percentage Increase	-0.0037
		(-0.34)
	ROA: Profitability	-0.8992
		(-1.35)
	Ln(Assets): Firm Size	-0. 0035
		(-0.10)
	LEV: Financial Leverage	-0.5310
		(-1.79)
	TANG: Tangible Assets	0.1525

		(0.80)
	F-value	183.66
	Adjusted R^2	0.6196
	N	786

Coefficients are the regression estimates for Saudi firms using WRSD data after adding the missing variables from 2004 to 2015, inclusive. T-stats are reported. F-statistics are significant at 0.000.

We expect that firms with good growth opportunities have their resources tightened up for the current and upcoming project. We find an insignificant positive relation between dividends and growth opportunities, contrary to the findings of other papers (Rozeff, 1982; Lloyd et al., 1985; Jensen et al., 1992; Holder et al., 1998)

When seeking to prove the second hypothesis, as in many papers, we use the return on equity (ROE) as a proxy for firm profitability. The profitable firms may have an abundance of cash, especially when they have low growth opportunities. Such conditions may increase dividends if corporate governance systems are effective. The profitability of the firm is a significant and positive factor of the dividend policy (Fama and French, 2000). Under this policy, the profitable firms are expected to distribute higher dividends when they are confident about their ability to generate enough cash flow in the future or have low growth opportunities. However, we do not find a significant relationship between these attributes in our sample.

With regard to the third hypothesis, we expect that firm size is positively correlated with financial performance and negatively with market risk (Mitton, 2002). Firm size is usually used as a sign of significance within internal control systems (Kenney and McDaniel, 1989). Large firms usually have the resources to hire skilled CEOs, have access to experienced board members, and have more media coverage. For these reasons, dividends are expected to be higher in larger firms. Our sample shows an insignificant relation between dividends and firm size.

With regard to the fourth hypothesis, the financial leverage, measured by debt ratio, is expected to have an inverse relation with the free cash flow problem and may increase dividends. Financial leverage may have a monitoring role as a governance mechanism in reducing agency costs. However, the benefits of debt as substitute monitoring do not necessarily lead to a higher dividends ratio among Saudi firms.

5.1 State Ownership and Payout Policy

We discuss the influence of state ownership on dividends. We explore whether the state-owned entities (SOEs) have a different dividends policy from other sample firms (non-SOEs). Examples of such differences are higher payout ratio or less dividends smoothing compared to other sample firms. The Saudi market is special because the government could be a lender and shareholder. The government taxes neither dividends nor capital gain, and its income is generated from exporting oil and gas over which it has the sole right of control. The government also influences the market through government spending. The majority of firms' sales depend on the government's new and ongoing projects. More government spending means more direct income (the government is the largest employer) and indirect income (more hiring and pay in the private sector) to residents of Saudi Arabia.

Table 2

This table shows the sample statistics for the period of 2004-2015. It is categorized into three groups. Panel A shows the summary statistics of the firms for which the government holds some of its shares (SOEs). Panel B shows the summary statistics of the firms for which the government does not own any of its stock (non-SOEs). Panel C shows the same statistics for the full sample.

a	SOEs					
	Statistic	Obs.	Mean	Std. Dev.	Min	Max
	EPS	540	3.4	3.1	-5.9	17.2
	DPS	540	2.0	2.2	0.0	13.0
	ROE	538	14%	13%	-38%	53%
	ROA	538	7%	9%	-24%	44%
	Book-to-Market	538	0.6301	0.3517	0.0873	2.3732
	Market Capitalization	538	22,708	48,812	80	370,865
b	Non-SOEs					
	Statistic	Obs.	Mean	Std. Dev.	Min	Max
	EPS	1,005	1.2	2.4	-7.7	17.5
	DPS	1,005	1.1	1.4	0.0	14.0
	ROE	1,003	1%	56%	-1255%	57%
	ROA	1,003	3%	11%	-131%	47%
	Book-to-Market	1,003	0.5209	0.4214	0.0053	9.0194
	Market Capitalization	1,003	3,085	8,935	60	120,200
c	Full Sample					
	Statistic	Obs.	Mean	Std. Dev.	Min	Max
	EPS	1,545	1.9	2.9	-7.7	17.5
	DPS	1,545	1.4	1.8	0.0	14.0
	ROE	1,541	5%	46%	-1255%	57%
	ROA	1,541	4%	11%	-131%	47%
	Book-to-Market	1,541	0.5590	0.4017	0.0053	9.0194
	Market Capitalization	1,541	9,936	31,149	60	370,865

We note that, when the government invests in a company, it usually buys between 5% and 70% and is typically a major shareholder. Our sample shows that the government invests in 30% of the public listed companies, which the market values represent 41% of the market capitalization on average. The government owns companies that have higher earnings and dividends per share. Those companies are also more profitable and less overvalued than those in the rest of the sample.

Table 3

Pooled results from estimation model (5), regressing dividends per share on prior dividends and earnings per share for the years 2004-2015, inclusive.

Model (5): $DPS_{it}=\alpha_t+\beta_{1t}EPS_{it}+\beta_{2t}DPS_{it-1}+\varepsilon_{it}$				
	Statistic	Constant	EPS_t	DPS_{t-1}
	Coefficient estimate	0.1731	0.1907	0.5749
	T- Stat	4.59	16.06	31.04
	No. of observations	1,372		
	Adjusted R^2	0.6401		
	F-statistic	1222.20		

Coefficients are regression estimates for Saudi firms using the WRSD data after adding the missing variables from years 2004 to 2015, inclusive. T-stats are reported, and p-values are significant at the 0.01 level. F-statistic is significant at 0.000. Excluding companies that did not pay dividends for two consecutive years reduces the sample to 932 but produces similar results.

Our sample shows that the current earnings and prior dividends are significant factors in the dividends decision, and their explanatory power is 62%. It seems that dividends smoothing (B_{2t}=1-c_t=.0.43) is a common policy in the sample. The EPS coefficient can be used to estimate the target payout ratio. The result shows that the target payout rate is 0.44 (0.19/0.43).

Yearly results from regressing dividends per share on prior dividends and EPS show that prior year dividends and earnings per share are significant during all years with the exception of 2005 for the latter. Dividends smoothing and the speed of adjustment fluctuate between 0.18 and 0.79, and the target payout ratio is from 0.03 to 0.43.

Table 4

Yearly results from estimating Model (5) regressing dividends per share on prior dividends and EPS for years 2004-2015, inclusive. From coefficient of one year dividends lag, the result shows dividends smoothing behavior.

Model(5): $DPS_{it}=\alpha_t+\beta_{1t}EPS_{it}+\beta_{2t}DPS_{it-1}+\varepsilon_{it}$

Variable	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Intercept	0.50	0.43	-0.18	0.54	0.26	0.07	0.07	0.10	0.11	0.15	-0.05
	(1.98)	(1.67)	(-0.75)	(3.24)	(2.16)	(0.87)	(0.91)	(1.61)	(1.34)	(1.52)	(-0.66)
EPS	-0.01	0.12	0.36	0.25	0.34	0.18	0.08	0.13	0.17	0.18	0.13
	(-0.26)	(2.30)	(6.82)	(5.43)	(7.63)	(5.44)	(2.97)	(4.55)	(5.96)	(5.01)	(4.66)
DPS_{it-1}	0.67	0.56	0.70	0.21	0.38	0.69	0.82	0.79	0.71	0.58	0.72
	(7.66)	(7.45)	(8.75)	(3.51)	(6.06)	(13.05)	(15.47)	(18.41)	(14.48)	(10.55)	(16.00)
F-value	35.95	36.32	95.07	38.11	86.37	247.11	337.65	456.92	268.08	162	243.88
Adj R^2	0.4961	0.4817	0.6888	0.4073	0.5773	0.7885	0.8248	0.8612	0.7751	0.6722	0.7499
N	72	77	86	109	126	133	144	148	156	158	163

T-stat is reported in the parenthesis. Earnings per share is significant in all years with the exception of 2005. Prior year dividend is significant in all years. Dividends smoothing or the speed of adjustment fluctuate from 0.18 to 0.79 and target payout ratio from 0.03 to 0.43.

The coefficient of earnings has a positive and significant effect on dividends per share. From the one-year lag of dividends, we can deduce that the dividends smoothing is common among Saudi firms. Moreover, this is more pronounced in state-owned firms, because the interaction term between SOEs dummy and previous dividends is significant and positive. The dividends smoothing among SOEs is 0.39 ($ct=1-B_{4t}+B_{3t}$), and the target payout is 0.58 (0.23/0.39) from the firm after considering the effect of state ownership. The model is robust upon including the control variables (firm size, leverage, age) and the year- and industry-fixed effect.

Table 5

Pooled results from estimation model (6) with the interaction terms of SOE by regressing the dividends per share on prior dividends per share, EPS, and controls variables for the period from 2004 to 2015.

Model(7) $DPS_{it}=\alpha_t+\beta_{1t}EPS_{it}+\beta_{2t}EPS_{it}*GOV_{it}+B_{3t}DPS_{it-1}+B_{4t}DPS_{it-1}*GOV_{it}+B_{5t}GOV_{it}+B_6LEV_{it}+B_{7t}Ln(Asset)_{it}+\varepsilon_{it}$		
	Variable	
	Intercept	-0.0032
		(-0.09)
	EPS	0.2306
		(10.60)
	EPS*GOV	-0.0041
		(-0.13)
	DPS	0.4091
		(12.67)
	DPS*GOV	0.1958
		(4.28)
	GOV	-0.4115
		(-3.25)
	LEV	-0.3472
		(-1.25)
	Ln(Assets)	-0.0032
		(-0.09)
	F-value	63.74
	Adjusted R^2	0.6399

	N	1,025

T-stats are reported in the parentheses. We reject the null that DPS and GOV coefficients are simultaneously equal to zero, as the P-value of the Wald test is 0.000.

We use a fixed-effects logistic model to estimate the likelihood of a company paying dividends. The current earnings and state ownership increase the likelihood of a dividends payment. A dividends payment is more likely if the firm has paid dividends in the past.

Table 6

Results from estimation logit model (9) testing the influence of state ownership on the likelihood of paying dividends for years 2004 to 2015.

Model(9) $CD_{it}=\alpha_t+\beta_{1t}EPS_{it}+\beta_{2t}EPS_{it}*GOV_{it}+\beta_{3t}CD_{it-1}+\beta_{4t}CD_{it-1}*GOV_{it}+\beta_{5t}GOV_{it}+\beta_{6}LEV_{it}+\beta_{7t}Ln(Asset)_{it}+\varepsilon_{it}$		
	Variable	
	Intercept	-0.1111
		(0.851)
	EPS	0.2805
		(0.000)
	EPS*GOV	0.9683
		(0.000)
	Prior Dividends Dummy	2.7750
		(0.000)
	GOV	-0.8197
		(0.022)
	LEV	-1.3939
		(0.045)
	Ln(Assets)	-0.0428
		(0.628)
	Model λ^2	365.48
	Pseudo R^2	0.4085
	N	1,025

P-values are reported in parentheses. This is a fixed-effects logistic model to estimate the likelihood of a company paying dividends. Current earnings and state ownership increase the likelihood of dividends payment. Dividends payment is more likely if the firm has paid dividends in the past.

5.2 Board Characteristics and Payout Policy

In this section, we discuss the effect of several board characteristics on dividends. Board characteristics include management share ownership, board size, chairperson-CEO duality, board meetings, independent directors, and the number of executives who are also board members. We measure the effect of non-SOE blockholders which expect to have a greater influence on firm decision compared to other shareholders.

Table 7

This table shows the sample firms' board characteristic for years 2004-2015. It is categorized into three groups. Panel A shows the board characteristic summary statistics of the firms for which the government holds some of its shares (SOEs). Panel B shows the board characteristic summary statistics of the firms for which the government does not own any of its stock (non-SOEs). Panel C shows the same statistics for the full sample.

a	SOEs					
	Statistic	Obs.	Mean	Std. Dev.	Min	Max
	Board Size	541	9	1.4	5	13
	Board Annual Meetings	541	5.7	2.2	2	16
	CEO Duality	541	0.1	0.3	0	1
	Independent Directors	541	4.1	1.6	0	1
	Indepen. Directors ratio	541	0.5	0.2	0	1
	Executives on the board	541	0.6	0.8	0	4
	Executives Ratio	541	0.1	0.1	0	0.4
	Non-SOE Blockholders	541	0.5	0.5	0	1
	MGMT Share Ownership	541	0.9	0.1	0	1
b	Non-SOEs					
	Statistic	Obs.	Mean	Std. Dev.	Min	Max
	Board Size	978	8.2	1.6	4	12
	Board Annual Meetings	978	4.8	1.9	1	17
	CEO Duality	978	0.1	0.3	0	1
	Independent Directors	978	3.9	1.6	0	9
	Indepen. Directors Ratio	978	0.5	0.2	0	0.8
	Executives on the Board	978	0.9	0.8	0	6
	Executives Ratio	978	0.1	0.1	0	0.6
	Non-SOE Blockholders	978	0.6	0.5	0	1
	MGMT Share Ownership	978	0.9	0.3	0	1

c	Full Sample					
	Statistic	Obs.	Mean	Std. Dev.	Min	Max
	Board Size	1,519	8.4	1.6	4	13
	Board Annual Meetings	1,519	5.2	2	1	17
	CEO Duality	1,519	0.1	0.3	0	1
	Independent Directors	1,519	4	1.6	0	10
	Indepen. Directors Ratio	1,519	0.5	0.2	0	1
	Executives on the Board	1,519	0.7	0.8	0	6
	Executives Ratio	1,519	0.1	0.1	0	1
	Non-SOE Blockholders	1,519	0.5	0.5	0	1
	MGMT Share Ownership	1,519	0.9	0.3	0	1

State-owned Entities' (SOEs) boards are on average larger and hold more annual meetings compared to those of firms with no government ownership. The number of independent directors on SOEs' boards is greater than that of the firm with no government ownership. Directors and top executives tend to own about the same number of shares whether there is state ownership or not. On the other hand, the number of executives who are also members of the board of directors is greater in non-SOEs. Moreover, block shareholders are more prevalent in firms for which the government is not a shareholder.

Board size (BSIZE), on average is eight members, with a maximum of thirteen members and a minimum four members. The ratio of independent directors among the board members (INDEP) accounts for 50% on average. In only 10% of firms, the functions of the chairman and CEO are held by the same person (DUAL). The number of board of meetings (BMET), on average, is 5. The minimum number of meetings in a year is 1, while the maximum is 16. The major shareholders' concentration or blockholder

(NGOV), who hold at least 5% of the firm capital, own 50% of outstanding shares on average.

Table 8

Pooled results from estimation model (7) that include the board characteristics for the period from 2004 to 2015. The second column shows the coefficients and significance of board characteristics in a subsample of state-owned entities (SOEs). The third column shows the coefficients and significance of board characteristics in a subsample of the firms in which the state is not a shareholder (non-SOEs). The last column shows the coefficients and significance of board characteristics in the full sample with year-fixed effects.

Model(7) $DPS_{it}=\alpha_t+\beta_{1t}EPS_{it}+\beta_{2t}EPS_{it}*GOV_{it}+B_{3t}DPS_{it-1}+B_{4t}DPS_{it-1}*GOV_{it}+B_{5t}GOV_{it}+\Sigma\beta_{it}Board_{it}+B_6LEV_{it}+B_{7t}Ln(Asset)_{it}+\varepsilon_{it}$			
Variable	SOEs	Non-SOEs	Full Sample
Intercept	-0.3621	0.4642	-0.3200
	(-0.48)	(1.29)	-0.2600
Earnings Per Share (EPS)	0.2154	0.2221	0.2287
	(8.41)	(11.01)	(13.57)
Dividends Per Share lag (DPSlag)	0.6152	0.3670	0.3781
	(18.05)	(11.48)	(11.66)
DPSlag*GOV	--	--	-0.3604
	--	--	(5.14)
State Ownership Dummy (GOV)	--	--	-0.3604
	--	--	(-2.92)
Blockholders	-0.0971	0.0331	0.0321
	(-0.68)	(0.35)	(-2.92)
MGMT Share Ownership	0.9003	-0.0622	-0.0473
	(2.04)	(-0.48)	(-0.34)
Board Size	-0.0050	-0.0127	-0.0422
	(-0.11)	(-0.39)	(-1.61)
CEO Duality	-0.0257	0.1128	-0.0880
	(-0.11)	(-0.39)	(-0.75)
Indepen. Directors ratio	0.1280	-0.2332	-0.2441
	(0.33)	(-0.96)	(-1.10)
Executives Ratio	-0.2846	1.9517	1.3858
	(-0.29)	(4.30)	(3.39)
Board Annual Meetings	-0.0364	-0.0001	0.0052
	(-1.24)	(-0.00)	(0.27)
Financial Leverage (LEV)	-0.2048	-0.1093	-0.3706

		-0.3670	(-0.37)	(-1.30)
	Firm Size (Ln(Assets))	-0.0015	0.0018	-0.0217
		-0.9590	(0.04)	(-0.53)
	F stat	94.8	51.8	51.6200
	Adj R^2	0.7308	0.4686	0.6423
	N	381	635	1,016

T-stats are reported in the parenthesis. -- indicates that government ownership dummy variable and its interaction with other variables are excluded from the regression since it was used to create the subsamples of SOE and Non-SOE.

As we find before, the current earnings and previous dividends are significant factors in explaining dividends. In SOEs, we note that blockholders, board size, CEO-chairperson duality, annual board meetings, and executives who are also members of the board are insignificant. It seems that directors and top executives who share ownership increase dividends per share in the presence of government ownership. In non-SOEs, we note that blockholders, directors, and top executives sharing ownership, board size, CEO-chairperson duality, and annual board meetings are insignificant. More executives on non-SOEs' board of directors increase dividends per share.

We turn our discussion to the effect of board characteristics on corporate governance mechanism (i.e. dividends policy). The first board characteristics are tested through the fifth hypothesis that ownership concentration (major shareholders or block shareholders), which may positively increase dividends. As reported by Driffield et al. (2007), the ownership concentration has significant positive effects on firm value, because major shareholders are more motivated to monitor the firm, and the manager is more inclined to listen to their opinions. Ownership concentration may imply effective governance, and therefore major shareholders can reduce the free cash problem and help to improve company operations that would result in higher dividends. However, we find this to be a positive but insignificant relation within our sample.

The second board characteristic we are interested in is management ownership, for which a percentage of shares are held by directors and top executives in a firm. The higher management ownership indicates confidence of the board and senior managers of a company in its current and future performance. It also aligns the manager interest with that of shareholders and thus serves as another mechanism for reducing the agency costs, as noted by Jensen and Meckling (1976). Therefore, the sixth hypothesis expects that the management ownership increases the propensity to pay dividends. The management ownership is not significant in our sample.

The third board characteristic is the independence of the board. Board members are expected to enrich the board with their expertise. Independent directors may provide managers with sincerer advice, since they enjoy greater freedom than other board members. Lasfer Belden et al. (2005) find that independent directors tend to reduce the agency costs of the firm. We hypothesize that the presence of independent directors on the board improves corporate governance systems and hence reduces the free cash problem and increases the firm's ability to pay dividends. Our sample shows that independent directors, however, have insignificant relations with dividends.

The fourth board characteristic of interest is the CEO duality. The results of CEO duality in the extant literature are mixed. This characteristic hinders the CEO's ability to exercise independent self-evaluation, according to Rechner and Dalton (1989). Some researchers find that the separation of the two positions improves firm performance

(Fosberg and Nelson, 1999), while others draw different conclusions. The eighth hypothesis postulates that CEO duality increases the free cash flow problem and reduces dividends due to weak governance. CEO duality and dividends have an insignificant relationship in our sample.

The annual meetings are expected to increase the involvement of the board members in firm operations, which assists them to judge on different matters and better advise the manager. A higher frequency of a firm's annual board meetings allows more information to be revealed for board members and firm managers. More frequent meetings keep the board member informed and help to address potential problems in a timely manner. Those meetings also help managers to stay focused on strategic matters and push him/her to work harder to show progress at every meeting. The interactions between managers and board members in those meetings enhance the board's ability to evaluate the manager and design compensation packages that motivate the manager to exert higher efforts. Therefore, we hypothesize that the greater number of meetings will reduce the free cash problem and increase the dividends due to the improved firm operations and governance. However, we find this relation to be insignificant in our sample.

5.3 Social Norms and Payout Policy

In this section, we discuss the effect of social norms on dividends, specifically firm compliance to Islamic guidelines in obtaining debt and making investing decisions. Islamic principles prohibit three main acts. The first is usury (Riba), which is the collection or payment of interest. The second is forbidden gambling and the similar unnecessary financial risk that depends mainly on chance and luck. The third act is a prohibition of gharar, which is an exchange in which one or more parties stand to be deceived through ignorance of an essential element of the exchange. In the Saudi market, the overwhelming majority of investors are Muslims who invest and consider investing in firms that comply with Islamic guidelines of debt finance and investing. A firm that fails to comply with Islamic guidelines may have to pay more dividends compared to complaint firms with equivalent risk to compensate for perceived risks, including illiquidity.

Table 9

This table shows compliant firms according to five well-known rating organizations which issue reports on firm compliance with Islamic guidelines in financing and investing. It also shows the state ownership in those firms. Column 5 shows compliant firms if three of the reports confirm the firm's compliance to Islamic guidelines. The last column shows the firms that were deemed to be non-compliant with Islamic guidelines by all rating agencies.

Variable	AAOIFI	Inma	Alrajhi	Compliant	Non-Compliant
Compliant Firm	1,273	1,230	1,231	1,196	349
State Ownership	405	421	409	405	136

The Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) was established to maintain and promote Shariah standards for Islamic financial institutions. Alinma Investment, a Saudi closed joint stock company wholly owned by Alinma Bank, is the leading company in the provision of a full range of Shariah-compliant investment products and services. Alrajhi Capital is a leading financial services company that provides Shariah-compliant financial products and services. Source: http://www.argaam.com/ar/company/shariahcompanies

The social norm does not seem to matter. Firms compliant with Islamic guidelines do not decrease dividends to increase their cash holdings to make up for the limited access to debt market or because they are more liquid compared to non-compliant stocks. Moreover, firms that do not follow Islamic guidelines do not seem to have a different dividends policy to compensate for the perceived risk for the limited investor base that may entail stock illiquidity. However, we assert that the insignificance of the social norm dummy variable may have been driven by the availability of conventional and Islamic debt instruments to all firms. Even though the Saudi government provides zero-interest loans to all firms, the state's funds do not have a strong presence in the non-compliant firms (136 out of 405 firm-years).

Table 10

Pooled results from the estimation model (8) that estimate the effect of social norm on dividends per share for the period from 2004 to 2015. The second column shows the result of regressions, including the social norm dummy variable. The third column shows the result of a subsample of firms rated to meet the social norm (Islamic guidelines) by less than three rating agencies or none. All regressions are run with year-fixed effects.

Model(6) $DPS_{it}=\alpha_t+\beta_{1t}EPS_{it}+\beta_{2t}EPS_{it}*GOV_{it}+B_{3t}DPS_{it-1}+B_{4t}DPS_{it-1}*GOV_{it}+B_{5t}GOV_{it}+\Sigma\beta_{it}Board_{it}+B_6LEV_{it}+B_{7t}Ln(Asset)_{it}+\varepsilon_{it}$		
Variable	Compliant Firm	Non-Compliant Firm
Social Nom Dummy Variable	0.0417	---
	-0.03	---
Earnings Per Share (EPS)	0.2352	0.2221
	-14.35	-1.57
Dividends Per Share (DPS)	0.3615	0.4926
	-11.07	-3.32
DPS*GOV	0.2575	0.1612
	-6.3	-0.46
State Ownership Dummy (GOV)	-0.2809	-1.2854
	(-2.39)	(-1.13)
Non-SOE Blockholders	-0.0476	0.1263
	(-0.60)	-0.15
MGMT Share Ownership	0.1337	0.191
	-1.02	-0.16
Board Size	-0.0159	-0.2646
	(-0.62)	(-1.53)
CEO Duality	0.0594	-0.4252
	-0.53	(-1.53)
Indepen. Directors ratio	-0.2132	2.8483
	(-1.02)	-1.78

	Executives Ratio	1.0798	1.8688
		-2.66	-0.66
	Board Annual Meetings	-0.012	-0.137
		(-0.72)	(-0.58)
	Financial Leverage (LEV)	-0.2048	0.4909
		-0.367	-0.18
	Firm Size (Ln(Assets))	-0.0015	0.0633
		-0.959	-0.14
	Adj R^2	0.6512	0.3853
	F-stat	137.1	4.2
	N	949	67

T-stats are reported in parentheses. --- indicates that social norm dummy variable is excluded from the regression since it was used to create the subsample of non-compliant firms.

6. Robustness Check

As a robustness check, we use feasible generalized least squares (FGLS) and Linear regression with panel-corrected standard errors (PCSE) to model our data. Both models confirm our findings of the influence of state ownership on dividends policy. Assuming that the disturbances are not independent and identically distributed (i.i.d.), we fit the sample using feasible generalized least squares (FGLS). This specification facilitates estimation in the presence of AR(1) autocorrelation within panels and cross-sectional correlation and heteroskedasticity across panels. We also use Linear regression with panel-corrected standard errors where the disturbances are assumed to be either heteroskedastic across panels or heteroscedastic and contemporaneously correlated across panels. The disturbances may also be assumed to be autocorrelated within the panel, and the autocorrelation parameter may be constant across panels or different for each panel.

Table 11

Robustness Check: Feasible Generalized Least Squares (FGLS) and Linear Regression with panel-corrected standard errors (PCSE)

Model (7) $DPS_{it}=\alpha_t+\beta_{1t}EPS_{it}+\beta_{2t}EPS_{it}*GOV_{it}+B_{3t}DPS_{it-1}+B_{4t}DPS_{it-1}*GOV_{it}+B_{5t}GOV_{it}+B_6LEV_{it}+B_{7t}Ln(Asset)_{it}+\varepsilon_{it}$			
	Variable	FGLS	PCSE
	Intercept	0.4450	0.4554
		(0.022)	(0.000)
	EPS	0.2212	0.2312
		(0.000)	(0.000)
	EPS*GOV	0.0082	-0.0032
		(0.790)	(0.906)
	DPS	0.4201	0.4198
		(0.000)	(0.000)
	DPS*GOV	0.2098	0.2089
		(0.000)	(0.000)
	GOV	-0.3762	-0.3775

		(0.001)	(0.000)
	LEV	-0.2048	-0.2533
		(0.367)	(0.025)
	Ln(Assets)	-0.0015	-0.0005
		(0.959)	(0.953)
	Model λ^2	1784.97	4109.66
	R^2	----	0.6429
	N	1,025	936

P-values are reported in parentheses. ---- R^2 of Feasible Generalized Least Squares (FGLS) usually is not reported.

The two-robustness check models give similar results to what has been reported and discussed above. The GLS model gives similar results to those that have been reported before. Linear regression with panel-corrected standard errors (PCSE) requires common time periods to all panels to estimate the disturbance covariance matrix using case-wise inclusion. Therefore, we dropped some observations to have a balanced panel (89 observation), and the model gives similar results to what has been reported and discussed above.

7. Conclusion

This chapter examines how government ownership, board characteristics, and social norms affect payout policy. The board characteristics include board size, the frequency of meetings, the presence of independent directors, management share ownership, and major shareholder ownership. Using Saudi Arabian public firms' annual reports from 2004 to 2015, we specify seven hypotheses for the dividends ratio based on the relevant literature.

This chapter provides new evidence of payout policy and corporate governance in a developing country. It also helps investors and finance professionals to recognize important firm characteristics in a market where government ownership is common and information asymmetry prevails.

We separate the state from other major shareholders to measure the effect of state-ownership on dividends policy. We find that dividends smoothing is common among Saudi firms and is more pronounced in SOEs. The state ownership increases the target payout ratio from 0.44 to 0.58 of the current earnings. We use a logit model to estimate the likelihood of paying dividends. We find that the current earnings and state ownership increase the likelihood of dividends payment. Dividends payment is more likely if the firm has paid dividends in the past.

Among all board characteristics that are considered in this chapter, it seems that only two factors have a significant impact on the dividends decision: management share ownership and executive directors. For state-owned firms, dividends are expected to increase with the increase of top executives board members' shares ownership. This relation holds only with SOEs. Therefore, the government may consider adding stock options as compensation for its firms' board members and top executives. For non-SOEs, dividends are expected to increase with more executives on the board. This finding holds with the full sample. Hence, the findings support the stewardship theory that encourages having more executives on the board to ensure an efficient functioning of the board.

We study the effect of social norms on dividends policy. We use firms adhering to Islamic guidelines in investing and financing as a proxy for social norm. Our result shows the proxy of the social norm is insignificant. We attribute the result to the availability of conventional and Islamic-compliant debt instruments for firms within both the government and private sectors.

We use year- and industry-fixed effects in our regressions, and as a robustness check, we use feasible generalized least squares (FGLS) and Linear regression with panel-corrected standard errors (PCSE) to model our data. Both models confirm our findings about the influence of state ownership on dividends policy.

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8. APPENDIX B

Table B.1 Variables Definition & Measurement (i=firm, t=year)

Variable	Variable Description	Variable Definition
DPS	Dividends Per Share	Dividends $_{i,t}$ / Common Share Outstanding $_{i,t}$
EPS	Earnings Per Share	Net Income $_{i,t}$ / Common Share Outstanding $_{i,t}$
DPSlag	One year lag of Dividends Per Share	Dividends $_{i,t-1}$ / Common Share Outstanding $_{i,t-1}$
GOV	State Ownership	Dummy variable equals 1 if the government own some share of Firm $_{i,t}$ and zero otherwise
GEPS	Interaction term Gov*eps	The interaction term between State Ownership and Earnings Per Share.
GDPSlag	Interaction term Gov*dpslag	The interaction term between State Ownership and One year lag of Dividends Per Share.
NGOV	Block shareholders	Dummy variable equals 1 if some share of Firm $_{i,t}$ are owned by Major Shareholder include Institution and Individual Investors.
MOWND	Management Ownership	Dummy variable equals 1 if some share of Firm $_{i,t}$ are owned of shares owned by executives and board member
BSIZE	Board Size	Number of directors on the firm board $_{i,t}$
DUAL	Chairman-CEO duality	Dummy, 1 if yes and zero otherwise
INDEP	Independent Directors	Number of Independent Directors on Firm $_{i,t}$ Board of Directors
INDEPR	Independent Directors Ratio	# of Independent Directors $_{i,t}$ / board size $_{i,t}$
EXEC	Executive Directors	Number of Executive Directors on Firm $_{i,t}$ Board of Directors
EXECR	Executive Directors Ratio	# of Executive Directors $_{i,t}$ / board size $_{i,t}$
BMET	Board Meetings	# of Annual Board Meetings $_{i,t}$
SIZE	Firm Size	Log(total Assets $_{i,t}$)
ROA	Firm Performance	Net Income $_{i,t}$ / Total Assets $_{i,t}$
TANG	Tangible Assets	Fixed Assets $_{i,t}$ / Total Assets $_{i,t}$

GROW	Assets Growth	(total assets $_{i,t}$ – total assets $_{i,t-1}$) / total assets $_{i,t}$
LEV	Leverage	Total Liability $_{i,t}$ / Total Assets $_{i,t}$

Table B.2 Correlation Matrix of Variables

Panel A) Correlation of Dividends with Earnings, Previous Dividends, State Ownership, and Major Shareholders

	dps	eps	dpslag	gov	ngov
dps	1				
eps	0.6313	1			
dpslag	0.7356	0.5367	1		
gov	0.1856	0.2817	0.1571	1	
ngov	-0.1325	-0.0795	-0.1062	-0.1202	1

Panel B) Correlation of Dividends with Board Characteristics

	DPS	mownd	bsize	dual	indep1	indepr	excu1	excur	bmet
dps	1								
mownd	0.1267	1							
bsize	0.0025	0.0834	1						
dual	-0.0194	0.0853	0.0624	1					
indep1	-0.0539	-0.0381	0.3118	-0.0371	1				
indepr	-0.0788	-0.1012	-0.1951	-0.0835	0.852	1			
excu1	0.1238	0.0921	0.0844	0.2956	-0.1515	-0.212	1		
excur	0.1142	0.0636	-0.1677	0.2795	-0.2366	-0.185	0.9455	1	
bmet	-0.0186	0.0444	-0.0188	-0.0085	0.0039	0.01	-0.1167	-0.0806	1

Panel C) Correlation of Dividends with Control Variables (Debt-to-Assets Ratio, Firm Size, ROA, Tangible Assets)

	dps	dta	lna	roa	fix
dps	1				
dta	-0.1487	1			
lna	0.1288	0.542	1		
roa	0.4954	-0.2048	0.1148	1	
Tang	0.0112	0.1814	0.6177	-0.0462	1

Table B.3 Dividends Ratio Correlation Matrix of Variables Descriptive Statistic by year and Sate Ownership for Earnings and Dividends Per Share and Payout Ratio

	EPS: Earning Per Share			DPS: Dividends Per Share			POR: Payout Ratio		
year	0**	1*	Total	0**	1*	Total	0**	1*	Tot

2004	Mean	0.94	4.08	2.47	1.05	2.86	1.93	2.10	0.87	1.50
	Std Dev	1.53	3.25	2.96	1.32	2.59	2.22	6.80	1.17	4.95
	Obs	37	35	72	37	35	72	37	35	72
2005	Mean	1.78	4.95	3.30	1.63	2.23	1.92	12.75	0.56	6.89
	Std Dev	2.54	4.15	3.74	2.26	2.47	2.37	76.89	0.94	55.43
	Obs	40	37	77	40	37	77	40	37	77
2006	Mean	1.82	4.33	2.96	1.74	2.22	1.96	5.68	0.80	3.47
	Std Dev	3.10	2.96	3.27	1.85	2.43	2.13	29.27	1.62	21.69
	Obs	47	39	86	47	39	86	47	39	86
2007	Mean	1.55	3.92	2.45	1.56	2.46	1.90	1.87	2.68	2.18
	Std Dev	2.80	3.29	3.20	2.29	2.64	2.46	8.84	11.68	9.98
	Obs	68	42	110	68	42	110	68	42	110
2008	Mean	1.03	3.06	1.77	1.02	1.73	1.28	2.03	0.85	1.60
	Std Dev	2.69	3.38	3.10	1.07	2.31	1.66	11.70	1.55	9.37
	Obs	80	46	126	80	46	126	80	46	126
2009	Mean	0.87	2.43	1.40	1.03	1.65	1.24	0.60	0.76	0.66
	Std Dev	2.22	2.46	2.41	1.24	2.04	1.58	6.60	0.95	5.36
	Obs	88	46	134	88	46	134	88	46	134
2010	Mean	0.93	2.91	1.57	0.94	1.79	1.21	1.30	0.75	1.12
	Std Dev	2.26	2.80	2.61	1.17	2.08	1.57	4.32	1.10	3.61
	Obs	98	47	145	98	47	145	98	47	145
2011	Mean	0.93	3.39	1.71	0.88	1.91	1.21	4.16	1.14	3.20
	Std Dev	2.39	3.21	2.91	1.00	2.32	1.61	36.66	4.30	30.36
	Obs	101	47	148	101	47	148	101	47	148
2012	Mean	1.44	3.24	2.00	0.98	2.05	1.31	0.87	0.62	0.79
	Std Dev	2.19	2.86	2.55	1.15	2.19	1.62	3.22	0.70	2.69
	Obs	106	48	154	106	48	154	106	48	154
2013	Mean	0.91	3.14	1.59	0.99	2.06	1.32	0.87	0.71	0.82

	Std Dev	2.50	3.04	2.86	1.26	2.25	1.70	3.65	0.91	3.08
	Obs	110	49	159	110	49	159	110	49	159
2014	Mean	1.36	3.13	1.91	0.98	1.88	1.26	4.80	0.57	3.48
	Std Dev	2.29	2.63	2.53	1.47	1.72	1.60	45.84	0.50	38.0 5
	Obs	113	51	164	113	51	164	113	51	164
2015	Mean	1.22	2.84	1.72	0.76	1.74	1.06	0.37	0.54	0.42
	Std Dev	2.52	2.56	2.64	1.30	1.85	1.55	1.17	0.73	1.05
	Obs	115	51	166	115	51	166	115	51	166
Total	Mean	1.18	3.38	1.95	1.05	2.02	1.39	2.51	0.89	1.94
	Std Dev	2.44	3.09	2.88	1.43	2.23	1.81	25.91	3.63	21.0 3
	Obs	1003	538	1541	1003	538	1541	1003	538	1541

* 0 & 1 is government ownership dummy.

**0 means that the government does not own any stock in a company

Table B.4 Industry Classification

Saudi Stock Market Industry Classification	
Code	Industry
1	Banks & Financial Services
2	Petrochemical Industries
3	Cement
4	Retail
5	Energy & Utilities
6	Agriculture & Food Industries
7	Telecommunication & Information Technology
8	Multi-Investment
9	Industrial Investment
10	Building & Construction
11	Real Estate Development
12	Transport
13	Media and Publishing
14	Hotel & Tourism
15	Insurance

Table B.5 Descriptive Statistic by Industry and Sate Ownership for Earnings and Dividends Per Share and Payout Ratio

		EPS: Earning Per Share			DPS: Dividends Per Share			POR: Payout Ratio		
Industry		0**	1*	Total	0**	1*	Total	0**	1*	Total
0	Mean	2.3	4.2	3.9	0.7	1.6	1.5	0.5	0.4	0.4
	Std Dev	3.9	2.6	3.0	0.8	1.5	1.4	1.5	0.3	0.7
	Obs	25	104	129	25	104	129	25	104	129
1	Mean	0.1	2.9	2.3	0.8	2.3	1.9	6.4	2.0	3.0
	Std Dev	0.8	3.7	3.5	0.5	2.8	2.6	34.7	7.7	17.8
	Obs	33	112	145	33	112	145	33	112	145
2	Mean	0.8	5.1	4.2	1.1	3.9	3.4	1.5	0.9	1.0
	Std Dev	0.6	2.1	2.6	1.1	2.5	2.5	3.8	1.0	1.9
	Obs	24	96	120	24	96	120	24	96	120
3	Mean	3.1	4.8	3.3	2.0	1.9	2.0	1.4	0.5	1.3
	Std Dev	2.9	2.4	2.9	1.9	0.5	1.8	6.2	0.2	5.9
	Obs	98	11	109	98	11	109	98	11	109
4	Mean	.	1.0	1.0	.	0.6	0.6	.	0.6	0.6
	Std Dev	.	0.8	0.8	.	0.6	0.6	.	0.4	0.4
	Obs	0	24	24	0	24	24	0	24	24
5	Mean	1.6	1.7	1.6	1.1	0.9	1.1	4.7	0.5	3.8
	Std Dev	2.3	3.0	2.4	1.3	1.0	1.2	43.5	1.1	38.0
	Obs	130	40	170	130	40	170	130	40	170
6	Mean	-1.7	4.5	1.9	0.5	1.7	1.2	-0.4	0.3	0.0
	Std Dev	1.3	3.0	3.9	0.8	1.9	1.6	0.6	0.3	0.6
	Obs	17	23	40	17	23	40	17	23	40
7	Mean	0.7	.	0.7	1.3	.	1.3	7.9	.	7.9
	Std Dev	2.4	.	2.4	2.1	.	2.1	42.1	.	42.1
	Obs	79	0	79	79	0	79	79	0	79
8	Mean	2.1	1.9	2.1	1.3	0.8	1.3	1.3	0.3	1.1
	Std Dev	1.7	1.3	1.6	1.2	0.7	1.2	3.8	0.3	3.5
	Obs	112	20	132	112	20	132	112	20	132
9	Mean	1.8	3.8	2.3	1.4	1.4	1.4	4.8	0.4	3.7

	Std Dev	2.3	2.8	2.6	1.1	0.9	1.1	46.0	0.7	39.9
	Obs	112	37	149	112	37	149	112	37	149
10	Mean	1.1	1.0	1.1	1.1	1.0	1.1	1.2	0.6	1.1
	Std Dev	1.3	0.8	1.2	1.0	1.8	1.2	4.3	0.8	3.7
	Obs	59	19	78	59	19	78	59	19	78
11	Mean	2.3	1.5	1.9	2.6	1.0	1.7	1.3	1.1	1.2
	Std Dev	2.9	1.1	2.1	2.1	0.4	1.7	5.4	1.0	3.7
	Obs	21	25	46	21	25	46	21	25	46
12	Mean	0.8	.	0.8	1.4	.	1.4	-0.1	.	-0.1
	Std Dev	1.7	.	1.7	1.7	.	1.7	3.2	.	3.2
	Obs	31	0	31	31	0	31	31	0	31
13	Mean	2.2	1.8	2.0	1.4	1.2	1.4	4.1	0.8	2.8
	Std Dev	3.3	1.2	2.6	1.5	0.3	1.2	13.3	0.4	10.3
	Obs	18	12	30	18	12	30	18	12	30
14	Mean	-0.2	4.2	0.1	0.1	3.0	0.3	0.2	0.4	0.2
	Std Dev	1.9	6.1	2.5	0.4	3.4	1.1	2.0	0.5	1.9
	Obs	244	15	259	244	15	259	244	15	259
Total	Mean	1.2	3.4	2.0	1.1	2.0	1.4	2.5	0.9	1.9
	Std Dev	2.4	3.1	2.9	1.4	2.2	1.8	25.9	3.6	21.0
	Obs	1003	538	1541	1003	538	1541	1003	538	1541

* 0 & 1 is government ownership dummy.

**0 means that the government does not own any stock in a company

Vita

This author completed his undergraduate studies at King Fahd University of Petroleum & Minerals (KFUPM) where graduated with B.S. in Management Information Systems. He also received MBA from the same institute. After working in Oil and Petrochemical sectors for a few years, he began his studies at the University of New Orleans where he received his M.S. in Financial Economics and became a teaching assistant at the University. While working on this dissertation, the author also taught classes at Tulane University. He was an assistant professor of finance at the University of Louisiana at Monroe in 2016/17 Academic year. This dissertation is the last requirement for the Ph.D. program.