Islamic calendar anomalies: Evidence from Pakistani firm-level data

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A B S T R A C T

Most prior research has tested for monthly regularities based on the Gregorian calendar; by contrast, little attention has been given to other calendars based on different religions or cultures. This paper examines Islamic monthly anomalies in a stock market located within a Muslim country – Pakistan. The study employs data for 106 companies listed on the Karachi Stock Exchange (KSE) over the period from 1995 to 2011 and an asymmetric generalized autoregressive conditional heteroscedasticity model to examine whether the mean value and volatility of share returns in the KSE vary with Islamic months. The results from the model offer very little statistical evidence of a monthly seasonal anomaly in average returns, but there is evidence of monthly patterns in the volatility of returns for KSE equities. This finding suggests that investors can formulate an investment strategy and choose a trading time in order to outperform on a risk-adjusted basis.

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1. Introduction

Early findings of the Efficient Market Hypothesis (EMH) were supportive of the hypothesis, but more recent evidence has thrown up several irregularities known as market 'anomalies' which cast doubt on the theory's validity (Jensen, 1978). These anomalies can appear at different times of the day (Ariel, 1987; Harris, 1986), on different days of the week (Brooks & Kim, 1997; Jaffe & Westerfield, 1985) and in different months of the year (Gamble, 1993; Gultekin & Gultekin, 1983). Monthly calendar irregularities have been shown to be a persistent anomaly in capital markets throughout the world; the returns in some months (especially January) are consistently higher than in others. The substantive literature relating to calendar anomalies appears to have initially concentrated on the share returns of developed markets such as the UK and the US. However, a relatively small number of investigations have begun to study the existence of monthly calendar anomalies in the stock markets of Muslim countries such as Pakistan (Ali & Akbar, 2009; Rafique & Shah, 2012; Zafar, Urooj, & Farooq, 2010). Calendar anomalies may be explained by the tax system of a country (Dbouk, Jamali, & Kryzanowski, 2013; Dyl, 1977; Roll, 1983), the institutional structures within a market (Hepsen, 2012), the trading mechanisms that may be in place (Fama & Blume, 1966) or cultural factors (Bley & Saad, 2010; Chan, Khanthavit, & Hugh, 1996); hence differences would be expected in the monthly performance of equities from one country to another. Thus, an analysis for a country such as Pakistan may offer interesting insights because monthly anomalies may be different from those in developed nations. Exploring Islamic monthly calendar anomalies in the KSE are appropriate as Muslims account for over 97 percent of the population in Pakistan; the results may have important implications for our understanding of the dynamics of pricing efficiency in countries which follow Islamic laws and customs.

The Islamic calendar year is approximately 11 days shorter than its Gregorian counterpart; this means that while Islamic months (and Muslim holy days) fall on the same date in the Islamic calendar, they actually vary by a few days each year on the Gregorian calendar (Halari, 2014). With this variability in the dates of Islamic calendar months relative to their Gregorian counterparts, any seasonality

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uncovered in this paper is likely to be caused by factors other than those examined in the case of developed capital markets.

As with its Gregorian counterpart, the Islamic calendar has twelve months but only a total of either 354 or 355 days in a year. An Islamic calendar month consists of either 29 or 30 days (based on the lunar cycle) unlike some of the Gregorian calendar months that go up to 31 days. The beginnings and endings of an Islamic calendar month are determined by the sighting of the crescent moon – known as 'Hilal'[1] in Arabic. The 12 Islamic months are: Muharram, Safar, Rabiul Awwal, Rabiul Thani, Jamatul Awwal, Jamatul Thani, Rajab, Shaban, Ramadan, Shawwal, Zil Qa'ad and Zil Hajj.

From an investment perspective, different Islamic months may be important because of the emotions that they evoke in individual religious observers as well as in the Muslim community of the country as a whole. Major historical Islamic events that took place during specific months can explain the emotions of Muslims at various times of the year. For example, the 9th month of the Islamic calendar, the month of Ramadan, is dominated by positive emotions and a joyous mood as Muslims exercise their faith in anticipation of reaping the blessings of the month and the forgiveness of their past sins (Al-Ississ, 2010). Ramadan is associated with increased consumer spending, similar to the shopping period during the run-up to Christmas in Western countries. Generally, in Muslim countries, business activity in the month of Ramadan is different from that in other months. Furthermore, during the month of Ramadan, economic activity within Islamic countries such as Pakistan slows down as people devote more time to the performance of religious rituals. The financial markets reduce their trading hours while restaurants and shops are closed during the day. The trading times at the Karachi Stock Exchange (KSE) are reduced by more than an hour during Ramadan (Bialkowski, Etebari, & Wisniewski, 2012; Husain, 1998). Normally, trading hours are 9:30am–3:30pm from Monday to Thursday with a pre-open session of 15 min. There are two sessions on Friday with a prayer break in between. The first session runs from 9:15am to 12:00pm while the second session operates from 2:30am to 4:30pm. During Ramadan, trading hours of the KSE are 9:15am–2:00pm from Monday to Thursday and 09:15am–12:30pm on Friday with a pre-open session of 15 min.

Apart from Ramadan, important Islamic events also occur in the other 11 months too. For example, at the start of Shawwal, the month following Ramadan, Muslims celebrate the festival of Eid-ul-Fitr, which marks the end of fasting. The behaviour of the people returns to normal after Eid-ul-Fitr. In Zil-Hajj which is the last month of the Islamic year, a large number of Muslims perform the annual pilgrimage to Mecca, animals such as cows, goats, and camels are slaughtered in memory of the sacrifice performed by Prophet Abraham and consumption increases while savings fall (Mustafa, 2008). Such changes in consumer behaviour during the different Islamic months may affect the returns of KSE listed securities and explain any Islamic calendar anomalies that may be present.

Most Pakistani studies about calendar anomalies focus on the day-of-the-week effect (Hussain, Hamid, Akash, & Khan, 2011; Nishat & Mustafa, 2002; Ullah, Ullah, & Usman, 2010) while only a handful of studies look at monthly seasonality for the KSE.

Yet, monthly seasonality is arguably a more realistic strategy for investors to follow since the transaction costs of attempting to exploit the former are very high – especially in a country where the derivatives market is relatively underdeveloped (Arif, 2007). Most Pakistani studies that have investigated monthly calendar anomalies have focused on the Gregorian calendar and assumed the risk to be unchanged over time. Two exceptions to this generalization are the studies by Husain (1998) and Mustafa (2008) which examined share returns from the KSE for any anomalous behaviour around Islamic calendar months while modelling volatility in equity returns. However, Husain (1998) only examined equity prices for a limited time span, while Mustafa (2008) focused on index data and only investigated returns for six of the Islamic months.[2]

The current research extends the findings of earlier work by testing data for a large number of listed firms in an Islamic country and examining a long time period for the Islamic calendar effect on both stock returns and volatility using an asymmetric Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model; more specifically, a Threshold GARCH (TGARCH) model. The impact on the volatility of KSE share returns of the terrorist attack on the Twin Towers in New York on September 11, 2001 (9/11), which previous studies have overlooked, is also investigated. To the best of our knowledge, this paper is one of the first to examine calendar effects on share returns and volatility across all 12 Islamic months for the KSE using an asymmetric GARCH approach. Ultimately, the current study adds to our knowledge about financial markets in non-developed countries with sizeable Muslim populations.

The remainder of this paper is organised as follows. Background information about the KSE is discussed in Section 2 while Section 3 provides a review of the relevant literature. Section 4 describes the data and reports on the descriptive statistics. The methodology is outlined in Section 5 while the results are presented in Section 6. Finally, Section 7 concludes.

2. An overview of the Karachi stock exchange

The KSE is the main stock exchange of Pakistan; it is the largest and the most active stock exchange in the country with over 560 Pakistani as well as overseas companies listed; its capitalisation amounts to 40 percent of the national GDP with a value of Rs. 5336 billion at the end of 2013.[3] It is the most active and liquid exchange in Pakistan with over 92 percent of the country's market capitalisation belonging to firms listed in the KSE. Therefore, the KSE was chosen as the primary source of data.

The KSE has grown in size and importance since its establishment on September 18, 1947. This growth was especially pronounced for share trading in the 1990s as barriers to foreign investments were removed and measures to deregulate the economy were adopted (Mirza, 1993). The increase in trading has been associated with a rise in volatility which grew throughout the 1990s (Ahmed & Rosser, 1995; Farid & Ashraf, 1995; Iqbal, 2012). Indeed, Farid and Ashraf (1995) documented that during the first half of

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[1] The word means crescent-moon in Arabic. Muslims look for the 'hilal' when determining the beginning and end of Islamic months. After the 29th sunset of the current month, the crescent of the next month is observed. Since this new moon (crescent) sets a while after the sunset, it requires careful observation. If the sky is somehow blocked by dust, smog or cloud, observation may be hard or even impossible. If the crescent cannot be observed, the current month is counted as 30 days. In such a situation, there is no need to observe the crescent the next day. The second month would be due that day by sunset since no lunar month lasts longer than 30 days. The exact day of the beginning of each Islamic month is not generally known until the night before, when the moon is actually sighted and confirmed.

[2] The Islamic months studied were Muharram, Shaban, Ramadan, Shawwal, Zil Qa'ad and Zil Hajj.

[3] The data has been collected from the Economic Surveys produced by Pakistan's Ministry of Finance in 2014. These indicate that it is a small market with high turnover which is a common feature in emerging stock markets around the world. The reasons for the shallowness of the market and high levels of turnover in emerging markets are poor information, insider trading, liquidity, and market manipulation. In developed markets, the market capitalisation ratio to GDP is large and turnover is small. The Pakistani stock market stands in contrast to developed markets like the US in which the market capitalisation to GDP ratio is 92 percent and turnover is 65 percent (Mustafa & Nishat, 2007).