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Turn-of-the-month effect: New evidence from an emerging stock market

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ABSTRACT

This paper analyzes the turn-of-the-month (ToM) effect in Turkish equity returns. We show that the ToM effect is strongly significant in BIST100 index over 1988–2014, and distinct from other calendar anomalies. In particular, the mean daily index return is 0.46% in the three-day period that covers the last trading day of each month and the first two trading days of the next month, and 0.09% in the remaining days. The ToM effect is more significant following months with (a) significant information flow and (b) above average market performance, and the fraction of index returns generated within the ToM period increases secularly from 39% over 1988–1996 to 49% over 1997–2005 and to 86% over 2006–2014. A similar month-end seasonal does not exist in index trading volume or realized volatility, ruling out standard liquidity or risk-based explanations. Estimating an e-GARCH model with daily index returns, however, we link the ToM effect to a decline in expected volatility in the days leading to month-turns. These findings resonate best with a story where gradual resolution of uncertainty following high information risk periods releases a large pool of "liquid funds" accumulated during such periods into the equity market, creating an abundance of liquidity and pushing equity prices up.

1. Introduction

The turn-of-the-month (ToM) effect is a widely recognized empirical pattern characterized by high returns around the month-ends. This pattern is first documented by Ariel (1987) in an analysis of an advice, voiced by several popular equity market analysts (e.g. Merrill, 1966; Hirsch, 1986; and Fosback, 1976), that sales should be deferred to the latter half of the month and the purchases should be made prior to month-ends to expropriate unusually high returns accrued in the early days of the month. Lakonishok and Smidt (1988) show that the four-day period that begins with the last trading day of a month and ends with the third trading day of the subsequent month accounts for all positive return to the DJIA over 1897–1986. McConnel and Xu (2008) adopt the same methodology over an extended sample from 1897 to 2005 and confirm that the ToM pattern is alive and well over the more recent 1987–2005 period.

The ToM effect is also observed in international equity markets. Among others, Cadsby and Ratner (1992) study international index returns over 1962–1989 and show that the mean daily return in the ToM period is significantly higher than that in other days in 6 out of 10 indices examined. Similarly, Kunkel et al. (2003) analyze a large cross-section of international index returns over 1988–2000 and find that the ToM pattern exists in 15 out of 19 countries studied, with ToM period

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returns on average accounting for 87% of the monthly index returns. In addition to these multi-country studies, several papers provide detailed analyses of the ToM effect in various stock exchanges across the globe.[1] Our analysis falls into this latter category.

This paper provides a detailed investigation of the ToM pattern in the Turkish equity market. Studying daily BIST100 index[2] returns over 1988–2014, we document that the effect is highly significant with a mean daily return of 0.46% in the ToM period, and 0.09% in the rest of the month. In subperiod analysis, we show that the mean ToM return is 0.60% over 1988–1996, 0.56% over 1997–2005, 0.20% over 2006–2014, and strongly significant in each case. While the mean ToM return is lower in the latest subsample, the fraction of total returns accounted for by the ToM period displays a secular increase from 39% over 1988–1996 to 49% over 1997–2005 and to 86% over 2006–2014, suggesting a strengthening in the ToM effect. Conditioning on the month of the year, we demonstrate that the mean daily return in ToM days exceeds that in the remaining days in all months except September, and is particularly high in April (1.13%), January (1.03%), December (0.62%), and June (0.51%) over the full sample period. In subperiod analysis, we find that April is the only month in which the mean daily return in the ToM period is consistently higher than that in remaining days in all three subperiods. Last, we extract the conditional volatility of the index via an exponential GARCH model in the spirit of Nelson (1991) and uncover a link between the ToM period returns and the dynamics of expected volatility in the days leading to month-turns. In particular, we show that the change in expected volatility from the previous month-end to the current month-end explains a statistically and economically significant portion of the ToM period returns. These results favor a story where 'liquid funds' created by wage and interest/dividend income, which are deterred from equity assets during high information risk periods, are released back into equities once information uncertainty is resolved in the aftermath of such periods.

What should one make of the evidence on the ToM effect in Borsa Istanbul returns? First, the evidence that the effect manifests itself consistently in almost all months of the year and in different sub-periods is consistent with Ogden (1990), who argues that re-investment of liquid funds created by wages and interest and dividend income at the month-ends drives equity prices up. The finding that ToM returns are strongest in month-turns that mark the ends of the first and last quarters of the year is in line with both window-dressing by fund managers prior to reporting deadlines as in Haugen and Lakonishok (1987) and Ritter (1988) and with early voluntary disclosure of good news and suppression of bad news as in McNichols (1988). The novel finding that the conditional volatility of returns declines as the turn-of-the-month draws closer supports a risk-based explanation in which uncertainty regarding equity fundamentals is gradually resolved towards month-ends, pushing risk premiums down and equity prices up.

Our paper adds to a list of papers that study the ToM effect in the Turkish stock market (e.g. Bildik, 2004; and Oguzsoy and Guven, 2003).[3] Our analysis updates their results using a more recent sample period, conducts subperiod tests, provides a monthly decomposition of the ToM effect, and incorporates conditional volatility dynamics around month-turns as an alternative explanation to the turn-of-the-month pattern. To our knowledge, this latter finding is novel.

The rest of the paper is organized as follows. The next section summarizes the extant research on the ToM effect and lays out several possible explanations for the existence and persistence of this pervasive seasonal pattern. Section 3 describes our data and methodology. Section 4 presents and discusses our empirical findings. Section 5 concludes.

2. Literature review

Ariel (1987) is the first to document a seasonal pattern in equity returns at the turn of the month in his analysis of an advice voiced by several popular stock market analysts that their clients should make anticipated sales in the latter half of the month and anticipated purchases before the month-ends to expropriate unusually high returns observed in early days of the month. The author finds that the mean daily return in the ten-day period including the last trading day of the month and the first nine trading days of the subsequent month is high and positive, while the mean return in the remaining days of the month is negative. Ariel also documents that removing disclosure months exacerbates the effect rather than eliminating it.

Lakonishok and Smidt (1988) refer to the four-day period beginning with the last trading day of the month and ending with the third trading day of the next month as the turn-of-the-month (ToM) period and show that ToM period returns account for all positive return to the DJIA from 1897 to 1986: the mean daily return during the ToM period is 0.47% compared to 0.35% over the full sample. In later work, Hensel and Ziemba (1996) show that a portfolio strategy that invests in the S&P500 in the ToM period and in T-bills otherwise outperforms a buy-and-hold strategy on S&P500 by 0.6% per year in the period from 1928 to 1993. More recently, McConnel and Xu (2008) confirm the results in Lakonishok and Smidt (1988) that the ToM effect accounts for all positive return to the U.S. stocks for the extended 1897–2005 period, and show that the ToM effect in U.S. equity returns persists in the period from 1897 to 2005.

[1] Notable examples include Compton et al. (2013), Maher and Parikh (2013), Jacobsen and Zhang (2013), Depenchuk et al. (2010), Raj and Kumari (2006), Lucey and Whelan (2004), and Booth et al. (2001).

[2] BIST100 is a value-weighted index of the largest 100 stocks trading in Borsa Istanbul (BIST). The stocks that comprise the index account for over 85% of the total market capitalization of the Turkish equity market.

[3] Bildik (2004) confirms the existence of the ToM effect in BIST100 over the period from 1988 to 1999, in addition to a distinct mid-month effect that coincides with the payment day customs of governmental institutions in Turkey.Oguzsoy and Guven (2003) study BIST30 index components over the same period and document starkly higher returns in the ToM period and drastically lower in the days surrounding the ToM period.

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