Full Length Article

Seasonality in government bond returns and factor premia

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\textbf{A B S T R A C T}

The study investigated both the January effect and the “sell-in-May-and-go-away” anomaly in government bond returns. It also tested whether the two seasonal patterns impact the performance of fixed-income factor strategies related to volatility, credit risk, value, and momentum premia. Our examination of government bond markets in 25 countries for years 1992–2016 proved that both the bond returns and factor premia had remained unaffected by the January and “sell-in-May” effects. These seasonal patterns in government bond markets appear to be merely a statistical artifact.

1. Seasonality in government bond returns and factor premia

Recent years have brought numerous academic studies devoted to finding commonalities in cross-sectional return patterns across various asset classes. The value effect – the tendency of low-priced assets to outperform high-priced securities – which first originated from equity markets, have now been found in commodities, fixed income, and bonds (Asness et al., 2013). The low-volatility effect – the tendency of risky assets to underperform – has been proven in: equities, fixed income, and commodities (Frazzini and Pedersen, 2014), and another widely respected cross-sectional effect: momentum, – the tendency of assets successful in the past to continue to outperform in the future – has also been found across all major asset classes (Asness et al., 2013). Finally, in 2015 Koijen, Moskowitz, Pedersen, and Vrugt demonstrated that the carry strategy – assuming overweighting high-yielding assets over low-yielding assets – could be successfully implemented in equities, fixed-income, commodities and currencies. The fundamental question underpinning all these studies probes the integration of global financial markets and the implications for the increasing return co-movements.

In comparison to the common strategies based on value, momentum, carry, and low-risk, the seasonal patterns have been most comprehensively studied in equities whereas other asset classes have yet to be covered by such extensive research, with government bonds, in particular, appearing to have slipped the attention of the academic community. Thus, the primary goal of this study was to bridge this gap by conducting a comprehensive examination of seasonal patterns in international government bond returns.

Plain vanilla bond is one of the simplest assets to estimate its “correct” price, mainly because the buyer can be certain (or almost certain) the value and dates of receiving future cash flow from such instrument. One variable that is not known in the future is required rate of return (or yield to maturity – YTM), but this variable is determined by market participants themselves by constant
quotations of the prices. Those prices reflect expectations of future interest rates, the probability of bankruptcy, other risks related to the bond and all of the unknown factors (socio-economic and behavioral – possibly season of the year too) that can influence such interest rates. How those discount rates are settled in reality (Bhaskar, 1978) and how they are perceived in financial research ("empirical layer" – according to Bhaskar (1978)), is the matter of understanding the limits of modern finance – described e.g. in Lagoarde-Segot (2016). The tests of seasonal patterns present in bond returns in our opinion try to describe real behaviors of market participants.

We believe that undertaking the subject of this research will be valuable not only for the academic community but also for individual investors by raising the level of their awareness of certain phenomena (seasonal anomalies) observed, among other things, in this study. The problems described in Ardalan (2008), Burrell and Morgan (1979), and recently in Lagoarde-Segot (2016), bring an important question to be asked: what if current financial theories are not sufficient to analyze the reality. Economic theories frequently tend to describe how society should behave (according to the researchers). A theory can be objectively correct, but assumptions underlying it could not fit reality because the decision-makers analyzed by the theory do not have, e.g., necessary financial knowledge, or meet other obstacles precluding them from making rational decisions. In our research, we used simplifying assumptions. We assume that professional market participants are most of the time able to exploit anomalies (caused by not rational decisions) – especially in the case of the bonds as relatively easy to price financial instruments. Therefore our research does not involve considerations about arbitrage mechanisms nor motives of market participants other than return maximization (economic base describing decision-makers), that is one of the basic assumption of finance and in more metaphysical context, part of investor’s nature. Of course, investors can be driven by other motives related e.g. to ethical choices, but in our opinion in research of government bonds, the return (simply defined) is the main criterion in decision-making process.

We focused on two well-documented seasonal anomalies: the January effect and the “sell-in-May-and-go-away” pattern. The January effect is the tendency of stock market companies to display particularly high returns in January. The evidence thereof dates back to the studies of Wachtel (1942), Rozeff and Kinney (1976), and has been reconﬁrmed in more recent and long-term samples (Haug and Hirschey, 2006). The “sell-in-May-and-go-away-effect” (in short: “sell-in-May,” also referred to as the Halloween indicator) is reﬂected in the outperformance of stocks within the period from November to April comparing to the remainder of the year. The phenomenon, originally identiﬁed by Bouman and Jacobsen (2002) across 36 equity markets, has been since conﬁrmed in broader and longer samples by Castro and Schabek (2014) or Jacobsen and Zhang (2014). Here we extended the research on these seasonal anomalies to include international government bonds.

The theoretical motivation of this study stems from the ‘parking-the-proceeds’ explanation of the January effect offered by Ritter (1988), according to which the returns in January can be driven by the inﬂow of money from the bond markets where the capital was temporarily “parked.” Thus, the abnormal positive returns in January should coincide with the capital outﬂow from the bond markets, effectively implying abnormal negative returns on government bonds in January.2 In this study, we extended this explanation to include the ‘sell-in-May’ anomaly, checking whether the positive abnormal equity returns within the period November-April coincide with abnormal negative returns in government bonds.3 While the January and “sell-in-May” effects may impact the government bond returns, they may not exert a similar influence on all market segments. For example, Clayton et al. (1989) suggested that the magnitude of the January effect might depend on the bond maturity. Thus, if the January effect impacts only some segments of ﬁxed-income securities, it might potentially inﬂuence the cross-sectional patterns in bond returns. In consequence, we were also interested whether both the January and “sell-in-May” anomalies be reﬂected not only in raw returns but also in government bond factor premia. In equities, the January effect has been investigated in relation to the size effect (e.g., Horowitz et al., 2000), value effect (e.g., Davis, 1994; Loughran, 1997), and momentum (e.g., Jegadeesh and Titman, 2001; Yao, 2012; Zaremba, 2015). Here, we considered four grant government bond return factors: volatility, credit risk, value, and momentum and tested their performance in the January and “sell-in-May” patterns in the time series of returns.

This study aims to contribute by providing new insights into asset pricing of international government bonds. To the best of our knowledge, it is the first paper to examine the January effect comprehensively in broad international government bond markets. Also, no study to date has investigated the “sell-in-May” effect in government bonds or researched the seasonal patterns in government bond factor premia. The results bear implications for both academic and practical purposes. First, they allow to understand the behaviour of government bond returns, and could also be viewed as a test of informational efﬁciency in international bond markets regarding seasonal anomalies. Second, they verify the implications of the “parking-the-proceeds” hypothesis by Ritter (1988).

1 As Lagoarde-Segot (2016) underline that sets of believes is inherent part of science of finance.
2 Finance literature offers also alternative explanations justifying the presence of the January effect in financial markets. The proposed hypotheses include: the tax-loss selling hypothesis (Reinganum, 1983), window dressing hypothesis (Ritter and Chopra, 1989; Lakonishok et al., 1991), intergenerational transfers hypothesis (Gamble, 1993). Furthermore, Kohers and Kohli (1992), Kramer (1994), and Priestley (1997) link the January effect with a business cycle, and Ogden (1990) argues that it could be attributed to the increase in investor’s liquidity at the turn of the years.
3 Alternative explanations of the “sell-in-May” effect can be summarize as follows: summer holiday as the reason of the anomaly is supported by Hong and Yu, (2009) which find out that trading activity drops in summer months; also ﬁndings of Kaustia and Rantapuska (2016) are in favor of holiday’s hypothesis. Kamstra et al., 2003 postulated Seasonal Affective Disorder (SAD) as the main reason of Halloween anomaly, their research however was strongly criticized by Kelly and Meschke (2010), Keel and Khaled (2011), and Jacobsen and Marquering (2008). Jacobsen et al., 2005 analyzed Halloween effect with control of size, book to market or divided yield and conclude that it still exists. Similar findings are presented in the work of Brounen and Ben-Hamo (2009) where authors examined calendar effects anomalies in sample of international property shares. Gerfach (2007) suggested that returns from October to December are higher because of macroeconomic announcements. Lucey and Zhao (2008) postulated that January effect is the reason of sell-in-May anomaly. These results were questioned by Haggard and Witte (2010), because of short periods used in Lucey and Zhao (2008) tests. Doeswijk (2008) argued that size and value factor do not influence “sell in May” effect, but behavioral factor – initial returns from IPOs has – some explanatory power.
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