SELECTED READINGS

Focus on: Calendar effects

November 2010
INDEX

INTRODUCTION .............................................................................................................................................. 5

1 WORKING PAPERS AND ARTICLES ............................................................................................................. 7


1.6 Mokhtar Darmoul and Mokhtar Kouki, 2009. “Calendar effect and intraday volatility patterns of euro-dollar exchange rate: new evidence of Europe lunch period”, HAL, Université Paris1 Panthéon-Sorbonne, Document de Travail du Centre d’Economie de la Sorbonne - 2009.70. ................................................................................................................................. 9

1.7 Maria Rosa Borges, 2009. “Calendar Effects in Stock Markets: Critique of Previous Methodologies and Recent Evidence in European Countries”, Department of Economics at the School of Economics and Management (ISEG), Technical University of Lisbon Working Papers No. 2009/37. .......................................................................................................................... 9

1.8 Eleftherios Giovanis, 2009. “Calendar Effects in Fifty-five Stock Market Indices”, Global Journal of Finance and Management, ISSN 0975 - 6477 Volume 1, Number 2 (2009), pp. 75-98. 10


INTRODUCTION

The main objective of any macroeconomic or financial modeling is ultimately to predict the direction and level of change in a given series. However, macroeconomic and financial series are quantitative measures of given behavior of underlying agents, (consumers, businesses, traders, etc.). Given that the behavior of economic agents is significantly affected by the calendar, it is obvious that the calendar can have effects on economic and financial time series. The most common and most widely studied of calendar effects is seasonality in time-series, which has been a widely researched and studied subject. “Calendar effects” that are the subject of these selected readings are second-order effects that are left in the data, once the seasonal adjustment has been carried out.

In modeling economic and financial time series, the first order of business is to identify the truly stochastic part of the series, that is the part that cannot be predicted by a trend, seasonality, or another regular occurrence. Certain variations in the series occur regularly, and as such can be modeled before submitting the series to a deeper analysis of the irregular components. The chief example is seasonal component of a time-series. Retail sales will rise toward the end of the year, and fall in the beginning of the next, as the Christmas tradition of gift-giving stimulates retail sales in December, and moderates them in January (when consumers are “recovering” from Christmas). Such behavior is clearly tied to the calendar, and as such can be modeled by including regressors that allow for adjustment of series for such seasonal variation. This is the crux of seasonal adjustment, which has been extensively studied in the past, and remains a lively topic of research today.

However, once the data is seasonally adjusted, there still remain effects tied to the calendar, such working-day effects, holiday effects (such as Halloween and Easter effect), etc. Obviously, in addition to the seasons of the year, agents’ behavior is affected by other calendar considerations. There is generally, and almost universally, lowered economic activity on the weekends. Hence any monthly time series will be influenced by the number of weekends that fall in a given month. Easter is another interesting effect for countries that celebrate it, as the date of Easter is not fixed, hence it is not as straight-forward to model as some other holidays. There are other
well-known and documented calendar effects that are presented and studied in the papers below. These effects are a subject of interest to both economic and finance researchers, and have been studied at some length. Also, both of the pre-eminent seasonal adjustment software packages TRAMO-SEATS and X-12 ARIMA have built-in capacity to adjust for different calendar effects.

What follows is a non-exhaustive collection of scholarly articles that describe calendar effects, gauge their magnitude, and provide solutions for dealing with them in time series analysis.

Contact point: GianLuigi Mazzi, "Responsible for Euro-indicators and statistical methodology", Estat - D5 "Key Indicators for European Policies" gianluigi.mazzi@ec.europa.eu.
1 WORKING PAPERS AND ARTICLES


This paper analyses the calendar effects present in Automated Teller Machines (ATM) withdrawals of residents, using daily data for Portugal for the period from January 1st 2001 to December 31st 2008. The results presented may allow for a better understanding of consumer habits and for adjusting the original series for calendar effects. Considering the Quarterly National Accounts’ procedure of adjusting data for seasonality and working days effects, this correction is important to ensure the use of the ATM series as an instrument to nowcast private consumption.

Full text available on-line at:


This paper provides an analysis of intraday volatility using 5-min returns for Euro-Dollar, Euro-Sterling and Euro-Yen exchange rates, and therefore a new market setting. This includes a comparison of the performance of the Fourier flexible form (FFF) intraday volatility filter with an alternative cubic spline approach in the modelling of high frequency exchange rate volatility. Analysis of various potential calendar effects and seasonal chronological changes reveals that although such effects cause deviations from the average intraday volatility pattern, these intraday timing effects are in many cases only marginally statistically significant and are insignificant in economic terms. Results for the cubic spline approach imply that significant macroeconomic announcement effects are larger and far more quickly absorbed into exchange rates than is suggested by the FFF model, and underscores the advantage of the cubic spline in permitting the periodicity in intraday volatility to be more closely
identified. Further analysis of macroeconomic announcement effects on volatility by country of origin (including the US, Eurozone, UK, Germany, France and Japan) reveals that the predominant reactions occur in response to US macroeconomic news, but that Eurozone, German and UK announcements also cause significant volatility reactions. Furthermore, Eurozone announcements are found to impact significantly upon volatility in the pre-announcement period.

*Full text available on-line at:*


This paper studies the interaction of the five most well-established calendar effects: the Halloween effect, January effect, turn-of-the-month effect, weekend effect and holiday effect. We find that Halloween and turn-of-the-month (TOM) are the strongest effects fully diminishing the other three effects to zero. The equity premium over the sample 1963-2008 is 7.2% if there is a Halloween or TOM effect, and -2.8% in all other cases. These findings are robust across different samples over time and stock markets.

*Full text available on-line at:*


In this paper, we propose to evaluate whether asymmetry influences the day-of-the-week effects on volatility. We also investigate empirically the impact of the day-of-the-week effect in major international stock markets using GARCH family models from a forecast framework. Indeed the existence of calendar effects might be interesting only if their incorporation in a model results in better volatility forecasts.

No abstract available.


Dans cet article, nous étudions le comportement ainsi que les caractéristiques systématiques de l'effet calendrier perdu dans la volatilité du taux de change intrajournalière de l'euro face au dollar à cinq minutes d'intervalle. Nous obtenons par le biais de cette analyse une différenciation de ces effets à travers deux types de filtres essentiels dans le traitement des rendements, tout en éliminant la forme de fourrier FFF qui condamne les structures de persistance des chocs à prendre une forme exponentielle. Ainsi, nous avons ressorti de nouvelles caractéristiques de la volatilité du taux de change euro-dollar, telle que l'heure de déjeuner en Europe.


This paper examines day of the week and month of the year effects in seventeen European stock market indexes in the period 1994-2007. We discuss the shortcomings of model specifications and tests used in previous work, and propose a simpler
specification, usable for detecting all types of calendar effects. Recognizing that returns are non-normally distributed, autocorrelated and that the residuals of linear regressions are variant over time, we use statically robust estimation methodologies, including bootstrapping and GARCH modeling. Although returns tend to be lower in the months of August and September, we do not find strong evidence of across-the-board calendar effects, as the most favorable evidence is only country-specific. Additionally, using rolling windows regressions, we find that the stronger country-specific calendar effects are not stable over the whole sample period, casting additional doubt on the economic significance of calendar effects. We conclude that our results are not immune to the critique that calendar effects may only be a “chimera” delivered by intensive data mining.

Full text available on-line at:


This paper examines the calendar anomalies/effects in 55 Stock market exchange indices of 51 countries around the world. The calendar effects which are examined are the turn-of-the-Month effect, the day-of-the-Week effect, the Month-of the-Year effect and the semi-Month effect. The methodology which is followed is the test hypothesis of two unequal data samples with bootstrapping simulated t-statistics. Simultaneously, with the same procedure a seasonality test is applied in order to investigate if more frequent seasonality on expected returns or in volatility is presented. The conclusion is that we reject all calendar effects in a global level, except from the turn-of-the-Month effect, which is present in 36 stock indices and that there is higher seasonality in volatility rather on expected returns, concerning the day of the week and the month of the year effects. The main purpose of the paper is to present a methodology appropriate for data mining which rejects the existence and persistence of main calendar anomalies as the Monday and January effects, while previous methodologies accept them. So this paper presents an alternative approach in the estimation of calendar anomalies and data mining, as well gives some guide notes for financial strategy.

We document a general pattern in the euro area overnight interbank rate (EONIA) and analyze how German banks compared to other EMU banks respond to these predictable changes in the price for reserve holdings. At the beginning of the maintenance period, when the EONIA is typically above average, we observe that German banks hold substantially less reserves than their daily average required reserves. Thus in contrast to other EMU banks, German banks back load the fulfillment of their reserve requirements over the reserve maintenance period and thereby benefit from the general pattern in the EONIA. Looking at the disaggregate data we find than this is particularly the case for the Landesbanks. We argue that the end of the calendar month effect in the EONIA may be driven by a temporary shortage of liquidity, relative to reserve requirements, at the beginning of the maintenance period (which coincides with the end of the calendar month).


The objective of this paper is to examine possible month of the year effect in an emerging market, in particular, the Stock Exchange of Mauritius (SEM). Monthly SEMDEX returns were computed from 1989 to 2006. The results show that returns on average are lowest in the month of March and highest in the month of June. However, equality mean-return tests show that returns are statistically the same across all months.
Also, the regression analysis reveals that returns are not dependent on the months of the year, except for January. Overall, the results seem to be more consistent with the prediction of the efficient market hypothesis.

*Full text available on-line at:*


The effectiveness of alternate models for estimating trading day and moving holiday effects in economic time series are examined. Several alternative approaches to modeling Easter holiday effects will be examined, including a method suggested by the Australian Bureau of Statistics that includes a linear effect. In addition, a more parsimonious technique for modeling trading day variation will be examined by applying the day-of-week constraints from the weekday/weekend trading day contrast regressor found in TRAMO and X-12-ARIMA to stock trading day.

*Full text available on-line at:*


The paper uses rolling sample tests to investigate time-varying calendar effects in the Chinese stock market, based on the GARCH (1, 1)-GED model. The Friday effect existed with low volatility at the early stage, but it seems to have disappeared since 1997. The positive Tuesday effect began to appear then. There is a small-firm January effect with high volatility. The turn-of-the-month effect has also disappeared in the Chinese stock market since 1997.

*Full text available on-line at:*

http://www.informaworld.com/smpp/content~content=a747992201~db=all
Several recently developed chaotic forecasting methods give better results than the random walk forecasts. However they do not take into account specific regularities of stock returns reported in empirical finance literature, such as the calendar effects. In this paper, we present a method for filtering the day-of-the-week and the holiday effect in a time series. Our main objective is twofold. On the one hand we study how the underlying dynamics of the Nasdaq Composite, and TSE 300 Composite returns series can be influenced by the presence of calendar effects. On the other hand we adapt our method to chaotic forecasting. Its computational advantages lead to significant improvements of forecasts.

Full text available on-line at:


A method is presented that takes into account the day-of-the-week and the turn-of-the-month effect and the holiday effect and embodies them to neural network forecasting. It adjusts the time series in order to make its dynamics less distorted. After a predicted value is calculated by the network, the inverse adjustment is made to obtain the final predicted value. If there are no calendar effects on the time series this method has approximately the same performance as its classic counterpart. Empirical results are presented, based on NASDAQ Composite, and TSE 300 Composite indices using daily returns form 1984 to 2003.

Full text available on-line at:

http://www.informaworld.com/smpp/content~content=a755210305~db=all

This study extends research on the day-of-the-week effect towards European real estate indices. We examine this anomaly for several European securitized real estate index returns between 1990 and 2003. Although the countries under analysis have unique country-specific patterns, we find that eight out of eleven European countries exhibit abnormally high Friday returns. Moreover, two different Europe indices also exhibit the Friday anomaly. The anomaly is robust with respect to extreme observations, alternative specifications and several well-known calendar effects.

Full text available on-line at:
http://www.springerlink.com/content/121637g007318h22/


This paper studies tests of calendar effects in equity returns. It is necessary to control for all possible calendar effects to avoid spurious results. The authors contribute to the calendar effects literature and its significance with a test for calendar-specific anomalies that conditions on the nuisance of possible calendar effects. Thus, their approach to test for calendar effects produces robust data-mining results. Unfortunately, attempts to control for a large number of possible calendar effects have the downside of diminishing the power of the test, making it more difficult to detect actual anomalies. The authors show that our test achieves good power properties because it exploits the correlation structure of (excess) returns specific to the calendar effect being studied. We implement the test with bootstrap methods and apply it to stock indices from Denmark, France, Germany, Hong Kong, Italy, Japan, Norway, Sweden, the United Kingdom, and the United States. Bootstrap p-values reveal that calendar effects are significant for returns in most of these equity markets, but end-of-the-year effects are predominant. It also appears that, beginning in the late 1980s, calendar effects have diminished except in small-cap stock indices.

The effects of a specific religious tradition on the food prices establish the central theme of this paper. In specific, I investigate whether the month Ramadan has any effect on food prices. I perform the analysis under two alternative calendar conventions, namely the Gregorian and Hijri calendars. Under both conventions, the paper reveals the effects of Ramadan, yet these effects are better captured when the latter is used. This highlights the importance of the calendar choice on econometric analysis, on the basis of a simple-yet-genuine socio-economic exercise. Possible benefits from this exercise in pedagogical terms as well as in inflation forecasting are also addressed.

Full text available on-line at:
http://mpra.ub.uni-muenchen.de/1141/1/MPRA_paper_1141.pdf


This paper uses a new data set from three Eastern European countries (Czech Republic, Slovakia and Slovenia) to investigate whether the so-called calendar effects are present in the newly developing financial markets in those countries. Five calendar effects are examined in both mean by OLS regression and variance by GARCH; the day of the week effect, the January effect, the half-month effect, the turn of the month effect and the holiday effect. In the empirical analysis, very weak evidence has been found for the calendar effects in the three countries, and these effects, where they exist, have different characteristics in the different stock markets.

Full text available on-line at:
http://www.informaworld.com/smpp/content~content=a714022613~db=all

No abstract available.

*Full text available on-line at:*


When evaluating the significance of calendar effects, such as those associated with Monday and January, it is necessary to control for all possible calendar effects to avoid spurious results. The downside of having to control for a large number of possible calendar effects is that it diminish the power and makes it harder to detect real anomalies.

This paper contributes to the discussion of calendar effects and their significance. We derive a test for calendar specific anomalies, which controls for the full space of possible calendar effects. This test achieves good power properties by exploiting a particular correlation structure, and its main advantage is that it is capable of producing data-mining robust significance.

We apply the test to stock indices from Denmark, France, Germany, Hong Kong, Italy, Japan, Norway, Sweden, UK, and USA. Our findings are that calendar effects are significant in most series, and it is primarily end-of-the-year effects that exhibit the largest anomalies. In recent years it seems that the calendar effects have diminished except in small cap stock indices.

*Full text available on-line at:*


This paper presents statistical investigations regarding the value of the trend concept and calendar effects for prediction of stock returns. The examined data covers 207 stocks on the Swedish stock market for the time period 1987-1996. The results show a very weak trend behavior. The massive better part of returns falls into a region, where it is very difficult to claim any correlation between past and future price trends. It is also shown that seasonal variables, such as the month of the year, affect the stock returns more than the average daily returns. This is consequential for all methods, where the seasonal variables are not taken into account in predicting daily stock returns.

Full text available on-line at:  


We address the problem of forecasting spatial activities on a daily basis that are subject to the types of multiple, complex calendar effects that arise in many applications. Our problem is motivated by applications where we generally need to produce thousands, and frequently tens of thousands, of models, as arises in the prediction of daily origin-destination freight flows. Exponential smoothing-based models are the simplest to implement, but standard methods can handle only simple seasonal patterns. We propose a class of exponential smoothing-based methods that handle multiple calendar effects. These methods are much easier to implement and apply than more sophisticated ARIMA-based methods. We show that our techniques
actually outperform ARIMA-based methods in terms of forecast error, indicating that our simplicity does not involve any loss in accuracy.

Full text available on-line at:

http://www.sciencedirect.com/science/article/B6V99-405SWHN-1/2/b01bb76a39e28699e06c07d3801a1485


Economics is primarily a non-experimental science. Typically, we cannot generate new data sets on which to test hypotheses independently of the data that may have led to a particular theory. The common practice of using the same data set to formulate and test hypotheses introduces data-snooping biases that, if not accounted for, invalidate the assumptions underlying classical statistical inference. A striking example of a data-driven discovery is the presence of calendar effects in stock returns. There appears to be very substantial evidence of systematic abnormal stock returns related to the day of the week, the week of the month, the month of the year, the turn of the month, holidays, and so forth. However, this evidence has largely been considered without accounting for the intensive search preceding it. In this paper we use 100 years of daily data and a new bootstrap procedure that allows us to explicitly measure the distortions in statistical inference induced by data-snooping. We find that although nominal P-values of individual calendar rules are extremely significant, once evaluated in the context of the full universe from which such rules were drawn, calendar effects no longer remain significant.

Full text available on-line at:

http://www.escholarship.org/uc/item/2z02z6d9


No abstract available.

No abstract available.

Full text available on-line at:


No abstract available.

Full text available on-line at:


The article tests a procedure for spotting and eliminating statistical outliers in economic time series which does not require previous information on the location of outliers and which estimates model parameters and outliers simultaneously. Results for three different time series suggest that this approach may be an alternative to intervention models. Furthermore, allowing for calendar and outlier effects significantly reduces the variance of model-based seasonal adjustment procedures and may prove clearly superior to conventional empirical-technical methods (Census X-11).

Full text available on-line at:
http://www.wifo.ac.at/wwa/jsp/index.jsp?fid=23923&id=1211&typeid=8&display_mode=2&pub_language=2&language=2

This paper provides a comprehensive study of weekly seasonal effects in GNMA, T-bond, T-note, and T-bill futures returns. Two distinct patterns are found in returns on GNMA, T-bond, and T-note contracts, while no seasonals are noted for T-bill futures. A negative Monday seasonal is found for GNMA and T-bond contracts. A positive Tuesday seasonal is found on GNMA, T-bond, and T-note contracts. Our evidence indicates that the significance of weekly seasonals depends in an important way on the time period studied. The negative Monday phenomenon occurs only in the data before 1982, while the positive Tuesday effect is present only after 1984. In addition, we find that both seasonal phenomena occur only during months prior to a delivery month. This effect appears to be related to the calendar month. More specifically, the Monday effect is apparently concentrated during February, while the Tuesday effect is concentrated during May.

Full text available on-line at:
http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=4472816


Adjusting for the changing number of working days is a prerequisite for any advanced statistical analysis of monthly production series. A series of industrial output has been constructed using auxiliary variables which adequately reflect the particularities of the Austrian calendar. It exhibits a regular component and a stable seasonal pattern. Its adjustment for seasonal variations and short-term extrapolation with time series techniques therefore poses no major difficulties.

Full text available on-line at:
http://www.wifo.ac.at/wwa/jsp/index.jsp?fid=23923&id=1019&typeid=8&display_mode=2&pub_language=2&language=2

Calendar effects are analysed in the class of structural time series models one of the two main model based approaches in time series decomposition. While Bell and Hillmer (1983) modeled calendar variation in the ARIMA model based approach, we represent structural models in the generalized regression form which allows to apply classical estimation and test procedures. It turns out that the expected high computational complexity $O(T^3)$ in the generalized regression model can be reduced to $O(T)$. As all parameters are estimated by maximizing the likelihood the Likelihood Ratio statistics can be used to test effects of the calendar composition.

Full text available on-line at:
http://www.springerlink.com/content/g7u4233q14j10254/


No abstract available.

Full text available on-line at:
http://www.springerlink.com/content/w36684q34074723g/


No abstract available.

Full text available on-line at:
http://www.jstor.org/pss/2288114


No abstract available.

No abstract available.

Full text available on-line at:

http://www.jstor.org/pss/2287705


No abstract available.

Full text available on-line at:


No abstract available.

Full text available on-line at:

http://www.jstor.org/pss/2287636


This paper reports work in progress. It systematically examines daily returns of the Thai Stock Market Index to determine whether there is evidence of calendar effects
due to the day of the week, the month of the year, days before or after holidays and within-month effects. Particular attention is given to the evidence of these ‘anomalies’ prior to, during and after the so-called Asian crisis. Daily data are used and runs from 3rd January 1995 to 29th December 2000 providing a total of 1473 observations. This total is subdivided into three periods; i.e. prior to (344 observations), during (570 observations) and after the crisis (559 observations). In each case the number of observations is sufficient to permit comparisons between the behaviour within the various periods. Most of the previous empirical evidence examines each effect in isolation. The approach adopted within this paper is to start with a general model which incorporates a range of different calendar effects before estimating the conditional volatility models. The intention is to test the final model by examining the forecast performance.

*Full text available on-line at:*

[http://www.ljmu.ac.uk/AFE/AFE_docs/cibef0302.pdf](http://www.ljmu.ac.uk/AFE/AFE_docs/cibef0302.pdf)