

THE FESTIVITY EFFECT

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The January effect: stock prices increase substantially in January.

The effect is particularly strong in the week starting with the last day of the previous month (this applies to all months: Ariel, 1987).

Various explanations have been given for January:

- end-of-year window dressing by fund managers and other market makers;
- tax-loss selling (end of the tax year, if in December);
- etc.

But is this really so?

1. What if January were actually a post-Christmas or post-New-Year effect?
Could it be due to fluctuations in investors liquidity around festivities?
2. Does this explanation predict/uncover effects around other festivities?
3. Can we be confident that January and other effects are not calendar related?
Test the theory on festivities that occur every year at a different date.

We consider:

1. Ramadan. It occurs about 11 days earlier every year.
2. Chinese New Year (CNY), alternatively known as Lunar New Year.
Its location varies, but will always be between January 21 and February 21.

We find:

1. Festivity effects exist, providing up to 4% excess returns *per week*.
2. They follow the patterns that our theoretical model predicts:
 - (a) negative before festivities (investors liquidate positions or can spare little to invest),
 - (b) positive after the festivities (re-investment takes place).
3. Positive autocorrelation of returns in the short run (“momentum”).

These anomalies could be arbitrated away, soon after they are pointed out. (You may call your broker now!) This all but happened to the January effect.

I. Two festivities

1. The Islamic year is based on a lunar calendar.
2. The Chinese year is based on a lunisolar calendar: sun and moon. Its *average* length is the same as the Western calendar, but CNY's location varies.

We focus on 9 markets: 4 in the Middle-East (Egypt, Jordan, Pakistan, Turkey) and 5 in the Far-East (Malaysia, Singapore, China, Hong Kong, Taiwan).

Malaysia and Singapore have large Chinese *and* Muslim populations, so we analyze the effects of both Ramadan and CNY there.

The trading platforms we consider have witnessed substantial growth during recent years and belong to the most important ones of the regions.

Other prominent ones (e.g. Saudi Arabia, Kuwait) were excluded because:

- no data are available on them in Datastream;
- none of the markets under consideration are from oil-rich countries where the concentration of wealth is very high.

	capitalization (billion \$)	value traded (billion \$)	turnover (%)	companies (#)
Cairo & Alexandria Stock Exchanges	38	5	14	795
Amman Stock Exchange	18	5	29	212
Karachi Stock Exchange	29	74	256	661
Istanbul Stock Exchange	98	147	149	297
Bursa Malaysia	182	62	34	959
Singapore Exchange	218	107	49	633
Shanghai Stock Exchange	314	323	103	837
Hong Kong Exchanges	861	439	51	1096
Taiwan Stock Exchange	441	719	163	702

Figures for 2004, and “turnover” is the ratio of value traded to market capitalization.

- ISE has the largest M-E capitalization and relatively high turnover.
- Egyptian market: the FT reported growth of 94% in \$-terms, making it “the best performing bourse in the world during the last two years”.
- KSE: high turnover and repeatedly ranked among the best performing exchanges in the world by Business Week and USA Today.
- HK: largest bourse in our group, and belongs to the 10 largest exchanges in the world, but has lower turnover than in Taiwan and Shanghai.

II. Empirical findings

We use widely-quoted indexes to measure the effects on broad market participation. This also circumvents problems of price limits for individual stocks.

	start sample	# obs.
Egypt: Hermes General	3/21/1997	431
Jordan: MSCI Jordan	1/1/1988	911
Pakistan: Karachi SE 100	6/23/1989	835
Turkey: ISE National 100	1/8/1988	910
Malaysia: KLCI Composite	6/14/1985	1044
Singapore: Straits Times (new)	6/14/1985	1044
China: Shanghai SE Composite	1/4/1991	754
Hong Kong: Hang Seng	6/14/1985	1044
Taiwan: SE 100	6/30/1995	520

Returns are regressed on their lags, as well as

$$\text{befRam}_j, \text{Ram}_j, \text{aftRam}_j, \quad \text{for } j = 1, 2, 3, 4 \quad (1)$$

and, where relevant,

$$\text{befCNY}_j, \text{CNY1}, \text{CNY2}, \text{aftCNY}_j, \quad \text{for } j = 1, 2, 3, 4. \quad (2)$$

We also have Jan_j for the j -th week of January (to check the January effect). We use dummies for strong outliers, e.g. due to Black Monday (1987) or the Asian crisis (1997–1998): Jordan 3, Malaysia 1, Singapore 2, China 2, HK 3.

Thus, the regression takes the form

$$r_t = \alpha_0 + \sum_{j=1}^p \rho_j r_{t-j} + \sum_{j=1}^d \alpha_j D_{j,t} + \varepsilon_t \quad (3)$$

where $D_{j,t}$ is the value of dummy j (e.g. “Ram1”) at time t . The Akaike and Schwarz information criteria indicate that $p \leq 4$ is optimal for our data set.

The long-run contribution of each dummy to expected returns is given by

$$\mu_k \equiv \frac{\alpha_k}{1 - \sum_{j=1}^p \rho_j}, \quad k = 0, 1, \dots, d, \quad (4)$$

where $\sum_{j=1}^p \rho_j < 1$ since the return series are stationary. For example, the table indicates that in Pakistan the average additional return from week 1 after Ramadan is

$$\frac{0.013}{1 - 0.20 - 0.062} \approx 0.018. \quad (5)$$

We report HAC t-ratios in parentheses. The hypotheses we are testing are 1-sided, and we remove insignificant coefficients when the p-value exceeds 10%. (We do not report the outliers’ dummies.)

r_t	Egypt	Jordan	Pakistan	Turkey
constant	0.0053 (2.09)	0.0016 (2.30)	—	0.0053 (2.06)
r_{t-1}	—	0.088 (2.57)	0.20 (4.59)	—
r_{t-2}	—	—	0.062 (1.80)	0.11 (2.57)
r_{t-3}	0.098 (1.80)	0.088 (2.08)	—	—
befRam3	—	-0.0069 (-1.85)	-0.012 (-1.72)	—
Ram2	—	—	—	0.037 (1.78)
aftRam1	0.020 (2.45)	0.0035 (2.20)	0.013 (2.18)	0.017 (1.86)
aftRam4	-0.013 (-1.68)	—	—	—
Jan1	—	0.012 (1.99)	0.028 (3.55)	0.042 (4.24)
Jan2	—	—	—	0.048 (2.50)
Jan3	0.028 (1.74)	—	—	—

We find:

1. positive autocorrelations (momentum) in returns within a month;
2. effect on returns is economically substantial relative to the weekly average;
3. all but one of the coefficients (Turkey's "Ram2") have the expected signs.

We investigate the evolving dynamics of this coefficient by RLS; see the Figure.

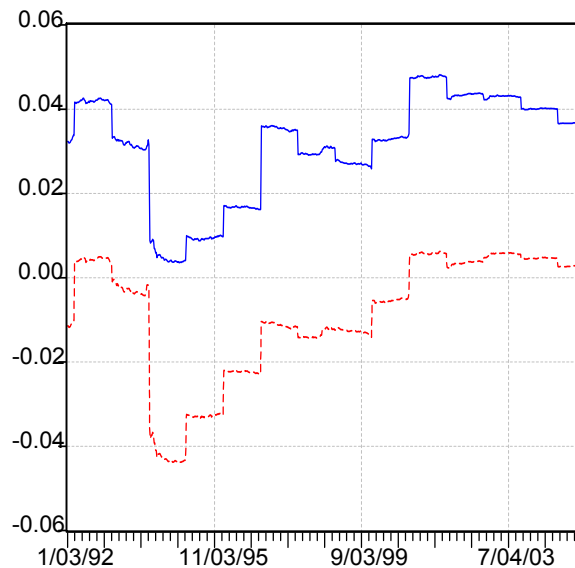


Figure 1: Recursive parameter estimates for Turkey's week 2 of Ramadan (solid line) and their 10% critical value or lower bound (dotted line).

It became significant at the turn of the century: market participants noticed the positive after-Ramadan effect and began taking advantage of it earlier.

The next figure confirms this: the positive coefficient for week 1 after Ramadan exhibits an overall downward trend to near the insignificance boundary.

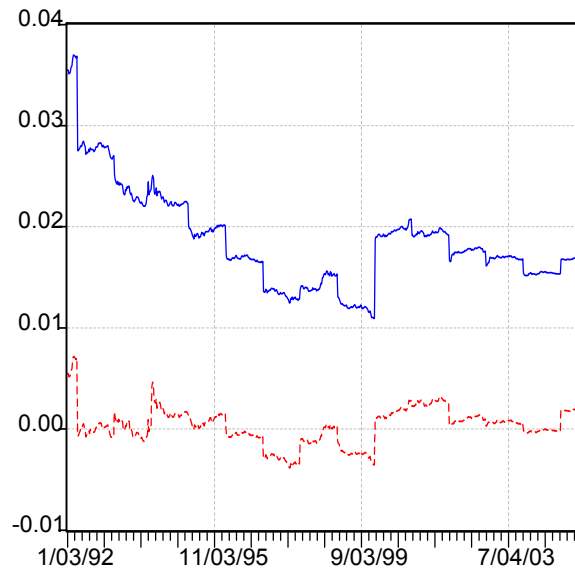


Figure 2: Recursive parameter estimates for Turkey's week 1 after Ramadan (solid line) and their 10% critical value or lower bound (dotted line).

Egypt provides two additional remarks:

1. The negative “aftRam4” is a correction to the large positive “aftRam1”.
2. The first two weeks of January have a positive impact on all the markets in the table, *except* Egypt where the effect happens later in week 3.

Result #2 is because of Orthodox Christmas that is celebrated on January 7, two weeks later than the Western Christmas of December 25.

The “January effect” has moved because Christmas happens later than in the West!

This is further evidence that January is actually an effect that follows Christmas and New Year festivities.

r_t	Malaysia	Singapore	China	Hong Kong	Taiwan
constant	—	—	—	0.0029 (2.73)	—
r_{t-1}	0.083 (1.81)	0.078 (1.88)	—	0.058 (1.99)	—
r_{t-2}	—	—	—	—	—
r_{t-3}	—	—	—	—	0.094 (1.66)
befRam4	—	0.011 (2.60)	—	—	—
befRam2	0.009 (1.75)	—	—	—	—
Ram3	—	0.020 (2.24)	—	—	—
Jan2	—	—	—	—	0.016 (1.77)
befCNY1	—	—	0.022 (1.89)	—	0.025 (2.62)
CNY1	0.011 (2.35)	0.007 (1.91)	—	0.012 (1.83)	—
aftCNY1	—	—	0.024 (1.99)	—	—
aftCNY2	—	—	—	—	0.022 (2.96)
aftCNY4	—	—	—	-0.021 (-2.80)	—

We find:

1. Positive autocorrelations (momentum) in returns within a month.
2. Malaysia: Ramadan effect is virtually nonexistent, but there is a CNY effect.
3. Singapore:
 - (a) Week 3 of Ramadan is significant, and RLS reveals it became so in 2001.
 - (b) An odd positive effect occurring as far as 4 weeks before Ramadan.
 - (c) CNY effect.
4. The rest:
 - (a) No negative pre-CNY effect, actually positive for China and Taiwan. RLS: these 2 became significant only in 2005 for China and 1999 for Taiwan.
 - (b) Positive effects during and after CNY. The last negative coefficient for HK occurs 4 weeks after CNY, a correction to the earlier positive effect.

When looking at the two tables jointly:

- CNY is quite short compared to Ramadan, so when the effect moves by a couple of weeks it ends up in pre-CNY!
- Ramadan effects are more pronounced than CNY, possibly because these Far-Eastern markets are, on the whole, more mature than the M-E ones.

There is a pattern of results that are being revealed:

1. Positive short-run autocorrelations;
2. Ramadan, CNY, January/NY, and Orthodox Christmas effects; all 4 of them festivities characterized by:
 - (a) positive returns after the festivities;
 - (b) often negative returns before festivities;
 - (c) but sometimes turning positive before festivities, as investors discover the pattern and take advantage of it earlier, particularly in developed markets.

Could it be that there is a single theory (preferably simple and realistic) to explain all this? Let us start by describing what the others have done...

III. Possible interpretations

III. A. Literature relating to festivities

The few studies that exist:

- are specific to one festivity or another;
- do not consider the weeks before and after the festivity.

Husain (1998) finds there's no change in returns *during* Ramadan for Pakistan. Similar result by Seyyed, Abraham, and Al-Hajji (2005) for Saudi Arabia.

Alper and Aruoba (2001) analyze various macroeconomic variables in Turkey, but their stock indexes do not exhibit any significant Ramadan periodicities.

Oğuzsoy and Güven (2004) consider the ISE in the couple of days before and after the feast of Eid al-Fitr, finding a big positive effect 2 days before.

Gao and Kling (2005) examine calendar effects in the Chinese stock market. They establish a strong year-end effect in Shanghai and Shenzhen up to 1991, after which it disappeared.

Related to festivities:

1. Holy days of religions. Frieder and Subrahmanyam (2004) analyze S&P500 and NYSE trading. Volume drops on the Jewish High Holy Days (Rosh Hashanah and Yom Kippur), with prices tending to increase during the 2 days that precede Rosh Hashanah and the Catholic St. Patrick's day.
2. The pre-holiday effect. Lakonishok and Smidt (1988), Ariel (1990), Cadsby and Ratner (1992) show that pre-holiday returns are higher than usual. However, the holiday effect is not about festivities:
 - (a) Festivities are more than just a holiday. They occur infrequently and are expensive (liquidity-constraint analysis to follow soon).
 - (b) When the pre-festivity effect is positive, RLS showed that it only became significant recently (learning or price-discovery by market participants).

III. B. Existing interpretations of related effects

Can the explanations put forward for the January effect be relevant here? January has been explained by:

1. Window dressing. Institutional trading gets rid of low-return stocks before the reporting date in December, then buys back those stocks in January to maintain the original portfolios. However,
 - (a) Odean (1998) shows that the opposite (profit-taking) is more prevalent;
 - (b) the Middle East Exchange Handbook and the World Federation of Exchanges state that institutional investment plays a much smaller role in the Middle East and Asia than in developed markets.
2. Tax-loss selling. However,
 - (a) The Far-Eastern countries under consideration impose no taxes on capital gains, so this tax-loss selling hypothesis cannot hold here.
 - (b) For the Middle-Eastern countries, this is not relevant to the Ramadan effect, since the tax year follows the Western calendar.

The role of moods and cultural factors on investments? Examples:

1. Saunders (1993), Hirshleifer and Shumway (2003), Kamstra, Kramer, and Levi (2002) find that returns increase with sunshine.
2. Frieder and Subrahmanyam (2004) show that returns are negative after Yom Kippur (solemn), but positive after Rosh Hashanah (joyful).
3. See Stulz and Williamson (2003) on cultural features and their effects on creditor's rights, and Nofsinger (2003) on social mood.

These are possible explanations for individual festivities but, for example, #1 cannot explain Ramadan which moves gradually from winter to summer over the years.

Also, the momentum effect is not covered by these theories (however, there are separate papers explaining it, to be mentioned below).

III. C. Liquidity constraints and the demand for assets

Let c_t and c_{t+1} denote consumption flows (in real terms) during periods t and $t + 1$. Point E is the endowment point, and the investor can:

- borrow to finance additional current c_t at a rate i_b ; or
- invest to finance future c_{t+1} at a risk-free rate i_f .

Assume that the investor is a price taker, so i_f and i_b are exogenously given. For individuals, typically $i_b > i_f$, a liquidity or borrowing constraint.

The difference between the two rates is a fact, even in the most developed financial markets; e.g. UK mortgage rates for individuals with a good credit rating are about 2% over the LIBOR rate of 4.5%, a substantial top-up.

The other extreme case of not being able to borrow is one whereby $i_b = \infty$, and the budget line to the right of point E is vertical in Figure 3.

In the traditional case of $i_b = i_f$, a slight change in preferences leads to a reallocation of consumption (starvation not allowed!).

This is not so here. In Figure 3, the individual can end up being at E for a range of different preferences.

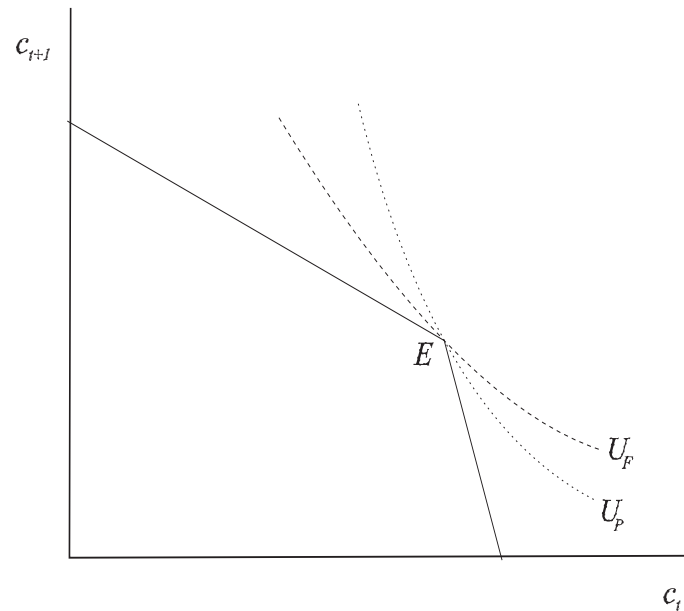


Figure 3: Alternative U_F and U_P , the former reflecting higher preference for future c_{t+1} over present c_t , at endowment point E , yet this difference has no effect on asset allocation: E remains optimal in both cases.

Intuitively, the spread between borrowing rates and the return on treasuries (or other risk-free equivalents) acts as a penalty on credit market activity.

We can also present this analysis in terms of i_b and i_f , highlighting further the likelihood of E being the equilibrium point.

When maximizing utility, three possibilities exist for the optimum point:

1. if the slope of U at that point lies in the interval $(-1 - i_b, -1 - i_f)$, then the solution point must be E ;
2. if the slope is exactly equal to $-1 - i_b$, then the solution will either be at E or along the portion of the budget line to the right of E ;
3. if the slope is exactly equal to $-1 - i_f$, then the solution will either be at E or along the portion of the budget line to the left of E .

Again, no corner solutions are allowed, so the slope cannot be outside the closed interval $[-1 - i_b, -1 - i_f]$. Its length is equal to the spread $i_b - i_f$.

There is another case where E remains the equilibrium point in spite of changes.

Suppose that preferences are fixed, but that i_f increases. Figure 4 shows that i_f needs to change beyond some threshold for asset allocations to start changing.

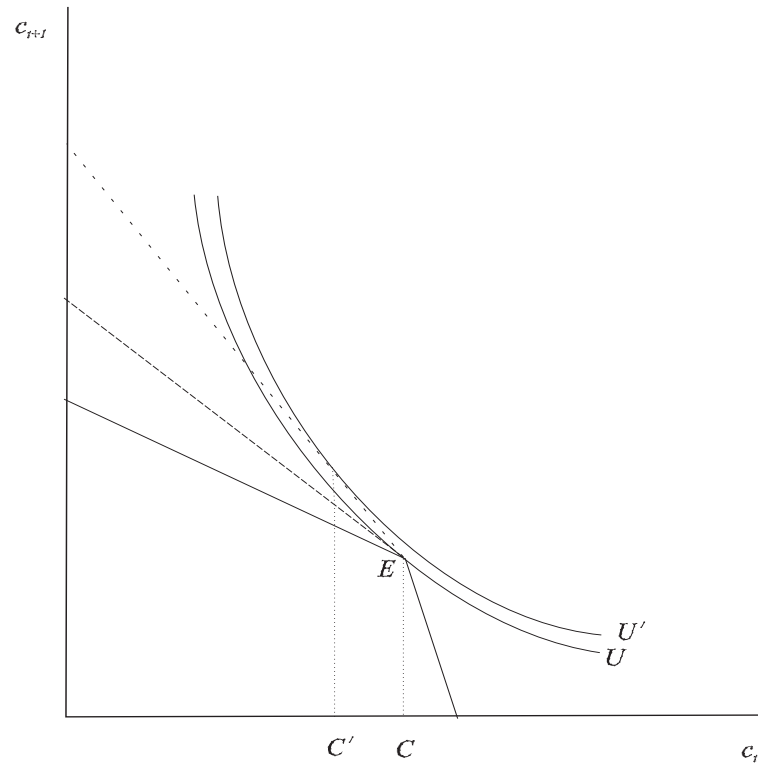


Figure 4: Changing returns and their effect on consumption and asset allocation, with E as the point of endowment and U, U' as two indifference curves.

The simple graphs have realistic implications. First, autocorrelations:

- Investors do not react to changes in market conditions until a certain level of i_f is reached (and similarly for i_b).
 - After this level, a slight increase in i_f will lead to increased investment, which may seem like an overreaction, given the earlier inaction.
 - If enough individuals act in this way, then aggregate demand will be affected. Market prices and returns (r_t) will be affected accordingly.

Market overreaction and autocorrelations of returns have been documented in De Bondt and Thaler (1985, 1987), Chopra, Lakonishok, and Ritter (1992), Daniel, Hirshleifer, and Subrahmanyam (1998).

- Figure 4 implies periods of persistent below-average reactions followed by periods of above average responses. This leads to positive autocorrelation in the short run, and negative in the medium run: let $\mu \equiv E(r_t)$ and

$$\rho_k \equiv E[(r_t - \mu)(r_{t-k} - \mu)]. \quad (6)$$

If a negative $(r_t - \mu)$ coincides, on average, with a negative $(r_{t-1} - \mu)$, then $\rho_1 > 0$. A similar reasoning applies to negative autocorrelation at long lags.

Second, regular event-related effects such as festivity or end-of-month effects:

- Let t be the period of festivity and pre-festivity lumped together, and $t + 1$ be the post-festivity period. Then,
 - the indifference map is steeper than usual, because current consumption becomes more valued than usual;
 - the equilibrium point moves to the right, and demand for financial assets is less than usual at t and more than usual at $t + 1$.
- If i_f and i_b differ substantially, the kink at E will be more pronounced and the adjustment will be less smooth. Therefore,
 - this festivity effect is more likely to occur in countries with financial markets that are less developed, in the sense of accessibility of credit markets, ease of margin trading, etc.
- Ariel (1987) finds that the week starting with the last day of the previous month provides large positive excess returns, especially in January.
 - The last day of the month coincides with the time of most salary payments!
 - Some of these will be invested in the markets, leading to price increases, particularly large for the week that follows Christmas and New Year.

- Food prices increase substantially before and during Ramadan, thus making the budget constraints of most individuals even more binding than usual.
- In terms of the graphs, the whole budget line shifts inwards towards the origin, since the axes are in terms of real (not nominal) consumption.
- As a result, there is even less investment in the stock market in period t .

Finally, although they will have different names in Islamic banking, the analysis in terms of i_b and i_f is still as above. The first is the markup over the cost of buying with your own funds, while the second is the profit-sharing scheme.

IV. Concluding comments

It may be that our empirical findings (autocorrelation, Ramadan effect, CNY effect, January/NY effect, and Orthodox Christmas effect) each have a different explanation.

However, it is a good indication when, within a simple framework, a theory is able to provide explanatory *and* predictive power for a variety of results.

The common framework explains two classes of liquidity-induced phenomena:

1. autocorrelation patterns in stock returns; and
2. regular event-related anomalies, especially around festivities but also around events where liquidity changes (e.g. end of month).

Our approach is not limited to the effects discussed in this paper: others may be interpreted or even uncovered by our method in the future.

Some of the current ones may disappear in the meantime, as investors learn about them!

Appendix

	% Muslims	% Chinese (Han)
Egypt	82	
Jordan	95	
Pakistan	97	
Turkey	99	
Malaysia	50	36
Singapore	17	76
China		94
Hong Kong		95
Taiwan		98

Sources: Encyclopædia Britannica (Macropædia whenever the % is stated explicitly there, Micropædia otherwise).