

*Stock price synchronicity in the Hotel industry: a comparison of
specialized REITs and Hotel companies*

by

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Stock price synchronicity and diversification issue in the hotel industry: a comparison of specialized REITs and Hotel companies

Abstract

Hotel industry is significantly heterogeneous and each brand and location may have a different performance on the basis of the tourism demand and the existing supply of similar destinations for the world demand. The current crisis and the restrictions applied to international travelling has highlighted the risk related to the lack of national and international demand for the industry and the impact on the profitability for the hotel investment strategy.

The paper focuses on the shareholders' point of view and evaluates the risk and synchronicity of an investment strategy in hotel listed companies and REITs specialized in the hotel industry. Results show synchronicity and crash risk exposure are different for the two types of shares but the differences are also driven by the size of the investment portfolio and the higher is the number of companies considered in the investment strategy the higher are the differences among the types of financial instruments on the risk profile point of view.

Keywords: Synchronicity, Hotel, REIT, Portfolio management

EFM codes: 780 – Real Estate, 370 - Portfolio Management and Asset Allocation, 380 - Portfolio Performance Evaluation

1. Introduction

Hotel industry is significantly heterogeneous and the behaviour of the stock prices is affected by the different risk perceived by each type of hotel or each location. As a matter of fact, hotels specialised on different customer's segment (i.e. casino vs commercial) are characterized by different business models but there is not unique consensus if it has a direct and economically significant effect on the yearly performance (Jang and Yu, 2002). Moreover, differences in the business strategy adopted by the hotel company (i.e. manager's features, type of location, brand, etc..) may have a significant effect on the performance achieved and its stability over time (Xiao et al., 2012). The existence of differences among hotel types and locations may justify the choice of the hotel companies' owners to diversify their investment strategy and empirical evidence demonstrates that a diversification strategy allows achieving a more stable performance in the stock market for the long term horizon (Lee and Jang, 2007).

During the last decade the REIT industry increased the attention given to the hotel sector as a new asset class that can be included in a diversified portfolio of real estate assets and/or can be used for constructing fully specialized real estate investment (Jackson, 2009). The main motivation related to the increase of interest is

the existence of significant differences in the performance of hotels with respect to other real estate classes: empirical evidence shows that hotels are characterized by a lower risk exposure and a faster capability to recovery in a downturn market scenario (Petersen et al., 2003). Specialized hotel REITs represent a fast growing market especially in the US market and preliminary evidences on their stock performance demonstrate an higher exposure to systemic risk with respect to other REITs (Kim, et al., 2002).

The paper aims to compare the stock price synchronicity for a set of REITs specialized in the Hotel sector with those of a set of Hotel companies listed in the stock market. The main expected output is to evaluate the existence of a difference in synchronicity in investing in the hotel industry by creating a portfolio of Hotel companies or by investing in a REIT focused on the sector. Results show the synchronicity and the crash risk for the hotel sector and lodging REITs are not comparable and also the explaining variables relevant for forecasting each risk exposure are not comparable among the two categories of shares.

The paper presents a detailed literature review on the hotel performance drivers and the main differences with respect to other real estate asset classes (section 2) and an empirical analysis on the comparison between stock price performance for REITs and hotel listed companies (section 3). The last section summarizes the results and the implication for investors in the stock market that wants to consider the opportunities related to the hotel market.

2. Literature review

The analysis of the performance of the Hotel sector focuses the attention on the role of macro-economic factors, shocks and tourism demand on the performance achieved by their shareholders.

Chen (2003) finds money supply and the unemployment rate are the main macro-economic drivers that affect the hotel stock returns. The main explanation is related to the financial constraints that affect the industry and the negative effect on the local demand related to an increase of unemployment in the area. The analysis of the impact of the overall trend of the economy (GDP) on the hotel performance shows that a linkage exists in the long term but it is not strong as for other sectors (Chen, 2010)

Chen (2003) evaluates also the impact of extraordinary events on the hotel performance like presidential elections, the 921 earthquake, the 2003 Iraq war, the outbreak of SARS, sports mega-events, the Asian financial crisis, and the 911 terrorist attacks. Empirical evidence shows that the sector performance is significantly affected by such type of events that causes a huge change in hotel stock returns for the days of the event and immediately after them (Chen, 2007a).

The main explanatory variable of the hotel sector performance is related to the tourism demand and an increase over time of the demand has a positive impact on the performance for hotel companies (Chen, 2007b). The type of customer (international vs local) matters in evaluating the reaction of the hotel performance to an increase or decrease of the number of arrivals: in an expanding stage of the economy the

hotel performance is driven by the local demand while the international arrivals matter the most during crisis phases.

First of all, the information asymmetry regarding the value of assets in a REIT means that public investors cannot distinguish the various qualities of REIT assets (Akerlof, 1970). Therefore, REIT shares generally sell at a discount price that reflects the estimate of the average quality investors. Working and Hotelling (1929) stress that real estate prices should be largely independent of changes in the reference market as REITs should also have little covariance with other assets.

There is evidence that bigger REITs have less synchronous stock prices because they do not need to report their asset quality. Damodaran and Liu (1993) find that self-reported asset valuations can have informational value, although, they do note that public disclosures of asset valuations may be overlooked by the market since such information generally is not highlighted in earnings reports.

However, short-sale constraints may cause large synchronous movements in REIT stock prices because when there is short-sale constraints only the private information of optimistic investors are capitalized into price because pessimistic investors who do not already own stock cannot trade (Diamond and Verrecchia, 1987). Using the institutional ownership as a control variable, empirical evidence shows that there is a negative correlation between company performance and institutional ownership (Black, 1998). In addition, Mei and Saunders (1997) consider that institutions tend to increase (decrease) their real estate investments at times when future performance is decreasing (increasing). As a general rule this behaviour is likely to cause a high (low) degree of synchronicity in REIT with high (low) institutional ownership. Chun et al (2008) find that there is a positive relationship between REIT stock price synchronicity and all institution excluding hedge funds and investment advisors.

REITs are attractive to investors, particularly institutional investors, due to their high dividend pay outs and ability to provide more liquidity to the underlying market for direct real estate investment.

Kahn and Winton (1998) show that monitoring and controlling the company is a function of the size of equity investments, so institutional investors will be the mostly motivated to monitor executives if they retain a certain share in a medium to long run.

Gaspar et al (2005) show that investor monitoring depends on shareholder investment horizon and the weak monitoring of short term shareholders enables managers to make undisciplined acquisitions at the cost of shareholders. Furthermore, Chen et al (2007b) find that independent long-term institutions with large holdings actively monitor firms' acquisition decision and do not capitalize their private information through short-term trade.

Several mechanisms could engender crash risk or, more generally, negative skewness in returns. For example, it is well known that trading among investors who have different opinions could reveal the private signals of others and move prices even in the absence of new fundamental information (Romer et al., 1993). In Hong and Stein (2003) this process, combined with short sale constraints, imports an asymmetry in which market

declines differentially reveal the private signals of relatively pessimistic investors. Such revelation could lead other investors to downgrade their assessments of a firm’s prospects, there by reinforcing the decline.

While the existence of negative asymmetries in market returns is generally not disputed, it is less clear what underlying economic mechanism these asymmetries reflect. Perhaps the most venerable theory is based on leverage effects (Black 1976) whereby a drop in prices raises operating and financial leverage, and hence the volatility of subsequent returns. However, French et al (1987), Campbell and Hentschel (1992) develop the theory based on a “volatility feedback”: when a large piece of good news arrives, this signals that market volatility has increased, so the direct positive effect of the good news is partially offset by an increase in the risk premium.

3. Empirical analysis

3.1 Sample

The sample is constructed using the Thomson Eikon database and considering all the hotel companies operating worldwide that are listed in a stock exchange and all REITs fully specialized in hotel or hospitality for the time period 2010-2019 (Table 1).

Table 1. Number of REITs and Hotel listed companies for year.

Year	Number Specialised REITs	Number Hotel listed companies	Country	Hotel	Reits
2010	404	24	Africa	4.73%	1.89%
2011	416	27		25	1
2012	428	31	America	7.94%	43.40%
2013	442	36		42	23
2014	459	37	Asia	65.60%	47.17%
2015	469	41		347	25
2016	479	45	Australia	1.70%	0.00%
2017	494	48		9	0
2018	508	50	Europe	20.04%	7.55%
2019	529	53		106	4

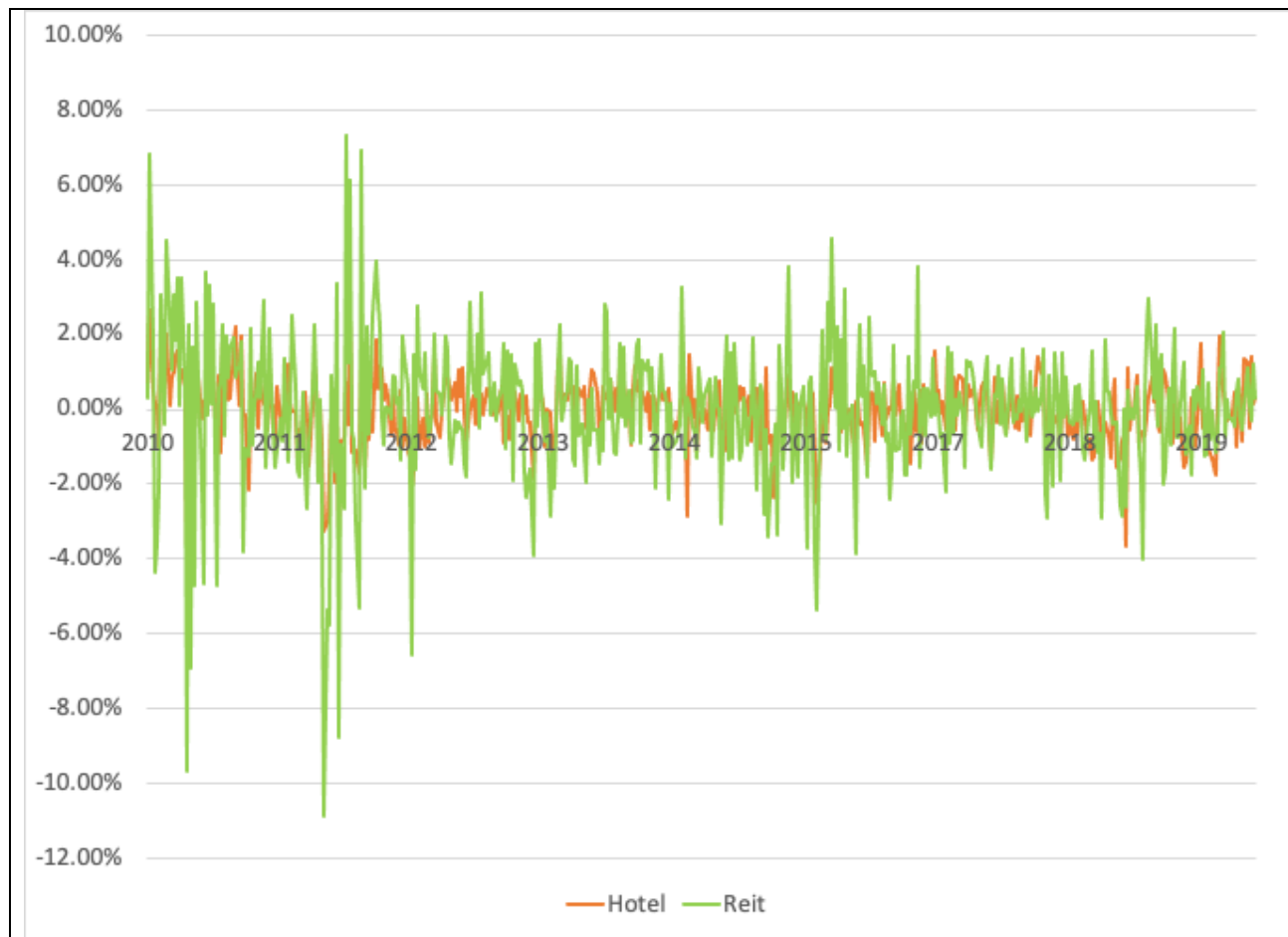
Source: Thomson Eikon data processed by the author.

The number of Hotels in the sample varies from 404 in 2010 up to 529 in 2019 while the sample of REITs, as expected, is significantly smaller and it varies from 24 (2010) up to 53 (2019). Looking at the geographical concentration of the sample hotels are prevalently based in Asia (65.60%) and in Europe (20.04%) while the most represented markets for the REIT industry are Asia (47.17%) and America (43.40%).

The database considers for each Hotel and REIT the weekly stock performance on the ten year time horizon and the market value of the company.

Table 1. A comparison of Hotel and Reit Performance

The table presents the weekly average return for the hotel and the REIT sample for the time period 2010-2019 and t-test unbalanced comparison between the two samples.



Year	Hotel listed companies	Specialized Reits	t-test
2010	0.49%	0.36%	0.13%
2011	-0.38%	-0.48%	0.10%
2012	-0.03%	0.33%	-0.37%*
2013	0.03%	-0.06%	0.09%
2014	0.14%	0.16%	-0.02%
2015	-0.15%	-0.33%	0.18%
2016	-0.20%	0.04%	-0.25%
2017	0.21%	0.14%	0.07%
2018	-0.36%	-0.41%	0.05%
2019	-0.09%	0.17%	-0.26%

Notes: * Statistically significant at 90% level, ** Statistically significant at 95% level, *** Statistically significant at 99% level

Source: Thomson Eikon data processed by the authors.

Hotel listed companies perform on average better with respect to specialized REITs but the difference is mainly driven by the higher volatility of the returns over time especially in the years 2000, 2011 and 2015. The comparison among returns of the two asset classes does not allow to identify a clear statistical difference

among the return achieved year-by-year and only in 2012 the differences are statistically significant at 90% level.

3.2 Methodology

As preliminary step for measuring the degree of synchronicity we follow the approach proposed by An and Zhan (2013) for identifying the expected return of each share (REIT and Hotel). The approach used is the following:

$$r_{i,k,w} = \alpha_i + \beta_i r_{m,w} + \gamma_i r_{k,w} + \varepsilon_{i,w} \quad (1)$$

where:

$r_{i,k,w}$ is the return of the firm i in industry k in week w

$r_{m,w}$ is the value weighted market return in week w

$r_{k,w}$ is the value weighted return of industry k in week w

The industry benchmark can be alternatively the hotel or the REIT sector and all the indices are constructed directly on the sample features by considering all existing firms (hotel companies or REITs) at the year t .

The main synchronicity proxy (An and Zhang, 2013) is based on the statistical fit of the linear model previous proposed and it measures the percentage of explanatory power of the forecasting model. In formula:

$$SYNCH_{i,t} = \ln\left(\frac{R_{i,t}^2}{1 - R_{i,t}^2}\right) \quad (2)$$

where $R_{i,t}^2$ is the statistical fit measure used for linear forecasting models and the ratio assumes values from 0 to 1. A higher value of SYNCH indicates that the stock price is more synchronized and less characterized by idiosyncratic risk.

An alternative proxy considered focuses the attention on the extreme events that are not predictable on the basis of the standard linear model and evaluate the sign of unexpected extreme events.

The first proxy of crash risk is the COUNT measure proposed by An, Wu and Wu (2015) that is constructed as:

$$COUNT_{i,t} = n^\circ Crashes_{i,t} - n^\circ Jumps_{i,t} \quad (3)$$

where $n^\circ Crashes_{i,t}$ is the number of crashes that are the weeks in which the return achieved is lower than the yearly average minus 3.09 standard deviations while the $n^\circ Jumps_{i,t}$ is the number of weeks with a performance higher than the average plus 3.09 standard deviations. Positive values of the proxy identify investment characterized by a higher risk of extraordinary losses with respect to extraordinary gains.

The second type of proxy for the crash risk considers the skewness of returns and it is constructed following the approach proposed by Kim et al (2011a, 2011b). In formula:

$$NCSKEW_{i,t} = -[n(n-1)^{\frac{3}{2}} \sum_{T=1}^n (W_{i,r,t} - \bar{W}_{i,t})^3] / [(n-1)(n-2) (\sum_{T=1}^n ((W_{i,r,t} - \bar{W}_{i,t})^2)^{3/2})] \quad (4)$$

where $W_{i,t}$ is the weekly return of the firm, $\bar{W}_{i,t}$ is the average firm weekly return and n is the number of observations. The measure computes the skewness of the real distribution with respect to the normal distribution and the skewness is expected to be negative.

The last type of crash risk measure is constructed coherently with Chen et al (2001) and compares the standard deviation of return in bull and bear market stages. In formula:

$$DUVOL = \ln \left(\frac{\sigma_{-weeks}}{\sigma_{+weeks}} \right) \quad (5)$$

where σ_{-weeks} is the standard deviation of returns for weeks with below the average performances and σ_{+weeks} is the standard deviation for weeks with above the average performances. Higher values of the index are associated to higher variability of returns in market bear-trends with respect to the variability registered during the bull-trends.

The four variables are used for testing the existence of significant differences in synchronicity and crash risk between the sample of Hotels and REITs using standard summary statistics and univariate tests.

The analysis will consider the opportunity to construct random diversified portfolios with different investment size (from 2 to 50 assets) and it will measure the stock price synchronicity proxies for hotel and REIT portfolios. The portfolio analysis will allow to test if results obtained on the synchronicity proxies matters only for one asset investment strategy or if they holds also under the hypothesis of a diversification strategy.

3.3 Results

Hotels and REITs show interesting differences in the return dynamics in the time period considered that may matter for an investment strategy (Table 1)

The difference in the performance trend shows a different risk exposure for investors that select to invest in Hotel companies with respect to REITs specialised in the hospitality sector and an analysis of the synchronicity proxies will help in understanding difference in the type of risk assumed (Table 2).

The comparison of the performance of single investment strategies with the market trend show a positive value of synchronicity for both Hotels and REITs but values in the two subsample are not comparable because in each year REITs reach an average value higher than 0.50 with respect to hotels. Values of the synchronicity proxy are less heterogenous for Hotels (max standard deviation 0.30) with respect to REITs (max standard deviation 0.99) and values are more stable over time in the case of the Hotels with respect to REITs.

The analysis of the number of crashes and jumps show significant difference between REITs and Hotels with the former more characterized by jumps and the latter more affected by crashes in the time period considered. Excluding 2011 and 2015, the choice of investing in REITs allows reducing significantly the exposure to crash risk and the gap identified is frequently statistical significant.

The analysis of the skewness shows that on average Hotels are characterized by a small positive skewness while REITs suffer from a more significant negative one and the difference is significant for the years considered excluding 2015 and 2019. Investors may expect more below the average values if they invest in REITs and they can achieve more frequently above the average results if they invest in hotels.

The comparison of volatility in bull and bear market stages show that independently with respect to type of investment released year by year the volatility in the bear market is higher than the bull market. Excluding 2015 and 2019, REITs have a higher gap between the volatility in the bear and bull market phases with respect to hotel.

The overall analysis of the single portfolio investment shows that REITs behave more coherently with the market trend but they expose the investor frequently to below the average returns characterized by a higher volatility. Hotels' investors may achieve lower returns but the investment could be safer even if each hotel may have a return more driven by idiosyncratic features with respect to systemic ones.

The analysis of the portfolios with multiple assets allow to identify some interesting differences in the risk proxies when the size of the portfolio increases (Table 3).

Table 2. Summary statistics for stock price synchronicity proxies for solo-portfolios in the hotel and in the REIT industry

The table present the yearly average value and the standard deviation (in brackets) for each synchronicity proxy for the hotel and the REIT sample for the time period 2010-2019 and t-test unbalanced comparison between the two samples.

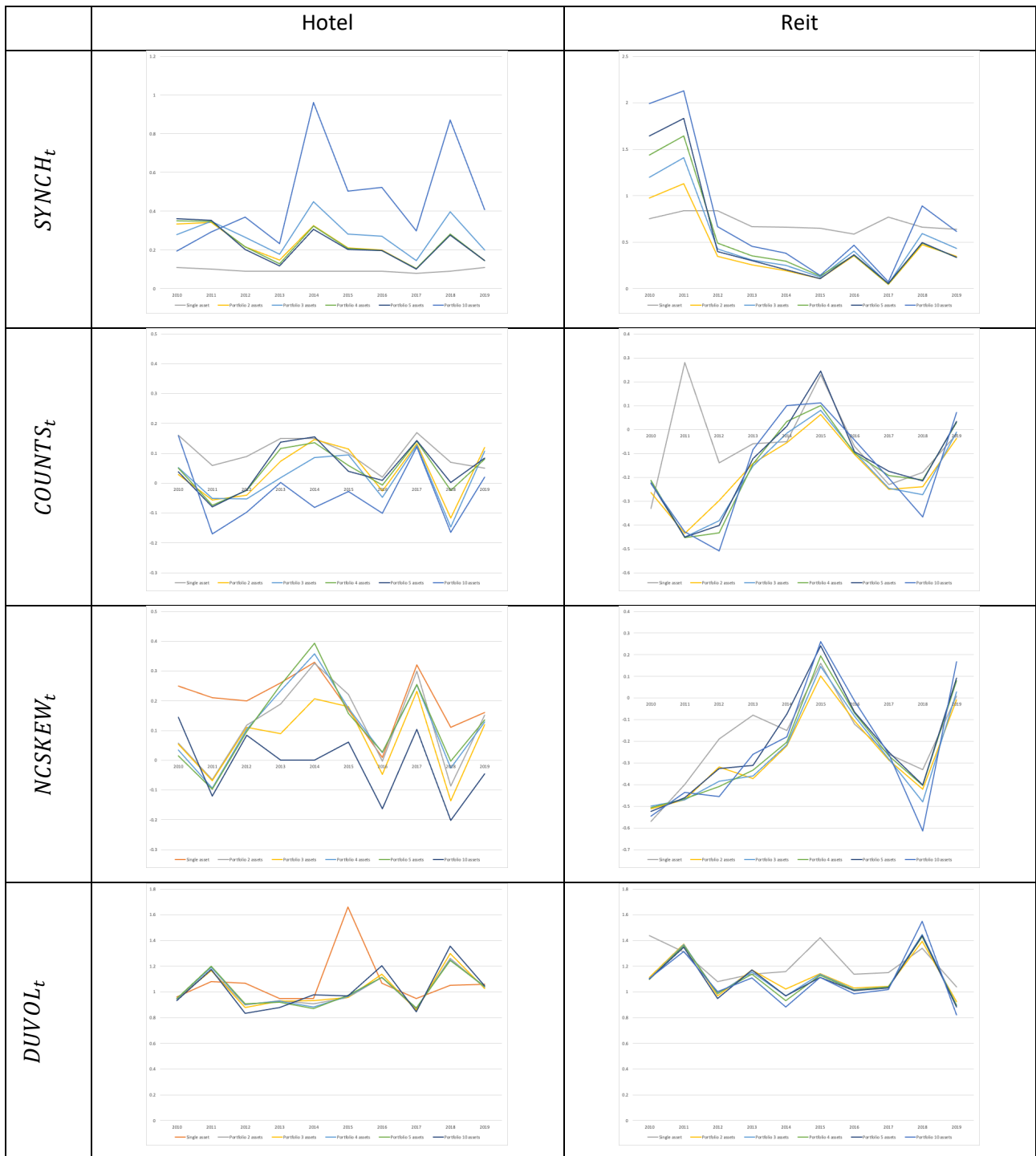
	$SYNCH_t$			$COUNTS_t$			$NCSKEW_t$			$DUVOL_t$		
	Hotel	REIT	t-test	Hotel	REIT	t-test	Hotel	REIT	t-test	Hotel	REIT	t-test
2010	0.11 (0.30)	0.75 (0.92)	0.64**	0.96 (0.44)	1.44 (0.61)	0.48**	0.16 (0.69)	-0.33 (0.48)	-0.49**	0.25 (0.98)	-0.57 (0.74)	- 0.82**
2011	0.10 (0.28)	0.84 (0.97)	0.74**	1.08 (0.46)	1.31 (0.42)	0.23**	0.06 (0.63)	0.28 (0.73)	0.22**	0.21 (0.88)	-0.40 (0.56)	- 0.61**
2012	0.09 (0.28)	0.84 (0.97)	0.75**	1.07 (0.38)	1.08 (0.46)	0.01	0.09 (0.62)	-0.14 (0.59)	-0.23*	0.20 (0.91)	-0.19 (0.64)	- 0.39**
2013	0.09 (0.28)	0.67 (0.90)	0.58**	0.95 (0.54)	1.14 (0.45)	0.19*	0.15 (0.70)	-0.06 (0.53)	-0.21*	0.26 (0.87)	-0.08 (1.01)	- 0.34**
2014	0.09 (0.27)	0.66 (0.88)	0.57**	0.95 (0.63)	1.16 (0.69)	0.21*	0.15 (0.69)	-0.05 (0.46)	-0.20*	0.33 (1.22)	-0.15 (0.81)	- 0.48**
2015	0.09 (0.27)	0.65 (0.87)	0.56**	1.66 (1.81)	1.42 (0.74)	-0.24	0.10 (0.70)	0.23 (0.80)	0.13	0.17 (0.85)	0.16 (0.62)	-0.01
2016	0.09 (0.26)	0.59 (0.85)	0.50**	1.07 (0.55)	1.14 (0.51)	0.07	0.02 (0.73)	-0.07 (0.49)	-0.09	0.01 (1.06)	-0.12 (0.64)	-0.13
2017	0.08 (0.26)	0.77 (0.99)	0.69**	0.95 (0.90)	1.15 (0.44)	0.20*	0.17 (0.67)	-0.23 (0.59)	-0.40**	0.32 (0.97)	-0.26 (0.80)	- 0.58**
2018	0.09 (0.25)	0.66 (0.94)	0.57**	1.05 (0.46)	1.34 (0.48)	0.29**	0.07 (0.77)	-0.18 (0.63)	-0.25**	0.11 (0.97)	-0.33 (0.64)	- 0.44**
2019	0.11 (0.27)	0.64 (0.91)	0.53**	1.06 (0.82)	1.04 (0.42)	-0.02	0.05 (0.69)	-0.02 (0.57)	-0.07	0.16 (1.17)	0.01 (0.72)	-0.15

Legend: $SYNCH$ = measure of stock price synchronicity, $NCSKEW$ = is the negative conditional skewness of firm-specific weekly return, $COUNTS$ = is the number of crashes minus the number of jumps, $DUVOL$ =is down-to-up volatility calculated as the log of the ratio of the standard deviation of firm weekly return on up weeks to that on down weeks.

* Statistical significant at the 95% level; ** Statistical significant at the 99% level.

Source: Thomson Eikon data processed by the authors.

Table 3. Average values of synchronicity proxies for solo-portfolios and diversified portfolio in the hotel and in the REIT industry



Legend: $SYNCH_t$ = measure of stock price synchronicity, $NCSKEW_t$ = is the negative conditional skewness of firm-specific weekly return, $COUNTS_t$ = is the number of crashes minus the number of jumps, $DUVOL_t$ = is down-to-up volatility calculated as the log of the ratio of the standard deviation of firm weekly return on up weeks to that on down weeks.

Source: Thomson Eikon data processed by the authors.

The synchronicity proxy increases significantly for Hotel investors when the number of assets in the portfolio increase (more than 20 times higher for diversified portfolios with respect to solo investment) while it does not change clearly in the case of the REIT investment.

The proxy on the extreme event (Jumps and Crashes) for the hotel investment remains positive for the Hotel investors until the number of assets in the portfolios is below ten while for the REIT investors the value became even more negative even when we add only an additional asset with respect to the solo portfolio.

The skewness remains negative for REIT investment independent with respect to the size of the portfolio while for hotel investment strategy only large portfolio (number of assets higher than 10 assets) the skewness assumes negative values.

The ratio between volatility in bear and bull markets for REIT portfolios decrease significantly when the number of assets in the portfolio increases even if the value is always higher than the one of portfolios of the same size focused on hotel investments.

4. Conclusion

Stock price behaviour for hotel firms and REITs show trends that are not strictly comparable and investors have to consider their differences in identifying the best investment strategy on the basis of the investors' risk attitude. An investment strategy focused on hotel firms normally exposes to higher risk with respect to the choice of investing in REITs but the former allows reducing the risk related to extreme events (crash risk) with respect to the latter.

The empirical analysis demonstrates that not only the size of the exposure is different for hotels and REITs but also the main features that increase the synchronicity or crash risk are different for the Hotel sector with respect to REITs. Synchronicity and crash risk can be easily forecasted for the hotel sector while, independently with respect to the risk proxy selected, REITs risk is prevalently driven by the institutional ownership share and few other REITs' features.

Results demonstrate that an investment strategy in the hotel industry may perform differently on the basis of the type of share bought (hotel vs REITs) but there is no evidence on the effect of the time horizon of the investment strategy and the choice of the best financial instrument available. Moreover, a deeper analysis of the portfolio owned may allow to identify if differences between hotels and REITs are driven by a different diversification strategy in the selection of hotel location in the portfolios owned by hotel chains and by institutional investors (like REITs).

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