Real Estate Exposure and Bank Share Price Synchronicity

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Abstract

Opaque asset can affect the stock price dynamics of banks due to the lower volume of information available in the market. Real estate is considered an opaque asset but there is no evidence on the impact of the real estate exposure on stock price dynamics.
The paper considers the crisis period and evaluates the effect of the real estate exposure on the banks' price synchronicity for lenders with different exposures on the real estate lending and studies the effect of an increase of the percentage of real estate exposure on different proxies of the role of the idiosyncratic performance component. Results obtained showed that the amount of exposure on the real estate sector can affect negatively the degree of synchronicity especially if the analysis considers the concordance of weekly return change during the yearly time horizon the statistical fitness of the linear regression model.

1. Introduction

Price co-movement in the stock market represents a proxy of the role of idiosyncratic risk in the market and the level of synchronicity is affected by the characteristics of the firm and the stock market in which is traded. The main driver identified for explaining lower level of synchronicity is the level of transparency that characterize the market or the firm and normally the higher is the role of opaque assets in the bank's balance sheet the lower is the synchronicity (Jin and Myers, 2006).

The real estate lending is normally considered an opaque market due to low volume of information available, the characteristics of the demand and the lack of homogeneity of financial contracts offered (i.a. time, interest rate, the low level of competition among lenders, the repayment scheme, the value of guarantee) (i.a. Hassink and Van Leuvensteijn, 2007). Empirical evidence demonstrates that the soundness of banks exposed to the real estate lending is significantly affected by the housing price dynamics because the value of the collateral (and so the capital requirements) will be affected by the real estate price dynamics (Koetter and Poghosyan, 2010).

The analysis of the relationship between banks' risk and real estate exposure is still limited and prevalently focused on the balance sheet analysis and the impact of real estate specialization on different balance sheet risk proxies (Eisenbeis and Kwast, 1991). Results obtained demonstrate that on a long term horizon an higher exposure to real estate lending can increase the credit risk assumed (Blasko and Sinkey, 2006) while on the short term horizon specialized real estate banks are not exposed to an higher liquidity risk (Giannotti, Gibilaro and Mattarocci, 2011).

Literature does not provide already evidence about the different price synchronicity for banks specialized in real estate and other bank and the paper wants to analyse this issue in a scenario of real estate market crisis. The paper is structured as follows: section 2 presents a detailed literature review on

the topic of stock price synchronicity, section 3 after describing the sample features (section 3.1), present the methodology adopted (section 3.2) and discuss the main results obtained (section 3.3) and section 4 summarize conclusion and implication of the paper.

2. Literature review

Stock price dynamics are affected by a market-related variation, an industry-related trend, and a firm specific factor. A standard regression fitness measure (R^2) allows to evaluate the role of idiosyncratic factor in explaining the overall performance of a share (Chen, Goldenstein and Jiang, 2007).

The main market features that can explain a structural lower or higher level of stock price synchronicity is the level of development and the protection rights. Empirical evidence demonstrates that less developed markets or characterized by low level of corporate governance are characterized by an higher level of synchronicity because investors do not trust to the specific characteristics and growing opportunities for each firm (Jin and Myers, 2006).

Firm features that could affect the degree of synchronicity are related to the amount of information available in the market and normally firms that are more transparent (because they are monitored by an higher number of analysts) show an higher predictability of returns and a lower relevance of idiosyncratic factors (Chan and Hameed, 2006). The role of the information available is also affected by the investors' composition because an higher proximity to the firm increases the availability of soft information and so increase the synchronicity among shares (Bae, Kim and Yang, 2013).

The degree of synchronicity is affected by the opaqueness of the business and higher role of transparent assets imply a lower capability of the manager to modify earning in order to obtain individual extra gains or to avoid losses. The degree of transparency of the balance sheet is related the role of idiosyncratic factors due to the lower effects related to any managerial choice on the firms' market evaluation (Hutton, Marcus and Tehranian, 2009). The sign of the relationship between the firms' opacity and the price synchronicity is still controversial; the main explanation about the difference in the results obtained is the assumption of an inversely U-shaped relationship that imply a different effect of above the average and below the average opacity (Xing and Anderson, 2011).

Literature demonstrates that there is a relationship between banks' risk and the real estate exposure but the risk does not increase linearly with the growth of the amount of lending exposure (Deacle and Elyasiani, 2014). Moreover empirical analysis does not study separately the idiosyncratic risk and the systematic risk and focus the attention only on the role of the overall risk for a investor.

3. Empirical analysis

3.1. Sample

The sample analysed considers all active banks classified as ultimate owners by the Bankscope database for the time period 2007-2013 that are listed in an US official stock market. For all the banks we collect the full balance sheet and income statement information for all the time horizon and we classified them on the basis of the real estate lending exposure (Table 1).

Table 1. Sample Description

		2007	2008	2009	2010	2011	2012	2013
No Real Estate	Number	299	300	294	294	285	231	59
	Total assets (mln $)	3690	2385	2479	2667	2679	2772	2780
First Quartile	Number	55	57	59	56	52	89	86
	Total assets (mln $)	9570	11021	11157	13108	13380	13014	13144
Second Quartile	Number	56	57	59	58	55	89	85
	Total assets (mln $)	731	438	440	429	451	462	466
Third Quartile	Number	56	58	59	57	53	89	85
	Total assets (mln $)	261	284	298	298	290	293	301
Fourth quartile	Number	57	59	60	58	54	89	85
	Total assets (mln $)	139	143	150	141	137	139	142
Overall	Number	523	531	531	523	499	587	400
	Total assets (mln $)	14391	14271	14524	16643	16937	16681	16833

Source: Bankscope data processed by the authors

The overall sample includes around 500 banks and the role of banks with a real estate exposure is increased over time from the 42% in 2007 to 85% in 2013. Bigger banks are normally the more diversified one and so banks with the higher level of exposure to real estate lending are normally smaller with respect to the others.

For each bank in the sample we collect the full balance sheet data available for the time period 2007-2013 and the weekly stock market performance. For the analysis of the stock market synchronicity we collect daily values a stock market proxy (S&P500), the bond market index (10 years US bond rate) and the a real estate market trend proxy (the NCREIF index).

3.2 Methodology

The price synchronicity using an augmented CAPM model that considers the sensitivity with respect to a stock market benchmark, the interest rate dynamics and the real estate market trend (e.g. Allen, Madura and Wiant, 1995). In formula:

$$r_{it} = \alpha + \beta_1 Stock_t + \beta_2 Bond_t + \beta_3 Real\ Estate_t + \varepsilon_{it} \quad (1)$$

where $Stock_t$ is the daily performance of the overall market index (a customized index that considers all the banks in the sample), $Bond_t$ is the interest rate offered by a ten year Treasury bond and $Real\ Estate_t$ is the daily performance of the real estate sector defined on the basis of the NCREIF index.

In order to consider the impact of the real estate exposure on stock market synchronicity, banks are classified on the basis of their real estate exposure computed on the basis of the following formula:

$$\%RE_{it} = \frac{Real\ Estate\ loans_{it}}{Total\ assets_{it}} \tag{2}$$

where $Real\ Estate\ loans_{it}$ is the overall amount of lending exposure (both residential and commercial) to the real sector and the $Total\ assets_{it}$ is the overall amount of assets owned by the bank i at time t. Banks are classified into four groups: no exposure to real estate and four quartiles on the basis of the $\%RE_{it}$ value (1st quartile lowest exposure and 4th highest exposure) and the model performs a fixed effect linear panel regression on the basis of the following formulas:

$$r_{it}^{NRE} = \alpha + \beta_1^{NRE} Stock_t + \beta_2^{NRE} Bond_t + \beta_3^{NRE} Real\ Estate_t + \varepsilon_{it} \tag{3a}$$

$$r_{it}^{RE1Q} = \alpha + \beta_1^{RE1Q} Stock_t + \beta_2^{RE1Q} Bond_t + \beta_3^{RE1Q} Real\ Estate_t + \varepsilon_{it} \tag{3b}$$

$$r_{it}^{RE2Q} = \alpha + \beta_1^{RE2Q} Stock_t + \beta_2^{RE2Q} Bond_t + \beta_3^{RE2Q} Real\ Estate_t + \varepsilon_{it} \tag{3c}$$

$$r_{it}^{RE3Q} = \alpha + \beta_1^{RE3Q} Stock_t + \beta_2^{RE3Q} Bond_t + \beta_3^{RE3Q} Real\ Estate_t + \varepsilon_{it} \tag{3d}$$

$$r_{it}^{RE4Q} = \alpha + \beta_1^{RE4Q} Stock_t + \beta_2^{RE4Q} Bond_t + \beta_3^{RE4Q} Real\ Estate_t + \varepsilon_{it} \tag{3e}$$

where r_{it}^{k} is a vector of returns of all the banks classified in each group. Following the approach proposed by He, Myer and Webb (1993), an F-test is performed in order to evaluate the role of each explaining factor in evaluating the banks' return. In formulas

$$F_S = \frac{R_S^2 - R_{RW}^2}{1 - R_S^2} \times \frac{N - Q_S}{Q_S - Q_{RW}} \tag{4a}$$

$$F_B = \frac{R_{SB}^2 - R_S^2}{1 - R_{SB}^2} \times \frac{N - Q_{SB}}{Q_{SB} - Q_S} \tag{4b}$$

$$F_R = \frac{R^2_{SBR} - R^2_{SB}}{1 - R^2_{SBR}} \times \frac{N - Q_{SBR}}{Q_{SBR} - Q_{SB}} \tag{4c}$$

where for each model R^2 is the R-square, Q is the number of explanatory variables plus the constant term and N is the number of observations. Models compared are the random walk (RW), the stock market model (S), the stock and bond market model (SB) and the stock, bond and real estate factor model (SBR).

In order to test the hypothesis that real estate exposure affect the share price synchronicity we test the following null of hypothesis

$$\text{Hyp: } \beta_k^{NRE} = \beta_k^{RE1Q} = \beta_k^{RE2Q} = \beta_k^{RE3Q} = \beta_k^{RE4Q} \tag{5}$$

The test is released for all the three factors in model (Stock, Bond and Real Estate) and if the comparison test is not satisfied the change in the real estate exposure do not affect the price synchronicity with respect to the explaining factor.

To evaluate if the results previously obtained can be explained or not by the features of the bank in the sample, we construct different measures of synchronicity for each bank and for each year on the basis of the statistical fitness of the regression between the real return and the expected return defined on the basis of the equation (1). The new proxies of synchronicity is the following:

$$Sync_{it}^{I} = \frac{\bar{f} - f_i}{\frac{1}{n° \, weeks}\sqrt{\bar{f}(1-\bar{f}) + f_i(1-f_i)}} \tag{6}$$

$$Sync_{it}^{II} = \ln\left(\frac{R^2_{it}}{1 - R^2_{it}}\right) \tag{7}$$

$$Sync_{it}^{III} = \frac{\text{Kurtosis}(\varepsilon_{it})}{\sigma(\varepsilon_{it})^3} \tag{8}$$

$$Sync_{it}^{IV} = n° \text{ Abnormal Neg Weeks}(\varepsilon_{it}) - \text{n° Abnormal Pos Weeks}(\varepsilon_{it}) \tag{9}$$

In the formula (6) $\bar{f}$ and $\bar{f}$ are the syncronicity proxies constructed for the overall sample and for the bank i during the year t on the basis of the number of rising and decreasing weeks defined on the basis of the following formulas: $f_i = \frac{\max\left(n_{it}^{Up}, n_{it}^{Down}\right)}{n_{it}^{Up} + n_{it}^{Down}}$ and $\bar{f} = \frac{1}{\text{m}}\sum_{k=1}^{m} f_k$. (i.a. Morck, Yeung and Yu, 2000).

Equation (7) defines the syncronicity on the basis of the R_{it}^2 is the statistical fitness proxy for a one year time series regression for the bank i during the year t and the index varies from 0 to 1 (1 is the highest level of synchronicity). The reference model used for the statistical fitness analysis is the augmented CAPM presented in the formula (1).

Equation (8) measures the syncronicity considering the skewness and the standard deviation of residuals for the bank i during the year t (Chen, Hong and Stein, 2001). The reference model used for the statistical fitness analysis is the augmented CAPM presented in the formula (1).

Equation (9) considers only extreme positive (negative) performance identified as the number of weeks in which the absolute value of the gap between the current error term and the average value is higher (lower) than k times the standard deviation[1]. The syncronicity proxy is constructed as the difference between the number of weeks with abnormal negative and positive performance (i.a. Jin and Myers, 2006) . The reference model used for the statistical fitness analysis is the augmented CAPM presented in the formula (1).

The synchronicity proxy is regressed (with a fixed effect panel regression) with respect to the percentage of Real Estate exposure and a set of controlling variables related to the asset portfolio composition, the bank characteristics and the macro-economic trend identified coherently with the literature (Jones, Lee and Yeager, 2013)[2]. In formula:

$$Sync_{it}^{k} = \alpha + \delta \%RE_{it} + \sum_{k=1}^{m} \gamma_k Portfolio_{it}^{k} + \sum_{s=1}^{l} \gamma_s Bank_{it}^{s} + \sum_{j=1}^{n} \gamma_j Macro\ Data_{it}^{j} + \varepsilon_{it} \qquad (7)$$

where the controlling variables are constructed as explained in table 2.

[1] k is chosen to generate frequencies of 0.01% in the lognormal distribution but results are robust with respect to a threshold change.

[2] With respect to the model proposed by Jones, Lee and Yeager (2013), there is no distinction between residential and commercial loans.

Table 2. Explaining factors of synchronicity

Type	Name	Description
Real Estate	Percentage of Real estate lending	Percentage of real estate loans (commercial and residential) with respect to total assets
Portfolio	Trading Assets	Percentage of trading assets with respect to total assets
	Other loans	Percentage of loans with respect to total assets excluding real estate lending
	Other Opaque Assets	MBS or ABS classified as available for sell or held to maturity that are not explicitly or implicitly guaranteed by a federal government-related entity, fixed asset, intangible assets, other assets, investment in unconsolidated subsidiary, other real estate owned divided tor total assets
	All Transparent Assets	Cash, Federal funds sold, securities purchased under agreement to resell, guaranteed AFS and HTM securities divided for total assets
Bank	EBIT	Earnings before taxes and extraordinary items divided for total assets
	Not Interest Income	Not interest income divided for total assets
	Not Performing Loans	Not accruing loans or those greater than 90 days past due divided for total assets
	Core Deposits	Core deposits divided for total assets
	Interest Risk	Absolute value of the difference between asset and liabilities with maturities lower than one year divided for total assets
	Capital	Bank equity capital divided for total assets
Macro	GDP	Annual growth U.S. Gross Domestic Product
	Money Supply	Annual growth of Money Supply (M2)
	Interest rate	3 Months Treasury bill rate

3.3. Results

The role of real estate in explaining banks' returns is evaluated considering separately the effect on the weekly performance for not real estate exposed and different level of real estate exposure (from 1st to 4th quartile (Table 2).

Table 2. Stock price return and real estate exposure

The table summarizes results of a panel regression analysis (fixed effects) of the weekly return of banks' shares with respect to a stock index (S&P 500), a bond index (10 year US Treasury Bond) and a real estate market proxy (NCREIF Index). Beta coefficients and standard deviation (in brackets) are presented in the table.

NoRe are Banks that do not have real estate lending exposure while RE1Q, RE2Q, RE3Q and RE4Q are respectively banks classified on the basis of their exposure in the real estate lending in the first, second, third or fourth quartile.

	NoRE	RE1Q	RE2Q	RE3Q	RE4Q
Constant	-0.0009 (0.012)	-0.0006 (0.0018)	0.0029 (0.0026)	-0.0025 (0.0024)	-0.0008 (0.0026)
Stock	0.1708*** (0.0067)	0.4797*** (0.0109)	0.3830*** (0.0123)	0.2941*** (0.0113)	0.2644*** (0.0131)
Bond	-0.0575 (0.0359)	-0.0110 (0.0599)	-0.0956 (0.0882)	-0.0823 (0.0812)	-0.0066 (0.0864)
Real Estate	0.1070*** (0.0087)	0.1743*** (0.0141)	0.1294*** (0.0158)	0.1519*** (0.0145)	0.1208*** (0.0167)
Observations	86775	23400	23206	23281	23202
Overall R^2	0.0260	0.1787	0.0974	0.0829	0.0508
Stock contribution to R^2 [Base model: Random walk]	0.0242*** F=2152.0090	0.1733*** F=4905.1010	0.0948*** F=2430.2190	0.0792*** F=2002.3630	0.0487*** F=1177.493
Bond contribution to R^2 [Base model: Stock]	0.0001*** F=8.8935	-0.0000 F=0.0000	0.0001* F=2.5638	-0.0002*** F=-5.0554	0.0001* F=2.4181
Real estate contribution to R^2 [Base model: Stock + Bond]	0.0017*** F=151.4501	0.0054*** F=153.8339	0.0025*** F= 64.2671	0.0039*** F=98.9905	0.0002*** F=48.4598

Source: Bankscope data processed by the authors

Results show that the performance is significantly positively affected by the overall stock performance and the trend of the real estate market independently with respect to the real estate exposure while bond returns have a negative effect (not statistically significant) on the banks' performance. As showed also by other studies (i.a. Mei and Saunders, 1995), The existence of a real estate exposure increases the sensitiveness with respect to the real estate market trend but there is no linear relationship between the stock's price sensitivity to the real estate sector and the exposure in the real estate lending. The stock market sensitivity is higher for banks with a real estate lending exposure but it decreases with the growth of real estate loans while the sensitivity to bond interest rates is never statistically significant.

The statistical fitness of the model is driven by the stock market performance and the real estate market while the bond market has a limited contribution to the fitness of the model. The increase or decrease of the real estate exposure does not imply a significantly higher or lower relevance of each explaining factor in the model.

The comparison among betas obtained for banks characterized by different real estate exposures allows to identify some statistically significant differences related to different relevance of real estate lending (Table 3).

Table 3. Regression Betas comparison for banks classified on the basis of the real estate exposure
The table summarizes results of a panel regression analysis (fixed effects) of the weekly return of banks' shares with respect to a stock index (S&P 500), a bond index (10 year US Treasury Bond) and a real estate market proxy (NCREIF Index). Beta coefficients and standard deviation (in brackets) are presented in the table.
NoRe are Banks that do not have real estate lending exposure while RE1Q, RE2Q, RE3Q and RE4Q are respectively banks classified on the basis of their exposure in the real estate lending in the first, second, third or fourth quartile.

		NoRE	RE1Q	RE2Q	RE3Q	RE4Q
Stock	NoRE	-	-	-	-	-
	RE1Q	-24.1431***	-	-	-	-
	RE2Q	-15.1502***	5.8839***	-	-	-
	RE3Q	-9.3857***	11.8214***	5.3225***	-	-
	RE4Q	-6.3613***	12.6337***	6.6001***	1.7167*	-
Bond	NoRE	-	-	-	-	-
	RE1Q	-0.6659	-	-	-	-
	RE2Q	0.4001	0.7935	-	-	-
	RE3Q	0.2793	0.7066	-0.1109	-	-
	RE4Q	-0.5440	-0.0419	-0.7208	-0.6385	-
Real Estate	NoRE	-	-	-	-	-
	RE1Q	-4.0620***	-	-	-	-
	RE2Q	-1.2419	2.1203**	-	-	-
	RE3Q	-2.6553***	1.1075	-1.0492	-	-
	RE4Q	-0.7329	2.4478***	0.3741	1.4062	-

Source: Bankscope data processed by the authors

The sensitivity to the stock market dynamics is significantly different for different types of banks while the effect of the bond market dynamics is not driven by the exposure to the real estate lending.

The effect of real estate market trend is lower for the banks with real estate exposure with respect to banks that are not offering real estate lending but it is statistically significant only for the first and the third quartile. Results are coherent with other international empirical evidence that shows that a specialization in the real estate sector imply better management skills with respect to the real estate market dynamics (Gibilaro and Mattarocci, forthcoming).

Four different proxies of stock price synchronicity are constructed starting from the augmented CAPM model discussed before in order to identify if real estate banks show a more or less synchronous trend with respect to the benchmark. Table 4 presents the average comparison of the four proxies for bank not exposed on the real estate and banks with different level of exposure in the sector.

Table 4. Average synchronicity measures for banks classified on the basis of the real estate exposure
The table compares average values of different synchronicity proxies computed on the yearly time horizon for all the years considered in the analysis. Formulas used for constructing the proxies are equations (6), (7), (8) and (9).
NoRe are Banks that do not have real estate lending exposure while RE1Q, RE2Q, RE3Q and RE4Q are respectively banks classified on the basis of their exposure in the real estate lending in the first, second, third or fourth quartile.

		2007	2008	2009	2010	2011	2012	2013	Average
$Sync^{I}$	NoRE	0.1434	0.1393	0.1336	0.1346	0.1446	0.2829	0.5070	0.2122
	RE1Q	0.6874	0.7645	0.9606	0.8002	0.8982	0.5613	0.2188	0.6987
	RE2Q	0.4455	0.8986	0.4918	0.5093	0.7438	0.3273	0.2866	0.5290
	RE3Q	0.5870	0.3989	0.7112	0.7068	0.9659	0.2841	0.5410	0.5993
	RE4Q	0.4629	0.6924	0.1848	1.0154	0.4646	0.0216	0.3403	0.4546
$Sync^{II}$	NoRE	-2.5051	-1.9435	-2.1801	-2.3452	-2.2592	-2.2995	-2.2528	-2.2551
	RE1Q	-0.3203	-0.1582	-0.5918	-0.5608	-0.2216	-0.8992	-1.3718	-0.5891
	RE2Q	-1.1069	-0.8379	-0.9001	-1.2924	-1.0832	-2.2272	-2.4392	-1.4124
	RE3Q	-1.3447	-1.4697	-1.1356	-1.5493	-1.0937	-2.2409	-2.3973	-1.6045
	RE4Q	-1.7216	-1.2695	-1.7850	-1.9349	-1.5994	-2.6129	-2.6132	-1.9338
$Sync^{III}$	NoRE	-0.1211	0.3214	0.1582	-0.0455	0.0004	-0.1001	-0.4205	-0.0296
	RE1Q	-0.2922	-0.0736	-0.0661	-0.3362	0.2736	0.0124	-0.4645	-0.1352
	RE2Q	-0.1975	-0.2651	-0.1118	-0.0239	0.3017	-0.0726	-0.2539	-0.0890
	RE3Q	-0.2154	0.0236	0.1509	-0.0682	0.0578	0.0108	-0.3604	-0.0573
	RE4Q	-0.1719	0.0186	0.1185	-0.1694	0.2959	-0.1089	-0.5587	-0.0823
$Sync^{IV}$	NoRE	-0.0134	0.2667	0.0952	-0.1361	-0.0211	-0.2597	-0.3559	-0.0606
	RE1Q	-0.4364	-0.1228	0.0508	-0.5357	0.2308	0.0225	-0.4883	-0.1827
	RE2Q	-0.2857	-0.5439	-0.2034	-0.1552	0.3091	-0.1124	-0.5529	-0.2206
	RE3Q	-0.2679	0.0690	0.1525	-0.2456	0.1887	-0.2247	-0.3882	-0.1023
	RE4Q	-0.2632	-0.0509	-0.1500	-0.1379	0.2407	-0.2360	-0.5412	-0.1626

Source: Bankscope data processed by the authors

The first synchronicity proxies constructed on the number of weeks with positive and negative returns on a yearly time horizon ($Sync^{I}$) is on average higher for banks with real estate exposure with respect to bank that are not offering real estate lending. The average value of the proxy do not increase with the increase of the exposure to the real estate market and it is significantly variable year-by-year.

The proxy constructed on the R^2 ($Sync^{II}$) is on average always negative because the average value of the statistical fitness proxy is lower than 0.5. Not real estate banks are those that show a lower average synchronicity and the higher mean is related to banks that have a limited real estate exposure (first quartile).

The analysis of the kurtosis ($Sync^{III}$) shows, as expected due to the events that characterized the time horizon analysed, a negative sign for almost all the banks (an higher relevance of losses with respect to gains) and the size of the losses is on average higher for banks with real estate exposures. There is no clear relationship between the size of the exposure on the real estate lending and the degree of kurtosis.

Considering the higher or lower propensity to be affected by stock crashes ($Sync^{IV}$), the average values for all the banks in the sample are significantly low demonstrating a low frequency of abnormal

positive or negative performances. On average the number of negative weeks is lower than positive ones and the result is confirmed especially for banks with a real estate exposure.

In order to identify is results previously obtained are driven or not by specific characteristics of the banks included in each bucket, a maximum likelihood panel regression analysis (Table 5).

Table 5. Synchronicity measures panel regression analysis
The table compares average values of different synchronicity proxies computed on the yearly time horizon for all the years considered in the analysis. Formulas used for constructing the proxies are equations (6), (7), (8) and (9). Independent variables construction are listed in table 2.

	$Sync^{I}$	$Sync^{II}$	$Sync^{III}$	$Sync^{IV}$
Real estate	0.3828*	-1.7014**	0.1552	0.1273
Transparent Assets	2.1100**	0.3607	-0.1664	-0.4960
Other loans	0.2854	-2.0744**	-0.0821	-0.1535
Other Opaque Assets	0.8390	-0.4094	0.2984	0.3184
All Other Assets	0.3714	-1.2232**	0.2237	0.0646
EBIT	1.2645*	0.5612	-0.4040	-0.5164
Not Interest Income	-0.0464	-0.0253*	-0.0090	0.0514
Not Performing Loans	-2.6861*	-4.1015**	-0.2045	-1.2844*
Core Deposits	0.0203	-0.0495	0.0065	-0.0258
Interest Risk	-0.0374	-0.0543**	0.0020	-0.0077
Capital	-0.0285	0.0667	-0.0258	-0.0976
GDP	1.3464	-3.9195**	-4.5344**	-3.8562**
M2	0.7915	0.6517	-0.0432	1.1377
Int. Rate	-8.3418**	-6.3429**	1.7007	1.5740
Observations	3315	3315	3315	3315
Log likelihood	-4890.8244	-4987.5126	-4980.8244	-5250.4531
Log likelihood test	0.0300 (Pr=0.4300)	2061.7200 (Pr=0.0000)	0.0300 (Pr=0.4300)	1.1400 (Pr=0.1430)
Wald χ^2 test	44.0000 (0.0001)	1062.9200 (0.0000)	43.4300 (0.0001)	67.3800 (0.0000)

Source: Bankscope data processed by the authors

The analysis of the determinants of the synchronicity shows a low predictability especially for measures constructed on the skewness and the crash frequency. Economic variables that could affect the role of the idiosyncratic component of stock price behaviour are the GPD trend and bond interest rate return. Banks' portfolio features that affect more the degree of synchronicity are relate either to the EBIT, the not interest income and the not performing loans. Portfolio composition can drive synchronicity constructed the frequency of positive and negative weekly performance and the statistical fitness of the linear regression model. Real estate exposure affects positively the frequency of weeks in the year experiencing the same trend of the performance ($Sync^{I}$) and the value of the synchronicity measured on the basis of the R^2 ($Sync^{II}$) is nearer to zero (perfect synchronicity) when the real estate exposure increases.

4. Conclusion

Banks' real estate lending exposure does not imply a lower level of synchronicity with respect to the market dynamics and an higher idiosyncratic risk for the investor. Real estate banks normally show a lower frequency of switching between negative and positive weekly performance and banks' return are frequently less characterized by a lower relevance of idiosyncratic price determinants.

Literature provides evidence on the criteria adopted by investors in selecting among bank's shares for constructing the optimal portfolio allocation showing that the systematic risk exposure for real estate banks is higher with respect to others (Deacle and Elyasiani, 2014). The different level of synchronicity showed by banks that are characterized by different real estate lending exposure has an impact for investors interested in investing on a portfolio of banks' shares that can consider their specific behavior for achieving the optimal risk-return profile due to the lower role of idiosyncratic risk that characterize these firm and so reduces the advantages related to an excessive portfolio diversification.

Further studies about the optimal portfolio construction strategy for investing in real estate banks can allow to evaluate if the change in the time horizon of the investment can affect the choice of the banks that has to be included in the portfolio and multiple years time horizon can allow to highlight the value added od investing in real estate banks that are less characterized by not systematic risk.

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