Available online at www.sciencedirect.com

Borsa İstanbul Review

Borsa İstanbul Review 19-3 (2019) 249–257

http://www.elsevier.com/journals/borsa-istanbul-review/2214-8450

Full Length Article

Foreign penetration, competition, and credit risk in banking

Muhammad Natsir [a], Wahyoe Soedarmono [b,*], Wahdi Salasi April Yudhi [b], Irwan Trinugroho [c], Ari Warokka [d,e]

[a] *Faculty of Economics and Business, Universitas Halu Oleo, Kendari, Indonesia*
[b] *Faculty of Business, Sampoerna University, Jakarta, Indonesia*
[c] *Faculty of Economics and Business, Universitas Sebelas Maret, Surakarta, Indonesia*
[d] *Centro Internacional "Carlos V", Universidad Autonoma de Madrid, Spain*
[e] *Faculty of Economics, Universitas Negeri Jakarta, Jakarta, Indonesia*

Received 30 October 2018; revised 20 May 2019; accepted 26 May 2019
Available online 11 June 2019

Abstract

This paper reveals that foreign penetration in terms of assets and branches exhibits different impacts on credit risk in banking. In general, a higher share of foreign banks' total assets exacerbates nonperforming loans, but the increased number of foreign banks diminishes credit risk. Moreover, the role of foreign banks in mitigating credit risk is conditional on the measure of bank competition and country income status. A higher share of foreign bank branches can diminish nonperforming loans after bank concentration, not bank market power, exceeds a certain level. These findings are more pronounced for emerging markets. In addition, higher bank credit risk due to foreign penetration and bank competition can partly be explained by the loss-leader hypothesis coming from higher bank noninterest income. Providing incentives for the banking industry to avoid cross-selling strategies in boosting noninterest income is necessary due to changes in foreign penetration and competition in banking.

JEL classification: G21; G28

Keywords: Foreign bank penetration; Bank competition; Credit risk

1. Introduction

Since the 1990s, financial deregulation and globalization have enabled greater foreign bank entry around the world. According to the Global Financial Development Database provided by the World Bank following Cihak, Demirguc-Kunt, Feyen, and Levine (2012), the average market share of foreign banks' total assets during the 1960–2015 period has exceeded 36% in high-income and middle-income countries, while it reached at least 55% in low-income countries. Indeed, the presence of foreign banks may boost competition and improve efficiency in the domestic banking industry through a decline in intermediation cost and operational cost (e.g., Claessens & Laeven, 2004; Demirguc-Kunt, Laeven, & Levine, 2004; Wu, Jeon, & Luca, 2010). However, higher bank competition can also be detrimental to financial stability because higher competition deteriorates bank franchise value, exacerbating bank risk-taking behavior (e.g., Ariss, 2010; Keeley, 1990).

In the meantime, the role of foreign bank penetration that may alter bank competition is essential to dealing with financial crises. For instance, Latin American and Asian countries have adopted banking reform policies that encourage

* Corresponding author.
E-mail addresses: dr_m.natsir@uho.ac.id (M. Natsir), wahyoe.soedarmono@sampoernauniversity.ac.id (W. Soedarmono), wahdi.yudhi@sampoernauniversity.ac.id (W.S. April Yudhi), irwan_t@staff.uns.ac.id (I. Trinugroho), ari.warokka@unj.ac.id (A. Warokka).

Peer review under responsibility of Borsa İstanbul Anonim Şirketi.

https://doi.org/10.1016/j.bir.2019.05.003

foreign bank penetration after financial crises in the 1990s (Jeon, Olivero, & Wu, 2011; Williams & Nguyen, 2005). Consequently, Latin America and Asia are the two largest recipients of foreign investment in banking in the form of cross-border mergers and acquisitions (Domanski, 2005; Soedarmono, Machrouh, & Tarazi, 2013). For Latin American and Asian countries, higher foreign bank penetration is also found to strengthen domestic banking market competition (Jeon et al., 2011). In times of crisis, foreign banks can also provide pressures to governments to ameliorate transparency and spur regulatory reforms (Mishkin, 2006).

With regard to the implications of foreign penetration and competition on risk-taking in banking, prior literature mainly assesses the foreign penetration–stability nexus and the competition–stability nexus in banking separately. In this paper, we build an empirical link between the foreign bank-stability literature and the competition-stability literature by investigating the joint impact of foreign penetration and competition on credit risk in banking. A closely related work is undertaken by Chen and Liao (2011), who document that foreign banks are more profitable than domestic banks when foreign banks operate in countries with lower bank competition, although the joint impact of foreign penetration and competition on riskiness in banking remains unexplored. Building on the work of Chen and Liao (2011), this present paper contributes in several directions.

First, we investigate whether the impact of foreign bank penetration on bank credit risk risk is conditional on the measurement of foreign bank penetration, whether it is based on the share of foreign bank total assets or the share of foreign-bank branches, following Jeon et al. (2011). However, they do not investigate the implication of foreign penetration on riskiness in banking. In parallel, Lehner and Schnitzer (2008) also show mixed effects of foreign bank penetration in that an increase in the number of foreign bank branches tends to boost domestic market competition, while foreign bank penetration through spillovers, enabling greater innovation in loan-screening technology in the domestic banking market, is less likely to enhance bank competition. Claeys and Hainz (2014) further point out that modes of foreign bank entry exhibit different impacts on lending rates in which greater greenfield entry tends to lower interest rates in the domestic banking industry.

Second, in assessing the joint impact of foreign bank penetration and competition on bank credit risk, we consider two measures of bank competition following Fu, Lin, and Molyneux (2014). These include bank concentration measured by the market share of the three largest banks within each country and the degree of market power in the banking industry measured by the Lerner index. This is because higher concentration is not necessarily associated with lower competition in banking (Yeyati & Micco, 2007), while Fu et al. (2014) also find that bank concentration and market power exhibit different impacts on bank stability.

Third, we estimate the joint impact of foreign penetration and competition on credit risk in banking for two distinct subsamples (i.e., high-income countries and emerging markets). Lensink and Hermes (2004) show that the degree of economic development can indeed affect demand for financial services. Yet high-income countries are characterized by higher innovation, rendering the banking industry more conducive to competition. This may also suggest that the riskiness of banks in high-income countries and emerging markets tends to differ.

As an additional contribution, we further analyze whether the joint impact of foreign penetration and competition on credit risk in banking can be explained by the share of noninterest income in banking. Previous studies highlight that higher bank activity diversification into non interest income-generating products can loosen credit standards in order to sell non interest income-generating products. Such loan mis-spricing behavior can aggravate credit risk in banking (Lepetit, Nys, Rous, & Tarazi, 2008; Trinugroho, Agusman, & Tarazi, 2014).

The rest of this paper is organized as follows. Section 2 describes our related literature review. Section 3 presents data set, variables, and methodology to tackle the issues raised in this paper. Section 4 discusses our empirical findings and provides several robustness checks, while Section 5 concludes.

2. Related literature review

Foreign banks can affect financial stability in host countries through at least three channels. First, foreign banks influence domestic financial stability through the contagion effect of foreign subsidiaries when financial crises occur in home countries, which might in turn decline bank performance in host countries (e.g. Claessens & Van Horen, 2012; Popov & Udell, 2012). Second, the effect of foreign banks on credit risk in host countries depends on whether or not foreign banks pursue “cherry-picking” strategies or take advantage of the quality of screening technology (e.g., Claessens & Van Horen, 2012; Lehner & Schnitzer, 2008). Foreign banks that “cherry pick” high-quality borrowers with low credit risk will likely force domestic banks to expand loans to high-risk borrowers (Jeon et al., 2011). If domestic banks' market share dominates, such foreign banks’ behavior may indeed render the domestic banking system more prone to credit risk. However, foreign bank entry can also be beneficial for financial stability, because loan-loss provisioning in banking tends to decline following an increase in foreign bank presence (Pería, Soledad, & Mody, 2004). Wu et al. (2017) also show that foreign banks tend to have lower risk-taking than domestic banks. Third, higher foreign penetration is likely to increase competition in banking (Claessens & Van Horen, 2012; Jeon et al., 2011; Lehner & Schnitzer, 2008), which may in turn affect financial stability, although the effect of competition on stability in banking remains ambiguous.

With regard to the competition-stability nexus in banking, prior literature documents mixed results depending on whether the franchise-value hypothesis or the competition-stability hypothesis occurs, including the work of Berger, Klapper, and Turk-Ariss (2009). The franchise-value literature in banking suggests that greater competition drives banks to take on more risk due to a decline in bank franchise value (Ariss, 2010; Keeley, 1990). Considering the presence of information asymmetry in the credit market, the competition-stability literature in banking finds the opposite, in which greater competition drives banks to reduce lending rates for borrowers (e.g., Boyd & De Nicoló, 2005; Boyd, De Nicolo, & Jalal, 2006; Soedarmono & Tarazi, 2016; Soedarmono et al., 2013; Uhde & Heimeshoff, 2009). Lower lending rates reduce the likelihood of entrepeneurs' pursuing higher risk taking. Consequently, entrepreneurs' prudent behavior can diminish nonperforming loans in banking that strengthen financial stability as a whole.

While the issues of foreign penetration and competition in banking tend to be interrelated in affecting risk in banking, very little attention has been given to study the interplay of foreign penetration, competition, and risk in banking. The present paper can also be considered an extension of prior literature on the determinants of nonperforming loans in banking, although we focus on the joint impact of foreign penetration and competition on credit risk in banking.

In parallel, another strand of literature suggests that the nexus between competition and stability in banking is affected by income diversification (Amidu & Wolfe, 2013; Carletti, Hartmann, & Spangnolo, 2007). Amidu and Wolfe (2013) argue that income diversification is a channel through which competition can affect bank stability. Carletti et al. (2007) also document that merged banks tend to decline their reserves due to diversification effects.

To the best of our knowledge, much less is understood on whether the impact of foreign bank penetration and competition on bank riskiness can be explained by bank noninterest income. This is because although bank income diversification into noninterest income can reduce risk (e.g., Baele, De Jonghe, & Vennet, 2007; Sanya & Wolfe, 2011), some literature casts doubt on the effectiveness of an income diversification strategy to mitigate bank risk (Hirtle & Stiroh, 2007; Mercieca, Schaeck, & Wolfe, 2007; Stiroh, 2004; Williams, 2016). Accordingly, our additional contribution in this paper is that we examine not only the joint impact of foreign bank penetration and bank competition on credit risk, but also on noninterest income in banking.

3. Data, variables, and methodology

In this study, we use country-level dataset retrieved from the Global Financial Development Database provided by the World Bank. Our sample consists of 206 countries during the 1960–2015 period.[1] Meanwhile, data related to countries' income status (i.e., high-income countries, lower middle–income countries, upper middle–income countries and low-income countries) come from the Financial Structure Database developed by the World Bank.

As a dependent variable, we use the ratio of nonperforming loans to total loans (*NPL*).[2] Higher *NPL* means higher credit risk. Our explanatory variables of interest consists of foreign bank penetration and bank competition. Foreign bank penetration is assessed using the share of foreign banks' total assets (*FBA*) or the ratio of the number of foreign banks' branches to total number of banks within each country (*FBN*). Bank competition is assessed using the share of the three largest banks' total assets (*CR3*) or the Lerner index (*LERNER*) to become consistent with Fu et al. (2014). Higher *CR3* is associated with higher concentration in banking, which may suggest that the banking industry is less competitive in terms of market share. Countries with higher *LERNER* are likely to have the banking industry with a greater capacity to maximize profits and minimize costs due to its competitiveness position. Higher *LERNER* could also mean higher monopolistic power or market power due to lower competition.

Several control variables that affect nonperforming loans are also considered in our regression models. These include capital adequacy ratio measured by the ratio of bank capital to risk-weighted assets (*CAR*), the loan-to-deposit ratio (*LDR*), the ratio of overhead cost to total assets (*OVER*), the ratio of bank credit to gross domestic product (*DEPTH*), and the growth rate of gross domestic product (*GDPG*).

Higher capital adequacy ratio is expected to diminish nonperforming loans, because higher capitalization enhances prudent behavior and alleviates portfolio risk in banking (Boyd, De Nicolo, & Smith, 2004; Fu et al., 2014; Vanhoose, 2007). However, a higher capital adequacy ratio may exacerbate bank risk-taking due to the presence of managerial moral hazard (Bitar, Pukthuanthong, & Walker, 2018; and; Guidara, Soumaré, & Tchana, 2013). Higher financial intermediation can also detrimental for bank stability (Foos, Norden, & Weber, 2010; Soedarmono, Sitorus, & Tarazi, 2017). For this reason, the loan-to-deposit ratio (*LDR*) is included to reflect financial intermediation activities. The ratio of overhead cost to total assets (*OVER*) reflects bank inefficiency in which higher *OVER* means higher inefficiency. We consider bank inefficiency as one of the independent variables, because higher inefficiency reduces the capacity of banking to enhance proftability and capitalization, which may be deterimental for financial stability (Altunbas, Carbo, Gardner, & Molyneux, 2007).

[1] Data from GFDD are available up to 2015 for a large number of countries considered in this study.

[2] Although the calculation of non-performing loans might differ from one country to another, previous studies have used the ratio of non-performing loans to total loans as a proxy of credit risk (e.g., Dimitrios, Helen, & Mike, 2016; Zhang, Cai, Dickinson, & Kutan, 2016). In this paper, we take into account such difference by considering country-specific fixed effect in running regression models.

For independent variables at the country level, we consider the degree of financial depth (*DEPTH*) to control the degree of demand for financial services or financial sector development. Financial sector development can adversely affect bank stability and end up in financial crises. Eventually, we also consider the influence of economic growth (*GDPG*) as a control variable, because bank credit risk management tends to be procylical through the business cycles (Bouvatier & Lepetit, 2012).

In terms of methodology, we proceed the analysis in three stages. In the first stage, we regress bank nonperforming loans on foreign bank penetration, bank competition, and a set of control variables as shown in the following equation:

$$NPL_{i,t} = \beta_0 + \beta_1 FP_{i,t-1} + \beta_2 CR3_{i,t-1} + \beta_2 LERNER_{i,t-1} + \sum_{i=4}^{8} \beta_i X_{i,t-1} \quad (1)$$

In Eq. (1), *FP* is one of the measures of foreign bank penetration (*FBA* or *FBN*), while *X* is a vector of control variables described earlier. We do not enter *FBA* and *FBN* simultaneously in one regression model, because both variables are highly correlated. We include two measures of bank competition (*CR3* and *LERNER*) simultaneously, because these measures are not highly correlated. As in Eq. (1), we consider the one-year lagged value of all independent variables to avoid reverse causality between nonperforming loans and each independent variable. In the second stage, Eq. (1) is modified by including the interaction terms between foreign bank penetration and bank competition as shown in Eq. (2). In Eq. (2), *COMP* represents either *CR3* or *LERNER*.

$$NPL_{i,t} = \beta_0 + \beta_1 FP_{i,t-1} + \beta_2 FP^{*}\, COMP_{i,t-1} + \beta_3 CR3_{i,t-1} + \beta_4 LERNER_{i,t-1} + \sum_{i=5}^{9} \beta_i X_{i,t-1} \quad (2)$$

In the third stage, we repeat the first and second stage as shown in Eq. (1) and Eq. (2), respectively, for two different sub-samples (i.e., advanced markets or emerging markets). Advanced markets include high-income countries, while emerging markets reflect countries with upper-middle-income, lower-middle-income, and low-income status following the classification of countries in the Financial Structure Database developed by the World Bank.

To investigate whether the interplay of foreign bank penetration, bank competition, and nonperforming loans can be explained by bank noninterest income, we repeat the three estimation procedures described earlier, but we replace *NPL* in Eqs. (1) and (2) with the ratio of noninterest income to total assets (*NNI*) as dependent variable.

We estimate all models using a static panel data analysis with country-level and year fixed effects. Because we have a large number of countries relative to observation periods, a dynamic panel data methodology will likely converge with a static panel data methodology. Hence, the use of a static panel data analysis is contextually relevant with the characteristics of our dataset.[3]

4. Empirical results

Because our study uses country-level dataset from Global Financial Development Database provided by the World Bank, the dependent and independent variables are unlikely to contain outliers. Table 1 presents our descriptive statistics, while all independent variables used in this study exhibit no strong correlation (see Table S1, available online).

Table 2 presents our empirical results regarding the effect of foreign penetration and credit risk in banking. It is shown that only *FBN* is negatively linked to *NPL*. This finding is more pronounced in emerging markets. Our results are consistent with the notion that foreign bank entry through greenfield investment that increases the number of foreign bank branches is beneficial for the domestic banking system in emerging markets. For instance, Claeys and Hainz (2014) find that domestic banks' lending rates decline following foreign bank penetration through greenfield entry, which may suggest lower credit risk in the domestic banking system.

In Table 3, we examine the impact of the interaction term between foreign bank penetration and concentration in banking on nonperforming loans. Only *FBN* and its interaction with *CR3* are statistically significant. Although Table 3 finds that the increased number of foreign banks (*FBN*) reduce credit risk, our results also suggest that such relationship is conditional on the degree of bank concentration and countries' income status. For high-income countries (or advanced markets), the number of foreign banks is positively linked to *NPL* when CR3 exceeds 78.5%. The increased presence of foreign banks is therefore detrimental for bank-asset quality in high-income countries, particularly when the banking market is highly concentrated. For emerging markets, the increased presence of foreign banks can reduce nonperforming loans when the degree of bank concentration (*CR3*) exceeds 52.8%, as shown in Table 3.

Table 4 presents our results when foreign bank penetration is interacted with market power in banking measured by the Lerner index. The interaction term between foreign bank penetration and market power in banking is significant when we observe emerging markets and use *FBN* as a measure of foreign bank penetration. Our results using *LERNER*, however, suggest that the increased number of foreign banks exacerbates nonperforming loans when market power in banking increases.

In this regard, our results highlight that concentration and market power in banking exhibit a different impact on bank credit risk, particularly when both variables are interacted with foreign bank penetration. This result is somehow in line with Fu et al. (2014), who find mixed results regarding the link

[3] Initially, we run regressions for Eqs. (1) and (2) using a dynamic panel data methodology based on the two-step system GMM estimation. However, the Hansen-J tests of many specifications are rejected, suggesting that our dynamic panel data models are not valid. These results are not presented in the paper but are available upon request to authors.

Table 1
Descriptive statistics.

Variables	Definition	Mean	Median	Maximum	Minimum	Std. Dev.	Observations
NPL	Ratio of nonperforming loans to total loans (%)	10.8412	5.5000	92.2300	0.0100	13.1768	2021
NNI	Ratio of noninterest income to total assets (%)	34.6322	34.2700	93.1800	0.1900	17.8628	3457
FBA	Ratio of foreign banks' assets to the banking system's total assets (%)	39.2654	28.0000	100	0	33.7406	1157
FBN	Ratio of number of foreign banks to each country's total number of banks (%)	36.2238	32.0000	100	0	27.7401	2542
CR3	Share of three largest banks' total assets (%)	68.2196	70.0100	100	3.0000	23.1072	2819
LERNER	Lerner index	0.2668	0.2600	22.7000	−44.6400	1.1809	2329
CAR	Ratio of total capital to risk-weighted assets (%)	14.8008	14.7000	45.2800	0.0400	6.4699	2031
LDR	Ratio of total loans to total deposits (%)	98.6726	86.1100	2861.0600	1.1400	75.6312	7778
OVER	Ratio of overhead cost to total assets (%)	4.1600	3.1900	89.4200	0	4.2912	3284
DEPTH	Ratio of bank credit to gross domestic product (%)	38.1031	26.1500	312.1500	0	36.2217	7224
GDPG	Annual growth of gross domestic product (%)	8.6911	7.8990	409.3292	−75.2464	16.5374	8307

Source: Author's calculation.

Table 2
Foreign penetration and credit risk in banking.

Variables	All countries		Advanced markets		Emerging markets	
	NPL	*NPL*	*NPL*	*NPL*	*NPL*	*NPL*
FBA(-1)	**0.03941** (0.017)**		0.00610 (0.028)		**0.06438** (0.023)***	
FBN(-1)		**−0.06479** (0.018)***		−0.00549 (0.027)		**−0.05027** (0.027)**
CR3(-1)	0.03858 (0.018)**	0.07946 (0.013)***	0.07624 (0.028)***	0.06061 (0.019)***	0.00831 (0.023)	0.06691 (0.017)***
LERNER(-1)	−9.74797 (1.969)***	−5.97871 (1.324)***	−9.30030 (2.534)***	−3.58917 (1.480)**	−10.29480 (2.812)***	−9.85239 (2.179)***
CAR(-1)	0.11073 (0.049)**	0.00505 (0.046)	0.32737 (0.089)***	0.14321 (0.081)*	0.03011 (0.064)	−0.05266 (0.060)
LDR(-1)	0.01048 (0.008)	0.03276 (0.007)***	0.02919 (0.011)**	0.03245 (0.009)***	0.00126 (0.010)	0.03266 (0.011)***
OVER(-1)	−0.04136 (0.040)	0.05919 (0.047)	−0.34051 (0.262)	0.00408 (0.183)	−0.02867 (0.044)	0.06065 (0.052)
DEPTH(-1)	0.03370 (0.014)**	0.06331 (0.011)***	−0.00958 (0.015)	0.04173 (0.012)***	0.09167 (0.027)***	0.05187 (0.025)**
GDPG(-1)	−0.06990 (0.012)***	−0.09857 (0.013)***	−0.08520 (0.020)***	−0.08328 (0.019)***	−0.05737 (0.016)***	−0.08592 (0.017)***
Constant	1.07118 (1.964)	1.58761 (1.645)	−5.09482 (3.245)	−4.64122 (2.183)**	5.13074 (2.561)**	9.36397 (2.662)***
Observations	779	1,227	338	572	441	655
R-squared	0.214	0.354	0.406	0.308	0.197	0.450
Number of countries	100	100	44	44	56	56

Notes: Definition of variables follows Table 1. Models are estimated using panel least squares regression, taking into account country-level and time fixed effects. Robust standard errors are shown in parentheses. *** indicates significance at the 1% level, while ** and * indicate significance at the 5% and 10% levels, respectively.

Source: Authors' calculation.

Table 3
Foreign penetration, concentration, and credit risk in banking.

Variables	All countries	Advanced markets	Emerging markets	All countries	Advanced markets	Emerging markets
	NPL	*NPL*	*NPL*	*NPL*	*NPL*	*NPL*
FBA(−1)	0.05004 (0.063)	−0.05293 (0.064)	0.09585 (0.052)			
FBA(−1) x CR3(−1)	−0.00017 (0.001)	0.00091 (0.001)	−0.00053 (0.001)			
FBN(-1)				**0.07974** (0.037)**	**−0.13929** (0.053)***	**0.29439** (0.050)***
FBN(-1) x CR3(−1)				**−0.00218** (0.000)***	**0.00177** (0.001)***	**−0.00558** (0.001)***
CR3(-1)	0.04429 (0.035)	0.05476 (0.035)	0.02761 (0.036)	0.15070 (0.020)***	0.00182 (0.028)	0.24710 (0.028)***
LERNER(−1)	−9.72419 (2.712)***	−9.28339 (2.534)***	−10.14360 (2.823)***	−5.45800 (1.317)***	−3.71034 (1.469)**	−7.94820 (2.080)***
CAR(-1)	0.11173 (0.073)	0.32233 (0.089)***	0.03163 (0.064)	0.02379 (0.046)	0.13952 (0.080)*	−0.01588 (0.057)
LDR(-1)	0.01045 (0.012)	0.02895 (0.011)**	0.00118 (0.010)	0.03049 (0.007)***	0.03462 (0.009)***	0.02859 (0.010)***
OVER(−1)	−0.04139 (0.020)**	−0.35545 (0.263)	−0.02847 (0.044)	0.05816 (0.046)	−0.00631 (0.181)	0.06453 (0.050)
DEPTH(−1)	0.03342 (0.026)	−0.00734 (0.015)	0.09117 (0.027)***	0.06560 (0.011)***	0.03962 (0.012)***	0.05228 (0.023)**
GDPG(−1)	−0.06936 (0.015)***	−0.08678 (0.020)***	−0.05560 (0.016)***	−0.09312 (0.013)***	−0.08395 (0.019)***	−0.06852 (0.016)***
Constant	0.71023 (3.490)	−3.66274 (3.535)	3.95723 (3.093)	−3.81308 (2.022)*	0.07607 (2.689)	−3.42275 (2.979)
Observations	779	338	441	1,227	572	655
R-squared	0.214	0.408	0.198	0.365	0.320	0.506
Number of countries	100	44	56	100	44	56

Notes: Definition of variables follows Table 1. Models are estimated using panel least squares regression taking into account country-level and time-fixed effects. Robust standard errors are shown in parentheses. *** indicates significance at the 1% level, while ** and * indicate significance at the 5% and 10% levels, respectively.

Source: Authors' calculation.

Table 4
Foreign penetration, market power, and credit risk in banking.

Variables	All countries	Advanced markets	Emerging markets	All countries	Advanced markets	Emerging markets
	NPL	*NPL*	*NPL*	*NPL*	*NPL*	*NPL*
FBA(−1)	**0.04784** (0.023)**	0.02725 (0.030)	0.04413 (0.037)			
FBA(−1) x LERNER(−1)	−0.03390 (0.063)	−0.11729 (0.071)	0.07142 (0.104)			
FBN(−1)				**−0.07857** (0.024)***	0.01368 (0.048)	**−0.14039** (0.064)**
FBN(−1) x LERNER(−1)				0.05212 (0.057)	−0.08264 (0.110)	**0.31325** (0.115)***
CR3(−1)	0.03889 (0.018)**	0.07553 (0.028)***	0.00731 (0.023)	0.07899 (0.013)***	0.05948 (0.038)	0.05894 (0.038)
LERNER(−1)	−8.58254 (2.930)***	−5.47439 (3.418)	−12.80038 (4.611)***	−7.36728 (2.005)***	−1.69818 (2.561)	−19.53747 (4.306)***
CAR(−1)	0.10893 (0.049)**	0.30327 (0.089)***	0.02925 (0.064)	0.00570 (0.046)	0.13544 (0.143)	−0.05693 (0.113)
LDR(−1)	0.01036 (0.008)	0.02892 (0.011)**	0.00149 (0.010)	0.03267 (0.007)***	0.03208 (0.019)*	0.03179 (0.020)
OVER(−1)	−0.03901 (0.040)	−0.34717 (0.261)	−0.03374 (0.045)	0.05970 (0.047)	−0.02774 (0.259)	0.05202 (0.055)
DEPTH(−1)	0.03351 (0.014)**	−0.01076 (0.015)	0.09225 (0.027)***	0.06382 (0.011)***	0.04097 (0.018)**	0.05366 (0.049)
GDPG(−1)	−0.06953 (0.012)***	−0.08383 (0.020)***	−0.05839 (0.016)***	−0.09918 (0.013)***	−0.08190 (0.023)***	−0.09029 (0.022)***
Constant	0.76492 (2.046)	−5.45654 (3.242)*	5.93867 (2.821)**	1.93443 (1.687)	−4.73737 (4.364)	12.40277 (4.281)***
Observations	779	338	441	1,227	572	655
R-squared	0.214	0.412	0.198	0.354	0.310	0.459
Number of countries	100	44	56	100	44	56

Notes: Definition of variables follows Table 1. Models are estimated using panel least squares regression taking into account country-level and time fixed effects. Robust standard errors are shown in parentheses. *** indicates significance at the 1% level, while ** and * indicate significance at the 5% and 10% levels, respectively.

Source: Authors' calculation.

Table 5
Foreign penetration and noninterest income in banking.

Variables	All countries		Advanced markets		Emerging markets	
	NNI	*NNI*	*NNI*	*NNI*	*NNI*	*NNI*
FBA(−1)	**0.14450** (0.044)***		**0.40776** (0.091)*		0.03032 (0.048)	
FBN(−1)		**−0.06691** (0.035)*		−0.11713 (0.067)		−0.05425 (0.044)
CR3(−1)	0.03479 (0.043)	0.09548 (0.025)***	0.03299 (0.094)	0.09208 (0.048)*	0.05946 (0.046)	0.06575 (0.030)**
LERNER(−1)	−8.87938 (4.935)*	−7.05223 (2.567)***	−10.66156 (8.332)	0.25136 (3.690)	−7.35087 (5.875)	−16.86065 (3.672)***
CAR(−1)	0.25137 (0.123)**	−0.05278 (0.088)	0.02428 (0.291)	−0.08136 (0.197)	0.30861 (0.135)**	−0.01612 (0.099)
LDR(−1)	−0.00096 (0.019)	0.01083 (0.014)	0.05547 (0.037)	0.04053 (0.021)*	−0.03563 (0.022)	−0.01933 (0.018)
OVER(−1)	0.24578 (0.101)**	0.51118 (0.090)***	−0.39135 (0.864)	0.68017 (0.451)	0.26226 (0.093)***	0.45157 (0.089)***
DEPTH(−1)	0.05759 (0.033)*	0.00525 (0.021)	0.03160 (0.046)	−0.00682 (0.027)	0.06960 (0.058)	−0.04096 (0.042)
GDPG(−1)	0.02309 (0.031)	−0.04103 (0.025)*	−0.02521 (0.067)	−0.04046 (0.048)	0.03970 (0.034)	−0.03935 (0.029)
Constant	27.66880 (4.826)***	31.77326 (3.121)***	22.08659 (10.552)**	28.57460 (5.313)***	30.02013 (5.375)***	42.22558 (4.513)***
Observations	794	1,267	344	585	450	682
R-squared	0.460	0.355	0.517	0.340	0.480	0.418
Number of countries	100	102	44	44	56	58

Notes: Definition of variables follows Table 1. Models are estimated using panel least squares regression taking into account country-level and time-fixed effects. Robust standard errors are shown in parentheses. *** indicates significance at the 1% level, while ** and * indicate significance at the 5% and 10% levels, respectively.

Source: Authors' calculation.

between competition and stability in banking when different measures of bank competition are used (i.e., bank concentration and market power). However, they do not consider the interaction term between bank concentration (or bank market power) and foreign bank penetration.

From Tables 5–7, we replace *NPL* with *NNI* as a dependent variable in order to provide insights into whether the loss leader (or cross-selling) hypothesis can explain the joint impact of foreign penetration and bank competition on nonperforming loans. Overall, we find that all the negative or positive coefficients between explanatory variables of interest (i.e., *FBA*, *FBN*, *FBA* x *CR3*, *FBA* x *LERNER*, *FBN* x *CR3*, or *FBN* x *LERNER*) and *NPL* as shown from Tables 2–4 are consistent with the positive or negative coefficients between all variables of interest and *NNI* as a dependent variable. These results suggest that the link between foreign penetration, competition, and credit risk in banking can be explained by bank cross-selling behavior, which tends to loosen credit standards in order to sell noninterest income-generating products.

Table 6
Foreign penetration, concentration, and noninterest income in banking.

Variables	All countries	Advanced markets	Emerging markets	All countries	Advanced markets	Emerging markets
	NNI	*NNI*	*NNI*	*NNI*	*NNI*	*NNI*
FBA(−1)	0.15477 (0.098)	0.29505 (0.210)	0.13126 (0.105)			
FBA(−1) x CR3(−1)	−0.00017 (0.001)	0.00173 (0.003)	−0.00172 (0.002)			
FBN(−1)				**0.05539** (0.071)*	−0.18878 (0.130)	**0.15645** (0.087)*
FBN(−1) x CR3(−1)				**−0.00186** (0.001)**	0.00095 (0.001)	**−0.00344** (0.001)***
CR3(−1)	0.04008 (0.062)	−0.00836 (0.117)	0.11766 (0.071)*	0.15664 (0.039)***	0.05977 (0.069)	0.17679 (0.049)***
LERNER(−1)	−8.85026 (4.944)*	−10.69476 (8.342)	−6.80927 (5.894)	−6.60387 (2.573)**	0.17183 (3.694)	−15.72937 (3.673)***
CAR(−1)	0.25248 (0.123)**	0.01323 (0.292)	0.31490 (0.135)**	−0.03629 (0.088)	−0.08503 (0.197)	0.00597 (0.099)
LDR(−1)	−0.00097 (0.019)	0.05472 (0.037)	−0.03577 (0.022)	0.00871 (0.014)	0.04176 (0.021)**	−0.02261 (0.018)
OVER(−1)	0.24584 (0.101)**	−0.41439 (0.866)	0.26411 (0.093)***	0.51067 (0.090)***	0.67596 (0.451)	0.45415 (0.089)***
DEPTH(−1)	0.05735 (0.033)*	0.03494 (0.046)	0.06779 (0.058)	0.00737 (0.021)	−0.00814 (0.027)	−0.04052 (0.042)
GDPG(−1)	0.02365 (0.031)	−0.02854 (0.067)	0.04578 (0.034)	−0.03616 (0.025)	−0.04107 (0.048)	−0.02877 (0.029)
Constant	27.32229 (5.659)***	24.99432 (11.638)**	26.34809 (6.348)***	27.16871 (3.883)***	31.18118 (6.686)***	34.50668 (5.254)***
Observations	794	344	450	1,267	585	682
R-squared	0.460	0.517	0.482	0.357	0.341	0.425
Number of countries	100	44	56	102	44	58

Notes: Definition of variables follows Table 1. Models are estimated using panel least squares regression taking into account country-level and time-fixed effects. Robust standard errors are shown in parentheses. *** indicates significance at the 1% level, while ** and * indicate significance at the 5% and 10% levels, respectively.

Source: Authors' calculation.

Table 7
Foreign penetration, market power, and noninterest income in banking.

Variables	All countries	Advanced markets	Emerging markets	All countries	Advanced markets	Emerging markets
	NNI	*NNI*	*NNI*	*NNI*	*NNI*	*NNI*
FBA(−1)	0.09576 (0.101)	**0.40656** (0.202)*	−0.16581 (0.102)			
FBA(−1) x LERNER(−1)	0.19367 (0.186)	0.00675 (0.197)	**0.68005** (0.242)***			
FBN(−1)				−0.05099 (0.046)	0.01262 (0.074)	**−0.32759** (0.065)***
FBN(−1) x LERNER(−1)				−0.06013 (0.109)	**−0.55759** (0.145)***	**0.95374** (0.170)***
CR3(-1)	0.03204 (0.050)	0.03300 (0.118)	0.04653 (0.053)	0.09603 (0.025)***	0.08502 (0.047)*	0.04179 (0.029)
LERNER(−1)	−15.62618 (6.746)**	−10.88288 (10.910)	−31.55862 (8.478)***	−5.44009 (3.891)	13.10314 (4.936)***	−46.41484 (6.358)***
CAR(−1)	0.25928 (0.151)*	0.02560 (0.374)	0.29356 (0.177)	−0.05298 (0.088)	−0.11881 (0.195)	−0.03023 (0.097)
LDR(−1)	−0.00051 (0.022)	0.05547 (0.045)	−0.03423 (0.019)*	0.01095 (0.014)	0.03815 (0.021)*	−0.02263 (0.017)
OVER(−1)	0.23209 (0.056)***	−0.39115 (1.214)	0.21369 (0.064)***	0.51062 (0.091)***	0.45675 (0.449)	0.42490 (0.087)***
DEPTH(−1)	0.05937 (0.040)	0.03169 (0.045)	0.07824 (0.070)	0.00449 (0.021)	−0.01330 (0.027)	−0.03441 (0.041)
GDPG(−1)	0.02134 (0.034)	−0.02531 (0.082)	0.03274 (0.032)	−0.04029 (0.025)	−0.02948 (0.047)	−0.05285 (0.028)*
Constant	29.52252 (7.594)***	22.11065 (14.011)	38.07446 (9.120)***	31.36991 (3.206)***	27.78128 (5.247)***	51.49787 (4.700)***
Observations	794	344	450	1,267	585	682
R-squared	0.461	0.517	0.494	0.355	0.359	0.447
Number of countries	100	44	56	102	44	58

Notes: Definition of variables follows Table 1. Models are estimated using panel least squares regression taking into account country-level and time-fixed effects. Robust standard errors are shown in parentheses. *** indicates significance at the 1% level, while ** and * indicate significance at the 5% and 10% levels, respectively.

Source: Authors' calculation.

5. Conclusion

This paper extends prior literature on the foreign bank–stability nexus and the competition-stability nexus in banking by using a global sample of 206 countries during the 1960–2015 period. Our empirical findings show complex relationships between foreign bank penetration, competition, and credit risk in banking, depending on the measurement of foreign bank penetration and competition, as well as country income status.

In general, the increased number of foreign banks, not higher foreign banks' assets, contribute to alleviating nonperforming loans. However, the negative association between the number of foreign banks and nonperforming

loans is conditional on the measurement of bank competition and country income status. For emerging markets, the number of foreign banks is negatively linked to nonperforming loans after bank concentration exceeds a certain threshold or when bank market power is sufficiently weak. With regard to advanced markets, the increased presence of foreign banks can also reduce nonperforming loans, particularly when bank concentration does not exceed a certain level. In addition, we find that the loss-leader (or cross-selling) hypothesis explains bank risk-taking behavior in excaerbating nonperforming loans in response to changes in foreign bank penetration and competition in banking.

Eventually, this study provides various policy implications to mitigate nonperforming loans. First, encouraging foreign penetration in banking to increase the quality of credit risk management needs to take modes of entry into close consideration, because there is a different impact of foreign bank penetration depending on its measure. Specifically, it is higher share of foreign bank branches, not foreign bank total assets, that alleviates nonperforming loans, particularly in emerging markets. Second, strengthening bank concentration in addition to boosting the entry of foreign bank branches is also necessary to deal with nonperforming loans, especially for emerging markets. Third, providing incentives for the banking industry to avoid cross-selling strategies in boosting noninterest income is also worth considering, given the fact that changes in nonperforming loans due to foreign penetration and competition in banking can be partly explained by changes in noninterest income.

Conflicts of interest

The authors declare that there is no conflict of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.bir.2019.05.003.

References

Altunbas, Y., Carbo, S., Gardner, E., & Molyneux, P. (2007). Examining the relationship between capital, risk and efficiency in European banking. *European Financial Management, 13*(1), 49–70.

Amidu, M., & Wolfe, S. (2013). Does bank competition and diversification lead to greater stability? Evidence from emerging markets. *Review of Development Finance, 3*, 152–166.

Ariss, R. T. (2010). On the implications of market power in banking: Evidence from developing countries. *Journal of Banking & Finance, 34*, 765–775.

Baele, L., De Jonghe, O., & Vennet, R. V. (2007). Does the stock market value bank diversification? *Journal of Banking & Finance, 31*, 1999–2023.

Berger, A., Klapper, L., & Turk-Ariss, R. (2009). Bank competition and financial stability. *Journal of Financial Services Research, 35*, 99–118.

Bitar, M., Pukthuanthong, K., & Walker, T. (2018). The effect of capital ratios on the risk, efficiency and profitability of banks: Evidence from OECD countries. *Journal of International Financial Markets, Institutions and Money, 53*, 227–262.

Bouvatier, V., & Lepetit, L. (2012). Effects of loan loss provisions on growth in bank lending: Some international comparisons. *International Economics, 132*, 91–116.

Boyd, J. H., & De Nicoló, G. (2005). The theory of bank risk-taking and competition revisited. *The Journal of Finance, 60*, 1329–1343.

Boyd, J. H., De Nicolo, G., & Jalal, A. M. (2006). *Bank risk taking and competition revisited: New theory and evidence*. IMF Working Paper. WP/06/297.

Boyd, J. H., De Nicolo, G., & Smith, B. D. (2004). Crises in competitive versus monopolistic banking systems. *Journal of Money, Credit, and Banking, 36*, 487–506.

Carletti, E., Hartmann, P., & Spangnolo, G. (2007). Bank mergers, competition, and liquidity. *Journal of Money, Credit, and Banking, 36*, 1067–1105.

Chen, S.-H., & Liao, C. C. (2011). Are foreign banks more profitable than domestic banks? Home and host country effects of banking market structure, governance, and supervision. *Journal of Banking & Finance, 35*, 819–839.

Cihak, M., Demirguc-Kunt, A., Feyen, E., & Levine, R. (2012). *Benchmarking financial systems around the world*. World Bank Policy Research Working Paper WPS6175.

Claessens, S., & Laeven, A. (2004). What drives bank competition? Some international evidence. *Journal of Money, Credit, and Banking, 36*(3), 563–583.

Claessens, S., & Van Horen, N. (2012). *Foreign banks: Trends, impact and financial stability*. IMF Working Paper No. 12/10.

Claeys, S., & Hainz, C. (2014). Modes of foreign bank entry and effects on lending rates: Theory and evidence. *Journal of Comparative Economics, 42*, 160–177.

Demirguc-Kunt, A., Laeven, L., & Levine, R. (2004). Regulations, market structure, institutions, and the cost of financial intermediation. *Journal of Money, Credit, and Banking, 36*(3), 593–622.

Dimitrios, A., Helen, L., & Mike, T. (2016). Determinants of non-performing loans: Evidence from Euro-area countries. *Finance Research Letters, 18*, 116–119.

Domanski, D. (2005). Foreign banks in emerging economies: Changing players changing issues. *BIS Quarterly Review December*, 69–81.

Foos, D., Norden, L., & Weber, M. (2010). Loan growth and riskiness of banks. *Journal of Banking & Finance, 34*(12), 2929–2940.

Fu, X., Lin, Y., & Molyneux, P. (2014). Bank competition and financial stability in Asia Pacific. *Journal of Banking & Finance, 38*, 64–77.

Guidara, A., Soumaré, I., & Tchana, F. (2013). Banks' capital buffer, risk and performance in the Canadian banking system: Impact of business cycles and regulatory changes. *Journal of Banking & Finance, 37*, 3373–3387.

Hirtle, J., & Stiroh, K. J. (2007). The return to retail and performance of US banks. *Journal of Banking & Finance, 31*, 1101–1133.

Jeon, B. M., Olivero, M. P., & Wu, J. (2011). Do foreign banks increase competition? Evidence from emerging Asian and Latin American banking markets. *Journal of Banking & Finance, 35*, 856–875.

Keeley, M. (1990). Deposit insurance, risk, and market power in banking. *The American Economic Review, 80*, 1183–1200.

Lehner, M., & Schnitzer, M. (2008). Entry of foreign banks and their impact on host countries. *Journal of Comparative Economics, 36*(3), 430–452.

Lensink, R., & Hermes, N. (2004). Short-term effects of foreign bank entry on domestic bank behaviour: Does economic development matter? *Journal of Banking & Finance, 28*, 553–568.

Lepetit, L., Nys, E., Rous, P., & Tarazi, A. (2008). The expansion of services in European banking: Implications for loan pricing and interest margins. *Journal of Banking & Finance, 32*(8), 1452–1467.

Mercieca, S., Schaeck, K., & Wolfe, S. (2007). Small European banks: Benefits from diversification? *Journal of Banking & Finance, 31*, 1975–1998.

Mishkin, F. (2006). *The next great globalization: How disadvantaged nations can harness their financial systems to get rich*. Princeton, N.J: Princeton University Press.

Pería, M., Soledad, M., & Mody, A. (2004). How foreign participation and market concentration impact bank spreads: Evidence from Latin America. *Journal of Money, Credit, and Banking, 36*, 511–537.

Popov, A., & Udell, G. F. (2012). Cross-border banking, credit access, and the financial crisis. *Journal of International Economics, 87*(1), 147–161.

Sanya, S., & Wolfe, S. (2011). Can bank in emerging market benefits from revenue diversification. *Journal of Financial Services Research, 40*, 79–101.

Soedarmono, W., Machrouh, F., & Tarazi, A. (2013). Bank competition, crisis and risk taking: Evidence from emerging markets in Asia. *Journal of International Financial Markets, Institutions and Money, 23*, 196–221.

Soedarmono, W., Sitorus, D., & Tarazi, A. (2017). Abnormal loan growth, credit information sharing and systemic risk in Asian banks. *Research in International Business and Finance, 42*, 1208–1218.

Soedarmono, W., & Tarazi, A. (2016). Competition, financial intermediation and riskiness of banks: Evidence from the Asia-Pacific region. *Emerging Markets Finance and Trade, 52*(4), 961–974.

Stiroh, K. J. (2004). Diversification in banking: Is non-interest income the answer? *Journal of Money, Credit, and Banking, 36*, 853–882.

Trinugroho, I., Agusman, A., & Tarazi, A. (2014). Why have bank interest margins been so high in Indonesia since the 1997/1998 financial crisis? *Research in International Business and Finance, 32*, 139–158.

Uhde, A., & Heimeshoff, U. (2009). Consolidation in banking and financial stability in Europe: Empirical evidence. *Journal of Banking & Finance, 33*, 1299–1311.

Vanhoose, D. (2007). Theories of bank behavior under capital regulation. *Journal of Banking & Finance, 31*, 3680–3697.

Williams, B. (2016). The impact of non-interest income on bank risk in Australia. *Journal of Banking & Finance, 73*, 16–37.

Williams, J., & Nguyen, N. (2005). Financial liberalisation, crisis, and restructuring: A comparative study of bank performance and bank governance in South East Asia. *Journal of Banking & Finance, 29*, 2119–2154.

Wu, J., Jeon, B. N., & Luca, A. (2010). Foreign bank penetration, resource allocation and economic growth: Evidence from emerging economies. *Journal of Economic Integration, 25*(1), 166–192.

Wu, J., Chen, M., Jeon, B. N., & Wang, R. (2017). Does foreign bank penetration affect the risk of domestic banks? Evidence from emerging economies. *Journal of Financial Stability, 31*, 45–61.

Yeyati, E. L., & Micco, A. (2007). Concentration and foreign penetration in Latin American banking sectors: Impact on competition and risk. *Journal of Banking & Finance, 31*, 1633–1647.

Zhang, D., Cai, J., Dickinson, D. G., & Kutan, A. (2016). Non-performing loans, moral hazard and regulation of the Chinese commercial banking system. *Journal of Banking & Finance, 63*, 48–60.

Borsa Istanbul Review

COUNTRY

Turkey

Universities and research institutions in Turkey

SUBJECT AREA AND CATEGORY

Economics, Econometrics and Finance
- Economics and Econometrics
- Finance

PUBLISHER

Borsa Istanbul Anonim Sirketi

H-INDEX

16

PUBLICATION TYPE

Journals

ISSN

22148450, 22148469

COVERAGE

2013-2020

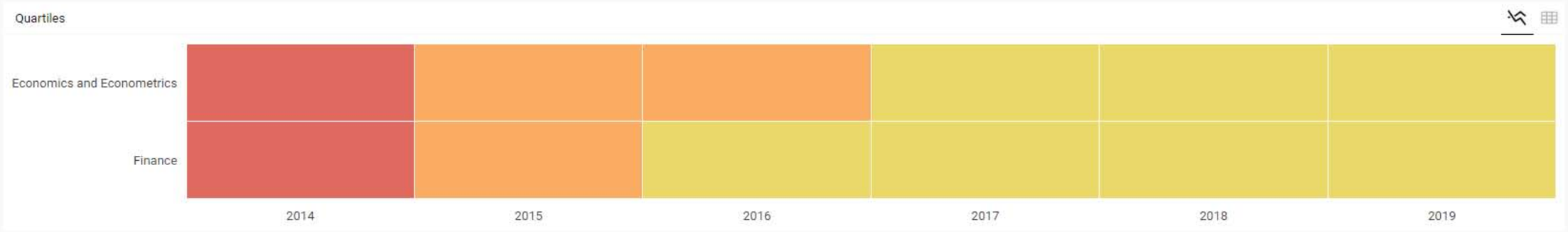
INFORMATION

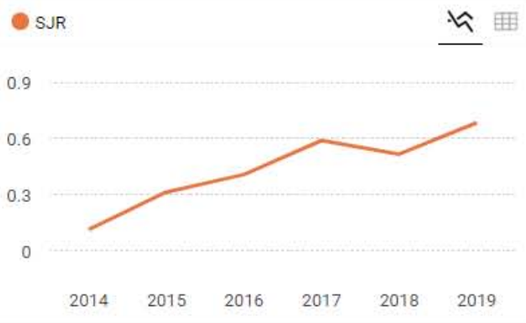
Homepage

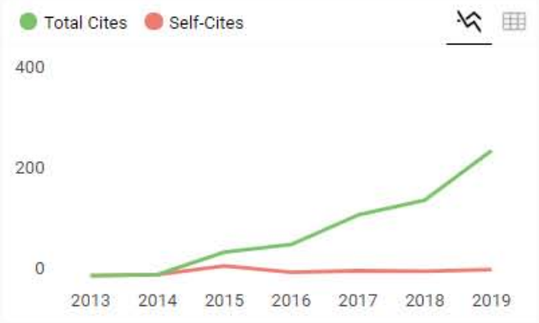
How to publish in this journal

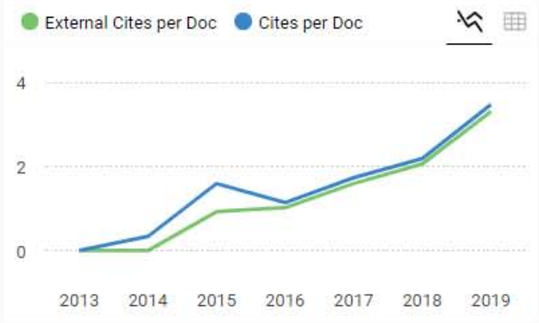
SCOPE

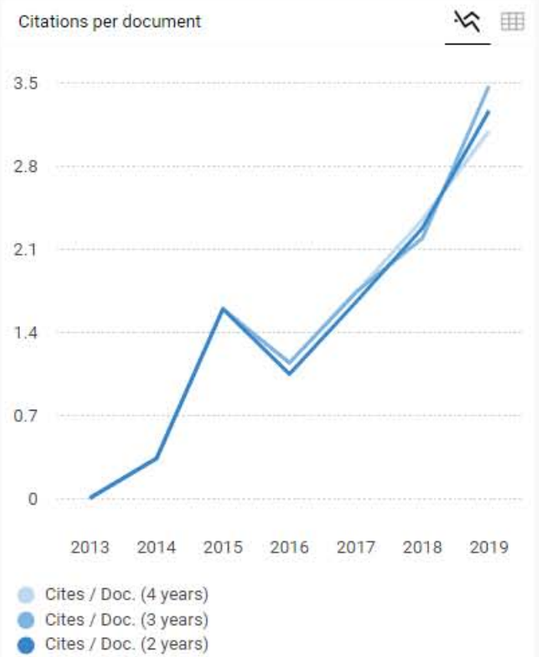
Borsa İstanbul Review provides a scholarly platform for empirical financial studies including but not limited to financial markets and institutions, financial economics, investor behavior, financial centers and market structures, corporate finance, recent economic and financial trends. Micro and macro data applications and comparative studies are welcome. Country coverage includes advanced, emerging and developing economies. In particular, we would like to publish empirical papers with significant policy implications and encourage submissions in the following areas: Research Topics: • Investments and Portfolio Management • Behavioral Finance • Financial Markets and Institutions • Market Microstructure • Islamic Finance • Financial Risk Management • Valuation • Capital Markets Governance • Financial Regulations


Quartiles
Economics and Econometrics
Finance
2014
2015
2016
2017
2018
2019

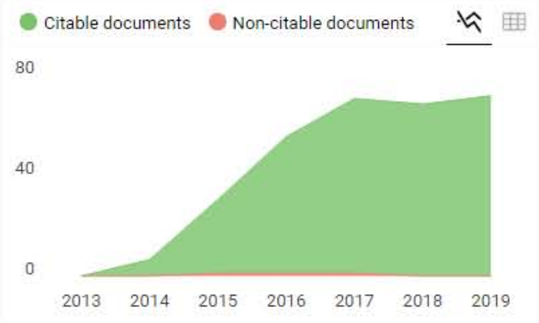

SJR
0.9
0.6
0.3
0
2014
2015
2016
2017
2018
2019

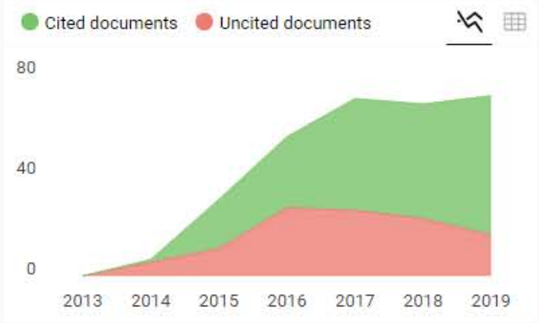

Total Cites
Self-Cites
400
200
0
2013
2014
2015
2016
2017
2018
2019


External Cites per Doc
Cites per Doc
4
2
0
2013
2014
2015
2016
2017
2018
2019


Citations per document
3.5
2.8
2.1
1.4
0.7
0
2013
2014
2015
2016
2017
2018
2019
Cites / Doc. (4 years)
Cites / Doc. (3 years)
Cites / Doc. (2 years)


% International Collaboration
60
40
20
0
2013
2014
2015
2016
2017
2018
2019


Citable documents
Non-citable documents
80
40
0
2013
2014
2015
2016
2017
2018
2019


Cited documents
Uncited documents
80
40
0
2013
2014
2015
2016
2017
2018
2019


Borsa Istanbul Review
Q2
Economics and Econometrics
best quartile
SJR 2019
0.68
powered by scimagojr.com
← Show this widget in your own website
Just copy the code below and paste within your html code:
<a href="https://www.scima