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The short-term effects of foreign bank entry on domestic bank behaviour: Does economic development matter?

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Abstract

This paper investigates the short-term effects of foreign bank entry on the behaviour of the domestic banking sector. We hypothesise that these effects are dependent on the level of economic development of the host country. Our investigation shows that at lower levels of economic development foreign bank entry is generally associated with higher costs and margins for domestic banks. At higher levels of economic development the effects appear to be less clear: foreign bank entry is either associated with a fall of costs, profits and margins of domestic banks, or is not associated with changes in these domestic bank variables.

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1. Introduction

Since the 1960s, international banking activity has grown quickly due to increased international trade flows and foreign direct investment activities, the globalisation

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of capital markets, and the liberalisation of domestic financial markets. [2] International banking activities may involve cross-border activities and activities of banks outside their home country (i.e. foreign banks). Of these two aspects of international banking, especially the activities of foreign banks have received increased interest recently. In many emerging market economies in particular, the presence of foreign banks has increased dramatically, especially during the late 1990s. In south-east Asia foreign bank control of the domestic financial market (measured as the ratio of assets of banks where foreigners own more than 50% of total equity over total assets of the entire banking sector) rose from 1.6 % in 1994 to 6% in 1999. Foreign bank control rose from 7.5% to 25% during the same period in Latin America. In Eastern Europe the rise of foreign control was most dramatic: from almost 8% in 1994 to 52% in 1999 (IMF, 2000, p. 153). Among other things, these increases in foreign bank control are due to the fact that since the early 1990s many countries have implemented financial liberalisation policies, allowing foreign banks to set up branches and domestic banks to be foreign-owned.

The increased presence of foreign banks raises questions about their effects on the domestic banking sector. This paper aims at empirically analysing the effects of foreign banks on the operation of domestic banks. It provides an econometric analysis based on bank level data for 48 countries for the period 1990–1996 with respect to operations of domestic banks and investigates how foreign bank entry may influence the activities of domestic banks. In particular, we are interested in investigating the short-term effects of foreign bank entry on the *efficiency* of the domestic banking system. Our point of departure is a paper by Claessens et al. (2001). In this paper, Claessens et al. show that foreign entry improves the functioning of national banking markets through increased market competition and improved efficiency of domestic banks. We elaborate on this finding and investigate to what extent the short-term effects of foreign entry on domestic banks may depend on the level of economic development of the host country. Based on the theoretical literature there are good reasons to believe that the level of economic development plays a crucial role in determining the effects of foreign bank entry on the domestic banking system, at least in the short-term. [3]

The remainder of this paper is organised as follows. Section 2 provides a brief survey of the discussion on the effects of foreign bank entry on the domestic financial market. Section 3 discusses the data and the empirical model. Section 4 discusses the methodology and presents the results of the empirical analysis. Section 5 provides our interpretation of the results. Section 6 concludes.

[2] Mullineux and Murinde (2002) provide a comprehensive overview of the major issues related to international banking.

[3] Ideally we would have like to analyse both short- and long-term effects of foreign bank entry on domestic bank behaviour. However, this would require estimating a dynamic error correction model, in which both short- and long-term effects are included. Yet, given the short time series we have (1990–1996), we are not able to estimate such a model.

2. Foreign bank entry and domestic bank behaviour: A brief survey

In the literature, several issues on the effects of foreign bank entry on domestic financial markets and institutions have been discussed. For instance, several papers focus on issues such as the differences in comparative advantages in financial services between countries and, the effects of foreign bank entry on the overall stability of the domestic financial system, etc. [4] In our survey below, we focus on one specific issue discussed in the literature, i.e. the arguments that have been forwarded to describe the relationship between foreign bank entry and domestic bank behaviour.

2.1. Effects of foreign banks on domestic bank behaviour: The arguments

Before the wave of financial liberalisation in the 1990s, countries often used various policies to restrict entry of foreign banks (and in several countries at least some of these policies are still in place). These policies reflected the strong hesitation governments used to have to open domestic financial markets to foreign competition. In the 1990s, restrictions on foreign bank entry were reduced considerably. This took place in the context of a more widely applied opening up of domestic markets to foreign competition. The opening up of domestic financial markets indicates that the view of governments with respect to the effects of foreign bank on domestic banks has changed. Several arguments may support the lifting of restrictions on foreign bank entry (Cho, 1990; Levine, 1996; Buch, 1997; Berger and Hannan, 1998).

First, the presence of foreign banks may stimulate domestic banks to reduce costs, increase efficiency and increase the diversity of financial services through competition. In the presence of foreign banks domestic banks are pressured to improve the quality of their services in order to retain their market shares. This may improve the quality of financial services of domestic banks. In particular, foreign bank presence may put old-style banking practices under pressure. Moreover, increased competition may lead to lower interest rate margins and profits.

Second, foreign bank entry may lead to positive spill-over effects. To begin with, foreign banks may introduce new financial services. The introduction of these services may stimulate domestic banks to also develop such new services, improving the efficiency of financial intermediation of the domestic financial system. Moreover, foreign banks may also introduce modern and more efficient banking techniques that are new to domestic banks. These modern banking techniques may be copied. Additionally, foreign banks may help to improve management of domestic banks, especially if foreign banks directly participate in the management of a domestic bank, for example in the case of a joint-venture or a take-over. Foreign bank entry may also lead to improvements of bank regulation and supervision, since these banks may demand improved systems of regulation and supervision from the regulatory authorities in the recipient countries. This may contribute to improving the quality of banking

[4] See Dages et al. (2000), IMF (2000), Mathieson and Roldos (2001) and Hermes and Lensink (2002) for more comprehensive surveys of the effects of foreign bank entry on the domestic financial system.

operations of domestic banks. Finally, foreign bank entrance may contribute to a reduced influence of the government on the domestic financial sector, which may reduce the importance of directed credit policies. All these spill-over effects may contribute to more efficient domestic banking practices, which may help to reduce costs. Yet, these cost reductions may only occur in the longer term, since banks may need to incur costs first to implement new services, improve the quality of existing services and operations, and implement new bank management techniques.

Third, foreign banks may increase the quality of human capital in the domestic banking system in a number of ways. To begin with, if foreign banks import high-skilled bank managers to work in their foreign branches, local employees/bankers may learn from the practices of these foreign bank managers. Moreover, foreign banks may invest in training of local employees. Increasing the quality of available human capital for the domestic banking system may contribute to more efficient domestic banking practices, which may help to reduce costs. Again, however, cost reductions may only occur in the longer term, since banks may need to incur costs first to upgrade their staff.

2.2. Foreign banks and domestic bank behaviour: Empirical evidence

Empirical evidence with respect to the effects of foreign bank entry on domestic bank behaviour is scarce. In an early paper on the issue, Cho (1990) finds that foreign bank presence in Indonesia contributes to increased competition in the banking industry. The most comprehensive study on the efficiency and competition effects of foreign bank entry is provided by Claessens et al. (2001). Using a large data set containing individual bank accounting information of domestic banks in 80 countries for the period 1988–1995, they show that increased presence of foreign banks is associated with reductions of profitability, non-interest income and overall expenses of domestic banks. Apparently, the competitive pressure of foreign banks leads to positive efficiency effects at domestic banks. Moreover, they find that these efficiency effects occur as soon as foreign banks enter the market; they do not seem to depend on the market share of foreign banks. Their conclusion is that foreign bank entry enhances efficiency and improves the functioning of domestic banks. They do not investigate whether or not the effects of foreign entry on domestic banks depend on the level of economic development of the host country.

The methodology used in Claessens et al. (2001) is also used in a number of country-specific case studies. Denizer (2000) analyses the effects foreign bank entry has on domestic banks in Turkey. His empirical results show that net interest rate margins, returns on assets and overhead expenses of domestic banks decrease after foreign bank entry. These findings support the idea that foreign banks put competitive pressure on the domestic banks in Turkey, despite the fact that these foreign banks had a market share of only between 3.5% and 5% during the period 1970–1997.

Barajas et al. (2000) carry out a similar analysis focussing on the Colombian banking system and using individual bank accounting data for the 1985–1998 period. Their study shows that foreign entry generally increases competition in the domestic banking system as evidenced by reduced intermediation spreads. Yet, foreign entry is

also associated with a deterioration of reported loan quality among domestic banks. Moreover, administrative costs of domestic banks rise, possibly due to the fact that these banks have to upgrade their activities because of increased competitive pressure. Thus, in general foreign entry seems to be associated with an increase of costs for the domestic banking system.

2.3. Foreign banks and domestic bank behaviour: The role of the level of economic development

Overall, the available empirical literature appears to conclude that foreign entry has effects on the behaviour of the domestic banking system through increased competition and improved efficiency. This suggests that foreign bank entry has positive welfare effects. Yet, these studies do not analyse whether the effects of foreign bank entry on domestic bank behaviour are dependent on the level of economic development of the host country. There may be good reasons, however, to believe that the level of economic development may play a role in determining the effects of foreign bank entry on the domestic banking system. In particular, we hypothesise that the level of economic development matters when looking at the short-term effects of foreign bank entry on domestic bank behaviour.

First of all, the spill-over effects as described above may be more important for less developed countries, because they generally have less developed financial systems (King and Levine, 1993). Thus, there may be more room for improvement of domestic banking practices when foreign banks enter the market. In the long term, this may have a positive influence on the functioning of the domestic banking system. In the short-term, however, costs may increase and these cost increases may be larger the lower the level of economic development.

Second, a similar argument holds with respect to the upgrading of the available human capital in the host country. Less developed countries generally have lower levels of human capital. Foreign bank entry may have a larger effect on human capital development (and thus on efficiency improvements) the lower the level of development of the host country. Again, however, at least in the short-term, costs may increase and these cost increases may be larger the lower the level of economic development.

Finally, competitive pressure from foreign bank entry may be less strong in less developed countries with underdeveloped financial systems. First of all, it is generally accepted that one of the main causes of less developed financial systems is the use of financial repression policies – at present and/or in the past – and that these policies are among other things characterised by stimulating or creating segmented markets (Fry, 1995). Moreover, since domestic financial markets of less developed markets are less developed, foreign banks may be interested to only serve parts of the demand for financial services, such as export financing, financial leasing, etc. and serve only specific groups of clients, such as foreign-owned multinationals and/or large export-oriented domestic enterprises. Financial services to other groups of clients may be seen as less desirable, perhaps due to higher risks, and/or high levels of information and transaction costs. This may reduce the competitive pressure on domestic banks if these

banks are mostly active in serving those other groups of clients, i.e. consumer credit, credit to small and medium enterprises, etc. If competitive pressure is lower, domestic banks may be able to pass on increased costs due to spill-over effects to their clients in the short-term. This may even lead to higher margins on financial services of banks, i.e. when interest rates charged are raised more than the increase of the interest rates paid. In the longer term, foreign bank entry may increase competition and may reduce the role of financial repression policies, which may contribute to reduced margins and costs.

Thus, as the above short discussion indicates, the effects of foreign bank entry on domestic banks may depend on the level of economic development. More specifically, based on the previous discussion we would expect that, at least in the short-term, at lower levels of economic development foreign bank entry leads to increased *costs*, and perhaps also increased *margins*, of domestic banks. At higher levels of economic development the effects may be less clear: foreign bank entry either has no effects or costs and margins of domestic banks fall. The effect of foreign bank entry on *profits* of domestic banks at lower levels of development is ambiguous, since both costs and margins may rise. At higher levels of development we are inclined to believe that profits will decline due to higher competitive pressure. The empirical analysis presented in the remainder of the paper attempts to investigate this issue in depth.

3. Description of the data and the empirical model

In order to be able to investigate the short-term effects of foreign bank entry on the behaviour of domestic banks, we first need variables that measure the presence of foreign banks in a host country. In line with Claessens et al. (2001) we use two different variables to measure this. First, we take the ratio of the number of foreign banks to the total number of banks in the host country (FBNUM). This measure basically looks at the sheer presence of foreign banks. Second, we use the share of foreign bank assets to total bank assets of the host country (FBSHR). This measure takes into account the size of foreign banks as compared to their domestic counterparts. Both variables are calculated based on the data set provided by Beck et al. (2000). These data are available for the 1990–1996 period.

Next, we construct variables reflecting domestic bank behaviour. Following Claessens et al. (2001) we choose variables measuring income, profits and costs of domestic banks:

- Two variables reflecting income of banks: Net interest rate margin to total assets (NMARGIN) and net non-interest income to total assets (NINTINC).
- A measure reflecting profitability of banks: Before tax profits to total assets (PROF).
- Two measures reflecting costs of banks: Total overhead costs to total assets (OVERHEAD) and loan loss provisioning to total assets (LLPROV).

Changes in these variables may, among other things, be associated with changes in foreign bank presence through competition and/or efficiency effects. To construct

these variables we use individual bank accounting data coming from BankScope. This data base contains information on balance sheets and income statements of banks, covering on average around 90% of total bank assets of the countries included in the data set (Claessens et al., 2001). The BankScope data base covers the 1988–1996 period. We only use data for the 1990–1996 period, similar to the data range for both foreign bank entry variables. This leaves us with 3967 observations for each of the five bank variables.

The empirical model we use is defined as follows (Claessens et al., 2001, p. 905):

$$\Delta I_{ijt} = \alpha_0 + \beta \Delta FS_{jt} + \gamma_i \Delta B_{ijt} + \delta_j \Delta X_{jt} + \varepsilon_{ijt}, \quad (1)$$

where I_{ijt} is a vector of variables of interest for bank i in country j at time t, FS_{jt} is a vector of variables measuring foreign bank presence in country j at time t, B_{ijt} is a set of bank specific variables for bank i in country j at time t, and X_{jt} is a set of country specific variables for country j at time t. The B and X variables are included as control variables as suggested by Claessens et al. (2001, p. 906). The bank specific variables used in the estimations are the short- and long-term deposits plus other non-deposit short-term funding to total assets (CSTFUN), the book value of equity (assets minus liabilities) to total assets (EQUITY), cash, non-interest earning deposits at other banks, and other non-deposit short-term funding to total assets (NINTASS), and total overhead costs to total assets (OVERHEAD). The country-specific variables included in the estimations are annual growth rate of GDP (GROWTH), annual inflation rate (consumer prices) (INFL), and real GDP per capita in US dollars (GDPPC). In the analysis, we estimate ten equations, since we have five different dependent and two different foreign bank presence variables. All equations are estimated in first differences. Moreover, all equations are estimated with fixed effects and with time dummies. Finally, in order to control for differences in the amount of banks per country taken into account in the estimates, all variables for a particular country are weighted by the amount of domestic banks. This methodology is also used by Claessens et al. (2001).

4. Empirical analysis: Methodology and results

In order to be able to investigate whether and to what extent the level of economic development plays a role in determining the short-term effects of foreign bank entry on domestic bank behaviour we use two different approaches:

- we estimate Eq. (1) and use a threshold estimation technique;
- we incorporate an interactive term of foreign bank entry and the level of economic development in the regression model as specified in Eq. (1).

4.1. Threshold estimations

First, we use a threshold estimation technique. This technique allows us to investigate whether, and if so, at what level of economic development there is a statistically

significant change in the coefficient of either one of the two foreign bank entry variables in the regression model as specified in Eq. (1). We take real GDP per capita in US dollars (GDPPC) as our measure of economic development. The main advantage of the threshold estimation technique is that the value of GDPPC at which a significant change in coefficients occurs is endogenously determined in the estimation procedure. We apply the approach set out by Hansen (1999), who has further developed the statistical theory of threshold models. The regression model we estimate can be specified as follows:

$$I_{ijt} = \alpha_1 FS_{jt}\mathrm{IF}\left(\mathrm{GDPPC}_{jt} < \mathrm{THR}\right) + \alpha_2 FS_{jt}\mathrm{IF}(\mathrm{GDPPC}_{jt} > \mathrm{THR}) + \alpha_3 B_{ijt} + \alpha_4 X_{jt} + \varepsilon, \quad (2)$$

where THR is the threshold value of real GDP per capita (GDPPC) and IF is an indicator function that has a value one if the argument is true and zero otherwise.

We estimate the threshold by using so-called conditional least squares. First, the observations are sorted based on the values for the threshold variable. Next, the equation is estimated for all values of the threshold variable. For all threshold values, the sum of squared residuals is computed. The optimal value of the threshold is the value that minimises the sum of squared residuals. The search for the thresholds is restricted to specific quantiles (the more quantiles the finer the grid to which the search is limited). The advantage of this is that the amount of regressions is reduced, but that it still generates precise estimates (see Hansen, 1999, pp. 349–350).

The threshold estimation technique as developed by Hansen requires a balanced data set, i.e. we need to construct a data set with the same amount of observations per individual bank. We balance our dataset by only including three observations per bank, which allows us to cover the largest amount of countries possible. If for a certain bank more observations are available in the original set, we only use the most recent three observations. [5] The balanced data set includes information on 990 domestic banks in 48 countries.

The estimation results are presented in Table 1. We also present the threshold values of GDPPC as well as a likelihood ratio test (LLH) to test whether the threshold effect is statistically significant under the null hypothesis of no threshold. Finally, we present the sum of squared errors (SQR) for the model with threshold and the linear model without threshold (SQRL).

The table shows that the results differ per endogenous variable, and per foreign bank entry indicator. Generally however, they seem to confirm our hypothesis that the effects of foreign bank entry on domestic bank behaviour depend on the level of development of a country. First of all, for nine out of ten estimated equations we find

[5] Note that the balancing of the original data set substantially reduces the number of observations used in the analysis from 3967 to 2970. We also analysed the role of the level of economic development in determining the effects of foreign bank entry on domestic banks by separating the bank data into developed versus developing country banks. The results of this analysis are generally similar to the threshold estimation results. They can be obtained on request from the authors. Although this analysis allows us to make use of the whole sample, in our view the threshold estimations are preferred on econometric grounds.

Table 1
Foreign bank entry and domestic bank performance

Independent variables	Dependent variables Equation number	NMARGIN (1)	NINTINC (2)	PROF (3)	OVERHEAD (4)	LLPROV (5)
Threshold estimates for FBSHR						
FBSHR	Below threshold	0.9423	0.0396	−0.0294	0.1170	−0.0176
		(2.51)***	(1.48)	(−0.73)	(2.17)**	(−0.33)
FBSHR	Above threshold	−0.0408	−1.8560	−2.1744	−0.0434	0.2530
		(−1.90)*	(−1.71)*	(−1.56)	(−0.86)	(2.44)***
GDPPC		0.0001	−0.0004	0.0004	0.0001	−0.0007
		(0.26)	(1.72)*	(1.02)	(0.48)	(−1.32)
GROWTH		−0.0004	−0.00003	−0.0009	−0.0004	0.0003
		(−1.07)	(−0.13)	(−1.03)	(−1.37)	(0.43)
INFL		0.0004	0.00006	0.0002	−0.0004	0.0001
		(1.86)*	(0.43)	(1.18)	(−2.20)**	(0.55)
EQUITY		0.00007	0.00002	0.00009	−0.000002	−0.00005
		(1.82)*	(0.71)	(1.46)	(−0.05)	(−0.84)
NINTASS		−0.00002	−0.00008	−0.00003	−0.00002	−0.00003
		(−0.66)	(−3.01)***	(−0.48)	(−0.59)	(−0.47)
CSTFUN		0.00002	0.00002	0.00006	0.00002	−0.00006
		(0.58)	(0.51)	(1.26)	(0.70)	(−1.93)*
OVERHEAD		0.0000008	−0.000008	−0.000005		−0.00001
		(0.28)	(−1.78)*	(−0.82)		(−1.93)*
	Threshold level of income	2102	16,362	16,362	4645	4645
SSQR		0.0026	0.0020	0.0063	0.0018	0.0067
SSQRL		0.0030	0.0024	0.0059	0.0020	0.0073
LLH		463.9	498.9	220.0	387.9	262.0
		($p = 0.00$)	($p = 0.00$)	($p = 0.00$)	($p = 0.00$)	($p = 0.04$)
N		2970	2970	2970	2970	2970
	Equation number	(6)	(7)	(8)	(9)	(10)
Threshold estimates for FBNUM						
FBNUM	Below threshold	0.1628	0.0707	0.0698	0.1132	0.3953
		(3.37)***	(2.54)***	(1.19)	(2.46)***	(2.16)**
FBNUM	Above threshold	−0.0277	−0.4763	−0.3062	0.0502	0.0149
		(−0.45)	(−2.20)**	(−2.64)***	(1.15)	(0.27)
GDPPC		0.0004	−0.0005	0.002	0.0001	−0.0001
		(1.30)	(1.43)	(0.53)	(0.51)	(−0.37)
GROWTH		−0.0005	0.00001	−0.0007	−0.0004	0.0004
		(−1.39)	(0.05)	(−1.38)	(−1.54)	(0.79)
INFL		−0.00007	−0.0002	0.00006	−0.0004	−0.0005
		(−0.45)	(−1.77)*	(0.34)	(−2.59)**	(−1.47)
EQUITY		0.00006	−0.00002	0.00005	−0.00004	0.00003
		(1.90)*	(−0.32)	(0.53)	(−1.30)	(0.72)
NINTASS		0.00001	−0.00008	−0.00005	−0.00002	−0.00003
		(0.35)	(−3.14)***	(−1.11)	(−0.74)	(−0.62)
CSTFUN		0.000002	0.00003	0.00009	0.00001	−0.00001
		(0.45)	(0.58)	(1.57)	(0.59)	(−0.29)
OVERHEAD		0.0001	−0.00002	−0.000001		0.000004
		(0.31)	(−1.79)*	(−0.12)		(0.67)

(*continued on next page*)

Table 1 (*continued*)

Independent variables	Dependent variables Equation number	NMARGIN (6)	NINTINC (7)	PROF (8)	OVERHEAD (9)	LLPROV (10)
	Threshold level of income	3794	12,532	3805	4650	3882
SSQR		0.0026	0.0021	0.0045	0.0014	0.0049
SSQRL		0.0021	0.0023	0.0061	0.0019	0.0056
LLH		710.5 ($p = 0.00$)	372.6 ($p = 0.00$)	1057.2 ($p = 0.00$)	1085.0 ($p = 0.00$)	396.4 ($p = 0.00$)
N		2970	2970	2970	2970	2970

Note: See Appendix A for explanations of the abbreviations used. Only domestic bank observations have been used in the analysis. The original data set (see main text) has been balanced and for each individual bank we have three observations. This means that we have used data for 990 banks in 48 different countries. All equations are estimated using levels. Moreover, all equations are estimated with fixed effects and with time dummies. In order to control for differences in the amount of banks per country taken into account in the estimates, all variables for a particular country are weighted by the amount of domestic banks. *t*-values are presented in parentheses. (*) denotes significance at the 10% level; (**) denotes significance at the 5% level; (***) denotes significance at the 1% level. LLH denotes the likelihood ratio test to test whether the threshold effect is statistically significant under the null hypothesis of no threshold. SQR is the sum of squared errors for the model with threshold. SQRL is the sum of squared errors for the model without threshold. *N* is the number of observations.

a statistically significant threshold level of GDPPC (the exception being the equation for PROF, using the FBSHR variable, in which case the coefficients below and above the threshold do not significantly differ from zero). In all nine cases the coefficient for the foreign bank variable is higher below the threshold value than its value above the threshold value.

More importantly, however, for six out of ten equations we find that the foreign entry variable has a positive and significant coefficient if GDPPC is below the threshold value; in two of these cases, it has a negative and significant coefficient if GDPPC is above the threshold value, whereas in the remaining four cases the coefficient does not differ significantly from zero above the threshold value.

When we look at the results per endogenous variable, the table shows that for NMARGIN and OVERHEAD we find positive and significant coefficients for both foreign entry variables below the threshold value. For NINTINC and LLPROV we find positive and significant coefficients below the threshold value only when FBNUM is used as the foreign entry variable. Finally, the results for PROF show that for both foreign entry variables we do not find statistically significant coefficients below the threshold value. When we look at the coefficients of the foreign bank entry variables above the threshold, we observe that for three endogenous variables (NMARGIN, PROF and OVERHEAD) one is negative and significant, whereas the other does not differ significantly from zero. For one variable (NINTINC) we find negative and significant coefficients for both foreign entry variables.

In our view, the results of our empirical analysis seem to be supportive to our hypothesis that the effects of foreign bank entry on domestic bank behaviour depend on the level of economic development. More specifically, we may conclude that, at least in the short-term:

- Foreign bank entry is associated with higher costs and margins of domestic banks at low levels of economic development, whereas there is no relation found for profits.
- Foreign bank entry is either not associated with any of the three bank variables, or is associated with falling costs, profits and margins of domestic banks at higher levels of economic development.

Next, we consider the value of the thresholds for the six equations for which we find a positive and significant coefficient for one or both foreign bank entry variables. The lowest threshold value we find is a GDP per capita of US$ 2102, which corresponds to income levels of Morocco. In four cases we find a threshold value of around US$ 4000, which corresponds to income levels of countries like Turkey and Hungary. In one case we find a rather high threshold value of US$ 12,532, which is similar to that of Italy. Generally, however, our results seem to indicate that foreign bank entry is associated with higher costs and margins of domestic banks in less developed and most emerging market economies, whereas there is either no relationship found for any of the three bank variables, or foreign bank entry is associated with falling costs, profits and margins of domestic banks in the more developed countries.

4.2. Estimations with interactive terms

While the threshold estimations allowed us to investigate at what level of economic development there is a statistically significant change in the coefficient of either one of the two foreign bank entry variables in the regression model as specified in Eq. (1), it might also be the case that the coefficient is constantly changing as the level of economic development changes. [6] We analyse whether this is the case by estimating Eq. (1) and adding a term, which interacts the foreign bank entry variable with the economic development variable GDPPC. If we find a statistically significant positive coefficient for the foreign bank entry variable and a statistically significant negative coefficient for the foreign bank entry variable interacted with GDPPC, then this indicates that the value of the coefficient of the foreign entry variable decreases the higher the level of economic development. Eventually, the coefficient may even turn from positive to negative. This analysis, in a somewhat different way, is used to investigate our premise that the effects of foreign bank entry on domestic bank behaviour depend on the level of economic development. The analysis is carried out using the same balanced set that has been used for the threshold estimations.

Table 2 shows the results of this analysis. The results generally seem to support our premise. In eight out of ten estimated equations we indeed find a statistically significant positive coefficient for the foreign bank entry variable, whereas the coefficient for the interactive term is zero or statistically significant and negative. Thus, as with the threshold estimations, the results of the estimations with interactive terms seem to confirm our premise that, at least in the short-term, foreign bank entry is

[6] We thank one of the referees for pointing out this remark to us.

Table 2
Foreign bank entry and domestic bank performance

Equation number	NMARGIN (1)	NINTINC (2)	PROF (3)	OVERHEAD (4)	LLPROV (5)
Interactive terms for FBSHR					
FBSHR	0.2549	0.1824	−0.2537	0.0907	0.6911
	(6.12)***	(4.56)***	(−3.54)***	(2.37)***	(7.37)***
FBSHR * GDPPC	−0.00004	−0.00004	0.00002	0.000000	−0.0001
	(−5.33)***	(−5.06)***	(1.20)	(0.01)	(−5.44)***
GDPPC	0.00002	−0.00002	−0.00003	−0.00002	0.00003
	(4.03)***	(−4.48)***	(−3.62)***	(−4.63)***	(2.64)***
GROWTH	−0.0003	0.0004	0.0005	0.00008	−0.0005
	(−2.31)**	(2.84)***	(2.21)**	(0.62)	(−1.50)
INFL	0.000004	−0.000003	0.00001	−0.000001	−0.00001
	(1.36)	(−1.02)	(2.66)***	(−0.29)	(−1.86)*
EQUITY	0.0858	−0.1082	0.3700	−0.0479	−0.3924
	(6.88)***	(−9.01)***	(17.24)***	(−4.19)***	(−13.95)***
NINTASS	0.1225	−0.0324	−0.1439	−0.0625	0.2339
	(10.06)***	(−2.77)***	(−6.87)***	(−5.60)***	(8.52)***
CSTFUN	−0.0136	−0.0371	−0.0010	−0.0173	−0.0496
	(−2.36)**	(−6.71)***	(−0.10)	(−3.27)***	(−3.83)***
OVERHEAD	0.2549	0.6483	−0.7070		0.8317
	(6.13)***	(23.91)***	(−14.59)***		(13.09)***
Income level at which the sign of the coefficient for FBSHR changes	5930	4667	–[a]	–[a]	6910
N	1964	1964	1964	1964	1964
Equation number	(6)	(7)	(8)	(9)	(10)
Interactive terms for FBNUM					
FBNUM	0.3412	0.2095	−0.6051	0.2488	1.1558
	(19.56)***	(11.51)***	(−22.54)***	(16.28)***	(39.02)***
FBNUM * GDPPC	−0.00003	−0.00003	0.00003	−0.00002	−0.0001
	(−12.30)***	(−11.91)***	(8.50)***	(−8.97)***	(−22.27)***
GDPPC	0.00005	−0.000004	−0.00009	0.000008	0.0001
	(10.01)***	(−0.83)	(−11.63)***	(1.85)*	(15.93)***
GROWTH	−0.0009	−0.00003	0.0017	−0.0005	−0.0027
	(−7.48)***	(−0.23)	(8.87)***	(−4.02)***	(−12.59)***
INFL	−0.000001	−0.000005	0.00003	−0.000005	−0.00003
	(−0.50)	(−1.82)*	(6.27)***	(−1.85)*	(−7.09)***
EQUITY	0.1546	−0.0829	0.2187	0.0119	−0.1470
	(13.85)***	(−7.12)***	(12.73)***	(1.13)	(−7.75)***
NINTASS	0.1089	−0.0371	−0.1148	−0.0600	0.1866
	(10.10)***	(−3.30)***	(−6.92)***	(−5.93)***	(10.20)***
CSTFUN	−0.0118	−0.0346	−0.0010	−0.0135	−0.0454
	(−2.32)**	(−6.54)***	(−0.13)	(−2.82)***	(−5.27)***
OVERHEAD	0.2255	0.5366	−0.1926		−0.0454
	(8.35)***	(19.04)***	(−4.63)***		(−0.99)
Income level at which the sign of the coefficient of FBNUM changes	10,656	6563	17,794	11,857	11,560
N	1964	1964	1964	1964	1964

Note: See footnote to Table 1. All Eqs. (1)–(5) are estimated in first differences.

[a] No change of the sign of the coefficient for FBSHR since the coefficient for the interactive term FBSHR * GDPPC is not statistically significant.

associated with higher costs and margins of domestic banks at lower levels of economic development, whereas there is either no relationship found for any of the three bank variables, or foreign bank entry is associated with falling costs, profits and margins of domestic banks at higher levels of economic development.

The table also shows the level of income at which the sign of the coefficient of FBSHR and FBNUM changes: in four cases the coefficient turns from positive to negative at levels of income between US$ 4500 and US$ 7000; in three cases, the turning point from positive to negative signs lies at levels of income of around US$ 11,000. In one case, the sign of the coefficient turns from negative to positive, while in two cases we do not find a turning point.

5. Interpretation of the results

We interpret our findings discussed in Section 4 as follows. At lower levels of economic development foreign bank entry may have a strong effect on domestic banks in terms of spill-overs of modern bank techniques and practices, since there is a large gap between the development of domestic and foreign banking. Yet, domestic banks need to make investments to implement these techniques and practices. Therefore, costs rise. At the same time, since domestic banks still have a relatively strong market power in domestic financial markets due to the fact that these markets are rather segmented in less developed banking markets, they are able to raise interest rate margins and non-interest rate income to pay for the investments made. This may lead to an increase of income of banks. Although foreign bank entry may put competitive pressure on domestic banks, this effect is cancelled out. Note that our interpretation of the effects of foreign bank entry on domestic bank behaviour focuses on the short-term; in the longer term the effects of implementing new bank services, techniques and practices may affect costs and margins negatively. Yet, the analysis in this paper does not allow us to deal with the long-term effects of foreign bank entry.

At higher levels of economic development spill-overs are less important since the gap between domestic and foreign banks is smaller and banking markets are more competitive. Therefore, the competitive pressure argument dominates the positive effects on income and costs. Domestic banks do not have enough market power to raise margins and tariffs on non-interest earning activities. Moreover, they feel the need to reduce costs and become more efficient in an effort to keep their market shares.

6. Concluding remarks

This paper has empirically analysed the short-term effect of foreign bank entry on the behaviour of domestic banks. As our point of departure we take the study by Claessens et al. (2001), which is the only comprehensive study of this issue. They find supportive evidence of the hypothesis that foreign bank entry improves the efficiency of domestic banks, since income, profitability and costs of these banks are negatively associated with the presence (rather than the size) of foreign banks.

We go one step further than Claessens et al. (2001) and investigate whether the relationship between foreign bank entry and domestic bank behaviour depends on the level of economic development. We argue that at lower levels of economic development, banking markets are generally also less developed, which means that in these cases spill-overs of banking techniques and practices may be more important; implementing them, however, raises costs, at least in the short-term. At the same time, less developed banking markets are less competitive, which may enable domestic banks to finance implementation costs by raising margins. At higher levels of development spill-overs are less important and market competition is stronger, which leads to lower costs, margins and profits due to the competitive pressure of foreign banks. Generally, we find supportive evidence for this hypothesis. In particular, we find that foreign bank entry is associated with increasing costs and margins at lower levels of economic development, while at higher levels of development costs, margins and profits are either not associated with foreign bank entry, or we find a negative association. Our investigation suggests that the findings of Claessens et al. (2001) need to be qualified: The level of economic development is an important factor determining the effects of foreign bank entry on domestic banks, at least when we look at the short-term effects of foreign bank entry.

Our analysis may be extended in two directions. First of all, it would be interesting to also investigate the longer-term effects of foreign bank entry on domestic bank behaviour, thereby taking into account differences in the level of economic development of host countries. This requires long time series data, which would allow estimating a dynamic error correction model, in which both short- and long-term effects are included. Second, in the paper we have used the level of economic development to analyse the differences in short-term effects of foreign bank entry on domestic banks among countries. Yet, there may be other variables, such as the level of domestic bank market concentration or the level of domestic financial development that may lead to differences in effects of foreign bank entry. We leave both these suggestions for further research.

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Appendix A. List of variables and data sources

CSTFUN	= short- and long-term deposits plus other non-deposit short-term funding to total assets
EQUITY	= book value of equity (assets minus liabilities) to total assets

FBSHR	= the share of foreign bank assets in total banking sector assets
FBNUM	= the number of foreign banks to total number of banks
GROWTH	= annual growth rate of GDP
INFL	= annual inflation rate (consumer prices)
LLPROV	= loan loss provisioning to total assets
NINTASS	= cash, non-interest earning deposits at other banks, and other non-deposit short-term funding to total assets
NINTINC	= non-interest income to total assets
NMARGIN	= interest income minus interest expense to total assets
OVERHEAD	= personnel expenses and other non-interest expenses to total assets
PROF	= before tax profits to total assets
GDPPC	= real GDP per capita in US dollars

All individual bank level variables are taken from the BankScope data base. FBSHR and FBNUM are obtained from the data set related to Beck et al. (2000) and available on the website of the World Bank. The other individual bank level data are taken from a data set, that was kindly provided to us by Stijn Claessens.

GROWTH, INFL and GDPPC are taken from Easterly and Yu (1999); available from the website of the World Bank: http://www.worldbank.org/html/prdmg/grthweb/gdndata/html. Inflation figures for Hong Kong and Romania were taken from World Bank Development Indicators (CD rom version).

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