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Do credit risks deter FDI? Empirical evidence from the SAARC countries

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Abstract

Purpose – This paper makes a novel attempt to estimate the potential impact of credit risk on foreign direct investment (FDI hereafter), thereby focusing on a completely unexplored area in the existing empirical literature.

Design/methodology/approach – To provide a comprehensive understanding of the relationship between credit risk and FDI inflows, the study incorporates all the eight-member economies of the South Asian Association of Regional Cooperation (SAARC hereafter) and analyzes a panel data set, over the period 2011 to 2019, extracted from the World Development Indicators, using the suitable econometric techniques for the efficient estimations of the specified models.

Findings – The results indicate a negative and statistically significant relationship between the credit risk of the banking sectors and FDI inflows. Similarly, market size and inflation rate appear to be the two other main factors behind the increasing FDI inflows in the SAARC member economies. Interestingly, the size of the market became irrelevant in attracting FDI inflows when the Indian economy is excluded from the sample due to its higher economic weight. On the other hand, FDI inflows are not dependent on the level of trade openness, with most of the specifications showing either an insignificant or negative coefficient of the variable.

Practical implications – The obtained results are unique and robust to alternative methodologies, and hence, the SAARC economies could consider them as the critical inputs in formulating the appropriate policies on FDI inflows.

Originality/value – The findings are unique and original. The authors have established a relationship between credit risk and FDI for the first time in the SAARC context.

Keywords FDI, Credit risk, Banking sector, SAARC

Paper type Research paper

1. Introduction

Foreign direct investment (FDI hereafter) helps multinational entities (MNEs hereafter) to penetrate new markets by opening subsidiaries abroad. The MNEs could be attracted by many favourable factors of the emerging economies, for example, the ever-growing local needs, abundant natural resources and cheap labour force, which are a few of the many (Alam *et al.*, 2023). On the contrary, the recipient countries, owing to their capital deficits, are supposed to welcome inward FDI to benefit from its many positive externalities, including

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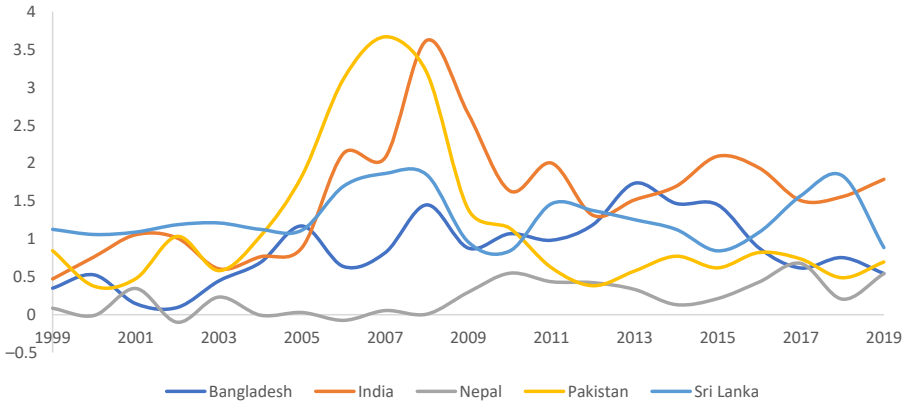
higher economic growth, new employment generations, technological knowledge and forward and backward integration with the mainstream industries (Dao and Ngo, 2022). Given the merits of FDI, the policymakers of the South Asian Association of Regional Cooperation (SAARC) have made several initiatives, including lower tariffs, a stable foreign exchange rate and a supportive environment for cross-border trade (Shah and Khan, 2016).

From Figure 1, we see that, in the case of all the major SAARC countries except Nepal, FDI inflows had been increasing from 1999 to 2007 before they plunged in 2008 due to the financial crisis throughout the world. In the 1990s, member countries of the SAARC initiated trade liberalisation policies by promoting privatisation, adopting favourable export policies and opening investment windows for foreign investors. These deregulation strategies resulted in a surge in FDI inflows into the region (Arif *et al.*, 2020). After recovering from the global financial crisis, the countries resumed attracting inward FDIs of 0.5%–1% of their GDPs from 2011 to 2019.

Despite the consistent FDI inflows into the SAARC region over the last decade, the member countries should attract more foreign capital to promote economic growth (Jena and Sethi, 2021). According to the previous studies, market size, trade openness, institutional quality, physical infrastructure and inflation rate of the destination countries appear to be the key forces of FDI inflows (Demirhan and Masca, 2008; Rahman, 2016; Asif and Majid, 2018; Mahmood *et al.*, 2019; Iqbal *et al.*, 2019; Uddin *et al.*, 2019; Tahir and Alam, 2022; Shahbaz *et al.*, 2021). However, the studies should have focused on the necessity of the local financial system, thereby ignoring the factors associated with the corporate financial decisions of foreign subsidiaries. Bilir *et al.* (2019) confirmed that the availability of external debt funding in the local financial markets significantly influences the MNEs to choose the locations for foreign affiliates and determines the types of affiliate sales as well.

The study claims that local financial institutions could play a key role by providing working capital financing, thereby facilitating foreign affiliates to export to other countries. In another study, Aggarwal and Kyaw (2008) argue that market-seeking FDI firms are supposed to take loans from local financial institutions owing to some factors in the host countries, including external credit availability, high tax rate and depreciating local currency. The study further posits that FDI firms tend to follow the capital structures of domestic firms operating in the same industries due to similar cash flow patterns. Hence, the FDI firms competing in the local markets will likely access external credits from domestic financial institutions if the local financial system is efficient.



Source(s): Own elaboration

Figure 1.
Inward FDI as a percentage of GDP

To have a paradigm shift from the conventional framework of international economics, Foley and Manova (2015) emphasised the necessity of easy access to finance in multinational operations and all other immovable physical capital factors, which could be decisive in opening a foreign subsidiary. However, the credit risk represented by the number of bad loans could hamper the stability of the banking sectors (Priyadi *et al.*, 2021). In another study, Hanifah (2016) argues that a higher level of non-performing loans (NPLs hereafter) erodes the financial condition of individual banks, being a threat to the overall banking sector. To demonstrate the detrimental effect of credit risk, Isaev and Masih (2017) concluded that it could prohibit commercial banks from performing their crucial financing role, making them less capable of facilitating a nation's economic growth.

Given the paramount importance of credit risk reduction, all three Basel Accords have given special attention to minimising NPLs for the soundness of the banking sector. In addition, Berger *et al.* (2010) argue that banks could be vulnerable to credit risk owing to their less diversification across different industries and sectors. To reduce credit risk, banks of host countries should finance FDI projects serving new industries with innovative products and services. However, the financial instability caused by the high number of NPLs could harm the inbound FDI projects if they want to fulfil their further financing requirements.

As inward FDI seems to rely on the sound financial sectors of the recipients, the SAARC countries have been increasing the level of private sector credits over the last decade. However, extending fresh credits could be seriously interrupted as commercial banks need to make loan loss provisions for the existing NPLs from their earnings (Kellard *et al.*, 2022). More importantly, with the elevated level of credit risk, the banking sectors cannot maintain sustainable growth in private sector credits, hampering the friendly investment environment for FDI projects. According to the existing literature, along with the bank-specific factors, some macroeconomic factors, including negative GDP growth, high inflation and high interest rates, could result in higher unemployment and lower levels of income, thereby reducing the borrowers' ability to repay the interest and principles (Anita *et al.*, 2022). In addition, the member countries of the SAARC suffer from credit risk owing to the poor loan assessment policies, contributing to adverse selection of borrowers (Bhowmik and Sarker, 2021). Therefore, it seems reasonable to assume that the substantial amount of NPLs in the SAARC region could harm the banking sector's primary financing activity, thereby shrinking its ability to extend credits to the high potential foreign subsidiaries and local firms.

Foreign investors are likely to prefer domestic financial markets over the global market in borrowing funds to support their further growth in the host country, thereby avoiding exchange rate risk in case of depreciating local currency (Bilir *et al.*, 2019). Mostly, foreign subsidiaries tend to borrow from commercial banks to finance their exports and other credit sales (Nguyen and Rugman, 2015). The exchange rate of local currency may be volatile in the short run. In that case, foreign subsidiaries should prefer the sources of the host countries over the global heads in case of international trade finance (Nguyen and Almodóvar, 2018). Unlike long-term equity investments in foreign subsidiaries, working capital financing seems to be short-term terms extending up to the credit terms of exports. Therefore, foreign subsidiaries could avoid short-term exchange rate risks by borrowing from the financial sectors of the host countries.

Since the prevailing credit risk could erode the availability of trade financing of the foreign subsidiaries in SAARC countries, the study opts for filling up the gap by introducing the NPL ratio, which is the prominent measure of credit risk, as one of the decisive forces of the inward FDI inflows into the economic zone. Hence, the researchers predict that the current study will likely make three novel contributions to the existing literature given the negative effects of prevailing credit risk on the availability of working capital financing. Firstly, the study would

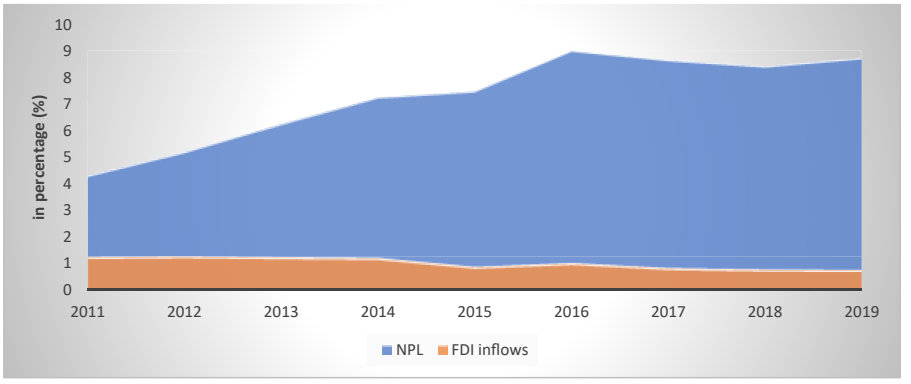
show how accumulating NPLs could discourage inward FDI. Secondly, it has incorporated all the member countries of the SAARC, thereby focusing on some countries, namely Afghanistan, Bhutan and the Maldives, which the previous relevant studies should have included. Thirdly, the study would provide policymakers with a way out of the sustainable management of inward FDI with the availability of short-term trade financing by reducing credit risk exposure.

The remaining portion consists of the following sections: Section 2 illustrates the actual scenario of the credit risk of the SAARC countries. In contrast, Section 3 demonstrates the literature review reflecting the relevant studies. Section 4 discusses the methodology, including the data collection, variables and analytical procedures. Section 5 presents the results with a comparison and contrast with the relevant previous studies. Section 6 represents the discussion reflecting the implications, shortcomings and future research window. Finally, Section 7 illustrates the conclusion section with a summary of the overall study and the research objectives.

2. The shortage of loanable funds in the SAARC countries

Figure 2 demonstrates that the banking sectors of the SAARC zone had been suffering from accumulating a sizeable portion of bad loans, representing the high credit risk of the banking industries of the region over the period 2011 to 2019. Some previous studies found that commercial banks in the SAARC region were less diversified in terms of assets and industries, resulting in an elevated level of concentration (Mani, 2016). Hence, the region's banking sectors could be vulnerable to external adversities, which could enhance credit risk. According to Figure 2, the median NPL ratio of the eight countries had been demonstrating an uprising trend, with the percentage increasing from 4.31% in 2011 to 8.74% in 2019. On the contrary, for the incoming FDI-to-GDP ratio, the figure shows an opposite trend, with the median value of the ratio declining from 1.22% in 2011 to 0.73% in 2019.

The percentage of NPLs is much greater in the case of the SAARC member countries than that of other top FDI-receiving Asian countries, namely China, Singapore and Indonesia, whose median values had been 1.46, 1.06 and 2.29%, respectively, over the period 2011 to 2019. The better management of the credit risk of those countries could be a critical factor in attracting the MNEs to open subsidiaries there. Moreover, the availability of financial support and the risk management skills of the banking industries of the economies could provide foreign investors with additional motivation to invest in those countries. The higher



Source(s): Own elaboration

Figure 2.
Median non-performing loan (NPL) ratio and FDI inflows

amount of NPLs could result in a shortage of loanable funds for promising business projects, which the commercial banks could have extended in financing the further expansion of the foreign subsidiaries operating in the region.

Due to the abundance of classified loans, commercial banks cannot issue fresh credits to competing business projects. Therefore, the prevailing poor credit risk management in the SAARC region could be a potential underlying reason, making the foreign investors less motivated to open subsidiaries through FDI in the member countries.

3. Literature review

3.1 Determinants of FDI

Given the importance of FDI to the host economies, the researchers attempted to explore the factors inducing foreign capital inflows. Demirhan and Masca (2008) endorsed the significance of openness to trade, inflation and GDP in encouraging FDI inflows. The study revealed that per capita GDP and trade flexibility favourably impact FDI inflows, while inflation adversely affects the same. In the case of the Asia-Pacific Economic Cooperation member countries, Rodríguez (2008) reinforced the importance of regional trade agreements in attracting FDIs in those countries. To provide evidence from Latin America, Iqbal *et al.* (2016) examined ten sample countries in the region. The results of the econometric procedure suggest that market size, trade openness and the size of the labour force are favourably connected with inward FDI. However, the study reported consumer price hikes and exports as insignificant in attracting inward FDI. To reveal the relationship between trade flexibility and FDI inflows, Rahman and Grewal (2017) investigated the member economies of the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) zone. The study indicated a significant causality from imports and exports to FDI inflows, meaning that trade openness will likely impact inward FDI positively. In a recent analysis, Gao *et al.* (2021) highlighted that the real GDP growth rate, inflation measured by Consumer Price Index (CPI), environmental quality and trade accessibility were favourably connected with FDI in the case of Chinese aggregate provincial data.

Another strand of literature emphasised the importance of the recipient country's financial development on incoming FDI. Hermes and Lensink (2003) outlined the impact of economic growth on domestic firms to absorb the technological diffusion of foreign subsidiaries. In another study, Guru and Yadav (2019) argue that financial results are essential to facilitate the economic growth of Brazil, Russia, India, China, South Africa (BRICS) member economies by channelling funds into the productive sectors. In the case of Organisation for Economic Co-operation and Development (OECD) countries and several non-OECD economies, Alfaro *et al.* (2004) highlighted the necessity of a vibrant financial system to support the higher level of economic affairs associated with growing inward FDI. The study emphasised that a sound financial plan could help foreign subsidiaries operate efficiently in the host country. To provide evidence from the Chinese economy, Xu (2012) revealed that FDI firms could only work efficiently if commercial banks facilitate them by a considerable amount of credit disbursed in the private sector. The study also suggests that credits issued for financing state-owned projects are negatively associated with China's economic growth, suggesting the necessity of a sound banking sector represented by a high focus on the private sector's credit growth.

Nguyen *et al.* (2022) recently showed the value of external funding in boosting the inclination of foreign subsidiaries to export. Since the export-oriented foreign subsidiaries should need additional working capital to finance the cross-border trades, the availability of short-term credits in the host countries could be a location-specific advantage for the subsidiaries. The study argues that the availability of bank loans, especially those extended by the host countries' commercial banks, could positively influence the subsidiaries to

engage in exports. In another very recent study, Kellard *et al.* (2022) revealed the negative impact of banking sector credit risks of both the investor and recipient countries on FDI decisions in the case of Euro Areas from 2009 to 2016. According to the study, MNEs may find it much more difficult to support the trade financing of their international subsidiaries due to the credit risk of their home countries. In contrast, the credit risk of the host country could be a locational disadvantage for foreign subsidiaries. The study also argues that foreign subsidiaries will be less interested in operating in countries with high credit risk. Though the previous studies have highlighted the requirements of the host country's financial development in facilitating the economic activities of FDI projects, the current study found that the impact of credit risk on inward FDI needs to be more researched. The study, according to the researchers, could add to the body of knowledge by demonstrating the significance of credit risk reduction in bolstering the perception of the influence of commercial banks on FDI inflows. Studies on SAARC economies extensively focused on different macroeconomic determinants of FDI, excluding the credit risk management of the banking sectors of those countries. Iqbal *et al.* (2018) conducted a study to highlight the relevant factors attracting inward FDIs in India and Sri Lanka. The results of the study suggest that the current account balance is positively associated with inward FDIs in the context of India. In contrast, market size positively affects inward FDIs in Sri Lanka. The study also reveals that inflation and trade openness do not impact FDI inflows for both countries. In another study, Rai and Sharma (2020) confirmed the causal associations of FDI inflows with economic size, trade flexibility and political condition in the SAARC zone. The study argues that expanding markets, trade liberalisation policies and political stability are decisive factors in attracting FDI to the region. In the context of Pakistan, Saleem *et al.* (2020) investigated the impact of some macroeconomic factors, including trade openness, institutional condition and economic growth, on inbound FDI. The results suggest a positive association of the forces with inbound FDI in the country. In another study, Adhikary (2017) highlighted the importance of trade openness and financial sector development in attracting FDIs to several SAARC countries. In the context of Pakistan, Asif and Majid (2018) investigated the forces affecting FDI inflows. The study outlines the implications of institutional quality and GDP in attracting inward FDI.

In the same economy, Uddin *et al.* (2019) verified different indicators of institutional forces on inbound FDI. The findings suggest that regulation positively influences inward FDIs. Nayyar and Mukherjee (2019) tried in a different study to pinpoint the pertinent external and policy-specific elements impacting FDIs coming into India. The authors find that bank-based financial sector development and trade liberalisation positively impact FDI. In another study, Tahir and Alam (2022) verified the importance of economic growth and trade accessibility in attracting inward FDIs in the context of the SAARC zone. The study also confirmed the positive influence of inflation on FDI inflows in the same sample countries. In a very recent study, Alam *et al.* (2023) reinforced the long-run connection of FDI inflows with flexible trade policies, economic size and inflation after analysing the time series data of Bangladesh.

3.2 Hypothesis development

We have developed the following testable hypotheses:

3.2.1 Credit risk and FDI.

H1. Credit risk is negatively associated with FDI inflows.

3.2.2 Macroeconomic factors and FDI.

H2. Market size positively influences FDI inflows.

H3. Trade openness positively impacts FDI inflows.

H4. Moderate inflation positively attracts FDI inflows.

4. Method

4.1 Model

We have designed Model 1 to show the potential connection between credit risk and FDI inflows in the presence of control variables.

$$FDI_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 MS_{it} + \beta_3 OPEN_{it} + \beta_4 INF_{it} + U_{it} \quad (1)$$

In Model 1, a net inflow of FDI is the dependent variable. The primary variable of interest is the credit risk represented by the NPL ratio. We captured market size by taking the logarithm of GDP, the standard practice in the existing literature. Similarly, we have used the trade volume-to-GDP ratio for measuring the influence of trade on FDI inflows. Moreover, we used the consumer price index's growth to quantify the inflation rate's impact on FDI inflows.

4.2 Data and variables

This study seeks to ascertain how credit risk and FDI inflows are associated while controlling for market size, trade openness and inflation. Although other variables, such as institutional quality, infrastructural development and political stability, could have been used as the control variables, we used only the variables found statistically significant in most of the previous studies. To make the model more economical, we did not incorporate the variables found insignificant in the previous studies. In addition, the excluded variables lack uniform proxy indicators, so we did not incorporate them into the study. In addition, the current study could not include credit risk data for Afghanistan due to the data unavailability for the country. In the case of trade openness, it is considered unbalanced panel data owing to the missing observations of Nepal for a few years. From 2011 to 2019, we gathered data on the eight SAARC nations from the World Development Indicators (WDI). We have provided a list of countries in Appendix, Table A1 and information about variables in Table A2.

4.3 Analytical procedure

Several efficient econometric tools are available to estimate models on panel data. The models that are most frequently encountered in earlier empirical investigations are the fixed-effect and random-effect estimators (Tahir and Alam, 2022; Asongu *et al.*, 2018). The researchers presume that the former estimator is appropriate for analysing data, mainly when the chances of serial correlation between the disturbance term and independent variables are high. However, the problem with panel data is that by its design, it cannot capture the impact of time-invariant factors such as dummy variables. On the other hand, the latter estimator works better in dealing with time-invariant factors. However, it is unsuitable when regressors and error terms are correlated.

Hausman (1978) put forward a tool that efficiently provides the relevancy of using either a fixed- or random-effect estimator for the panel data. In the χ^2 testing, rejecting the null hypothesis would suggest using the fixed-effect estimator. On the other hand, using random effects would be recommended, if researchers could not deny the null hypothesis. In our case, the Hausman test provides considerable evidence about using the fixed-effect model, with the rejection of the null hypothesis (Appendix, Table A3). Moreover, results for the redundant test are provided in Table A4, Appendix.

In the next step of the analysis, we used generalised least squares (GLS) for estimating models. Researchers consider the GLS-based estimation as an alternative to fixed effects. They could also use the GLS estimator for testing the sensitivity of the static panel data model

(Tahir and Alam, 2022). Moreover, the study also employs the two-stage least squares (TSLS) to address the endogeneity problem. The TSLS is preferred over the Generalized Method of Moments (GMM) estimator as the number of cross sections is relatively tiny. Usually, GMM estimation is suitable in the case of large cross sections and short periods. However, in this study, fewer cross sections were used than the number of time periods. Roodman (2009) asserts that the ratio of instruments to cross sections needs to be less than one. We are unable to employ higher order lagged values of the regressors and dependent variables as the instruments due to the minimal number of cross sections, and hence, we could end up with inadequate instruments. Therefore, the study did not use GMM estimation due to insufficient instruments.

5. Results

Results are shown in Table 1 in columns 2 and 3, which provide findings from Pooled Least Squares (PLS) and fixed-effect analyses of the entire sample. On the other hand, the last two columns show results without the Indian economy due to its relatively larger size than the remaining SAARC economies. The PLS results indicate that credit risk could positively and significantly influence FDI inflows. Similarly, economic size and trade accessibility have also accelerated the speed of FDI inflows. Moreover, the inflation rate is also positively but insignificantly related to FDI inflows.

In column 3, the fixed-effect estimator shows that credit risk is one of the main problems the SAARC economies face in attracting FDI. The coefficient of the NPLs, the proxy of credit risk, is negative and statistically significant. The fixed-effect findings are consistent with the GLS-based conclusion on the connection between credit risk and FDI inflows. The underlying reason behind this inverse association could be the inefficient allocation of loanable funds to unproductive projects, resulting from the poor credit risk management of the countries' banking sectors. This misallocation of the funds could further restrict the commercial banks from extending loans to the productive sectors, thereby causing the crowding out of the investable funds for the promising business ventures of the foreign affiliates.

Consequently, foreign subsidiaries and affiliates will need more external capital to grow to their optimal levels in the domestic market. Besides, domestic firms producing the necessary inputs for the MNEs cannot thrive due to the external financing crisis. Therefore, poor credit risk management could deter the potential FDI inflows in the region by exerting a detrimental

	Whole sample		Without India	
Variables	PLS	Fixed effects	PLS	Fixed effects
$CR_{i,t}$	0.065*** (0.019)	−0.030** (0.015)	0.777** (0.372)	−0.428** (0.209)
$MS_{i,t}$	1.366*** (0.058)	0.695** (0.327)	1.821*** (0.328)	−0.824* (0.448)
$OPEN_{i,t}$	2.402*** (0.271)	−0.292 (0.530)	10.244*** (1.096)	−0.308 (0.820)
$INFL_{i,t}$	0.146 (0.107)	0.118*** (0.028)	0.100 (0.306)	0.090* (0.048)
C	−23.911 (2.384)	4.199 (9.433)	84.732 (11.799)	21.690 (12.286)
Diagnostics	R^2: 0.912	R^2: 0.966	R^2: 0.734	R^2: 0.854
	R^2(Adj): 0.907	R^2(Adj): 0.960	R^2(Adj): 0.716	R^2(Adj): 0.820
	S.E.R: 0.717	S.E.R: 0.469	S.E.R:1.975	S.E.R: 0.506
	F-test: 172.606	F-test: 155.536	F-test: 40.212	F-test: 25.288
	P(F-test): 0.000	P(F-test): 0.000	P(F-test): 0.000	P(F-test): 0.000

Note(s): The dependent variable is the natural logarithm of FDI inflows. Values in parentheses represent standard errors. * = p< 0.1, * * =p< 0.05, * * * =p< 0.01, respectively
Source(s): Own elaboration

Table 1.
Regression results

impact on the further growth of the foreign subsidiaries and their related business firms operating at the lower stages of the supply chain.

The study indicates that incoming FDI depends significantly on the size of the host economy. The findings show that the market size variable has a positive coefficient and is statistically significant, which is in line with earlier research and our hypothesised view. The enormous market size of the host countries could be friendly to earning significant profit margins from higher sales volume. The favourable connection between economic size and FDI inflows is apparent and expected as the sampled countries include one of the giant economies, such as India, and some moderate size economies, such as Pakistan, Bangladesh and Nepal. Additionally, the findings of Asongu *et al.* (2018) and Asiamah *et al.* (2019) support the favourable connection between economic size and incoming FDI. Therefore, the study recommends that the sampled nations expand their economies and draw more FDI from the industrialised nations. Moreover, the findings demonstrate a statistically significant and favourable association between inflation and FDI inflows. It seems obvious that moderate inflation could influence the inflows of FDI in the economy. More importantly, an inflation rate in the moderate range is an indicator of a thriving economy and signals potential foreign investors for further investment as the profit margins are rising. On the other hand, stagnant economies have deflation that cannot encourage FDI inflows as the profit margins in such economies are marginal. Therefore, the economies could maintain a moderate level of inflation to encourage inward FDI.

Unlike previous literature, we found that trade accessibility is irrelevant in explaining cross-border investments. The results reveal that trade openness and FDI inflows are negatively associated. Trade liberalisation policies usually flourish economic activities and enhance outputs, encouraging FDI inflows. Hence, the study perceived a favourable relationship between the two variables. Some studies reported a positive relationship between trade openness and cross-border investments, while others reported an opposite connection between the two (Rathnayaka Mudiyanselage *et al.*, 2021). The current study's negative relationship between the two variables is aligned with the finding of the recent study of Rathnayaka Mudiyanselage *et al.* (2021). There could be multiple factors, such as the use of poor proxy of trade openness and adopted policies of the SAARC economies, responsible for the insignificant negative relationship between the two variables. For instance, data on alternative measures of trade openness, such as tariff rates, have been available for limited SAARC economies; otherwise, the study would have provided more robust results by including the different measures.

Similarly, most SAARC economies have yet to be incredibly open regarding trade openness owing to the presence of barriers. Therefore, the economies need significant improvements in trade liberalisation, including removing or relaxing trade barriers. Hence, gearing up the process of trade liberalisation will not only improve the economic growth of the SAARC economies, as trade openness is considered the engine of growth in previous literature, but also help them to receive increased FDI inflows.

Acknowledging that the Indian economy is a potential outlier due to its larger economic size and other economic parameters, we have excluded the Indian economy from the sample and re-estimated the specified model. Results presented in the last two columns of Table 1 without the Indian economy show that the main finding of the negative relationship between credit risk and FDI inflows remains unaffected. This means that the research outcome is a robust finding. However, excluding the Indian economy from the sample has turned the positive association between economic size and FDI inflows into a negative one, suggesting that the Indian economy was a potential outlier. This implies that the size of the domestic market does not matter anymore for FDI inflows if we exclude the giant Indian economy from the sample. Moreover, the association between trade openness and inward FDI and the

significant favourable connection between inflation rate and inbound FDI remained unchanged even after the exclusion of India from the sample.

The estimated models are good owing to their greater explanatory power. Similarly, the joint significance test (*F*-test) was also high and statistically significant, indicating the overall fitness of the model. Therefore, the estimated models are valid, and hence, the results have critical policy implications for policymakers.

5.1 Robustness results

Having discussed the main findings based on fixed-effect and GLS estimators, in this section, we focused on investigating the sensitivity of the findings. For instance, we have provided the results of GLS and TSLS in the second and third columns of Table 2 for the whole sample. The last two columns include results from excluding the Indian economy from the sample.

According to results based on the GLS estimator, the connection between credit risk and FDI inflows is opposite and significant, being in line with the results reported in Table 1. Similarly, the market size and inflation rate have retained their positive connections with incoming FDI in the GLS-based estimation. However, we observed a slight change in the connection between trade accessibility and inward FDI in GLS analyses.

The TSLS findings, which are displayed in the last column of Table 2, have also confirmed the preceding findings. The TSLS results show that credit risk has negatively and significantly impacted incoming FDI. According to the TSLS estimation, both market size and inflation continue to have favourable effects on FDI inflows. Finally, in the TSLS estimation, the negative impact of trade on FDI turns insignificant with a positive coefficient.

The results without the Indian economy reported in the last two columns of Table 2 reflect that the inverse connection between credit risk and FDI inflows is a robust finding. However, like the earlier findings, the domestic market size does not matter for FDI inflows if we exclude the Indian economy from the sample as the coefficient of market size is negative though statistically insignificant. Moreover, the insignificant negative impact of trade openness and the significant positive impact of the inflation rate on FDI inflows remain unchanged in the GLS and TSLS-based estimations.

In summary, the negative influence of credit risk on FDI inflows obtained in the fixed-effect model remains valid in both GLS and TSLS estimations. Credit risk is one of the main hurdles for the SAARC economies to encourage FDI inflows. Finally, the GLS and TSLS estimators corroborated the findings of the fixed effects on the control variables. As the main

	Whole sample		Without India	
Variables	GLS	TSLS	GLS	TSLS
$CR_{i,t}$	−0.031*** (0.011)	−0.042** (0.018)	−0.316** (0.155)	−0.537* (0.293)
$MS_{i,t}$	0.820*** (0.201)	0.986*** (0.436)	−0.263 (0.401)	−0.962 (0.618)
$OPEN_{i,t}$	−0.758* (0.391)	0.194 (0.923)	0.239 (0.600)	−0.387 (1.012)
$INFL_{i,t}$	0.098*** (0.027)	0.114*** (0.034)	0.106* (0.053)	0.108*** (0.040)
C	3.063 (5.954)	−4.815 (13.615)	5.739 (11.298)	25.515 (17.912)
Diagnostics	R^2: 0.980	R^2: 0.966	R^2: 0.918	R^2: 0.847
	R^2(Adj): 0.976	R^2(Adj): 0.959	R^2(Adj): 0.902	R^2(Adj): 0.812
	S.E.R: 0.455	S.E.R: 0.483	S.E.R: 0.491	S.E.R: 0.518
	F-test: 265.907	*F*-test: 136.006	*F*-test: 56.557	*F*-test: 24.764
	P(*F*-test): 0.000	P(*F*-test): 0.000	P(*F*-test): 0.000	P(*F*-test): 0.000

Note(s): The dependent variable is the natural logarithm of FDI inflows. Values in parentheses represent standard errors. * = $p < 0.1$, * * = $p < 0.05$, * * * = $p < 0.01$, respectively
Source(s): Own elaboration

Table 2. Robustness of the estimations

findings are robust and dependable, policymakers could consider them while formulating appropriate policies for encouraging FDI inflows.

6. Discussion

6.1 Theoretical implications

The study attempts to make a theoretical contribution by incorporating credit risk as a critical factor for attracting FDI inflows and other conventional factors. With empirical support, the study argues that credit risk could harm the further expansion of the FDI projects as they cannot access required funds owing to the abundance of NPLs in the banking system. On the contrary, commercial banks could reduce credit risk by financing foreign subsidiaries' projects in new industries.

6.2 Policy implications

The study reveals the detrimental effect of the prevailing credit risk on inward FDI in the SAARC region. Therefore, the central banks of the SAARC countries should make the commercial banks strictly follow the corresponding credit risk management policy while disbursing loans to promote economic growth. More importantly, commercial banks should diversify their assets across industries and regions to minimise credit risk in the event of external shocks. In conjunction with proper credit assessment policies, the deep financial systems would provide the foreign subsidiaries, affiliates and the associated domestic business firms with adequate external funds, which unproductive business ventures otherwise would have misused. More importantly, to attract a higher volume of FDI and to reduce credit risk, commercial banks should extend credits to the business projects of foreign subsidiaries. As foreign projects are likely to operate in new industries, commercial banks could get the opportunity to diversify their loan portfolios by financing those projects. Besides the credit risk issue, SAARC countries should be concerned with consistent economic growth to attract more FDI inflows. Although inflation impacts FDI inflows positively, policymakers should not allow inflation to exceed its tolerable limit. To promote trade liberalisation, policymakers of the SAARC countries should remove or relax both tariff and non-tariff barriers. The more open the countries will be to the global market, the more the inflows of FDI are likely to come from the developed countries, helping the emerging SAARC countries achieve their desired economic growth.

6.3 Limitations and future research agenda

Even though the study aims to advance the field by showing the unfavourable association between credit risk and FDI inflows, future research could broaden the study's focus by integrating additional measures of trade openness. The study tried to reduce potential data risk by collecting data from a reliable source of the World Bank. Potential data risk still might arise due to the absence of a good proxy for any variable incorporated in the study. In addition, the study considered a relatively brief period owing to the absence of credit risk and trade openness data for a few SAARC countries. To overcome these shortcomings, researchers should conduct future studies on any other economic group by incorporating several indicators of trade openness and a more extended period, ensuring more robustness of the findings.

7. Conclusions

This study opted for determining the connection between credit risk and FDI inflows, which its authors found under-researched in the available empirical literature. We included all eight

economies in the sample and sourced data for all variables from the WDI for 2011–2019. We employed econometric techniques such as fixed effects, GLS and TSLS to obtain efficient estimates of the regressor coefficients. The results proved our hypothesised perception regarding credit risk and FDI inflows. According to the results, credit risk is one of the main hurdles for the SAARC economies to attract more inbound FDI from other countries. The financial sector of the recipient economy is supposed to exert a direct effect on FDI by providing external financing to enhance the capacity of the foreign subsidiaries.

Moreover, the growth of different secondary industries resulting from the technology and managerial spill overs of the MNEs is heavily dependent on the sufficient credits issued by the commercial banks. Commercial banks should extend credits with the help of a proper credit risk management system to facilitate the growth of prospective entrepreneurial ventures. We discovered that, in addition to credit risk, inflation and market size are the primary impetuses for booming inward FDI. Unlike the previous studies, trade openness does not play a positive role in attracting FDI inflows in the case of the SAARC economies.

We could explain the insignificance of trade in attracting FDI inflows by the inadequate openness of the SAARC member economies to global economic markets owing to some trade barriers. Therefore, policymakers should take adequate measures to gear up the process of trade liberalisation by removing or relaxing both tariff and non-tariff barriers, thereby attracting a substantial amount of FDI inflows. Interestingly, the economic size matters for attracting higher FDI inflows for the whole sample and became irrelevant when we excluded India from the sample due to its higher economic weight. All other previously discussed results remained robust even after excluding the Indian economy from the sample.

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Appendix

Afghanistan	Maldives
Bangladesh	Nepal
Bhutan	Pakistan
India	Sri Lanka

Source(s): Own elaboration

Table A1.
List of countries

Table A2.
Variables and data sources

Variables	Definition	Source
$FDI_{i,t}$	"Foreign direct investment, net inflows (% of GDP)"	WDI
$CR_{i,t}$	"Bank non-performing loans to total gross loans (%)"	
$MS_{i,t}$	"GDP (constant 2010 US$)"	
$OPEN_{i,t}$	"Trade (% of GDP)"	
$INF_{i,t}$	"Inflation, consumer prices (annual %)"	

Source(s): Own elaboration using data of the World Bank

Table A3.
Hausman test

Cross-section and random-effect testing Summary	Statistics	D.F	Prob
"Cross-section random" (whole sample)	10.853	4	0.0283
"Cross-section random" (without India)	8.486	4	0.0753

Source(s): Authors' own calculation using Eviews 10

Table A4.
Redundant test

Cross-section and period fixed-effect testing	Statistics	D.F	Prob
Effects test			
"Cross-section F"	10.873	(7.51)	0.000
"Cross-section χ^2"	64.840	7	0.000
"Period F"	0.291	(8.51)	0.965
"Period χ^2"	3.177	8	0.922
Without India			
"Cross-section F	16.397	(6,44)	0.000
"Cross-section χ^2"	73.984	6	0.000
"Period F"	0.758	(8,44)	0.640
"Period χ^2"	8.142	8	0.419

Source(s): Authors' own calculation using Eviews 10

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