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The China effect on regional economic integration: a longitudinal study of Central, South, and Southeast Asia

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ABSTRACT

Does China's growing economic presence pose an opportunity or a threat to regional economic integration? The authors answer this question by analyzing longitudinal and cross-country evidence from three regions, Central, South, and Southeast Asia. A unique panel dataset detailing bilateral economic cooperation and each economy's political-economic factors from 2000 to 2019 was examined. This study concludes that (1) inbound foreign direct investment from China is positively associated with a country's intra-regional integration, (2) trade ties to China show a negative relationship with intra-regional integration, and (3) the level of a country's regional economic integration is conditioned by domestic economic and political factors such as transportation and information connectivity, per capita GDP, population size, trade openness, and public governance. This article contributes to the literature by using fresh cross-regional evidence to decipher the China effect on regional integration, embedding the political economy at both national and regional levels, and identifying variations and significance of various political-economic factors.

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Introduction

Economic integration has been central to regional studies for decades (Krieger-Boden and Soltwedel 2013; Sally 2011; Shi and Yao 2020; Song et al. 2021; Tumwebaze and Ijjo 2015). Eliminating discrimination by means of a free trade region, a customs union, a common market, or an economic union, or a permutation of two or more of these factors, a region's economic gains can be enhanced by efficiently deploying comparative cost advantages and the benefits of a larger regional market (Krapohl and Vasileva-Dienes 2020). Regional integration also involves state-business interactions that facilitate

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cross-border division of labor, creating new niches in goods and service provision. Empirical studies demonstrate that economic integration and linkage to global value chains benefit domestic economic development, institutional reforms, and productivity growth (Bong and Premaratne 2018; World Bank 2020). Integration occurs among neighboring countries willing to incorporate their economic activities and coordinate policy initiatives for common economic or political goals. This is especially so for developing countries that are relatively insignificant in regional and global politics (Krapohl and Vasileva-Dienes 2020). As economic development is core for most governments' missions, the growth effects of regional integration are generally emphasized. Researchers contend that regional integration can benefit economic development through agglomeration effects, attracting investments, creating trade, promoting knowledge and technology transfer, collaborating in regulatory matters, and improving the political environment (Raihan and De 2020; Shah 2021).

Regional economic integration has proceeded unevenly in Asia before 2000 (Pataccini and Malikov 2020; Raihan and De 2020). Some scholars even argue that comprehensive economic integration in Asia is less likely to happen in the near future (Korwatanasakul 2022). However, economic integration has been significantly facilitated since 2000, when China became an increasingly important variable in Asian economic development (Huh and Park 2018; Xu and Wu 2021). Southeast Asia (SEA) has been considered as one of the most successful cases of economic integration. Over the past three decades, intra-regional trade among Southeast Asian countries has intensified (Andal 2017; Chen, De Lombaerde, and Cuyvers 2017). In 2018, the proportion of intra-region trade and investment in the region's total trade and investment was, respectively, 23% and 15% (ASEAN 2020). Economic integration in Central Asia (CA) and South Asia (SA) also progressed, albeit at a slower pace (Bong and Premaratne 2018; Krapohl and Vasileva-Dienes 2020; Zhang 2015). According to the International Trade Centre (2021), the share of CA's total trade constituted by intra-regional trade was only 6.7% and 7.9% in 2001 and 2019, respectively. The share in SA was 6% in 2006 and 7% in 2019, which was much lower than the average proportion of world trade (55% to 58%) that derives from intra-regional trade blocs (Sumanasiri 2020). SA's intra-regional trade is surprisingly low, even though SA is a large trade bloc with low nominal tariffs.

Several institutions promoting regional integration and/or regional trade agreements have been established. They include the Association of Southeast Asian Nations (ASEAN) Plus Three, the Eurasian Economic Union (EAEU), the Shanghai Cooperation Organization (SCO), the South Asian Association for Regional Cooperation (SAARC), the Agreement on South Asian Free Trade Area (SAFTA), and, most recently, the Regional Comprehensive Economic Partnership (RCEP). The latter came into force in January 2022 and has helped lift the mood at a time of a slowdown in global trade.

Whilst China has played an increasingly important role in Asian economic cooperation, this increased role has not been unanimously viewed positively. For example some studies highlight the prospect of China "crowding out" other countries within the region, thereby undermining integration (Yu et al. 2020). Coxhead argues that China's voracious demand for natural resource products has trapped some of SEA's

smaller economies in a "new resource curse," eroding the latter's comparative advantage in labor-intensive manufacturing (Coxhead 2007). Nevertheless, some recent work offers a more nuanced take, qualifying the parameters by which China's economic influence is impacting smaller regional economies (Vidya and Taghizadeh-Hesary 2021). The on-going debate calls for empirically solid comparative studies, especially from a longitudinal and cross-country perspective which has been largely neglected.

Since its "reform and opening up" in 1978, the Chinese economy has integrated more fully with regional and global markets (Ito 2020; Mayer and Zhang 2021). Two of the most important channels are trade and FDI flows (Xu and Wu 2021; Zhang and Zhang 2021). By early 2022China had signed as many as 19 Free Trade Agreements (FTAs), which have helped the nation become the largest trade partner for most Asian economies (Kam and Tham 2022; Sampson 2021). Given China's huge amount of international reserves (Gu, Zhou, and Rabiul Alam Beg 2014), its outward FDI has increased in volume, especially following the post-2008 deceleration of the global economy (King and Du 2018). China has become the leading investor and service provider in CA, and its trade with the region has shot up since 2001 (Ambrosio 2017). For example, CA's trade with China accounts for 17.72% of the region's total trade in 2019 (e.g. 64.13% and 26.43%, respectively, in Turkmenistan and Kyrgyzstan, see Table A1) (ARIC 2021a). Economic ties between China and SA are gradually improving. In 2019, Afghanistan, Bangladesh, and Pakistan's trade with China accounted for 15.52%, 15.23%, and 19.61%, respectively, of their total trade (Table A1). According to the *ASEAN Key Figures 2019* (ASEAN, 2019), China was SEA's largest external export market (13.9%) and the largest source of imports (20.5%).

In all three regions, the common denominator is the relative lack of integration before the turn of the twenty first century. China's growing integration with the international economy since the late 1990s, either through multilateral mechanisms (such as accession to the World Trade Organization (WTO) in 2001 or more regionally-focused initiatives such as SCO and ACFTA), has seemingly catalyzed development in these three regions. In 2013, this dynamic was further fueled by the launch of the Belt and Road Initiative (BRI), which has been viewed as China's "foremost diplomatic and economic strategy" (Liow, Liu, and Xue 2021; Liu and Lim 2019; Zhao 2020). It aims to integrate Asia (including CA, SA, and SEA), the Middle East, and East Africa into "a larger coordinated economic space" (Mayer and Zhang 2021). It would more closely link China with almost all economies in Eurasia and promote connectivity and economic integration (CNDRC 2015; Tortajada and Zhang 2021; Tripathi 2019). Notwithstanding these grand narratives, the pertinent question is whether the strengthening of economic ties with China undermines or enhances intra-regional economic cooperation. More importantly, how, and to what extent, does a rising China reshape economic integration within and across the three regions? This study critically examines the relevant data and proposes three hypotheses in the following section.

Having this as the backdrop, this article addresses the following research questions: Does China's economic presence undermine or promote regional integration in Asia?

More specifically, taking into account the diversified political and socio-economic constraints in each territory, how does a country's economic ties with China, in terms of trade and FDI, influence its level of intra-regional economic integration? This study provides empirical evidence to unpack China's economic presence in CA, SA, and SEA. These three regions are chosen because they account for three of the largest economic blocs in China's "near abroad." CA, SA, and SEA also collectively account for 34.42% of the global population. In addition, the article's focus on the impact of China's FDI and trade on regional integration reexamines some issues explored in the existing literature, which primarily documents the impact of FDI and trade flows originating in the Global North. Put in another way, because of their relatively recent and increasingly important role in the international arena, China's FDI and trade are akin to a "strategic research site" where the phenomena are to be "interpreted to such advantage and in such accessible form that they enable the fruitful investigation of previously stubborn problems" (Merton 1987). This article argues that economic ties to China in these regions have shaped regional economic integration, which has been further affected by the political economy of the respective nations.

To examine the impact of China's economic presence on regional economic integration in Asia, a unique dataset from 2000–2019 was built using longitudinal data from three regions of Asia: CA (five countries), SA (eight countries), and SEA (ten countries). A semi-gravity-type model is employed to investigate the relationship between China's economic presence and regional economic integration. This article contributes to the literature by (1) using fresh empirical evidence and cross-regional comparisons to understand the impact of China's economic presence; (2) embedding the political economy at national as well as regional levels; (3) incorporating consistent sets of explanatory factors used across the regions for a longitudinal period; and (4) identifying variations and significance of those explanatory factors.

The remainder of the article is structured as follows. The next section critiques the existing literature before proposing the hypotheses. Subsequently, the methods are described, including data collection, measurements, analysis, and results. The penultimate section discusses the main findings and contributions.

Literature review

Determinants of regional economic integration

Intra-regional economic integration is shaped by a large number of political and economic factors (Sumanasiri 2020), including market (e.g. diversity, size, and transportation), social factors (e.g. language, religion, and trust), public governance, and tariff (e.g. tax reliefs, cross-border formalities). In our view, the determinants of regional integration can generally be categorized into two avenues in existing studies. The first is geographic and cross-border infrastructure and the conditions accompanying it. The most obvious obstacles to integration are geographic borders and proximity, which significantly condition the movement of people and goods (Medeiros 2019; Tripathi 2019). Countries located a short distance away from one another or with a common border trade more, while landlocked countries tend to find it more difficult to integrate with the regional or global market (Hertel and Mirza 2009). Besides,

transport infrastructures, especially shipping and air transport, are crucial for regional integration (Vidya and Taghizadeh-Hesary 2021). Lack of transportation connectivity with the regional market would significantly undermine regional trade (Cheung et al. 2021; Felipe and Kumar 2012).

The second factor concerns institutions, including socio-economic conditions, tariff barriers, and public governance. According to North (1990), institutions are broadly defined as "code of conducts, norms of behavior, conventions and formal rules (p. 36)". They are also meant to "reduce uncertainty by providing a structure to everyday life (p. 3)" (North 1990). More recent literature has identified complicated cross-border formalities, high interaction costs, different fiscal and property regimes, different management styles, negative attitudes towards neighboring countries, and different levels of economic and technological development as some of the major socio-economic conditions inhibiting integration (Bensassi, Jarreau, and Mitaritonna 2019). Studies also show that diverse levels of economic development, diverse cultural backgrounds and population feature would undermine regional integration (Gani and Scrimgeour 2019; Hamanaka 2014).

In addition, trade policies such as tariff barriers are commonly mentioned (Maggi, Mrázová, and Neary 2022). Sally indicates that Free Trade Agreements (FTAs) may facilitate a country's transnational economic integration. FTAs are expected to reduce trade barriers substantially and to promote the liberalization of intra-regional economic integration (e.g. cross-border trade and investments). However, some FTAs may result in disintegration when they are discriminatory (e.g. bilateral and exclusive), thus weakening the multilateral trading system. Studies also find that regional trade agreements are more likely to happen when participating countries have similar economic development levels (e.g. GDP per capita) and size, in addition to more intra-industry trade (Banik and Gilbert 2010; Nguyen et al. 2020).

Further, public governance factors such as regulatory environment, corruption, and political stability are important determinants (Bong and Premaratne 2018). Bakhsh and colleagues find that corruption, government effectiveness, the quality of regulation, and the rule of law have a significant impact on a country's exports (Bakhsh et al. 2022). The literature also points to the influence of political and economic transparency on cross-border cooperation (Castanho et al. 2019).

China's economic impact on regional integration in CA, SA, and SEA

Current literature offers a mixed interpretation of China's impact on regional integration in CA, SA, and SEA. Based on the history of China's interactions with the three regions, it is evident that China is adopting a distinct strategy of inter-regional cooperation. Instead of using exclusive bilateral institutions, China mainly relies on inclusive and pluralistic means (Zhang 2019). For example, the China-led SCO commits to facilitating intra-regional cooperation in various domains, including security, economy, and energy in CA (Konopelko 2018; Reeves 2018). Freeman argues that China identifies the benefits of promoting regional development and cooperation and that it sees a peaceful neighborhood as a public good that would facilitate economic collaboration, peace, and stability in the region (Freeman 2018).

While Krapohl and Vasileva-Dienes contend that the extra-regional economic dependence of a regional member state would undermine regional integration (Krapohl and Vasileva-Dienes 2020), Berger holds that China's economic presence in SEA is an essential driving force of regional integration (Berger 2018; see also Liu 2022a). According to the Asian Regional Integration Center (ARIC 2021b), the share represented by intra-regional trade increased in almost all Southeast Asian countries from 2001 to 2019, while the share of their trade with China increased simultaneously. Commentators have noted that intra-ASEAN trade dropped slightly, from 24.58 to 22.79% between 2010 and 2018, a period in which the ASEAN region's total trade with China increased (Vidya and Taghizadeh-Hesary 2021). More prosaically, Kam explains that China-Southeast Asian trade grew in volume following China's accession into the WTO and the ACFTA (Kam 2017). What has transpired is the growing centralization of China within the "Factory Asia" model, where the continent functions as a "global factory" that imports intermediate goods from its regional networks before assembling and exporting them as finished products to higher-income countries.

In a similar vein, China's trade with South Asia increased between 2000 and 2019 (ARIC 2021a). Studies suggest that China's economic presence may have positive spillover effects in neighboring regions (e.g. more FDI and inclusion in global production networks) (Ba 2014). Flint and Zhu believe that one of the primary goals of China's "go-abroad" policy is to remove trade barriers and promote economic cooperation (Flint and Zhu 2019). China prefers region-wide cooperation because bilateral mechanisms may fragmentize the regional market (Jakóbowski 2018; Zhang and Zhang 2021). We thus deduce that the increasing Chinese economic presence can reinforce regional cooperation (Liu and Lim 2019).

Together, the pressing need for infrastructure in CA, SA, and SEA juxtaposed with China's relatively more advanced capacities in infrastructure development (e.g. high-speed rail, expressways, and ports) are generating opportunities for its national firms (He 2019; Oh 2018; Zhai 2018; Zhao 2020). For example, China invested about $1 trillion in 130 countries between 2014 and 2018 (Clifton and Dai 2019). As much as 66.4% of China's outbound FDI in stock ($1.4602 trillion) went to Asian countries. Singapore, Indonesia, Vietnam, Thailand, Laos, Malaysia, and Kazakhstan were top destinations between 2016 and 2019 (CMOC 2020a, 2020b). The point is, the respective potential benefits in terms of development provide incentives for many countries to forge close economic ties with China (Liu, Fan, and Lim 2021). The massive investments in transport infrastructure in CA, SA, and SEA could also promote the movement of domestic and regional goods and people (Oh 2018; Vidya and Taghizadeh-Hesary 2021), which would ultimately facilitate this regional economic integration (Ba 2014; Summers 2016). Pavlićević and Kratz (2018) show that China's high-speed railway projects in SEA provide critical public goods. Felipe and Kumar argue that "developing regional infrastructure will provide transport corridors for trade within and outside the region" (Felipe and Kumar 2012, 22), which may in turn promote regional integration.

Based on the above discussions, this article argues that the actual impact of China's economic presence in the three Asian regions has been mixed and uneven. On the one hand, as China has been most countries' largest trade partner, denser

trade ties with China may undermine regional economic cooperation. On the other hand, China's FDI in the three Asian regions may promote regional integration. Moreover, China's impact is conditioned by the political economy of individual countries. This article thus hypothesizes that, in the context of CA, SA, and SEA:

H1: A country's trade ties to China is positively associated with its regional economic integration.

H2: A country's inbound FDI from China is positively associated with its regional economic integration.

H3: A country's regional economic integration is conditioned by various domestic political and economic factors.

Methods

Empirical approach

The gravity model is commonly employed by researchers investigating international trade flows and related determinants (Benedictis and Taglioni 2011; Kepaptsoglou, Karlaftis, and Tsamboulas 2010). Since the core gravity model only considers limited explanatory variables such as GDP and geographic distance, Maciejewski and Wach (2019) recommend using the "augmented gravity model," which introduces additional explanatory variables. A semi-gravity-type model may be more appropriate since the present study does not investigate bilateral trade but focuses primarily on the unilateral impact of economic ties to China (Buch, Kokta, and Piazolo 2003; Ismail 2009). The baseline model is specified as below:

$$Regional\ integration_{it} = \beta_0 + \beta_1 China's\ FDI_{it} + \beta_2 Trade\ with\ China_{it} + \beta_3 Control_{it} + \varepsilon_{it}$$

where i denotes country and t is year.

Regional integration is the dependent variable of this study. China's FDI and trade with China are the two indicators of the independent variable (economic ties to China). Other confounding factors need to be taken into consideration as the impact of economic ties to China on regional cooperation may be unequal in countries with varied characteristics (e.g. fiscal constraints, political instability, etc.) (Lim, Li, and Adi Syailendra 2021; Oh 2018). The selection of explanatory variables is guided by the discussion above and by Kepaptsoglou, Karlaftis, and Tsamboulas's review of the existing studies that applied gravity models (Kepaptsoglou, Karlaftis, and Tsamboulas 2010). This study thus selected the following control variables: GDP per capita, population, transportation connectivity, information connectivity, public governance, and trade openness.

Data

Panel data was collected from 2000 to 2019 from 23 countries in the three Asian regions: ten countries in SEA, eight countries from SA, and five CA republics. All the regional and bilateral trade data were from the Trade Map generated by the

International Trade Center UNCTAD/WTO (ITC). The data on China's outbound FDI were from the *2019 Statistical Bulletin of China's Outward FDI* and the *2011 Statistical Bulletin of China's Outward FDI* provided by China's Ministry of Commerce. Data for FTA were from the Asian Regional Integration Center. The authors collected other data from the World Bank Databank.

Measures

Regional integration

This article measures regional integration by focusing solely on economic integration, which can be measured with the help of two indicators. The first is the share of a country's regional trade in its total trade. The second is the share of a country's regional FDI in its total inbound FDI. Data on FDI in some less developed countries are not always available, while some countries do not necessarily have outbound investments every year. The share of regional trade in total regional trade is a more valid indication of economic integration (Soesastro 2006). As such, the present study mainly uses regional trade.

Economic ties to China

This article uses two indicators to measure economic ties to China: (1) bilateral trade between each country and China; and (2) China's outward FDI in each country. A country's bilateral trade (e.g. Malaysia) with China is calculated by summing up its total imports from China and exports to China, which are subsequently divided by the total volume of its global trade. Scholars argue that China's investments (especially in infrastructure) in developing regions would ultimately facilitate regional economic integration (Oh 2018; Summers 2016; Zhang 2017). The FDI received from China is measured by FDI stock, thus capturing its accumulated effects. For comparison purposes, the authors also use trade flows as an alternative measure of a country's economic ties to China.

Transportation connectivity

Transportation infrastructure is critical for regional economic cooperation. Thus, it is included as a control variable (Vidya and Taghizadeh-Hesary 2021). This article measures transportation connectivity by proxy indicators: the volume of goods transported by airlines and the number of registered air carrier departures worldwide. This article also includes a dummy variable to address whether a country is landlocked (landlocked = 1 and having access to sea = 0) as an alternative measure of transportation connectivity to the regional market.

Information connectivity

Under the new era of Industry 4.0, ICT infrastructure and information connectivity play an increasingly important role in transnational economic cooperation (Xu and Wu 2021). This article includes two indicators of information connectivity: the proportion of residents using the internet and the number of mobile cellular subscriptions per 100 people.

Market size

Perhaps unsurprisingly, market size has a positive impact on bilateral trade and investments. A larger market may import more from partner countries. The present study uses population to measure market size. GDP per capita is often included in gravity models as an explaining factor of trade (Kahouli and Maktouf 2013, 2015). In this study, GDP per capita is deemed as a proxy of market size and the level of economic development.

Public governance

Evidence shows that public governance quality positively associates with bilateral trade (Álvarez et al. 2018). This article uses the Worldwide Governance Indicators (WGI) to measure the level of public governance: corruption control, political stability, rule of law, and voice and accountability. These indicators represent various aspects of the public governance of each economy. Government effectiveness and regulatory quality are not included due to their high correlations with other indicators ($r > 0.8$). Values of the four WGI indicators range from -2.5 to 2.5.

Trade openness

Trade policies (FTAs) shape the movement of cross-country goods (Caporale et al. 2009). An open economy is expected to trade more with the global market (Sally 2006). The present study measures openness by using trade share in GDP and the number of free trade agreements in force. This article only includes those bilateral or plurilateral FTAs notified to the World Trade Organization (WTO). Those signed FTAs but not in effect are not included.

Descriptive analysis

Table 1 shows the descriptive analysis of the variables. On average, from 2000 to 2019 most countries' regional trade was larger than their trade with China (e.g. The mean of regional trade was US$21.32 and the mean of bilateral trade with China was US$17.71 billion). This study uses graphs to demonstrate each country's regional trade and its trade with China. Most countries' trade with China increased between 2000 and 2019, except in the case of Brunei, Bhutan, the Maldives, and Nepal, whose trade with China scarcely changed (see Figures A1–A3 in the supplementary file). Some countries' trade with China grew steeply (e.g. that of Indonesia, Malaysia, Singapore, Vietnam, Myanmar, and Pakistan), while that of others fluctuated (e.g. Afghanistan, Kazakhstan, Kyrgyzstan, and Tajikistan). Regarding trade share, several countries' regional trade underwent a downturn while their trade with China increased (e.g. Afghanistan, Kyrgyzstan, the Maldives, and Vietnam). However, some countries' regional trade share went up or down in parallel with the share of their trade with China (e.g. Brunei, Malaysia, Nepal, Philippines, and Thailand).

Table A1 in the Supplementary file shows each country's trade profile, FDI, population, and GDP per capita in 2019. Eight of the 22 countries in the sample traded more with China than within a region (e.g. Vietnam, India, Pakistan, and four CAR countries). most countries had trade deficits with China – the exceptions were Laos,

Table 1. Descriptive analysis.

Variables	Obs	Mean	Std. Dev.	Min	Max
China FDI inflows (million US$)	366	340.4148	909.2183	−2510.27	10452.48
China FDI stock (million US$)	366	2153.201	5550.705	0	52636.56
Regional trade (billion US$)	437	21.31845	41.05244	0.03041	216.1229
Regional exports (billion US$)	437	11.36085	24.03606	0.003756	137.9374
Exports to China (billion US$)	437	7.576494	13.32712	0	71.62989
Trade with China (billion US$)	437	17.71223	28.31581	0.000161	162.0828
Trade balance, China (billion US$)	437	−2.55924	9.515465	−58.0306	34.25059
Population (million)	460	98.74403	247.5026	0.29	1366.418
GDP per capita (constant 2010 USD)	457	5988.347	11208	330.3036	59073.49
Trade openness (% of GDP)	442	97.75722	73.27311	0.1674176	437.3267
FTAs	424	5.851415	4.972178	0	28
Mobile cellular (per 100 people)	460	68.01295	52.98361	0	186.159
Internet (% of population)	459	21.45346	23.48241	0.0001517	95
Air transport freight (million ton-km)	451	662.7175	1470.86	0	7981.253
Control of corruption	454	−0.54696	0.8653186	−1.672876	2.32558
Government effectiveness	454	−0.2833	0.8557894	−2.231651	2.436975
Political stability	454	−0.52497	1.033251	−2.810035	1.615338
Regulatory quality	454	−0.45043	0.8937014	−2.344109	2.260543
Rule of law	454	−0.50428	0.7892624	−1.896632	1.878559
Voice and accountability	454	−0.81753	0.6955904	−2.259159	0.467803

Malaysia, Thailand, and Turkmenistan in 2019. China's investments varied in the 22 countries (see Table A1 in the supplementary file). china's FDI stock share in each country's total FDI ranged from less than 0.59% in Turkmenistan to 83.07% in Laos in 2019, except in the case of Bhutan, where China had no direct investments. This percentage was 18.99% in Cambodia, 12.12% in Myanmar, 13.79% in Pakistan, 26.26% in Afghanistan, 28.46% in Nepal, 34.16% in Uzbekistan, and 27.73% in Kyrgyzstan.

This study also compares China's investments in the three regions, showing that China invested more in SEA than in CA and SA combined (see Table A2 in the supplementary file). Regarding trade, data indicate that the average intraregional trade of each country was US$45.62 billion in SEA, US$1.22 billion in CAR, and US$4.07 billion in SA. The average of each country's trade with China was US$31.22, US$5.28, and US$8.91 billion respectively in the three regions. Unlike SEA, countries in CA and SA traded more with China than with their neighboring countries. Most countries imported more from China than they exported to China. The average regional trade balance with China was US$-1.60 billion in SEA, US$-0.58 billion in CA, and US$-4.97 billion in SA.

This article uses correlation analysis to examine the relationship between various predictors. Table 2 shows that several control variables have an inter-correlation exceeding 0.70, suggesting that multicollinearity could be present. To address this concern, variables with a strong intercorrelation and a variance inflation factor (VIF) beyond five were entered into the regression model separately.

Estimation results

Fixed effects (FE) and random effects modeling (RE) are generally applied to estimate the parameters of the empirical models with panel data (Bell and Jones 2015). FE assumes the non-accidental nature of the individual effects, while RE assumes that

Table 2. Correlation analysis.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Regional trade (%)	–														
2. Trade with China (%)	−0.20	–													
3. China FDI stock (*log*)	−0.05	0.43	–												
4. Population	−0.29	−0.06	0.08	–											
5. GDP per capita (*log*)	−0.12	0.01	0.22	−0.14	–										
6. Air transport (*log*)	−0.38	−0.03	0.17	0.31	0.36	–									
7. Mobile cellular (%)	−0.12	0.44	0.60	−0.09	0.55	0.19	–								
8. Internet (%)	−0.03	0.18	0.46	−0.12	0.72	0.34	0.78	–							
9. FTAs	−0.26	0.36	0.62	0.10	0.32	0.25	0.56	0.57	–						
10. Trade openness (%)	0.04	−0.05	0.23	−0.24	0.57	0.25	0.34	0.51	0.25	–					
11. Corruption control	0.28	−0.28	0.22	−0.01	0.69	0.32	0.29	0.57	0.15	0.67	–				
12. Political stability	0.23	−0.03	0.19	−0.23	0.70	−0.08	0.35	0.51	0.14	0.56	0.62	–			
13. Voice and accountability	−0.04	−0.36	0.12	0.44	0.25	0.42	0.18	0.22	0.01	0.19	0.51	0.01	–		
14. Rule of law	0.13	−0.29	0.25	0.11	0.73	0.45	0.35	0.60	0.20	0.62	0.93	0.59	0.62	–	
15. Regulatory quality	−0.04	−0.27	0.27	0.01	0.73	0.45	0.38	0.60	0.28	0.66	0.79	0.49	0.62	0.88	–
16. Government effectiveness	0.07	−0.23	0.28	0.04	0.78	0.47	0.39	0.66	0.26	0.68	0.91	0.61	0.55	0.95	0.90

individual effects exist as random variables that are not correlated with regressors in the model. Following Greene (2000), this article uses the Hausman test to determine whether fixed effects or random effects models are preferred. Hausman test results fail to reject the null hypothesis that there is no correlation between the unique errors and the regressors in the model. The authors also use the Breusch and Pagan Lagrangian multiplier (LM) test to verify whether RE is superior to Ordinary Least Squares (OLS) regression. Results fail to uphold the null hypothesis that the random effects estimator is inappropriate. Thus, random effects models are preferred.

The results in the last three columns of RE in Table 3 are used for reference. Table 3 demonstrates that (1) a country's trade with China associates negatively with its level of regional economic integration; (2) a country's inward FDI from China associates positively with its level of regional economic integration; (3) population size and information connectivity relate positively to regional economic integration when they are significant; (4) GDP per capita, trade openness, and corruption control are negatively associated with regional economic integration; (5) other control variables do not seem to matter.

Robustness checks

To further validate the above results, this article runs several sets of additional analyses to check robustness: (1) adding dummy variables regarding country, region, and time; (2) using time-lagged terms of independent variables; (2) using alternative measures of the DV; (3) using alternative measures of the IVs.

Dummy variables such as region, country, and year are introduced into the model

Three groups of dichotomous variables are included in the model to control unobserved effects of region (CA = 1 and otherwise = 0; SA = 1 and otherwise = 0), country, and time. Another dummy variable regarding whether or not a country is landlocked is also included (landlocked = 1 and otherwise = 0). Results are shown in Column 1–3 of Table 4. Consistent with the main findings, trade ties with China are negatively associated with regional trade connectivity. FDI from China is not

Table 3. Fixed effects and random effects models.

DV: Regional trade	(1) FE	(2) FE	(3) FE	(4) RE	(5) RE	(6) RE
Trade with China (%)	−0.150***	−0.155***	−0.146***	−0.148***	−0.152***	−0.144***
	(0.0315)	(0.0277)	(0.0279)	(0.0313)	(0.0273)	(0.0274)
China FDI stock (*log*)	0.365*	0.166	0.126	0.516***	0.247	0.202
	(0.192)	(0.175)	(0.174)	(0.179)	(0.158)	(0.159)
Population (*log*)	8.196*	2.762	2.167	−1.514	−1.389	−1.544
	(4.692)	(4.740)	(4.700)	(1.841)	(1.761)	(1.778)
GDP per capita (*log*)	−3.853**			−2.986**		
	(1.555)			(1.402)		
Air transport (*log*)	0.00442	−0.117	−0.109	−0.0421	−0.142	−0.132
	(0.134)	(0.133)	(0.132)	(0.133)	(0.131)	(0.130)
Mobile cellular (%)	0.0121			0.0121		
	(0.00768)			(0.00765)		
FTAs	−0.228***	−0.271***	−0.251***	−0.178***	−0.257***	−0.239***
	(0.0714)	(0.0720)	(0.0721)	(0.0679)	(0.0694)	(0.0695)
Trade openness (%)	−0.0283***	−0.0316***	−0.0283***	−0.0352***	−0.0343***	−0.0308***
	(0.00979)	(0.00969)	(0.00975)	(0.00906)	(0.00899)	(0.00911)
Political stability	0.161	−0.146	−0.140	0.181	−0.125	−0.113
	(0.512)	(0.488)	(0.483)	(0.511)	(0.486)	(0.480)
Voice and accountability	−1.200	−0.719	−0.239	−1.014	−0.723	−0.259
	(0.762)	(0.796)	(0.818)	(0.755)	(0.791)	(0.812)
Internet (%)		0.0597***	0.0627***		0.0626***	0.0655***
		(0.0172)	(0.0169)		(0.0166)	(0.0163)
Rule of law		−1.769			−1.485	
		(1.212)			(1.190)	
Control of corruption			−2.796**			−2.558**
			(1.089)			(1.077)
Constant	27.67	16.38	17.48	52.20***	29.61***	29.25***
	(17.16)	(15.30)	(15.13)	(12.84)	(6.655)	(6.695)
Hausman test	2.80	2.13	0.28			
	0.9858	0.9953	1.000			
LM test	1942.48	1690.32	1662.21			
	0.000	0.000	0.000			
Observations	347	347	347	347	347	347
R-squared	0.194	0.208	0.219			
Number of countries	22	22	22	22	22	22

Notes: ***$p < 0.01$,**$p < 0.05$, *$p < 0.1$. Standard errors in parentheses.

significant. Population and information connectivity show positive signs when significant. GDP per capita, trade openness, and corruption control are negatively associated with regional trade integration. A country being landlocked is positively associated with regional integration. Region dummies are significantly negative, demonstrating the presence of cross-regional differences in integration.

All IVs and control variables are lagged for one period

Given the complicated relations between trade, investments, and GDP (Xu and Wu 2021), one-period lagged predictors are used to address the potential reverse causality and simultaneity issues (e.g. FDI in stock and GDP per capita). Results in Column 4–6 of Table 4 are consistent with the main findings, which demonstrate that stronger trade ties with China are associated with a lower level of regional economic integration.

Alternative measurements for the DV

For the purposes of comparison, in the models this article uses two alternative measures of regional trade as the DV. The first measure is the total flows of regional trade

Table 4. Results of models including region, country, year, and time lagged predictors.

DV: Regional trade	(1)	(2)	(3)	(4)	(5)	(6)
Trade with China (%)	−0.111***	−0.159***	−0.148***	−0.104***	−0.155***	−0.139***
	(0.0314)	(0.0301)	(0.0302)	(0.0325)	(0.0308)	(0.0308)
China FDI stock (*log*)	−0.116	−0.145	−0.250	−0.0575	−0.0797	−0.244
	(0.213)	(0.227)	(0.225)	(0.220)	(0.233)	(0.230)
Population (*log*)	0.0168**	0.00648	0.0107	0.0219**	0.0107	0.0163*
	(0.00836)	(0.00901)	(0.00876)	(0.00909)	(0.00985)	(0.00949)
GDP per capita (*log*)	−9.983***			−10.06***		
	(1.689)			(1.743)		
Air transport (*log*)	−0.0470	−0.156	−0.154	−0.176	−0.302**	−0.252*
	(0.127)	(0.133)	(0.132)	(0.146)	(0.153)	(0.152)
Mobile cellular (%)	0.00787			0.00605		
	(0.00915)			(0.00924)		
FTAs	−0.413***	−0.351***	−0.341***	−0.448***	−0.365***	−0.361***
	(0.0739)	(0.0783)	(0.0771)	(0.0832)	(0.0878)	(0.0857)
Trade openness (%)	−0.0339***	−0.0391***	−0.0355***	−0.0396***	−0.0442***	−0.0391***
	(0.00891)	(0.00945)	(0.00949)	(0.00929)	(0.00978)	(0.00982)
Political stability	0.100	−0.388	−0.384	−0.139	−0.594	−0.557
	(0.495)	(0.511)	(0.507)	(0.507)	(0.523)	(0.516)
Voice and accountability	−1.265*	−0.435	0.107	−1.511**	−0.514	0.188
	(0.734)	(0.801)	(0.824)	(0.757)	(0.829)	(0.850)
Internet (%)		0.0417*	0.0469**		0.0443*	0.0499**
		(0.0219)	(0.0218)		(0.0228)	(0.0225)
Rule of law		−1.670			−2.298*	
		(1.275)			(1.291)	
Control of corruption			−2.929***			−3.879***
			(1.120)			(1.168)
Landlocked country	0.421	35.83***	34.46***			
	(6.738)	(3.722)	(3.690)			
CA	−46.57***	−11.02***	−12.59***	−48.82***	−13.72***	−15.31***
	(6.304)	(2.913)	(2.621)	(6.571)	(2.987)	(2.648)
SAARC	−8.139***	−5.089*	−5.136*	−61.59***	−24.18***	−27.53***
	(2.725)	(2.772)	(2.741)	(7.019)	(2.827)	(3.014)
i.Country	–	–	–	–	–	–
i.Year	–	–	–	–	–	–
Constant	130.8***	31.25***	31.93***	133.4***	33.26***	33.81***
	(16.85)	(1.961)	(1.938)	(17.42)	(2.083)	(2.027)
Observations	347	347	347	330	330	330
Number of countries	22	22	22	22	22	22

Notes: ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. Predictors in Column 4–6 are lagged one period. Standard errors in parentheses. To save space, the coefficients of country and year are not shown.

calculated by adding up exports and imports. The second is regional exports. Imports of intermediates generally exist in many Asian countries, so using total trade may inflate the volume of the actual trade. Furthermore, exports are commonly deemed to be an important policy goal for decision-makers in export-oriented economies when deciding to promote regional economic cooperation. As shown in Table 5, trade with China exhibits negative signs when significant, whereas FDI from China has positive associations when significant. Several control variables, including GDP per capita, trade openness, rule of law, and corruption control, associate positively with regional exports or total trade when the control variables are significant). Transportation connectivity, information connectivity, and political stability show positive effects when significant.

Alternative measures of independent variables (IVs)

Further specifications were made to analyze whether exports and imports from China have a different impact on each country's regional economic cooperation. Exports

Table 5. Results using alternative measures of DV.

DVs	(1) Export	(2) Export	(3) Export	(4) Trade	(5) Trade	(6) Trade
Trade with China (%)	−0.0155***	0.00269	0.00234	−0.0151***	0.00166	0.00169
	(0.00426)	(0.00451)	(0.00459)	(0.00268)	(0.00305)	(0.00308)
China FDI stock (*log*)	−0.00245	0.122***	0.123***	0.0563***	0.162***	0.162***
	(0.0238)	(0.0258)	(0.0263)	(0.0151)	(0.0175)	(0.0177)
Population (*log*)	1.184***	0.759***	0.780***	0.883***	0.595***	0.601***
	(0.128)	(0.125)	(0.127)	(0.101)	(0.101)	(0.103)
GDP per capita (*log*)	1.483***			0.961***		
	(0.156)			(0.108)		
Air transport (*log*)	−0.0184	0.0274	0.0260	−0.00174	0.0278*	0.0272*
	(0.0185)	(0.0215)	(0.0218)	(0.0115)	(0.0146)	(0.0146)
Mobile cellular (%)	0.00366***			0.00517***		
	(0.00105)			(0.000658)		
FTAs	0.0104	0.0306***	0.0313***	−0.00267	0.0147*	0.0152*
	(0.00926)	(0.0113)	(0.0115)	(0.00583)	(0.00769)	(0.00776)
Trade openness (%)	0.00221*	0.00324**	0.00323**	0.00341***	0.00422***	0.00425***
	(0.00119)	(0.00139)	(0.00144)	(0.000762)	(0.000963)	(0.000989)
Political stability	−0.0992	0.120	0.142*	0.0193	0.187***	0.194***
	(0.0700)	(0.0792)	(0.0793)	(0.0440)	(0.0539)	(0.0536)
Voice and accountability	−0.312***	−0.437***	−0.404***	−0.0552	−0.112	−0.0985
	(0.102)	(0.128)	(0.132)	(0.0646)	(0.0872)	(0.0899)
Internet (%)		0.000473	0.00172		0.00275	0.00315*
		(0.00275)	(0.00272)		(0.00186)	(0.00183)
Rule of law		0.610***			0.168	
		(0.183)			(0.127)	
Control of corruption			0.378**			0.0819
Trade openness (%)			(0.172)			(0.118)
Constant	−15.43***	−3.240***	−3.396***	−9.527***	−1.768***	−1.826***
	(1.333)	(0.515)	(0.519)	(0.935)	(0.403)	(0.405)
Observations	347	347	347	347	347	347
Number of countries	22	22	22	22	22	22

Notes: ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. Standard errors in parentheses. Both DVs are in logarithm forms.

and imports are measured in two ways: net volume; and trade share of total exports or imports. Results in Column 1–3 of Table 6 show that the share of exports to China in a country's total exports associates negatively with the country's regional integration, and the share of imports from China is not significant. As shown in Column 4 to 6 of Table 6, both export and import volumes have significant negative associations with regional integration. China's (Andal 2017) stock shows a significant positive sign. The control variables also show results consistent with the baseline models. These results support the robustness of the main findings.

Main findings and discussions

Based on a series of tests on panel data from the three Asian regions, this study finds mixed results regarding the impact of China's economic presence on each country's regional economic integration. More specifically, bilateral trade with China and inbound FDI from China associate in a variety of ways with regional economic cooperation. The former relates negatively to regional trade integration, and the latter positively. These findings suggest that trade ties to China may undermine regional economic integration while FDI from China may promote regional economic integration in the three Asian regions.

Table 6. The impact of exports and imports on regional integration.

DV: Regional trade	(1)	(2)	(3)	(4)	(5)	(6)
Exports to China (%)	−0.131***	−0.127***	−0.123***			
	(0.0181)	(0.0168)	(0.0166)			
Imports from China (%)	−0.00887	−0.0266	−0.0199			
	(0.0389)	(0.0382)	(0.0379)			
China FDI stock (*log*)	0.510***	0.329**	0.284*	0.759***	0.525***	0.462**
	(0.173)	(0.153)	(0.153)	(0.205)	(0.198)	(0.197)
Population (*log*)	−2.160	−1.971	−2.079	0.0937	0.276	0.130
	(1.765)	(1.681)	(1.783)	(1.915)	(1.696)	(1.806)
GDP per capita (*log*)	−2.192			−2.555*		
	(1.343)			(1.552)		
Air transport (*log*)	−0.0835	−0.156	−0.149	−0.0326	−0.138	−0.132
	(0.128)	(0.127)	(0.126)	(0.137)	(0.134)	(0.132)
Mobile cellular (%)	0.0108			0.00924		
	(0.00736)			(0.00769)		
FTAs	−0.217***	−0.269***	−0.253***	−0.145**	−0.228***	−0.211***
	(0.0671)	(0.0687)	(0.0683)	(0.0729)	(0.0743)	(0.0731)
Trade openness (%)	−0.0372***	−0.0361***	−0.0329***	−0.0244**	−0.0221**	−0.0187*
	(0.00883)	(0.00885)	(0.00893)	(0.00977)	(0.00967)	(0.00968)
Political stability	−0.252	−0.423	−0.397	0.598	0.327	0.316
	(0.501)	(0.482)	(0.474)	(0.519)	(0.498)	(0.487)
Voice and accountability	−1.327*	−1.178	−0.670	−2.012***	−1.805**	−1.193
	(0.729)	(0.774)	(0.789)	(0.773)	(0.822)	(0.837)
Internet (%)		0.0486***	0.0531***		0.0635***	0.0675***
		(0.0167)	(0.0161)		(0.0170)	(0.0164)
Rule of law		−0.706			−1.310	
		(1.163)			(1.257)	
Control of corruption			−2.126**			−2.763**
			(1.044)			(1.084)
Exports to China (*log*)				−0.735***	−0.810***	−0.788***
				(0.248)	(0.209)	(0.201)
Imports from China (*log*)				−0.932**	−1.012***	−0.936***
				(0.377)	(0.370)	(0.361)
Constant	47.76***	31.16***	30.52***	39.56***	19.66***	19.28***
	(12.25)	(6.328)	(6.687)	(14.85)	(6.603)	(6.966)
Observations	347	347	347	347	347	347
Number of countries	22	22	22	22	22	22

Notes: ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. Standard errors in parentheses.

The possible explanation for the negative effects of trade ties may be that a country tends to depend less on regional trade when it has access to a big market like China (Krapohl and Vasileva-Dienes 2020). Most countries in the three regions, especially in Central and South Asia, tend to compete with each other due to their homogeneous export structures. For example, a large proportion of Central Asian countries' exports are natural resources, with most such countries targeting the Chinese market (Mukhamediyev and Khitakhunov 2017). Regional trade is therefore likely to be crowded out when each country's exports to China increase (Grafe, Raiser, and Sakatsume 2006). In South Asia, another explanation of the negative relationship between regional cooperation and trade with China may be conflicts between countries each seeking to bolster its own economic cooperation with China (Chung 2018). India, the largest economy in the region, is likely concerned that too large a Chinese influence may undermine Indian national interest (Yoder and Bajpai 2023). Contrarily, Bangladesh, the Maldives, Pakistan, and Sri Lanka welcome China's involvement as a way of balancing India's clout. Our findings provide empirical evidence for Krapohl and Vasileva-Dienes (2020) that the existence of extra-regional

partners would undermine intraregional integration (e.g. Russia and China in Central Asia).

This dynamic, nevertheless, manifests differently in the case of FDI. Our regression results (e.g. Tables 3–6) demonstrate that China's FDI positively associates with intraregional economic integration. A key explanation of this is the relatively long period needed for FDI to materialize. FDI tends to restructure the host economies' productive capacity, driving up their long term competitiveness. For example, our results demonstrate that a significant proportion of Chinese FDI in the three Asian regions financed regional transport infrastructure, which could eventually promote regional trade. These findings support the argument in previous studies that increasing Chinese economic presence can reinforce regional cooperation (e.g. Berger 2018; Flint and Zhu 2019; Liu and Lim 2019; Liu 2022a).

Findings also demonstrate the effects of other explanatory factors within the context of the national and regional political economy. Trade openness measured by the number of FTAs and the share of trade in a country's GDP is found to be negatively associated with regional trade integration. It could be argued that this is an expected outcome: an open economy (such as Singapore) tends to have more trade partners across the globe, reducing its reliance on neighboring countries. Information infrastructure measured by internet access is positively associated with regional trade. Moreover, landlocked countries tend to demonstrate a higher level of regional integration. Surprisingly, control of corruption associates negatively with regional trade, which means corruption is associated with stronger regional trade ties. One explanation for this seeming anomaly is that paying bribes is an alternative way to speed the trade process (e.g. customs clearance) in countries with complicated and non-transparent custom formalities (Banik and Gilbert 2010). Additionally, anti-corruption measures without institutional change and transparent formalities have undermined bureaucrats' willingness to make public service more efficient. Results also demonstrate a cross-regional difference in regional integration. Countries in CA or SA tend to have a lower level of integration than in SEA. This is probably because SEA has a more institutionalized structure for regional trade, investments, and policy coordination.

The present study has some limitations. Due to data availability, we only measured one dimension of regional economic integration (intraregional trade). Regional economic integration is multi-dimensional and may consist of cooperation in trade, investments, people movement, education, and so on. Future studies need to examine the impact of China's economic presence with consideration of other dimensions of regional economic integration. Moreover, this study has not considered the impact of other big powers on regional economic integration, such as Russia in CA and the USA and Japan in SEA. Future studies may improve the empirical model of this study by including more diverse ranges of factors in global geopolitics.

Conclusions and implications

This study provides fresh insights into how China has been shaping its various neighbors' pathways to economic development in view of its growing economic and

political presence, not least since the first decade of the twenty-first century. Looking ahead, the BRI – a long-term diplomatic and economic strategy – is expected to play an even more prominent role in the Asia-Pacific region (Heikkila 2020; Huhe and Tang 2021; Liow, Liu, and Xue 2021). More recently, the RCEP, an FTA embracing ASEAN and its Plus Five partners (China, Japan, Korea, Australia, and New Zealand), announced that it would knit together the signatory economies more tightly (Armstrong and Drysdale 2022; Shimizu 2021). However, it is not yet clear to what extent the RCEP is remolding economic integration in SEA. In this regard, much remains to be discovered regarding India's last-minute withdrawal from the RCEP. Relatively few studies have empirically examined economic integration within the Global South, in contrast to North-South integration. This gap appears untenable when South-South FTAs are increasingly taking center stage and China has played a much more prominent role in its extensive engagement with the Global South (Byun 2022; Gamso and Postnikov 2022; Liu 2022b; Murphy 2022).

This study provides unique and detailed empirical evidence that China's FDI could facilitate regional economic cooperation, while the opposite may be true of trade ties. Moreover, given increasing research interest in Asian emerging development dynamics, this study's analysis of longitudinal political and economic factors covering three key regions of the developing world facilitate a better understanding on how aggregate economic expansion can, at the same time, create new channels of growth. The insights here add value to literature focusing on Asian public policy, regional and inter-regional cooperation, and economic development.

Second, in view of the anaemic recovery of the Global North economies since the post-2008 banking crisis, China has increasingly served as the motor of the global economy. However, the global pandemic and China's stringent "Zero Covid" policy may have hampered its economic output (Cheung et al. 2021). In April 2022, the International Monetary Fund revised downwards, from 4.8 to 4.4%, its estimate of the growth of China's gross domestic product (Lee 2022). The confluence of these factors means that regional efforts at integration, simply because of the (over-)reliance on China as the single most important driving force, are perhaps more fragile than previously thought. This will, in turn, impact the future trajectories of Asian economic integration.

Last but not least, this study echoes – and even extends – existing debates about the impact that globalization and regionalization have on each other (Selvarajah 1998; Yilmaz and Li 2020). Our findings demonstrate that inbound FDI may have positive effects on regional integration, whereas inter-regional trade may undermine it. The negative association between trade openness and regional trade implies that globalization may not always assist regional integration. This is especially so in CA and SA. While structural factors such as a lack of mechanisms designed to build institutions and trust have slowed down the drive for integration in CA and SA, at least relative to SEA, it would probably be egregious to claim that the latter is not impacted by domestic constituents and their politicking. The challenge, instead, lies in distinguishing what macro-level data explains from actual reality. This suggests that a more careful analysis of how closer investment and trade ties to China have stimulated (or stunted) economic progress is urgently needed. Future research would do well to

explore in greater detail how these economic linkages foster the long-term competitive advantages of particular economies within these three regions.

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