

Measuring Regional Economic Integration: The Case of ASEAN Economies

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3rd BNM Annual Economic Research Workshop, 9 November 2015,
Kuala Lumpur

Outlines

- Background
- Objectives of the study
- Methodology
- Findings
- Conclusion

Background

- The ASEAN, the regional organization comprising 10 countries, is committed to strengthen regional cooperation and integration via the formation of ASEAN Economic Community (AEC) by end-2015.
- AEC aims to establish ASEAN as a single market and production base making that comprises of 5 core elements: (i) free flow of goods; (ii) free flow of services; (iii) free flow of investment; (iv) free flow of capital; and (v) free flow of skilled labour

Background

- Since 2008, there have been a total of 458 out of 506 or 90.5% of AEC Scorecard measures and prioritised key deliverables that have been implemented.
- Although ASEAN has come long way toward realizing its goal, but is ASEAN likely to achieve the goal of regional economic integration?

Background

- Diverse economic structure among ASEAN countries:
 - Business cycle
 - Inflation rate
 - Income per capita
 - Intra-ASEAN trade
 - Dependency on intra-ASEAN trade
 - Financial openness
 - Exchange rate regimes

Background

- Downside risks to ASEAN's growth have increased arising from the moderating growth momentum in the major emerging market economies such as China, uncertainty in commodity prices and the heightened volatility in financial markets

Objectives of the Study

- Given the current regional and global economic conditions, the present study aims to measure the progress of regional economic integration by focusing on goods and services markets as well as on financial markets.

Objectives of the Study

- Specifically, this study intends to address three questions.

1. What is the current degree of trade and financial market relations?
2. Are ASEAN's real markets integrated?
3. Are ASEAN's financial markets integrated?
4. Does the economic integration persistent?

Measuring Economic Integration

There are three measures:

1. International parity conditions
2. Quantity based measures
3. Regulatory and institutional measures

Measuring Economic Integration

- Mankin (1994) observed the international parity conditions remained a popular analytical tool to consider economic integration for several reasons:
 - (i) they are fundamental tenets of macro-economic theory;
 - (ii) the results utilizing such fundamental tenets could be more clearly interpreted; and
 - (iii) data for testing are readily available in high frequency.

Methodology

Theoretical Framework:

- Real interest parity (RIP) framework is used.
- RIP combines both uncovered interest parity (UIP) and purchasing power parity (PPP) as shown below:

$$r_t^{ke} - r_t^{k^*e} = \left(i_t^k - i_t^{k^*} - \Delta S_{t+k}^e \right) - \left(\pi_{t+k}^e - \pi_{t+k}^{*e} - \Delta S_{t+k}^e \right) \quad (1)$$

Methodology

- Due to both expected exchange rates and prices are unobservable in the current period, the operational version of Equation 1 based on ex post differentials with the assumption of rational expectations can be expressed as:

$$r_t^k - r_t^{k*} = \left(i_t^k - i_t^{k*} - \Delta S_{t+k} \right) - \left(\pi_{t+k} - \pi_{t+k}^* - \Delta S_{t+k} \right) \quad (2)$$

- In testing for economic integration, both UIP and PPP must hold or in other word, stationarity of UIP and PPP are required.

Methodology

Econometric Method:

Zivot and Andrews (1992) unit root test with one endogenously determined structural break:

- If the test statistic is greater than the critical value in absolute term, the null hypothesis of PPP (UIP) does not hold is rejected.
- This implies that countries are integrated with the flow of goods and services (the flow of financial capital).

Methodology

- **The Data:** This study employs monthly data from January 2000 to June 2015.

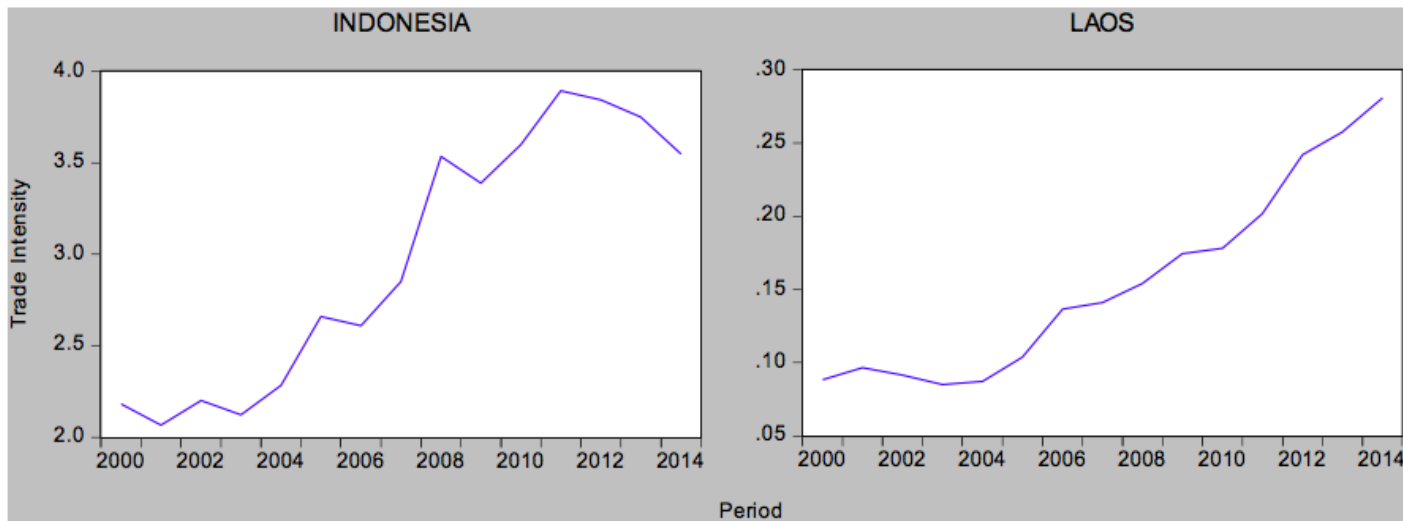
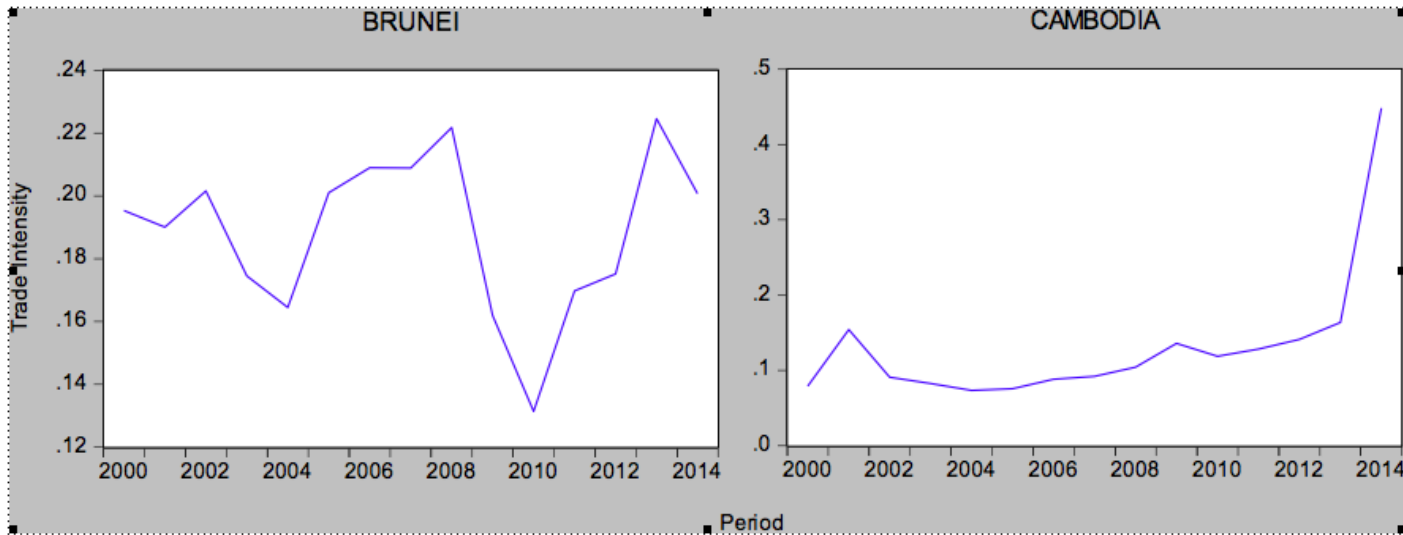
Data	Country	Source of data
End-of-period nominal exchange rate	All ASEAN countries	International Financial Statistics (IFS), IMF
Consumer price index	All ASEAN countries	IFS, IMF
Money market rate	Indonesia, Malaysia, the Philippines, Thailand and Singapore	IFS, IMF
Lending rate	Cambodia, Myanmar and Vietnam	IFS, IMF
Lending rate	Lao PDR	Bank of Lao PDR
Deposit rate	Brunei Darussalam	IFS, IMF

Findings

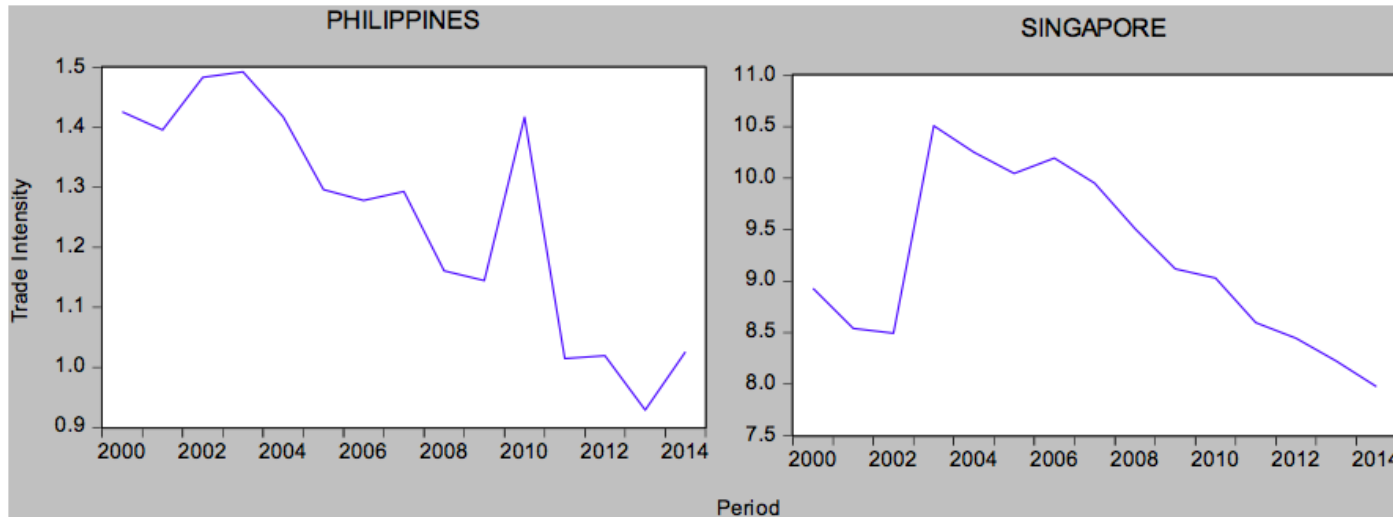
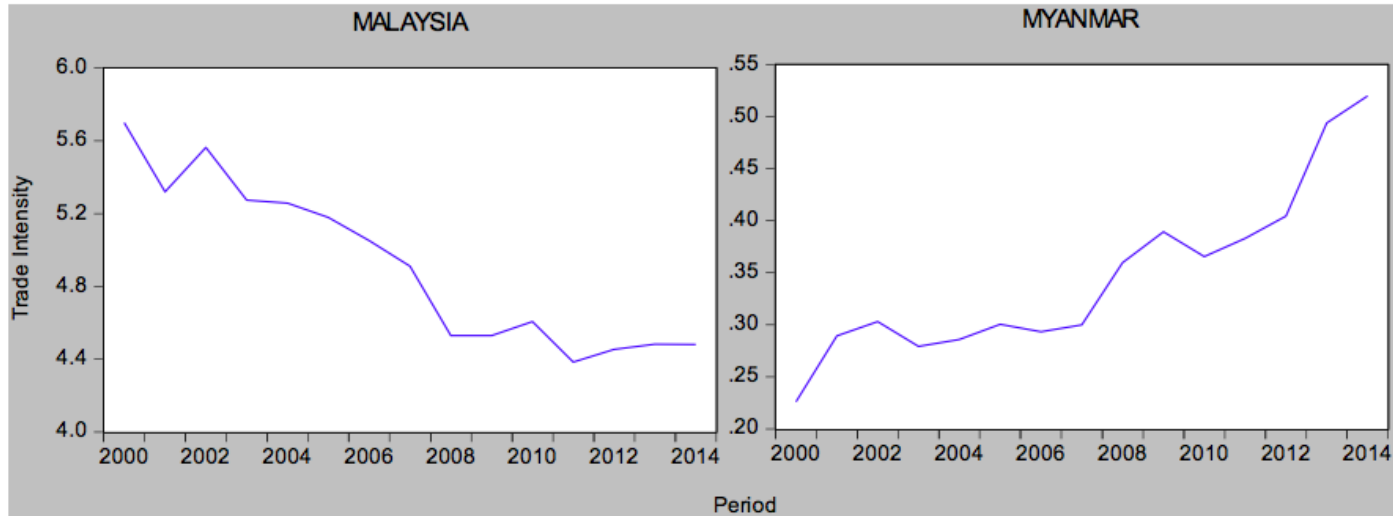
- Prior to the tests for economic integration, this section assesses the degree of trade relations and interest rate comovement.
- The trade intensity series are generated by:

$$X_{ij,t} = (Ex_{ij,t} + Ex_{ji,t}) / (\text{ASEAN's total world trade}) \quad (3)$$

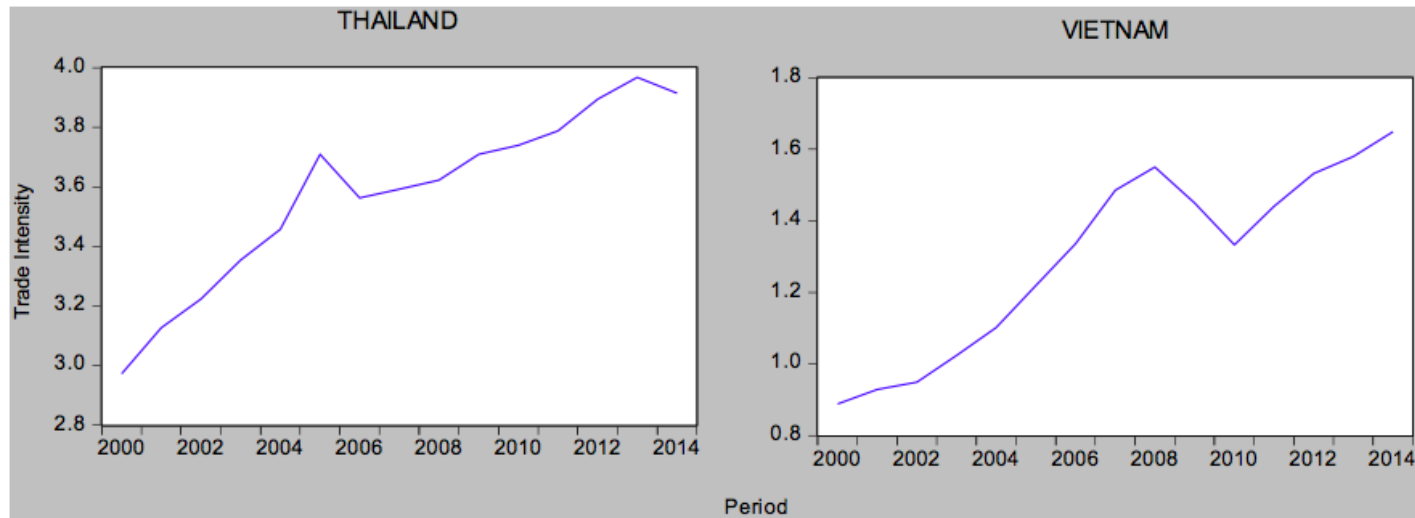
Findings



Findings



Findings



Findings

- Tables 2 and 3 show **the correlation of interest rates** amongst ASEAN countries.
- It appears that interest rates of **Brunei, Cambodia, Indonesia, Laos, Myanmar and the Philippines** became more correlated with interest rates of ASEAN countries

Findings

Table 2: Interest Rates Correlation for the period January 2000 – December 2007

	Brunei	Cambodia	Indonesia	Laos	Myanmar	Malaysia	Philippines	Singapore	Thailand	Vietnam
Brunei	1.000									
Cambodia	-0.428	1.000								
Indonesia	-0.329	-0.277	1.000							
Laos	-0.379	0.804	-0.203	1.000						
Myanmar	0.508	-0.681	-0.008	-0.549	1.000					
Malaysia	0.480	-0.893	0.290	-0.699	0.747	1.000				
Philippines	-0.347	-0.197	0.690	-0.097	-0.035	0.201	1.000			
Singapore	-0.021	-0.628	0.618	-0.549	0.301	0.578	0.702	1.000		
Thailand	0.182	-0.796	0.564	-0.653	0.534	0.817	0.588	0.894	1.000	
Vietnam	0.144	-0.716	0.451	-0.795	0.440	0.631	0.357	0.803	0.843	1.000

Findings

Table 3: Interest Rates Correlation for the period January 2008 - June 2015

	Brunei	Cambodia	Indonesia	Laos	Myanmar	Malaysia	Philippines	Singapore	Thailand	Vietnam
Brunei	1.000									
Cambodia	0.795	1.000								
Indonesia	0.866	0.655	1.000							
Laos	0.916	0.727	0.869	1.000						
Myanmar	0.778	0.964	0.677	0.689	1.000					
Malaysia	-0.028	-0.285	0.064	0.167	-0.346	1.000				
Philippines	0.709	0.840	0.525	0.712	0.763	-0.011	1.000			
Singapore	0.724	0.444	0.526	0.706	0.404	0.305	0.480	1.000		
Thailand	-0.028	-0.149	-0.044	0.144	-0.278	0.842	0.213	0.254	1.000	
Vietnam	0.225	0.478	0.169	0.294	0.432	0.276	0.651	0.184	0.516	1.000

Findings

Testing for PPP:

- In the case of PPP series, the null hypothesis of a unit root is rejected in all country pairs (except Laos-Myanmar) at high levels of statistical significance, implying that the deviations from PPP are stationary and tend to disappear over time.
- This suggests that real integration strongly holds amongst ASEAN countries.

Findings

Testing for UIP:

- However, in the case of UIP, evidence of UIP is relatively weak compared to PPP. In total there are 34 out of 45 country pairs support the UIP.
- All in all, although there is evidence that PPP and UIP hold in ASEAN region, it appears that real integration has progressed further than financial integration.

Findings

- Testing for PPP (Real Integration):

A Summary of PPP Results

	Brunei	Cambodia	Indonesia	Laos	Myanmar	Malaysia	Philippines	Singapore	Thailand	Vietnam
Brunei										
Cambodia	-14.65***									
Indonesia	-9.23***	-11.29***								
Laos	-13.14***	-9.89***	-10.79***							
Myanmar	-6.93***	-4.83*	-5.62***	-4.53						
Malaysia	-12.85***	-10.26***	-9.31***	-12.50***	-4.89*					
Philippines	-8.35***	-9.06***	-12.47***	-10.57***	-6.48***	-9.34***				
Singapore	-13.93***	-9.46***	-10.15***	-7.48***	-6.57***	-8.36***	-8.47***			
Thailand	-13.99***	-12.30***	-8.89***	-11.15***	-6.14***	-13.48***	-13.32***	-15.18***		
Vietnam	-15.48***	-10.24***	-10.81***	-9.66***	-4.74*	-14.54***	-14.56***	-15.94***	-13.66***	

Notes: 1%, 5% and 10% critical values are -5.34, -4.93 and -4.58 respectively. ***, ** and * denotes 1%, 5% and 10% significance levels respectively.

Findings

- Testing for UIP (Financial Integration):

A Summary of UIP Results

	Brunei	Cambodia	Indonesia	Laos	Myanmar	Malaysia	Philippines	Singapore	Thailand	Vietnam
Brunei										
Cambodia	-6.86***									
Indonesia	-4.95**	-5.01**								
Laos	-5.18**	-4.67*	-4.77*							
Myanmar	-4.52	-5.96***	-6.46***	-5.60***						
Malaysia	-10.23***	-6.64***	-4.92*	-5.87***	-5.21**					
Philippines	-6.42***	-4.25	-6.69***	-4.79*	-7.17***	-7.58***				
Singapore	-4.10	-4.78*	-4.76*	-3.38	-4.31	-6.24***	-7.37***			
Thailand	-5.32**	-4.96**	-5.25**	-4.19	-5.01**	-8.32***	-7.28***	-6.79***		
Vietnam	-3.84	-4.26	-4.02	-4.93*	-4.67*	-5.72***	-5.72***	-4.26		

Notes: 1%, 5% and 10% critical values are -5.34, -4.93 and -4.58 respectively. ***, ** and * denotes 1%, 5% and 10% significance levels respectively.

Findings

Persistence Test:

- To validate the PPP and UIP conditions, this study tests the persistence of the deviations from PPP and interest differentials using the equation below:

$$d_t = \beta_0 + \sum_{k=1}^p \beta_k d_{t-k} + \varepsilon_t \quad (4)$$

Findings

Persistence Test:

- Under UIP (PPP) condition, the interest differentials (the deviations from PPP) is random, has a zero mean, and cannot be predicted by available information.
- Thus, if the parity condition is significantly persistent, interest differentials (the deviations from PPP) is predictable and the markets are not efficient. This is considered as evidence against the validity of the parity conditions.

Findings

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- Thus, if the parity condition is significantly persistent, interest differentials (the deviations from PPP) is predictable and the markets are not efficient. This is considered as evidence against the validity of the parity conditions.

Findings

Persistence Test:

- The results demonstrate that 10 out of 44 PPP deviations can be predicted by available information. These are considered as evidence against the validity of PPP condition.

Findings

Persistence Test:

- However, in the case of UIP, only 7 out of 34 interest differentials cannot be predicted by available information and the markets are efficient.

Findings

- Testing for the Persistence of Purchasing Power Differential:

A Summary of the Persistence of PPP Deviations

	Brunei	Cambodia	Indonesia	Laos	Myanmar	Malaysia	Philippines	Singapore	Thailand	Vietnam
Brunei										
Cambodia	-14.65***									
Indonesia	-9.23***	-11.29***								
Laos	-13.14***	-9.89***	-10.79***							
Myanmar	-6.93***	-4.83*	-5.62***							
Malaysia	-12.85***	-10.26***	-9.31***	-12.50***	-4.89*					
Philippines	-8.35***	-9.06***	-12.47***	-10.57***	-6.48***	-9.34***				
Singapore	-13.93***	-9.46***	-10.15***	-7.48***	-6.57***	-8.36***	-8.47***			
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Vietnam	-15.48***	-10.24***	-10.81***	-9.66***	-4.74*	-14.54***	-14.56***	-15.94***	-13.66***	

Findings

- Testing for the Persistence of Interest Rate Differential:

A Summary of the Persistence of Interest Differentials

	Brunei	Cambodia	Indonesia	Laos	Myanmar	Malaysia	Philippines	Singapore	Thailand	Vietnam
Brunei										
Cambodia	-6.86***									
Indonesia	-4.95**	-5.01**								
Laos	-5.18**	-4.67*	-4.77*							
Myanmar		-5.96***	-6.46***	-5.60***						
Malaysia	-10.23***	-6.64***	-4.92*	-5.87***	-5.21**					
Philippines	-6.42***		-6.69***	-4.79*	-7.17***	-7.58***				
Singapore		-4.78*	-4.76*			-6.24***	-7.37***			
Thailand	-5.32**	-4.96**	-5.25**		-5.01**	-8.32***	-7.28***	-6.79***		
Vietnam				-4.93*	-4.67*	-5.72***	-5.72***			

Conclusion

- The findings show that while PPP holds, there is less strong indication for UIP holding.
- The same result is confirmed when the test for the persistence of UIP and PPP differentials are conducted.
- The results indicate that while the real integration has progressed well, financial markets in ASEAN region are less integration compared to the real integration.
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Conclusion

- The implication of the findings is that although the degree of financial integration between amongst ASEAN countries is limited, the gains in future will be substantially large.
- Further liberalization efforts under ASEAN Banking Integration Framework, which aims to liberalize the banking market by 2020, could result in a larger sized market and strengthen their economic integration

Thank You

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