Dynamics of Bond Market Integration in ASEAN-5 Economies

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Abstract

This paper attempts to analyse the dynamics of bond market integration in ASEAN-5 Economies: Indonesia, Malaysia, Philippines, Singapore and Thailand. Results revealed that there is limited overall integration within ASEAN-5 bond markets. This also applies when paired with US government bonds. However, an analysis by sub-periods revealed that integration post-global financial crisis has significantly increased. The policy implication for this is that although government bond markets in the region are considered to be well developed, there may still be room to enhance linkages between the markets.

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Introduction

ASEAN economies aspire to realise an ASEAN Economic Community (AEC), a region that is economically integrated by 2015. The AEC envisions developing a single market and production base, to transform itself into a highly competitive economic region that is of equitable economic development and fully integrated into the global economy (ASEAN, 2008). With the realisation of AEC, ASEAN economies are expected to benefit tangibly; from the development of local small and medium industries to the increase of foreign investment (Runkel & Associates, 2012)

As part of this initiative, financial integration has been identified as an integral limb towards achieving an ASEAN economic community. Financial integration is vital for sustainable and inclusive growth, provides risk sharing, risk diversification and improves the efficiency of allocation of capital. Financial integration will always be an important priority of the AEC and works on ensuring further financial integration is a priority post - 2015 (Secretariat, 2015).

In the lead up to the Asian Financial Crisis 1997, ASEAN's finance systems were extremely bank-centric, which meant that most of the risks were being concentrated in the banking system. There was a lack of 'spare tyre', a different channel of intermediation that could be used if the banks once again encountered difficulties, hence diversifying the sources of funding for an economy and contributing to financial resilience. Furthermore, the conception of 'original sin' with the lack of development of local currency bond markets meant that many corporates suffered from double mismatch on their balance sheets. Not to mention, economies in the region were dependent on volatile capital flows which posed a risk to financial stability (Einchengreen, 2006).

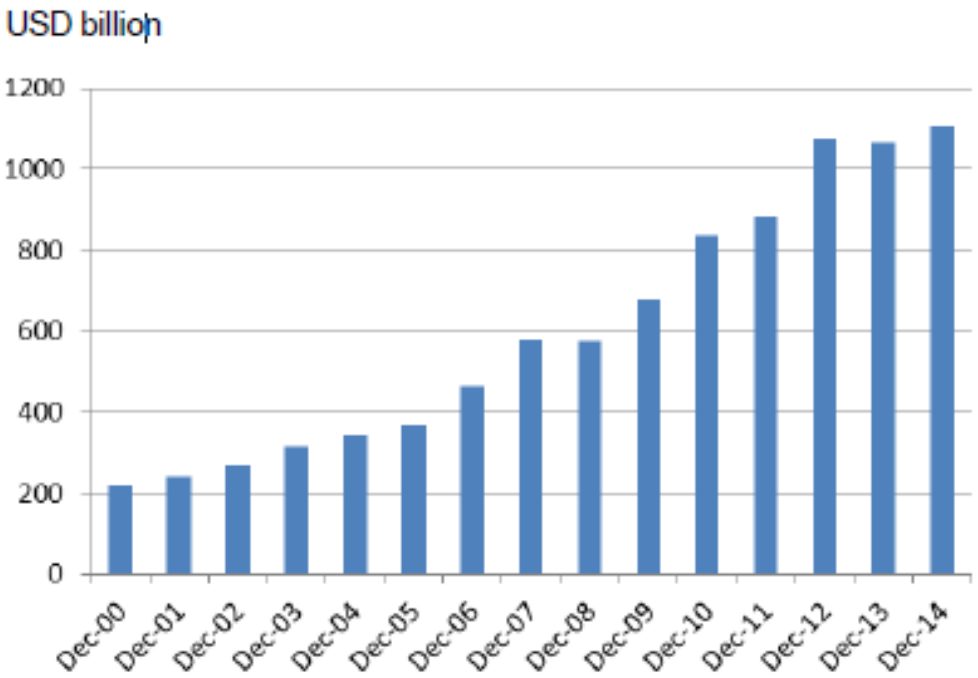
Hence, it is no surprise that policymakers in ASEAN have since then placed bond market development as a major priority. An evident of such initiative is the establishment of the ASEAN+ 3 Bond Market Initiative (Asian Development Bank, 2015) in August 2003. The ABMI has brought about some significant development to the ASEAN bond market. Among the notable examples is the establishment of Asian Bond Online, a platform that provides latest information about bond markets in the region, the establishment of Credit Guarantee and Investment Facility to support the issuance of local currency bonds in the region by providing credit enhancement and the establishment of the ASEAN+ 3 Bond Market Forum to achieve standardization of market practice and harmonization of regulations relating to cross-border bond transactions in the region (Kurihara, 2012). ABMI has also established working groups to address areas in relation to creating new securitised debt instruments, credit guarantee mechanism, foreign exchange transactions and settlement issues, issuance of bonds denominated in local currency , local and regional rating agencies and technical assistance coordination (Secretariat, 2015).

Under the EMEAP grouping, central banks have also collaborated under the Asian Bond Fund 2 to develop local currency bond markets. In a review, the BIS (Chan, Chui, Packer, & Remolona, 2012) found that the ABF initiative played a catalytic role in removing market impediments and improving the liquidity of bond markets.

As a result of such efforts, bond markets in the region has developed considerably (Figure 1). By many counts, the development of the local currency bond markets have improved the resilience of region’s domestic financial systems with deep and liquid

domestic capital markets to contribute to sustainable and inclusive economic growth (Chan, Chui, Packer, & Remolona, 2012).

Figure 1: Growth of Local Currency Bond Markets in ASEAN-5 and Vietnam



Source: ADB Asian Bonds Online

Given the various efforts undertaken in the region to develop local currency bond markets, it is essential to take stock to empirically analyse the level of integration among government bond markets. Government bonds are the backbone of most fixed-income securities markets in both developed and developing economies. Apart from what is provided by the central bank, a government bond market provides an avenue for domestic funding of budget deficits reducing the need for direct and potentially damaging monetary financing of government deficits and avoiding an increase of foreign currency–

denominated debt. It can also strengthen the transmission and implementation of monetary policy, including the achievement of monetary targets or inflation objectives (Ping, 2001).

Many have argued that the ASEAN bond market's degree of integration is limited as the underdeveloped state of bond market is a reason for the slow convergence in bond market yields in the region (Danareksa Research Institute, 2004). The study conducted by the BIS indicates weak integration of the Asian bond market, although one can argue that this is due to China being taken into account in the data sample (Fung, Tam, & Yu, 2010). Kim, Lee, & Shin (2006) also found little evidence of integration as they posited that the low level of financial integration is attributed to the lack of incentive for diversification of portfolios within the region.

The developments in Asia have always been compared with Europe. Here, the study on European bond market shows a reasonable level of integration. This could probably be outcome of a common monetary policy that governs the European Union. The study conducted by (Baele, 2004) assessed the bond market integration in two different areas; price based measures of government bond market integration and news based measures of bond market integration. His study shows a reasonably high integration in the government- and corporate-bond markets. A study was conducted to test the unconditional correlations between yield of different economies before and after the European Monetary Union (EMU) shows that pre EMU the correlation between the top 4 economies (UK, Spain, Italy and France) was very strong that it reaches .99 and post EMU their correlation with the UK falls (Erhmann, 2009). It can be deduced that

having a common monetary policy which spills over to a standardization of rules and regulations seem to contribute towards the integration of the money market in the region.

To foster a better understanding on the integration of local currency bond markets in this region, this paper will be focusing on the 5 most developed bond markets in the region: Malaysia, Indonesia, Singapore, Philippines and Thailand. The ASEAN-5 region inherently serves as a familiarization turf for foreign investors. Most investment firms are using the ASEAN-5 economies to help foreign investors to get access to the region and develop confidence in investing in other ASEAN nation like Myanmar or Vietnam (JP Morgan, 2015).

The study will examine cointegration between the ASEAN-5 bond markets as a proxy for the level of financial integration. Cointegration examines the long run relationship between the variables in terms of its comovement across time that may be driven by a common factor with a possibility of short-run divergence.

Method and data

The dataset includes weekly yields for ASEAN-5 local currency government benchmark for 2 year and 10 year bonds obtained from Bloomberg. It includes data for 496 weeks that begins in the week ending 1 July 2005 until 26 December 2014, providing cumulatively with 4960 total observations. The yields for the 2 year and 10 year bonds are depicted in Figure 2 and 3 respectively while the summary statistics are listed in Table 1.

Figure 2: 2 year ASEAN-5 government benchmark bond yields

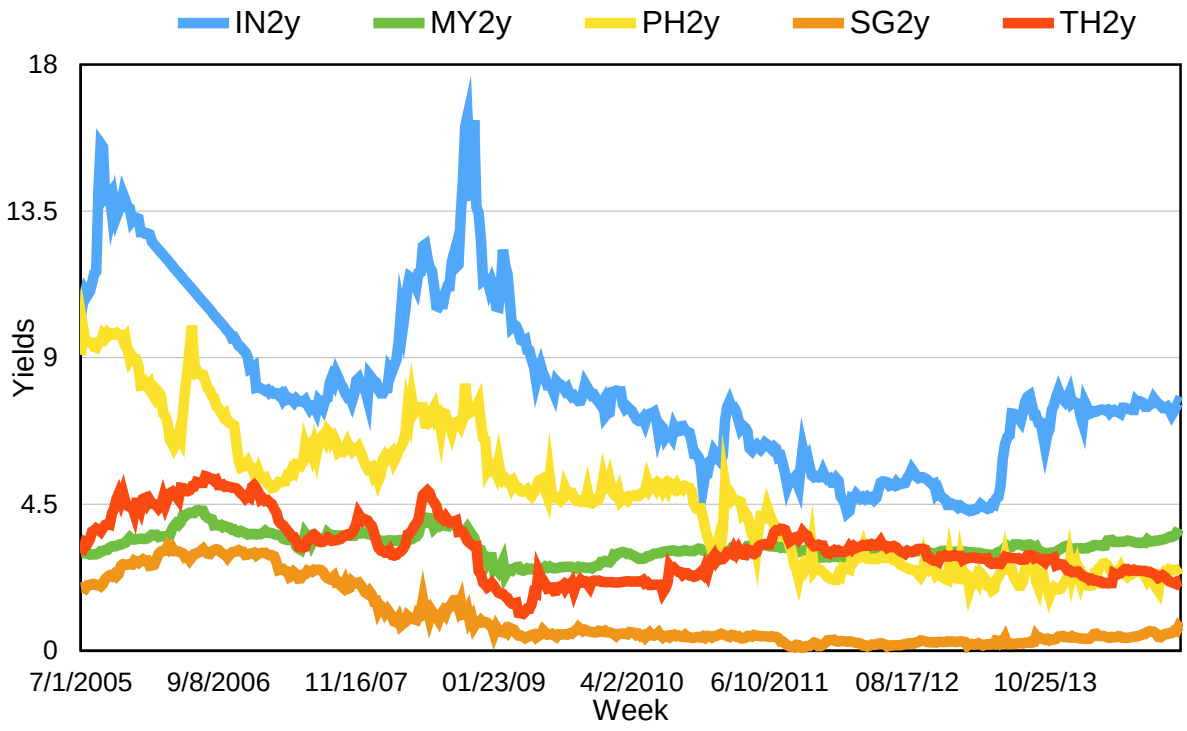


Figure 3: 10 year ASEAN-5 government benchmark bond yields

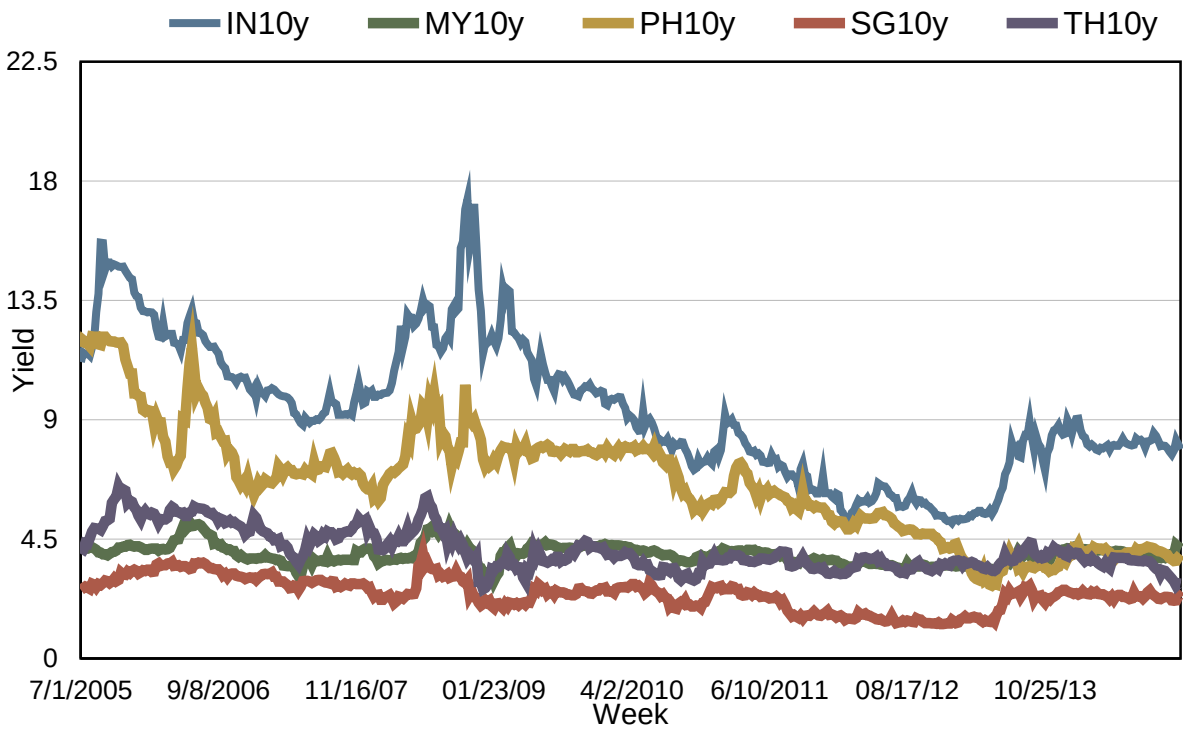


Table 1: Descriptive statistics for ASEAN-5 bonds for sample period

Variable	Mean	Std.Dev	Min	Max	Skewness	Kurtosis
IN 2year	8.091423	2.589057	4.225	16.41	0.7673781	3.06704
IN 10year	9.345192	2.611198	5.116	17.301	0.4602945	2.660787
MY 2year	3.211714	.3813129	2.32	4.32	0.3323286	3.173193
MY 10year	3.931887	.3694212	2.947	5.14	0.5426978	3.752119
PH 2year	4.746213	2.184992	1.675	9.9857	0.4914111	2.299302
PH 10year	6.615233	2.166896	2.75	12.1464	0.3925087	2.856798
SG 2year	1.048754	.984146	.082	3.22	1.009561	2.41613
SG 10year	2.438042	.601761	1.2971	3.9407	-0.0872845	2.366323
TH 2year	3.136453	.9488349	1.127	5.354	0.4814226	2.52541
TH 10year	4.088878	.7771776	2.615	6.482	0.8314662	2.914899

To test for nonstationarity of the data, the Dickey-Fuller (ADF) test was applied. The null hypothesis for the dataset is for the existence of a unit root. Results show that the null for all cannot be rejected and hence unit root can be observed for all 10 benchmark bond series. The results of the ADF in the level is listed in Table 1.

Table 2: Test of Unit Root for ASEAN-5 Government Bonds

Bonds	ADF
IN - 2 year	-1.239
IN - 10 year	-1.506
MY - 2 year	-1.787
MY - 10 year	-2.734

Bonds	ADF
PH - 2 year	-1.830
PH - 10 year	-2.095
SG - 2 year	-1.070
SG - 10 year	-1.989
TH - 2 year	-1.131
TH - 10 year	-1.895

Note: Critical values at 5% is -2.870

Empirical analysis

Having determined that the variables are non-stationary, using the Johansen (1991) trace method, we test for the number of cointegration vectors for both 2 year and 10 year bonds as well as within the respective maturities. The results of the trace test for the variables is listed in Table 3 and 4 below.

Table 3: Trace statistics for 2 year bonds for ASEAN-5

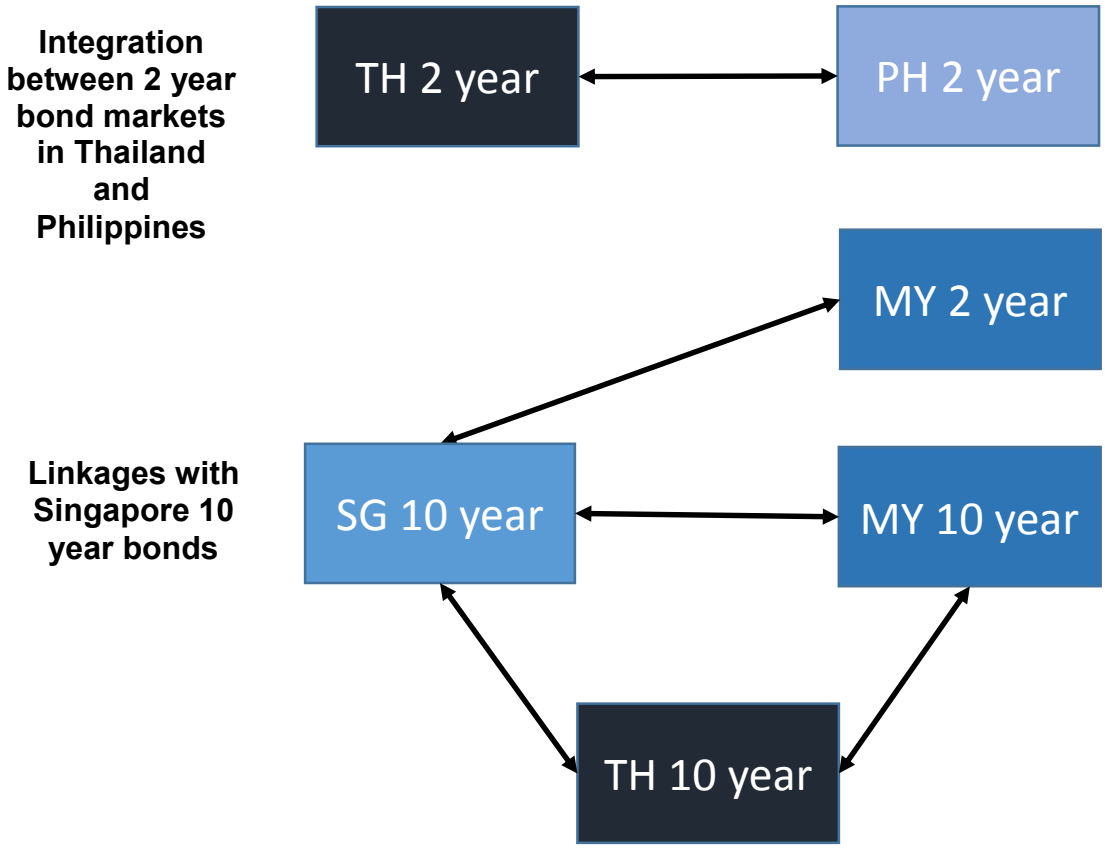
H=0	Trace statistic	Critical value at 5%
r=0	54.4508*	68.52
r=1	28.5600	47.21
r=2	15.8072	29.68
r=3	5.8317	15.41
r=4	1.9069	3.76

Table 4: Trace statistics for 10 year bonds for ASEAN-5

H=0	Trace statistic	Critical value at 5%
r=0	74.3433	68.52
r=1	41.7501*	47.21
r=2	25.6347	29.68
r=3	13.3367	15.41
r=4	1.8643	3.76

The Johansen test accepts the first *H=0* not rejected. We can see that among each sample, there are no cointegration factors among the 2 year bond sample and one factor for the 10 year bond sample.

Figure 4: Significant pairwise cointegration in ASEAN-5 bond markets



Conducting the test on the individual pairs, we found five significant cointegration relationships as listed in Figure 4 above.

Global financial crisis (GFC)

Delving deeper, we looked at whether the integration of bond markets could be affected by the structural break arising from the global financial crisis that was triggered into September 2008. Thus, we conducted the identical analysis as above by dividing the sample into two sub periods (pre and post GFC).

Table 5: Trace statistics for 2 year ASEAN-5 bonds before vs after GFC

	Pre-GFC	Post-GFC	Critical value = 5%
H=0	**Trace statistic**	**Trace statistic**	
r=0	69.2625	164.4459	68.52
r=1	44.8257*	75.0035	47.21
r=2	25.4289	26.8932*	29.68
r=3	8.5589	7.4327	15.41
r=4	1.4044	1.1394	3.76

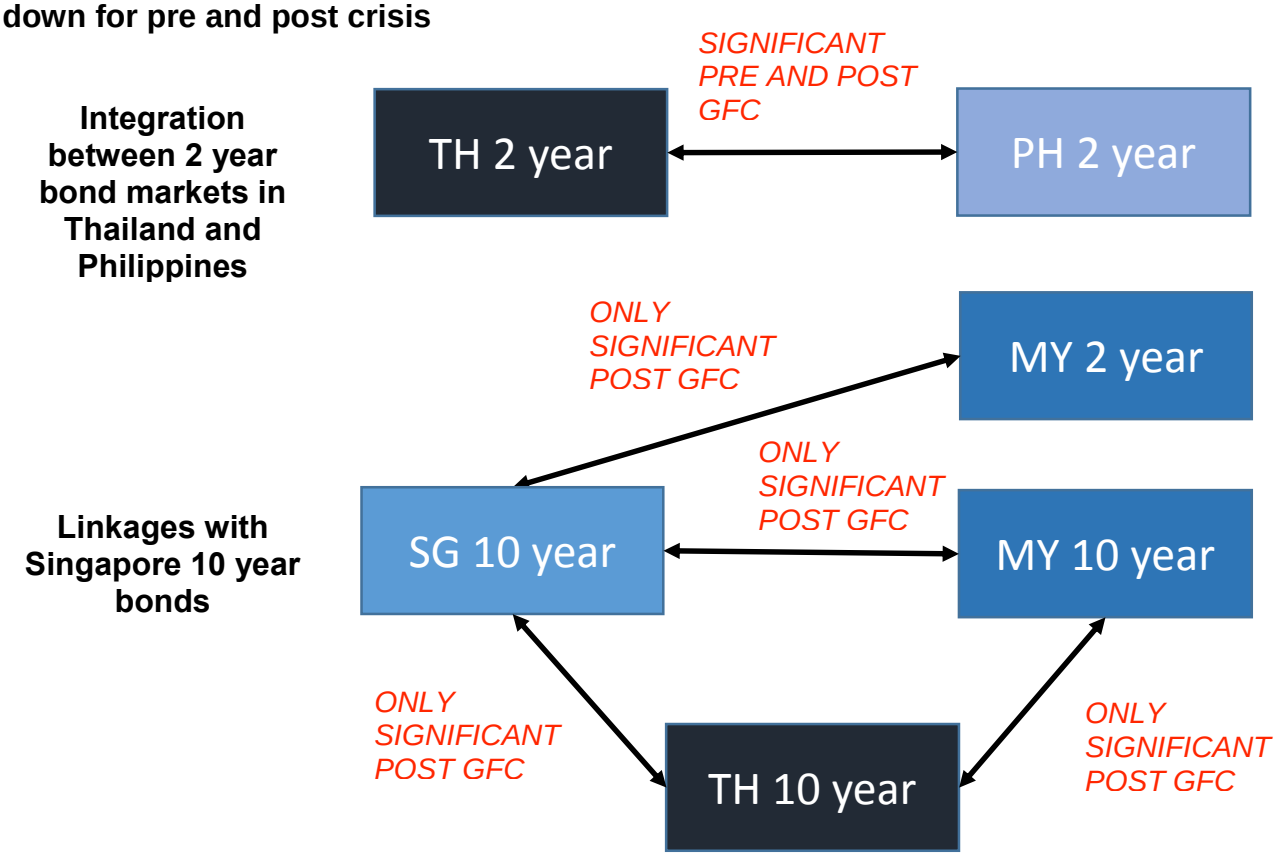
Table 6: Trace statistics for 10 year ASEAN-5 bonds before vs after GFC

	Pre-GFC	Post-GFC	Critical value = 5%
H=0	**Trace statistic**	**Trace statistic**	
r=0	68.3656*	93.2629	68.52
r=1	36.4220	53.0817	47.21
r=2	17.4839	20.9287*	29.68

	Pre-GFC	Post-GFC	Critical value = 5%
H=0	Trace statistic	Trace statistic	
r=3	6.3528	7.7592	15.41
r=4	0.1809	1.5451	3.76

From the results, we can observe that cointegration has increased post-crisis for both 2 year and 10 year bonds, more notably an increase in two cointegration relationships for the 10 year bond. Next, we examine the pairwise cointegration to provide an indication on which economies have shown more cointegration in government bond yields. Figure 5 reviews the results by focusing on the significant pairwise cointegration in Figure 4. It shows that most of the cointegration occurred after the GFC.

Figure 5: Review of pairwise cointegration in ASEAN-5 bond markets by breaking it down for pre and post crisis



Convergence with the United States

US securities play a critical role in global financial markets, with significant spillovers to markets in Asia (Bayoumi, T, & Bui, T, 2012). The US yield curve has been shown to be one of the main driver of spreads for emerging market bonds (Vivek, 2006). Given its important driving role, we sought to examine the relationship between the ASEAN-5 government bonds with the 2 year and 10 year bond benchmarks of the United States for the same sample period. In summary, there seems to be a lack of evidence of cointegration between US bonds and ASEAN-5 with the exception of Singapore, which show cointegration with the US for both the 2 year and 10 year tenor (Table 13 and 14). The other pairs do not exhibit any cointegration.

Table 7: Descriptive statistics for US Government Bonds, 2 year and 10 year for sample period

Bond	Mean	Std.Dev	Min	Max	Skewness	Kurtosis
US 2year	1.718107	1.762678	0.1652	5.261	0.8915299	2.073563
US 10year	3.273301	1.032128	1.452	5.2223	0.1068888	1.860041

Table 8: Test of Unit Root for US Government Bonds

Bonds	ADF
US 2year	-1.026
US 10year	-1.254

Note: Critical values at 5% is -2.870

Table 9: Trace statistics for 2 year bonds for ASEAN-5 and US

H=0	Trace statistic	Critical value at 5%
r=0	109.3689	94.15
r=1	56.2855*	68.52
r=2	28.1168	47.21
r=3	14.8583	29.68
r=4	5.5089	15.4

Table 10: Trace statistics for 10 year bonds for ASEAN-5 and US

H=0	Trace statistic	Critical value at 5%
r=0	104.8029	94.15
r=1	55.4973*	68.52
r=2	34.4473	47.21
r=3	20.0571	29.68
r=4	8.0021	15.41

Table 11: Trace statistics for 2 year bonds for Singapore and US

H=0	Trace statistic	Critical value at 5%
r=0	30.7416	15.41
r=1	1.0448*	3.76

Table 12: Trace statistics for 10 year bonds for Singapore and US

H=0	Trace statistic	Critical value at 5%
r=0	19.2588	15.41
r=1	1.5666*	3.76

Discussion and Conclusion

Overall, the results indicate that firstly, there is limited integration in bond markets for the sample period and that the integration of ASEAN-5 bond markets with the US is limited. Although counterintuitive, it is consistent with findings that the movement of yields in the US can be better captured via the US Feds Fund Rate and the VIX and it in itself is not a driver of global liquidity (Csonto & Ivaschenko, 2013).

On the former, a drilldown of the data revealed that there are major differences within the sample period, most notably the structural break brought about by the Global Financial Crisis in 2008. In particular, these can be explained through two factors: firstly, the concerted efforts by policymakers to pursue financial integration and secondly, the abundant global liquidity conditions (IMF, 2015a). In support of the first factors, various research have found that the initiatives driven by ASEAN have had material impact on market development (Chan, Chui, Packer, & Remolona, 2012); (J, et al., 2011). The finding on the significant linkages of Singapore with other economies post-GFC is consistent with the rise of the role of Singapore as the financial centre in intermediating flows in the region (Remolona & Shim, 2015).

Moving forward, it is imperative for ASEAN-5 to actively continue to build capacity and the infrastructure to further develop its bond markets. There are challenges ahead, most notably the new landscape of financial services arising from global regulatory reforms. Such structural changes may present challenges for liquidity in bond markets and other unintended consequences (IMF, 2015b). Therefore, in pushing ahead, a concerted, prudent and flexibile approach is needed. An efficient and integrated capital market remains a crucial bedrock for the development of an ASEAN Economic Community.

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