Opening power trade in ASEAN would encourage the development of renewable energy generation and save cost. Monetary Union might not be necessary for ASEAN but monetary cooperation brings substantial gains. China-ASEAN trade growth is far higher than originally predicted when component trade is included. Chiang Mai Initiative Multilateralisation (CMIM) should coordinate with existing bilateral swap facilities between ASEAN+3 countries.
**MONETARY UNION MIGHT NOT BE NECESSARY FOR ASEAN BUT MONETARY COOPERATION BRINGS SUBSTANTIAL GAINS**

**BACKGROUND**

**Research objective:**
To explore the implications of an ASEAN Monetary Union (MU).

- ASEAN’s objective with the ASEAN Economic Community (AEC) is to deepen its regional integration.
- The three components needed for full economic integration are a customs union, a common market and an economic union.

ASEAN has made some progress in all above mentioned areas but the questions remain whether further adjustments are required beyond the national borders and how ASEAN can move onwards towards the goal of creating an AEC.

In this study, the authors assess the potential gains and losses of ASEAN countries if they would form a MU compared with the status-quo.

**KEY FINDINGS**

**Simulation results**

<table>
<thead>
<tr>
<th>SCENARIOS</th>
<th>COALITION STRUCTURE</th>
<th>TYPE OF PRICE SHOCK</th>
<th>OUTCOME</th>
<th>INTERPRETATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>National monetary policies but no fiscal policies</td>
<td>Non-cooperative regime</td>
<td>Symmetric</td>
<td>Convergence of prices to a new higher equilibrium level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Asymmetric</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>National monetary and active fiscal policies</td>
<td>Non-cooperative regime</td>
<td>Symmetric</td>
<td>Convergence of prices to a new equilibrium level, lower than in Scenario 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Asymmetric</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Monetary union and national fiscal policies</td>
<td>Non-cooperative regime</td>
<td>Symmetric</td>
<td>Convergence of prices to a new equilibrium level, lower than in Scenario 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Asymmetric</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**METHODOLOGY**

- The study formulates a small-scale dynamic general equilibrium model of nine ASEAN countries and estimates the model with recent data.
- The dataset is taken from ASEAN Statistical Yearbooks for 1995-2007, and from 2002-2007 through selected ASEAN indicators. Myanmar is omitted because there is no data on budget deficit since 2002.
- The study then explores the theoretical implications of an ASEAN MU using the model in a dynamic game setting.
- The authors then find analytical conditions for the existence of equilibria in the model, and analyse impulse response functions to see the consequences of different economic shocks under different coalition structures and the desirability of monetary cooperation.
WHY IT MATTERS

While ASEAN has not made any commitment towards forming a monetary union, some still see such a union as a logical final step of economic integration. This study shows that some of the benefits that come with a monetary union, can also be achieved with lower levels of monetary cooperation. As we have seen with the European Monetary Union and the European sovereign debt crisis, a monetary union can be risky and should not be entered into prematurely. Moreover, a monetary union might not be a feasible option if economic shocks are country specific.

The main finding is that there are substantial gains from monetary policy cooperation, but whether a monetary union would improve upon monetary cooperation is not clear.

Interestingly, the estimation procedure reports that current fiscal policy has not had much effect on the economic variables in ASEAN countries, likely due to the fact that ASEAN countries have not used fiscal instruments to counter economic shocks in the past few years.

But in case ASEAN would form an MU, individual countries would need to restructure to rely more on fiscal policies since they cannot use monetary instruments as the monetary policy would be set by a regional central bank.

Another interesting point is the conflict of interest between fiscal and monetary authorities regarding cooperation.

Fiscal authorities benefit most from full cooperation.

Monetary authorities benefit most from not cooperating with fiscal authorities.

Furthermore, in case countries are hit by an asymmetric shock and if there is some form of fiscal cooperation, the countries that are not hit suffer more than the country that is hit by the shock.

Therefore, such economic cooperation might only be feasible for those ASEAN countries that have similar economic structure and are not often hit by country specific shocks.

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The APG and the Trans-ASEAN Gas Pipeline (TAGP) were planned to create an energy-interconnected ASEAN, connecting energy resource-rich and energy resource-poor members. The problem of how the available resources can be used to meet the rising energy need of the region is exacerbated by the uneven distribution of energy resources and different levels of economic development across ASEAN. Due to ASEAN’s high economic growth, electricity demand in ASEAN is projected to grow by 6.1% to 7.2% per annum, which would mean that it would have more than tripled by 2030.

The study has two main purposes:
1. To examine the least-cost development of different types of energy resources
2. To scan alternative combinations of energy resources needed for power generation in each time period

The authors use the dynamic linear programming framework in power generation first developed by Turvey and Anderson (1977) but add extensions:
- A new country dimension is added to allow cross-border electricity trade
- The cost of cross border power transmission and transmission loss are taken into account
- Carbon emissions and carbon cost from power generation are also covered

The ASEAN Center for Energy estimates that ASEAN has:
- 22 billion barrels of oil reserve
- 227 trillion cubic feet of natural gas reserve
- 20 gw of geothermal capacity
- 234 GW of hydropower potential
- 46 billion tons of coal reserve
- 20 gw of geothermal capacity
- 234 GW of hydropower potential
- 46 billion tons of coal reserve

Expected growth rate of power demand in ASEAN countries 2010-2030

<table>
<thead>
<tr>
<th>Country</th>
<th>Growth rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodia</td>
<td>2</td>
</tr>
<tr>
<td>Myanmar</td>
<td>4</td>
</tr>
<tr>
<td>Laos</td>
<td>6</td>
</tr>
<tr>
<td>Vietnam</td>
<td>8</td>
</tr>
<tr>
<td>Thailand</td>
<td>10</td>
</tr>
<tr>
<td>Philippines</td>
<td>12</td>
</tr>
<tr>
<td>Malaysia</td>
<td>14</td>
</tr>
<tr>
<td>Singapore</td>
<td>16</td>
</tr>
<tr>
<td>Indonesia</td>
<td>18</td>
</tr>
<tr>
<td>Brunei</td>
<td>20</td>
</tr>
</tbody>
</table>

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  1. To examine the least-cost development of different types of energy resources
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- The authors use the **dynamic linear programming framework** in power generation first developed by Turvey and Anderson (1977) but add extensions:
  - A new country dimension is added to allow cross-border electricity trade
  - The cost of cross border power transmission and transmission loss are taken into account
  - Carbon emissions and carbon cost from power generation are also covered

**Assumption:** The APG infrastructure is in place

**Dynamic Linear Programming Model:** The study models ASEAN’s power planning for the next few decades with a dynamic linear programming model.

**Results:**
1. No power trade allowed
2. 20% of demand allowed to be met by power trade
3. 50% of demand allowed to be met by power trade
**KEY FINDINGS**

- **Natural gas appears to be the dominant future energy source** for power generation in ASEAN, against its main two competitors - coal and hydropower, mainly because it is more competitive in terms of cost and emission efficiency.

- In the scenario where no power trade is allowed, countries that lack renewable energy sources are forced to build more natural gas or coal power generation capacities to meet growing demand.

- In the scenarios where power trade is allowed, the APG is successful in enabling active cross-border power trade between resource-rich countries and high-demand countries.

- With increased power trade, the required amount of new natural gas power plants decreases significantly, and the amounts of new renewable energy plants, especially hydropower, geothermal, and wind, increases.

- **Power trading is cost saving** as countries are able to import power from resource rich countries instead of building new power facilities.

- **Hydropower is the dominant renewable energy source.**

- **Other renewable energy sources** (geothermal, wind, and biomass) are projected to be developed much later than hydropower, or between the years 2026-2028, in all scenarios.

- The level of biomass power generation, which uses domestic biomass resources, decreases with increased trade, as countries are able to draw from cheaper resources from other countries.

- **Solar PV (Photo voltaic) power** generation is not developed in any of the scenarios, suggesting that it is either too costly or not efficient enough compared with other resources.

**WHY IT MATTERS**

This study shows that ASEAN’s energy cooperation is on the right path, given that it will follow through on its energy-interconnectivity initiatives such as the APG and the TAGP. The region has enough energy reserves to meet its growing energy need, and it could meet those needs more efficiently if countries are able to trade power between each other. Increased power trade is also environmentally friendly, as it increases the production of renewable sources and decreases the production of fossil fuel sources.
Research objective:
To explore how trade in parts and components differ from trade in final goods following the implementation of the ASEAN-China Free Trade Agreement (ACFTA), how much trade flows between China and ASEAN has changed since ACFTA and whether increased integration between China and ASEAN would negatively affect members' trade with non-members.

- The ACFTA came into effect on 1 January 2010. It is the world’s third largest in economic size after NAFTA (North American Free Trade Agreement) and the EU, and it has the highest population of all free trade areas with 1.9 billion people.

- By 2015, the zero-tariff rate on Chinese goods will be extended to the CLMV (Cambodia, Laos, Myanmar and Vietnam) countries.

- Trade flows between ASEAN and China has grown rapidly in the past few decades; China is currently ASEAN's largest trading partner and ASEAN is currently China’s third largest trading partner.  

The authors include trade in *parts and components* in their model as they believe conventional predictions of trade between the two regions after the implementation of ACFTA, to be underestimated.

- They highlight three characteristics of *component trade* and its impact on trade creation:
  1. its growth may follow a different path than growth in final goods trade
  2. new component trade is the pattern likely to be determined by cross-country industrial linkages according to countries’ comparative advantages
  3. trade with the rest of the world may increase as non-member countries can also be involved in the production chain

- The share of trade in parts and components of total trade between ASEAN and China is large compared with the rest of the world.

### ASEAN members and China trade share (%)

<table>
<thead>
<tr>
<th></th>
<th>SINGAPORE</th>
<th>MALAYSIA</th>
<th>THAILAND</th>
<th>INDONESIA</th>
<th>PHILIPPINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imports</td>
<td>33.1</td>
<td>22</td>
<td>21.8</td>
<td>17.9</td>
<td>5.2</td>
</tr>
<tr>
<td>Exports</td>
<td>34.6</td>
<td>25.1</td>
<td>21.2</td>
<td>15.1</td>
<td>3.9</td>
</tr>
</tbody>
</table>

**ACFTA**

Average tariffs between China and ASEAN-6:

- **Imports**
  - 9.8% (before 2010) → 0.1% (2010)
  - 12.8% (before 2010) → 0.6% (2010)

**Trade in goods**

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### Share of parts and components in total manufacturing exports (2004)

<table>
<thead>
<tr>
<th></th>
<th>ASEAN (+6)</th>
<th>EU</th>
<th>NAFTA (US, Canada, Mexico)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share (%)</td>
<td>33.5%</td>
<td>20.9%</td>
<td>30.7%</td>
</tr>
</tbody>
</table>

Footnote: 1. ASEAN Secretariat, December 2012
**METHODOLOGY**

- The study uses an extended gravity model that takes bilateral imports, exports and related trade in parts and components between China and ASEAN into account.
- The dataset consists of 76,417 observations from 117 countries.
- The data is from Subramanian and Wei (2007) for the period from 1980 to 2000, and from the IMF for the period 2001-2008.

**KEY FINDINGS**

- The study shows that by explicitly accounting for component trade, the predicted impact of ACFTA has on bilateral trade between China and ASEAN is substantially higher than shown by previous studies that use conventional gravity models.
- According to the study, ACFTA affects bilateral trade in parts and components via an additional channel of cross-country linkages.
- A large share of trade flows between China and ASEAN is likely to be in parts and components, and concentrated among a sub-group of member countries with strong industrial linkages.
- Trade creation in component trade between ASEAN and China will have positive spill-over effects to non-member countries due to their involvement in the production chain, meaning that trade creation effect dominates trade diversion effects after the establishment of ACFTA.

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CMIM SHOULD COORDINATE WITH EXISTING BILATERAL SWAP FACILITIES BETWEEN ASEAN+3 COUNTRIES

Title of study: Enhancing the Effectiveness of CMIM and AMRO: Selected Immediate Challenges and Tasks

BACKGROUND

Research objective:
To explore the challenges of the Chiang Mai Initiative Multilateralisation (CMIM) and the ASEAN+3 Macroeconomic Research Office (AMRO) and to suggest possible areas in which their effectiveness can be improved.

- The CMIM is a multilateral currency swap between the ASEAN+3 countries. It was established in March 2010 with a pool of US$120 billion, which was increased to US$240 billion in May 2012.

- Despite the doubling of the amount, the fund has been criticised for being insufficient. In comparison, the European Financial Stability Facility (EFSF) of 750 billion euros (US$978 billion) in 2011 is about 8% of aggregated GDP of the Eurozone, while the CMIM is only about 1.5% of the total ASEAN+3 GDP.

- In May 2012, it was decided that the ASEAN+3 Finance Ministers Meeting should henceforth include Central Bank Governors, creating a more comprehensive and integrated regional financial cooperation as both fiscal and monetary authorities oversee and decide on CMIM matters.

- Several other major new commitments were announced during the May 2012 meeting:

  - AMRO, a surveillance office for the CMIM, was established in May 2011 and is based in Singapore.
  - Since December 2011, AMRO has released a quarterly set of surveillance reports, which have been identified as the key factor behind the decision to double the total swap facility and to increase the IMF de-linked portion.

<table>
<thead>
<tr>
<th>Countries</th>
<th>Financial Contribution (US$ billion)</th>
<th>Share (%)</th>
<th>Purchasing Multiple</th>
<th>Maximum Swap Amount (US$ billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plus Three</td>
<td>192.00</td>
<td>80.00</td>
<td>1.0</td>
<td>117.30</td>
</tr>
<tr>
<td>Japan</td>
<td>76.80</td>
<td>32.00</td>
<td>2.0</td>
<td>38.40</td>
</tr>
<tr>
<td>China</td>
<td>76.80</td>
<td>32.00</td>
<td>1.5</td>
<td>34.20</td>
</tr>
<tr>
<td>Mainland</td>
<td>68.40</td>
<td>28.50</td>
<td>2.5</td>
<td>6.30</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>8.40</td>
<td>3.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Korea</td>
<td>38.40</td>
<td>16.00</td>
<td>1.0</td>
<td>38.40</td>
</tr>
<tr>
<td>ASEAN</td>
<td>48.00</td>
<td>20.00</td>
<td>1.0</td>
<td>126.20</td>
</tr>
<tr>
<td>Indonesia</td>
<td>9.104</td>
<td>3.793</td>
<td>2.5</td>
<td>22.76</td>
</tr>
<tr>
<td>Thailand</td>
<td>9.104</td>
<td>3.793</td>
<td>2.5</td>
<td>22.76</td>
</tr>
<tr>
<td>Malaysia</td>
<td>9.104</td>
<td>3.793</td>
<td>2.5</td>
<td>22.76</td>
</tr>
<tr>
<td>Singapore</td>
<td>9.104</td>
<td>3.793</td>
<td>2.5</td>
<td>22.76</td>
</tr>
<tr>
<td>Philippines</td>
<td>9.104</td>
<td>3.793</td>
<td>2.5</td>
<td>22.76</td>
</tr>
<tr>
<td>Vietnam</td>
<td>2.00</td>
<td>0.833</td>
<td>5.0</td>
<td>10.00</td>
</tr>
<tr>
<td>Cambodia</td>
<td>0.24</td>
<td>0.10</td>
<td>5.0</td>
<td>1.20</td>
</tr>
<tr>
<td>Myanmar</td>
<td>0.12</td>
<td>0.05</td>
<td>5.0</td>
<td>0.60</td>
</tr>
<tr>
<td>Brunei</td>
<td>0.60</td>
<td>0.25</td>
<td>5.0</td>
<td>0.30</td>
</tr>
<tr>
<td>Laos</td>
<td>0.06</td>
<td>0.25</td>
<td>5.0</td>
<td>0.30</td>
</tr>
<tr>
<td>Total</td>
<td>240.00</td>
<td>100.00</td>
<td></td>
<td>243.50</td>
</tr>
</tbody>
</table>

- Despite the doubling of the amount, the fund has been criticised for being insufficient.

IMF de-linked portion: Any drawing below this percentage does not require countries to submit to IMF guidelines.

CMIM Contributions and access to maximum swap amounts.

IMF de-linked portion: Any drawing below this percentage does not require countries to submit to IMF guidelines.

AMRO, a surveillance office for the CMIM, was established in May 2011 and is based in Singapore.

Since December 2011, AMRO has released a quarterly set of surveillance reports, which have been identified as the key factor behind the decision to double the total swap facility and to increase the IMF de-linked portion.

PREVIOUS | ANNOUNCED MAY 2012
--- | ---
Size of swap facility | US$120 billion | US$240 billion
IMF de-linked portion | 20% | 30%
Maturity (full amount) | 90 days | 30 months, with 2 renewals
Scope of facilities | Crisis resolution | Crisis resolution + Crisis prevention

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METHODOLOGY

- The paper explores the history of the CMIM and AMRO, and highlights some of their recent developments and commitments. It then discusses the challenges that these agencies face and suggests responses to overcome them.

KEY FINDINGS

- Despite the limited size of the swap facility of only US$240 billion, there are a number of measures that can be adopted in order to enhance the effectiveness of the CMIM framework. The paper focuses on two key areas:

1. COORDINATION BETWEEN BILATERAL AND MULTILATERAL SWAP FACILITIES
   - There are several existing bilateral swap agreements between the ASEAN+3 nations, some with larger maximum swap facility than the CMIM.
   - The ASEAN+3 countries could agree upon a common framework in a joint memorandum of understanding (MoU), in which the two facilities could coordinate with each other to avoid either facility being undermined by the other.
   - The CMIM could be the coordinating body, in charge of evaluating applications.
   - If a requested amount is larger than the CMIM has available, the bilateral swap can provide additional funds.
   - Benefits of coordination:
     - The recipient country can receive a higher swap amount that is available under the CMIM.
     - The providing country does not have to shoulder the risk of the full amount and it can rely on the surveillance process of the CMIM.

2. DESIGN OF THE CMIM DISBURSEMENT
   - Despite the stigma regarding conditionalities of IMF loans following the Asian crisis, some conditionalities are needed for the CMIM to function.
   - Conditionalities for the CMIM facility must be as flexible and accessible as possible, while still safeguarding the pool of funds from moral hazard practices.
   - The CMIM should establish a framework for conditionality with full CMIM ownership that is large enough to be useful, with related conditionalities that are strict enough to protect lenders’ interest while supporting the economy of the borrower.
   - The framework should include relevant policy adjustments in the borrowing economy, focused on addressing the cause of the crisis and ensure that funds will be repaid.

WHY IT MATTERS

The CMIM has so far remained off-limits to its members, mostly due to the IMF restrictions and the limited size of the swap agreement. It is important to find ways to increase the effectiveness of the CMIM and make it an attractive option for the member countries, for it to become a regional financial safety net for the ASEAN+3 economies. This paper suggests that this can be done by coordinating with bilateral swap agreements, but it also warns that it has to be done without leading to moral hazard issues by including some conditionalities on the loans.