Exchange Rate Policy and Regimes

Bank Indonesia International Workshop and Seminar
Central Bank Policy Mix: Issues, Challenges and Policies
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Natan Epstein

The views expressed herein are those of the author and should not be attributed to the IMF, its Executive Board, or its management.
Objectives and Outline of the Lecture

- Concept and taxonomy of exchange rate regimes
  - Note the extent to which countries’ official and actual regimes differ
  - Hard/soft pegs, floating, and specific regimes within those classes
  - *De jure* versus *de facto* exchange rate regimes

- History of exchange rate arrangements (brief)

- Exchange rate regimes and the broader policy framework.
  - Interaction of the ER regime with monetary policy and capital mobility
  - Mundell’s impossible trinity (aka Trilemma) and perfect capital mobility
  - Analysis of the incompatibility of autonomous monetary policy, perfect capital mobility, and a pegged ER regime
  - The relevance of Mundell’s result and a case of limited capital mobility
Introduction
What is an Exchange Rate Regime?

- Simply put: A country’s policy stance toward managing exchange rates and intervening in foreign exchange markets.

- At its most basic, this policy stance can be described by its goal for the behavior of nominal exchange rates.
  - At one extreme are **Fixed (or Pegged) Exchange Rate Regimes**. They involve a commitment to exchange local currency against a foreign currency (or a basket of currencies) at a rate that is fixed
  - At the other extreme are **Floating Exchange Rate Regimes**. They involve letting the private market determine exchange rates with little or no official intervention

- In between, there are a multiplicity of exchange rate regimes that vary by:
  - The **degree to which exchange rates are determined in the market** rather than by official actions
  - The **type of official action used to influence** exchange rates
Taxonomy of Exchange Rate Regimes
This simple scheme has two general categories for pegs—hard and soft—and one general category for floating.

**Hard Pegs**
- No separate legal tender
- Currency board

**Soft Pegs (Intermediate)**
- Conventional
- Stabilized arrangement
- Peg with horizontal bands
- Crawling: peg or band

**Floating**
- Managed
- Free
Hard Pegs

• **No separate legal tender**: Some countries adopt another country’s currency (*dollarization or euroization*).

  - A **currency union** is classified under the arrangement governing the joint currency.

• Others fix an exchange rate with strict arrangements that limit how domestic-currency liquidity is managed (**currency board arrangements**).
• Some countries let exchange rates float almost exclusively without intervention (free floating).

• And some intervene to influence exchange rates in some limited way (floating), such as to limit volatility without trying to alter underlying trends (and without aiming for a particular level).
Soft Pegs

• Soft pegs aims to mix ER stability with easier adjustment -- to changes in conditions -- inherent in floating ER regimes.

• This mixing has been done in a variety of ways:
  - Conventional peg that may need to be adjusted from time to time
  - Target zone or band, which allows fluctuations within a range
  - Stabilized arrangement
  - Crawling peg, which allows predictable periodic changes in the peg
  - Crawling band

• Balancing stability and adjustability can be difficult, hard to sustain. As a result, some have advocated a bipolar view: choose either a hard peg or a float (aka the corner solution).
In many countries there is a disconnect between how policymakers officially describe their exchange rate regime (de jure) and how the exchange rate behaves in practice (de facto).

- Possibility #1: Countries that are de jure pegged but adjust the peg often.

- Possibility #2: Countries that are de jure floaters but limit exchange rate fluctuations, for example by intervening in FX markets.

- The disconnect is more of an issue for floating regimes, i.e., there are many de jure floaters that are de facto intermediate regimes.

- ER classification schemes mainly focus on the de facto regime.
**IMF AREAER: De Facto regimes**

### Table 3. Exchange Rate Arrangements, 2008–16

*(Percent of IMF members as of April 30)¹*

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<td>Pegged exchange rate within horizontal bands</td>
<td>1.1</td>
<td>2.1</td>
<td>1.1</td>
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<td>36.0</td>
<td>34.7</td>
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<td>Floating</td>
<td>20.2</td>
<td>24.5</td>
<td>20.1</td>
<td>18.9</td>
<td>18.4</td>
<td>18.3</td>
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<td>15.7</td>
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<td>Residual</td>
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<td>9.4</td>
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</table>

¹ Percent of IMF members as of April 30

² 2008 data includes 61 members

³ 2009 data includes 66 members

⁴ 2010 data includes 69 members

⁵ 2011 data includes 72 members

⁶ 2012 data includes 75 members

⁷ 2013 data includes 78 members

⁸ 2014 data includes 81 members

⁹ 2015 data includes 84 members

¹⁰ 2016 data includes 87 members
Stabilized Arrangement entails a spot market exchange rate that remains within a margin of 2% for six months or more (with the exception of a specified number of outliers or step adjustments) and is not floating. The required margin of stability can be met either with respect to a single currency or a basket of currencies. The classification does not imply a policy commitment.

Floating ER is largely market determined, without an ascertainable or predictable path for the rate. In particular, an exchange rate that satisfies the statistical criteria for a stabilized or a crawl-like arrangement will be classified as such unless it is clear that the stability of the exchange rate is not the result of official actions. Foreign exchange market intervention may be either direct or indirect, and intervention serves to moderate the rate of change and prevent undue ER fluctuations.

Free floating ER implies that intervention occurs only exceptionally and aims to address disorderly market conditions and if the authorities have provided information or data confirming that intervention has been limited to at most three instances in the previous six months, each lasting no more than three business days.

Other Managed Arrangements is a residual category and is used when the exchange rate arrangement does not meet the criteria for any of the other categories. Arrangements characterized by frequent shifts in policies may fall into this category.
# ASEAN ER Arrangements

<table>
<thead>
<tr>
<th>ASEAN Countries</th>
<th>Classification of Exchange Rate Arrangements</th>
<th>Monetary Policy Framework</th>
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<tbody>
<tr>
<td>Brunei Darussalam</td>
<td>Currency Board</td>
<td>ER (SGD)</td>
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<tr>
<td>Cambodia</td>
<td>Managed Floating</td>
<td>Other Managed Arrangement</td>
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<td>Indonesia</td>
<td>Floating</td>
<td>Floating</td>
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<td>Laos P.D.R.</td>
<td>Managed Floating</td>
<td>Stabilized Arrangement</td>
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<td>Malaysia</td>
<td>Floating</td>
<td>Other Managed Arrangement</td>
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<tr>
<td>Myanmar</td>
<td>Managed Floating</td>
<td>Other Managed Arrangement</td>
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<td>Philippines</td>
<td>Floating</td>
<td>Floating</td>
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<tr>
<td>Singapore</td>
<td>Other Managed Arrangement</td>
<td>Stabilized Arrangement</td>
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<tr>
<td>Thailand</td>
<td>Floating</td>
<td>Floating</td>
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<tr>
<td>Vietnam</td>
<td>Managed Floating</td>
<td>Stabilized Arrangement</td>
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<sup>1</sup>Includes countries that have no explicitly stated nominal anchor, but rather monitor various indicators in conducting monetary policy.
Other classification schemes, like the IMF’s, have been developed to monitor and study the evolution of regimes.

Among advanced economies, the biggest development was the introduction of the currency union in the euro area.

Among the group of emerging market countries, more are becoming floaters, but still a large proportion have *de facto* (soft) pegs.

And among developing countries, pegging is the dominant exchange rate regime.
A (brief) History of Exchange Rate Arrangements
The Gold Standard (1880-1914)

- Access to world capital markets required pegging currencies to gold (countries in yellow).
- Gold standard period coincided with free capital mobility.

Reinhart and Rogoff (2004)
The Interwar Period (1918-1939)

• Most countries suspended gold convertibility during WWI. After the war, some countries returned to the gold standard, while others were forced to float.
  
  o For example, fiscal pressures in Germany led to hyperinflation and abandonment of the peg. This is an example (albeit extreme) of how large fiscal finance can undermine the viability of an exchange rate peg.

• During the Great Depression, the gold standard became a constraint on the stance of monetary policy: Concerns with the possibility of large gold outflows if policies were accommodative kept monetary policies too tight.
  
  o The gold standard played a large role in propagating and amplifying the crisis, which increased calls for new ER arrangements.
The Bretton Woods Era (1945-1973)

- Fixed but adjustable exchange rate pegs, limited international capital mobility, monetary policy independence.
- Some countries adjusted their pegs often, or had parallel exchange rate markets.

Reinhart and Rogoff (2004)
The Modern Era (1973-)

- A variety of ER arrangements, considerable international capital mobility.
- Increased experimentation with regimes, but also recurrent exchange rate crises.

Reinhart and Rogoff (2004, updated dataset)
Exchange Rate Regimes and the Broader Policy Framework
The choice of exchange rate regimes needs to be understood within the broader macroeconomic policy framework. In particular, exchange rate regimes interact closely with two other policies:

- Monetary Policy
- Financial Stability Policy, including capital and financial account policies, which influence the degree of capital mobility

The viability of any regime also depends on:

- The sustainability of fiscal policy
- The resilience of the financial sector to domestic and external shocks
Example: 3 Policy Choices

- **Choice 1: Exchange Rate Policy**
  - Pegging an exchange rate
  - Allowing exchange rates to float freely

- **Choice 2: Monetary Policy**
  - Having the freedom (autonomy) to adjust stance of policy as needed to help achieve other objectives (e.g. price stability, full employment)
  - Focusing exclusively (no autonomy) on achieving an ER target

- **Choice 3: Capital Mobility**
  - Allowing the free flow of capital into and out of the country (perfect capital mobility)
  - Adopting policies to restrict the flow of capital into or out of the country (imperfect capital mobility)
Survey: Where would you put your economy?

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</table>

- Peg
- Float

No
Suppose your policymakers decided that they would like to achieve the following three objectives:

- To stabilize an exchange rate
- To enjoy perfect capital mobility
- To have the freedom to conduct monetary policy to achieve domestic goals

Robert Mundell developed an influential model in which he showed that those three choices are incompatible.

Mundell’s result has been called the Impossible Trinity. (It is also referred to as the Trilemma.)
Countries face a trilemma: Must choose two out of three

The Impossible Trinity

or

The Trilemma

Perfect Capital Mobility

Inflation Targeting
Money Targeting

Hard Pegs,
Monetary union,
Currency board

Independent
Monetary policy

Fixed Exchange Rate with
Imperfect Capital Mobility

Fixed Exchange Rate
A key idea in Mundell’s analysis is the concept of **perfect capital mobility (PCM)**.

PCM has two components:
- **Unimpeded capital flows** into and out of the country
- **Perfect substitutability between the assets** of the home country and the foreign country to which the home country might peg

The second feature of PCM is important because it means that sterilized intervention is ineffective.
Under **perfect capital mobility**, we start with the uncovered interest rate parity condition:

\[ i_t = i_t^* + \Delta E_{t+1} \]

- A peg implies no change in \( E_t \) over time, so \( \Delta E_{t+1} = 0 \).

- What happens if policy makers move \( i_t \) for domestic reasons?
Why can’t countries with a peg have an independent monetary policy?

- Loosening MP: $i_t < i^*_t$ would induce capital outflows.

- To maintain the peg, the central bank would sell foreign currency and drain (decrease) domestic currency liquidity.

- The decrease in domestic liquidity will increase $i_t$, bringing interest rates back into line. So it would not be possible to lower the interest rate (while maintaining the peg and PCM).

- Sterilized intervention to defend the peg is ineffective, since by assumption domestic and foreign assets are perfect substitutes in this world of perfect capital mobility.
Why can’t countries with a peg have an independent monetary policy?

- Tightening MP $i_t > i_t^*$ would induce capital inflows.

- To maintain the peg, the central bank would buy foreign currency and increase domestic currency liquidity.

- The increase in domestic liquidity will reduce $i_t$, bringing interest rates back into line.

- So it would not be possible to raise the interest rate either.
Why can’t countries with a peg have an independent monetary policy?

• Under imperfect capital mobility, we can use the augmented interest parity relationship

\[ i_t = i^*_t + \Delta E_{t+1} + \omega_t, \]

where \( \omega_t \) is a risk premium that can vary over time. Imperfect substitutability of assets or capital controls may create such a risk premium.

• In that case, the scope for sterilized intervention to be effective in maintaining the peg depends on its power to alter \( \omega_t \).
Mundell’s Key Result

• If you want the benefits of free capital mobility, then monetary policy is going to have to choose between
  ❖ stabilizing domestic prices and/or domestic output and
  ❖ stabilizing an exchange rate

• Corollary: If you are willing to accept imperfect capital mobility, then it may be possible for monetary policy to seek domestic objectives and sterilized intervention to stabilize its exchange rate.
Do Countries that Peg Give Up on Monetary Independence?

- Obstfeld, Shambaugh, and Taylor (2005) focused on estimates of $\alpha$ in the following relationship:

$$\Delta i_t = \alpha \Delta i_t^*$$

- Under a peg with perfect capital mobility, Mundell’s result says that the domestic ST interest rate ($i_t$) must move one for one with the ST interest rate of the country the currency is pegged to ($i_t^*$). In that case, $\alpha = 1$.

- For countries that float, $\alpha = 1$ is not necessary; indeed, under floating, complete independence of monetary policy could yield $\alpha = 0$.

- So high correlations ($\alpha$ close to 1) were seen as suggesting little monetary policy independence and low correlations ($\alpha$ near 0) were seen as suggesting more independence.
Do Countries that Peg Give Up on Monetary Independence?

- Finding: countries that peg are more constrained by foreign interest rates (less MP autonomy; i.e. $\alpha$ closer to 1) than countries that do not peg.

<table>
<thead>
<tr>
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<th>Gold Standard Peg</th>
<th>Gold Standard Non-Peg</th>
<th>Modern Era Peg</th>
<th>Modern Era Non-Peg</th>
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<tbody>
<tr>
<td>$\alpha$</td>
<td>0.52**</td>
<td>0.05</td>
<td>0.46**</td>
<td>0.27**</td>
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<tr>
<td>$R^2$</td>
<td>0.41</td>
<td>0.00</td>
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<td>0.01</td>
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<tr>
<td>Observations</td>
<td>350</td>
<td>140</td>
<td>748</td>
<td>1103</td>
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Obstfeld, Shambaugh, and Taylor (2005)

- During the Bretton Woods period (not shown in this table), even though pegging was so widespread, there was quite a bit of monetary autonomy, consistent with the view that capital controls (prevalent at the time) can break the link between monetary policy and exchange rate policy.
Obstfeld, Shambaugh, and Taylor (2004) also find that non-peggers respond more to changes in foreign interest rates in the modern era than during the gold standard.

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Obstfeld, Shambaugh, and Taylor (2005)

Why do you think that is?
How strict is the Mundell result?

- The empirical relation between domestic and foreign interest rates under pegs is not as tight as the theory predicts ($\hat{\alpha} < 1$).

- It suggests that there may be some (very limited) scope for monetary policy discretion in a peg, especially when the capital and financial accounts are not fully open.

- One possible reason for such scope is that pegging an exchange rate in many cases involves keeping it within a range. So some limited floating can occur.

- Another possible reason is that risk premiums are likely present in some cases. Recall the interest rate relationship for pegs under imperfect capital mobility:

$$i_t = i_t^* + \frac{\Delta E_{t+1}}{0} + \omega_t$$

- If sterilized interventions influence $\omega_t$, then this can give policymakers some scope to move rates ($\Delta i_t \neq \Delta i_t^*$) without giving up on the peg.
What about limited capital mobility?

- China is often cited as pegging an exchange rate, having an independent monetary policy, and having less open capital and financial accounts.

- Yet differences in monetary policy relative to the US led to big swings in reserves:
  - Accommodative monetary policy since 2008 in the US contributed to large reserve accumulation in China.
  - Expectations of policy normalization in the US since 2014 and policy accommodation in China have resulted in a large drainage of reserves.

- China’s experience shows that limited capital mobility may allow for independent monetary policy and control over exchange rates but not without potentially significant implications for reserves.
China: Benchmark Interest rates and FX Reserves 2010-2016

Benchmark rates on loans of as much as a year and one-year deposits

Lending rate

 Deposit rate

Source: People’s Bank of China via CEIC Data

China: International Reserves (US$ Billions)

China: Capital Flows (US$ Billions)
High Capital Mobility, Exchange Rate Regimes, and Monetary Policy

• What does high capital mobility imply for the interaction between exchange rate policy and monetary policy?

• With high capital mobility, pegging countries will need to direct monetary policy toward maintaining the peg. The ability to focus monetary policy on the achievement of domestic goals will be limited.

• With high capital mobility, floating countries will be able to direct monetary policy toward the achievement of domestic goals, but the countries must be willing to tolerate some fluctuations in exchange rates.

• Floaters can use monetary policy to manage exchange rates, but to the extent that they do, they sacrifice some focus on domestic goals. “Mind the policy tradeoffs.”
Takeaways
Takeaways

• The exchange rate regime is a key part of a country’s macro framework.

• The taxonomy of regimes is rich and evolving, no consensus on the best way to classify ER regimes, much less on the best regime.

• Exchange rate volatility appears to be a concern for some policymakers, which is reflected in their reluctance to let exchange rates float freely and perhaps also the disconnect between *de facto* and *de jure* ER regimes.

• At the same time, capital mobility can have an important influence on the feasibility of monetary policy autonomy under pegged ER regimes.
Thank you


References


Appendix
History of Capital Controls: Timeline

Classical gold standard

1880 - 1914

Free capital mobility

Keynes: “The inhabitant of London could ... adventure his wealth in the natural resources and new enterprises of any quarter of the world: (1920)
Source: Klein, 2012

Inter war period

1925-1933(GR)-1939

Very strict capital controls

During the Great Recession (1933) Keynes calls for more controls on capital flows. He wrote in a speech “... let goods to be home-spun whenever reasonable... and above all, let finance be national...”

Source: Klein, 2012
History of Capital Controls: Timeline

Bretton woods system

1946 - 1970

Capital controls

Capital controls and controls to currency convertibility were part of the Bretton woods agreement.

Capital controls were in place for the first time at a broad basis.

1970-1997

Trend towards larger financial liberalization

Positive view of capital flows.
- Financial flows foster development and growth
- Promote financial development
- New type of countries “Emerging Market Economies”

1997

Asian crisis

The Asian Crisis was the first challenge to the positive view

- Capital control accepted as crisis measure.
- Accumulation of reserves assets by EMEs surge.
- The trend towards financial liberalization in EMEs decrease.

Source: Klein, 2012
History of Capital Controls: Timeline

2008

**Capital controls in emerging markets**

The IMF recognizes capital controls as crisis response mechanism.

However, several countries establish capital controls and keep them even after the crisis.

Currency wars, etc. EME economies

Source: Klein, 2012

2012-present

**IMF official position on capital controls**

The IMF accepts that a full liberalization is not an appropriate goal for all countries at all times. Liberalization may be appropriate given some macroeconomic and financial regulation conditions.

Moreover, capital controls or capital flow management (CFM) measures may be useful for supporting macro-adjustment and safeguard financial stability.

They should not be used to avoid needed macroeconomic adjustment.

More on this in coming lectures.

MCF
Financial integration

- L&MF measure financial integration using the IFIGDP indicator.

\[
IFIGDP_{it} = \frac{(FA_{it} + FL_{it})}{GDP_{it}}
\]

which is the sum of foreign assets and liabilities over GDP for a given country.

- This indicator is widely used in academic papers and policy institutions.
Financial Openness Measure: Total FA and FL

Lane Milesi-Ferreti
IFIGDP Index

Source: updated and extended version of dataset constructed by Lane and Milesi-Ferretti (2007)
LMF Equity Measure of Financial Integration

Financial integration through equity

- L&MF proposed another measure of financial integration that takes into account only cross-border equity flows.

\[ GEQY_{it} = \frac{(PEQA_{it} + FDA_{it} + PEQL_{it} + FDL_{it})}{GDP_{it}} \]

where PE() stands for Portfolio Equity and FD() for direct investment. A and L stand for Assets and Liabilities.
Financial Openness Measure: Equity Assets and Liabilities

Source: updated and extended version of dataset constructed by Lane and Milesi-Ferretti (2007)