International Macroeconomics
Lecture 3.2: Crises, the 'Trilemma,' and Global Financial Institutions

Zachary R. Stangebye

University of Notre Dame

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Putting It All Together

- How do exchange rates impact current account imbalances (and vice versa)?
- First, understand difference between real and nominal ER
  1. Real Exchange Rate: $R_t = \frac{Basket\ \ Price\ \ in\ \ Home\ \ (in\ \ apples)}{Basket\ \ Price\ \ in\ \ Foreign\ \ (in\ \ apples)}$
  2. Nominal Exchange Rate: Relative price of currencies
     - Units of ϵ_t: $\frac{home\ \ currency}{foreign\ \ currency}$
- Currency is *strong* when
  1. R_t is large
  2. ϵ_t is small
- In either case: Foreign goods relatively cheap

Putting It All Together II

- Suppose currency strength shifts exogenously
- When currency is strong, easy to purchase foreign goods
  1. Propensity to import increases: $TB_t \downarrow$
  2. Must be financed, since B_t cannot change in t and

$$CA_t = TB_t + rB_t$$

  3. CA_t falls to equilibriate market for goods/capital
- Strong currency puts downward pressure on current account
- Capital tends to flow *into the country*
- Opposite happens when currency is weak (capital tends to flow out)

Putting It All Together III

- Causality often flows other direction, as well!
- Exchange rates are **prices**
  - Reflect movement in fundamentals
- Suppose capital flowing into a country e.g. Switzerland during crisis (safe haven), Latin America in '70s (productive investment)
  1. Capital flowing in $\implies$ $CA_t \downarrow$
  2. Market for goods/capital must clear: $CA_t = TB_t + rB_t$
     - Sometimes *LHS* is referred to as **Capital Account** and *RHS* is labeled Current Account
     - In equilibrium, they must be equal
  3. B_t cannot change this period, so TB_t must fall
  4. Currency strengthens to encourage imports
     - ϵ_t falls
     - If ϵ_t pegged, domestic prices rise to induce more imports $\implies$ $R_t \uparrow$: Inflation over time

"It is not the speed that kills; it is the sudden stop."
-Rudiger Dornbusch

- Many international financial crises share common features
- Often referred to as 'sudden stops': Tend to happen very quickly relative to build-up
  - Tends to come from 'sell-off' or 'fire sale' of home country's assets
  - Both from foreign investors *and domestic residents*
- Typical Sudden Stop Features (good metrics for crisis)
  1. Drop in output/GDP
  2. Spike in interest rates
     - Rise in sovereign default risk spread (more later)
     - Endogenous central bank response (stem capital outflow)
  3. Nominal exchange rate devaluation
  4. Current account reversal: $CA_t < 0$ and $CA_{t+1} > 0 \iff$ Capital flight
  5. Increased frequency of default on foreign debt

Sudden Stops: Examples

- Often underlying causes of sudden stop vary, but result looks similar
  1. Illiquidity/Inability to roll over large short-term liabilities (Mexico, 1994)
  2. Banking crisis results in government bailout $\Longrightarrow$ Normally solvent governments at risk of insolvency (East Asia, 1997)
  3. Terms of trade shock/speculative attack on currency (Russia, 2015)
  4. Sudden, large increase in risk-free borrowing costs (Latin America, Early 1980's)
  5. Natural disasters (Small Caribbean economies following large hurricanes)

Mundell's Model

- Studies consequences of monetary and fiscal policy under different ER regimes
- Assumes no capital controls/free mobility of capital
  1. Under a flexible ER policy
     - Monetary policy has expansionary bite
     - Fiscal policy has no bite
  2. Under a fixed ER policy
     - Monetary policy has no expansionary bite
     - Fiscal policy has bite
- Roles of two switch based on regime!

Assumptions of Mundell's Model

1. 4 'sectors'
   - Government, private, foreign, banking
2. 4 'markets'
   - Goods, securities (domestic assets), money, international reserves (foreign assets)
3. Cagan-type equation for domestic money demand:

$$m_t - p_t = -\eta i_{t+1} + \phi y_t$$

4. Nominal ER = Real ER: $e_t = q_t$
5. ER impacts output via trade surplus
   - Depreciation $\rightarrow$ Surplus $\uparrow$ and $y_t \uparrow$
6. Low/Stable inflation $\rightarrow$ Nominal/Real Interest rate same and fixed abroad

Benchmark Table

TABLE I

Sector \ Market	Goods		Securities		Money		International Reserves	
Government	$T-G$	+	Government Borrowing	+	Government Dishoarding	+	*1	= 0
	+		+		+		+	+
Private	$S-I$	+	Private Borrowing	+	Private Dishoarding	+	*2	= 0
	+		+		+		+	+
Foreign	$M-X$	+	Capital Outflow	+	*3	+	Increase in Reserves	= 0
	+		+		+		+	+
Banking	*4	+	Open Market Sales	+	Monetary Expansion	+	Foreign Exchange Sales	= 0
	‖		‖		‖		‖	‖
	0	+	0	+	0	+	0	= 0

Flexible ER: Monetary Policy

- Central bank purchases domestic assets from domestic banks (open-market operations)
  1. Banks sell domestic assets (1) For cash (increase M) and (2) Substitute out for foreign assets (capital outflow)
  2. Money supply increases causes ER depreciation: Raises output (trade surplus)
  3. Through money demand, increase in money supply must raise output more than proportionally since interest rate fixed (multiplier)
  4. Output increase raises taxes/domestic saving, but also reduces government debt fosters saving abroad
  5. Further capital outflow $\rightarrow$ Further output (trade surplus) increase
- Monetary policy has no impact on interest rate, but causes ER depreciation
  - Capital outflows, export increases, output rises

Flexible ER: Monetary Policy

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	‖		‖		‖		‖	‖
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Flexible ER: Alternative Monetary Policy

- Central bank purchases *foreign* assets using printed money
  1. Reserves increase; Causes ER depreciation through impact on money supply
  2. Money supply increase causes ER depreciation: Raises output (trade surplus)
  3. Through money demand, increase in money supply must raise output more than proportionally since interest rate fixed (multiplier)
  4. Output increase raises taxes/domestic saving, but also reduces government debt fosters saving abroad
  5. Further capital outflow $\rightarrow$ Further output (trade surplus) increase
- ER policy has symmetrical impact as monetary policy
  - Capital outflows, exports increase, output rises
  - Increase in foreign reserves instead of domestic assets on CB balance sheet

Flexible ER: ER Policy

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Flexible ER: Fiscal Policy

- Government issues debt to finance spending
  1. Normally increases output, *but*
     - Cagan model: Interest rate fixed; money supply fixed
     - Output cannot change
  2. Output constant implies domestic behavior unchanged
     - Capital inflows finance borrowing
     - ER appreciates: Trade balance weakens
- Fiscal policy has no bite
  - Borrow from abroad to consume foreign goods (higher imports)
  - No change in output/GDP

Flexible ER: Fiscal Policy

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Fixed ER: Monetary Policy

- Central bank purchases domestic assets from domestic banks
  1. Cannot alter money supply without altering ER: Sell reserves to finance
  2. Reduction in reserves $\iff$ Outflow of capital
  3. No effect on real variables (output, trade balance, etc.)
- Monetary policy (open-market operation) completely neutered, since money supply can't change!

Fixed ER: Monetary Policy

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Fixed ER: Fiscal Policy

- Government issues debt to finance increased expenditure
  1. Both foreign and domestic investors purchase issued debt
  2. Saving and imports rise as a consequence
  3. Exogenous shift in y_t: Money demand can (and must) rise *without impacting ER*
  4. Households sell domestic assets to acquire money
     - Private sector demands more money as well: Sell assets for cash
     - Causes even further capital outflows
  5. To prevent ER appreciation, CB prints money for private sector and purchases reserves
- Fiscal policy causes tendency to appreciation
- Since ER cannot move, CB increases money supply to offset
- Monetary expansion allows for real expansion to take place
  - Capital outflows, exports increase, output rises

Fixed ER: Fiscal Policy

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Other Scenarios

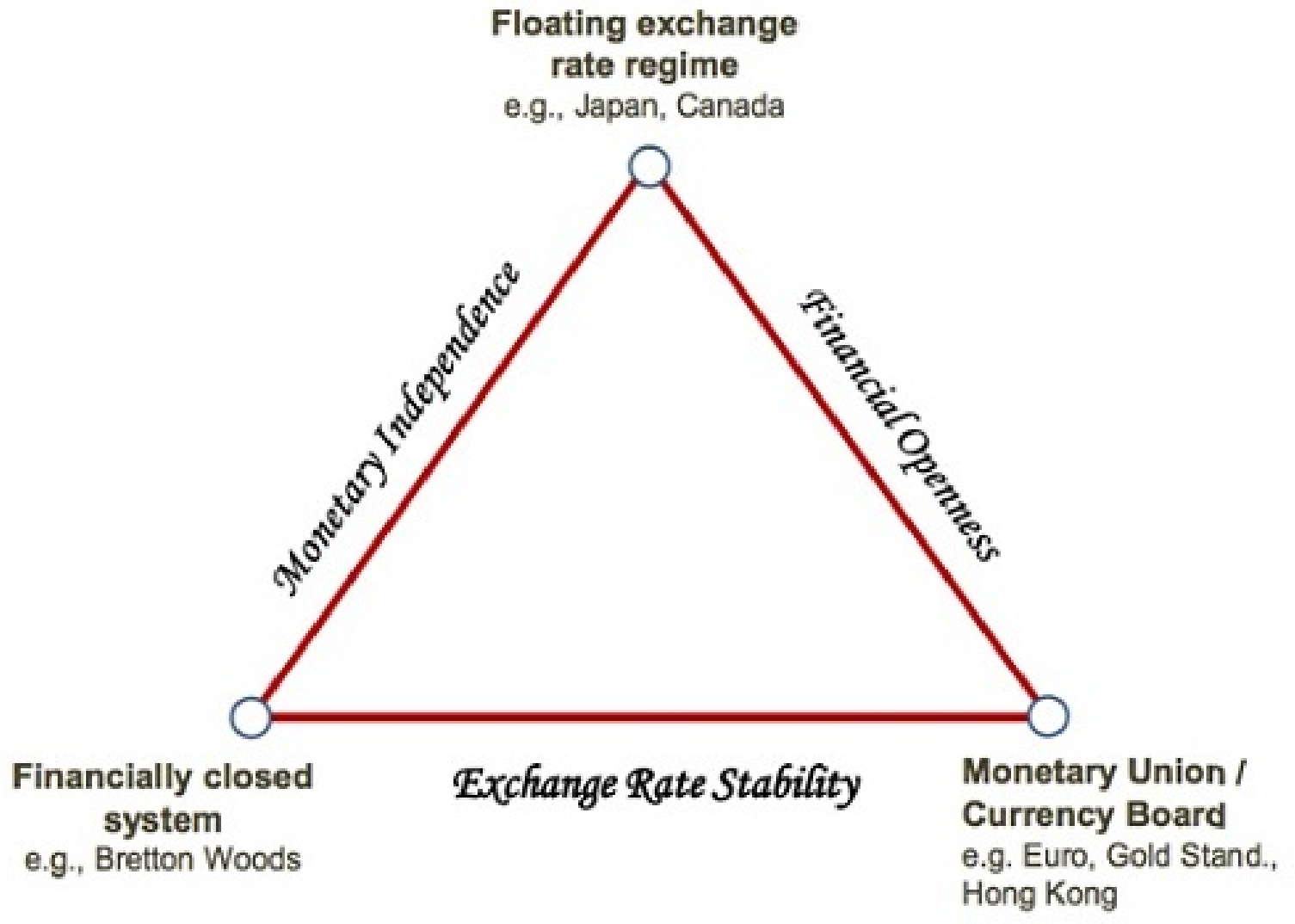
1. Speculative attack build-up described
2. Notes contradiction in *Sterilization Policy* with fixed ER
    - Sterilization policy: All shifts in foreign assets met by equal shifts in domestic assets (no money supply movement)
    - In fixed ER world, if government increases spending...
    - Must be met by increase in reserves
    - But increase in reserves is sterilized with foreign domestic asset sales rather than monetary expansion
    - Without monetary expansion, fiscal expansion of GDP could never have occurred to begin with!
        - Contradiction: Inconsistent policy

- Can't peg ER *and* sterilize all asset purchases
- Something's 'gotta give'. Either
    - ER peg collapse
    - Money supply responds: Abandon sterilization
- Forecasted collapse of Bretton Woods (fixed ER; gold sterilization)

Why a 'Trilemma'?

- Because results hold only under perfect capital mobility
- Can in principle limit capital mobility with policy
  - **Capital Controls** are legal restrictions on cross-border financial transactions
- Examples
  - Illegalize currency trading (Malaysia 1997)
  - Illegalize foreign deposits at domestic banks (Brazil, recent)
  - Cap foreign transfers of funds (Greece, 2015)
- Black markets always emerge (limited effectiveness)
- 'Trilemma' in words: When capital is freely mobile, floating ER allows for effective monetary policy

Trilemma Graphically



Pre-Wars Era

- Increasing globalization throughout 19th century
- Currency stability becoming progressively more important
  - Gold standard adopted by many countries
    1. 15% of countries in 1870
    2. 70% of countries in 1913
  - Not always easy: William Jennings Bryan's 'Cross of Gold' speech in 1896
  - Why gold? Network externality
- Collapsed with WWI
  1. Inflation tax required
  2. War substantially reduced trade ($\approx$ 100% warring, 50% non-warring)

Inter-War Era

- International gold standard still prevalent, but shaken
  1. Trade flows stayed low post-WWI
  2. Extreme volatility in 20's and 30's raised cost of pegging (trilemma)
  3. Large asymmetry in gold reserve allotment after war: Difficult for many countries to peg

  Speculative Attacks in early '30s caused
- Abandon peg
  - Britain, US
- Impose capital controls
  - Austria, Germany, Latin America
- Those remaining on gold standard (France, Switzerland, etc.) paid heavy price: 21-26% loss of output relative to others

Bretton Woods System

- 44 states/governments met in July, 1944 in Bretton Woods, NH
  - *During* WWII. Discussed global financial system in expectation of victory
- Stability of gold standard still preeminent/desired
  - Distrust of foreign financiers: "Drive...the usurious money lenders from the temple of international finance." -Henry Morgenthau (U.S. Treasury Secretary)
  - Aimed for capital controls of a sort while maintaining worldwide pegs and autonomous monetary policy
- World would peg to US$ and US$ pegged to gold
  - Tried to place legal restrictions on 'speculative trade,' to limit capital mobility without hindering trade finance
  - Hard to enforce in long-run

Collapse of BWS

- System collapsed between 1971-1973
  - High inflation in US from Vietnam war made peg difficult to sustain
  - Capital mobility could not be capped and trilemma held
- Different countries went different ways
  1. Float: US, UK, Japan, Australia, ...
  2. Peg: Many developing economies, Europe, ...
  3. Hybrid: India, Mexico, ...
  4. Capital controls: China
- The 'pillars' of Bretton Woods were not abandoned though
  1. International Monetary Fund (IMF)
  2. World Bank/International Bank for Reconstruction and Development (IBRD)

The 'Pillars' of the New BW Order: World Bank

- IMF and World Bank are owned and directed by governments of member nations
  - Designed to reconstitute and stabilize global financial system
- World Bank
  - Primary Goal: Finance economic development when private sector won't
    1. Infrastructure public in nature
    2. Too risky for private investors
  - First loans extended in late 1940's: Reconstruct Western Europe
  - In latter half of 20th century, turned attention to developing nations: More than $330 billion lent so far

Structure Today

- World Bank has many subsidaries:
  1. IBRD
  2. International Development Association (IDA)
  3. International Finance Corporation, International Center for Settlement of Investment Disputes, and Multilateral Guarantee Agency
- 12,000 staff members in 130 different offices throughout world
  - Many different types of professionals
- $\geq$ 180 member nations
  - Votes based on weighted average of GDP, openness, and 'economic variability' (same for IMF)

Operations

- Member nations share equity in the Bank
  - IBRD issues AAA bonds to raise funds
    - Bonds guaranteed by member nations
  - Invest funds in developing economies' public projects at subsidized rate
    - Developing, moderately wealthy countries
    - 12-15 year loan maturity
  - IDA funded largely by grants from member countries
    - Loans interest-free funds to severely underdeveloped countries
    - Repayment schedule: 35-40 years
- Both target development that disproportionately benefits poorest people
- Both apply same standards at the project level

The 'Pillars' of the New BW Order: The IMF

- IMF
  - Primary goal: Stabilize international financial markets. Members must
    1. Allow for unhindered foreign trading of their currency
    2. Keep IMF informed of changes in fiscal/monetary policies with international ramifications
    3. Modify policies on recommendation of IMF to accommodate needs of world community
  - Secondary goal: Manages a pool of funds from which countries can borrow when in danger with international capital markets
    - Loan packages come with policy requirements i.e. 'strings attached'
- Over past half-century, primary and secondary roles have swapped

Structure Today

- Unlike, World Bank, IMF has no subsidiaries
- Substantially smaller staff (2400); almost all work in DC headquarters
  - Most are professional economists/financial experts
  - A few work in branches in Paris, Geneva, and the UN in New York
- Led by Board of Governors: One from each member country
- Managing Director traditionally European (or non-American); WB typically US-national in contrast
  - Currently Christine Lagarde (French)

Operations

- IMF finances itself through membership fees from 180+ members
  - Size of fee contingent on size and strength
  - Can borrow in dire circumstances, but typically does not need to
- All nations, regardless of development, have access to IMF resources
  - Nearly all nations have drawn on it to smooth balance of payments problems
  - Assistance packages: Loans that mature in 3-5 years
- In theory, IMF *not an independent institution*
  - Supposed to channel the will of the member majority into action
  - In practice, it typically has its own (benevolent, at least in intention) agenda

Shifted Mandate

- Initially intended to smooth over Bretton Woods imbalances
- Once collapsed in 1973, re-think mandate
- Constitutional amendment in 1978
  1. Continue to foster currency convertibility
  2. Supervise policies that influence balance of payments (rather than monitoring compliance in fixed exchange system). Advisory role
  3. **Provide short-medium term financial assistance when member nations encounter BOP difficulties**
- IMF also has its own currency! *Special Drawing Rights* (SDR), which have time-varying convertibility to any member nations' currency
  - Can be used in place of other currencies in international transactions

IMF Activity

- Examples of IMF Intervention
  1. Latin American Debt Crisis: 1980's
  2. Mexico: 1994-1995
  3. Russia: Early post-USSR (early 1990's)
  4. Asian Crisis: 1997-1998
  5. Argentinian Default: 2001
  6. Greece/Peripheral Eurozone Economies: 2010-present

Cooperation

- Cooperation between World Bank and IMF has increased over past few decades
- IMF has turned more attention toward institutional reforms that enable long-term growth e.g. well-developed infrastructure
- World Bank subsidizes such infrastructure
- Staff frequently consult with each other (right across street in DC!)
- Since early 90's, IMF targeted assistance to 70 or so poorer member nations in conjunction with IDA

Other Post-War Institutions

- European Coal and Steel Community (ECSC)
  - Established unified market for coal in steel in Europe in early 1950's
  - Goal: Economic integration prevent any further conflict in mainland Europe: "Make war not only unthinkable but materially impossible."
  - Marked movement toward unity very shortly after violent conflict
  - Developed into European Community (trade group), then to European Union, and (45 years later) to common currency
- Asian Development Bank (ADB)
  - Formed in 1966: Asia-focused World-Bank equivalent largely led by Japan and US
  - Headquarters in Manila, Philippines