The Costs of Foreign Exchange Intervention

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Overview

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   - Benefits of Foreign Exchange Intervention
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Extent of Foreign Exchange Intervention

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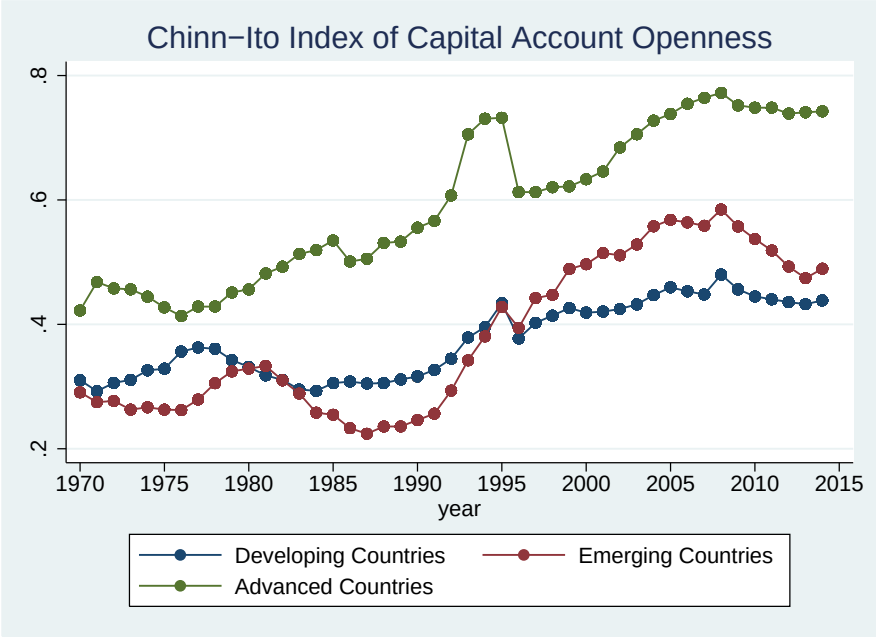
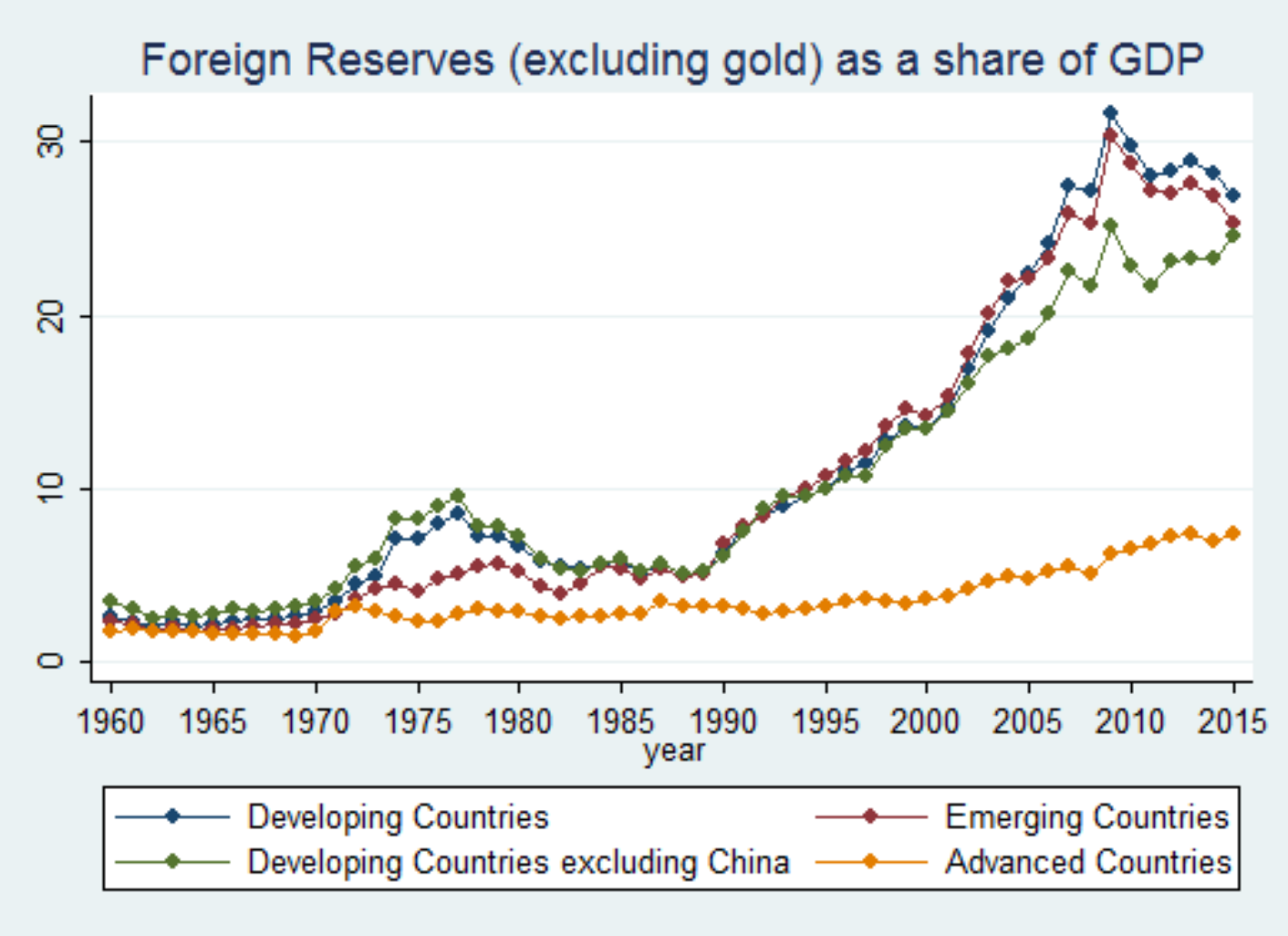
- This accumulation has also further increased due to increased liberalization of the capital account around the world

Figure: Evolution of Capital Account Openness



Source: Own Calculations based on Chinn-Ito (2006)

Figure: Reserves as a Share of GDP (%)



Source: Author's Calculations based data from World Bank World Development Indicators

Figure: Reserves in Months of Import

Source: Author's Calculations based data from World Bank World Development Indicators

Benefits of Foreign Exchange Intervention

- Reserve holdings allow central banks to lean against the trilemma or widen the policy space constrained by the trilemma
- A rise in reserve holdings often lowers the cost of private debt and equity capital (Feldstein, 1999)
- To some extent, reserve holdings have substituted for capital controls (Ilzetzki et al., 2017)
- Holding of international reserves equal to at least the value of short term external debt reduces the annual probability of a country experiencing a share reversal in capital flows, which can precipitate and external debt and/or currency crisis, by 10 percentage points (Rodrik, 2006)
- Reserves of foreign exchange are built to provide insurance against speculative currency attacks

But what is the Cost of this Self-Insurance?

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- Therefore, the cost of Foreign Exchange is the cost of carrying that position. Following Adler and Mano (2017), this is measured as the deviations from uncovered interest parity

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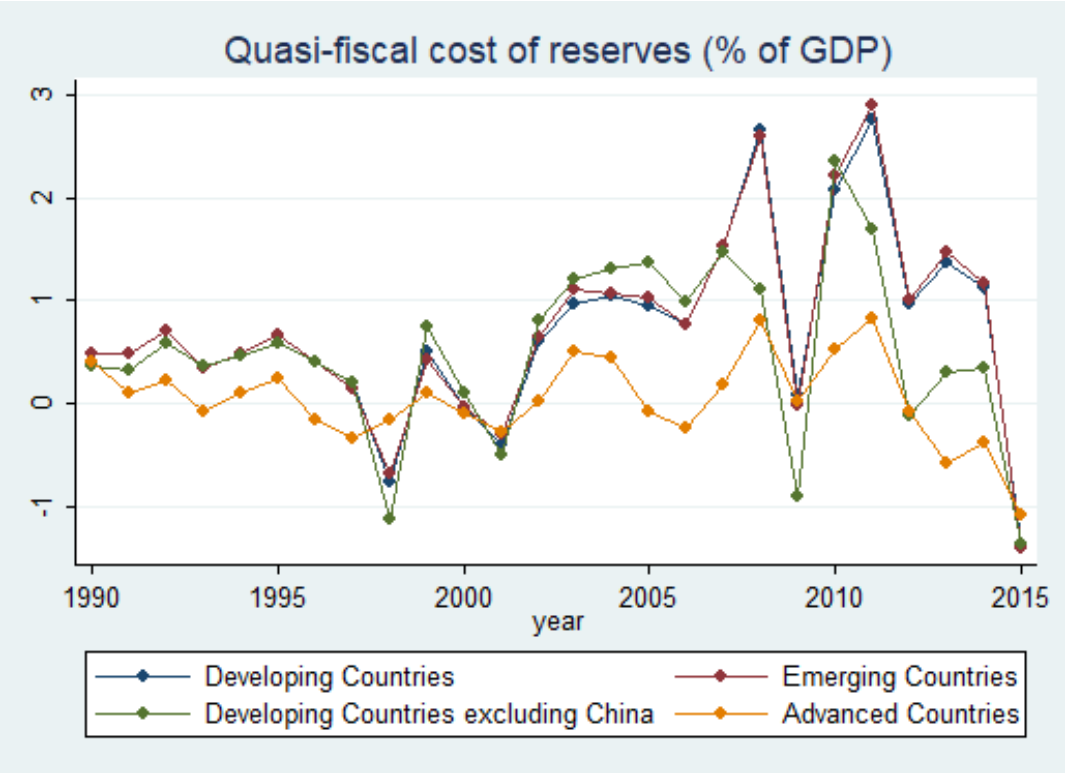
- Since most central banks are quasi-government bodies that typically transfer their surpluses to the government, this total costs is the quasi-fiscal cost of foreign exchange intervention

Calculating Costs

- The spread considered is that between sovereign debt of the country in question over US Treasury Bills
- In 2014, this cost was about 1.16% and 1.12% of the GDP for emerging market economies



Source: Author's Calculations based data from World Bank World Development Indicators and IMF International Financial Statistics

Cross Country Distribution of Cost

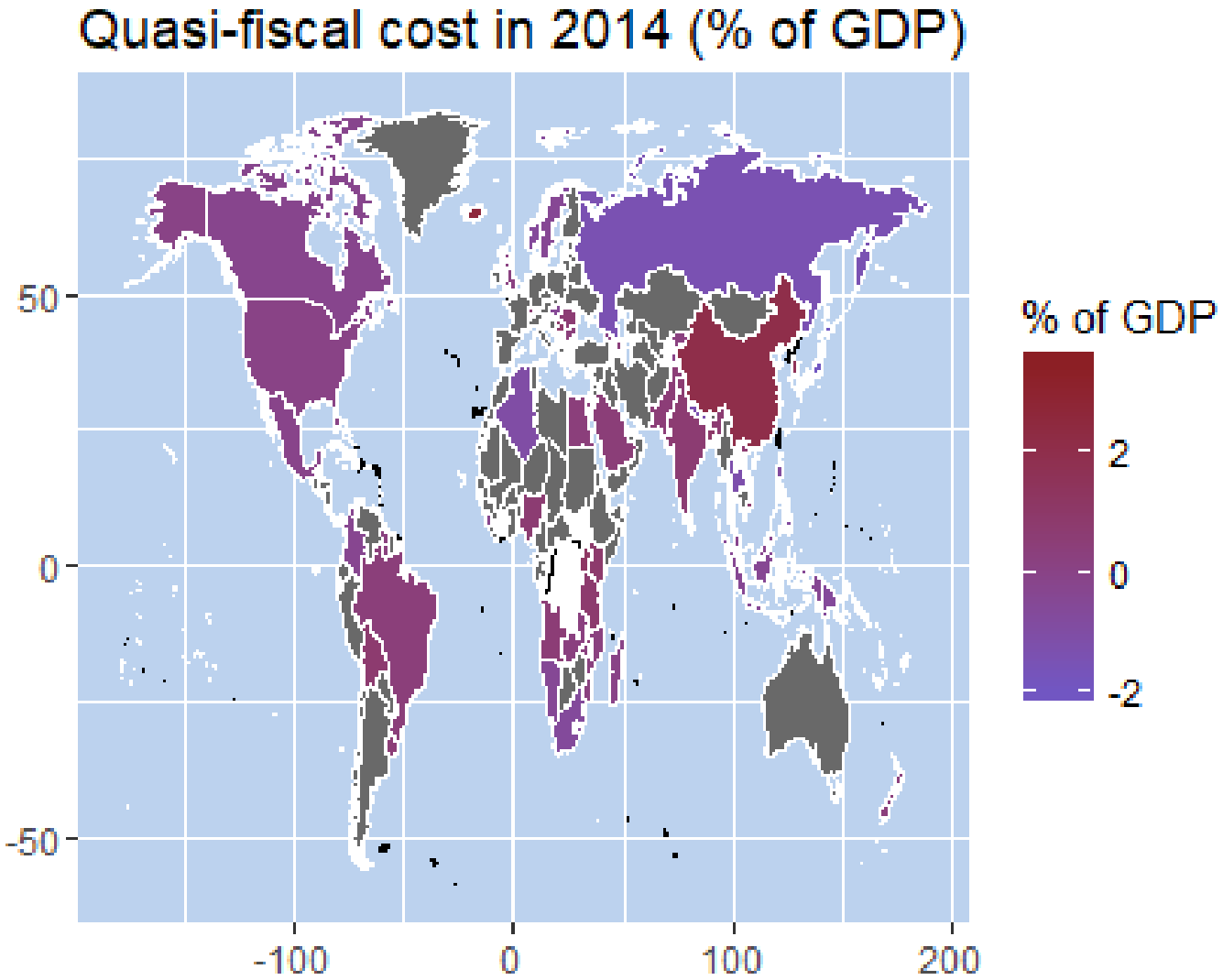


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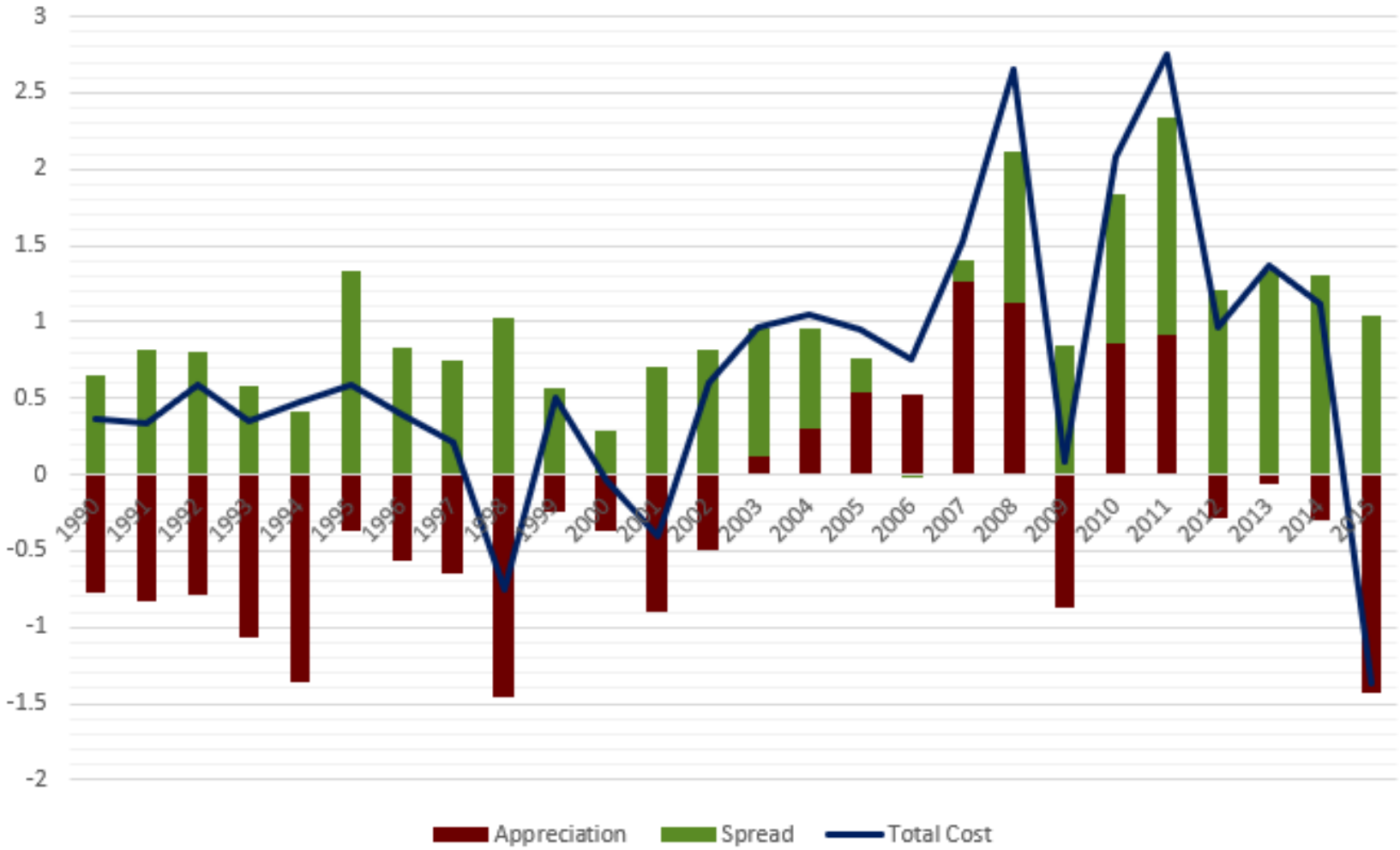
Table: Summary Statistics: Quasi Fiscal Cost

Year	Mean	Standard Deviation	Maximum	Country incurring Maximum cost
1996	-0.211	1.030	1.433	Guyana
1997	-0.169	0.828	0.779	Lesotho
1998	-0.249	1.233	1.993	Lao
1999	0.038	0.913	5.321	Indonesia
2000	0.034	0.688	4.298	Ghana
2001	-0.090	0.579	1.058	Kyrgyz Republic
2002	0.165	0.801	2.853	Czech Republic
2003	0.240	1.442	4.720	Malta
2004	0.149	0.938	2.159	Albania
2005	0.109	0.577	2.121	Yemen
2006	0.131	0.472	2.283	Yemen
2007	0.490	1.345	10.576	Iraq
2008	0.512	1.486	7.274	Iraq
2009	-0.169	1.522	2.932	Lebanon
2010	0.492	0.999	4.295	Lebanon
2011	0.644	1.092	4.547	Iceland
2012	0.074	0.925	2.911	Lebanon
2013	0.179	0.832	2.832	Lebanon
2014	0.059	0.592	3.022	Lebanon
2015	-0.892	2.215	2.894	Lebanon

Decomposition of Costs for Emerging Countries



Source: Author's Calculations based data from World Bank World Development Indicators

Determinants of these Costs

- Following Obstfeld et al. (2010), the following simple Random Effects Model is estimated

$$Y_{it} = \alpha + \beta \times X_{it} + u_{it}$$

$$u_{it} = \mu_i + v_{it}$$

Determinants of these Costs

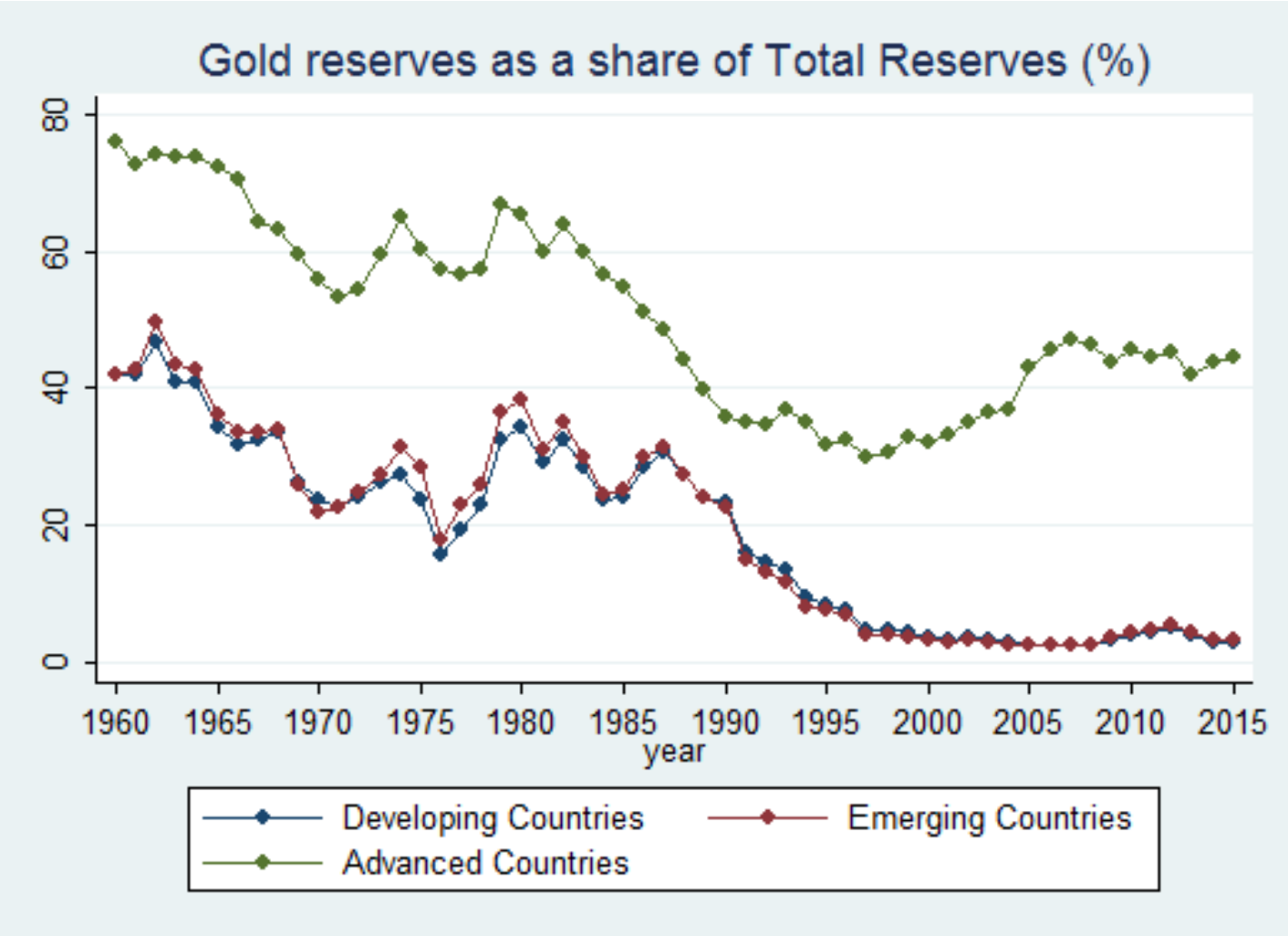
The dependent variables are the logarithm of the reserves to GDP ratio and the total cost of foreign exchange intervention. Following, Obstfeld et al. (2010), the explanatory variables include

- Advanced country dummy variable *advanced*.
- Normalized Chinn-Ito index of capital account openness, *ka_open*.
- Exchange Rate Peg dummy variable, *peg*, where 1 is a pegged exchange rate and 0 indicates a non-pegged exchange rate.
- Logarithm of the ratio of total trade (exports to imports) to GDP, *logtrade*.
- Exchange Rate Volatility calculated as the standard deviation of the monthly percentage change in exchange rate against the dollar over the current year, *evol*.
- Logarithm of the share of M2 in GDP, *logm2*.
- Year Specific dummies

Determinants of these Costs

The model in Obstfeld et al. (2010) is supplemented with the following explanatory variables:

- Historical currency crisis dummy, *histcc*, where the variable takes the value 1 if the country has experienced a currency crisis in the past.
- *RFA* is a binary variable that takes the value 1 if the country is a member of a Regional Financial Arrangement and 0 otherwise.
- *Swap* is a binary variable that takes the value 1 if the country's central bank has historically had a swap line with another central bank and 0 otherwise .
- *Fedswap* is a binary variable that takes the value 1 if the country's central bank has historically had a swap line with the Federal Reserve and 0 otherwise .
- *ECBswap* is a binary variable that takes the value 1 if the country's central bank has historically had a swap line with the European Central Bank and 0 otherwise.
- *BOEswap* is a binary variable that takes the value 1 if the country's central bank has historically had a swap line with the Bank of England and 0 otherwise.



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Results

	(1) Reserves	(2) Cost	(3) Reserves	(4) Cost
advanced	-0.179	0.355**	-0.0500	0.375***
	(0.108)	(0.010)	(0.662)	(0.009)
ka_open	0.236**	0.177	0.289***	0.216
	(0.045)	(0.230)	(0.009)	(0.159)
peg	0.0181	0.227	0.0406	0.267*
	(0.706)	(0.140)	(0.379)	(0.087)
logm2	0.0520	-0.115	0.0754**	-0.131
	(0.118)	(0.268)	(0.030)	(0.253)
logtrade	0.665***	-0.186	0.662***	-0.213
	(0.000)	(0.136)	(0.000)	(0.106)
histcc			0.313**	0.0196
			(0.014)	(0.864)
rfaindicator			0.0143	0.0345
			(0.845)	(0.810)
histswap			-0.0575	0.583**
			(0.606)	(0.012)
histfedswap			-0.291	-0.564*
			(0.125)	(0.056)
histecbswap			-0.305	-0.406
			(0.139)	(0.117)
histboeswap			0.411	-0.0339
			(0.303)	(0.941)
Constant	-5.826***	0.257	-5.790***	0.264
	(0.000)	(0.619)	(0.000)	(0.636)
N	5114	2398	5114	2398
R^2	0.2967	0.2534	0.2805	0.2353

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- RFA membership and having access to most swap lines is not associated with statistically significant lower accumulation of reserves or lower costs.
- Access to a Federal Reserve Swap line reduces reserve accumulation and the associated costs. The cost coefficient is statistically significant at the ten percent level