

Measuring the Speed of Currency Substitution

Itai Agur¹ (International Monetary Fund)

Abstract

Financial dollarization is a prevalent and persistent phenomenon among emerging and developing economies. This paper uses data on deposit dollarization in 173 countries between 1975 and 2018 to present stylized facts on the speed of currency substitution, which has not previously been systematically measured. In doing so, the paper casts a wide net in defining what constitutes a currency substitution episode. Overall, when currency substitution happens, it happens fast: the share of total deposits that is denominated in foreign currency rises by 6.5 percentage points per year during an average episode.

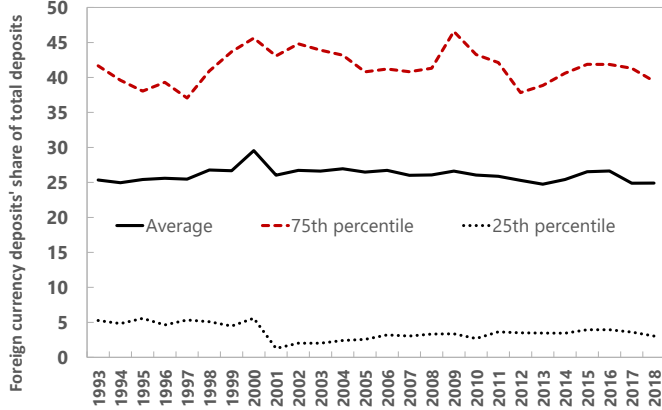
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JEL codes: F31, F65, G15.

¹ Itai Agur is a Senior Economist at the Research Department of the IMF. Email: iagur@imf.org. Tel: +1-202- 6234164. IMF, 700 19th Street, Washington DC 20431, USA.

In a financially dollarized economy, a sizable share of deposits and/or loans are denominated in foreign currency, often the US dollar. Financial dollarization is prevalent in many emerging and developing economies (EMDEs) and can profoundly affect the propagation of shocks and the transmission of a country’s macroeconomic and financial policies (Ben Naceur et al., 2018; Christiano et al., 2021; Levy Yeyati, 2021; Montamat, 2020).² Moreover, once substitution of deposits and/or loans into a foreign currency has taken place, financial dollarization often becomes entrenched and therefore difficult to dislodge even after the original impetus for substitution, such as high domestic inflation, has abated (IMF, 2020). Figure 1 shows the average, 75th percentile and 25th percentile of deposit dollarization among countries in our dataset described below, highlighting the global prevalence and persistence of dollarization, as well as its dispersion (i.e., many advanced economies have very low dollarization rates).

Fig. 1. Deposit dollarization around the world (in percent)



Sources: IMF SRF; Bannister et al. (2018); and author calculations

² The use of a foreign currency as a store of value in the financial sector is normally also a prerequisite for its use as a medium of exchange: financial dollarization is an important driver of the dollarization of retail payments (Drenik and Perez, 2021). A common threshold for high financial dollarization that the share of foreign currency deposits in total bank deposits is over is 30 percent (Baliño et al., 1999).

An important policy question is how rapidly currency substitution unfolds. If an EMDE witnesses a first impetus toward currency substitution and its policy makers decide that currency substitution is undesirable, how much time would they have to formulate and implement countermeasures before it becomes entrenched?³ To our knowledge, no systematic measurement of the speed of currency substitution has previously been undertaken in the literature on financial dollarization. That is the aim of this paper.

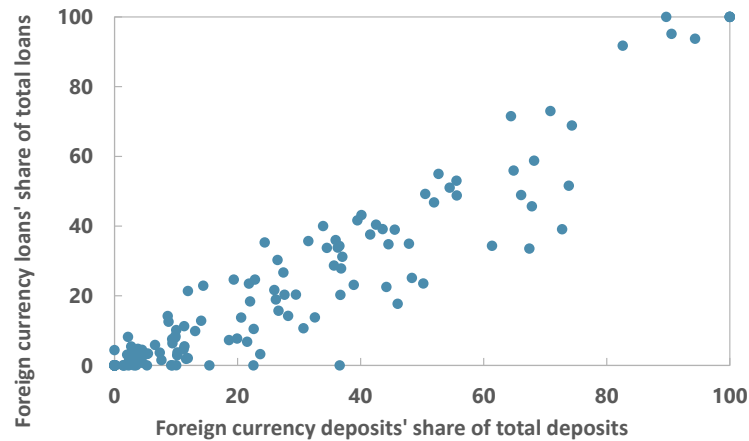
This paper collects a dataset on deposit dollarization, comprising an unbalanced panel of 173 countries between 1975 and 2018.⁴ This data is primarily sourced from the IMF’s Standardized Reporting Forms (SRF).⁵ The focus is on foreign currency deposits because data on this is available for more countries and years than on foreign currency loans. The correspondence between deposit and loan dollarization is close, however, as shown in Figure 2.

³ The risks and implications of currency substitution are coming under renewed scrutiny due to the rise of digital currencies. To the extent that private cryptocurrencies or digital currencies issued by foreign central banks will spur foreign currency adoption in EMDEs, a new wave of (digital) dollarization could emerge (IMF, 2020, 2021).

⁴ The reason that this panel is unbalanced panel is that not all countries have data entries for all years (in particular, many start later than 1975). We have observations on 4,234 country-year pairs out of a maximum possible of 7,612 (i.e., for a balanced panel from 1975 till 2018 with 173 countries).

⁵ In a few cases, we supplement this SRF data with historical data from Bannister et al. (2018) or Levy Yeyati (2006), to obtain series that go back farther in time. We have checked that merging this data does not lead to time-series jumps. We further note that the data do not allow for a currency breakdown (i.e., per country, they group deposits for all foreign currencies together). As is common in the literature, this paper uses the term “dollarization” as a synonym for “currency substitution”, rather than specifically substitution into US dollars.

Fig. 2. Comparing currency substitution in deposits and loans
(in percent)



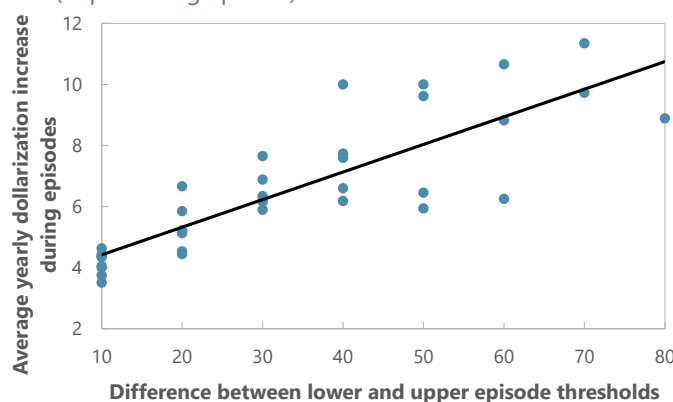
Sources: IMF SRF; Bannister et al. (2018); and author calculations. Dots represent the most recent (annual) observation per country.

The pivotal challenge for this study is defining what constitutes an episode of currency substitution, for which speed can be measured. Should one say, for instance, that such an episode occurred when a country initially had less than 20% foreign currency deposits (as a share of total deposits) and subsequently crossed 50%? Or should the thresholds be set from, e.g., 30% to 70%? This paper takes an agnostic approach and casts a wide net of thresholds. Table 1 considers every set of lower and upper thresholds with 10 percentage point increments, leading to 36 different identifications (each in one row) of currency substitution episodes.

In Table 1, entries in the first column represent the lower threshold of an episode, while the second column shows the upper threshold. Both are expressed as the share of foreign currency deposits in total deposits. The third column notes the percentage point distance between these thresholds, which we term the “size” of an episode. The fourth column reports how many currency substitution episodes are found based on the lower and upper thresholds defined in the first two columns. The fifth and sixth columns record the velocity measurements for the currency substitution episodes. In particular, the fifth column reports how many years it took on average for countries to move from deposit dollarization below the lower threshold to deposit dollarization above the upper

threshold.⁶ For a given definition of a currency substitution episode (as provided in the first two columns), the fifth column thus represents our speed measurement. We can also scale this speed measurement by the size of an episode to make the findings more readily comparable across the rows of Table 1. To this end, the sixth column divides the size of an episode (third column) by its speed (fifth column). That is, it computes the average annual percentage point increase in deposit dollarization during currency substitution episodes.

Fig. 3. Currency substitution speed compared to episode size (in percentage points)



Sources: IMF SRF; Bannister et al. (2018); Levy Yeyati (2006); author calculations

The main results of Table 1 are summarized by Figure 3. This figure plots Table 1’s episode speed (sixth column) against episode size (third column). Here, every dot represents one row in Table 1 (i.e., one definition of a currency substitution episode). There are two main takeaways from this figure. First, currency substitution episodes tend to be rapid: on average, the share of foreign currency to total deposits rises by between 4-12 percentage points per year, depending on the

⁶ Episode identification runs from the last year below the lower threshold to the first year above the upper threshold, regardless of variation between the thresholds. For example, a dollarization pattern like “year 1 = 18 percent”, “year 2 = 31 percent”, “year 3 = 22 percent”, “year 4 = 41 percent” would be counted as a single episode in the row that measures dollarization from below 20 to above 40 percent in Table 1.

episode definition. Second, larger episodes unfold faster, as Figure 3 portrays a positive relation between episode size and speed.

The last row of Table 1 summarizes the main result on speed in a different way by calculating averages over all episode definitions (i.e., over all rows). This indicates that a typical size episode (33 percentage point rise in the share of foreign currency to total deposits) plays out in 4.8 years, implying an average yearly percentage point increase in deposit dollarization of 6.5 percentage points.

Table 2 conducts the same exercise for de-dollarization episodes. The main finding of Table 2 is that sizable de-dollarization episodes are rare. For some of the larger episode definitions, such as the first rows, there are no entries at all, and only a handful of countries experienced de-dollarization of 40 percentage points or more. On average, then, de-dollarization is rare and if it occurs, usually relatively small (in percentage point reduction of foreign currency deposits). Nevertheless, there have been a few cases where a large de-dollarization effort was both successful and quite rapid. For example, Del Rio Rivera and Montero Kuscevic (2014), Luján Chavez (2012) and Kehoe, Gustavo Machicado and Peres-Cajías (2019) describe the de-dollarization experience of Bolivia, which went from above 93 percent deposit dollarization in 2003 to 11 percent in 2018 and includes years during which dollarization decreased by as much as 10 percentage points per year. This specific case has quite a lot of weight in determining the average over all rows in Table 2, because for various rows it is the unique entry.

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ORCID. Itai Agur: <https://orcid.org/0000-0002-6150-737X>

References

- Baliño, Tomás J.T., Adam Bennett, and Eduardo Borenszstein (1999) “Monetary Policy in Dollarized Economies” IMF Occasional Paper 171.
- Bannister, Geoffrey, Malin Gardberg, and Jarkko Turunen (2018) “Dollarization and Financial Development” IMF Working Paper 18/200.
- Ben Naceur, Sami, Amr Hosny, and Gregory Hadjian (2018) “How to De-Dollarize Financial Systems in the Caucasus and Central Asia” *Empirical Economics* 56: 1979-1999.
- Christiano, Lawrence, Hüsnü Dalgic, and Armen Nurbekyan (2021) “Financial Dollarization in Emerging Markets: Efficient Risk Sharing of Prescription for Disaster?” NBER Working Paper No. 29034.
- Del Rio Rivera, Marco Antonio, and Casto Martín Montero Kuscevic (2014) “Financial De-Dollarization in Bolivia” *Estudios Económicos de el Colegio de México* 57: 1-25.
- Drenik, Andrés, and Diego J. Perez (2021) “Domestic Price Dollarization in Emerging Economies” *Journal of Monetary Economics* 112: 28-55.
- IMF (2020) “Digital Money Across Borders: Macro-Financial Linkages” International Monetary Fund Policy Paper 2020/050.
- IMF (2021) “The Crypto Ecosystem and Financial Stability Challenges” Global Financial Stability Report, October 2021, Chapter 2.
- Kehoe, Timothy J., Carlos Gustavo Machicado, and José Peres-Cajías (2019) “The Case of Bolivia” Federal Reserve Bank of Minneapolis Working Paper.

Levy Yeyati, Eduardo (2006) “Financial Dollarization: Evaluating the Consequences” *Economic Policy* Vol. 21(45), pp. 62–118.

Levy Yeyati, Eduardo (2021) “Financial Dollarization and De-Dollarization in the New Millennium” FLAR Working Paper Jan. 2021.

Luján Chávez, Ramiro Martín (2012) “De-Dollarizing Bolivian Economy: An Empirical Model Approach” Banco Central de Bolivia, Quinto Encuentro de Economistas de Bolivia, 5EEB.

Montamat, Giselle (2020) “Stubborn Dollarization: Love for the Dollar and Fear of the Peso”, Working Paper, Harvard University.

Table 1. The speed of deposit dollarization during currency substitution episodes.

<u>Lower threshold</u> <i>From a share of foreign currency deposits in total deposits below</i>	<u>Upper threshold</u> <i>To a share of foreign currency deposits in total deposits above</i>	<u>Episode size</u> <i>Difference between thresholds (in pp.)</i>	<u>Sample size</u> <i>Number of episodes found</i>	<u>Episode duration</u> <i>Average years from lower to upper threshold</i>	<u>Dollarization speed</u> <i>Average annual increase in deposit dollarization during episodes</i>
10%	90%	80	4	9.0	8.9
10%	80%	70	6	6.2	11.3
10%	70%	60	10	9.6	6.3
10%	60%	50	12	8.4	5.9
10%	50%	40	15	5.3	7.6
10%	40%	30	22	4.7	6.3
10%	30%	20	31	3.9	5.1
10%	20%	10	40	2.9	3.5
20%	90%	70	5	7.2	9.7
20%	80%	60	8	5.6	10.7
20%	70%	50	12	7.8	6.5
20%	60%	40	15	6.5	6.2
20%	50%	30	23	5.1	5.9
20%	40%	20	32	4.4	4.5
20%	30%	10	48	2.7	3.7
30%	90%	60	5	6.8	8.8
30%	80%	50	10	5.2	9.6
30%	70%	40	16	6.1	6.6
30%	60%	30	22	4.9	6.2
30%	50%	20	34	3.9	5.2
30%	40%	10	49	2.5	4.0
40%	90%	50	5	5.0	10.0
40%	80%	40	11	4.0	10.0
40%	70%	30	22	4.4	6.9
40%	60%	20	33	3.4	5.8
40%	50%	10	50	2.2	4.6
50%	90%	40	6	5.2	7.7
50%	80%	30	13	3.9	7.7
50%	70%	20	24	3.8	5.2
50%	60%	10	38	2.3	4.4
60%	90%	30	6	4.8	6.2
60%	80%	20	13	3.0	6.7
60%	70%	10	30	2.3	4.3
70%	90%	20	6	4.5	4.4
70%	80%	10	14	2.3	4.4
80%	90%	10	6	2.5	4.0
Average outcomes based on all threshold sets:		33.3	19.3	4.8	6.5

Table 2. The speed of deposit de-dollarization episodes.

<u>Upper threshold</u> <i>From a share of foreign currency deposits in total deposits above</i>	<u>Lower threshold</u> <i>To a share of foreign currency deposits in total deposits below</i>	<u>Episode size</u> <i>Difference between thresholds (in pp.)</i>	<u>Sample size</u> <i>Number of episodes found</i>	<u>Episode duration</u> <i>Average years from lower to upper threshold</i>	<u>De-dollarization speed</u> <i>Average annual decrease in deposit dollarization during episodes (in pp.)</i>
90%	10%	80	0		
80%	10%	70	0		
70%	10%	60	0		
60%	10%	50	1	20.0	2.5
50%	10%	40	3	7.3	5.5
40%	10%	30	6	7.0	4.3
30%	10%	20	11	5.3	3.8
20%	10%	10	16	3.7	2.7
90%	20%	70	1	11.0	6.4
80%	20%	60	1	9.0	6.7
70%	20%	50	2	4.5	11.1
60%	20%	40	3	5.7	7.1
50%	20%	30	9	6.8	4.4
40%	20%	20	12	5.5	3.6
30%	20%	10	24	4.0	2.5
90%	30%	60	1	9.0	6.7
80%	30%	50	1	7.0	7.1
70%	30%	40	2	3.5	11.4
60%	30%	30	7	6.0	5.0
50%	30%	20	17	5.2	3.9
40%	30%	10	25	3.0	3.3
90%	40%	50	1	8.0	6.3
80%	40%	40	5	9.8	4.1
70%	40%	30	10	7.0	4.3
60%	40%	20	18	4.1	4.9
50%	40%	10	36	2.8	3.6
90%	50%	40	1	7.0	5.7
80%	50%	30	7	10.3	2.9
70%	50%	20	13	5.7	3.5
60%	50%	10	26	3.0	3.3
90%	60%	30	1	5.0	6.0
80%	60%	20	8	6.8	3.0
70%	60%	10	21	2.9	3.5
90%	70%	20	1	4.0	5.0
80%	70%	10	11	2.9	3.4
90%	80%	10	1	3.0	3.3
Average outcomes based on all threshold sets:		33.3	8.4	6.2	4.9