

Wealth Redistribution After Exchange Rate Devaluations

By ANDRES DRENIK, GUSTAVO PEREIRA AND DIEGO J. PEREZ*

A fraction of households in emerging economies save and borrow in foreign currency. By doing so they become exposed to revaluation effects on their wealth coming from movements in the nominal exchange rate. In this paper, we analyze the redistribution of liquid wealth across different households after nominal exchange rate devaluations. The key channel we focus on is the revaluation of nominal net asset positions denominated in different currencies.

We begin our analysis by documenting the fact that a significant fraction of households in emerging economies have some assets denominated in foreign currency, usually either in US Dollars or Euros. Our analysis covers 13 countries from Eastern Europe and Latin America. We show that the likelihood of having assets in foreign currency is increasing in households' income. This fact is generalized across all countries in our sample. Then, we analyze the redistributive effects of a nominal exchange rate devaluation. We compute the magnitude of the revaluation of liquid wealth associated with a nominal devaluation of the local currency of 18% for different types of households. We find that there is an important degree of redistribution from households with low income to those with high income.

The existing literature has analyzed the redistributive impact of nominal exchange rate devaluations through its effects on the labor market (Drenik, 2016) and the cost

of living (Cravino and Levchenko, 2017). Our findings suggest that the revaluation of nominal net asset positions is an important channel through which exchange rate devaluations entail redistributive effects.

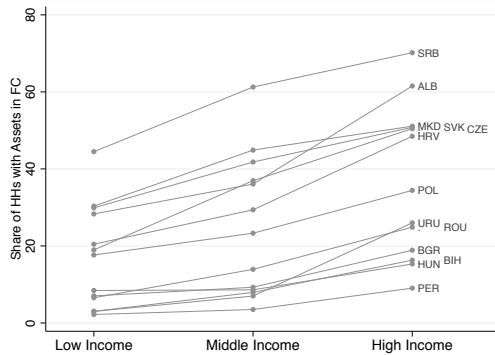
I. Heterogeneity in Savings in Foreign Currency

Our analysis uses data from three different household surveys and covers the following countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Hungary, Macedonia, Peru, Poland, Romania, Serbia, Slovakia and Uruguay. The first source of micro data is the Euro Survey carried out by the Austrian Central Bank (OeNB) and covers all the mentioned European countries. This survey contains biannual data from 2007 to 2015. While having wide coverage in terms of countries and time span, this survey has limited information regarding households' holdings of financial assets in foreign currency. The second source of data is a similar survey from Peru conducted in 1997, for which a similar caveat applies. The last source is the household financial survey from Uruguay conducted in 2013 that contains detailed information on households' assets and liabilities broken down by the currency of denomination. The structure of this survey is similar to the structure of the Survey of Consumer Finances conducted in the US.

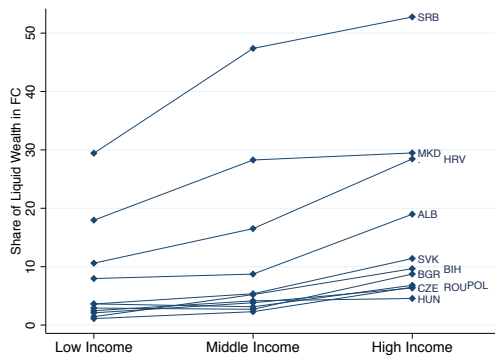
We first document the degree of heterogeneity in the exposure of households to foreign currency. For this, we group households into three terciles according to their level of income and compute the share of households that have some liquid asset denominated in foreign currency. For Peru and Uruguay we consider cash holdings, time and savings bank deposits as all possible liquid assets. For the European countries we consider cash holdings only due

* Drenik: Department of Economics, Columbia University, 420 W. 118th Street, New York, NY, 10027 (email: ad3376@columbia.edu); Pereira: Department of Economics, Columbia University, 420 W. 118th Street, New York, NY, 10027 (email: p.gustavo@columbia.edu); Perez: Department of Economics, New York University, 19 W. 4th Street, 6FL, New York, NY 10012 (email: diego.perez@nyu.edu). We thank Alberto Cavallo for useful comments and the Austrian Central Bank and the Economics Department at Universidad de la República (Uruguay) for sharing their data.

to data limitations.¹ Figure 1a shows the share of households that have a positive fraction of their wealth denominated in foreign currency. The average share of households exposed to foreign currency differs significantly across countries, ranging between 5% and 65%. Despite this heterogeneity, within each country the likelihood of being exposed to foreign currency increases with households' income. The share of households in the top income tercile exposed to foreign currency is higher than the share for those in the bottom income tercile in every country. These findings suggest that the market for foreign currency is segmented, with more limited participation by low-income households.



(A) SHARE OF HOUSEHOLDS WITH ASSETS IN FC



(B) SHARE OF LIQUID WEALTH IN FC

FIGURE 1. HETEROGENEITY IN SAVINGS IN FOREIGN CURRENCY

¹In our Online Appendix we repeat the analysis for the European countries with bank deposits and reach similar conclusions.

In Figure 1b, we show the fraction of households' liquid wealth that is denominated in foreign currency and also find that it is increasing in households' income in all countries. This fact is mostly driven by the participation/non-participation margin documented above.

Finally, we also document that these differences in exposure to foreign currency persist over time. In the Online Appendix we show that in almost every point in time the likelihood that households are exposed to foreign currency is increasing in income. This is due to the fact that although the share of households that are exposed to foreign currency varies over time for each income tercile, it tends to co-move strongly across the income distribution. This persistence suggests that the redistributive effects of devaluations should be present in most devaluation episodes, regardless of when they occur.

II. Redistributive Effects of an Exchange Rate Devaluation

We investigate the redistributive effects of an exchange rate devaluation by analyzing how the value of liquid wealth denominated in local and foreign currency is affected on-impact by an unexpected and permanent devaluation. The goal of this exercise is to determine how unequal is the distribution of gains and losses experienced by households. We focus on Uruguay since it is the country with the most granular data. We also measure effects on *liquid* wealth since changes in liquid wealth are more likely to translate into changes in consumption in the short-run. This exercise is similar to the one carried out by [Doepke and Schneider \(2006\)](#) that focus on the redistributive effects of inflation in the US.

Investments in local and foreign currency in emerging economies can have different payoffs given the fluctuations of nominal exchange rate. Figure 2 shows the distribution of the monthly devaluation rates that Uruguay experienced between 1995 and 2016. Large monthly devaluations (above 10%) are occasionally observed. Additionally, there are also periods of con-

tinued large devaluations, such as the one experienced between June and September 2002 when the nominal exchange rate increased by 89%. Finally, the distribution is positively skewed, so large devaluations are more common than large appreciations.

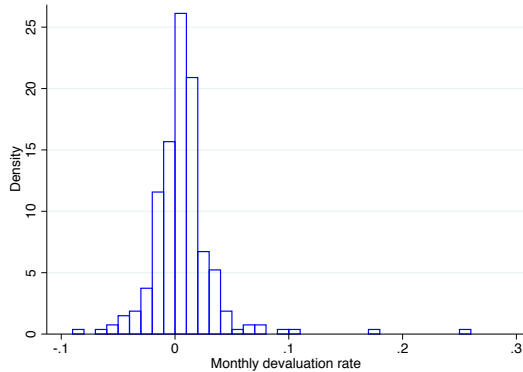


FIGURE 2. DISTRIBUTION OF DEVALUATION RATES: URUGUAY 1995-2016

The first step in our analysis requires computing nominal net liquid asset positions by currency of denomination for each household in the survey. On the asset side of the balance sheet we include: savings and checking accounts and cash.² On the liability side we include: credit card debt and non-mortgage/non-vehicle related debt. All these assets and liabilities are categorized as being denominated in foreign (*FC*) and local currency (*LC*). Foreign currency assets/liabilities are almost completely denominated in US dollars. Thus, we define total net liquid wealth (*TNW*) measured in pesos and dollars as

$$(1) \quad TNW_{\text{in Pesos}} = \varepsilon NW_{FC} + NW_{LC}$$

and

$$(2) \quad TNW_{\text{in Dollars}} = NW_{FC} + NW_{LC}/\varepsilon$$

respectively, where ε denotes the nominal exchange rate (units of Uruguayan pesos

²We do not include other types of liquid nominal financial assets (such as bonds), since data on holdings by currency of denomination is not available. However, most households savings are in the form of bank accounts and cash.

per US dollar) and $NW_{FC}(NW_{LC})$ is the net liquid wealth denominated in foreign (local) currency.

Table 1 presents summary statistics about the composition of households' nominal portfolios.³ Statistics are presented for the overall population and by income tercile. First, notice that only a small fraction of households have any type of nominal asset or liability. Only 11% of households have assets in foreign currency, 9% have assets in local currency and a third of households have any kind of liability. However, the share of households with some assets is increasing in household income. While only 3% (5%) of households with low income have assets in foreign (local) currency, 26% (19%) of households with high income have assets in foreign (local) currency. The share of households with any kind of liability is fairly stable across the income distribution.

In terms of the intensive margin, on average households have US\$16,406 in foreign currency assets, US\$7,324 in local currency assets and US\$3,081 in local currency liabilities (all conditional on having a positive amount). The average net liquid wealth is around US\$1,000. However, the distribution of net liquid wealth is highly unequal: the bottom decile is US\$-2,864, the median is US\$0 and the top decile is US\$1,440. Mean holdings and net wealth are also increasing in income. While the average net liquid wealth is US\$-637 among the low income households, it is equal to US\$4,970 among high income households.

Next, we compute the revaluation gains and losses of these net liquid wealth positions after a nominal exchange rate devaluation. We measure the percentage change in net liquid wealth measured in both currencies (expressed in pesos and dollars) since they can provide bounds for real effects. If the price index of the consumption bundle moves closely with the nominal exchange rate (full pass-through), one should focus on revaluation effects expressed in

³Summary statistics on foreign currency liabilities are not included, since less than 0.1% of households declared having any.

TABLE 1—COMPOSITION OF NOMINAL PORTFOLIO

	<i>Fraction</i>	<i>Percentiles</i>			
	<i>Positive</i>	<i>10th</i>	<i>50th</i>	<i>90th</i>	<i>Mean</i>
A. All Households					
Assets FC	11%	800	6400	39200	16406
Assets LC	9%	440	2800	16000	7324
Liabilities LC	33%	160	1280	8000	3081
Net Wealth	-	-2864	0	1440	991
B. Low income					
Assets FC	3%	800	4000	8400	4858
Assets LC	5%	200	800	11200	4079
Liabilities LC	30%	156	960	4480	2913
Net Wealth	-	-1840	0	0	-637
C. Middle Income					
Assets FC	7%	720	5600	38400	12644
Assets LC	7%	400	2400	6400	3276
Liabilities LC	36%	160	1200	6400	2443
Net Wealth	-	-3160	0	320	38
D. High Income					
Assets FC	26%	1440	8000	40000	20500
Assets LC	19%	800	4000	28000	10472
Liabilities LC	31%	240	2400	9440	4225
Net Wealth	-	-4120	0	16000	4970

Notes: Figures in columns 2 to 5 are expressed in US Dollars.

dollars to get an idea of real effects. The opposite is true if the price index does not comove with the nominal exchange rate (no pass-through). Thus, the realized effects will likely lie somewhere in between these bounds. For this exercise we choose a nominal devaluation rate of 18%, which is equal to the magnitude of a devaluation episode that occurred while the survey was being conducted.

Given the definitions of net wealth in (1) and (2), the revaluation effects measured in pesos and in dollars are defined as

$$\frac{\Delta TNW_{\text{in Pesos}}}{|TNW_{\text{in Pesos}}|} = \frac{\Delta \varepsilon}{\varepsilon} \times \frac{\varepsilon NW_{FC}}{|TNW_{\text{in Pesos}}|}$$

and

$$\frac{\Delta TNW_{\text{in Dollars}}}{|TNW_{\text{in Dollars}}|} = -\frac{\Delta \varepsilon}{\varepsilon} \times \frac{NW_{LC}}{\varepsilon |TNW_{\text{in Dollars}}|},$$

respectively. Revaluation effects are measured as percentage changes of the abso-

lute value of net wealth, since a fraction of households have negative net wealth. Note that the revaluation effects in pesos and dollars for a given household can have the same sign if that household is a net debtor in one currency and a net creditor in the other currency. Results are presented in Table A1.

When measured in pesos, net wealth increases after a nominal devaluation of 18% by 1.21% on average. The average effect is positive since most households have positive net wealth in foreign currency (assets in foreign currency exceed liabilities in foreign currency for most households). More importantly, revaluation gains are increasing in households' income. While the average increase in net wealth is 0.29% for households in the lowest income tercile, it increases to 3% for households with high income. Also, revaluation gains are highly concentrated. While the top decile of the distribution of revaluation gains is zero for low and middle income households, it is 16.2% for high income households.

TABLE 2—REVALUATION EFFECTS

	Percentiles			Mean
	10th	50th	90th	
A. All Households				
In Pesos	0.00	0.00	0.00	1.21
In Dollars	0.00	0.00	18.00	4.79
B. Low income				
In Pesos	0.00	0.00	0.00	0.29
In Dollars	0.00	0.00	18.00	4.68
C. Middle Income				
In Pesos	0.00	0.00	0.00	0.95
In Dollars	0.00	0.00	18.00	5.72
D. High Income				
In Pesos	0.00	0.00	16.20	3.00
In Dollars	-10.80	0.00	18.00	3.52

Notes: Figures expressed in percentage points of the absolute value of net wealth.

This indicates that the gains are concentrated among the richest households and that most of the redistribution operates through the participation margin.

On the other hand, when measured in dollars, net wealth increases by 4.79% on average. In this case, the average effect is also positive because most households have negative net wealth in local currency (liabilities in local currency exceed assets in local currency for most households). When measured in dollars, average effects are not monotonic in household income anymore. The largest average gain corresponds to middle income households, since the fraction of households with local currency liabilities is much larger than the fraction with local currency assets. Finally, a fraction of high income households also experienced losses. These are the households that have assets primarily in local currency.

Our findings suggest sizable revaluation effects of nominal exchange rate devaluations. These are greater in magnitude than those estimated by [Lluberá and Odriozola \(2015\)](#), who analyze the effects of a nominal devaluation on total wealth (including real assets) and conclude that the amount of redistribution across households is small given that housing accounts for the main source of wealth. We also find that the net gain experienced by high income house-

holds is higher than the gain experienced by low income households. Our findings reinforce the results presented by [Cravino and Levchenko \(2017\)](#), who show that the cost of living of poorer households increased by up to 1.62 times more than the cost of living of richer households after the 1994 Mexican devaluation. In our case the redistribution operates through the revaluation of nominal liquid assets in different currencies.

III. Conclusion

We have shown that a fraction of households from many emerging countries have part of their wealth denominated in foreign currency. Within countries there is significant heterogeneity in the likelihood of having assets in foreign currency. High-income households tend to have a larger fraction of their wealth in foreign currency and the differences across the income distribution are persistent over time. Using detailed micro-data from Uruguay, we analyze the redistributive effects of nominal exchange rate devaluations on households' net nominal positions and show that those gains are highly concentrated among households with high-income. Thus, exchange rate policy can have large impact on wealth inequality, and thus on consumption inequality as well.

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ONLINE APPENDIX

ADDITIONAL FIGURES AND TABLES

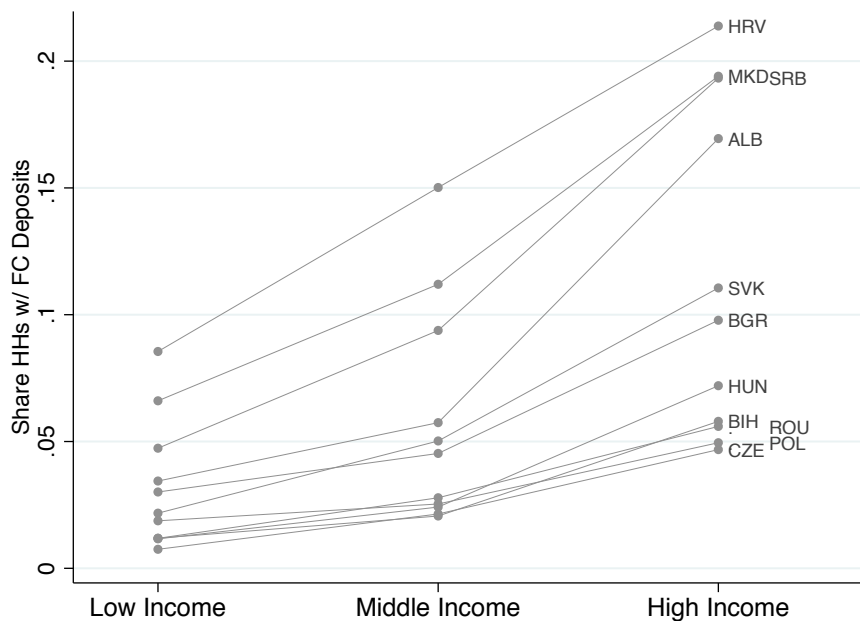


FIGURE A.1. SHARE OF HOUSEHOLDS EXPOSED TO DEPOSITS IN FC

TABLE A1—DYNAMIC BEHAVIOR OF EXPOSURE TO FC: CORRELATIONS OVER TIME

<i>Country</i>	<i>Low Inc.- Middle Inc.</i>	<i>High Inc.- Middle Inc.</i>
Albania	58.2%	70.4%
Bulgaria	61.2%	53.7%
Bosnia Her.	42.8%	67.6%
Czech Rep.	61.8%	61.0%
Croatia	84.4%	79.8%
Hungary	14.4%	35.4%
Macedonia	90.0%	83.4%
Poland	78.2%	72.9%
Romania	34.2%	63.2%
Serbia	79.6%	72.5%

Notes: First (second) column: correlation between share of households exposed to foreign currency in low (high) and middle income tercile over time. Sample period: 2007-2015.

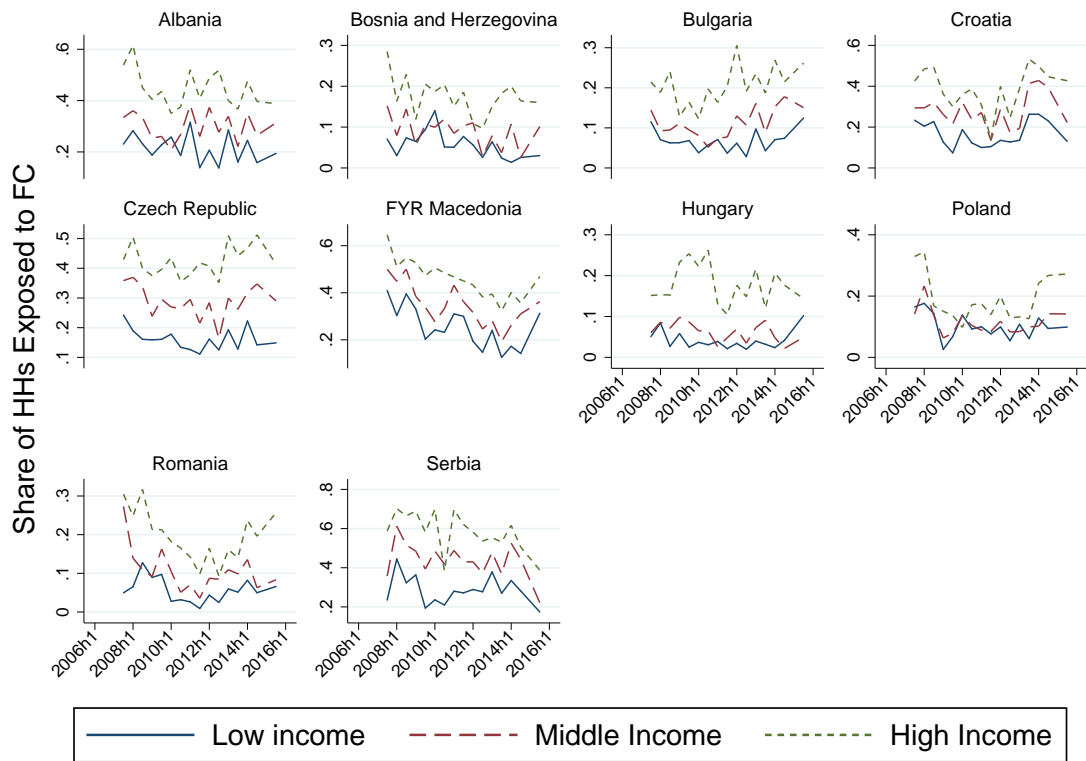


FIGURE A.2. EXPOSURE TO FC OVER TIME