Macroprudential policy over the business cycle*

Pablo Federico
University of Maryland

Carlos A. Vegh
University of Maryland and NBER

Guillermo Vuletin
Colby College

Preliminary and incomplete: June 6, 2012

Abstract

Based on a novel dataset for 52 countries for the period 1970 to the present, we analyze the use and cyclical properties of reserve requirements as a macroeconomic stabilization tool and whether reserve requirement policy (RRP) substitutes or complements monetary policy. We find that (i) more than 50 percent of developing countries have used RRP as a macroeconomic tool compared to no industrial country; (ii) 74 percent of developing countries use RRP countercyclically compared to just 38 percent that have engaged in countercyclical monetary policy; and (iii) in most developing countries, RRP has substituted monetary policy as a countercyclical tool. We interpret the latter finding as reflecting the reluctance of many emerging markets to reduce interest rates in bad times for fear of letting their currency depreciate rapidly or raising interest rates in good times for fear of attracting even more capital inflows.

JEL Classification:

Keywords:

*This paper was written while the authors were visiting the World Bank's Office of the Chief Economist for Latin America and the Caribbean and Vegh was also visiting the Macroeconomics and Growth Division (DEC) at the World Bank, and is part of an ongoing project on macroprudential policy at the Office of the Chief Economist. The authors are very grateful for the hospitality and stimulating policy and research environment and would like to thank Tito Cordella, Augusto de la Torre, Alain Ize, and participants at several brainstorming sessions for many helpful comments and discussions. The views expressed in the paper are the authors' own and do not necessarily reflect those of the Office of the Chief Economist or the World Bank.

1 Introduction

The recent global financial crisis has triggered an intense debate on the pros and cons of using macroprudential policy, broadly defined as the use of prudential tools, such as reserve or capital requirements, for macroeconomic stabilization purposes. Although the discussion is certainly not novel – many emerging countries had resorted to macroprudential policy well before Lehman Brothers' demise on September 15, 2008 – it took an urgent undertone in light of the sudden realization of the severe contractionary forces that could be unleashed by the abrupt unwinding of financial imbalances and systemic risk.

Perhaps one of best examples of the renewed debate on macroprudential policy is the resurgence of the so-called "Tobin tax" – a financial tax on short-term capital inflows – whose popularity had arguably reached a low point by the middle 2000's, after gaining some limited popularity in previous decades thanks to its use by Chile.[1] The mere fact that even the IMF – presumably a bulwark of macroeconomic orthodoxy – has come out in favor of using Tobin taxes under some circumstances is a dramatic illustration of the search for new policy tools in this much changed post-Lehman world.

There are, of course, many prudential tools that can be used for macroeconomic stabilization purposes, including reserve requirements, capital requirements, caps on the loan-to-value ratio, credit ceilings, and dynamic provisioning, among many others. Broadly speaking, the purpose of using these instruments is to reduce the amplitude of

[1] See Edwards, De Gregorio, and Valdes (2000).

the financial cycle and contain potential financial vulnerabilities that could be created as a result. Whether many of these instruments should be used at all and how effective they may be is the subject of an emerging literature. Lim *et al.* (2011) present some empirical evidence to the effect that macroprudential policy may be effective in reducing procyclicality of financial variables and reducing systemic risk. In a similar vein, Tovar *et al.* (2012) conclude that reserve requirements have had some temporary effect in containing the growth of real private bank credit growth.[2] By and large, however, the effectiveness of macroprudential policy is still very much an open question.

This paper contributes to the empirical discussion on macroprudential policy by focusing on a particular dimension: the use of reserve requirements over the business cycle. We focus on (legal) reserve requirements because they are arguably the most commonly used macro-prudential tool and the one for which a large dataset can be most easily gathered. Based on a novel dataset comprising 52 countries and ranging from 1970 to the present, we ask the following questions: (i) what countries have used reserve requirements as a macroeconomic stabilization tool? (ii) How does the use of RRP as a macroeconomic stabilization tool compare in emerging and industrial countries? (iii) In countries that use reserve requirements as a macroeconomic stabilization tool, have they been used countercyclically? (iv) Have reserve requirements acted as a substitute for or complement to monetary policy?

To answer these questions, we first compute the frequency of change in reserve re-

[2]See also Borio and Shim (2007), Calderon and Serven (2011), De la Torre, Ize, and Schmukler (2012), Glocker and Towbin (2012), Montoro and Moreno (2011), and Vargas *et al.* (2010).

quirements. Unlike standard economic time-series (like, say, government spending) which vary continuously over time, reserve requirements may stay constant for prolonged periods of time (i.e., they behave like tax rate or individual goods prices series). In the case of Chile, for instance, legal reserve requirements have changed only twice in our 31 year sample. We take the frequency of changes as an indicator of whether reserve requirements are used for macroeconomic stabilization purposes. In particular, if reserve requirements are changed more than once over the business cycle, we conclude that countries make active use of reserve requirement policy (RRP).[3] Based on this indicator, we divide our sample of 52 countries into "active" versus "passive" countries when it comes to RRP. We conclude that 37 percent of the countries in our sample have pursued an active RRP. This figure, however, masks an enormous difference between emerging markets and industrial countries: 51 percent of developing countries have been active whereas *no* industrial country has been active.

We then compute the cyclical properties of RRP for the active group of countries and find that 74 percent have pursued countercyclical RRP. The fact that so many developing countries have used RRP as a countercyclical tool is nothing short of remarkable in light of the fact that only 38 percent of developing countries have engaged in countercyclical monetary policy (compared to 87 percent of industrial countries). We attribute this difference to what we refer to as the "fear of free falling," henceforth FFF, defined as the reluctance of emerging markets to lower interest rates in bad times

[3]Naturally, it could be the case that reserve requirements are changed frequently for, say, microprudential reasons but this is unlikely. In fact, our classification remains robust to alternative operational definitions.

to help the economy get out of the recession for fear of facing rapid currency depreciation. Under these circumstances, having a second tool (reserve requirements) offers policymakers the possibility of lowering reserve requirements in bad times while not changing (or even increasing) the policy rate.

An alternative explanation for RRP as a substitute for monetary policy is the idea that, during good times, the monetary authority may be reluctant to increase interest rates for fear of attracting more capital inflows and hence chooses to keep interest rates unchanged (or even lower them) and increase reserve requirements to cool down the economy.

To capture the complementarity/substitutability between monetary and RRP, we construct a 3x3 "policy mix matrix" that combines the cyclical stance of monetary and RRP. The typical industrial country is acyclical when it comes to RRP and countercyclical in monetary policy. The most common policy mix for emerging markets is acyclical monetary policy (reflecting, in our interpretation FFF) and countercyclical RRP. In this case, RRP acts as a *substitute* for monetary policy in the sense that, in bad times for example, lower reserve requirements attempt to do what monetary policy cannot do (i.e., spur growth). The same is true when RRP is countercyclical but monetary policy is procyclical.

In contrast, when both monetary and RRP are countercyclical, we say that they act as *complements* because they both pursue the same goal (reactivating the economy in bad times and cooling it down in good times).

The paper proceeds as follows. Section 2 describes the data. Section 3 shows some

broad patterns in the data. Section 4 develops the main analysis. Section 5 analyzes the complementarity/substitutability between RRP and monetary policy. Section 6 concludes.

2 Data

The database for this paper is part of a World Bank regional study on macroprudential policy carried out by the Office of the Chief Economist for Latin America. The database comprises 52 "countries," 15 industrial and 37 developing countries:[4] Argentina, Australia, Belarus, Brazil, Canada, Chile, China, Colombia, Costa Rica, Croatia, Czech Rep., Denmark, Dominican Rep., Ecuador (dollarization), Ecuador (pre-dollarization), El Salvador, Euro-17, France, Germany, Guatemala, Honduras, Hungary, India, Israel, Jamaica, Japan, Latvia, Lithuania, Macedonia, Malaysia, Mexico, New Zealand, Nicaragua, Norway, Panama, Peru, Philippines, Poland, Portugal, Romania, Serbia, Singapore, Spain, Sweden, Switzerland, Thailand, Trinidad and Tobago, Turkey, United Kingdom, United States, Uruguay, and Venezuela.

The source for real GDP and central bank interest rate data are mostly from Global Financial Data and IFS (IMF). The data on reserve requirements is from local sources such as central banks and other government agencies. Real GDP data is seasonally-adjusted.

[4]For convenience, we will use the term "countries," but notice that our list includes the Euro zone as a single economic unit and Ecuador as two different economic units (before and after full dollarization in the year 2000).

3 General trends

To set the stage, we begin by briefly discussing some broad features of the data. Table 1 illustrates the wide diversity of reserve requirements in our sample. The table distinguishes between four different arrangements: (i) single reserve requirement; (ii) reserve requirements that vary according to maturity; (iii) reserve requirements that vary according to currency of denomination; and (iv) reserve requirements that vary according to both maturity and currency of denomination.[5] We can see that all industrial countries (including the Euro zone) fall in the first two categories, including Australia, Canada, Denmark, New Zealand, Norway, Sweden (since 1995), and United Kingdom, which have no legal reserve requirements. In contrast, developing countries span the whole spectrum, ranging from Mexico, which has had zero legal reserve requirements since 1992, to a fairly numerous group that has reserve requirements that vary according to both maturity and currency of denomination. The existence of reserve requirements based on currency of denomination in many developing countries should perhaps come as no surprise given the widespread phenomenon of "dollarization" or, more broadly, foreign currency deposits.[6]

To get an idea of how reserve requirements have evolved over time, Figure 1 plots the average reserve requirement across countries since 1975 to the present and the corresponding linear trend.[7] For developing countries, we can see a clear declining

[5] Single reserve requirement includes the case of no legal reserve requirement.

[6] In Uruguay, for example, @ percent of M2 is denominated in U.S. dollars. For Turkey, the corresponding figure is @. For a detailed discussion of dollarization, see Savastano, Reinhart, and Rogoff (2003) and the references therein.

[7] This is the simple average of existing reserve requirements for a given country averaged over all

trend reflecting financial liberalization and financial deepening. We can also see an increase in actual average reserve requirements in the period 2005-2010 reflecting, as discussed in detail below, the greater reliance on macroprudential policy in the period surrounding Lehman's fall on September 15, 2008. We see a similar declining trend, but much less steeper, for industrial countries.

Figure 2 depicts the dispersion of reserve requirements over time and the corresponding linear trend.[8] For developing countries – and line with Figure 1 – we see a clear declining trend with an increase in the actual dispersion over the last 5 years. For industrial countries, we see essentially no pattern.

4 Data analysis

Needless to say, not all countries make use of reserve requirements for macroeconomic stabilization purposes. An obvious example would be countries, such as the industrial countries mentioned above, that have zero legal reserve requirements. In other cases, however, reserve requirements may occasionally change but owing to microprudential reasons (broadly defined as including any reason not related to the business cycle). Since our purpose is to analyze the cyclical properties of reserve requirements in those countries that use them for macroeconomic stabilization purposes, we need an operational definition that will allow us to divide countries into those that make active use of reserve requirements for such purposes and those that do not. Once we have put

countries.

[8] We compute the standard deviation of existing reserve requirements for each country and then average across countries.

countries into these two categories, we can proceed to compute the cyclicality of reserve requirement policy for the active group.

To this end, we first compute the frequency of change in reserve requirements. Notice that, unlike standard macroeconomic time series, such as government consumption, which evolve in a continuous fashion over time, the legal reserve requirement rate is a "discontinuous series" in the sense that it may not change for prolonged periods of time.[9] For this type of time series, the frequency of changes is an important statistic. Figure 3 illustrates the quarterly frequency of changes in reserve requirements for all the countries in our sample.[10] Yellow bars denote emerging markets while black bars indicate industrial countries. For example, a frequency of 1 indicates that, on average, a country changes reserve requirements once per quarter or 4 times a year, whereas a frequency of 0.25 indicates a change every 4 quarters. The first obvious message of this picture is that yellow bars tend to be concentrated on the right-side (indicating frequent changes in reserve requirements) whereas black bars tend to be bunched towards the left-side (including many industrial countries with zero frequency and hence no discernible bar). This already tells us that we should expect to find many more developing countries in our group of active users of reserve requirements.

Clearly, a country with zero frequency of changes will fall in the category of passive (i.e., non-active) countries. A country like Chile with a frequency of 0.016 (having

[9] Other macroeconomic time series that share this property are, for example, prices of goods at a grocery store or tax rates. The frequency of changes of prices at grocery stores is typically taken as an indicator of how "sticky" are nominal prices; see, for example, @@.

[10] When a country has multiple reserve requirements, we compute the frequency for each one and take the average. Generally speaking, the frequency of changes does not vary substantially across different reserve requirements for a given country.

changed reserve requirements only twice in our 31 year-sample) will also fall in the passive category. But where do we draw the line? Since we are focusing on the use of reserve requirements for macro-stabilization purposes, it makes sense to think that if a country changes reserve requirements at a frequency that is lower than that of its business cycle, it is not actively using reserve requirements to smooth out the business cycle. Hence, what we do is to compute for each country the average duration of the business cycle based on quarterly GDP. If the frequency of changes in reserve requirements is higher (lower) than the average cycle, then we classify that country as an active (passive) country in terms of reserve requirement policy. For example, the average duration of the business cycle for Turkey is 3.8 years, whereas reserve requirements change, on average, every 2.1 years. We thus classify Turkey as an active country when it comes to using reserve requirements as a macroeconomic stabilization tool. Conversely, the average business cycle for Chile is 2.5 years whereas reserve requirements change, on average, every 15 years, which makes Chile a passive country for our purposes.

Figure 4 uses a scatter plot to illustrate the classification of countries into active and passive. The horizontal axis measures the average duration (in years) of the business cycle in a given country while the vertical axis measures the time (also in years) between changes in reserve requirements in the same country. Along the 45 degree line, the duration of the business cycle and the time between changes are the same. According to our definition, points below the 45 degree line are countries in which the time between changes in reserve requirements is more than the business cycle frequency

(active countries), while the reverse is true for countries above the 45 degree line.[11]

Based on this criterion, 19 out of the 52 countries (or 37 percent) depicted in Figure 3 are classified as active countries. As expected, there is a striking difference between industrial and developing countries: 19 out of 37 (or 51 percent) of developing countries are classified as active, whereas there is not a single industrial country with active reserve requirement policy.

Having identified a group of countries which, according to our definition, has pursued reserve requirement policy for macroeconomic stabilization purposes, we can now proceed to compute the cyclical properties of reserve requirement policy for this group. Figure 5 depicts the correlation between the cyclical components of reserve requirements and GDP for active countries. We can see that most countries (14 out of 19, or 74 percent) have pursued countercyclical reserve requirement policy.

5 Complementarity/substitutability with monetary policy

In and of itself, the fact that 74 percent of developing countries have, on average, pursued countercyclical reserve requirement policy may not seem that remarkable. But it is actually remarkable when compared to the percentage of developing countries that have pursued countercyclical monetary policy.[12] Figure 6 depicts the correlation be-

[11] Countries with zero frequency of change would have an "infinite" amount of time between changes and are plotted out of scale.

[12] See Vegh and Vuletin (2012) for a detailed analysis of the cyclicality of monetary policy.

tween the cyclical components of policy interest rates and GDP on a quarterly basis. We can see that all industrial countries (black bars) exhibit a positive correlation indicating countercyclical monetary policy (i.e., the policy rate is low in bad times and high in good times) and in 13 out of 15 cases (or 87 percent), the correlation is significantly different from zero. In sharp contrast, only 38 percent (or 14 out of 37) of developing countries show countercyclical monetary policy (i.e., positive correlation significantly different from zero).

Why do we see such a sharp difference in the conduct of monetary policy? Vegh and Vuletin (2012) argue that a critical factor is the "fear of free falling," hereafter FFF, defined as the need for developing countries to defend their currency in bad times. While a typical industrial country can lower interest rates in bad times without the fear of a sharp depreciation of their currency, this is often not true of developing countries. In bad times, when capital is flowing out and credibility is at a low point, many developing countries see the value of their currency plummet. In those circumstances, the monetary authority may have no choice but to either increase the interest rate to defend the currency (or at least not reduce it for fear of exacerbating the fall).[13] This implies that developing countries may be caught in the common policy dilemma of too few instruments (the policy interest rate) relative to the number of targets (output and

[13]In fact, this has been part of the standard IMF policy advice to developing countries, most notably during the Asian crisis of 1997. To quote Stanley Fischer, at the time the IMF's First Deputy Managing Director, in a 1998 lecture delivered at UCLA, "[i]n weighing this question [are the IMF programs in Asia too tough?], it is important to recall that when they approached the IMF, the reserves of Thailand and Korea were perilously low, and the Indonesian rupiah was excessively depreciated. Thus, the first order of business was, and still is, to restore confidence in the currency. To achieve this, countries have to make it more attractive to hold domestic currency, which, in turn, requires increasing interest rates temporarily, even if higher interest costs complicate the situation of weak banks and corporations."

the nominal exchange rate).

Viewed in this light, it is perhaps not surprising to see developing countries resort to the use of reserve requirements in a countercyclical manner, as they provide the second instrument that may be needed to achieve the two targets just mentioned. In other words, during bad times a country may not be able to lower interest rates (as it would like, were it not for the fear of free falling), but may lower reserve requirements instead. In other words, reserve requirement policy is acting as a substitute for monetary policy.

On the other hand, there are emerging markets that do not suffer from the FFF and may therefore be able to pursue countercyclical monetary policy. If, in addition, they also use reserve requirements in a countercyclical way, we say that reserve requirement policy is acting as a complement for monetary policy since both instruments are being used for the same purpose (to increase output in the case of a recession).

Table 2 classifies countries according to the cyclical properties of both monetary policy and reserve requirement policy. Since countries may be procyclical, acyclical, or countercyclical, there are 9 possible cells or combinations. Given that, as already discussed, all industrial countries are passive when it comes to RRP, they will all be located along the second row. And, since most of them pursue countercyclical monetary policy, they will be located in the cell (2,3), colored in orange (dark gray).

In contrast, most emerging markets pursue countercyclical reserve requirement policy and are therefore located along the third row. Within this group, most are located in cell (3,2), colored in yellow (light gray), because they are acyclical when it comes to monetary policy. Two countries (Argentina and India) are in cell (3,1) because

they exhibit procyclical monetary policy. In light of the above discussion, we refer to countries in cells (3,1) and (3,2) as cases in which RRP is a *substitute* for monetary policy. In contrast, we refer to countries in cell (3,3), where both monetary and reserve requirement policy are countercyclical, as cases in which reserve requirement policy is a *complement* for monetary policy.

While FFF offers a plausible story for the substitutability of monetary and reserve requirement policy, an alternative story is based on what we could refer as "fear of capital inflows." The idea would be that in periods of capital inflows (and ensuing output boom), the monetary authority is reluctant to raise interest rates because of the fear of attracting even more capital inflows (or fear of currency appreciation). As a result, they either keep interest rates unchanged or even lower them to attract less capital inflows at the same time that they raise reserve requirements to cool off the economy (by increasing the lending spread).[14]

Has the complementarity/substitutability of monetary and RRP changed in recent times? As mentioned when discussing Figure 1, it seems that over the last 6 years or so, countries have resorted more frequently to macroprudential policy and, according to our stories, this shift would have accompanied shifts in monetary policy. To answer this question, Figure 7 breaks the sample before and after 2005 and shows, for the active countries defined above, the correlations between the cyclical components of the policy rate and reserve requirements with GDP. We can see that RRP was slightly

[14]This was the position of the Turkish Central Bank as described in a Financial Times article on Dec 13, 2010. The deputy governor argued that the way to deal with heavy capital inflows was to reduce interest rates (to reduce capital inflows and currency appreciation) while using other instruments (i.e., reserve requirements) to reduce credit growth.

countercyclical before 2005 but much more after 2005. On the other hand, monetary policy was slightly procyclical before 2005 but shifted to markedly countercyclical after 2005. In terms of the policy mix matrix (Table 2), the average active country would have been in cell (3,1) before 2005 (RRP and monetary policy were substitutes) and in cell (3,3) after 2005 (RRP and monetary policy have been complements). This would suggest that the average country has overgrown both the FFF and the fear of capital inflows and is using both instruments for the same purpose.

Finally, Table 3 shows the policy mix matrix for all of LAC before and after 2005. Before 2005, there are no countries in the cells (2,3) and (3,3) and only two countries – Colombia and Jamaica – exhibit countercyclical monetary policy. In sharp contrast, after 2005, we see seven countries that have countercyclical monetary policy with three countries falling in the cell (2,3) and another three in the cell (3,3). In particular, Colombia, Peru, and Venezuela have used RRP and monetary policy as complements.

6 Conclusions

This paper has uncovered several stylized facts regarding the use of reserve requirements as a macroeconomic stabilization tool and its relation to monetary policy. In particular, we have seen that more than 50 percent of emerging markets use reserve requirements as a macroeconomic stabilization tool compared to no industrial country in our sample. The majority of emerging countries that have actively used reserve requirements do it countercyclically and most have used it as a substitute for monetary policy. Two

possible explanations for the use of reserve requirements as a substitute for monetary policy is the fear of free falling (the need to defend the currency in bad times by raising policy rates) and the fear of capital inflows (the idea of reducing interest rates in good times to avoid attracting even more capital inflows).

References

[1] Borio, C., and I. Shim (2007), "What can (macro-)prudential policy do to support monetary policy? , BIS Working Papers No. 242.

[2] Calderon, C., and L. Serven (2011), "Macro-prudential policies over the cycle in Latin America," unpublished manuscript (World Bank).

[3] De Gregorio, J., S. Edwards, and R. Valdes (2000), "Controls on capital inflows: Do they work?" NBER Working Paper No. 7645.

[4] De la Torre, A., A. Ize, and S. Schmukler (2012), Financial development in Latin America and the Caribbean (World Bank: Latin American and Caribbean Studies).

[5] Fischer, S. (1998), "The IMF and the Asian Crisis," Speech delivered at UCLA (available on the IMF website).

[6] Glocker, C., and P. Towbin (2012), "The Macroeconomic effects of reserve requirements," Austrian Institute of Economic Research, Working Paper No. 420/2012.

[7] Lim, C, F. Columba, A. Costa, P. Kongsamut, A. Otani, M. Saiyid, T. Wezel, and X. Wu (2011), "Macroprudential policy: What instruments and how to use them?" IMF Working Paper 11/238.

[8] Montoro, C., and R. Moreno (2011), "The use of reserve requirements as a policy instrument in Latin America," BIS Quarterly Review (March).

[9] Nier, E., J. Osinski, L. Jacome, and P. Madrid (2011), "Towards effective macroprudential policy frameworks: An assessment of stylized institution models," IMF Working Paper 11/250.

[10] Reinhart, C., K. Rogoff and M. Savastano (2003), "Addicted to dollars," NBER Working Paper No. 10015.

[11] Tovar, C., M. Garcia-Escribano, and M. Vera (2012), "Credit growth and the effectiveness of reserve requirements and other macroprudential instruments in Latin America," IMF Working Paper No. 142.

[12] Vargas, H., Betancourt, Y., Rodriguez, N. and Varela, C. (2010): "Effects of reserve requirements in an inflation targeting regime: the case of Colombia," BIS Papers, no 54, pp 133–70.

Figure 1. Average reserve requirements over time

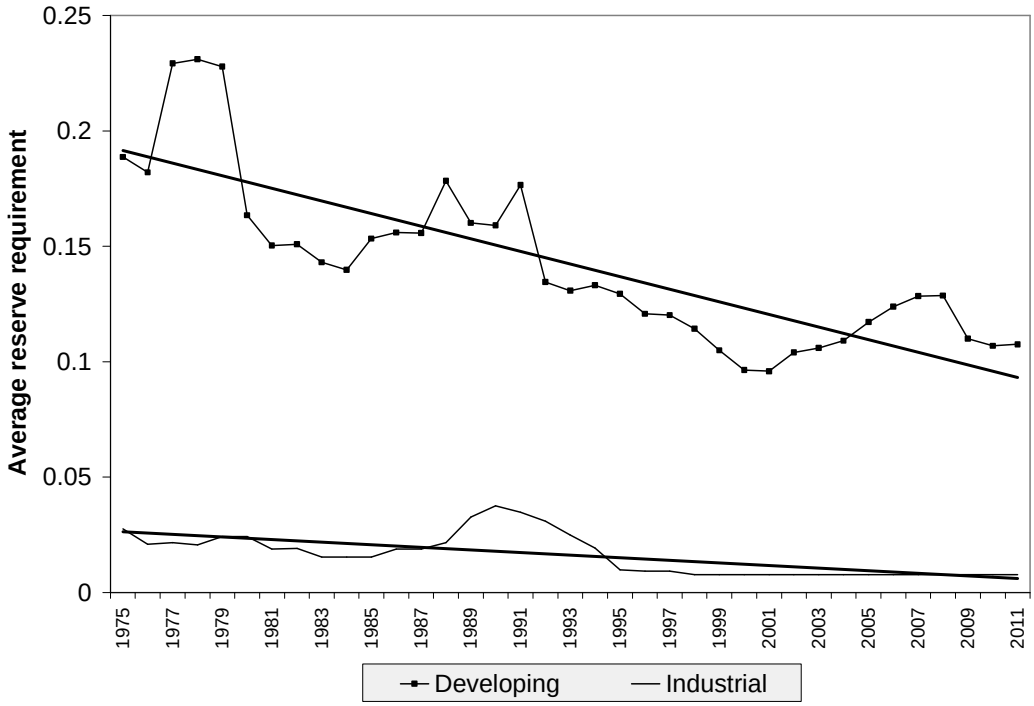


Figure 2. Dispersion of reserve requirements over time

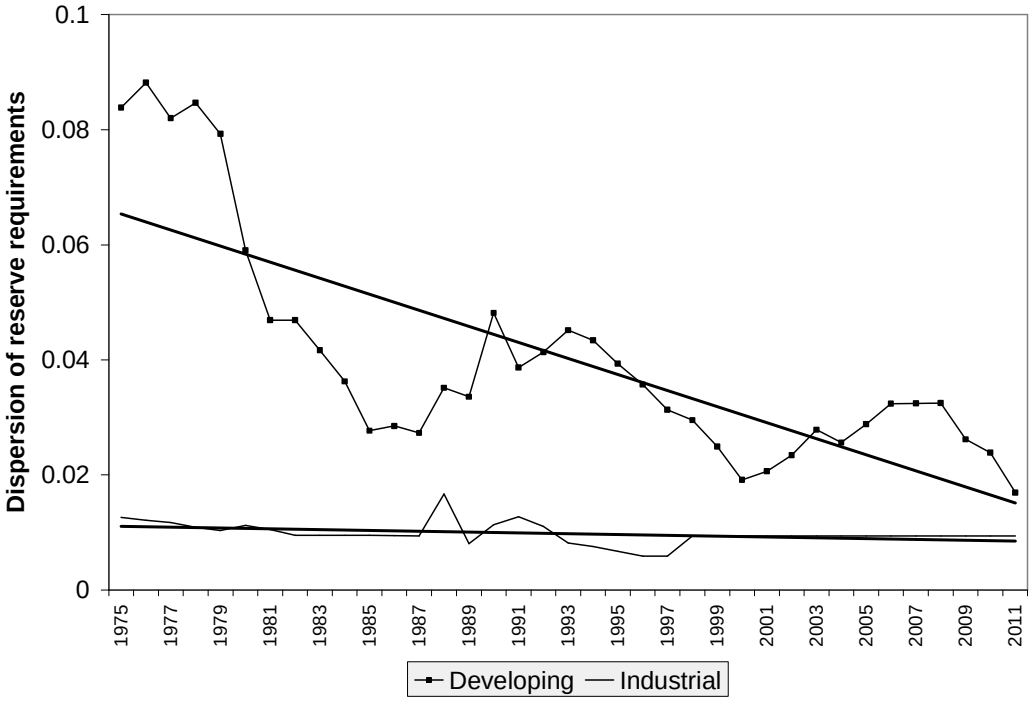


Figure 3. Frequency of changes in reserve requirements

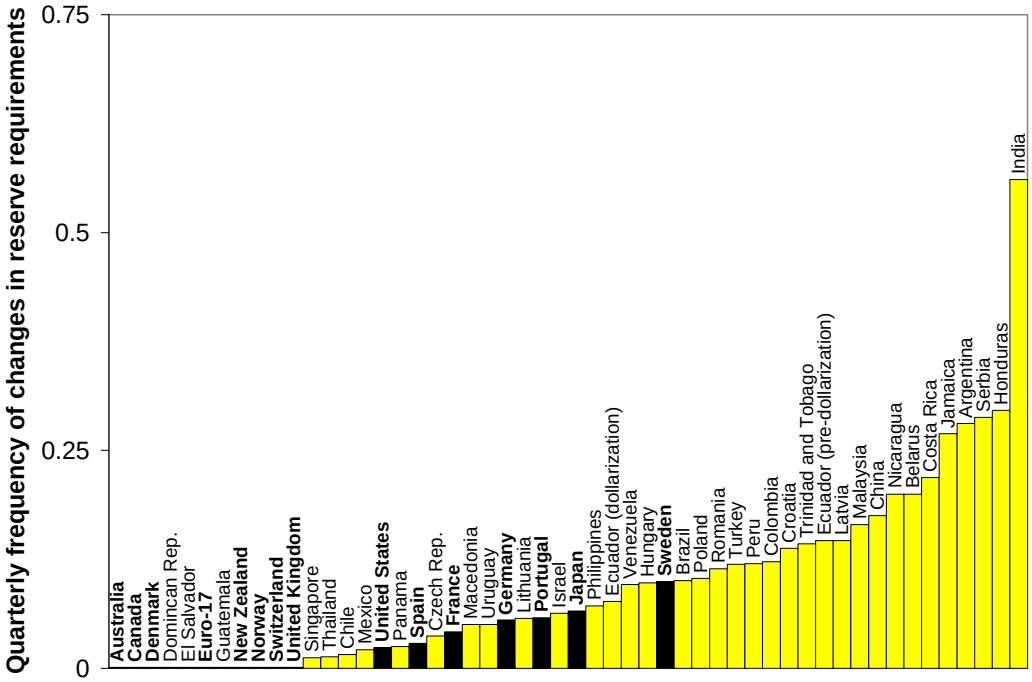
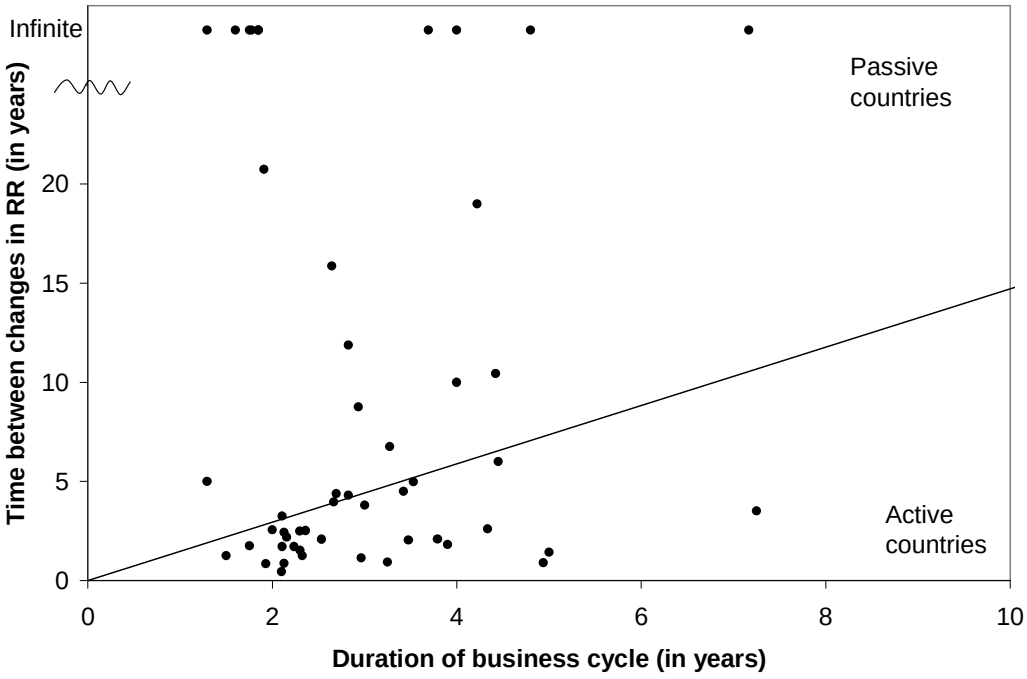
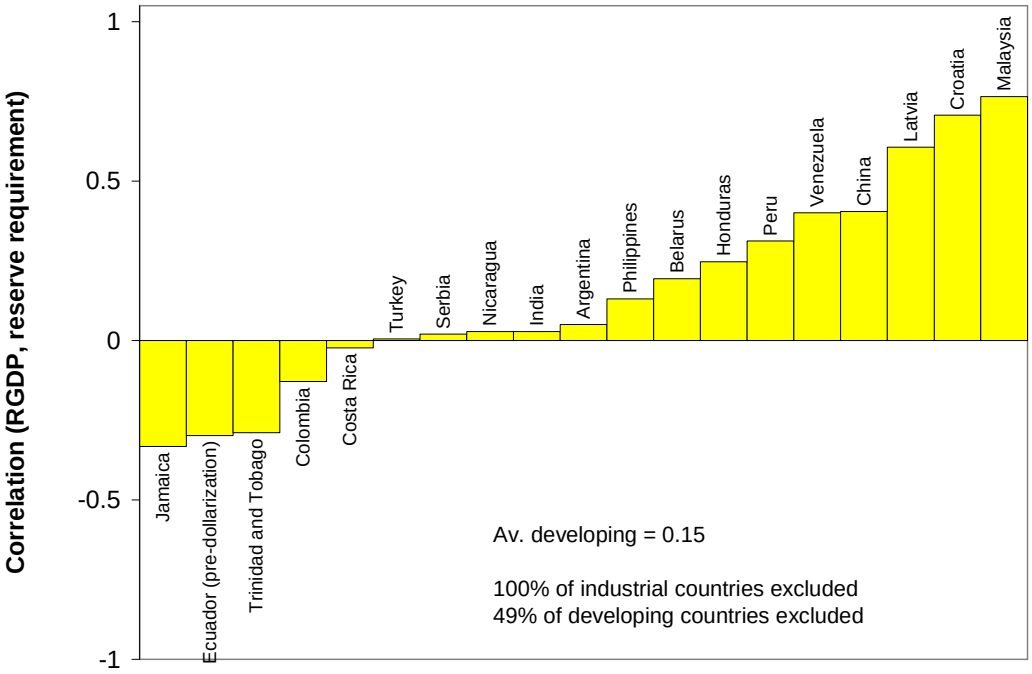


Figure 4. Active versus passive reserve requirement policy



Note: The solid line is a 45 degree line. Countries located below (above) the 45 degree line are countries for which the change in reserve requirements takes place, on average, at least (less than) one time per business cycle.

Figure 5. Cyclicality of reserve requirement policy



Note: Sample only includes active reserve requirement policy countries.

Figure 6. Cyclicality of interest rate policy

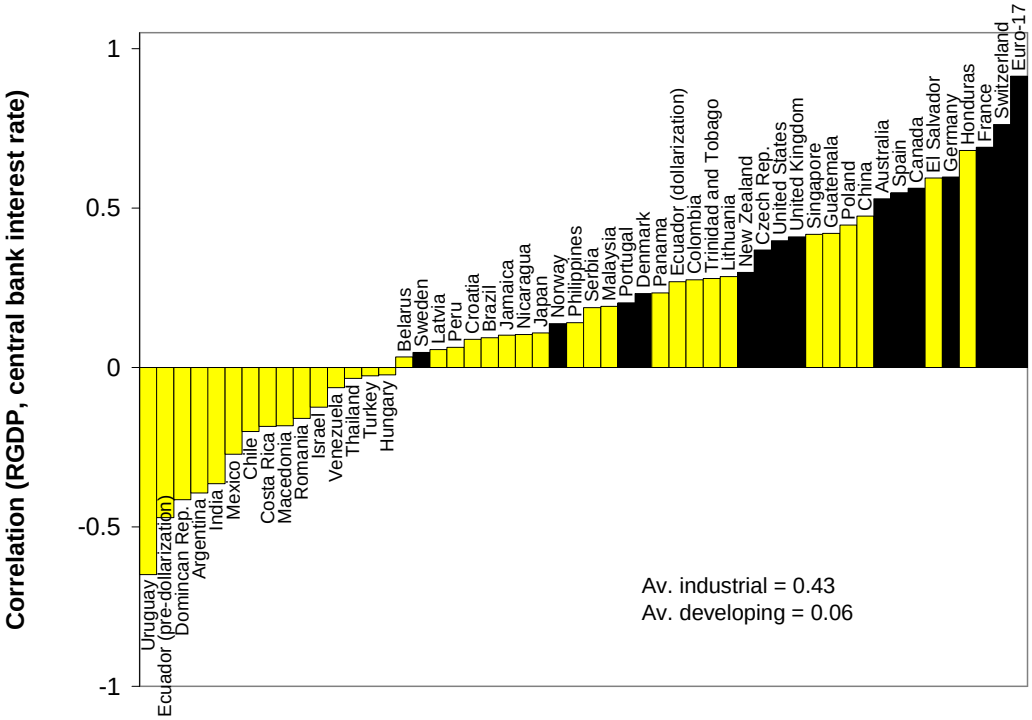


Figure 7. Cyclicality of interest rate and reserve requirement policies (before and after)

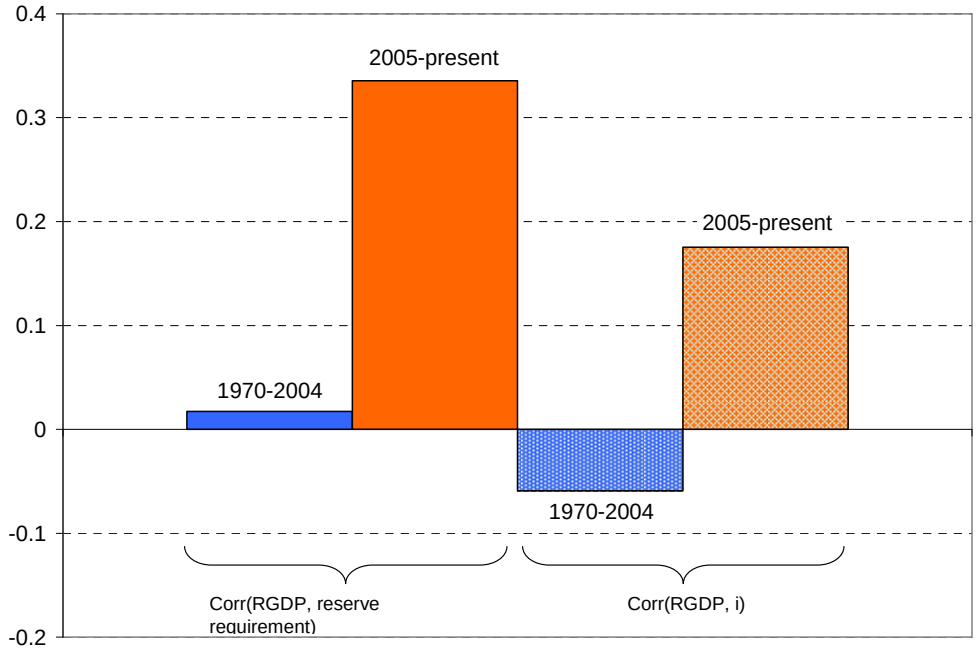


Table 1. Varieties of reserve requirements

	Single RR (19)	Maturity RR (16)	Currency RR (8)	Maturity and currency (9)
Developing (37)	China Colombia Ecuador (after dollarization) India Jamaica Malaysia Mexico Panama Philippines Singapore Thailand Trinidad and Tobago	Brazil Chile Czech Rep. El Salvador Hungary Israel Latvia Venezuela	Croatia Guatemala Honduras Lithuania Macedonia Nicaragua Peru Serbia	Argentina Belarus Costa Rica Dominican Republic Ecuador (before dollarization) Poland Romania Turkey Uruguay
Industrial (15)	Australia Canada Denmark New Zealand Norway Sweden United Kingdom	Euro France Germany Japan Portugal Spain Switzerland United States		

Table 2. Policy mix matrix (1970-present)

		Central bank interest rate policy		
		Pro-cyclical	**A-cyclical**	**Counter-cyclical**
Reserve requirement policy	**Pro-cyclical**	Costa Rica, Ecuador (pre-dollarization)	Jamaica	Colombia, Trinidad and Tobago
	A-cyclical	Chile, Domincan Rep., Mexico, Uruguay	Brazil, Hungary, Israel, **Japan**, Macedonia, Romania, **Sweden**, Thailand	**Australia, Canada,** Czech Rep., **Denmark,** Ecuador (dollarization)**,** El Salvador, **Euro-17, France, Germany,** Guatemala, Lithuania**, New Zealand, Norway,** Panama, Poland, **Portugal,** Singapore**, Spain, Switzerland, United Kingdom, United States**
	Counter-cyclical	Argentina, India	Belarus, Croatia, Latvia, Nicaragua, Philippines, Serbia, Turkey, Venezuela	China, Honduras, Malaysia, Peru

Substitutes

Complements

Table 3. Latin America and the Caribbean: Policy mix matrix (before and after)

Panel A. Before (1970-2004)

		Central bank interest rate policy		
		Pro-cyclical	**A-cyclical**	**Counter-cyclical**
Reserve requirement policy	**Pro-cyclical**	Ecuador (pre-dollarization)	Costa Rica, Nicaragua, Trinidad and Tobago	Colombia, Jamaica
	A-cyclical	Chile, Dominican Republic, Mexico, Uruguay	Brazil, El Salvador, Guatemala, Panama	
	Counter-cyclical	Argentina,	Peru, Venezuela	

Panel B. After (2005-present)

		Central bank interest rate policy		
		Pro-cyclical	**A-cyclical**	**Counter-cyclical**
Reserve requirement policy	**Pro-cyclical**		Jamaica	Trinidad and Tobago
	A-cyclical		Brazil, Dominican Republic, Mexico, Panama, Uruguay	Chile, El Salvador, Guatemala
	Counter-cyclical	Costa Rica	Argentina, Costa Rica, Nicaragua	Colombia, Peru, Venezuela