The Emerging Global Financial Architecture: Tracing and Evaluating the New Patterns of the Trilemma's Configurations

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Abstract: Using the indexes we developed (Aizenman, Chinn, and Ito, 2008) to measure the degree of the three policy choices countries make with respect to the trilemma: exchange rate stability, monetary independence, and capital account openness, we investigate the normative questions pertaining to the trilemma, that is, how the policy choices among the three trilemma policies affect output growth volatility, inflation rates, and the volatility of inflation, with focus on developing economies. Some key findings for developing countries include: (i) greater monetary independence can dampen output volatility while greater exchange rate stability implies greater output volatility, which can be mitigated by reserve accumulation; (ii) greater monetary autonomy is associated with a higher level of inflation while greater exchange rate stability and greater financial openness could lower the inflation level; (iii) a policy pursuit of stable exchange rate while financial development is at the medium level can increase output volatility, and while greater financial openness with a high level of financial development can reduce output volatility, greater financial openness with a low level of financial development can be volatility-increasing; (iv) net inflow of portfolio investment and bank lending can increase output volatility and higher levels of short-term debt or total debt services can increase both the level and the volatility of inflation.

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1. Introduction

Against the backdrop of the most severe financial crisis since the Great Depression, the issue of whether the trilemma – the hypothesis that a country only achieve two, but not all three, goals of monetary independence, exchange rate stability and financial integration – seems rather distant. We would argue that, on the contrary, the way in which the trilemma has been felt, and how it will constrain future policy choices, are questions that need to be answered in order to understand how the world economy has arrived at this juncture. In particular, reserve accumulation on the part of East Asian countries can be viewed as part of how the stage was set for the low interest rates that are blamed by some for the speculative excesses of the last few years.

A key message of the trilemma is instrument scarcity – policy makers face a tradeoff, where increasing one trilemma variable (such as higher financial integration) would induce a drop in the weighted average of the other two variables (lower exchange rate stability, or lower monetary independence, or a combination of the two).[1] In our previous paper (Aizenman, et al., 2008), we constructed the indexes that measure each aspect of the three trilemma configurations for both industrialized and developing countries in the period 1970 to 2006. Using these indexes, we have shown that major crises in the last four decades, namely, the collapse of the Bretton Woods system, the debt crisis of 1982, and the Asian crisis of 1997-98, caused structural breaks in the trilemma configurations. We also tested whether the three macroeconomic policy goals are "binding" in the context of the impossible trinity. That is, we tested the linearity of the indexes and confirmed that countries face the trade-off of the three policy choices. This result indicates that a change in one of the trilemma variables would induce a change with the opposite sign in the weighted average of the other two. With these results, we can safely expect that the present turbulence in the global financial markets could challenge the stability of the current trilemma configuration.

Now the question becomes: if policy makers are bound to choose any two out of the three macroeconomic goals, what kind of policy goals would they like to achieve through the choice of the combination? Hence, we decide to test how each one of the three policy choices as well as the combination of the two could affect the economic outcomes policy makers pay close attention to, such as output volatility, inflation volatility, and medium-term inflation rates, with a particular focus on developing countries.

Understanding the trilemma choices of developing countries and emerging market countries (EMG) is crucial since more than half of the global GDP is produced by these countries, at times when the EMGs (where more than 40% of the global population lives) grow at a much faster rate than the industrialized countries. Yet, these countries are also characterized by higher

[1] See Obstfeld, Shambaugh, and Taylor (2005) for further discussion and references dealing with the trilemma.

volatility of terms of trade, greater exposure to commodity prices shocks, lower financial depth, and frequently polarized society. These vulnerabilities suggest that the cost of suboptimal choices of the Trilemma policies would be more significant for developing countries than for industrialized ones. In addition, the greater variation in the experience of developing countries should help with identifying the impacts of Trilemma choices on the performance of these countries. To gain further insight, we report in Figure 3b and 3c the average pattern of the three Trilemma indices for the EMGs and non emerging markets countries. Comparing the two figures reveals the distinctively different trilemma patterns of these two groups of countries.[2] EMGs moved towards greater exchange rate flexibility than Non-EMGs, buffering it by holding much higher IR/GDP, as well as towards higher financial integration and lower monetary independence. In short, EMGs have experienced convergence to some middle ground among all three indexes. In contrast, non-EMGs, on average, have not exhibited such convergence. While the degree of exchange rate stability declined from the early 1970s to the early 1990s, it increased during the last fifteen years – though one could expect that the present crisis would induce these countries to move toward higher exchange rate flexibility. Currently, non-EMGs exhibit a greater degree of exchange rate stability and monetary independence, but a lower degree of financial integration compared to EMGs.

As EMGs collectively have outperformed non-EMGs in terms of average economic growth rates, the above observations could suggest that it is the middle ground configuration of the trilemma policies that may have contributed to better, rapid development and high economic growth. Yet, without controlling for the macroeconomic environment, one must be cautious with articulating the causality, as the convergence towards the middle ground may also be the outcome of successful take offs and prolonged growth spells. Our paper attempts to verify these issues through regression analyses, looking more systematically at the association between trilemma choices and economic performance.

Upon investigating the link between the trilemma policy configurations and macroeconomic performance of the countries of our focus, we also pay close attention to three other factors, namely, international reserves (IR) holding, financial development, and external finance.

As has been intensively investigated in the literature, for the last decade since the Asian crisis of 1997-98, developing countries, especially those in East Asia and the Middle East, are rapidly increasing the amount of international reserves hoarding. China, the world's largest holder of international reserves, currently holds about $2 trillion of reserves, accounting for 30%

[2] Table 1 shows that the differences of the Trilemma indexes for monetary independence, exchange rate stability, and financial openness as well as international reserves holding (as a ratio to GDP) between EMGs and non-EMG developing countries are found to be statistically significant.

of the world's total. As of 2006, the top 10 biggest holders are all developing countries except for Japan, and the nine developing countries, including China, Russia, Taiwan, and Korea hold about 50% of international reserves available in the world. Against this backdrop, it has been argued that one of the main reasons for the rapid IR accumulation is countries' desire to stabilize exchange rate movement. Hypothetically, one could argue that countries hold massive international reserves to have balanced combinations of exchange rate stability, monetary policy autonomy, and financial openness. Thus, evidently, one cannot discuss the issue of the trilemma without incorporating the effect of IR holding, which we will do in this paper.

Secondly, the ongoing crisis has made it clear that financial development can be a double-edged sword. While it can enable more efficient allocation of capital, it also embraces the possibility of amplifying shocks to the economy. As a country may incorporate financial development into its decision-making process for the trilemma configurations, as China has been alleged to pursue closed financial markets with exchange rate stability as precautionary measures to protect its underdeveloped financial system, the degree of financial development could affect the macroeconomic performance of the economy.[3] Some also argue that countries with newly liberalized financial system tend to experience financial fragility (Demirguc-Kent and Detragiache, 1998). Thus, trilemma policy configurations need to be investigated while incorporating the level of financial development.

Thirdly, as globalization proceeds with an unprecedented speed, and more countries are abolishing capital controls, policy makers in countries, especially developing ones, cannot ignore the effect of capital flows from other countries. As Lane and Milesi-Ferretti (2006) show, the type, volume, and direction of capital flows has been changing over time, thus policy makers have to aim at moving targets in their policy decision making. Especially, considering that the present crisis has shown that the speed and the volume of tsunami of capital flows can be enormous, we must be abreast of the cost and benefit of trilemma configurations in tandem with those of external financing such as FDI flows, portfolio flows, and banking lending across countries.

In the remainder of the paper, Section 2 briefly outlines the methodology for the construction of our "trilemma indexes" that measures the extent of achievement in the three policy goals. Section 3 conducts more formal analysis on how the policy choices affect output growth volatility, inflation rates, and the volatility of inflation, with focus on developing economies. In Section 4, we extend our empirical investigation and focus on important economic variables related to the current crisis. More specifically, we first we take a closer look at the interactive effect of financial development with the trilemma configurations on output volatility.

[3] See Prasad (2008) for the argument that China's policy of exchange rate stability and closed financial markets is impairing the country's macroeconomic management.

Secondly, we examine the impacts of external financing on output volatility, inflation volatility, and the medium-term level of inflation, focusing on how the trilemma configurations interact with external financing and affect these macroeconomic goals. In Section 5, we make casual observations to see whether our empirical findings are consistent with the economic conditions that led to the ongoing severe crises in some countries. We present our concluding remarks in Section 6.

2. Development of the Trilemma Configurations

2.1. Metrics to Measure the Trilemma Configurations

The empirical analysis of the tradeoffs being made requires measures of the policies. Unfortunately, there's paucity of good measures; in Aizenman et al. (2008), we attempt to remedy this deficiency by creating several indices.

Monetary Independence (MI)

The extent of monetary independence is measured as the reciprocal of the annual correlation of the monthly interest rates between the home country and the base country. Money market rates are used.[4]

The index for the extent of monetary independence is defined as:

$$MI = 1 - \frac{corr(i_i, i_j) - (-1)}{1 - (-1)}$$

where *i* refers to home countries and *j* to the base country. By construction, the maximum and minimum values are 1 and 0, respectively. Higher values of the index mean more monetary policy independence.[5]

Here, the base country is defined as the country that a home country's monetary policy is most closely linked with as in Shambaugh (2004). The base countries are Australia, Belgium, France, Germany, India, Malaysia, South Africa, the U.K., and the U.S. For the countries and years for which Shambaugh's data are available, the base countries from his work are used, and for the others, the base countries are assigned based on IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER)* and *CIA Factbook*.

[4] The data are extracted from the IMF's *International Financial Statistics* (60B..ZF...). For the countries whose money market rates are unavailable or extremely limited, the money market data are supplemented by those from the Bloomberg terminal and also by the deposit rates series from *IFS*.

[5] The index is smoothed out by applying the three-year moving averages encompassing the preceding, concurrent, and following years ($t-1$, t, $t+1$) of observations.

Exchange Rate Stability (ERS)

To measure exchange rate stability, annual standard deviations of the monthly log-change in the exchange rate between the home country and the base country are calculated and included in the following formula to normalize the index between zero and one:

$$ERS = \frac{0.01}{0.01 + stdev(\Delta(\log(exch\_rate))}$$

Merely applying this formula can easily create a downward bias in the index, that is, it would exaggerate the "flexibility" of the exchange rate especially when the rate usually follows a narrow band, but is de- or revalued infrequently.[6] To avoid such downward bias, we also apply a threshold to the exchange rate movement as has been done in the literature. That is, if the rate of monthly change in the exchange rate stayed within +/-0.33 percent bands, we consider the exchange rate is "fixed" and assign the value of one for the ERS index. Furthermore, single year pegs are dropped because they are quite possibly not intentional ones.[7] Higher values of this index indicate more stable movement of the exchange rate against the currency of the base country.

Financial Openness/Integration (KAOPEN)

Without question, it is extremely difficult to measure the extent of capital account controls.[8] Although many measures exist to describe the extent and intensity of capital account controls, it is generally agreed that such measures fail to capture fully the complexity of real-world capital controls. Nonetheless, for the measure of financial openness, we use the index of capital account openness, or *KAOPEN*, by Chinn and Ito (2006, 2008). *KAOPEN* is based on information regarding restrictions in the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions* (*AREAER*). Specifically, *KAOPEN* is the first standardized principal component of the variables that indicate the presence of multiple exchange rates, restrictions on current account transactions, on capital account transactions, and the requirement of the

[6] In such a case, the average of the monthly change in the exchange rate would be so small that even small changes could make the standard deviation big and thereby the ERS value small.

[7] The choice of the +/-0.33 percent bands is based on the +/-2% band based on the annual rate, that is often used in the literature. Also, to prevent breaks in the peg status due to one-time realignments, any exchange rate that had a percentage change of zero in eleven out of twelve months is considered fixed. When there are two re/devaluations in three months, then they are considered to be one re/devaluation event, and if the remaining 10 months experience no exchange rate movement, then that year is considered to be the year of fixed exchange rate. This way of defining the threshold for the exchange rate is in line with the one adopted by Shambaugh (2004).

[8] See Chinn and Ito (2008), Edison and Warnock (2001), Edwards (2001), Edison et al. (2002), and Kose et al. (2006) for discussions and comparisons of various measures on capital restrictions.

surrender of export proceeds.[9] Since *KAOPEN* is based upon reported restrictions, it is necessarily a *de jure* index of capital account openness (in contrast to *de facto* measures such as those in Lane and Milesi-Ferretti (2006)). The choice of a *de jure* measure of capital account openness is driven by the motivation to look into policy intentions of the countries; *de facto* measures are more susceptible to other macroeconomic effects than solely policy decisions with respect to capital controls.[10]

The Chinn-Ito index is normalized between zero and one. Higher values of this index indicate that a country is more open to cross-border capital transactions. The index is available for 171 countries for the period of 1970 through 2006.[11] The data set we examine does not include the United States. The Appendix presents data availability in more details.

2.2. Summary Statistics of the Trilemma Indexes

Figures 1 and 2 provide a concise summary of the recent history of trilemma configurations for different income groups and regional groups. In each diamond chart, the origin is normalized so as to represent zero monetary independence, pure float, zero international reserves and financial autarky. Figure 2 summarizes the trends for industrial countries, those excluding the 12 euro countries, emerging markets, and non-emerging developing countries.

That figure reveals that, over time, while both industrialized countries and emerging market countries have moved towards deeper financial integration and losing monetary independence, non-emerging market developing countries have only inched toward financial integration and have not changed the level of monetary independence. Emerging market countries, after giving up some exchange rate stability during the 1980s, have not changed their stance on the exchange rate stability whereas non-emerging market developing countries seem to be remaining at or slightly oscillating around a relatively high level of exchange rate stability. The pursuit of greater financial integration is much more pronounced among industrialized countries than developing countries while emerging market countries have been increasingly becoming more financial open. Interestingly, emerging market developing countries stand out from other groups by achieving a relatively balanced combination of the three macroeconomic policy goals by the 2000s, i.e., middle-range levels of exchange rate stability and financial integration while not losing as much of monetary independently as industrialized countries. The

[9] This index is described in greater detail in Chinn and Ito (2008).
[10] *De jure* measures of financial openness also face their own limitations. As Edwards (1999) discusses, it is often the case that the private sector circumvents capital account restrictions, nullifying the expected effect of regulatory capital controls. Also, IMF-based variables are too aggregated to capture the subtleties of actual capital controls, that is, the direction of capital flows (i.e., inflows or outflows) as well as the type of financial transactions targeted.
[11] The original dataset covers more than 131 countries, but data availability is uneven among the three indexes. *MI* is available for 171 countries; *ERS* for 179; and *KAOPEN* for 177. Both *MI* and *ERS* start in 1960 whereas *KAOPEN* in 1970. For the data availability of the trilemma indexes, refer to Appendix.

recent policy combination has been matched by a substantial increase in IR/GDP at a level that is not observed in any other groups.

To confirm the different development paths of the trilemma indexes for the groups of EMGs and non-EMG developing countries for the last four decades, we conduct mean-equality tests on the three trilemma indexes and the IR holding ratios between EMGs and non-EMG developing countries. We report the test results in Table 1 and statistically confirm that the development path of the trilemma configurations has been different between these two groups of countries.

Figure 2 illustrates heterogeneous trends among developing countries in Asia, Latin American countries (LATAM), and Sub Saharan Africa. We can see that Latin American economies have liberalized their financial markets rapidly since the 1990s after retrenching their liberalization efforts significantly during the 1980s. Emerging markets in Latin America appear different from other developing economies in the region in that they reduced the extent of monetary independence in recent years and maintained a lower level of exchange rate stability. Emerging Asian economies differ from other developing economies in both Asia and Latin America. These economies have achieved comparable levels of exchange rate stability and financial openness while consistently reducing monetary independence. This group of economies differ from the other ones the most with their high levels of international reserves holding. Lastly, Sub-Saharan African countries appear to have pursued the policy combination of exchange rate stability and monetary independence while lagging in financial liberalization behind the other regions.

Figure 3 presents the development of trilemma indexes for 50 countries (32 of which are developing) during the 1970-2006 time period for which we can construct a balanced data set. For the industrialized countries, financial openness accelerated after the beginning of the 1990s and exchange rate stability rose after the end of the 1990s, reflecting the introduction of the euro in 1999. The extent of monetary independence has experienced a declining trend, especially after the early 1990s. For developing countries, the experience is strikingly different. Up to 1990, exchange rate stability was the most pursued policy among the three, though it had been on the declining trend since the early 1970s. On average, during the 1990s, monetary independence and stable exchange rates became the most pursued policies while financial openness steadily increased during the period. Since the millennium, interestingly, while exchange rate stability moderately increased its levels and has become the most pursued macroeconomic policy goal, monetary independence and financial integration have converged. This development indicates that developing countries may have been trying to cling to moderate levels of both monetary independence and financial openness while maintaining higher levels of exchange rate stability – leaning against the trilemma in other words – which may explain the reason why some of these

economies hold sizable international reserves, potentially to buffer the trade-off arising from the trilemma.

3. Regression Analyses

Although the above characterization of the trilemma indexes allows us to observe the development of policy orientation among countries, it fails to identify countries' motivations for policy changes. Hence, we examine econometrically how various choices regarding the three policies affect final policy goals, namely, output growth stability, low inflation, and inflation stability.

The basic model we estimate is given by:

$$y_{it} = \alpha_0 + \alpha_1 TLM_{it} + \alpha_2 TR_{it} + \alpha_3 (TLM_{it} \times TR_{it}) + X_{it}\mathrm{B} + Z_t\Gamma + D_i\Phi + \varepsilon_{it} \qquad (1)$$

y_{it} is the measure for macro policy performance for country i in year t. More specifically, y_{it} is either output volatility measured as the five-year standard deviations of the growth rate of per capita real output (using Penn World Table 6.2); inflation volatility as the five-year standard deviations of the monthly rate of inflation; or the five-year average of the monthly rate of inflation. TLM_{it} is a vector of any two of the three trilemma indexes, namely, *MI*, *ERS*, and *KAOPEN*.[12] TR_{it} is the level of international reserves (excluding gold) as a ratio to GDP, and (TLM_{it} x TR_{it}) is an interaction term between the trilemma indexes and the level of international reserves. We are particularly interested in the effect of the interaction terms because we suspect that international reserves may complement or substitute for other policy stances.

X_{it} is a vector of macroeconomic control variables that include the variables most used in the literature, namely, relative income (to the U.S. based on PWT per capita real income); its quadratic term; trade openness (=(*EX*+*IM*)/*GDP*); the TOT shock as defined as the five-year standard deviation of trade openness times TOT growth; fiscal procyclicality (as the correlations between HP-detrended government spending series and HP-detrended real GDP series); M2 growth volatility (as five-year standard deviations of M2 growth); private credit creation as a ratio to GDP as a measure of financial development; the inflation rate; and inflation volatility. Z_t is a vector of global shocks that includes change in U.S. real interest rate; world output gap; and relative oil price shocks (measured as the log of the ratio of oil price index to the world's CPI). D_i is a set of characteristic dummies that includes a dummy for oil exporting countries and

[12] In Aizenman, et al. (2008), we have shown that these three measures of the trilemma are linearly related. Therefore, it is most reasonable to include two of the indexes concurrently, not just individually nor all three collectively.

regional dummies. Explanatory variables that persistently appear to be statistically insignificant are dropped from the estimation. ε_{it} is an *i.i.d.* error term.

The data set is organized into five-year panels of 1972-1976, 1977-81, 1982-1986, 1987-91, 1992-96, 1997-2001, 2002-06. All time-varying variables are included as five-year averages. The full sample is divided into the groups of industrialized countries (IDC) and developing countries (LDC) which also includes a subgroup of commodity exporters (COMMOD-LDC), i.e., developing countries that are either exporters of fuel or those of non-fuel primary products as defined by the World Bank, and a subgroup of emerging market countries (EMG). We report the results only for the last three groups, i.e., only subsamples related to developing countries.

Since inflation volatility turned out to be a significant explanatory variable for the regressions for output volatility and the level of inflation, and also the inflation level for the regressions for inflation volatility, we need to implement an estimation method that handles outliers properly. Hence, we decide to use the robust regression method which downweights outliers.[13] Also, we remove the observations if their values of inflation volatility are greater than a value of 30 or the rate of inflation (as an explanatory variable) is greater than 100%. Furthermore, for comparison purposes, the same set of explanatory variables is used for the three subsamples except for the regional dummies.

3.1 Estimation of the Basic Model

3.1.1. Output Volatility

The regression results for the estimation on output volatility are shown in Tables 2-1 through 2-3 for the three subsamples of developing countries, i.e., developing countries, developing commodity exporters, and emerging market countries. Different specifications are tested using different combinations of the trilemma indexes as well as their interaction terms. The results are presented in columns 1 through 6 in each table.[14] The variables that consistently appear to be statistically insignificant are dropped from the estimations.

The model explains well the output volatility for the developing countries subsample (Table 2-1). Across different model specifications, the following is true for the group of developing countries: The higher the level of income is (relative to the U.S.), the more reduced output volatility is, though the effect is nonlinear. The bigger change occurs on U.S. real interest rate, the higher output volatility of developing countries may become, indicating that the U.S. real interest rate may represent the debt payment burden on these countries. The higher TOT shock there is, the higher output volatility countries experience, consistent with Rodrik (1998)

[13] The robust regression procedure conducts iterative weighted least squares regressions while downweighting observations that have larger residuals until the coefficients converge.

[14] The dummies for "East Asia and Pacific" and "Sub-Saharan Africa" are included in the model for developing countries, but not reported to conserve space.

and Easterly, Islam and Stiglitz (2001) who argue that volatility in world goods through trade openness can raise output volatility.[15] Countries with procyclical fiscal policy tend to experience more output volatility while oil exporters also experience more output volatility.[16]

Countries with more developed financial markets tend to experience lower output volatility, a result consistent with the theoretical predictions by Aghion, et al. (1999) and Caballero and Krishnamurthy (2001) as well as past empirical findings such as Blankenau, et al. (2001) and Kose et al. (2003). This result indicates that economies armed with more developed financial markets are able to mitigate output volatility, perhaps by allocating capital more efficiently, lowering the cost of capital, and/or ameliorating information asymmetries (King and Levine, 1993, Rajan and Zingales, 1998, Wurgler, 2000). We will revisit this issue later on.

Among the trilemma indexes, only the monetary independence variable is found to have a significant effect on output volatility; the greater monetary independence one embraces, the less output volatility the country tends to experience. This finding is no surprise, considering that stabilization measures should reduce output volatility, especially more so under higher degree of monetary independence.[17] Mishkin and Schmidt-Hebbel (2007) find that countries that adopt inflation targeting – one form of increasing monetary independence – are found to reduce output volatility, and that the effect is bigger among emerging market countries.[18] This volatility reducing effect of monetary independence may explain the tendency that developing countries, especially, non-emerging market ones, try not to reduce the extent of monetary independence over years.

Like other developing countries, less developed commodity exporting countries are also susceptible to changes in U.S. real interest rates and TOT shocks, but other variables do not exhibit the same effects (Table 2-2). Again, countries with greater monetary independence tend to experience lower output volatility. Interestingly, more exchange rate stability per se does not

[15] The effect of trade openness is found to have insignificant effects for all subgroups of countries and is therefore dropped from the estimations. This finding reflects the debate in the literature, in which both positive (i.e., volatility enhancing) and negative (i.e., volatility reducing) effects of trade openness has been evidenced. The volatility enhancing effect in the sense of Easterly et al. (2001) and Rodrik (1998) is captured by the term for (TOT*Trade Openness) volatility. For the volatility reducing effect of trade openness, refer to Calvo et al. (2004), Cavallo (2005, 2007), and Cavallo and Frankel (2004). The impact of trade openness on output volatility also depends on the type of trade, i.e., whether it is inter-industry trade (Krugman, 1993) or intra-industry trade (Razin and Rose,1994).

[16] Countries in East Asia and Pacific as well as in Sub Sahara Africa tend to experience more output volatility (results not reported).

[17] This finding can be surprising to some if the concept of monetary independence is taken synonymously to central bank independence because many authors, most typically Alesina and Summers (1993), have found more independent central banks would have no or little at most impact on output variability. However, in this literature, the extent of central bank independence is usually measured by the legal definition of the central bankers and/or the turnover ratios of bank governors, which can bring about different inferences compared to our measure of monetary independence.

[18] The link is not always predicted to be negative theoretically. When monetary authorities react to negative supply shocks, that can amplify the shocks and exacerbate output volatility. Cechetti and Ehrmann (1999) find the positive association between adoption of inflation targeting and output volatility.

have any significant impact on output volatility, but if it is coupled with higher levels of international reserves holding, then countries can reduce output volatility, which may help explain the recent buildup of international reserves by developing, especially oil exporting, countries. Additionally, more financially open commodity exporters seem able to reduce output volatility, though, interestingly, the coefficient on the interaction term between *KAOPEN* and international reserve holding is significantly *positive* in one of the models. This result indicates that countries with higher levels of reserves holding than 27% of GDP can experience *more* output volatility. This result is somewhat counterintuitive.

While emerging market developing countries share many of the same traits in macroeconomic variables as those in the LDC sample, the results on the trilemma indexes are a little different. Countries with more stable exchange rate tend to experience higher output volatility, which conversely implies that countries with more flexible exchange rates will experience lower levels of output volatility, as was found in Edwards and Levy-Yeyati (2003) and Haruka (2007). However, the interaction term is found to have a statistically negative effect, suggesting that countries holding high levels of international reserves are able to reduce output volatility. The threshold level of international reserves holding is 21-24% of GDP. Singapore, a country with a middle level of exchange rate stability (0.50 in the 2002-06 period) and a very high level of international reserves holding (100% as a ratio of GDP), is able to reduce the output volatility by 2.65-3.2 percentage points.[19] China, whose exchange rate stability index is as high as 0.97 and whose ratio of reserves holding to GDP is 40% in 2006, is able to reduce volatility by 1.1-1.5 percentage points. The estimation results on the trilemma variables are summarized in Table 5.[20]

Figure 4 graphically shows the marginal interactive effects between ERS and IR based on the estimates from Column 2 of Table 2-3. For presentation purposes, in the figure, the EMG group of countries is divided into (a) the Asian group, (b) the Latin American group, and (c) the other EMG countries. In all the panels of figures, the contours are drawn to present different levels of the effect of ERS on output volatility conditional on the level of IR. Also, the solid horizontal line refers to the threshold of IR at 21% of GDP, above which higher levels of ERS will have a negative impact on output volatility.[21] For example, the solid line of contour above

[19] See Moreno and Spiegel (1997) for earlier study of trilemma configurations in Singapore.
[20] Following Acemoglu (2003), we also suspect institutional development plays a role in reducing output volatility. To measure the level of institutional development, we use the variable LEGAL, which is the first principal component of law and order (LAO), anti-corruption measures (CORRUPT), and bureaucracy quality (BQ). However, it turns out that the LEGAL variable is statistically insignificant and sometimes with the wrong sign (not reported). Given small variations in the time series of the variable, this result is not surprising.
[21] We also note that the estimated coefficient on IR (level) is significantly positive in Columns (2) and (6) of Table 2-3, which indicates that, while a higher level of IR holding can lessen the positive effect of ERS, a higher level of IR holding itself is volatility-enhancing. This is not captured in Figure 4 since we focused on the effect of ERS and how it changes depending on the level of IR.

the threshold shows the combinations of ERS and IR that leads to a one percentage point reduction in the output volatility. In the figure, we can see that the further toward the northeast corner in the panel, i.e., the higher level of ERS *and* IR a country pursues, the more negative impact it can have on output volatility. Below the threshold, however, it is true that the further toward the southeast corner, i.e., the higher level of ERS *and* the lower level of IR a country pursues, the more *positive* impact it can have on output volatility. In each of the panels, the scatter diagrams of ERS and IR are superimposed. The black circles indicate ERS and IR for the period of 2002-06 and the red "x's" for the 1992-96 period.

Using these diagrams, we can make several interesting observations. First, between the 1992-96 and 2002-06 periods, a period which encompasses the last wave of global crises, i.e., the Asian crisis of 1997-98, the Russian crisis of 1998, and the Argentina crisis of 2001-02, many countries, especially those in East Asia and Eastern Europe, increased their IR holding above the threshold. Secondly, the movement is not necessarily toward the northeast direction. Rather, it is around the threshold level where the effect of ERS is neutral (i.e., zero percentage point impact), unless they move much higher toward output volatility-reducing territory (such as China and Bulgaria). Thirdly, while we observe a moderately positive association between ERS and IR, none of these observations are applicable to Latin American countries. Lastly, there are not many countries that have achieved combinations of ERS and IR to reduce output volatility significantly. Countries such as Botswana, China, Hong Kong, Malaysia, Jordan, and Singapore are more of exceptions. However, at the very least, these estimation results should explain why many countries, especially those with the intention of pursuing greater exchange rate stability, are motivated to hold a massive amount of international reserves.

3.1.2. Inflation Volatility

We repeat the exercise for inflation volatility. The results for subsamples of developing countries are reported in Tables 3-1 through 3-3 and summarized in Table 5.

Across different subsamples, countries with higher relative income tend to experience lower inflation volatility, and naturally, those with higher levels of inflation are expected to experience higher inflation volatility. The TOT shock is found to increase inflation volatility. Furthermore, for commodity exporters, oil price increases would lead to higher inflation volatility.

The performance of the trilemma indexes appears to be the weakest for this group of estimations overall. Monetary independence is found to be an inflation volatility decreasing factor for commodity exporters. However, given that it is also an output volatility decreasing factor for this group of countries, this finding is somewhat counterintuitive.

Emerging market countries, on the other hand, tend to experience higher inflation volatility if they are more open to capital account transactions. This significantly positive effect of financial openness may be capturing financial turbulence that can arise as a result of financial liberalization policy. In fact, when we include the interaction term between the crisis dummy and the financial openness variable, the statistical significance of the financial openness variable declines while the interaction term enters the estimation marginally significantly.

3.1.3. Medium-run Level of Inflation

Tables 4-1 through 4-3 show the results for the regressions on the level of inflation. These three tables report that countries with higher inflation volatility, M2 growth volatility, and oil price shocks tend to experience higher output volatility. Also, when the world economy is experiencing a boom, developing countries tend to experience higher inflation, which presumably reflects strong demand for goods produced and exported by developing countries.

Countries with more monetary autonomy tend to experience higher inflation. From the perspective that greater monetary independence should be synonymous with a more independent central bank, most typically exemplified by the literature of time-inconsistency in monetary policy, a country with greater monetary independence should be able to lower inflation.[22] One possible explanation would be that countries with higher levels of monetary independence attempt to monetize their debt and cause higher inflation. Such countries may be better off if they are not monetarily independent and just import monetary policy from other countries through fixed exchange rate arrangements.

As a matter of fact, in all three subsamples, higher exchange rate stability is found to lead countries to experience lower inflation, a result consistent with the literature (such as Ghosh et al., 1997). This finding and the previously found positive association between exchange rate stability and output volatility are in line with the theoretical prediction that establishing stable exchange rates is a trade-off issue for policy makers; it will help the country to achieve lower inflation by showing a higher level of credibility and commitment, but at the same time, the efforts of maintaining stable exchange rates will rid the policy makers of an important adjustment mechanism through fluctuating exchange rates – which would explain the negative coefficient on monetary independence in the output volatility regressions.

Furthermore, for the LDC group, the interaction term between ERS and international reserves holding is found to have a positive impact on the rate of inflation. Models 2 and 6 in Table 4-1 show that if the ratio of reserves holding to GDP is greater than 53% or 65%, respectively, the efforts of pursuing exchange rate stability can help *increase* the level of

[22] In other words, more independent central bankers should be able to remove the inflation bias (Kydland-Prescott, 1977 and Barro-Gordon, 1983).

inflation. Although these levels of reserves holding are very high, this means that countries with excess levels of reserves holding will eventually face the limit in the efforts of fully sterilizing foreign exchange intervention to maintain exchange rate stability, thereby experiencing higher inflation.[23]

Lastly, models (3) through (6) in all subsamples show that the more financially open a developing country is, the lower inflation it will experience. Interestingly, the more open to trade a country is, the more likely it is to experience lower inflation, though this effect is weakly significant only for the LDC group.

As globalization became actively debated, the negative association between "openness" and inflation was more frequently remarked upon.[24] Romer (1993), extending the Barro-Gordon (1983) model, theorized and empirically verified that the more open to trade a country becomes, the less motivated its monetary authorities are to inflate, suggesting a negative link between trade openness and inflation. Razin and Binyamini (2007) predicted that both trade and financial liberalization will flatten the Phillips curve, so that policy makers will become less responsive to output gaps and more aggressive in fighting inflation.[25] Here, across different subsamples of developing countries, we present evidence consistent with the negative openness-inflation relationship.

3.2. How Does a Policy Orientation Affect Macroeconomic Performance?

Composite Indexes for Policy Orientation

As we have already seen, decisions on which two of the three policy goals – monetary independence, exchange rate stability, and financial integration – to retain, or which one to give up, characterizes the international financial regime a country decides to implement. For example, currency unions such as the Euro countries and the Gulf Cooperation Council (GCC) or countries with currency boards like Argentina before 2001 require member countries to abandon monetary independence, but retain exchange rate stability and financial openness. The Bretton Woods system kept countries financially closed, but let them exercise an independent monetary policy and to stabilize their currency values. Thus, measures constructed by two of the above three indexes can allow one to summarize the policy orientations of countries. In other words, measures composed of two of the three indexes should be able to show how close countries are to the "vertex" of the trilemma triangle.

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[23] Aizenman and Glick (2008) and Glick and Hutchison (2008) show that China, whose ratio of reserves holding to GDP is estimated to be 50%, has started facing more inflationary pressure in 2007 as a result of intensive market interventions to sustain exchange rate stability (though the onset of global crisis has reversed these trends).
[24] Rogoff (2003) argues that globalization contributes to dwindling mark-ups, and thereby, disinflation.
[25] Loungani et al. (2001) provides empirical evidence that countries with greater restrictions on capital mobility face steeper Phillips curves.

For this purpose, we construct composite indexes based on two of the above three measures. The principal component of *MI* and *ERS* measures how close countries (*MI_ERS*) are toward the vertex of "closed economy" whereas that of *ERS* and *KAOPEN* (*ERS_KAO*) refers to the vertex of currency union or currency board, and that of *MI* and *KAOPEN* (*MI_KAO*) to "floating exchange rate." Again, all three indexes are normalized between zero and one. Higher values indicate a country is closer toward the vertex of the trilemma triangle.

Estimation with Composite Indexes

Columns 7 though 12 in Tables 2-1 through 4-3 show the estimation results for different models each of which include one composite index and its interaction with reserves holding. Tables 2-1 and 2-2 show that countries with higher MI_KAO, i.e., countries with more flexible exchange rates, tend to experience lower output volatility, which is in line with the oft-argued automatic stabilizing role of flexible exchange rates. For developing countries, the more financially closed an economy is (the higher its MI_ERS is), output volatility tends to be lower. Given that monetary independence is found to have a volatility reducing effect in the estimations with individual trilemma indexes, it is monetary independence that leads to lower output volatility whether financially closed economies with more stable exchange rates or financially open but with more flexible exchange rates. Emerging market economies (Table 2-3), on the other hand, seem to follow different dynamics. Economies with higher MI_ERS, i.e., more closed financial markets, are able to reduce output volatility only when they hold ample reserves.

In Tables 3-1 through 3-3, we see that developing countries or emerging market economies with higher exchange rate stability and more financial openness (ERS and KAO), or those with weaker monetary independence, tend to experience higher inflation volatility. Commodity exporters that pursue greater monetary independence and financial openness (MI and KAO) tend to experience less inflation volatility (Table 3-2).

The level of inflation can be lowered if a developing or commodity-exporting country pursues greater monetary independence and more stable exchange rates (Columns 7 and 8 in Tables 4-1 and 4-2). Or, if developing countries, whether commodity-exporting or emerging market ones, pursue a policy combination of greater exchange rate stability and more financial openness, these economies should be able to lower the level of inflation. This finding can be disappointing news for monetary authorities because it implies that, to implement disinflationary policy, policy makers should yield monetary policy making to another country and invite more policy discipline by opening financial markets.

4. Further Analyses of the Trilemma Configurations on Macro-Performance

While the above analysis sheds important light on how the trilemma configurations affect macroeconomic performance of the economies, other important questions, especially those which have emerged out of the ongoing financial crisis, are not directly addressed. In this section, we further investigate the following two more issues. First, we take a closer look at the effect of financial development on output volatility. Secondly, we examine the impacts of external financing on output volatility, inflation volatility, and the medium-term level of inflation.

4.1 Interactions Between the Trilemma Configurations and Financial Development

The ongoing global financial crisis has illustrated that financial development can be a double-edged sword. While further financial development may enhance output growth and stability by ameliorating information asymmetry, enabling more efficient capital allocation, and allowing for further risk sharing, it can also expose economies to high-risk, high-return financial instruments, thereby involving the possibility of amplifying real shocks and/or falling into the boom-burst cycles. Naturally, the effect of financial development deserves further investigation, which we are about to conduct.

In Tables 2-1 through 2-3, we have seen that more financial development can lead to less output volatility, but its effect is significant only for the LDC subsample. One may also wonder how trilemma configurations can interact with the level of financial development. There is no question that monetary policy with high levels of authorities' independence, which is found to be volatility-reducing, should work better with more developed financial markets. Exchange rate stability, which can lead to higher output volatility, may be less disturbing if financial markets handle capital allocation more efficiently. Financial liberalization can easily be expected to work hand in hand with financial development to reduce economic volatility.

With these assumptions, we test to see if there is any interaction between the trilemma indexes and financial development which we measure using private credit creation as a ratio to GDP (*PCGDP*). The results turn out to be simply futile; when the previous output volatility regressions from Tables 2-1 through 2-3 are repeated, including interaction terms between the trilemma indexes and *PCGDP*, none of the interaction terms turn out to be significant (not reported). These results are not surprising or discouraging, because, as we already mentioned, we suspect that the effect of financial development can be ambiguous.

The weakness of using interaction terms is that we must assume that the effect of *PCGDP* on the link between the trilemma indexes and output volatility is monotonic; a higher level of *PCGDP* must either enhance, have no impact on, or lessen the link. Given the insignificance of the interaction terms from the initial investigation, we suspect the nonlinearity

of *PCGDP*. As such, we decide to use the dummies for different level groups of *PCGDP*.[26] That is, *PCGDP_HI* is assigned a value of one for a country if the country's *PCGDP* is above the 75th percentile in the distribution of five-year averages of *PCGDP* within a five-year window, and zero, otherwise. *PCGDP_LO* takes a value of one if the country's *PCGDP* is below the 25th percentile, and zero, otherwise. *PCGDP_MD* takes a value of one if the country's *PCGDP* lies between the 25th and 75th percentiles in a five-year period. We interact these level category dummies with the trilemma indexes and include the interaction terms in the output volatility regressions, hoping to capture the nonlinear effect of financial development on the link between the trilemma configurations and output volatility.

Table 6 reports the estimation results only for the *PCGDP* variable and the interaction terms for the developing countries subsample (Columns 1-3) and the emerging market countries subsample (Columns 4-6) in order to conserve space. At the bottom of the tables, we also report the Wald test statistics for the tests on the differences in the estimated coefficients of the interaction terms between the trilemma indexes and different *PCGDP* groups.

In Columns 1-3, we can see that this analysis does not yield any significant results for the group of developing countries. Exchange rate stability may contribute to higher output volatility if the country is equipped with medium (or higher) levels of financial development while the low level of financial development may contribute to reducing output volatility, though none of the estimated coefficients are significant.

Among EMGs (Columns 4-6), we see more interesting results. The estimated coefficient on the term "ERS x Medium *PCGDP*" is significant in Columns 4 and 5. In Column 5, the coefficient on "ERS x High *PCGDP*" is also significant, and both "ERS x Medium *PCGDP*" and "ERS x High *PCGDP*" are greater than "ERS x Low *PCGDP*" in the estimates' magnitude although they are not statistically significantly different. At least, we can surmise that for countries with underdeveloped financial markets, higher levels of exchange rate stability do not lead to higher output volatility. Those with medium levels of financial development do seem to experience higher output volatility when they pursue a more stable exchange rate, suggesting that countries with newly developed financial markets can be volatile when they pursue greater exchange rate stability. Furthermore, in both Columns 4 and 5, the estimated coefficients on the interaction term between ERS and IR are found to be significantly negative. Using the estimates, we can estimate that to cancel or lessen the volatility-enhancing effect of ERS, EMGs with medium (or higher) levels of financial development need to hold at least 22-25% of GDP of international reserves. However, this rule is not applicable to those with underdeveloped financial markets.

[26] This investigation is motivated by Hnatkovska and Loayza (2005), who examines the nonlinear effect of structural variables, including financial development, on the output volatility-growth link.

Financial development and financial openness seem to have interesting interactive effects on output volatility as well. While those EMGs with medium or higher levels of financial openness tend to experience less output volatility when they decide to pursue more stable exchange rates, those with underdeveloped financial markets are expected to experience greater output volatility. When the coefficient of "*KAOPEN* x Medium *PCGDP*" and "*KAOPEN* x High *PCGDP*" are compared to that of "*KAOPEN* x Low *PCGDP*," the difference is found to be statistically significant. These results indicate that emerging market economies need to be equipped withhighly developed financial markets if they want to reap the benefit of financial liberalization on their output volatility.

These findings suggest that a policy management leaning more toward exchange rate stability is most likely to exacerbate output volatility when the economy is equipped with medium levels of financial development. Having a higher level of financial openness and financial development can yield a synergistic impact to dampen output volatility, presumably by facilitating allocation of capital, ameliorating information asymmetry, and thereby reducing the cost of capital.[27] The worst and more significant case is that a country with underdeveloped financial markets can exacerbate output volatility caused by financial liberalization.

4.2 The Effects of External Financing

Financial liberalization has increased its pace over the last two decades. This, however, does not mean that countries suddenly became more financially linked with others. In the 1980s, developing countries received external financing in the form of sovereign debt, but the debt crisis experience spurred many of these countries to shy away from sovereign debt. After the 1990s, the role of FDI became more important and more recent waves of financial liberalization have contributed to a rise in portfolio flows across borders as well. As Lane and Milesi-Ferretti (2006) note, the type, volume, and direction of capital flows have changed over time.

4.2.1 Incorporation of External Financing

Against this backdrop, we extend our investigation by incorporating the effect of external financing. More specifically, we include the variables that capture net FDI inflows, net portfolio inflows, net 'other' inflows (which mostly includes bank lending in IFS), short-term debt, and total debt service. For net capital flows, we use the IFS data and define them as external liabilities (= capital inflows with a positive sign) minus assets (= capital inflows with a negative sign) for each type of flows – negative values mean that a country experiences a net outflow

[27] See Bekaert et al., (2000, 2001), Henry (2000), Stultz (1999) among others for the link between financial liberalization and the cost of capital. Chinn and Ito (2006) show that financial openness can exogenously lead to more financial development.

capital of the type of concern. Short-term debt is included as the ratio of total external debt and total debt service as is that of Gross National Income (GNI). Both variables are retrieved from WDI. Because the debt-related variables are limited, we only deal with one subsample that is composed of developing countries for which the debt-related variables are available. Also, to isolate the effect of external financing from currency crises, we include a dummy for currency crises.[28]

The results are reported in Table 7 for all three dependent variables, output volatility in columns 1 through 3, inflation volatility in columns 4 through 6, and inflation level in columns 7 through 9. We present the estimated coefficients only for the variables of interest.[29] Table 6 shows that the more 'other' capital inflows, i.e., banking lending or more net portfolio inflows, a country receives, the more likely it is to experience higher output volatility, reflecting the fact that countries that experience macroeconomic turmoil often experience an increase in inflows of banking lending or "hot money" such as portfolio investment. FDI inflows appear to contribute to lowering inflation volatility, which is somewhat counterintuitive. One possible explanation is that countries tend to stabilize inflation movement to attract FDI, and this may also explain the negative, but less significant, coefficients on the net FDI inflow variables in the inflation level regressions. Other types of capital flows do not seem to matter for either inflation volatility or inflation levels.

Both short-term debt and total debt service are positive and significant contributors to both inflation volatility and inflation level, supporting our previous argument that countries do tend to monetize their debt especially when their monetary authorities embrace more independence – the estimated coefficient on monetary independence continues to be significantly positive in the inflation level regressions.

Among the trilemma indexes, greater monetary independence continues to be a negative contributor to output volatility though it is also a positive contributor to the level of inflation. More financial openness is now a negative contributor to output volatility for this sample of countries while its negative impact on the level of inflation remains. Higher exchange rate stability continues to dampen the level of inflation, but holding too much of international reserves (more than 45% of GDP) can cancel the negative effect and contribute to higher inflation.

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[28] The currency crisis dummy variable is derived from the conventional exchange rate market pressure (EMP) index pioneered by Eichengreen *et al.* (1996). The EMP index is defined as a weighted average of monthly changes in the nominal exchange rate, the international reserve loss in percentage, and the nominal interest rate. The weights are inversely related to the pooled variance of changes in each component over the sample countries, and adjustment is made for the countries that experienced hyperinflation following Kaminsky and Reinhart (1999). For countries without data to compute the EMP index, the currency crisis classifications in Glick and Hutchison (2001) and Kaminsky and Reinhart (1999) are used.

[29] Overall, other macroeconomic variables retain the characteristics found in the previous regressions, though they tend to be less statistically significant.

4.2.2 External Financing and Policy Orientation

Given that the combination of two out of three policy stances is what matters to the macro outcomes, when we estimate the effect of external financing, it is important to condition on what kind of policy combination is being pursued by the recipient countries.[30] The best way for us to do that is to examine the interactive effect between the type of external financing and that of the policy combination. For that purpose, we create dummy variables for the types of policy orientation using the composite trilemma indexes we have been using. That is, if the composite index MI_ERS turns out to be the highest compared to the other two, MI_KAO and ERS_KAO, then a value of one is assigned for D_MI_ERS and zero for the other two, D_MI_KAO and D_ERS_KAO. In the results shown in Table 8, the external financing variables are interacted with the dummy for one particular type of policy combination. For example, in columns 1 and 2 of Table 8 we use in the estimation of output volatility the dummy for the policy orientation of greater monetary independence and exchange rate stability (MI_ERS; or "financially closed" policy option) and interact it with the external financing variables. Columns 3 and 4 use the dummy for the policy orientation of greater monetary independence and further financial opening ("more flexible exchange rate" policy), and columns 5 and 6 use that of greater exchange rate stability and further financial opening ("currency union" or currency board). The following six columns report the results for the estimation of inflation volatility and the next six for the level of inflation.

For output volatility, we find different types of external financing can have different impacts on output volatility depending on the policy regime in place. Net FDI inflows, for example, tend to dampen output volatility in general, but it can enhance the volatility in a regime that has pursued greater monetary independence and more stable exchange rates (i.e., less financial openness). Net portfolio inflows seem to have a positive impact on output volatility, but its volatility increasing impact is especially higher for the countries with the ERS-KAO ("currency union") regimes, in line with what has been found in the crisis literature. Countries with more flexible exchange rates (or monetary independence and financial openness), on the other hand, may be able to dampen the volatility-increasing effect, though its effect for this policy orientation is not found to be statistically significant. Positive net inflows of bank lending can be volatility increasing, but that effect can be dampened, though only marginally significantly, if the country adopts the policy combination of exchange rate stability and financial openness.

[30] See IMF (2007) for an examination of the relationship between how countries manage capital inflows and subsequent macroeconomic outcomes.

The greater the debt service is, the more likely a country is to experience higher levels of output volatility, especially when the country pursues a combination of greater exchange rate stability and financial openness. This result appears to be consistent with the "original sin" argument; countries that are indebted in a foreign currency and that try to maintain both exchange rate stability and capital account openness often experience sudden capital flow reversal and consequently higher output volatility.

In the inflation volatility regressions, it seems that net inflow of FDI contributes to lower inflation volatility across different policy regimes in general. However, the volatility-reducing effect is even higher for countries with flexible exchange rates. The table also shows that, for countries with flexible exchange systems, portfolio inflows can lower inflation volatility. These results imply that if a country is considering to allow more influx of FDI or portfolio flows while wanting to lower inflation volatility, it would be best to adopt a flexible exchange rate system or keep the overall level of financial openness at low levels. Lastly, total debt services can make countries with monetary independence and financial openness experience higher inflation volatility while financially closed regimes would experience a slight drop in inflation volatility. This may be because rapid currency depreciation could enlarge the size of total debt which could encourage countries to monetize away the debt.

Different types of policy combinations seem to matter only for 'other' (i.e., bank lending) inflows in the estimation for the level of inflation; a net recipient of bank lending flows tends to experience lower inflation if it adopts a policy combination of monetary independence and financial openness, but it could experience higher inflation if it adopts a financially closed system. One merit of a country with currency union-like regime is that it can dampen the inflation pressure of total debt services. A country with closed financial markets on the other hand may experience higher output volatility as a result of higher levels of debt services.

5. Implications for the Current Crisis

5.1 International Reserve Holdings: Is the Trilemma Still Binding?

It has been argued that one of the main causes of the financial crisis of 2008 is the ample liquidity provided by the global imbalances; current account surplus countries hoard international reserves in an attempt to stabilize their exchange rates, export liquidity to the global markets, and finance profligacy in the advanced countries, especially the United States.[31] In Figure 4, we have seen that some, but not many, countries pursue higher levels of ERS and IR concurrently. Figure 5 updates Figure 4 by using the updated Trilemma indexes and IR data for 2007 and compare with the data from the 2002-06 period. In the panels of figures, we can observe that countries' positions do not change much. The only noticeable change would be that

[31] See Roubini (2008) as one example.

countries continue to increase their IR holding, but they are not necessarily moving toward the northeast corner. Why do these countries continue to increase their IR holding?

One possible conjecture is that countries holding a massive amount of foreign reserves might allow the relaxation of the trilemma, i.e., achieve all three goals at the same time. Figure 6 displays a scatter diagram for EMG countries' ERS and MI_KAO (composite index of MI and KAOPEN), which the concept of the trilemma predicts should be negatively correlated. There are two groups of country-years shown in the diagram; one is a group of country-years with the IR holding greater than 21% of GDP, the threshold above which ERS can have output volatility-reducing effect as shown in Figures 4 and 5, and the other is those with the IR holding less than 21% of GDP. If the above speculation is right, the (green) triangles – country-years with >21% IR – in the diagram should be scattered above the circles – country-years with <21% IR.

Theoretically, these two variables should be negatively correlated – the higher level of ERS a country pursues, the lower level of MI-KAO, which is a proxy to the weighted average of MI and KAO it has to choose as we formally confirmed in our previous paper (Aizenman, et al. 2008). In the figure, however, the fitted lines for both groups are barely negatively sloped – the estimated coefficients for both are statistically insignificantly negative. We test whether the slopes and intercepts of these two fitted lines are statistically different. If the conjecture that higher levels of IR holding could relax the trilemma, a country should be able to pursue higher levels of MI-KAO with the same level of ERS, which would either make the slope flatter or raise the intercept, i.e., the conditional mean of MI-KAO. Simple coefficient equality tests reveal that the slopes of the two fitted lines are not statistically different from each other, but that the intercept for the fitted line for the country-years with >21% IR is significantly higher than that for the <21% IR group. This is in line with the conjecture that higher levels of IR holding can allow a country to pursue a higher weighted average of MI and KAOPEN, i.e., relax the trilemma.

Given the findings from the output volatility regressions in Table 2, for the EMG countries, having greater monetary independence could lead a country to reduce output volatility. If a country holds a higher level of IR than 21% of its GDP, it may be able to relax the trilemma, so that it may decide to pursue greater monetary independence and financial openness while maintaining exchange rate stability. One easy candidate that fits this category is China. Figure 8 shows the trilemma configurations and IR holding for emerging market countries in East Asia and China. We can observe that while it does not give up its exchange rate stability and monetary independence, China's IR holding has been increasing and financial openness has inched up. Although we have not tested formally, we find evidence consistent with the view that countries' efforts to "relax the trilemma" can involve an increase in IR holding, which may have

contributed to the global expansion of liquidity prior to the financial crisis of 2008-09. We leave testing this argument as one of our future research agendas.

5.2 Is the Current Crisis Consistent with Our Models?

As the IMF has revised the GDP estimates downward for many developing countries several times since the fall of 2008, it has become clear that the ongoing crisis is not just an American problem or the one in the industrial world, but a major challenge for the global economy**.** In other words, the concept of "de-coupling" is no longer applicable.

Given that we can identify the countries that are experiencing more severe economic situations than others as the time of this writing, we examine whether the current crisis situations are consistent with what we have found from our previous findings. That is, we use the data from 2007 for the variables upon which we have focused in this paper and see whether the conditions of these variables as of the eve of the crisis present any signals for the ongoing crisis. For this purpose, Table 9 presents the variables of our focus for a group of emerging market countries. Namely, the table reports *PCGDP*, IR (both as% of GDP), the three trilemma indexes, and the external finance variables. *dX* refers to the change of the variable *X* compared to the 2002-06 period.[32] In the table, we also report swap lines provided by the U.S. Federal Reserve and rescue loans provided by the IMF (as of March 2009). The swap lines and rescue loans are reported to identify which countries are experiencing more severe situations than others although countries without these arrangements can be also experiencing dire situations.

Before making observations of these countries, it is noteworthy to point out that the size of the swap lines or the IMF rescue loans is not so big for most of the countries. For Brazil, Mexico, and Korea, it is about 2-3% of GDP and 7% for Pakistan. It is only for Singapore and Hungary that the size of the additionally available IR is relatively substantial, around 18% of GDP. Based on what we found in Figures 4 and 5, we can see that, except for Singapore and Hungary, the effect of these swap lines or IMF rescue loans can be quite minimal at most to reduce output volatility. Obstfeld et al. (2009) also mention the smallness of the additional IR provided for developing countries, especially compared to industrialized countries, and argue that these additional reserves would merely have signaling effects, unlike industrial countries' that can have real effects to relax liquidity constraints.[33] Our results are consistent with their observation.

Let us now make observations about the conditions pertaining to trilemma configurations and both internal and external financing of the concerned countries. Among the countries with

[32] *PCGDP* is as of 2006 (or 2005 if the figure for 2006 is unavailable) because it is unavailable for 2007.
[33] They also argue that the fact that a more substantial amount of rescue reserves can be readily available for industrialized countries should be the reason why industrialized countries do not (have to) hold a massive amount of IR.

the swap or rescue loan arrangements, Hungary, Korea, and Pakistan experienced a relatively rapid increase in net inflows of bank lending ('Other'). In Table 7, we see that countries with positive net inflow of 'other' investment tend to experience higher output volatility. Among the three countries, Hungary appears to have pursued the combination of MI and KAOPEN whereas Pakistan did that of MI and ERS. Both combinations, MI-KAO or MI-ERS, are found to lead bank lending flows to have a bigger impact on output volatility (Table 8). The Pakistani economy is also subject to higher output volatility because its financial development level is not high although it pursues greater exchange rate stability. Interestingly, several other East European countries, such as Lithuania, Poland, and Slovak Republic, and Russia also experienced large increases in net inflow of bank lending, which suggest that these economies can be subject to higher output volatility.[34] In Table 7, we also found that the higher level of net inflow of portfolio investment it receives, the greater output volatility a country would have to face. The impact can be greater especially when the country pursues a policy combination of ERS and KAO. Both Brazil and Argentina experienced a rapid increase in net inflow of portfolio investment although neither of them pursued the policy combination of ERS and KAO. The table also shows that Venezuela may be exposed to higher output volatility; it pursued fixed exchange rate though its IR fell significantly while portfolio inflow increased. Thus, our casual observations confirm that the inferences we obtained from our estimations seem to be consistent with the economic conditions that led to severe crisis situations.

6. Concluding Remarks

We are probably experiencing the most severe global recession since the Great Depression. While the epicenter of the crisis was the United States, it has now spread to both industrial and developing countries, and will likely spur a comprehensive reevaluation of international macroeconomic policies and the international financial architecture. When policy makers decide on the specifics of international macroeconomic policies, they will have to confront the choices posed by the trilemma as we have found in our previous paper (Aizenman, et al. 2008) that external forces could affect countries' decisions on the configurations of the trilemma.

Now when it comes to deciding on the specifics of the combination of the three policies, the most crucial question will be what kind of goals they would like to achieve by choosing a combination of any two out of the three. Hence, we tested how each one of the three policy choices as well as the combination of the two could affect critical economic outcomes, such as

[34] Latvia, though not categorized as an EMG country in the dataset, also experienced an influx of bank lending in this year and is experiencing a severe economic crisis in 2008-09.

output volatility, inflation volatility, and medium-term inflation rates, with a particular focus on developing countries.

We found countries with higher levels of monetary independence tend to experience lower output volatility. When we restrict our sample to emerging market economies, we also found that countries with higher levels of exchange rate fixity tend to experience higher output volatility. However, this effect can be mitigated by holding international reserves if the level of international reserves is higher than 19-22% of GDP. This result motivates the reason why so many emerging market countries want to hold massive amounts of international reserves.

We also found that countries with more monetary autonomy tend to experience higher inflation, which may reflect countries' motives to monetize their debt. Countries with higher exchange rate stability tend to experience lower inflation as has been found in the literature. Furthermore, financial openness helps a country to experience lower inflation, possibly indicating that globalization gives more discipline than monetary autonomy to a country's macroeconomic management.

We also extended our estimation model to investigate the following two questions relevant to the current crisis: 1) Can financial development affect the link between trilemma policy configurations and output volatility?; and 2) How can external financing affect macroeconomic performances interactively with the trilemma configurations?

Regarding the effect of financial development on the link between the trilemma configurations and output volatility, we found a nonlinear effect among emerging market economies that medium-levels of financial development can raise the volatility-enhancing impact of exchange rate stability. Highly developed financial markets can help financial liberalization policy to reduce output volatility while underdeveloped financial markets could exacerbate output volatility, signifying the synergistic effects between financial development and financial opening.

In the estimations with the variables for external financing, we find the following: net recipients of cross-border bank lending or portfolio flows – or the "hot money" – tend to experience higher output volatility, a result consistent with the literature. We also took a closer look at the effect of policy orientations on the effect of external financing and found that the effect of different types of external financing can depend upon the policy regime adopted by a country. First, net FDI inflows tend to dampen output volatility in general, but it can enhance the volatility in a "financially closed" regime, i.e., one with greater monetary independence and more stable exchange rates. Net portfolio inflows can be volatility-increasing, and its effect is greater for the countries with currency union or alike regimes. This type of regimes, however, can dampen the volatility-enhancing effect of bank lending. Among the variables related to sovereignty debt, the greater the debt service is, the more likely a country could experience

higher levels of output volatility, especially when combined with greater exchange rate stability and financial openness, a result consistent with the "original sin" literature.

Our results also help answer why many countries have been hoarding massive amount of IR, which has been claimed to be one of the causes of the current global financial crisis. A motive for countries to hold massive IR is its desire to relax the trilemma; voluminous IR holding allows countries to pursue *both* a higher level of exchange rate stability *and* a higher weighted average of the other two trilemma policies through active foreign exchange interventions. Given our finding that holding a higher level of IR than 21-24% of GDP can dampen or even reverse the volatility-increasing effect of exchange rate stability, this finding is plausible.

Lastly, our empirical findings are consistent with the conditions of the countries that are currently experiencing macroeconomic turmoil; countries in turmoil do seem to be the ones with the trilemma variables and those related to both internal and external financing at the levels that lead to higher output volatility. In other words, our model could predict higher output volatility for countries experiencing or at the brink of financial crises. This bolsters the validity of our empirical analyses.

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Table 1: Mean-Equality Tests of the Trilemma Indexes between Emerging Market Countries (EMG) and Non-Emerging Market Developing Countries (Non-EMG LDC)

		1971 – 1980	1981 – 1990	1991 – 2000	2001-2006
Monetary Independence (MI)	Non-EMG LDC	.4495	.4510	.4748	.4427
	EMG	.4784	.4772	.4941	.3847
	Difference	.02883	.0262	.0193	-.0579
	t-statistics	2.86***	2.71***	2.07**	4.31***
Exchange Rate Stability (ERS)	Non-EMG LDC	.7941	.7228	.6508	.7266
	EMG	.6703	.4983	.4901	.5364
	Difference	-.1238	-.2245	-.1607	-.1902
	t-statistics	6.70***	11.04***	8.47***	8.68***
Financial Openness (KAOPEN)	Non-EMG LDC	.3511	.3138	.3785	.4177
	EMG	.2803	.2522	.4014	.5498
	Difference	-.0708	- .0616	.0230	.1320
	t-statistics	3.42***	3.08***	$1.19^{12\%}$	5.09***
International Reserves Holding (% of GDP; IR)	Non-EMG LDC	.1013	.1093	.1331	.1772
	EMG	.1109	.1104	.1697	.2322
	Difference	.0095	.0011	.0366	.0550
	t-statistics	1.31*	0.12	4.25***	4.67***

Table 2-1: Output Volatility: Less Developed Countries (LDC), 1972 – 2006, Panels of 5-year Windows

	(1)	(2)	(3)	(4)	(5)	(6)		(7)	(8)	(9)	(10)	(11)	(12)
Relative Income	-0.032	-0.039	-0.034	-0.022	-0.031	-0.045	Relative Income	-0.029	-0.036	-0.035	-0.037	-0.026	-0.047
	[0.020]	[0.020]*	[0.020]*	[0.020]	[0.020]	[0.021]**		[0.020]	[0.020]*	[0.020]*	[0.020]*	[0.020]	[0.021]**
Relative Income, sq.	0.05	0.062	0.059	0.034	0.057	0.085	Relative Income, sq.	0.046	0.057	0.063	0.07	0.047	0.089
	[0.024]**	[0.024]**	[0.024]**	[0.025]	[0.024]**	[0.026]***		[0.024]*	[0.024]**	[0.024]***	[0.024]***	[0.024]**	[0.025]***
Change in US real interest rate	0.173	0.171	0.166	0.166	0.168	0.17	Change in US real interest rate	0.174	0.173	0.164	0.164	0.171	0.172
	[0.045]***	[0.046]***	[0.046]***	[0.046]***	[0.046]***	[0.046]***		[0.045]***	[0.045]***	[0.046]***	[0.046]***	[0.046]***	[0.046]***
Volatility of TOT*OPN	0.037	0.037	0.036	0.036	0.035	0.035	Volatility of TOT*OPN	0.036	0.037	0.036	0.036	0.035	0.035
	[0.008]***	[0.008]***	[0.008]***	[0.008]***	[0.008]***	[0.008]***		[0.008]***	[0.008]***	[0.008]***	[0.008]***	[0.008]***	[0.008]***
Inflation volatility	0.001	0.001	0.001	0.001	0.001	0.001	Inflation volatility	0.001	0.001	0.001	0.001	0.001	0.001
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]		[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Fiscal Procyclicality	0.003	0.003	0.003	0.003	0.003	0.003	Fiscal Procyclicality	0.003	0.003	0.003	0.003	0.003	0.003
	[0.002]	[0.002]	[0.002]*	[0.002]*	[0.002]*	[0.002]*		[0.002]	[0.002]	[0.002]*	[0.002]*	[0.002]*	[0.002]*
Oil Exporters	0.011	0.012	0.011	0.011	0.011	0.011	Oil Exporters	0.011	0.012	0.011	0.011	0.01	0.011
	[0.004]***	[0.004]***	[0.004]***	[0.004]***	[0.004]***	[0.004]***		[0.004]***	[0.004]***	[0.004]***	[0.004]***	[0.004]***	[0.004]***
Private credit creation	-0.009	-0.009	-0.01	-0.009	-0.009	-0.009	Private credit creation	-0.009	-0.008	-0.01	-0.011	-0.009	-0.009
	[0.005]*	[0.006]	[0.005]*	[0.005]*	[0.005]*	[0.006]		[0.005]	[0.005]	[0.005]*	[0.005]*	[0.005]*	[0.006]
Total Reserve/GDP	0.018	0.049	0.019	0.021	0.018	0.045	Total Reserve/GDP	0.018	0.048	0.019	0.025	0.019	0.045
	[0.008]**	[0.041]	[0.008]**	[0.033]	[0.009]**	[0.025]*		[0.008]**	[0.034]	[0.008]**	[0.031]	[0.008]**	[0.024]*
Monetary Independ. (MI)	-0.02	-0.015	-0.019	-0.016			PC of MI & ERS	-0.018	-0.009				
	[0.008]**	[0.012]	[0.008]**	[0.012]				[0.008]**	[0.012]				
MI x reserves		-0.038		-0.017			MI_ERS x reserves		-0.068				
		[0.067]		[0.063]					[0.071]				
Exchange Rate Stability (ERS)	-0.005	-0.001			-0.003	0.002	PC of MI & KAO			-0.02	-0.018		
	[0.004]	[0.005]			[0.004]	[0.005]				[0.009]**	[0.012]		
ERS x reserves		-0.029				-0.034	MI_KAO x reserves				-0.012		
		[0.032]				[0.031]					[0.058]		
KA Openness			-0.005	-0.007	-0.004	-0.002	PC of ERS. & KAO					-0.006	0
			[0.004]	[0.005]	[0.004]	[0.005]						[0.005]	[0.007]
KAOPEN x reserves				0.015		-0.02	ERS_KAO x reserves						-0.054
				[0.025]		[0.025]							[0.041]
# of Obs.	412	412	412	412	412	412	# of Obs.	412	412	412	412	412	412
Adjusted R2	0.21	0.21	0.22	0.2	0.21	0.22	Adjusted R2	0.21	0.21	0.22	0.22	0.2	0.23

Notes: Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. The estimated coefficients of the dummies for East Asia and Pacific and Sub-Saharan Africa are not reported.

Table 2-2: Output Volatility: Less Developed, Commodity Exporting Countries (LDC-CMD), 1972 – 2006, Panels of 5-year Windows

	(1)	(2)	(3)	(4)	(5)	(6)		(7)	(8)	(9)	(10)	(11)	(12)
Relative Income	-0.057	-0.055	-0.062	-0.071	-0.04	-0.044	Relative Income	-0.053	-0.054	-0.066	-0.073	-0.037	-0.037
	[0.040]	[0.039]	[0.040]	[0.039]*	[0.039]	[0.038]		[0.038]	[0.038]	[0.039]*	[0.038]*	[0.039]	[0.039]
Relative Income, sq.	0.133	0.133	0.138	0.145	0.121	0.126	Relative Income, sq.	0.13	0.132	0.141	0.147	0.118	0.119
	[0.046]***	[0.045]***	[0.046]***	[0.045]***	[0.045]***	[0.044]***		[0.045]***	[0.045]***	[0.046]***	[0.044]***	[0.045]***	[0.045]***
Change in US real interest rate	0.232	0.246	0.213	0.211	0.227	0.238	Change in US real interest rate	0.234	0.242	0.218	0.212	0.23	0.234
	[0.086]***	[0.085]***	[0.087]**	[0.085]**	[0.086]***	[0.084]***		[0.086]***	[0.086]***	[0.087]**	[0.084]**	[0.086]***	[0.086]***
Volatility of TOT*OPN	0.03	0.03	0.029	0.029	0.028	0.028	Volatility of TOT*OPN	0.03	0.03	0.03	0.029	0.028	0.028
	[0.012]**	[0.012]**	[0.012]**	[0.012]**	[0.012]**	[0.012]**		[0.012]**	[0.012]**	[0.012]**	[0.012]**	[0.012]**	[0.012]**
Inflation volatility	0.001	0.002	0.001	0.001	0.001	0.001	Inflation volatility	0.001	0.001	0.001	0.001	0.001	0.001
	[0.003]	[0.002]	[0.003]	[0.002]	[0.003]	[0.002]		[0.002]	[0.002]	[0.003]	[0.002]	[0.003]	[0.003]
Fiscal Procyclicality	0.002	0.002	0.003	0.004	0.003	0.003	Fiscal Procyclicality	0.002	0.002	0.003	0.004	0.002	0.002
	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]		[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]
Oil Exporters	0.011	0.01	0.01	0.009	0.008	0.007	Oil Exporters	0.01	0.01	0.01	0.01	0.008	0.008
	[0.006]*	[0.006]*	[0.006]	[0.006]	[0.006]	[0.006]		[0.006]*	[0.006]*	[0.006]*	[0.006]	[0.006]	[0.006]
Private credit creation	0.003	0.005	-0.005	-0.006	0.002	0.004	Private credit creation	0.004	0.005	-0.005	-0.006	0.005	0.005
	[0.017]	[0.016]	[0.017]	[0.016]	[0.016]	[0.016]		[0.016]	[0.016]	[0.017]	[0.016]	[0.016]	[0.016]
Total Reserve/GDP	0.01	0.021	0.015	-0.105	0.011	0.031	Total Reserve/GDP	0.009	0.053	0.015	-0.124	0.009	0.024
	[0.015]	[0.072]	[0.015]	[0.073]	[0.015]	[0.050]		[0.014]	[0.058]	[0.015]	[0.067]*	[0.014]	[0.049]
Monetary Independ. (MI)	-0.021	-0.031	-0.021	-0.043			PC of MI & ERS	-0.024	-0.011				
	[0.017]	[0.024]	[0.017]	[0.024]*				[0.016]	[0.023]				
MI x reserves		0.092		0.15			MI_ERS x reserves		-0.095				
		[0.131]		[0.133]					[0.124]				
Exchange Rate Stability (ERS)	-0.009	0.004			-0.005	0.007	PC of MI & KAO			-0.034	-0.078		
	[0.007]	[0.010]			[0.007]	[0.010]				[0.019]*	[0.027]***		
ERS x reserves		-0.105				-0.091	MI_KAO x reserves				0.295		
		[0.061]*				[0.063][15%]					[0.139]**		
KA Openness			-0.015	-0.035	-0.012	-0.023	PC of ERS. & KAO					-0.016	-0.012
			[0.009]*	[0.013]***	[0.009]	[0.013]*						[0.010]	[0.016]
KAOPEN x reserves				0.129		0.068	ERS_KAO x reserves						-0.033
				[0.062]**		[0.064]							[0.101]
# of Obs.	180	180	180	180	180	180	# of Obs.	180	180	180	180	180	180
Adjusted R2	0.22	0.24	0.22	0.24	0.22	0.24	Adjusted R2	0.22	0.22	0.22	0.25	0.22	0.22

Notes: Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. The estimated coefficients of the dummies for East Asia and Pacific and Sub-Saharan Africa are not reported.

Table 2-3: Output Volatility: Emerging Market Countries (EMG), 1972 – 2006, Panels of 5-year Windows

	(1)	(2)	(3)	(4)	(5)	(6)		(7)	(8)	(9)	(10)	(11)	(12)
Relative Income	-0.032	-0.04	-0.033	-0.026	-0.031	-0.039	Relative Income	-0.036	-0.038	-0.031	-0.032	-0.033	-0.044
	[0.024]	[0.024]*	[0.024]	[0.025]	[0.024]	[0.026]		[0.023]	[0.022]*	[0.023]	[0.024]	[0.023]	[0.025]*
Relative Income, sq.	0.046	0.056	0.048	0.038	0.045	0.056	Relative Income, sq.	0.049	0.052	0.047	0.049	0.046	0.064
	[0.030]	[0.030]*	[0.029]*	[0.032]	[0.029]	[0.034]		[0.028]*	[0.027]*	[0.028]*	[0.030]	[0.028]	[0.033]*
Change in US real interest rate	0.204	0.212	0.2	0.198	0.196	0.2	Change in US real interest rate	0.207	0.212	0.194	0.196	0.2	0.21
	[0.055]***	[0.054]***	[0.055]***	[0.054]***	[0.054]***	[0.054]***		[0.052]***	[0.051]***	[0.053]***	[0.053]***	[0.052]***	[0.053]***
Volatility of TOT*OPN	0.006	0.003	0.011	0.013	0.006	0.001	Volatility of TOT*OPN	0.015	0.014	0.013	0.013	0.014	0.013
	[0.013]	[0.013]	[0.013]	[0.013]	[0.013]	[0.013]		[0.013]	[0.012]	[0.013]	[0.013]	[0.013]	[0.013]
Inflation volatility	0.057	0.06	0.049	0.043	0.054	0.059	Inflation volatility	0.039	0.04	0.043	0.043	0.04	0.042
	[0.005]***	[0.005]***	[0.005]***	[0.005]***	[0.005]***	[0.005]***		[0.005]***	[0.005]***	[0.005]***	[0.005]***	[0.005]***	[0.005]***
Fiscal Procyclicality	0.005	0.005	0.004	0.005	0.005	0.005	Fiscal Procyclicality	0.004	0.004	0.004	0.004	0.004	0.004
	[0.002]**	[0.002]**	[0.002]*	[0.002]**	[0.002]**	[0.002]**		[0.002]*	[0.002]**	[0.002]**	[0.002]**	[0.002]**	[0.002]**
Oil Exporters	0.011	0.013	0.012	0.012	0.01	0.012	Oil Exporters	0.013	0.014	0.011	0.011	0.012	0.011
	[0.005]**	[0.005]***	[0.005]**	[0.005]***	[0.005]**	[0.005]**		[0.005]***	[0.004]***	[0.005]**	[0.005]**	[0.004]**	[0.005]**
Private credit creation	-0.007	-0.004	-0.008	-0.008	-0.007	-0.003	Private credit creation	-0.006	-0.004	-0.008	-0.008	-0.006	-0.005
	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]		[0.005]	[0.005]	[0.006]	[0.006]	[0.005]	[0.006]
Total Reserve/GDP	0.026	0.105	0.028	0.041	0.028	0.059	Total Reserve/GDP	0.027	0.089	0.029	0.04	0.027	0.053
	[0.008]***	[0.038]***	[0.008]***	[0.035]	[0.008]***	[0.024]**		[0.008]***	[0.030]***	[0.008]***	[0.033]	[0.008]***	[0.023]**
Monetary Independ. (MI)	-0.017	-0.005	-0.02	-0.013			PC of MI & ERS	-0.012	0.01				
	[0.010]*	[0.014]	[0.010]**	[0.013]				[0.010]	[0.013]				
MI x reserves		-0.081		-0.043			MI_ERS x reserves		-0.139				
		[0.063]		[0.061]					[0.065]**				
Exchange Rate Stability (ERS)	0.004	0.017			0.005	0.017	PC of MI & KAO			-0.017	-0.014		
	[0.005]	[0.007]**			[0.005]	[0.007]**				[0.010][11%]	[0.013]		
ERS x reserves		-0.081				-0.072	MI_KAO x reserves				-0.018		
		[0.033]**				[0.032]**					[0.060]		
KA Openness			-0.004	-0.005	-0.001	-0.003	PC of ERS. & KAO					-0.001	0.006
			[0.005]	[0.006]	[0.004]	[0.006]						[0.006]	[0.009]
KAOPEN x reserves				0.011		0.008	ERS_KAO x reserves						-0.047
				[0.026]		[0.026]							[0.042]
# of Obs.	208	208	208	208	208	208	# of Obs.	208	208	208	208	208	208
Adjusted R2	0.47	0.5	0.44	0.41	0.46	0.5	Adjusted R2	0.39	0.42	0.41	0.41	0.4	0.41

Notes: Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. The estimated coefficients of the dummies for East Asia and Pacific and Sub-Saharan Africa are not reported.

Table 3-1: Inflation Volatility: Less Developed Countries (LDC), 1972 – 2006, Panels of 5-year Windows, Robust Regression

	(1)	(2)	(3)	(4)	(5)	(6)		(7)	(8)	(9)	(10)	(11)	(12)
Relative Income	-0.078	-0.078	-0.087	-0.078	-0.08	-0.071	Relative Income	-0.08	-0.084	-0.084	-0.081	-0.08	-0.075
	[0.026]***	[0.026]***	[0.027]***	[0.028]***	[0.026]***	[0.027]***		[0.026]***	[0.026]***	[0.026]***	[0.027]***	[0.026]***	[0.027]***
Relative Income, sq.	0.074	0.075	0.082	0.062	0.072	0.054	Relative Income, sq.	0.08	0.086	0.083	0.079	0.072	0.061
	[0.032]**	[0.033]**	[0.033]**	[0.036]*	[0.033]**	[0.036]		[0.033]**	[0.033]**	[0.033]**	[0.034]**	[0.033]**	[0.036]*
Volatility of TOT*OPN	0.017	0.016	0.02	0.021	0.017	0.017	Volatility of TOT*OPN	0.017	0.017	0.017	0.017	0.017	0.017
	[0.010]*	[0.010]*	[0.010]**	[0.010]**	[0.010]*	[0.010]*		[0.010]*	[0.010]*	[0.010]*	[0.010]*	[0.010]*	[0.010]*
Inflation Rate	0.215	0.213	0.221	0.222	0.223	0.221	Inflation Rate	0.207	0.21	0.212	0.211	0.223	0.224
	[0.010]***	[0.010]***	[0.010]***	[0.010]***	[0.010]***	[0.010]***		[0.010]***	[0.010]***	[0.010]***	[0.010]***	[0.010]***	[0.010]***
Relative oil price shocks	0.005	0.005	0.006	0.006	0.005	0.005	Relative oil price shocks	0.006	0.006	0.006	0.006	0.005	0.005
	[0.003]	[0.003]	[0.003]**	[0.003]*	[0.003]*	[0.003]		[0.003]**	[0.003]**	[0.003]**	[0.003]**	[0.003]*	[0.003]*
Total Reserve/GDP	-0.008	0.033	-0.012	-0.01	-0.01	-0.022	Total Reserve/GDP	-0.01	0.016	-0.011	-0.02	-0.009	-0.026
	[0.012]	[0.057]	[0.012]	[0.050]	[0.012]	[0.035]		[0.012]	[0.049]	[0.012]	[0.045]	[0.012]	[0.034]
Monetary Independ. (MI)	-0.01	-0.001	-0.011	-0.006			PC of MI & ERS	0	0.008				
	[0.012]	[0.017]	[0.012]	[0.017]				[0.012]	[0.018]				
MI x reserves		-0.058		-0.04			MI_ERS x reserves		-0.059				
		[0.094]		[0.093]					[0.104]				
Exchange Rate Stability (ERS)	0.007	0.011			0.007	0.01	PC of MI & KAO			0.006	0.003		
	[0.005]	[0.008]			[0.005]	[0.008]				[0.013]	[0.018]		
ERS x reserves		-0.027				-0.011	MI_KAO x reserves				0.019		
		[0.045]				[0.043]					[0.083]		
KA Openness			0.008	0.004	0.009	0.004	PC of ERS. & KAO					0.016	0.012
			[0.006]	[0.008]	[0.006]	[0.008]						[0.008]**	[0.011]
KAOPEN x reserves				0.03		0.032	ERS_KAO x reserves						0.031
				[0.036]		[0.035]							[0.057]
# of Obs.	429	429	429	429	429	429	# of Obs.	429	429	429	429	429	429
Adjusted R2	0.59	0.59	0.59	0.59	0.59	0.59	Adjusted R2	0.58	0.58	0.58	0.58	0.6	0.59

Notes: Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. The estimated coefficients of the dummies for Middle East and North Africa and Sub-Saharan Africa are not reported.

Table 3-2: Inflation Volatility: Less Developed, Commodity Exporting Countries (LDC-CMD), 1972 – 2006, Panels of 5-year Windows, Robust Regression

	(1)	(2)	(3)	(4)	(5)	(6)		(7)	(8)	(9)	(10)	(11)	(12)
Relative Income	-0.184	-0.18	-0.162	-0.16	-0.147	-0.143	Relative Income	-0.169	-0.167	-0.151	-0.151	-0.152	-0.152
	[0.066]***	[0.065]***	[0.066]**	[0.066]**	[0.069]**	[0.068]**		[0.066]**	[0.065]**	[0.065]**	[0.064]**	[0.068]**	[0.069]**
Relative Income, sq.	0.234	0.232	0.218	0.217	0.198	0.198	Relative Income, sq.	0.223	0.222	0.208	0.208	0.205	0.204
	[0.087]***	[0.086]***	[0.087]**	[0.087]**	[0.091]**	[0.088]**		[0.088]**	[0.087]**	[0.087]**	[0.086]**	[0.089]**	[0.090]**
Volatility of TOT*OPN	0.06	0.059	0.054	0.055	0.047	0.047	Volatility of TOT*OPN	0.055	0.055	0.051	0.051	0.048	0.048
	[0.022]***	[0.022]***	[0.022]**	[0.022]**	[0.023]**	[0.022]**		[0.022]**	[0.022]**	[0.022]**	[0.022]**	[0.022]**	[0.023]**
Inflation Rate	0.323	0.315	0.319	0.315	0.303	0.288	Inflation Rate	0.294	0.295	0.319	0.313	0.287	0.29
	[0.033]***	[0.032]***	[0.031]***	[0.032]***	[0.035]***	[0.034]***		[0.032]***	[0.031]***	[0.031]***	[0.031]***	[0.034]***	[0.035]***
Relative oil price shocks	0.021	0.023	0.018	0.019	0.024	0.025	Relative oil price shocks	0.026	0.027	0.019	0.018	0.027	0.026
	[0.009]**	[0.009]**	[0.009]**	[0.009]**	[0.010]**	[0.009]***		[0.009]***	[0.009]***	[0.009]**	[0.009]**	[0.009]***	[0.009]***
Total Reserve/GDP	-0.036	0.081	-0.032	-0.033	-0.039	-0.011	Total Reserve/GDP	-0.046	0.075	-0.033	-0.093	-0.044	-0.029
	[0.032]	[0.160]	[0.032]	[0.163]	[0.034]	[0.116]		[0.033]	[0.132]	[0.032]	[0.153]	[0.033]	[0.115]
Monetary Independ. (MI)	-0.076	-0.054	-0.082	-0.069			PC of MI & ERS	-0.061	-0.022				
	[0.036]**	[0.053]	[0.035]**	[0.052]				[0.037]	[0.053]				
MI x reserves		-0.113		-0.084			MI_ERS x reserves		-0.262				
		[0.291]		[0.299]					[0.278]				
Exchange Rate Stability (ERS)	-0.004	0.012			-0.003	0.01	PC of MI & KAO			-0.094	-0.11		
	[0.017]	[0.023]			[0.017]	[0.023]				[0.038]**	[0.057]*		
ERS x reserves		-0.122				-0.118	MI_KAO x reserves				0.124		
		[0.134]				[0.146]					[0.314]		
KA Openness			-0.026	-0.041	-0.023	-0.034	PC of ERS. & KAO					-0.028	-0.023
			[0.019]	[0.028]	[0.019]	[0.029]						[0.026]	[0.040]
KAOPEN x reserves				0.095		0.079	ERS_KAO x reserves						-0.033
				[0.137]		[0.145]							[0.235]
# of Obs.	182	182	182	182	182	182	# of Obs.	182	182	182	182	182	182
Adjusted R2	0.48	0.47	0.48	0.48	0.45	0.44	Adjusted R2	0.45	0.45	0.48	0.48	0.44	0.44

Notes: Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 3-3: Inflation Volatility: Emerging Market Countries (EMG), 1972 – 2006, Panels of 5-year Windows, Robust Regression

	(1)	(2)	(3)	(4)	(5)	(6)		(7)	(8)	(9)	(10)	(11)	(12)
Relative Income	-0.078	-0.075	-0.087	-0.085	-0.083	-0.082	Relative Income	-0.08	-0.081	-0.085	-0.088	-0.079	-0.079
	[0.031]**	[0.031]**	[0.031]***	[0.034]**	[0.031]***	[0.034]**		[0.029]***	[0.030]***	[0.031]***	[0.032]***	[0.030]***	[0.033]**
Relative Income, sq.	0.082	0.08	0.087	0.084	0.082	0.08	Relative Income, sq.	0.085	0.087	0.087	0.094	0.078	0.079
	[0.039]**	[0.040]**	[0.039]**	[0.046]*	[0.039]**	[0.048]*		[0.037]**	[0.038]**	[0.038]**	[0.042]**	[0.038]**	[0.045]*
Volatility of TOT*OPN	0.102	0.1	0.105	0.105	0.099	0.098	Volatility of TOT*OPN	0.106	0.104	0.099	0.099	0.096	0.096
	[0.017]***	[0.017]***	[0.017]***	[0.017]***	[0.017]***	[0.017]***		[0.016]***	[0.016]***	[0.016]***	[0.016]***	[0.016]***	[0.016]***
Inflation Rate	0.177	0.177	0.184	0.185	0.184	0.186	Inflation Rate	0.167	0.17	0.178	0.176	0.18	0.181
	[0.011]***	[0.011]***	[0.011]***	[0.011]***	[0.011]***	[0.011]***		[0.010]***	[0.010]***	[0.011]***	[0.011]***	[0.011]***	[0.011]***
Relative oil price shocks	0.003	0.003	0.004	0.004	0.003	0.003	Relative oil price shocks	0.003	0.003	0.004	0.004	0.003	0.003
	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]		[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]
Total Reserve/GDP	-0.005	0.034	-0.009	0.008	-0.009	-0.004	Total Reserve/GDP	-0.004	0.015	-0.005	0.012	-0.008	-0.007
	[0.011]	[0.053]	[0.012]	[0.051]	[0.012]	[0.034]		[0.011]	[0.043]	[0.011]	[0.047]	[0.011]	[0.033]
Monetary Independ. (MI)	-0.009	0.002	-0.006	0.001			PC of MI & ERS	-0.003	0.004				
	[0.014]	[0.019]	[0.014]	[0.019]				[0.013]	[0.019]				
MI x reserves		-0.058		-0.039			MI_ERS x reserves		-0.042				
		[0.087]		[0.087]					[0.092]				
Exchange Rate Stability (ERS)	0.006	0.01			0.005	0.009	PC of MI & KAO			0.013	0.018		
	[0.007]	[0.010]			[0.007]	[0.010]				[0.015]	[0.020]		
ERS x reserves		-0.024				-0.016	MI_KAO x reserves				-0.032		
		[0.045]				[0.044]					[0.086]		
KA Openness			0.011	0.011	0.011	0.01	PC of ERS. & KAO					0.017	0.017
			[0.007]*	[0.009]	[0.006]*	[0.009]						[0.009]*	[0.012]
KAOPEN x reserves				0.002		0.006	ERS_KAO x reserves						-0.002
				[0.038]		[0.037]							[0.059]
# of Obs.	215	215	215	215	215	215	# of Obs.	215	215	215	215	215	215
Adjusted R2	0.68	0.68	0.69	0.69	0.69	0.68	Adjusted R2	0.68	0.68	0.68	0.68	0.69	0.69

Notes: Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. The estimated coefficients of the dummies for Middle East and North Africa and Sub-Saharan Africa are not reported.

Table 4-1: Inflation: Less Developed Countries (LDC), 1972 – 2006, Panels of 5-year Windows, Robust Regression

	(1)	(2)	(3)	(4)	(5)	(6)		(7)	(8)	(9)	(10)	(11)	(12)
Relative Income	-0.028	-0.015	0.013	0.036	-0.028	0.005	Relative Income	-0.022	-0.019	0.004	0.012	-0.022	0.016
	[0.052]	[0.052]	[0.053]	[0.055]	[0.050]	[0.052]		[0.054]	[0.054]	[0.055]	[0.055]	[0.050]	[0.051]
Relative Income, sq.	0.059	0.045	0.014	-0.022	0.074	0.027	Relative Income, sq.	0.052	0.049	0.018	0.005	0.068	0.013
	[0.062]	[0.063]	[0.065]	[0.068]	[0.060]	[0.064]		[0.065]	[0.065]	[0.066]	[0.068]	[0.060]	[0.064]
World Output Gap	0.876	0.91	0.71	0.714	0.897	0.921	World Output Gap	0.901	0.898	0.8	0.771	0.861	0.871
	[0.310]***	[0.310]***	[0.321]**	[0.321]**	[0.300]***	[0.298]***		[0.323]***	[0.323]***	[0.328]**	[0.330]**	[0.300]***	[0.296]***
Trade openness	-0.013	-0.014	-0.015	-0.018	-0.008	-0.012	Trade openness	-0.02	-0.02	-0.021	-0.023	-0.007	-0.012
	[0.008]*	[0.008]*	[0.008]*	[0.008]**	[0.007]	[0.008]		[0.008]**	[0.008]**	[0.008]***	[0.008]***	[0.007]	[0.008]
Volatility of TOT*OPN	0.032	0.031	0.027	0.025	0.022	0.02	Volatility of TOT*OPN	0.042	0.041	0.041	0.041	0.019	0.018
	[0.021]	[0.021]	[0.022]	[0.022]	[0.020]	[0.020]		[0.022]*	[0.022]*	[0.022]*	[0.022]*	[0.020]	[0.020]
Inflation volatility	0.311	0.31	0.295	0.293	0.304	0.303	Inflation volatility	0.3	0.3	0.297	0.297	0.3	0.299
	[0.013]***	[0.013]***	[0.013]***	[0.013]***	[0.012]***	[0.012]***		[0.013]***	[0.013]***	[0.014]***	[0.014]***	[0.012]***	[0.012]***
Private Credit Creation	-0.016	-0.022	-0.011	-0.014	-0.017	-0.025	Private Credit Creation	-0.015	-0.017	-0.012	-0.013	-0.016	-0.024
	[0.013]	[0.013]	[0.014]	[0.014]	[0.013]	[0.013]*		[0.014]	[0.014]	[0.014]	[0.014]	[0.013]	[0.013]*
M2 Growth Volatility	0.137	0.146	0.116	0.116	0.144	0.149	M2 Growth Volatility	0.127	0.13	0.111	0.112	0.142	0.147
	[0.036]***	[0.036]***	[0.038]***	[0.037]***	[0.035]***	[0.035]***		[0.038]***	[0.038]***	[0.038]***	[0.039]***	[0.035]***	[0.035]***
Fiscal Procyclicality	-0.001	-0.001	0.003	0.003	-0.003	-0.002	Fiscal Procyclicality	0.002	0.002	0.004	0.004	-0.003	-0.002
	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]		[0.005]	[0.005]	[0.005]	[0.005]	[0.005]	[0.005]
Oil Shock	0.044	0.044	0.038	0.037	0.04	0.04	Oil Shock	0.039	0.039	0.038	0.038	0.038	0.038
	[0.005]***	[0.006]***	[0.006]***	[0.006]***	[0.005]***	[0.005]***		[0.006]***	[0.006]***	[0.006]***	[0.006]***	[0.005]***	[0.005]***
Total Reserve/GDP	-0.021	-0.122	0.014	-0.002	-0.01	-0.136	Total Reserve/GDP	-0.001	-0.114	0.011	-0.058	-0.002	-0.128
	[0.024]	[0.104]	[0.025]	[0.089]	[0.024]	[0.061]**		[0.025]	[0.090]	[0.026]	[0.083]	[0.023]	[0.059]**
Monetary Independ. (MI)	0.037	0.033	0.063	0.067			PC of MI & ERS	-0.092	-0.125				
	[0.022]*	[0.030]	[0.022]***	[0.031]**				[0.022]***	[0.033]***				
MI x reserves		0.029		-0.067			MI_ERS x reserves		0.248				
		[0.169]		[0.166]					[0.189]				
Exchange Rate Stability (ERS)	-0.074	-0.096			-0.08	-0.099	PC of MI & KAO			-0.009	-0.031		
	[0.010]***	[0.014]***			[0.009]***	[0.013]***				[0.025]	[0.034]		
ERS x reserves		0.161				0.152	MI_KAO x reserves				0.138		
		[0.082]*				[0.075]**					[0.159]		
KA Openness			-0.037	-0.051	-0.048	-0.059	PC of ERS. & KAO					-0.131	-0.16
			[0.011]***	[0.015]***	[0.010]***	[0.013]***						[0.014]***	[0.018]***
KAOPEN x reserves				0.095		0.086	ERS_KAO x reserves						0.238
				[0.068]		[0.064]							[0.104]**
# of Obs.	403	403	403	403	403	403	# of Obs.	403	403	403	403	403	403
Adjusted R2	0.72	0.72	0.68	0.68	0.73	0.74	Adjusted R2	0.68	0.68	0.66	0.66	0.73	0.74

Notes: Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. The estimated coefficients of the dummies for Latin American and the Caribbean and Eastern Europe are not reported.

Table 4-2: Inflation: Less Developed, Commodity Exporting Countries (LDC-CMD), 1972 – 2006, Panels of 5-year Windows, Robust Regression

	(1)	(2)	(3)	(4)	(5)	(6)		(7)	(8)	(9)	(10)	(11)	(12)
Relative Income	-0.015	-0.003	-0.044	-0.04	-0.012	-0.004	Relative Income	-0.088	-0.078	-0.082	-0.078	-0.013	-0.012
	[0.083]	[0.084]	[0.086]	[0.088]	[0.079]	[0.079]		[0.087]	[0.088]	[0.088]	[0.089]	[0.078]	[0.077]
Relative Income, sq.	0.019	0.007	0.037	0.032	0.038	0.029	Relative Income, sq.	0.092	0.082	0.067	0.063	0.042	0.038
	[0.100]	[0.101]	[0.104]	[0.106]	[0.094]	[0.095]		[0.106]	[0.106]	[0.107]	[0.107]	[0.094]	[0.093]
World Output Gap	1.355	1.35	1.08	1.1	1.39	1.372	World Output Gap	1.079	1.01	0.955	1.025	1.35	1.315
	[0.521]**	[0.530]**	[0.540]**	[0.560]*	[0.499]***	[0.503]***		[0.555]*	[0.558]*	[0.557]*	[0.566]*	[0.496]***	[0.491]***
Trade openness	0.006	0	-0.018	-0.018	0.001	-0.002	Trade openness	-0.019	-0.022	-0.021	-0.022	-0.004	-0.003
	[0.017]	[0.017]	[0.017]	[0.018]	[0.016]	[0.016]		[0.017]	[0.017]	[0.017]	[0.018]	[0.015]	[0.015]
Volatility of TOT*OPN	-0.013	-0.017	-0.001	-0.004	-0.025	-0.027	Volatility of TOT*OPN	0.005	0.001	0.016	0.013	-0.028	-0.026
	[0.029]	[0.029]	[0.030]	[0.031]	[0.028]	[0.028]		[0.030]	[0.031]	[0.031]	[0.031]	[0.027]	[0.027]
Inflation volatility	0.297	0.296	0.285	0.284	0.289	0.289	Inflation volatility	0.29	0.291	0.288	0.287	0.286	0.286
	[0.016]***	[0.017]***	[0.017]***	[0.018]***	[0.016]***	[0.016]***		[0.018]***	[0.018]***	[0.018]***	[0.018]***	[0.016]***	[0.015]***
Private Credit Creation	-0.043	-0.046	-0.037	-0.038	-0.058	-0.061	Private Credit Creation	-0.052	-0.056	-0.038	-0.036	-0.06	-0.062
	[0.038]	[0.038]	[0.039]	[0.040]	[0.036]	[0.036]*		[0.040]	[0.040]	[0.041]	[0.041]	[0.036]*	[0.035]*
M2 Growth Volatility	0.209	0.226	0.177	0.191	0.226	0.234	M2 Growth Volatility	0.21	0.217	0.171	0.18	0.231	0.227
	[0.059]***	[0.060]***	[0.061]***	[0.064]***	[0.056]***	[0.057]***		[0.062]***	[0.063]***	[0.063]***	[0.064]***	[0.056]***	[0.055]***
Fiscal Procyclicality	-0.006	-0.005	0.001	0.001	-0.009	-0.007	Fiscal Procyclicality	-0.003	-0.004	0.003	0.003	-0.009	-0.007
	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]		[0.008]	[0.008]	[0.008]	[0.008]	[0.007]	[0.008]
Oil Shock	0.05	0.048	0.043	0.043	0.045	0.044	Oil Shock	0.041	0.039	0.043	0.044	0.042	0.042
	[0.009]***	[0.010]***	[0.010]***	[0.010]***	[0.009]***	[0.009]***		[0.010]***	[0.010]***	[0.010]***	[0.010]***	[0.009]***	[0.009]***
Total Reserve/GDP	-0.046	-0.137	0.027	0.1	-0.031	-0.159	Total Reserve/GDP	-0.005	-0.191	0.023	0.114	-0.016	-0.168
	[0.034]	[0.167]	[0.035]	[0.184]	[0.033]	[0.112]		[0.036]	[0.144]	[0.036]	[0.175]	[0.031]	[0.106]
Monetary Independ. (MI)	0.048	0.044	0.07	0.099			PC of MI & ERS	-0.141	-0.198				
	[0.039]	[0.057]	[0.040]*	[0.060]*				[0.041]***	[0.056]***				
MI x reserves		-0.009		-0.19			MI_ERS x reserves		0.408				
		[0.306]		[0.332]					[0.305]				
Exchange Rate Stability (ERS)	-0.104	-0.126			-0.108	-0.13	PC of MI & KAO			-0.002	0.028		
	[0.017]***	[0.023]***			[0.016]***	[0.022]***				[0.048]	[0.069]		
ERS x reserves		0.184				0.193	MI_KAO x reserves				-0.188		
		[0.146]				[0.146]					[0.359]		
KA Openness			-0.049	-0.054	-0.061	-0.071	PC of ERS. & KAO					-0.178	-0.217
			[0.022]**	[0.032]*	[0.019]***	[0.029]**						[0.024]***	[0.035]***
KAOPEN x reserves				0.026		0.067	ERS_KAO x reserves						0.317
				[0.154]		[0.141]							[0.217]
# of Obs.	173	173	173	173	173	173	# of Obs.	173	173	173	173	173	173
Adjusted R2	0.72	0.72	0.68	0.67	0.74	0.74	Adjusted R2	0.67	0.67	0.66	0.65	0.74	0.75

Notes: Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. The dummy for Latin America is not reported.

Table 4-3: Inflation: Emerging Market Countries (EMG), 1972 – 2006, Panels of 5-year Windows, Robust Regression

	(1)	(2)	(3)	(4)	(5)	(6)		(7)	(8)	(9)	(10)	(11)	(12)
Relative Income	-0.079	-0.062	-0.019	-0.039	-0.073	-0.071	Relative Income	-0.021	-0.016	0.002	-0.002	-0.075	-0.066
	[0.090]	[0.092]	[0.085]	[0.090]	[0.088]	[0.095]		[0.088]	[0.088]	[0.087]	[0.090]	[0.086]	[0.093]
Relative Income, sq.	0.122	0.101	0.075	0.107	0.134	0.138	Relative Income, sq.	0.063	0.055	0.048	0.057	0.132	0.118
	[0.110]	[0.112]	[0.104]	[0.115]	[0.108]	[0.122]		[0.108]	[0.108]	[0.107]	[0.112]	[0.106]	[0.119]
World Output Gap	0.994	1.016	0.781	0.812	0.888	0.939	World Output Gap	0.978	0.974	0.928	0.937	0.93	0.926
	[0.440]**	[0.444]**	[0.422]*	[0.425]*	[0.433]**	[0.431]**		[0.439]**	[0.439]**	[0.431]**	[0.435]**	[0.423]**	[0.425]**
Trade openness	-0.012	-0.011	-0.004	-0.002	-0.004	-0.001	Trade openness	-0.01	-0.009	-0.006	-0.006	-0.005	-0.006
	[0.011]	[0.011]	[0.011]	[0.012]	[0.011]	[0.012]		[0.011]	[0.011]	[0.011]	[0.012]	[0.011]	[0.011]
Volatility of TOT*OPN	0.068	0.07	0.052	0.051	0.066	0.067	Volatility of TOT*OPN	0.062	0.064	0.056	0.055	0.068	0.069
	[0.040]*	[0.041]*	[0.039]	[0.039]	[0.040]*	[0.039]*		[0.040]	[0.040]	[0.040]	[0.040]	[0.039]*	[0.039]*
Inflation volatility	0.443	0.444	0.443	0.446	0.423	0.432	Inflation volatility	0.458	0.457	0.455	0.455	0.432	0.431
	[0.023]***	[0.023]***	[0.023]***	[0.023]***	[0.023]***	[0.023]***		[0.023]***	[0.023]***	[0.023]***	[0.023]***	[0.022]***	[0.023]***
Private Credit Creation	-0.026	-0.031	-0.039	-0.039	-0.031	-0.037	Private Credit Creation	-0.038	-0.04	-0.044	-0.045	-0.03	-0.031
	[0.018]	[0.019]	[0.018]**	[0.018]**	[0.018]*	[0.018]**		[0.018]**	[0.018]**	[0.018]**	[0.018]**	[0.018]*	[0.018]*
M2 Growth Volatility	0.128	0.136	0.155	0.145	0.178	0.169	M2 Growth Volatility	0.123	0.128	0.142	0.15	0.151	0.155
	[0.051]**	[0.052]***	[0.050]***	[0.050]***	[0.051]***	[0.050]***		[0.051]**	[0.051]**	[0.051]***	[0.051]***	[0.050]***	[0.050]***
Fiscal Procyclicality	-0.01	-0.01	-0.008	-0.008	-0.013	-0.012	Fiscal Procyclicality	-0.008	-0.008	-0.008	-0.008	-0.012	-0.012
	[0.007]	[0.007]	[0.007]	[0.007]	[0.007]*	[0.007]*		[0.007]	[0.007]	[0.007]	[0.007]	[0.007]*	[0.007]*
Oil Shock	0.027	0.026	0.015	0.015	0.02	0.02	Oil Shock	0.021	0.02	0.016	0.016	0.022	0.021
	[0.008]***	[0.008]***	[0.008]*	[0.008]*	[0.008]**	[0.008]**		[0.008]***	[0.008]**	[0.008]*	[0.008]*	[0.008]***	[0.008]***
Total Reserve/GDP	-0.023	-0.138	-0.018	0.01	-0.02	-0.048	Total Reserve/GDP	-0.026	-0.126	-0.026	-0.005	-0.018	-0.037
	[0.030]	[0.121]	[0.029]	[0.108]	[0.030]	[0.076]		[0.030]	[0.101]	[0.030]	[0.106]	[0.030]	[0.075]
Monetary Independ. (MI)	0.034	0.012	0.02	0.019			PC of MI & ERS	-0.026	-0.063				
	[0.031]	[0.043]	[0.031]	[0.042]				[0.032]	[0.044]				
MI x reserves		0.115		0.002			MI_ERS x reserves		0.219				
		[0.197]		[0.188]					[0.210]				
Exchange Rate Stability (ERS)	-0.04	-0.059			-0.042	-0.059	PC of MI & KAO			-0.067	-0.061		
	[0.016]**	[0.023]***			[0.016]***	[0.021]***				[0.034]*	[0.044]		
ERS x reserves		0.118				0.112	MI_KAO x reserves				-0.043		
		[0.102]				[0.097]					[0.202]		
KA Openness			-0.048	-0.038	-0.052	-0.042	PC of ERS. & KAO					-0.092	-0.098
			[0.014]***	[0.019]**	[0.014]***	[0.018]**						[0.020]***	[0.028]***
KAOPEN x reserves				-0.057		-0.058	ERS_KAO x reserves						0.037
				[0.086]		[0.086]							[0.139]
# of Obs.	203	203	203	203	203	203	# of Obs.	203	203	203	203	203	203
Adjusted R2	0.78	0.78	0.8	0.8	0.79	0.8	Adjusted R2	0.78	0.78	0.79	0.79	0.8	0.79

Notes: Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. The estimated coefficients of the dummies for Latin American and the Caribbean and Eastern Europe are not reported.

Table 5: Summary of the Effects of the Trilemma Configurations

(A) Output Volatility

	Monetary Independ. (MI)	Exchange Rate Stab. (ERS)	Financial Openness (KAO)	MI and ERS	MI and KAO	ERS and KAO
Less Developing Countries (LDC)	Decreases			Decreases	Decreases	
Commodity Exporters (LDC-CMD)	Decreases	Decreases if coupled w. higher IR	Decreases, but can be increased if IR > 27%		Decreases, but can be increased if IR > 26%	
Emerging Market Countries (EMG)	Decreases	Increases, but can be reduced if IR > 21-24%		Decreases if coupled w. higher IR		

(B) Inflation Volatility

	Monetary Independ. (MI)	Exchange Rate Stab. (ERS)	Financial Openness (KAO)	MI and ERS	MI and KAO	ERS and KAO
Less Developing Countries (LDC)						Increases
Commodity Exporters (LDC-CMD)	Decreases				Decreases	
Emerging Market Countries (EMG)			Increases			Increases

(C) Level of Inflation

	Monetary Independ. (MI)	Exchange Rate Stab. (ERS)	Financial Openness (KAO)	MI and ERS	MI and KAO	ERS and KAO
Less Developing Countries (LDC)	Increases	Decreases, but can be increased if IR >53-65%	Decreases	Decreases		Decreases, but can be increased if IR > 67%
Commodity Exporters (LDC-CMD)	Increases	Decreases	Decreases	Decreases		Decreases
Emerging Market Countries (EMG)		Decreases	Decreases		Decreases	Decreases

Table 6: Output Volatility: the Trilemma Indexes Interacted w/ different levels of *PCGDP*

	Developing Countries (LDC)			Emerging Market Countries (EMG)		
	(1)	(2)	(3)	(4)	(5)	(6)
Private credit creation (% of GDP)	-0.012 [0.008]	-0.013 [0.007]*	-0.011 [0.008]	0.001 [0.008]	0.001 [0.007]	-0.005 [0.008]
MI x Int'l reserves	-0.042 [0.068]		-0.023 [0.065]	-0.092 [0.068]		-0.068 [0.065]
MI x High *PCGDP*	-0.014 [0.017]		-0.009 [0.016]	-0.006 [0.020]		-0.01 [0.017]
MI x Medium *PCGDP*	-0.016 [0.012]		-0.019 [0.012]	-0.007 [0.014]		-0.016 [0.014]
MI x Low *PCGDP*	-0.005 [0.015]		-0.018 [0.013]	0.009 [0.023]		-0.022 [0.018]
ERS x Int'l reserves	-0.036 [0.033]	-0.042 [0.031]		-0.082 [0.037]**	-0.067 [0.032]**	
ERS x High *PCGDP*	0.002 [0.010]	0.012 [0.009]		0.013 [0.012]	0.017 [0.009]*	
ERS x Medium *PCGDP*	0.003 [0.006]	0.003 [0.005]		0.018 [0.007]**	0.017 [0.007]**	
ERS x Low *PCGDP*	-0.011 [0.007]	-0.005 [0.006]		0.019 [0.016]	0.005 [0.010]	
KAOPEN x Int'l reserves		-0.014 [0.027]	-0.001 [0.027]		0.026 [0.027]	0.032 [0.027]
KAOPEN x High *PCGDP*		-0.012 [0.010]	-0.015 [0.009]		-0.012 [0.010]	-0.018 [0.010]*
KAOPEN x Medium *PCGDP*		0 [0.006]	0 [0.006]		-0.005 [0.006]	-0.008 [0.006]
KAOPEN x Low *PCGDP*		-0.004 [0.009]	-0.01 [0.010]		0.037 [0.016]**	0.039 [0.018]**
Adjusted R2	0.23	0.24	0.23	0.49	0.48	0.44
Significance of the estimated coefficients of the interaction terms b/w the trilemma indexes and different PCGDP groups is tested using a Wald test.						
MI: High vs. Med.	0.04		0.85	0.00		0.26
MI: Med. vs. Low	1.25		0.03	0.60		0.24
MI: High vs. Low	0.32		0.42	0.42		0.51
ERS: High vs. Med.	0.02	1.30		0.17	0.00	
ERS: Med. vs. Low	4.39**	2.60*		0.01	1.57	
ERS: High vs. Low	1.82	3.70**		0.11	1.05	
KAO: High vs. Med.		1.81	2.74*		0.45	1.27
KAO: Med. vs. Low		0.19	0.81		6.61***	6.83***
KAO: High vs. Low		0.52	0.17		7.35***	8.84***

Table 7: The Impact of External Financing: Less Developed Countries

Dependent Variable:	**Output Volatility**			**Inflation Volatility**			**Level of Inflation**		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Total Reserve/GDP	0.057	-0.022	0.039	0.039	0.038	-0.038	-0.074	0.162	-0.096
	[0.058]	[0.055]	[0.036]	[0.086]	[0.083]	[0.055]	[0.145]	[0.145]	[0.089]
Currency Crisis	0.018	0.016	0.014	0.052	0.053	0.053	0.131	0.144	0.118
	[0.011]	[0.011]	[0.011]	[0.016]***	[0.017]***	[0.017]***	[0.028]***	[0.028]***	[0.027]***
Net FDI inflows/GDP	-0.022	0.009	0.003	-0.24	-0.287	-0.286	-0.388	-0.299	-0.293
	[0.074]	[0.075]	[0.075]	[0.065]***	[0.067]***	[0.067]***	[0.208]*	[0.219]	[0.204]
Net portfolio inflows/GDP	0.124	0.136	0.15	0.172	0.258	0.237	-0.078	-0.098	-0.119
	[0.087]	[0.087][12%]	[0.087]*	[0.179]	[0.188]	[0.187]	[0.306]	[0.326]	[0.306]
Net 'other' inflows/GDP	0.045	0.051	0.056	-0.015	-0.035	-0.03	-0.017	0.06	0.032
	[0.030]	[0.030]*	[0.030]*	[0.042]	[0.043]	[0.043]	[0.071]	[0.074]	[0.070]
Short-term Debt	-0.003	0.005	0.006	0.042	0.041	0.038	0.054	0.094	0.085
(as % of total external debt)	[0.017]	[0.017]	[0.017]	[0.023]*	[0.024]*	[0.024][11%]	[0.043]	[0.045]**	[0.042]**
Total debt service	0.047	0.058*	0.048	0.12	0.106	0.109	0.203	0.281	0.209
(as % of GNI)	[0.036]	[0.035]	[0.036]	[0.052]**	[0.053]**	[0.053]**	[0.099]**	[0.100]***	[0.096]**
Monetary Independence (MI)	-0.021	-0.029		-0.009	-0.01		0.03	0.078	
	[0.015]	[0.015]**		[0.022]	[0.023]		[0.038]	[0.039]**	
MI x reserves	-0.003	0.063		-0.11	-0.1		-0.02	-0.223	
	[0.095]	[0.095]		[0.140]	[0.144]		[0.237]	[0.249]	
Exchange Rate Stability (ERS)	0.001		0.003	0.002		0.002	-0.084		-0.09
	[0.007]		[0.007]	[0.011]		[0.011]	[0.018]***		[0.017]***
ERS x reserves	-0.049		-0.044	0.03		0.039	0.189		0.202
	[0.048]		[0.047]	[0.071]		[0.070]	[0.121]		[0.115]*
KA Openness		-0.018	-0.014		0.006	0.004		-0.035	-0.052
		[0.008]**	[0.008]*		[0.013]	[0.012]		[0.022]	[0.020]***
KAOPEN x reserves		0.063	0.041		0.019	0.046		-0.01	0.051
		[0.045]	[0.044]		[0.071]	[0.068]		[0.124]	[0.112]
Observations	313	313	313	321	321	321	306	306	306
Adjusted R-squared	0.21	0.22	0.21	0.6	0.59	0.59	0.75	0.73	0.76

Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 8: External Financing and Policy Orientation

Dependent variable	**Output Volatility**						**Inflation Volatility**					
(*Policy Orientation*)	**Mon. Indep. & ERS "Financially Closed"**		**Mon. Indep. & KAO "More Flexible Exch. R"**		**ERS & KAO "Currency Union"**		**Mon. Indep. & ERS "Financially Closed"**		**Mon. Indep. & KAO "More Flexible Exch. R"**		**ERS & KAO "Currency Union"**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Total Reserve/GDP	0.04	0.039	0.017	0.02	0.034	0.032	0	0	0.006	0.002	0.004	0.004
	[0.014]***	[0.014]***	[0.014]	[0.014]	[0.014]**	[0.014]**	[0.021]	[0.022]	[0.021]	[0.020]	[0.023]	[0.023]
Currency Crisis	0.015	0.015	0.014	0.014	0.017	0.019	0.053	0.052	0.042	0.043	0.048	0.046
	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]*	[0.017]***	[0.017]***	[0.018]**	[0.017]**	[0.018]***	[0.018]**
(*Policy Orientation*)	0.002	0.004	-0.001	0.002	0.002	-0.009	-0.011	-0.005	0.016	0.004	0.006	0.014
	[0.004]	[0.007]	[0.005]	[0.008]	[0.005]	[0.008]	[0.007]*	[0.011]	[0.008]**	[0.012]	[0.007]	[0.012]
(*Policy Orientation*)	-0.034	-0.034	0.032	0.028	-0.011	-0.003	0.004	-0.005	-0.015	-0.011	-0.008	-0.007
x Reserves	[0.024]	[0.023]	[0.024]	[0.024]	[0.023]	[0.023]	[0.035]	[0.036]	[0.038]	[0.037]	[0.035]	[0.036]
Net FDI inflows/GDP	-0.089	-0.196	0.015	0.023	-0.038	-0.035	-0.251	-0.302	-0.179	-0.164	-0.394	-0.41
	[0.086]	[0.086]**	[0.080]	[0.081]	[0.112]	[0.112]	[0.070]***	[0.072]***	[0.071]**	[0.069]**	[0.180]**	[0.182]**
Net FDI inflow	0.174	0.332	-0.223	-0.181	0.022	0	-0.034	-0.111	-0.508	-0.664	0.206	0.189
x (*Policy Orientation*)	[0.176]	[0.175]*	[0.188]	[0.191]	[0.151]	[0.152]	[0.245]	[0.261]	[0.289]*	[0.283]**	[0.200]	[0.202]
Net portfolio inflows/GDP	0.181	-0.121	0.191	0.199	0.06	0.061	0.149	0.183	0.278	0.237	-0.102	-0.137
	[0.133]	[0.131]	[0.090]**	[0.091]**	[0.105]	[0.104]	[0.196]	[0.204]	[0.225]	[0.217]	[0.369]	[0.375]
Net Portfolio inflow	-0.066	0.234	-0.348	-0.277	0.298	0.332	0.042	0.14	-0.679	-0.948	0.363	0.451
x (*Policy Orientation*)	[0.176]	[0.174]	[0.273]	[0.284]	[0.187][11%]	[0.190]*	[0.924]	[0.958]	[0.463]	[0.464]**	[0.435]	[0.446]
Net 'other' inflows/GDP	0.059	0.066	0.028	0.03	0.079	0.08	0.005	0.026	-0.064	-0.052	-0.03	-0.033
	[0.044]	[0.044]	[0.032]	[0.033]	[0.034]**	[0.033]**	[0.066]	[0.069]	[0.048]	[0.047]	[0.052]	[0.052]
Net 'Other' inflow	0.009	0.004	0.097	0.084	-0.106	-0.094	-0.073	-0.095	0.166	0.174	-0.053	-0.03
x (*Policy Orientation*)	[0.056]	[0.056]	[0.069]	[0.070]	[0.068][12%]	[0.070]	[0.085]	[0.089]	[0.112]	[0.109]	[0.106]	[0.110]
Short-term Debt (as % of	-0.003	0.005	0	-0.004	0.002	0.001	0.034	0.017	0.04	0.044	0.047	0.061
total external debt)	[0.018]	[0.021]	[0.017]	[0.019]	[0.018]	[0.020]	[0.025]	[0.031]	[0.025]	[0.028]	[0.025]*	[0.029]**
Short-term Debt		-0.026		0.020		-0.002		0.049		-0.015		-0.051
x (*Policy Orientation*)		[0.030]		[0.032]		[0.032]		[0.047]		[0.046]		[0.049]
Total debt service	0.054	0.072	0.069	0.097	0.055	0.008	0.088	0.149	0.149	0.081	0.111	0.114
(as % of GNI)	[0.036]	[0.044]	[0.035]*	[0.041]**	[0.035]	[0.042]	[0.053]*	[0.068]**	[0.055]***	[0.060]	[0.055]**	[0.069]*
Total debt service		-0.038		-0.102		0.172		-0.187		0.271		-0.002
x (*Policy Orientation*)		[0.067]		[0.080]		[0.074]**		[0.106]*		[0.117]**		[0.115]
Observations	313	313	313	313	313	313	319	319	319	319	319	319
Adjusted R-squared	0.2	0.23	0.21	0.21	0.2	0.21	0.56	0.55	0.55	0.55	0.54	0.54

Robust p values in brackets * significant at 10%; ** significant at 5%; *** significant at 1%

Table 8 (con't): External Financing and Policy Orientation

Dependent variable	**Level of Inflation**					
Policy Orientation	**Mon. Indep. & ERS "Financially Closed"**		**Mon. Indep. & KAO "More Flexible Exch. R"**		**ERS & KAO "Currency Union"**	
	(13)	(14)	(15)	(16)	(17)	(18)
Total Reserve/GDP	0.03	0.025	0.051	0.052	0.034	0.044
	[0.039]	[0.039]	[0.037]	[0.037]	[0.037]	[0.037]
Currency Crisis	0.167	0.162	0.138	0.137	0.142	0.134
	[0.029]***	[0.029]***	[0.029]***	[0.029]***	[0.028]***	[0.028]***
(*Policy Orientation*)	0.014	-0.011	0.037	0.029	-0.045	-0.013
	[0.012]	[0.018]	[0.014]***	[0.022]	[0.011]***	[0.019]
(*Policy Orientation*)	0.029	0.04	-0.069	-0.067	0.037	0.022
x Reserves	[0.061]	[0.062]	[0.063]	[0.064]	[0.057]	[0.058]
Net FDI inflows/GDP	-0.186	-0.146	-0.393	-0.39	-0.404	-0.366
	[0.240]	[0.242]	[0.229]*	[0.230]*	[0.302]	[0.304]
Net FDI inflow	-0.31	-0.435	0.205	0.203	0.212	0.19
x (*Policy Orientation*)	[0.464]	[0.469]	[0.505]	[0.512]	[0.379]	[0.382]
Net portfolio inflows/GDP	-0.266	-0.246	0.032	0.037	0.236	0.173
	[0.349]	[0.351]	[0.342]	[0.345]	[0.500]	[0.503]
Net Portfolio inflow	1.331	1.289	-0.268	-0.326	-0.363	-0.268
x (*Policy Orientation*)	[0.860][12%]	[0.860]	[0.806]	[0.828]	[0.633]	[0.645]
Net 'other' inflows/GDP	-0.129	-0.151	0.091	0.09	-0.009	-0.017
	[0.115]	[0.117]	[0.081]	[0.081]	[0.080]	[0.081]
Net 'Other' inflow	0.249	0.251	-0.479	-0.46	0.131	0.11
x (*Policy Orientation*)	[0.148]*	[0.150]*	[0.187]**	[0.191]**	[0.169]	[0.176]
Short-term Debt (as % of	0.099	0.086	0.038	0.03	0.082	0.111
total external debt)	[0.047]**	[0.058]	[0.044]	[0.049]	[0.044]*	[0.050]**
Short-term Debt		0.073		0.021		-0.073
x (*Policy Orientation*)		[0.080]		[0.081]		[0.079]
Total debt service	0.217	0.102	0.216	0.199	0.277	0.406
(as % of GNI)	[0.100]**	[0.124]	[0.098]**	[0.110]*	[0.096]***	[0.117]***
Total debt service		0.284		0.088		-0.326
x (*Policy Orientation*)		[0.180][11%]		[0.208]		[0.188]*
Observations	306	306	306	306	306	306
Adjusted R-squared	0.72	0.72	0.73	0.72	0.75	0.74

Robust p values in brackets * significant at 10%; ** significant at 5%; *** significant at 1%

Table 9: Trilemma Configurations and External Financing of Major EMG Countries as of 2007

	Financial Develop.	Trilemma Indexes								External Finances						Swap /IMF ($ bill.)**
	PCGDP*	IR	dIR	MI	dMI	ERS	dERS	KA-OPEN	dKAO	FDI	dFDI	Port.	dPort	Other	dOther	
Argentina	11.4%	17.2%	4.5%	0.74	0.49	0.61	0.29	0.24	-0.08	1.9%	0.1%	2.7%	5.3%	-3.0%	3.6%	
Brazil	32.9%	13.6%	6.0%	0.12	-0.36	0.24	0.05	0.64	0.06	2.1%	0.8%	3.7%	3.5%	1.0%	2.1%	30 (FR)
Chile	74.5%	10.3%	-7.4%	0.96	0.74	0.35	0.06	1.00	0.07	6.5%	2.5%	-9.6%	-5.7%	-2.9%	-2.8%	
China	135.5%	46.6%	15.7%	0.50	-0.02	0.75	-0.22	0.15	0.00	3.7%	0.9%	0.6%	0.9%	-2.1%	-2.5%	
Colombia	24.5%	10.2%	-1.5%	0.83	0.24	0.17	-0.16	0.39	0.10	4.7%	1.9%	0.5%	1.4%	0.8%	0.6%	
Czech Rep.	37.3%	19.7%	-6.6%	0.16	-0.34	0.38	0.00	0.81	-0.15	4.7%	-1.1%	-1.5%	-0.5%	-0.3%	-2.7%	
Egypt	52.6%	23.6%	3.6%	0.50	0.18	0.64	-0.11	1.00	0.06	8.5%	5.0%	-2.8%	-3.3%	-3.4%	2.7%	
Hong Kong	138.7%	73.9%	2.8%	0.10	-0.11	0.79	-0.21	1.00	0.00	-3.3%	-2.7%	-1.3%	18.8%	-7.7%	-12.8%	
Hungary	51.4%	17.4%	1.0%	0.86	0.24	0.38	0.01	0.81	-0.07	3.2%	-0.1%	-1.7%	-6.3%	4.8%	3.4%	25 (IMF)
India	40.2%	24.3%	7.1%	0.37	0.21	0.35	-0.14	0.15	0.00							
Indonesia	22.7%	12.7%	-1.1%	0.32	-0.02	0.34	0.04	0.69	0.00	0.5%	0.0%	1.3%	0.0%	-1.1%	0.9%	
Israel	87.5%	17.4%	-4.4%	0.55	0.20	0.28	-0.11	1.00	0.02	1.6%	1.3%	0.2%	2.3%	-3.0%	-0.1%	
Korea	112.5%	27.0%	1.0%	0.93	0.56	0.40	0.06	0.39	0.00	-1.4%	-1.5%	-2.5%	-3.0%	4.3%	3.0%	30(FR)***
Lithuania	37.2%	19.4%	2.4%	0.11	-0.12	0.71	0.18	1.00	0.00	3.7%	0.5%	-0.6%	-0.7%	13.3%	7.4%	
Malaysia	110.2%	54.0%	6.8%	0.50	0.06	0.44	-0.46	0.39	0.00	-1.4%	-2.5%	3.0%	1.8%	-7.5%	-1.9%	
Mexico	19.5%	8.5%	-0.5%	0.90	0.48	0.42	0.09	0.69	0.10	2.1%	-0.2%	1.7%	1.1%	-1.4%	-0.8%	30 (FR)
Pakistan	26.5%	9.8%	-1.5%	0.51	0.24	0.76	-0.06	0.15	0.00	3.6%	2.0%	1.5%	0.8%	1.9%	2.9%	10 (IMF)
Peru	17.3%	25.1%	7.6%	0.93	0.76	0.50	-0.05	1.00	0.00	4.9%	1.9%	3.1%	2.4%	0.5%	2.4%	
Philippines	29.0%	21.0%	1.6%	0.10	-0.18	0.37	-0.12	0.45	0.00	-0.4%	-1.6%	3.1%	1.5%	-0.5%	2.0%	
Poland	28.6%	14.9%	0.4%	0.13	-0.20	0.37	0.08	0.45	0.00	4.3%	1.5%	-1.2%	-3.0%	6.9%	7.4%	
Russian	26.2%	36.1%	14.8%	0.80	0.35	0.48	-0.07	0.39	0.00	0.7%	0.5%	0.5%	0.5%	6.2%	6.1%	
Singapore	96.1%	101.2%	0.9%	0.52	-0.03	0.51	0.00	1.00	0.00	7.3%	-1.8%	-10.3%	-0.5%	-8.4%	4.5%	30 (FR)
Slovak	35.9%	24.0%	-9.0%	0.73	0.28	0.39	-0.03	0.76	0.25	4.0%	-3.5%	-1.0%	-1.7%	6.3%	3.8%	
S. Africa	103.6%	10.5%	3.2%	0.97	0.43	0.29	0.12	0.15	0.00	1.0%	0.7%	4.2%	1.7%	2.8%	3.0%	
Thailand	86.9%	34.8%	4.4%	0.19	0.09	0.52	0.11	0.15	-0.24	3.0%	-0.5%	-2.8%	-3.9%	-1.4%	1.6%	
Turkey	28.8%	11.1%	-3.2%	0.02	-0.47	0.31	0.12	0.15	0.00	3.1%	1.7%	0.1%	-1.2%	4.2%	2.0%	
Venezuela	13.4%	10.6%	-8.5%	0.94	0.64	1.00	0.19	0.31	-0.06	-0.7%	-0.9%	1.8%	3.8%	-11.1%	-3.3%	

Notes: *dX* refers to a change of the variable *X* compared to the 2002-06 period.
* PCGDP is as of 2006 or 2005 if the figure for 2006 is unavailable.
** "Swap/IMF" refer to the amount of swap lines provided by the U.S. Federal Reserve on Oct. 29, 2008 as well as the loans provided by IMF as of Mach 2009. The information on Fed's swap lines is based on Obstfeld et al. (2009)
*** In December 2008, China and Japan also agreed to provide Korea with the swap lines of $28 billion and $20 billion, respectively.

Figure 1: The Trilemma and International Reserves Configurations over Time

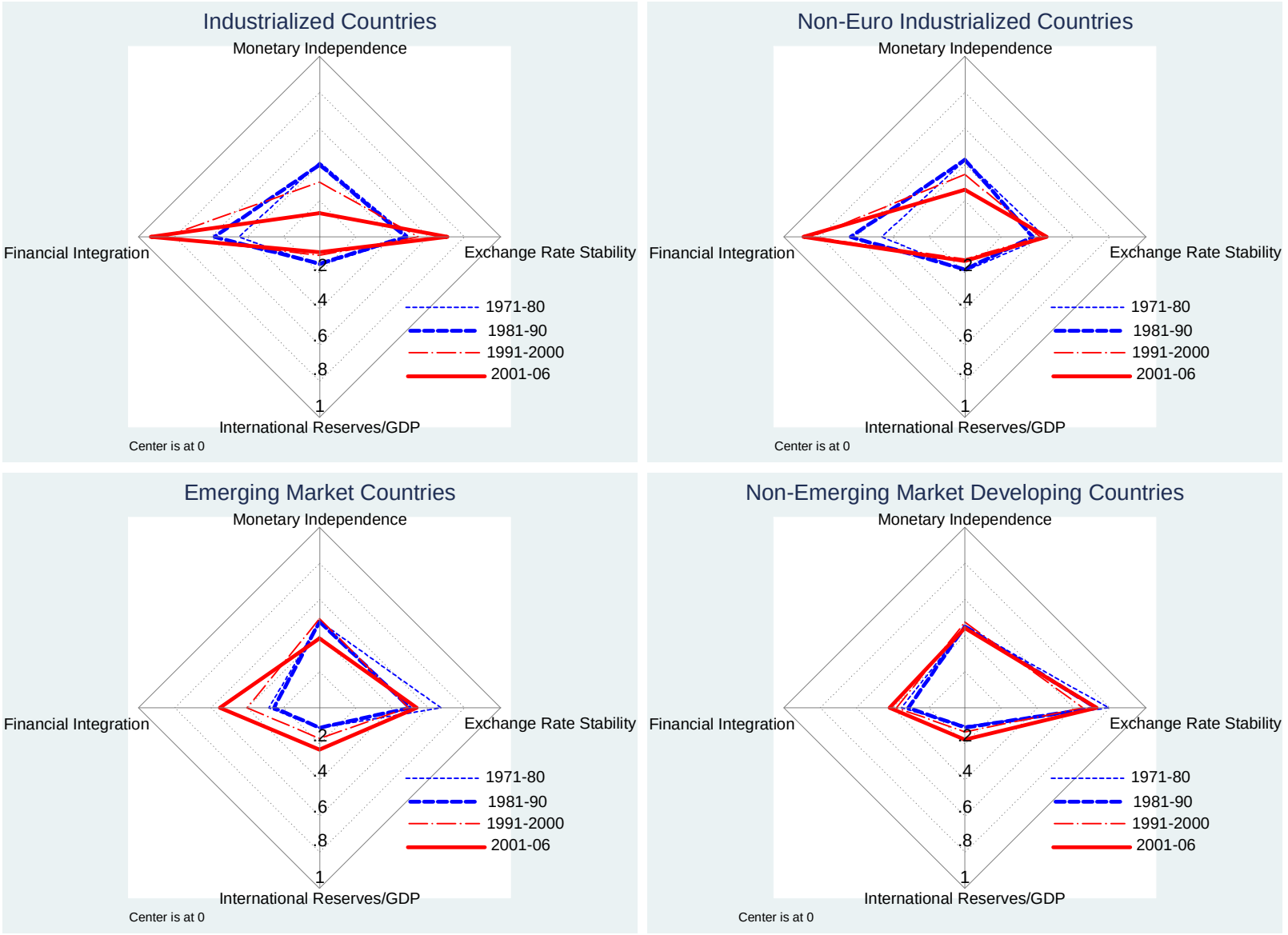
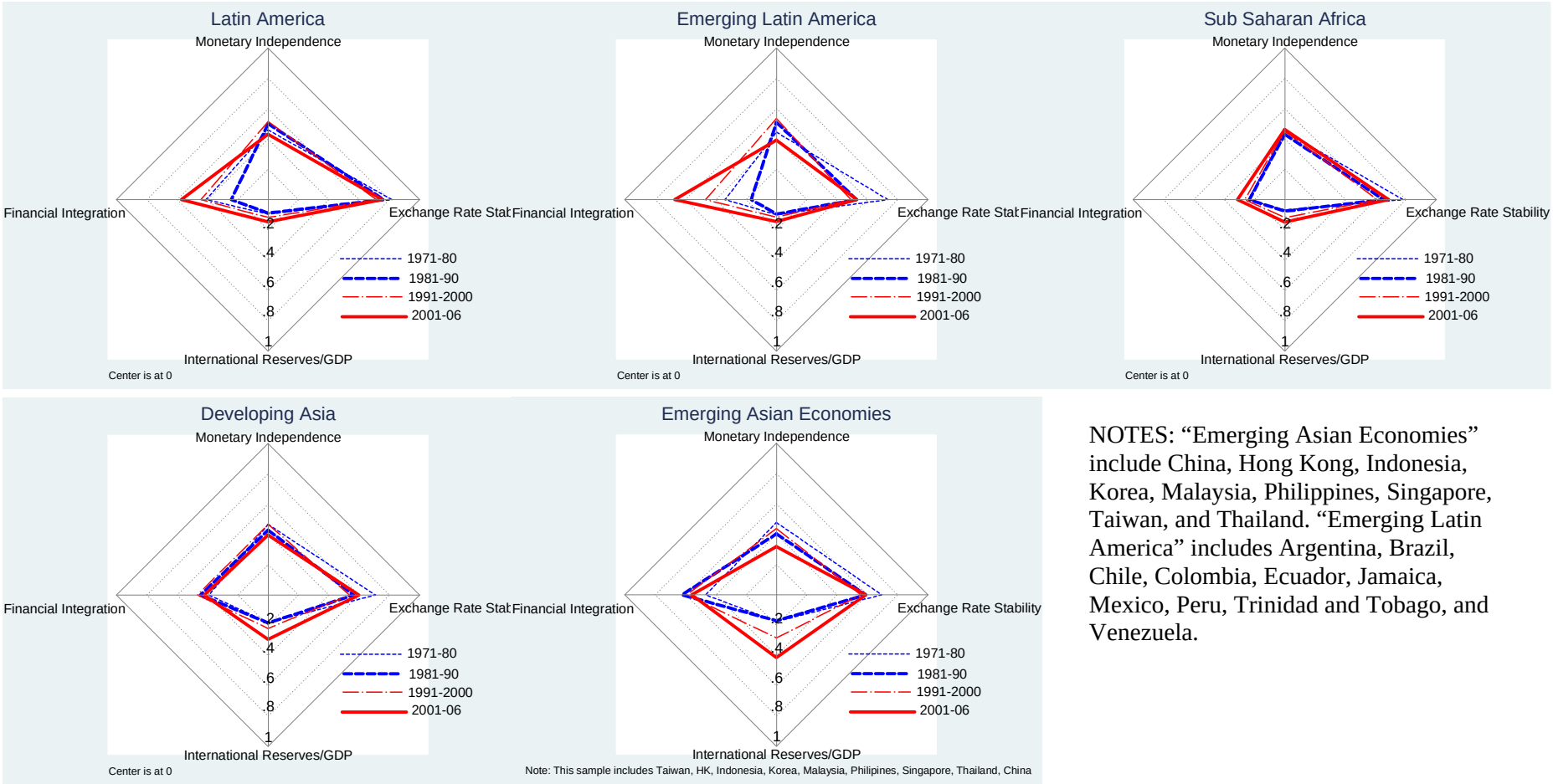


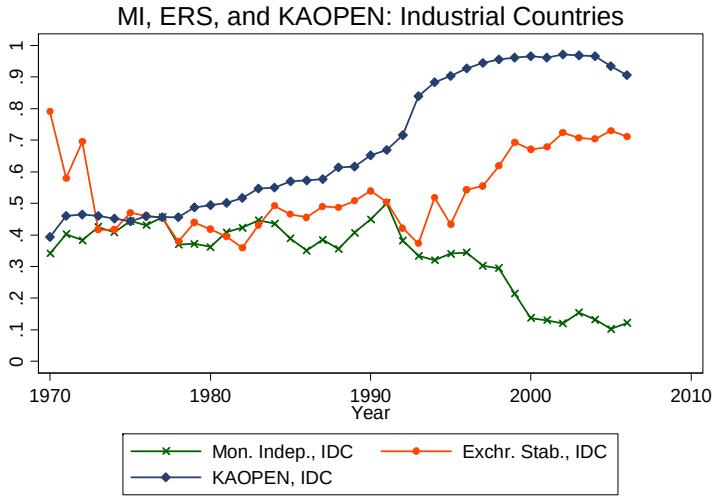
Figure 2: The Trilemma and International Reserves Configurations over Time: Regional Patterns for Developing Countries



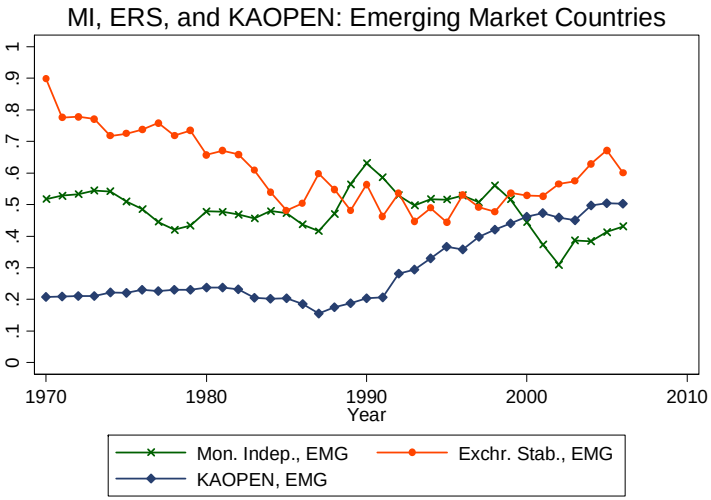
NOTES: "Emerging Asian Economies" include China, Hong Kong, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan, and Thailand. "Emerging Latin America" includes Argentina, Brazil, Chile, Colombia, Ecuador, Jamaica, Mexico, Peru, Trinidad and Tobago, and Venezuela.

Figure 3: The Evolution of Trilemma Indexes

(a) Industrialized Countries



(b) Emerging Market Countries



(c) Non-Emerging Market Developing Countries

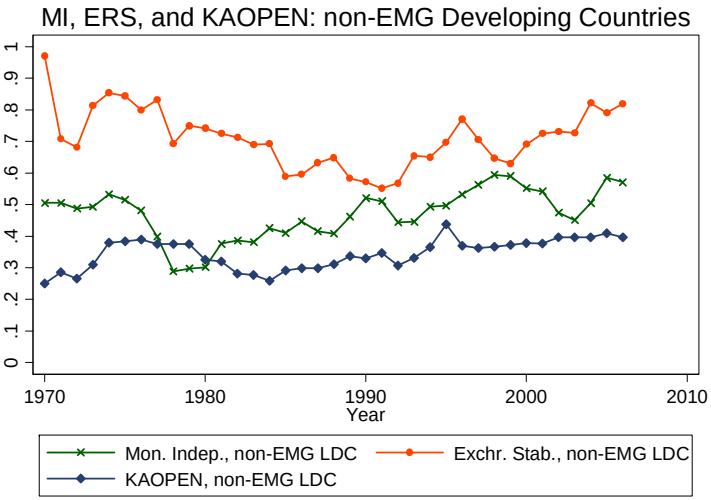
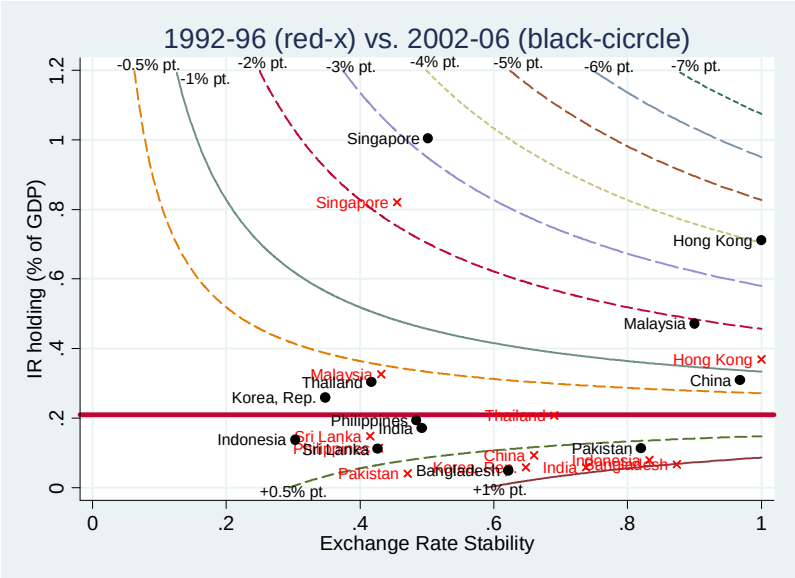
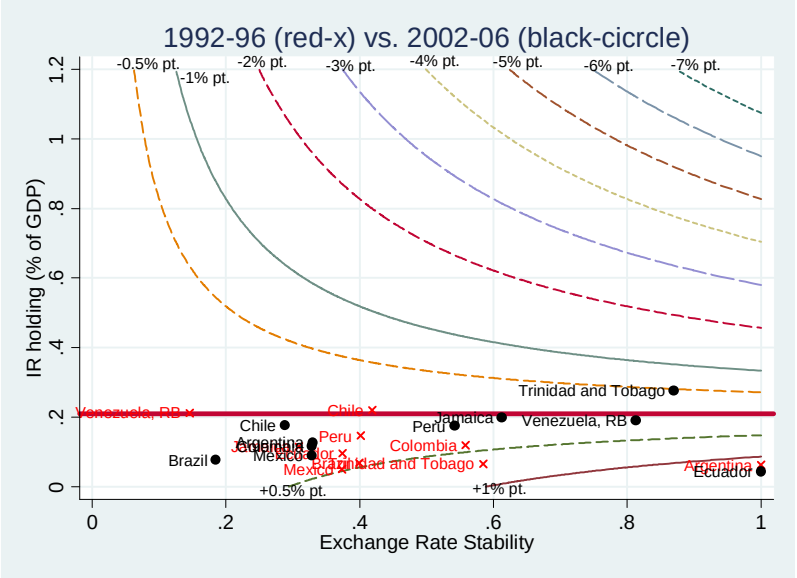


Figure 4: Non-linear Effect of Exchange Rate Stability – 1992-96 vs. 2002-06

(a) Asian EMG



(b) Latin American EMG



(c) EMG excluding Asia and Latin America

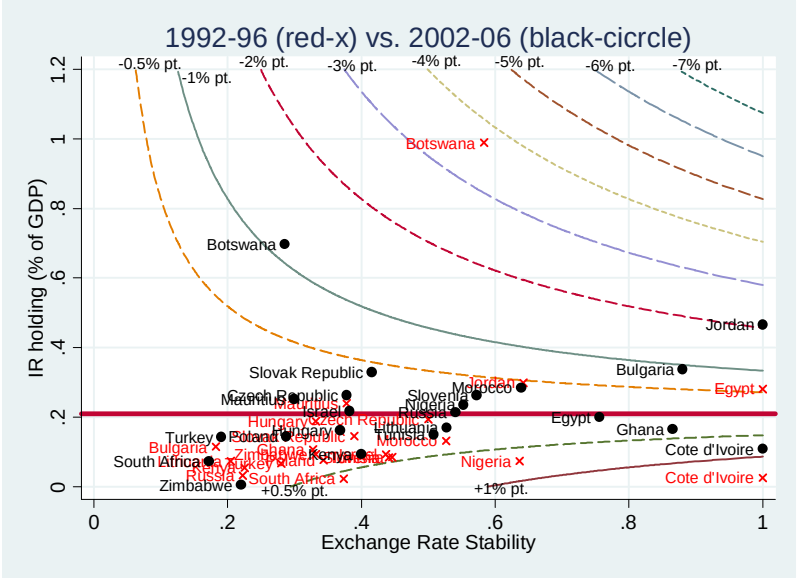
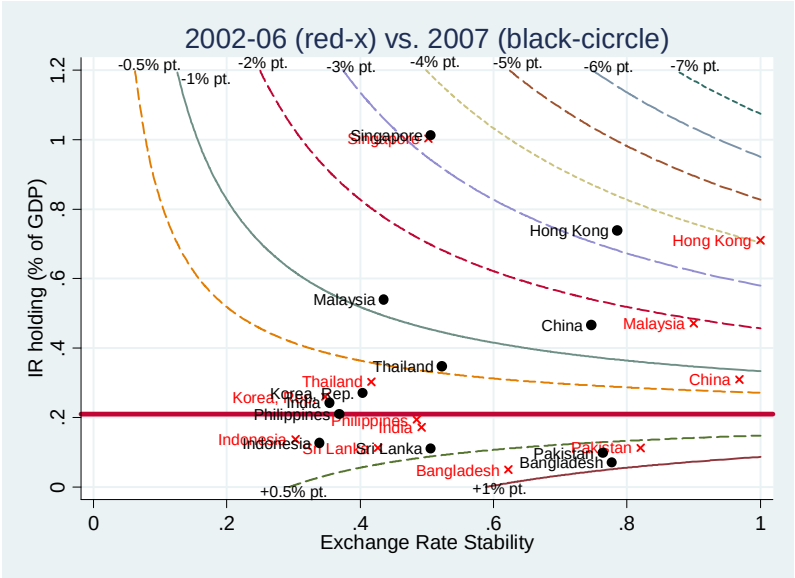
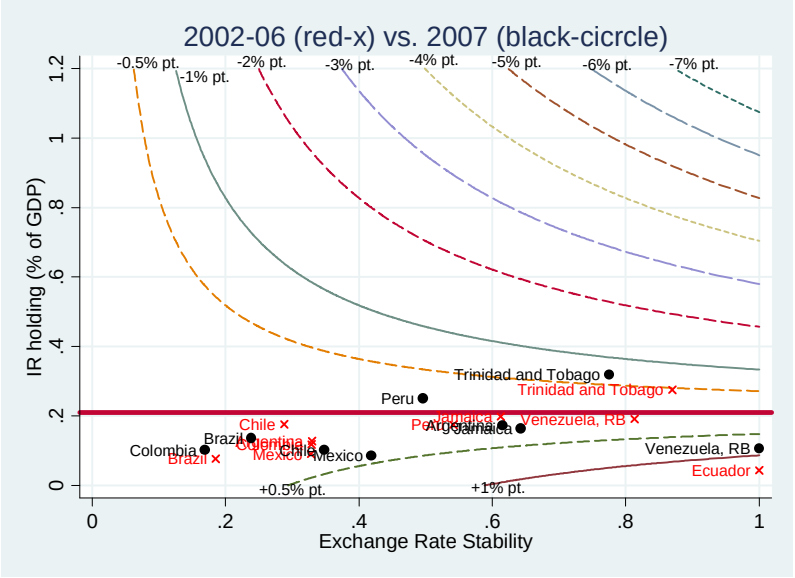


Figure 5: Non-linear Effect of Exchange Rate Stability – 2002-06 vs. 2007-08

(a) Asian EMG



(b) Latin American EMG



(c) EMG excluding Asia and Latin America

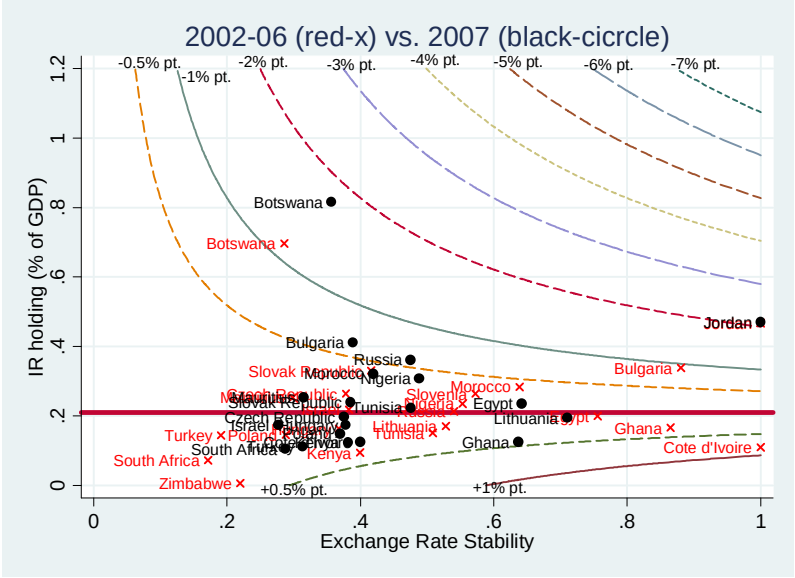


Figure 6: MI-KAO vs. Exchange Rate Stability

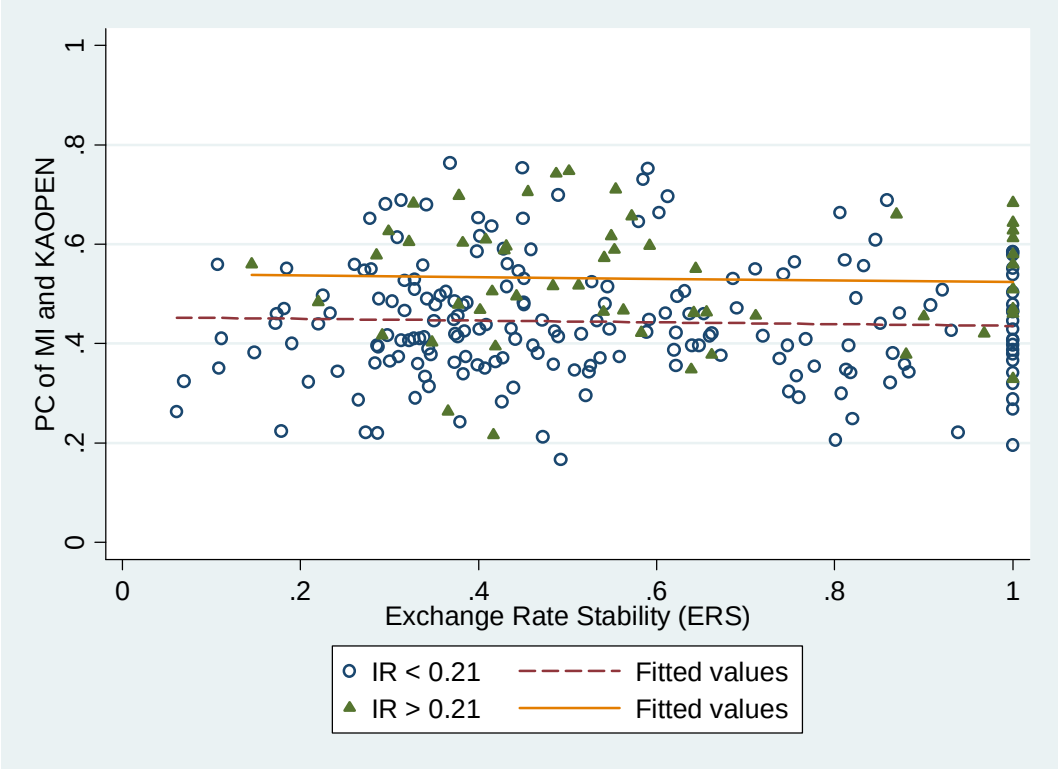
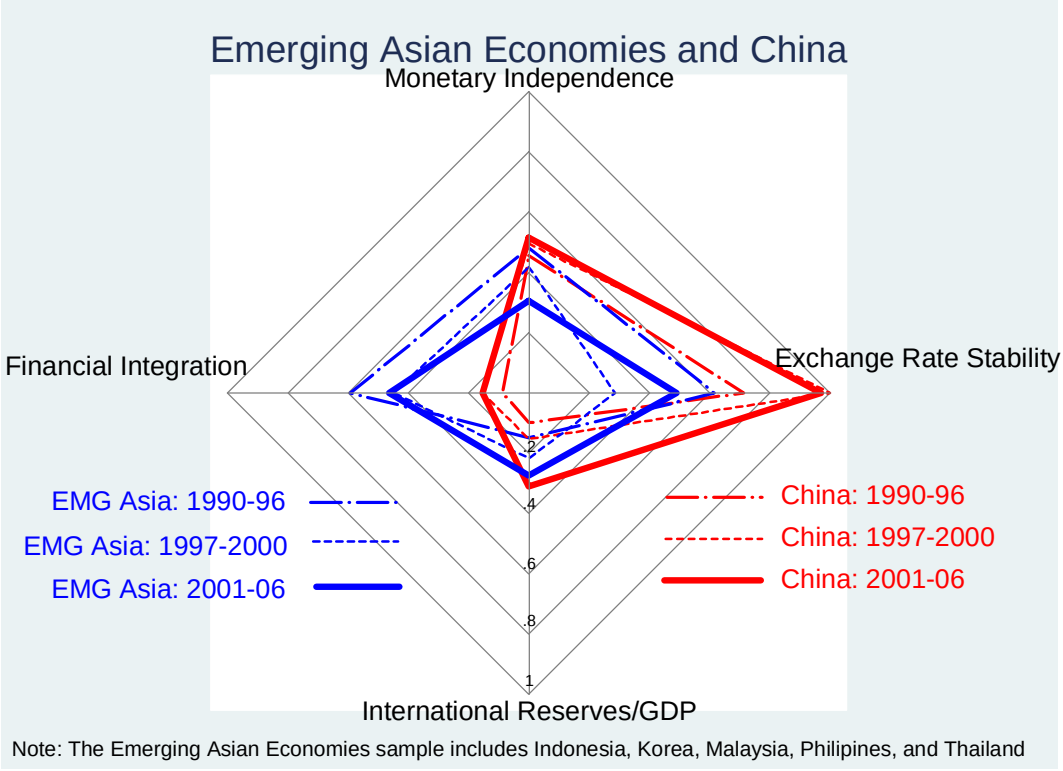


Figure 7: Trilemma Indexes and IR Holding for Asian EMG and China



Note: The Emerging Asian Economies sample includes Indonesia, Korea, Malaysia, Philipines, and Thailand