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## Assessing the Emerging Global Financial Architecture: Measuring the Trilemma's Configurations over Time

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# Assessing the Emerging Global Financial Architecture: Measuring the Trilemma's Configurations over Time

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**Abstract:** We develop a methodology that allows us to characterize in an intuitive manner the choices countries have made with respect to the trilemma during the post Bretton-Woods period. The first part of the paper deals with positive aspects of the trilemma, outlining new metrics for measuring the degree of exchange rate flexibility, monetary independence, and capital account openness. The evolution of our “trilemma indexes” illustrates that after the early 1990s, industrialized countries accelerated financial openness, but reduced the extent of monetary independence while sharply increasing exchange rate stability. This process culminated at the end of the 1990s with the introduction of the euro. In contrast, the group of developing countries pursued exchange rate stability as their key priority up to 1990, although many countries moved toward greater exchange rate flexibility from the early 1970s onward. Since 2000, measures of the three trilemma variables have converged towards intermediate levels characterizing managed flexibility, using sizable international reserves as a buffer, thus retaining some degree of monetary autonomy. Using these indexes, we also test the linearity of the three aspects of the trilemma: monetary independence, exchange rate stability, and financial openness. We confirm that the weighted sum of the three trilemma policy variables adds up to a constant, validating the notion that a rise in one trilemma variable should be traded-off with a drop of the weighted sum of the other two. The second part of the paper deals with normative aspects of the trilemma, relating the policy choices to macroeconomic outcomes such as the volatility of output growth and inflation, and medium term inflation rates. Some key findings for developing countries include: (i) greater exchange rate stability implies greater output volatility, which can only be slightly mitigated by reserve accumulation; (ii) somewhat counter to previous findings, greater exchange rate stability is also associated with greater inflation volatility, and (iii) greater monetary autonomy is associated with a higher level of inflation. We believe these results differ from those identified in previous studies due to the comprehensive nature of our analysis, which encompasses more than 100 countries and 37 years, as well as the inclusion of a number of additional structural and policy variables in the regressions.

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## 1. Introduction

A fundamental contribution of the Mundell-Fleming framework is the impossible trinity, or the trilemma, which states that a country simultaneously may choose any two, but not all, of the following three goals: monetary independence, exchange rate stability and financial integration. The trilemma is illustrated in Figure 1; each of the three sides – representing monetary independence, exchange rate stability, and financial integration – depicts a potentially desirable goal, yet it is not possible to be simultaneously on all three sides of the triangle. The top vertex – labeled “closed capital markets” – is associated with monetary policy autonomy and a fixed exchange rate regime, but not financial integration, the preferred choice of most developing countries in the mid to late 1980s.<sup>1</sup>

Over the last 20 years, most developing countries have opted for increasing financial integration. The trilemma implies that a country choosing this path must either forego exchange rate stability if it wishes to preserve a degree of monetary independence, or forego monetary independence if it wishes to preserve exchange rate stability.

The purpose of this paper is to outline a methodology that will allow us to easily and characterize in an intuitive manner the choices countries have made with respect to the trilemma during the post Bretton-Woods period. The first part of our study deals with positive aspects of the trilemma, outlining new ways of tracing the evolving financial configurations. The second part deals with normative aspects of the trilemma, relating the policy decisions chosen to macroeconomic outcomes, such as the volatility of output growth and inflation, and medium term inflation rates.

We begin by observing that over the last two decades, a growing number of developing countries have opted for hybrid exchange rate regimes – e.g., managed float buffered by increasing accumulation of international reserves [IR henceforth]. Despite the proliferation of greater exchange rate flexibility, IR/GDP ratios increased dramatically, especially in the wake of the East Asian crises. Practically all the increase in IR/GDP holding has taken place in emerging market countries [see Figure 2]. The magnitude of the changes during recent years is staggering: global reserves increased from about USD 1 trillion to more than USD 5 trillion between 1990 and 2006.

The dramatic accumulation of international reserves has been uneven: while the IR/GDP ratio of industrial countries was relatively stable at approximately 4%, the IR/GDP ratio of developing countries increased from about 5% to about 27%. Today, about three quarters of the global international reserves are held by developing countries. Most of the accumulation has been in Asia, where reserves increased from about 5% in 1980 to about 37% in 2006 (32% in Asia excluding China). The most dramatic changes occurred in China, increasing its IR/GDP

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<sup>1</sup> See Obstfeld, Shambaugh, and Taylor (2005) for further discussion and references dealing with the trilemma.

ratio from about 1% in 1980, to about 41% in 2006 (and approaching 50% by 2008). Empirical studies suggest several structural changes in the patterns of reserves hoarding (Cheung and Ito, 2007; Obstfeld, et al. 2008). A drastic change occurred in the 1990s in terms of reserve management among developing countries. The IR/GDP ratios shifted upwards; the ratios increased dramatically immediately after the East Asian crisis of 1997-98, but subsided by 2000. Another structural change took place in the early 2000s, mostly driven by an unprecedented increase in the accumulation of international reserves by China.

The globalization of financial markets is evident in the growing financial integration of all groups of countries. While the original framing of the trilemma was silent regarding the role of reserves, recent trends suggest that reserve accumulation may be closely related to changing patterns of the trilemma for developing countries. The earlier literature focused on the role of international reserves as a buffer stock critical to the management of an adjustable-peg or managed-floating exchange-rate regime.<sup>2</sup> While useful, the buffer stock model has limited capacity to account for the recent development in international reserves hoarding – the greater flexibility of the exchange rates exhibited in recent decades should help reduce reserve accumulation, in contrast to the trends reported above.

The recent literature has focused on the adverse side effects of deeper financial integration of developing countries – the increased exposure to volatile short-term inflows of capital (dubbed “hot money”), subject to frequent sudden stops and reversals (see Calvo, 1998). The empirical evidence suggests that international reserves can reduce both the probability of a sudden stop and the depth of the resulting output collapse when the sudden stop occurs.<sup>3</sup> Aizenman and Lee (2007) link the large increase in reserves holding to the deepening financial integration of developing countries and find evidence that international reserves hoarding serves as a means of self-insurance against exposure to sudden stops. In extensive empirical analysis of the shifting determinants of international reserve holdings for more than 100 economies over the 1975-2004 period, Cheung and Ito (2007) find that while trade openness is the only factor that is significant in most of the specifications and samples under consideration, its explanatory power has been declining over time. In contrast, the explanatory power of financial variables has been increasing over time.

The increasing importance of financial integration as a determinant for international reserves hoarding suggests a link between the changing configurations of the trilemma and the level of international reserves. Indeed, Obstfeld, et al. (2008) find that the size of domestic financial liabilities that could potentially be converted into foreign currency (M2), financial

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<sup>2</sup> Accordingly, optimal reserves balance the macroeconomic adjustment costs incurred in the absence of reserves with the opportunity cost of holding reserves (Frenkel and Jovanovic, 1981).

<sup>3</sup> See Ben-Bassat and Gottlieb (1992), Rodrik and Velasco (1999), and Aizenman and Marion (2004) for papers viewing international reserves as output and consumption stabilizers.

openness, the ability to access foreign currency through debt markets, and exchange rate policy are all significant predictors of international reserve stocks.

We begin by constructing an easy and intuitive way to summarize these trends, in the form of a “Diamond chart,” where we add to the three trilemma dimensions – monetary independence, exchange rate stability and financial integration – a measure of international reserves hoarding (IR/GDP). Applying the methodology outlined in the next section, we construct for each country a vector of trilemma and IR configurations that measures each country’s monetary independence, exchange rate stability, international reserves and financial integration. These measures are normalized between zero and one. Each country’s configuration at a given instant is summarized by a ‘generalized diamond,’ whose four vertices measure monetary independence, exchange rate stability, IR/GDP, and financial integration.

Figures 3 and 4 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 3 summarizes the trends for industrial countries, emerging markets, and non-emerging developing countries. That figure reveals that, over time, developing countries moved towards greater exchange rate flexibility and deeper financial integration. Both trends are more pronounced for the emerging markets than for the non-emerging developing countries. There has been a decline in monetary independence and sizable increase in international reserves, trends that were more pronounced for the emerging markets than for the non-emerging developing countries in the 2000s. In contrast, industrial countries, after giving up some exchange rate stability during the 1980s, increased the stability of their exchange rates during the period of 1991-2006. They embraced rapid convergence to comprehensive financial integration at rates faster than the developing countries. On average, industrial countries ended up with lower monetary independence, and lower IR/GDP.

Figure 4 illustrates regional trends in developing countries. The move towards exchange rate flexibility is most evident in developing Asia, LATAM, and Sub Saharan Africa. Emerging Asian economies shared this trend until 2000, at which time exchange rate stability started increasing. The gain in IR/GDP is shared by all these regional blocs, but is much more pronounced in emerging Asia. And while the move towards financial integration applies to all these blocs, it’s more pronounced in LATAM than in developing Asia.

Figures 5 and 6 present 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, the level of monetary independence went up while more countries adopted floating exchange rates and liberalized financial markets. Since the millennium, interestingly, all three variables have converged, suggesting that developing countries have converged towards managed exchange rate flexibility buffered by sizable international reserves holding enabling the retention of monetary autonomy even as financial integration proceeded.

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). Yet, to our knowledge, the validity of this tradeoff among the three trilemma variables has not been tested properly. A possible concern is that the trilemma framework does not impose an exact functional restriction on the association between the three trilemma policy variables.

We conduct a regression analysis to test the validity of the simplest functional specification for the trilemma: whether the three trilemma policy goals are linearly related. For this purpose, we also examine and validate that the weighted sum of the three trilemma policy variables adds up to a constant (see Figure 7). This result confirms the notion that a rise in one trilemma variable should be traded-off with a drop of a linear weighted sum of the other two trilemma variables. The regression results also provide another diagnostic tool, allowing a simple description of the changing ranking among the three trilemma policy goals over time.

We close the paper by investigating the normative questions pertaining to the trilemma. More specifically, we examine 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. In this exploration, we also incorporate the effects of different types of cross-border financial flows.

In the remaining of the paper, Section 2 outlines the methodology for the construction of our “trilemma indexes” that measure the extent of achievement in the three policy goals. This section also presents summary statistics of the indexes and examines whether the indexes entail any structural breaks corresponding to major global economic events. Furthermore, in this section, we test the validity of a linear specification of the trilemma indexes to examine whether the notion of the trilemma can be considered to be a trade-off and binding. 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. Lastly, in Section 4, we

examine the effects of different types of cross-border financial flows in the context of how the trilemma configurations interact with external financing and affect the macroeconomic goals.

To summarize our results, we find that developing countries with more stable exchange rates tend to experience higher output volatility, although higher international reserves can mitigate that effect. This result is most pronounced among emerging market countries. Also, countries with more developed financial markets experience lower levels of output volatility. Commodity exporters with more open financial markets tend to experience lower output volatility, though accumulating higher levels of international reserves can cancel that effect and lead to higher output volatility.

Somewhat counter to previous findings, greater exchange rate stability leads to greater inflation volatility. For commodity exporting countries, higher levels of monetary independence tend to lead to lower inflation volatility. Despite the findings in the inflation volatility regressions, we find countries with higher exchange rate stability tend to experience lower inflation as has been found in the literature. Also, countries with more monetary autonomy tend to experience higher inflation, which may reflect countries' motives to monetize their debt. Furthermore, financial openness helps a country to experience lower inflation.

In the investigations that incorporate the effect of external financing, we find that net recipients of cross-border bank lending tend to experience higher output volatility, a result that possibly reflects that countries that experience macroeconomic turmoil often experience an increase in banking lending inflows prior to the turmoil. The influx of portfolio investment also seems to lead to higher inflation volatility. We also find that the volatility increasing effect of net inflows of bank lending can be dampened if the country adopts the policy combination of monetary independence and financial openness (i.e., greater flexibility of exchange rate regime).

Furthermore, countries with more fixed exchange rates that also adopt whether greater monetary independence or more capital account openness, are particularly vulnerable to the risk of portfolio inflows making inflation more volatile, which conversely implies that those economies with more flexible exchange rates can prevent FDI or portfolio inflows from increasing inflation volatility. Lastly, our findings indicate that net-recipients of either portfolio investment or bank lending can alleviate inflationary pressure by having more flexible exchange rates.

## **2. Measures of the Trilemma Dimensions**

The empirical analysis of the tradeoffs being made requires measures of the policies. Unfortunately, there's a paucity of good measures; in this paper we attempt to remedy this deficiency by creating several indices.



## 2.1 Construction of the Trilemma Measures

### *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.<sup>4</sup>

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

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

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.

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*.

### *Exchange Rate Stability (ERS)*

To measure exchange rate stability, annual standard deviations of the monthly 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:

$$ERS = \frac{1}{1 + \frac{\text{stdev}(\text{exch\_rate})}{|d \log E_t / dt| + 0.01}}$$

$|d \log E_t / dt|$  is the absolute value of the year-on-year depreciation rate using the exchange rate as of December of the year. Higher values of this index indicate more stable movement of the exchange rate against the currency of the base country.

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<sup>4</sup> 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*.

## ***Financial Openness/Integration (KAOPEN)***

Without question, it is extremely difficult to measure the extent of capital account controls.<sup>5</sup> 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 surrender of export proceeds.<sup>6</sup> 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.<sup>7</sup>

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.<sup>8</sup> The data set we examine does not include the United States. The Appendix presents data availability in more details.

## **2.2 Tracking the Indexes**

### ***Variations across Country Groupings***

Comparing these indexes provides some interesting insights into how the international financial architecture has evolved over time. For this purpose, the “diamond charts” are most useful. Figure 3 summarizes the trends for industrialized countries, those excluding the 12 euro countries, emerging market countries, and non-emerging market developing countries.<sup>9</sup> It shows that industrial countries have moved toward financial liberalization over the years. One can see

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<sup>5</sup> 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.

<sup>6</sup> This index is described in greater detail in Chinn and Ito (2008).

<sup>7</sup> *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.

<sup>8</sup> 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.

<sup>9</sup> The emerging market countries are defined as the countries classified as either emerging or frontier during the period of 1980-1997 by the International Financial Corporation plus Hong Kong and Singapore.

that industrialized countries have also stabilized exchange rates, but this result is mainly driven by the countries that have adopted the euro. Once the euro countries are removed, the remaining industrialized countries do not appear to have lost monetary independence. The figure also highlights that developing countries moved toward greater exchange rate flexibility and deeper financial integration. Both trends are more pronounced for the emerging market countries than for non-emerging market developing countries. In addition, the emerging market group of countries is distinct in terms of experiencing a rapid rise in the level of international reserves accumulation. While non-emerging market developing countries also experienced some increase in their international reserves, the change in their reserves has been much more moderate. In contrast, industrialized countries have lowered their holdings of reserves.

Figure 4 compares developing countries across different geographical groups. Developing countries in both Asia and Latin America (LATAM) have moved toward exchange rate flexibility, but LATAM countries have rapidly increased financial openness while Asian counterparts haven't. Asian emerging market economies have moved further toward financial openness on a level comparable with LATAM emerging market countries, yet one key difference between the two groups is that the former holds much more international reserves than the latter. Sub-Saharan African countries have also moved toward floating exchange rate and financial liberalization compared to the 1980s, but the extent of the change is much less marked.

### ***Patterns in a Balanced Panel***

Figure 5 again presents the development of trilemma indexes for different subsamples while focusing on the time dimension of the development of the indexes, but also restricts the entire sample to include only the countries for which all three indexes are available for the entire time period. By balancing the dataset, the number of countries included in the sample reduces to 50 countries out of which 32 countries are developing countries including 18 emerging market countries. Each panel presents the full sample (i.e., cross-country) average of the trilemma index of concern and also its one-standard deviation band. There is a striking difference between industrialized and developing countries.

The top-left panel shows that, between the late 1970s and the late 1980s, the levels of monetary independence are closer to each other between industrialized countries and developing ones. However, since the early 1990s, these two groups have been diverging from each other. While developing countries have been hovering around the medium levels of monetary independence and slightly deviating from the cross-country average, industrialized countries have steadily become much less monetary independent and moved farther away from the cross-

country average, reflecting the efforts made by the euro member countries.<sup>10</sup> In the case of the exchange rate stability index, industrialized countries experienced a constant level of exchange rate stability until the end of the 1990s, while developing countries had been on a general trend toward more exchange rate flexibility since the mid-1970s. After the introduction of the euro in 1999, industrialized countries drastically increased the level of exchange rate stability while developing countries continued to remain around the mid-level of exchange rate flexibility.<sup>11</sup> Not surprisingly, industrialized countries have achieved higher levels of financial openness throughout the period. The acceleration of financial openness in the mid-1990s remained significantly high compared to the cross-country average of both the full sample and LDC subsample. On the other hand, developing countries also accelerated financial openness in the early 1990s, but this is after some retrenchment during the 1980s. Overall, LDC countries have been in parallel with the global trend of financial liberalization throughout the sample period, but the difference from the industrialized countries has been moderately rising in the last decade.

The difference between emerging market countries and non-emerging market, developing countries (shown in the bottom row of Figure 5) is smaller than that between IDC and LDC subsamples. However, the divergence in terms of monetary independence and financial openness has been noticeable since the mid-1990s. While non-EMG countries have retained relatively constant levels of monetary independence, EMG countries have become less monetary independent. EMG countries have also become more financially open compared with non-EMG countries.

Table 6 shows the development paths of these indexes altogether, making the differences between IDCs and LDCs appear more clearly. For the industrialized countries, it is clear that after the late 1990s, financial openness and exchange rate stability are the most pursued macroeconomic policies, reflecting the introduction of the euro in 1999.<sup>12</sup> The group of developing countries presents a very different picture. Up to 1990, exchange rate stability was the most pervasive policy among the three, though it has been on a declining trend since the early 1970s. During the 1990s, the level of monetary independence went up on average while more countries adopted floating exchange rates and liberalized financial markets. Interestingly, all three variables have been converged since the 2000. This result suggests that developing countries have converged towards managed exchange rate flexibility, and also is consistent with

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<sup>10</sup> When the euro countries are removed from the IDC sample, the extent of the divergence from the average becomes less marked although there is still a tendency among the non-euro countries to move toward lower levels of monetary independence.

<sup>11</sup> The trend of the non-euro industrialized countries after the late 1990s more or less traces that of developing countries though it is a little more volatile.

<sup>12</sup> If the euro countries are removed from the sample (not reported), financial openness evolves similarly to the IDC group that includes the euro countries, but exchange rate stability hovers around the line for monetary independence, though at a bit higher levels, after the early 1990s. The difference between exchange rate stability and monetary independence has been slightly diverging after the end of the 1990s.

the sizable increase in international reserves which many have viewed as critical to sustaining monetary independence in a time of growing financial integration. Willett (2003) has called this compulsion by countries with a mediocre level of exchange rate fixity to hoard reserves the “unstable middle” hypothesis.

### 2.3 Identifying Structural Breaks

To shed more light on the evolution of the index values, we investigate whether major international economic events have been associated with structural breaks in the index series. We conjecture that major events – such as the breakdown of the Bretton Woods system in 1973, the Mexican debt crisis of 1982 (indicating the beginning of 1980’s debt crises of developing countries), and the Asian Crisis of 1997-98 (the onset of sudden stop crises affecting high-performing Asian economies (HPAEs), Russia and other emerging countries) – may have affected economies in such significant ways that they opted to alter their policy choices.

We identify the years of 1973, 1982, 1997-98, and 2001 as candidate structural breaks, and test the equality of the group mean of the indexes over the candidate break points for each of the subsample groups.<sup>13</sup> The results are reported in Table 1 (a). The first and second columns of the top panel indicate that after the breakdown of the Bretton Woods system, the mean of the exchange rate stability index for the industrialized country group fell statistically significantly from 0.55 to 0.45, while the mean of financial openness slightly increase from 0.44 to 0.47. Interestingly, non-emerging market developing countries significantly increased the level of fixity of their exchange rates (from 0.52 to 0.82) over the same time period while they became less monetarily independent and more financially open. However, the movement toward more fixed exchanged rates is not observed among emerging market economies. In fact, these economies moved toward more freely floating exchange rates.

Even after the Mexican debt crisis, industrialized countries continued to increase exchange rate flexibility and financial openness, while holding constant the level of monetary independence. In contrast, the debt crisis led *all* developing countries to pursue further exchange rate flexibility, most likely reflecting the fact that crisis countries could not sustain fixed exchange rate arrangements. However, these countries also simultaneously pursued more monetary independence. Interestingly, non-emerging market countries tightened capital controls as a result of the debt crisis while emerging market countries did not alter their stance.

The Asian crisis also appears to be a significant event in the evolution of the trilemma indexes. The level of industrialized countries’ monetary independence dropped significantly

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<sup>13</sup> The data for the candidate structural break years are not included in the group means either for pre- or post-structural break years. For the Asian crisis, we assume the years of 1997 and 1998 are the break years and therefore remove observations for these two years.

while their exchange rates became much more stable and their efforts of capital account liberalization continued, all reflecting the European countries' movement toward economic and monetary union. Non-emerging market developing countries on the other hand started pursuing financial integration and continued to pursue more flexible exchange rates and more independent monetary policy. Emerging market countries on the other hand also started liberalizing financial markets much further, but lost monetary independence while pursuing flexible exchange rates.

Several other major events are candidates for inducing structural breaks identified. For example, anecdotal accounts date globalization at the beginning of the 1990s, when many developing countries began to liberalize financial markets. Also, China's entry to the World Trade Organization in 2001 was, in retrospect, the beginning of the country's rise as *the* world's manufacturer. Because the effect of these events may have often been conflated with that of the Asian crisis we also test whether the years of 1990 and 2001 can be structural breaks.

The results are reported in Table 1 (b); the first two columns show the results of the mean equality test for the trilemma indexes with the year of 1990 as the candidate structural break whereas the last two columns report those with the year of 2001 as the structural break. The top panel shows that for industrialized countries, 1990 can be a structural break for all three indexes. However, when we compare the statistical magnitude of the change in the index for monetary independence across different candidate structural breaks (i.e., compare the t-statistics for monetary independence in column 4 of Table 1 (a), in column 2 of Table 1 (b), and in column 4 of Table 1 (b)), the mean equality test is most strongly rejected for the no structural break of 1997-98 hypothesis. We obtain the same result for exchange rate stability though for financial openness, the structural break of 1990 rejects the null hypothesis the most significantly.<sup>14</sup>

We apply the same test to the samples of non-emerging developing countries and emerging market countries. For the group of non-emerging market developing countries, the structural break of 1990 is the most significant for all indexes. For emerging market countries, however, the most significant structural break is found to have occurred in 2001 for monetary independence, in 1990 for exchange rate stability, and in 1997-98 for financial openness.

Lastly, we compare the t-statistics across different structural breaks for each of the indexes and subsamples. Given that the balanced dataset is used in this exercise, the largest t-statistics should indicate the most significant structural break for the series. For example, industrial countries' monetary independence and exchange rate stability series have the largest t-

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<sup>14</sup> The finding that both monetary independence and exchange rate stability entail structural breaks around the Asian crisis can be driven merely by the countries that adopted the euro in 1999. We repeat the same exercise using the industrial countries sample without the euro countries, and find that the structural breaks for monetary independence and financial opens remain the same as in the full IDC sample (1997-98 and 1990, respectively), but that the exchange rate stability series is found to have a structural break in 2001. Also, the change in the exchange rate stability series is negative (i.e., further exchange rate flexibility) in both 1990 and 2001.

statistics when the structural break of 1997-98 is tested.<sup>15</sup> For financial openness, however, the year of 1990 is identified with the largest structural break. The results for other variables and subsamples are shown in Table 1 (c). For non-emerging LDC and EMG countries, structural breaks for monetary independence and exchange rate stability are found to have occurred in 2001 and 1982, respectively. While the breakdown of the Bretton Woods system was the most significant event for non-emerging LDC countries in terms of the countries' financial liberalization policy, the Asian crisis was the most significant event for emerging market countries.

## 2.4 The Linear Relationships between the Trilemma Indexes

While the preceding analyses are quite informative on the evolution of international macroeconomic policy orientation, we have not shown whether these three macroeconomic policy goals are “binding” in the context of the impossible trinity. That is, it is important for us to confirm that countries have faced the trade-offs based on the trilemma. A challenge facing a full test of the trilemma tradeoff is that the trilemma framework does not impose any obvious functional form on the nature of the tradeoffs between the three trilemma variables. To illustrate this concern, we note that the instrument scarcity associated with the trilemma implies that increasing one trilemma variable, say higher financial integration, should induce lower exchange rate stability, or lower monetary independence, or a combination of these two policy adjustments.<sup>16</sup> Yet, the nature of the trade-off is not specified. Hence, we test the validity of a simplest possible trilemma specification – a linear tradeoff. Specifically, we test that the weighted sum of the three trilemma policy variables adds up to a constant. This reduces to examining the goodness of fit of this linear regression:

$$1 = a_j MI_{i,t} + b_j ERS_{i,t} + c_j KAOPEN_{i,t} + \varepsilon_t \quad \text{where } j \text{ can be either IDC, ERM, or LDC.} \quad (1)$$

Because we have shown that different subsample groups of countries have experienced different development paths, we allow the coefficients on all the variables to vary across different groups of countries – industrialized countries, the countries that have been in the European Exchange Rate Mechanism (ERM), and developing countries – allowing for interactions between the

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<sup>15</sup> When the sample is restricted to non-euro IDCs, the most significant structural break is found to be 2001 for exchange rate stability while those for monetary independence and financial openness are unchanged.

<sup>16</sup> More generally, increasing of one Trilemma variable should induce a drop of the second Trilemma variable, or a drop in the third Trilemma variable, or a combination of the two.

explanatory variables and the dummies for these subsamples.<sup>17</sup> The regression is run for the full sample period as well as the subsample periods identified in the preceding subsection. The results are reported in Table 2.

The rationale behind this exercise is that policy makers of an economy must choose a weighted average of the three policies in order to achieve a best combination of the two. Hence, if we can find the goodness of fit for the above regression model is high, it would suggest a linear specification is rich enough to explain the trade off among the three policy dimensions. In other words, the lower the goodness of fit, the weaker the support for the existence of the trade-off, suggesting either that the theory of the trilemma is wrong, or that the relationship is non-linear.

Secondly, the estimated coefficients in the above regression model should give us some approximate estimates of the weights countries put on the three policy goals. However, the estimated coefficients alone will not provide sufficient information about “how much of” the policy choice countries have actually implemented. Hence, looking into the predictions using the estimated coefficients and the actual values for the variables (such as  $\hat{MI}$ ,  $\hat{ERS}$ , and  $\hat{KAOPEN}$ ) will be more informative.

Thirdly, by comparing the predicted values based on the above regression, i.e.,  $\hat{MI} + \hat{ERS} + \hat{KAOPEN}$ , over a time horizon, we can obtain some inferences regarding how “binding” the trilemma is. If the trilemma is found to be linear, the predicted values should hover around the value of 1, and the prediction errors should indicate how much of the three policy choices have been “not fully used” or to what extent the trilemma is “not binding.”

Table 2 presents the regression results. The results from the regression with the full sample data are reported in the first column, and the others for different subsample periods are in the following columns. First of all, the adjusted R-squared for the full sample model as well as for the subsample periods is found to be above 94%, which indicates that the three policy goals are linearly related to each other, that is, countries face the trade-off among the three policy options. Across different time periods, the estimated coefficients vary, suggesting that countries alter over time the weights on the three policy goals.

Figure 7 illustrates the goodness of fit from a different angle. In the top panels, the solid lines show the means of the predicted values (i.e.,  $\hat{MI} + \hat{ERS} + \hat{KAOPEN}$ ) based on the full sample model in the first column of Table 2 for the groups of industrial countries (left) and developing countries (right).<sup>18</sup> To incorporate the time variation of the predictions, the subsample mean of the prediction values as well as their 95% confidence intervals (that are shown as the

<sup>17</sup> The dummy for ERM countries is assigned for the countries and years that corresponds to participation in the ERM (i.e., Belgium, Denmark, Germany, France, Ireland, and Italy from 1979 on, Spain from 1989, U.K. only for 1990-91, Portugal from 1992, Austria from 1995, Finland from 1996, and Greece from 1999).

<sup>18</sup> For this exercise, predictions also incorporate the interactions with the dummy variables shown in Table 2.



shaded areas) are calculated using five-year rolling windows.<sup>19</sup> The panels also display the rolling means of the predictions using the coefficients and actual values of only two of the three trilemma terms –  $\hat{a}MI + \hat{b}ERS$  (brown line with diamond nodes),  $\hat{a}MI + \hat{c}KAOPEN$  (green line with circles),  $\hat{b}ERS + \hat{c}KAOPEN$  (orange line with “x”).

From these panels of figures, we can see first that the predicted values based on the model hover around the value of one closely for both subsamples. For the group of industrial countries, the prediction average is statistically below the value of one in the late 1970s, the early 1980s, and the late 1980s. However, since the beginning of the 1990s, one cannot reject the null hypothesis that the mean of the prediction values is one, indicating that the trilemma is “binding” for industrialized countries since then. For developing countries, the model is under-predicting from the end of the 1970s through the beginning of the 1990s. However, unlike the IDC group, the mean of the predictions has become statistically smaller than one since 2000. At the very least, the mean of the predictions never rises above the value of one in statistical sense, implying that, despite some years when the trilemma is not binding, the three macroeconomic policies are linearly related with each other.<sup>20</sup>

The top panels also show that, among industrialized countries, the policy combination of increasing exchange rate stability and more financial openness became increasingly prevalent after the beginning of the 1990s whereas that of monetary independence and exchange rate stability has been consistently declining over the years. Among developing countries, the policy combination of exchange rate stability and financial openness has been the least prevalent over the sample period, most probably reflecting the bitter experiences of currency crises. The policy combinations of monetary independence and financial openness or that of monetary independence and exchange rate stability has been quite dominant, but that is mainly because of the dominant preference for monetary independence through the time period.

<sup>19</sup> Both the mean and the standard errors of the predicted values are calculated using the rolling five-year windows.

The formula for the mean and the standard errors can be shown as  $\bar{x}_{t|t-4} = \frac{\sum_{i=1}^{t-4} \sum_{j=1}^n \hat{x}_{i,t}}{n \times 5}$  and

$SE(\hat{x}) = \sqrt{\frac{\sum_{i=1}^{t-4} \sum_{j=1}^n (\hat{x}_{i,t} - \bar{x}_{t|t-4})^2}{n \times 5 - 1}} / \sqrt{n \times 5}$ , respectively, where  $n$  refers to the number of countries in a subsample (i.e., IDC and

LDC),  $\hat{x}_{i,t}$  to the prediction values, and  $\bar{x}_{t|t-4}$  to the mean of  $\hat{x}_{i,t}$  in the rolling five-year window.

Because of the use of rolling five-year windows, the lines in the figures only start in 1974.

<sup>20</sup> One may question the uniqueness of this regression exercise by pointing at the left-hand side variable being an identity scalar. As a robustness check, we ran a regression of  $MI_{i,t}$  on  $ERS_{i,t}$  and  $KAOPEN_{i,t}$ , recovered the estimated coefficients for  $a_j$ ,  $b_j$ , and  $c_j$  in equation (1), and recreated panels of figures comparable to those in Figure 7. These alternative figures appeared to be very much comparable to Figure 7 and therefore confirmed our conclusions about the linearity of the trilemma indexes as well as the development of the subsample mean of prediction values based on equation (1).

In the lower panels, we can observe the contributions of each policy orientation (i.e.,  $\hat{MI}$ ,  $\hat{ERS}$ , and  $\hat{KAOPEN}$ ) for the IDC and LDC groups.<sup>21</sup> These panels present a picture consistent with Figures 5 and 6. While less developed countries maintained high, though fluctuating, levels of monetary independence as well as a low, but constant level of exchange rate stability, these countries gradually increased the level of capital account openness since the 1990s. However, this effort of achieving three policy goals at once can be done only when the countries accumulate high levels of international reserves that allow them to intervene in foreign exchange markets, consistent with the fact that many developing countries increased international reserves in the aftermath of the Asian crisis of 1997-98. However, as the concept of the trilemma predicts, this sort of environment must involve a rise in the costs of sterilized intervention especially when the actual volume of cross-border transactions of financial assets increase and when there is no reversal in the three policies.<sup>22</sup> This seems to explain the drop in the level of monetary independence after 2000 for this group of countries.<sup>23</sup>

The experience of the industrialized countries casts a stark contrast. Although monetary independence was also IDC's top priority until the 1990s, it yielded to financial integration in the early 1990s when many industrialized countries liberalized their financial markets. The efforts of financial liberalization correspond to declines in the level of monetary independence, which persistently kept falling and became the lowest priority in the 2000s. Such changes in the relative weights of the three policy goals do not require the countries to accumulate international reserves as was the case with developing countries.

We also repeat the exercise using the regression models for each of the subsample period (excluding the break years). The results (not reported) are qualitatively the same as in Figure 7. Also, using the predictions based on the subsample-based models, we test to see if there are any structural breaks in the predicted values in the same way as in the previous subsection. Interestingly, we find that for both IDC and LDC groups, the year of 1990 is found to be the most significant structural break. As far as the test results are concerned, the year of 1990, or the starting year of waves of globalization, appears to be the most significant event that affects the international financial architecture.

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<sup>21</sup> They are again the means based on five-year rolling windows.

<sup>22</sup> Refer to Aizenman and Glick (2008) and Glick and Hutchison (2008) for more analysis on the limit of sterilized intervention.

<sup>23</sup> When this exercise is repeated for both the emerging market country (EMG) group and the non-emerging market developing country group (Non-EMG LDC), the results remain about the same, only except for that the financial liberalization is more evident and the drop in the level of monetary independence is larger for the EMG group.

### 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:

$$y_{it} = \alpha_0 + \alpha_1 TLM_{it} + \alpha_2 TR_{it} + \alpha_3 (TLM_{it} \times TR_{it}) + X_{it}B + Z_t\Gamma + D_i\Phi + \varepsilon_{it} \quad (2)$$

$y_{it}$  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 the trilemma index, namely,  $MI$ ,  $ERS$ , and  $KAOPEN$ , included individually or collectively.  $TR_{it}$  is the level of international reserves (excluding gold) as a ratio to GDP, and  $(TLM_{it} \times TR_{it})$  is an interaction term between the trilemma index and the level of international reserves. We are particularly interested in the effect of the interaction term 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 include a dummy for oil exporting countries and regional dummies. Explanatory variables that persistently appear to be statistically insignificant are dropped from the estimation.  $\varepsilon_{it}$  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), the latter 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

defined by the World Bank, and a subgroup of emerging market countries (EMG). Except for the regional dummies, the same set of explanatory variables is used for the three subsamples for comparison purposes. Below, we will present and discuss the regression results primarily focusing on developing countries.

### **3.1 Estimation of the Basic Model**

#### ***Output Volatility***

The regression results for the estimation on output volatility are shown in Tables 3-1 through 3-3 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.<sup>24</sup>

The model explains well the output volatility for the developing countries subsample. 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 in this context is on U.S. real interest rate, the higher output volatility of developing countries becomes, 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 becomes, consistent with Rodrik (1998) and Easterly, Islam and Stiglitz (2001) who argue that volatility in world goods through trade openness can raise output volatility. Countries with procyclical fiscal policy tend to experience more output volatility while oil exporters experience more output volatility. Countries in East Asia and Pacific as well as in Sub Sahara Africa tend to experience more output volatility (results not reported).

Significantly, 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).

Interestingly, countries with more stable exchange rate tend to experience higher output volatility. Conversely, this implies that countries with more flexible exchange rates will experience lower levels of output volatility, as was found in Edwards and Levy-Yeyati (2003)

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<sup>24</sup> 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 Haruka (2007). This result is detected in different specifications (columns 2, 4, and 6) and is robust to the inclusion of other trilemma indexes, the interaction term, or both. These results highlight the contrast between the developing countries and the industrialized countries (not reported) that tend to experience higher output volatility when they have more monetary independence and more closed financial markets.

Like other developing countries, less developed commodity exporting countries are also susceptible to TOT shocks, but other variables do not exhibit the same effects. Countries with higher levels of exchange rate fixity, again, tend to experience higher output volatility. Unlike the LDC sample, more financially open commodity exporters are supposed to experience smaller output volatility. But interestingly, the coefficient on the interaction term between *KAOPEN* and international reserve holding is found to be significantly *positive*. These results indicate that countries with higher levels of reserves holding tend to experience *more* output volatility; only countries with total reserves less than 21% (model 5) to 23% (model 6) of GDP can experience lower levels of output volatility. This result is somewhat counterintuitive.

Emerging market countries (Table 3-3) share many of the same traits as the LDC sample. The effect of trade openness, which characterizes emerging market countries, is found to have ambiguous effects for emerging market countries, and indeed for all other subsamples of developing countries. In a sense, 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.<sup>25</sup>

The positive effect of exchange rate stability on output volatility is also found for this group of countries. Additionally, the interaction term is found to have a negative effect, suggesting that countries with high levels of international reserves holding are able to reduce output volatility. The threshold level of international reserves holding is 33% of GDP, which is very much on the high end. Singapore, a country with a high level of exchange rate stability (0.86 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 4.7 percentage points.<sup>26</sup> Even for China, whose exchange rate stability index is 0.34 and whose ratio of reserves holding to GDP is 40% in 2006, is able to reduce volatility by a mere -0.002.<sup>27</sup> Thus, only a handful of countries are able to cancel the output-volatility-enhancing effect of having more fixed exchange rate. Countries with

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<sup>25</sup> 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. (2003), Cavallo (2005, 2007), and Cavallo and Frankel (2004).

<sup>26</sup> See Moreno and Spiegel (1997) for earlier study of trilemma configurations in Singapore.

<sup>27</sup> The Chinese exchange rate stability index drastically drops after 2005 when the country aborted its fixed exchange rate and adopted a managed float system in July 2005.

lower levels of reserves than the threshold can reduce output volatility by adopting a more flexible exchange rate regime.<sup>28</sup>

Countries that experience currency crises could experience a high volatility in their output growth. Therefore, we also test if including a dummy that captures currency crises could affect the estimation results.<sup>29</sup> The results are unaffected by the inclusion of a crisis dummies.

### ***Inflation Volatility***

We repeat the exercise for inflation volatility. Since the estimation results are sensitive to the inclusion or exclusion of outliers, we decide to use the robust regression method which downweights outliers.<sup>30</sup> Also, we remove the observations if their values of inflation volatility are greater the value of 30 or the rate of inflation (as an explanatory variable) is greater than 100%. The results for subsamples of developing countries are reported in Tables 4-1 through 4-3.

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. For commodity exporters and emerging market countries, the TOT shock is found to increase inflation volatility.

Among the trilemma indexes, in the LDC subsample, and to a lesser degree the EMG subsample, more stable exchange rates are associated with *higher* inflation volatility, which is contrary to what has been found in the literature (such as Ghosh, et al., 1997) and somewhat counterintuitive, because countries with more fixity in their exchange rates should experience lower inflation and thereby lower inflation volatility. One possible explanation is that countries with fixed exchange rates tend to lack fiscal discipline and eventually experience devaluation as Tornell and Velasco (2000) argue.<sup>31</sup> When we include the interaction term between the crisis

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<sup>28</sup> 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.

<sup>29</sup> 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.

<sup>30</sup> The robust regression procedure conducts iterative weighted least squares regressions while downweighting observations that have larger residuals until the coefficients converge.

<sup>31</sup> Tornell and Velasco argue that while countries with flexible exchange rates face the cost of having lax fiscal policy immediately, countries with fixed exchange rates tend to lack fiscal discipline because “under fixed rates bad behavior today leads to punishment tomorrow.” Another possible interpretation is that greater exchange rate stability tends to increase the volatility of the CPI in countries affected by terms of trade shocks. Under a flexible exchange rate regime, exchange rate appreciation (depreciation) induced by terms of trade improvement

dummy and the ERS variable to isolate the effect of exchange rate stability for the crisis countries, the estimated coefficient on ERS still remains with the same magnitude and statistical significance.

For the group of commodity exporters, countries with higher levels of monetary independence appear to be able to lower inflation volatility. This finding is reasonable given the monetary independence allows a country to use monetary policy to adjust to internal or external shocks.

### ***Level of Inflation***

Tables 5-1 through 5-3 show the results for the regressions on the level of inflation. These regressions are also conducted using the robust regression method because of the presence of extreme outliers.<sup>32</sup> These three tables report that countries with higher inflation volatility and M2 growth volatility tend to experience higher output volatility.

Despite the findings in the inflation volatility regressions, countries with more monetary autonomy tend to experience higher inflation. This result is somewhat counterintuitive and contradict the results from the regressions in inflation volatility. One possible explanation would be that countries with higher levels of monetary independence attempt to monetize their debt and cause constantly (i.e. with lower variance) higher inflation.

As has been found in the literature, higher exchange rate stability leads countries to experience lower inflation, a result persistently found in all the three subsamples. Ghosh et al. (1997) and many others have shown that pegged exchange rate regimes tend to experience lower inflation. 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.

Furthermore, for the group of developing countries, the interaction term between ERS and international reserves holding is found to have a positive impact on the rate of inflation. Models 4 and 6 in Table 5-1 show that if the ratio of reserves holding to GDP is greater than 34% or 42%, respectively, the efforts of pursuing exchange rate stability can help increase the

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(deterioration) tends to dampen the inflationary (deflationary) effects of the greater (lower) demand for non traded goods induced by the income effect of terms of trade improvement (deterioration). In contrast, in a credibly fixed exchange rate, terms of trade shocks would result with greater volatility of the CPI than the one observed under a flexible exchange rate regime. Hence, in regimes where exchange rate stability reduces average inflation, we may detect higher inflation volatility, which de-facto indicates higher CPI volatility.

<sup>32</sup> We also removed extreme outliers in the same way as in the inflation volatility regressions.

level of inflation. These levels of reserves holding are relatively high. This means that countries with very high levels of reserves holding will not succeed in fully sterilizing foreign exchange intervention to maintain exchange rate stability, thereby experiencing higher inflation. Both Aizenman and Glick (2008) and Glick and Hutchison (2008) show that China has started facing more inflationary pressure as a result of intensive market interventions to sustain exchange rate stability.

Lastly, the more financially open a developing country is, the lower inflation it will experience. The negative coefficient on *KAOPEN* is consistently found among the three subsamples. Interestingly, the more open to trade a country is, the more likely it is to experience lower inflation, though this effect is statistically significant only for the LDC group.

As globalization became actively debated, the negative association between “openness” and inflation was more frequently remarked upon.<sup>33</sup> Romer (1993), extending the Barro-Gordon 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.<sup>34</sup> Here, across different subsamples of developing countries, we present evidence consistent with the negative openness-inflation relationship.<sup>35</sup>

### **3.2. How Does a Policy Orientation Affect Macroeconomic Performance?**

#### ***Composite Indexes for Policy Orientation***

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 in Figure 1.

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<sup>33</sup> Rogoff (2003) argues that globalization contributes to dwindling mark-ups, and thereby, disinflation.

<sup>34</sup> Loungani et al. (2001) provides empirical evidence that countries with greater restrictions on capital mobility face steeper Phillips curves.

<sup>35</sup> The same finding is also evidenced for the group of industrialized countries (not reported).



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\_KAOPEN*) refers to the vertex of currency union or currency board, and that of *MI* and *KAOPEN* (*MI\_KAOPEN*) to “floating exchange rate.” Again, all three indexes are normalized between zero and one. Higher values indicate closer a country is toward the vertex of the trilemma triangle.

### ***Estimation with Composite Indexes***

Columns 7 through 12 in Tables 3-1 through 5-3 show the estimation results for different models each of which include one composite index and its interaction with reserves holding. Tables 3-1 through 3-3 show that countries with higher *MI\_ERS* and countries with higher *ERS\_KAO* tend to experience higher output volatility. This is more evident among emerging market countries. For this group, it is found that countries with the ratio of international reserves holding greater than 31% of GDP are able to alleviate the positive (i.e., output volatility-increasing) impact of pursuing the policy combination of monetary independence and exchange rate stability. Countries with higher monetary independence and higher degree of financial openness are prone to face lower output volatility. However, commodity exporters with a higher IR ratio than 24% will have to face higher output volatility.

In Tables 4-1 through 4-3, we see that developing countries with greater monetary independence and higher exchange rate stability tend to experience higher inflation volatility, although countries with higher international reserves holding, higher than 29% of their GDP, are marginally able to alleviate that impact. Commodity exporters that pursue greater monetary independence and financial openness tend to experience less inflation volatility (Table 4-2), while emerging market countries with greater exchange rate stability and financial openness tend to experience higher inflation volatility.<sup>36</sup>

The level of inflation can be lowered if a country pursues greater monetary independence and more stable exchange rates (Columns 7 and 8 in Table 5-1). However, holding a higher level of international reserves (higher than 34% of its GDP) can nullify the benefit of pursuing that policy combination. Interestingly, the signs of the estimated coefficients are opposite between the finding for the output volatility regression (in Table 3-1) and that for the inflation level regression (in Table 5-1) for both the composite indexes and their interaction terms with similar threshold levels of reserves holding. This result implies that countries with higher levels of monetary independence and exchange rate stability have to face a trade-off; such policy

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<sup>36</sup> This result is somewhat counterintuitive. However, once external financing is incorporate as we do in a later section, this positive coefficient disappears.

combination will allow it to reduce the level of inflation, but make it face higher output volatility. A policy combination of more stable exchange rates and more open capital account will allow a country to experience lower inflation. This finding holds for all three groups of developing countries.

## **4. Further Analyses of the Impact of External Financing**

### **4.1 Impacts of External Financing**

We have seen that financial liberalization increased its pace over the last two decades. However, this 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 shy away from sovereign debt. After the 1990s, the role of FDI became important for countries' development and the recent waves of financial liberalization have contributed to a rise in portfolio flows across borders as well. In sum, as Lane and Milesi-Ferretti (2006) note, the types, the volumes, and direction, of capital flows have changed over time.

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 capital of the type of concern. Short-term debt is included as the ratio of total external debt and total debt service is as 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.

The estimation results are reported in Table 5 for all three dependent variables, output volatility in columns 1 through 4, inflation volatility in columns 5 through 8, and inflation level in columns 9 through 12. To conserve space, we present the estimated coefficients only for the variables of our interest.<sup>37</sup> Table 5 shows that the more 'other' capital inflows, i.e., banking lending, a country receives, the more likely it is to experience higher output volatility, possibly reflecting that countries that experience macroeconomic turmoil often experience an increase in banking lending inflows. The influx of portfolio investment also seems to lead to higher inflation

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<sup>37</sup> Overall, other macroeconomic variables retain the characteristics found in the previous regressions, though they tend to be less statistically significant.

volatility (in columns 7 and 8). However, FDI inflows do seem 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 mostly insignificant, coefficients on the net FDI inflow variables in the inflation level regressions. More importantly, the negative effect of net portfolio inflows is bigger and more significant. We come back to this issue later on.

Both short-term debt and total debt service are positive and significant contributors to both inflation volatility and inflation level, indicating that countries tend to monetize their debt.

Among the trilemma indexes, more stable exchange rates continue to be a positive contributor to output volatility and a negative one to the level of inflation. A country with greater monetary independence is expected to experience higher inflation. Holding more international reserves may dampen the effect of monetary independence, but the estimated coefficient is not significant. Financial openness is now a negative contributor to output volatility, but if the level of international reserves held by a country is above 21-22%, financial openness can positively help increase output volatility. But given the positive coefficients on net portfolio inflows and net 'other' inflows, though only the latter is statistically significant, financial openness being a positive contributor to output volatility is somewhat understandable.

#### **4.2. External Financing and Policy Orientation**

The combination of two of three policy stances is what matters to the macro outcomes. Hence, 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.<sup>38</sup> 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. However, because it is not uncommon that a country has all three indexes scoring high values, we create dummy variables for the type of policy orientation. 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 estimations, whose results are shown in Table 6, we interact the external financing variables with the dummy for one particular type of policy combination. For example, in columns 1 and 2 of Table 6, we use in the estimation of output volatility the dummy for the policy orientation of greater monetary independence and exchange rate stability (MI\_ERS) 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, and columns 5 and 6 use that of greater exchange rate stability and further financial

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<sup>38</sup> See IMF (2007) for an examination of the relationship between how countries manage capital inflows and subsequent macroeconomic outcomes.

opening. The following six columns report the results for the estimation of inflation volatility and the next six for the level of inflation.

In the estimation of output volatility, we find that the greater the debt service is, the more likely a country is to experience higher levels of output volatility. However, if the country pursues a combination of greater monetary independence and exchange rate stability, it could dampen, or even reduce, the level of output volatility, although the estimated coefficient of the interaction term between total debt service and MI\_ERS is not statistically significant. Columns 3 and 4 show that positive net inflows of bank lending can be volatility increasing, but also that that effect can be dampened if the country adopts the policy combination of monetary independence and financial openness (i.e., floating exchange rate regime). Given flexible exchange rate allows a country to adjust itself, smaller output volatility is reasonable. The table also shows that a country with greater exchange rate stability and financial openness (i.e., currency unions and currency boards) would experience higher output volatility if its debt service is high. 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.

We can also see that a country with monetary independence and exchange rate stability would experience net portfolio inflow leading to higher inflation volatility (columns 7 and 8). Such an effect is also observed among the countries that have adopted the policy combination of ERS and KAO (column 11). But once it decides to further open capital account and becomes a country with monetary independence, but financial openness, it can reduce inflation volatility. These results seem to indicate that countries that adopt higher levels of exchange rate fixity, whether coupled with greater monetary independence or more capital account openness, are particularly vulnerable to the risk of portfolio inflows making inflation more volatile (which is consistent with the results in Tables 4-1 and 4-3). Conversely, this means that those economies can experience lower inflation volatility even if they allow influx of FDI or portfolio flows as long as they adopt more flexible exchange rate systems (Columns 9 and 10).<sup>39</sup>

Similar effects of the types of policy combination are also observed in the estimation for the level of inflation; a country with the policy combination of monetary independence and exchange rate stability or that of exchange rate stability and financial openness tends to experience higher inflation if it is a net recipient of portfolio flows. A country that pursues monetary independence and financial openness, on the other hand, is able to dampen the inflationary effect of portfolio inflows. However, if the level of debt service is high, then it

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<sup>39</sup> Although its net bank lending inflows could increase the level of inflation volatility, its impact is not big compared to the volatility reducing effect from FDI or portfolio inflows.

would have to face higher inflation. These results indicate that, although we previously found that countries with exchange rate stability are more likely to experience lower inflation, if they are net-recipients of either portfolio investment or bank lending, having more flexible exchange rates would help them fend off inflationary pressure. However, this generalization is not applicable to an economy that has to spend more for debt service.

## **5. Concluding Remarks**

Our paper outlined a methodology to trace the changing patterns of the trilemma configurations. Taking a longer-run view, it reveals striking differences between the choices of industrialized and developing countries during 1970-2006. The recent trend suggests that among developing countries, the three dimensions of the trilemma configurations: monetary independence, exchange rate stability, and financial openness, are converging towards a “middle ground” with managed exchange rate flexibility, which they attempted to buffer by holding sizable international reserves, while maintaining medium levels of monetary independence and financial integration. Industrialized countries, on the other hand, have been experiencing divergence of the three dimensions of the trilemma and moved toward the configuration of high exchange rate stability and financial openness and low monetary independence as most distinctively exemplified by the euro countries’ experience.

This configuration of the three macroeconomic policies is an outcome of the evolution of different system arrangements. Over years, external shocks have affected the policy arrangement across countries. In this regard, 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. For both industrialized and developing countries, the major events in the last decade, such as the emergence of rapid globalization and the rise of China, have also impacted the policy arrangements significantly. 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.

We also tested whether the three macroeconomic policy goals are “binding” in the context of the impossible trinity. That is, we attempted to provide evidence that countries have faced the trade-offs based on the trilemma. Because there is no specific functional form of the trade-offs or the linkage of these three policy goals, we tested a simplest linear specification for the three trilemma indexes and examined whether the weighted sum of the three trilemma policy variables adds up to a constant. Our results confirmed that countries do face the binding trilemma. That is, a change in one of the trilemma variables would induce a change with the opposite sign in the weighted average of the other two.

While external forces could impact countries' decisions on the trilemma configurations, policy makers decide on the specifics of the combination of the three policies depending on the goals they would like to achieve. Hence, we also tested 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.

Through our regression exercises, we found countries with higher levels of exchange rate fixity tend to experience higher output volatility. However, this effect can be mitigated by holding international reserves, but the level of international reserves must be as high as 33% of GDP (which is even higher than the average level China experienced in the 2002-06 period). This result led us to conclude adopting a flexible exchange rate system is more effective in controlling the level of output volatility.

We also found more stable exchange rates tend to lead developing countries to experience *higher* inflation volatility while higher levels of monetary independence seem to let commodity exporting countries experience lower inflation volatility.

Despite the findings in the inflation volatility regressions, countries with more monetary autonomy tend to experience higher inflation, which may reflect countries' motives to monetize their debt. But we also found 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. These results seem to indicate that globalization gives more discipline than monetary autonomy to a country's macroeconomic management.

When we examined the impact of policy orientation, i.e., which two out of three policies to choose, on output volatility, inflation volatility, and medium-term inflation rates, we also found interesting results. Countries with higher levels of monetary autonomy and exchange rate stability and countries with higher levels of exchange rate stability and financial openness tend to experience higher output volatility. This is more evident among emerging market countries. For this group, it is found that countries with the ratio of international reserves holding greater than 31% of GDP are able to alleviate the output volatility-increasing impact of pursuing the policy combination of monetary independence and exchange rate stability. Countries with higher monetary independence and higher degree of financial openness are prone to face lower output volatility.

Developing countries with greater monetary independence and higher exchange rate stability are found to experience higher inflation volatility, although countries with higher international reserves holding, higher than 29% of their GDP, are marginally able to alleviate that impact. Commodity exporters that pursue greater monetary independence and financial

openness tend to experience less inflation volatility while emerging market countries with greater exchange rate stability and financial openness tend to experience higher inflation volatility.

As for the impact of policy orientation on the level of inflation, we found that inflation can be lowered if a country pursues greater monetary independence and more stable exchange rates. This result implies that countries with this policy combination have to face a trade-off; such policy combination will allow it to reduce the level of inflation, but make it face higher output volatility.

We also extended our estimation model to investigate whether and how external financing can affect these macroeconomic performances and interact with the trilemma policy configurations. In the model that include net portfolio flows, net FDI flows, and net “other” flows – mostly composed of cross-border bank lending, we find the following: net recipients of cross-border bank lending tend to experience higher output volatility, a result that possibly reflects that countries that experience macroeconomic turmoil often experience an increase in banking lending inflows prior to the turmoil. The influx of portfolio investment also seems to lead to higher inflation volatility. However, FDI inflows are found to contribute to lowering inflation volatility, which is somewhat counterintuitive. Despite the tendency that positive net inflows of bank lending can increase output volatility increasing, we also found that the volatility increasing effect can be dampened if the country adopts the policy combination of monetary independence and financial openness (i.e., floating exchange rate regime).

As for the effect of policy orientation and external financing on inflation volatility, we found that countries with more fixed exchange rates that also adopt whether greater monetary independence or more capital account openness, are particularly vulnerable to the risk of portfolio inflows making inflation more volatile, which conversely implies that those economies with more flexible exchange rates can prevent FDI or portfolio inflows from increasing inflation volatility.

Lastly, although we found that exchange rate stability can help countries to experience lower levels of inflation, we also found that if they are net-recipients of either portfolio investment or bank lending, having more flexible exchange rates would help them fend off inflationary pressure.

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## Appendix: Data Availability of the Trilemma measures

	Country code (cn)	Country Name	Base Country	Monetary Independence (MI) (171)		Exchange rate stability (ERS) (179)		KA Openness (KAOPEN) (177)	
1	512	Afghanistan (C)	U.S.	-	-	1961	2005	1970	2004
2	914	Albania (C)	U.S.	1992	2006	1993	2006	1996	2006
3	612	Algeria (C)	France	1974	2006	1961	2006	1970	2006
4	614	Angola (C)	U.S.	1995	2006	1961	2006	1993	2006
5	311	Antigua and Barbuda	U.S.	1981	2006	1961	2006	1985	2006
6	213	Argentina (E) (C)	U.S.	1977	2006	1961	2006	1970	2006
7	911	Armenia	U.S.	1995	2006	1993	2006	1996	2006
8	314	Aruba	U.S.	1986	2006	1987	2006	1992	2006
9	193	Australia	U.S.	1969	2006	1961	2006	1970	2006
10	122	Austria	Germany	1960	2006	1961	2006	1970	2006
11	912	Azerbaijan	U.S.	1993	2006	1993	2006	2000	2006
12	313	Bahamas, The	U.S.	1970	2006	1961	2006	1977	2006
13	419	Bahrain (C)	U.S.	1975	2006	1967	2006	1976	2006
14	513	Bangladesh (E)	U.S.	1972	2006	1972	2006	1976	2006
15	316	Barbados	1960-74 U.K.; 1975-U.S.	1967	2006	1961	2006	1974	2006
16	913	Belarus	U.S.	1993	2006	1993	2006	1996	2006
17	124	Belgium	Germany	1960	2006	1961	2006	1970	2006
18	339	Belize	U.S.	1979	2006	1961	2006	1985	2006
19	638	Benin	France	1964	2006	1961	2006	1970	2006
20	514	Bhutan	Rupee	1982	2006	1961	2006	1985	2006
21	218	Bolivia (C)	U.S.	1960	2006	1961	2006	1970	2006
22	616	Botswana (E) (C)	South Africa	1976	2006	1961	2006	1972	2006
23	223	Brazil (E)	U.S.	1964	2006	1965	2006	1970	2006
24	918	Bulgaria (E)	Germany	1991	2006	1961	2006	1996	2006
25	748	Burkina Faso	France	1964	2006	1961	2006	1970	2006
26	618	Burundi (C)	1960-70 Belgium; 1971-U.S.	1977	2006	1961	2006	1970	2006
27	662	Cote d'Ivoire (E) (C)	France	1964	2006	1961	2006	1970	2006
28	522	Cambodia	U.S.	1994	2006	1961	2006	1973	2006
29	622	Cameroon	France	1968	2006	1961	2006	1970	2006
30	156	Canada	U.S.	1960	2006	1961	2006	1970	2006
31	624	Cape Verde	Germany	1985	2006	1961	2006	1982	2006
32	626	Central African Rep.	France	1968	2006	1961	2006	1970	2006
33	628	Chad (C)	France	1968	2006	1961	2006	1970	2006
34	228	Chile (E) (C)	U.S.	1977	2006	1961	2006	1970	2006
35	924	China (E)	U.S.	1980	2006	1961	2006	1970	2006
36	233	Colombia (E)	U.S.	1964	2006	1961	2006	1970	2006
37	632	Comoros	France	1983	2006	1961	2006	1981	2006
38	636	Congo, Dem. Rep. (C)	U.S.	1982	2003	1961	2006	1970	2000
39	634	Congo, Rep. (C)	France	1968	2006	1961	2006	1970	2006
40	238	Costa Rica	U.S.	1964	2006	1961	2006	1970	2006
41	960	Croatia	Germany	1992	2006	1993	2006	1998	2006
42	423	Cyprus	Germany	1969	2006	1961	2006	1970	2006
43	935	Czech Republic (E)	Germany	1993	2006	1994	2006	1998	2006
44	128	Denmark	Germany	1960	2006	1961	2006	1970	2006
45	611	Djibouti	U.S.	1996	2006	1961	2006	1982	2006
46	321	Dominica	U.S.	1981	2006	1961	2006	1982	2006
47	243	Dominican Republic	U.S.	1995	2006	1961	2006	1970	2006
48	248	Ecuador (E)	U.S.	1970	2006	1961	2006	1970	2006
49	469	Egypt, Arab Rep. (E)	U.S.	1964	2006	1961	2006	1970	2006
50	253	El Salvador	U.S.	1983	2005	1961	2006	1970	2006
51	642	Equatorial Guinea (C)	France	1985	2006	1961	2006	1973	2006
52	643	Eritrea	U.S.	-	-	1961	2006	1998	2006
53	939	Estonia	Germany	1993	2006	1993	2006	1998	2006
54	644	Ethiopia (C)	U.S.	1985	2006	1961	2006	1970	2006
55	819	Fiji	U.S.	1974	2006	1961	2006	1975	2006
56	172	Finland	Germany	1960	2006	1961	2006	1970	2006
57	132	France	Germany	1964	2006	1961	2006	1970	2006
58	646	Gabon (C)	France	1968	2006	1961	2006	1970	2006
59	648	Gambia, The	U.K.	1977	2006	1961	2006	1971	2006
60	915	Georgia	U.S.	1995	2006	1996	2006	1998	2006
61	134	Germany	U.S.	1960	2006	1961	2006	1970	2006
62	652	Ghana (E) (C)	U.S.	1964	2006	1961	2006	1970	2006
63	174	Greece	1960-80 U.S.; 1981-Germany	1960	2006	1961	2006	1970	2006
64	328	Grenada	U.S.	1981	2006	1961	2006	1979	2006

	Country Code (cn)	Country Name	Base Country	Monetary Independence (MI)		Exchange rate stability (ERS)		KA Openness (KAOPEN)		
	65	258	Guatemala (C)	U.S.	1960	2006	1961	2006	1970	2006
	66	656	Guinea (C)	1960-73 France; 1974-U.S.	1986	2006	1961	2005	1970	2006
	67	654	Guinea-Bissau (C)	U.S.	1975	2006	1961	2006	1981	2006
	68	336	Guyana (C)	1960-75 U.K.; 1976-U.S.	1966	2006	1961	2006	1970	2006
	69	263	Haiti	U.S.	1994	2006	1961	2006	1970	2006
	70	268	Honduras (C)	U.S.	1979	2006	1961	2006	1970	2006
	71	532	Hong Kong, China (E)	U.S.	1982	2006	1961	2006	1970	2006
	72	944	Hungary (E)	1960-91 U.S.; 1992-Germany	1971	2006	1969	2006	1998	2006
	73	176	Iceland (C)	1960-90 U.S.; 1991-Germany	1964	2006	1961	2006	1970	2006
	74	534	India (E)	1960-79 U.K.; 1980-U.S.	1964	2006	1961	2006	1970	2006
	75	536	Indonesia (E)	U.S.	1983	2006	1968	2006	1970	2006
	76	429	Iran, Islamic Rep. (C)	U.S.	1960	2006	1961	2006	1970	2006
	77	433	Iraq (C)	U.S.	-	-	1961	2006	1970	2006
	78	178	Ireland	1960-78 U.K.; 1979-Germany	1964	2006	1961	2006	1970	2006
	79	436	Israel (E)	U.S.	1982	2006	1961	2006	1970	2006
	80	136	Italy	Germany	1964	2006	1961	2006	1970	2006
	81	343	Jamaica (E)	U.S.	1961	2006	1961	2006	1970	2006
	82	158	Japan	U.S.	1960	2006	1961	2006	1970	2006
	83	439	Jordan (E)	U.S.	1966	2006	1961	2006	1970	2006
	84	916	Kazakhstan	U.S.	1994	2006	1994	2006	1998	2006
	85	664	Kenya (E)	U.S.	1967	2006	1961	2006	1970	2006
	86	826	Kiribati	Australia	-	-	1961	2006	1990	2005
	87	542	Korea, Rep. (E)	U.S.	1964	2006	1961	2006	1970	2006
	88	443	Kuwait	U.S.	1975	2006	1961	2006	1970	2006
	89	917	Kyrgyz Republic	U.S.	1993	2006	1994	2006	1998	2006
	90	544	Lao PDR	U.S.	1979	2006	1961	2006	1970	2006
	91	941	Latvia	Germany	1993	2006	1993	2006	1998	2006
	92	446	Lebanon	U.S.	1964	2006	1961	2006	1970	2006
	93	666	Lesotho	South Africa	1980	2006	1961	2006	1972	2006
	94	668	Liberia (C)	U.S.	1981	2006	1961	2006	1970	2006
	95	672	Libya (C)	U.S.	1963	2006	1961	2006	1970	2006
	96	946	Lithuania (E)	Germany	1994	2006	1993	2006	1998	2006
	97	137	Luxembourg	1960-78 Belgium; 1979- Germany	1985	2006	1961	2006	-	-
	98	674	Madagascar (C)	France	1970	2006	1961	2006	1970	2006
	99	676	Malawi (C)	U.S.	1963	2006	1961	2006	1970	2006
	100	548	Malaysia (E)	U.S.	1966	2006	1961	2006	1970	2006
	101	556	Maldives	U.S.	1978	2006	1961	2006	1982	2006
	102	678	Mali (C)	France	1964	2006	1961	2006	1970	2006
	103	181	Malta	France	1969	2006	1961	2006	1972	2006
	104	682	Mauritania (C)	1960-73 France; 1974-U.S.	1964	2006	1961	2005	1970	1964
	105	684	Mauritius (E)	U.K.	1967	2006	1961	2006	1972	1967
	106	273	Mexico (E)	U.S.	1976	2006	1961	2006	1970	1976
	107	868	Micronesia, Fed. Sts.	U.S.	1996	2006	1961	2006	1996	1996
	108	921	Moldova	U.S.	1995	2006	1992	2006	1998	1995
	109	948	Mongolia (C)	U.S.	1993	2006	1991	2006	1998	1993
	110	686	Morocco (E)	France	1969	2006	1961	2006	1970	1969
	111	688	Mozambique	U.S.	1994	2006	1961	2006	1988	1994
	112	518	Myanmar (C)	U.S.	1975	2006	1961	2006	1970	1975
	113	728	Namibia (C)	South Africa	1991	2006	1962	2006	1994	1991
	114	558	Nepal	1960-82 U.S.; 1983-India	1974	2006	1961	2006	1970	1974
	115	138	Netherlands	Germany	1960	2006	1961	2006	1970	1960
	116	353	Netherlands Antilles	U.S.	1980	2006	1961	2006	1970	1980
	117	196	New Zealand (C)	Australia	1969	2006	1961	2006	1970	1969
	118	278	Nicaragua (C)	U.S.	1990	2006	1961	2006	1970	1990
	119	692	Niger (C)	France	1964	2006	1961	2006	1970	1964
	120	694	Nigeria (E) (C)	U.S.	1964	2005	1961	2006	1970	1964
	121	142	Norway	Germany	1964	2006	1961	2006	1970	1964
	122	449	Oman (C)	U.S.	1980	2006	1961	2006	1977	1980
	123	564	Pakistan (E)	U.S.	1964	2006	1961	2006	1970	1964
	124	283	Panama	U.S.	1986	2006	1961	2006	1970	1986
	125	853	Papua New Guinea (C)	1960-85 Australia; 1986-U.S.	1974	2006	1961	2006	1979	1974
	126	288	Paraguay (C)	U.S.	1990	2006	1961	2006	1970	1990
	127	293	Peru (E) (C)	U.S.	1960	2006	1961	2006	1970	1960
	128	566	Philippines (E)	U.S.	1964	2006	1961	2006	1970	1964
	129	964	Poland (E)	Germany	1991	2006	1961	2006	1990	1991
	130	182	Portugal	Germany	1960	2006	1961	2006	1970	1960
	131	453	Qatar (C)	U.S.	1980	2006	1967	2006	1976	1980
	132	968	Romania	U.S.	1994	2006	1961	2006	1976	1994

	Country Code (cn)	Country Name	Base Country	Monetary Independence (MI)		Exchange rate stability (ERS)		KA Openness (KAOPEN)	
133	922	Russian Federation (E)	U.S.	1995	2006	1993	2006	1998	2006
134	714	Rwanda (C)	1960-73 Belgium; 1974-U.S.	1966	2006	1961	2006	1970	2006
135	716	Sao Tome & Principe (C)	U.S.	1989	2006	1961	2006	1981	2006
136	862	Samoa	Australia	1983	2006	1961	2006	1975	2006
137	135	San Marino	Germany	-	-	1961	2006	1996	2006
138	456	Saudi Arabia (C)	U.S.	1997	2006	1961	2006	1970	2006
139	722	Senegal	France	1964	2006	1961	2006	1970	2006
140	718	Seychelles	U.S.	1979	2006	1961	2006	1981	2006
141	724	Sierra Leone	1960-77 U.K.; 1978-U.S.	1966	2006	1961	2006	1970	2006
142	576	Singapore (E)	Malaysia	1972	2006	1961	2006	1970	2006
143	936	Slovak Republic (E)	Germany	1993	2006	1994	2006	1998	2006
144	961	Slovenia (E)	Germany	1993	2006	1992	2006	1998	2006
145	813	Solomon Islands (C)	1960-85 Australia; 1986-U.S.	1981	2006	1961	2006	1982	2006
146	726	Somalia (C)	U.S.	-	-	1961	1989	1970	2006
147	199	South Africa (E)	U.S.	1960	2006	1961	2006	1970	2006
148	184	Spain	Germany	1964	2006	1961	2006	1970	2006
149	524	Sri Lanka (E)	1960-92 U.S.; 1993-India	1964	2006	1961	2006	1970	2006
150	361	St. Kitts and Nevis	U.S.	1981	2006	1961	2006	1988	2006
151	362	St. Lucia	U.S.	1981	2006	1961	2006	1983	2006
152	364	St. Vinc. & the Gren. (C)	U.S.	1981	2006	1961	2006	1983	2006
153	732	Sudan (C)	1960-71 U.K.; 1972-U.S.	1978	1984	1961	2006	1970	2005
154	366	Suriname (C)	U.S.	1991	2006	1961	2006	1970	2006
155	734	Swaziland (C)	South Africa	1974	2006	1961	2006	1973	2006
156	144	Sweden	Germany	1960	2006	1961	2006	1970	2006
157	146	Switzerland	Germany	1964	2006	1961	2006	1996	2006
158	463	Syrian Arab Republic	U.S.	2003	2006	1961	2006	1970	2006
159	528	Taiwan (E)	U.S.	1985	2006	1983	2006	-	-
160	923	Tajikistan	U.S.	1997	2006	1993	2006	1998	2006
161	738	Tanzania (C)	U.S.	1973	2006	1961	2006	1970	2006
162	578	Thailand (E)	France	1977	2006	1961	2006	1970	2006
163	742	Togo (C)	Australia	1964	2006	1961	2006	1970	2006
164	866	Tonga	1960-75 U.K.; 1976-U.S.	1981	2006	1961	2006	1989	2006
165	369	Trinidad & Tobago (E) (C)	France	1965	2006	1961	2006	1970	2006
166	744	Tunisia (E)	U.S.	1964	2006	1961	2006	1970	2006
167	186	Turkey (E)	U.S.	1964	2006	1961	2006	1970	2006
168	925	Turkmenistan (C)	U.S.	-	-	1994	2001	1998	2006
169	746	Uganda (C)	U.S.	1980	2006	1961	2006	1970	2006
170	926	Ukraine	U.S.	1992	2006	1993	2006	1998	2006
171	466	United Arab Emirates (C)	Germany	-	-	1967	2006	1976	2006
172	112	United Kingdom	U.S.	1960	2006	1961	2006	1970	2006
173	298	Uruguay	U.S.	1976	2006	1965	2006	1970	2006
174	846	Vanuatu	1960-89 France; 1990-U.S.	1981	2006	1961	2006	1985	2000
175	299	Venezuela, RB (E) (C)	U.S.	1964	2006	1961	2006	1970	2006
176	582	Vietnam (C)	U.S.	1996	2006	1961	2006	1970	2006
177	474	Yemen, Rep.	U.S.	1996	2006	1991	2006	1995	2006
178	754	Zambia (C)	U.S.	1965	2006	1961	2006	1970	2006
179	698	Zimbabwe (E) (C)	U.S.	1965	2005	1961	2005	1984	2006

Notes: The base countries are primarily based on Shambaugh (QJE) and complemented by information from IMF's *Annual Report on Exchange Arrangement and Exchange Restrictions* and *CIA Factbook*

**Table 1 (a): Tests for Structural Breaks in the Trilemma Indexes**

			<b>1970-72</b>	<b>1974-81</b>	<b>1983-96</b>	<b>1999-2006</b>
<b>Industrial Countries (18)</b>	Monetary Independence	Mean	0.376	0.407	0.389	0.139
		Change		+0.031	-0.018	-0.250
		t-stats (p-value)		1.31 (0.11)	0.85 (0.20)	11.91 (0.00)***
	Exchange Rate Stability	Mean	0.554	0.450	0.384	0.712
		Change		-0.104	-0.066	+0.328
		t-stats (p-value)		5.24 (0.00)***	4.88 (0.00)***	19.59 (0.00)***
	Financial Openness	Mean	0.439	0.469	0.688	0.955
		Change		+0.030	+0.219	+0.266
		t-stats (p-value)		1.62 (0.07)*	4.34 (0.00)***	5.27 (0.00)***
			<b>1970-72</b>	<b>1974-81</b>	<b>1983-96</b>	<b>1999-2006</b>
<b>Non-Emerging Developing Countries (32)</b>	Monetary Independence	Mean	0.500	0.399	0.457	0.534
		Change		-0.101	+0.058	+0.077
		t-stats (p-value)		1.68 (0.06)*	1.84 (0.04)**	3.55 (0.00)***
	Exchange Rate Stability	Mean	0.524	0.821	0.574	0.489
		Change		+0.298	-0.247	-0.085
		t-stats (p-value)		7.86 (0.00)***	5.51 (0.00)***	1.94 (0.03)**
	Financial Openness	Mean	0.267	0.365	0.326	0.391
		Change		+0.098	-0.040	+0.065
		t-stats (p-value)		5.73 (0.01)***	2.25 (0.02)**	3.93 (0.00)***
			<b>1970-72</b>	<b>1974-81</b>	<b>1983-96</b>	<b>1999-2006</b>
<b>Emerging Market Countries (18)</b>	Monetary Independence	Mean	0.526	0.474	0.508	0.407
		Change		-0.052	+0.034	-0.100
		t-stats (p-value)		2.16 (0.03)**	1.42 (0.09)*	3.81 (0.00)***
	Exchange Rate Stability	Mean	0.694	0.748	0.495	0.450
		Change		-0.054	-0.253	-0.045
		t-stats (p-value)		3.14 (0.01)***	12.43 (0.00)***	2.19 (0.02)***
	Financial Openness	Mean	0.210	0.229	0.240	0.474
		Change		+0.020	+0.010	+0.234
		t-stats (p-value)		5.03 (0.00)***	0.40 (0.35)	8.88 (0.00)***

Note: \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 1(b): Tests for Structural Breaks in the Trilemma Indexes**

			<b>1983-89</b>	<b>1991-2006</b>	<b>1983-2000</b>	<b>2002-2006</b>
<b>Industrial Countries (18)</b>	Monetary Independence	Mean	0.396	0.246	0.355	0.126
		Change		-0.150		-0.229
		t-stats (p-value)		3.17 (0.00)***		5.82 (0.00)***
	Exchange Rate Stability	Mean	0.402	0.543	0.422	0.727
		Change		+0.141		+0.290
		t-stat (p-value)		2.05 (0.03)**		5.61 (0.00)***
	Financial Openness	Mean	0.578	0.905	0.748	0.949
		Change		+0.327		+0.201
		t-stats (p-value)		9.22 (0.00)***		2.62 (0.01)**
			<b>1983-89</b>	<b>1991-2006</b>	<b>1983-2000</b>	<b>2002-2006</b>
<b>Non-Emerging Developing Countries (32)</b>	Monetary Independence	Mean	0.421	0.522	0.483	0.517
		Change		+0.100		+0.034
		t-stats (p-value)		4.80 (0.00)***		1.05 (0.15)
	Exchange Rate Stability	Mean	0.670	0.481	0.549	0.508
		Change		-0.189		-0.041
		t-stats (p-value)		7.39 (0.00)***		0.78 (0.22)
	Financial Openness	Mean	0.296	0.376	0.336	0.400
		Change		+0.080		+0.064
		t-stats (p-value)		5.94 (0.00)***		3.20 (0.00)***
			<b>1983-89</b>	<b>1991-2006</b>	<b>1983-2000</b>	<b>2002-2006</b>
<b>Emerging Market Countries (18)</b>	Monetary Independence	Mean	0.471	0.469	0.508	0.385
		Change		-0.002		-0.123
		t-stats (p-value)		0.08 (0.47)		4.52 (0.00)***
	Exchange Rate Stability	Mean	0.539	0.444	0.485	0.439
		Change		-0.095		-0.046
		t-stats (p-value)		6.88 (0.00)***		1.80 (0.04)**
	Financial Openness	Mean	0.188	0.403	0.282	0.482
		Change		+0.215		+0.200
		t-stats (p-value)		6.27 (0.00)***		4.23 (0.00)***

Note: \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 1(c): Summary of the Structural Breaks Tests**

		<b>Structural Breaks</b>
<b>Industrial Countries (IDC)</b>	Monetary Independence	1997-98
	Exchange Rate Stability	1997-98 (1973 for non-Euro Countries)
	Financial Openness	1990
<b>Non-Emerging Developing Countries (NOEMG)</b>	Monetary Independence	1990
	Exchange Rate Stability	1973
	Financial Openness	1990
<b>Emerging Market Countries (EMG)</b>	Monetary Independence	2001
	Exchange Rate Stability	1982
	Financial Openness	1997-98



**Table 2: Regression for the Linear Relationship between the Trilemma Indexes:  $1 = a_j MI_{i,t} + b_j ERS_{i,t} + c_j KAOPEN_{i,t} + \varepsilon_t$**

	(1) FULL	(2) 1970-72	(3) 1974-81	(4) 1983-96	(5) 1999-2006	(6) 1983-89	(7) 1991-2006	(8) 1983-2000	(9) 2002-2006
Monetary Independence	1.356 [0.041]***	1.444 [0.139]***	1.527 [0.083]***	1.279 [0.063]***	0.34 [0.104]***	1.372 [0.066]***	0.687 [0.113]***	1.22 [0.063]***	0.512 [0.097]***
Exch. Rate Stability	0.302 [0.033]***	0.402 [0.084]***	0.357 [0.061]***	0.184 [0.075]**	0.001 [0.050]	0.394 [0.080]***	-0.062 [0.051]	0.151 [0.061]**	0.01 [0.075]
KA Openness	0.472 [0.024]***	0.445 [0.049]***	0.306 [0.066]***	0.559 [0.055]***	0.952 [0.039]***	0.385 [0.066]***	0.879 [0.047]***	0.587 [0.044]***	0.913 [0.044]***
ERM x MI	-0.445 [0.088]***	–	1.45 [0.172]***	-0.393 [0.132]***	0.183 [0.132]	0.325 [0.356]	-0.223 [0.141]	-0.4 [0.104]***	-0.173 [0.104]*
ERM x ERS	0.025 [0.049]	–	-0.037 [0.149]	0.059 [0.106]	0.123 [0.063]**	-0.157 [0.154]	0.191 [0.062]***	0.092 [0.077]	0.138 [0.090]
ERM x KAOPEN	0.197 [0.043]***	–	-0.695 [0.163]***	0.128 [0.073]*	-0.062 [0.052]	0.024 [0.218]	-0.005 [0.058]	0.136 [0.058]**	-0.037 [0.064]
LDC x MI	-0.019 [0.047]	0.176 [0.160]	-0.353 [0.117]***	0.086 [0.070]	0.942 [0.115]***	-0.05 [0.082]	0.654 [0.117]***	0.138 [0.069]**	0.811 [0.110]***
LDC x ERS	0.021 [0.036]	-0.281 [0.093]***	0.084 [0.074]	0.152 [0.078]*	0.301 [0.059]***	0.001 [0.085]	0.339 [0.055]***	0.179 [0.064]***	0.288 [0.084]***
LDC x KAOPEN	-0.1 [0.032]***	-0.174 [0.088]*	-0.036 [0.081]	-0.198 [0.068]***	-0.503 [0.050]***	0.101 [0.091]	-0.493 [0.055]***	-0.268 [0.056]***	-0.448 [0.058]***
Observations	1850	150	400	700	400	350	800	900	250
Adjusted R-squared	0.94	0.97	0.94	0.94	0.95	0.94	0.95	0.94	0.95

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

NOTES: ERM is a dummy for the countries and years that correspond to participation in ERM (i.e., Belgium, Denmark, Germany, France, Ireland, and Italy from 1979, Spain from 1989, U.K. only for 1990-91, Portugal from 1992, Austria from 1995, Finland from 1996, and Greece from 1999).

**Table 3-1: 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	-0.05 [0.022]**	-0.056 [0.022]**	-0.052 [0.022]**	-0.057 [0.023]**	-0.047 [0.023]**	-0.055 [0.023]**	Relative Income	-0.05 [0.022]**	-0.05 [0.022]**	-0.051 [0.022]**	-0.05 [0.022]**	-0.055 [0.022]**	-0.054 [0.023]**
Relative Income, sq.	0.101 [0.027]***	0.108 [0.027]***	0.103 [0.027]***	0.109 [0.027]***	0.097 [0.029]***	0.105 [0.029]***	Relative Income, sq.	0.101 [0.027]***	0.101 [0.027]***	0.104 [0.026]***	0.101 [0.028]***	0.104 [0.027]***	0.102 [0.029]***
Change in US Real Int.	0.148 [0.065]**	0.108 [0.065]*	0.147 [0.065]**	0.111 [0.066]*	0.144 [0.064]**	0.108 [0.065]*	Change in US Real Int.	0.126 [0.064]**	0.128 [0.064]**	0.143 [0.065]**	0.14 [0.066]**	0.137 [0.066]**	0.137 [0.067]**
World Output Gap	0.123 [0.155]	0.089 [0.150]	0.123 [0.155]	0.09 [0.151]	0.123 [0.155]	0.089 [0.151]	World Output Gap	0.1 [0.150]	0.102 [0.151]	0.124 [0.155]	0.12 [0.155]	0.107 [0.153]	0.107 [0.153]
Trade openness	0.002 [0.005]	0.001 [0.005]	0.002 [0.005]	0 [0.004]	0.002 [0.005]	0.001 [0.005]	Trade openness	0.002 [0.004]	0.002 [0.004]	0.002 [0.005]	0.002 [0.005]	0 [0.004]	0 [0.005]
Volatility of TOT*OPN	0.03 [0.010]***	0.029 [0.010]***	0.03 [0.011]***	0.029 [0.010]***	0.029 [0.010]***	0.028 [0.010]***	Volatility of TOT*OPN	0.028 [0.011]***	0.028 [0.011]***	0.03 [0.010]***	0.03 [0.010]***	0.03 [0.011]***	0.03 [0.011]***
Fiscal Procyclicality	0.005 [0.002]**	0.005 [0.002]**	0.005 [0.002]**	0.005 [0.002]**	0.005 [0.002]**	0.005 [0.002]**	Fiscal Procyclic.	0.005 [0.002]**	0.005 [0.002]**	0.005 [0.002]**	0.005 [0.002]**	0.005 [0.002]**	0.005 [0.002]**
Oil exporters	0.017 [0.006]***	0.016 [0.006]**	0.017 [0.006]***	0.016 [0.006]***	0.017 [0.006]***	0.016 [0.006]**	Oil exporters	0.016 [0.006]**	0.016 [0.006]**	0.017 [0.006]***	0.017 [0.006]***	0.017 [0.006]***	0.017 [0.006]***
Private credit creation	-0.015 [0.006]**	-0.016 [0.006]***	-0.015 [0.006]**	-0.016 [0.006]***	-0.016 [0.006]**	-0.016 [0.006]***	Private credit creation	-0.016 [0.006]**	-0.016 [0.006]**	-0.015 [0.006]**	-0.016 [0.006]***	-0.015 [0.006]**	-0.015 [0.006]**
Total Reserve/GDP	0.005 [0.011]	0.007 [0.011]	-0.001 [0.027]	0.011 [0.026]	-0.003 [0.018]	0.003 [0.043]	Total Reserve/GDP	0.005 [0.011]	0.016 [0.040]	0.006 [0.011]	-0.016 [0.031]	0.005 [0.010]	-0.001 [0.025]
Monetary Independ. (MI)		0 [0.010]	-0.008 [0.012]			-0.001 [0.014]	PC of MI & ERS	0.022 [0.011]**	0.025 [0.015]*				
MI x reserves			0.016 [0.056]			0.016 [0.031]	MI_ERS x reserves		-0.019 [0.071]				
Exchange Rate Stability (ERS)		0.011 [0.004]***		0.012 [0.005]**		0.013 [0.006]**	PC of MI & KAO			-0.01 [0.010]	-0.016 [0.013]		
ERS x reserves				-0.007 [0.033]		-0.01 [0.035]	MI_KAO x reserves				0.047 [0.061]		
KA Openness		-0.002 [0.005]			-0.006 [0.006]	-0.004 [0.006]	PC of ERS. & KAO					0.013 [0.006]**	0.012 [0.007]*
KAOPEN x reserves					0.019 [0.031]	0.009 [0.058]	ERS_KAO x reserves						0.01 [0.039]
# of Obs.	392	392	392	392	392	392	# of Obs.	392	392	392	392	392	392
Adjusted R2	0.2	0.21	0.19	0.21	0.2	0.21	Adjusted R2	0.21	0.2	0.2	0.2	0.21	0.2

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 3-2: 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	-0.041 [0.043]	-0.072 [0.046]	-0.05 [0.046]	-0.07 [0.046]	-0.053 [0.043]	-0.079 [0.046]*	Relative Income	-0.046 [0.043]	-0.047 [0.044]	-0.053 [0.045]	-0.063 [0.044]	-0.053 [0.045]	-0.054 [0.045]
Relative Income, sq.	0.123 [0.037]***	0.155 [0.042]***	0.132 [0.040]***	0.15 [0.040]***	0.138 [0.039]***	0.162 [0.043]***	Relative Income, sq.	0.126 [0.037]***	0.128 [0.038]***	0.14 [0.041]***	0.147 [0.041]***	0.132 [0.038]***	0.132 [0.038]***
Change in US Real Int.	0.122 [0.110]	0.058 [0.114]	0.116 [0.110]	0.084 [0.114]	0.118 [0.105]	0.095 [0.110]	Change in US Real Int.	0.101 [0.112]	0.114 [0.110]	0.098 [0.109]	0.095 [0.109]	0.109 [0.114]	0.109 [0.114]
World Output Gap	0.122 [0.259]	0.1 [0.253]	0.118 [0.266]	0.107 [0.251]	0.124 [0.261]	0.106 [0.263]	World Output Gap	0.112 [0.257]	0.147 [0.266]	0.125 [0.257]	0.071 [0.263]	0.103 [0.256]	0.097 [0.260]
Trade openness	-0.012 [0.009]	-0.014 [0.008]	-0.013 [0.009]	-0.012 [0.008]	-0.008 [0.008]	-0.008 [0.008]	Trade openness	-0.01 [0.008]	-0.01 [0.008]	-0.014 [0.009]	-0.012 [0.009]	-0.012 [0.009]	-0.012 [0.009]
Volatility of TOT*OPN	0.034 [0.014]**	0.031 [0.013]**	0.035 [0.014]**	0.035 [0.014]**	0.03 [0.013]**	0.032 [0.014]**	Volatility of TOT*OPN	0.033 [0.014]**	0.034 [0.014]**	0.032 [0.013]**	0.033 [0.013]**	0.036 [0.014]**	0.036 [0.014]**
Fiscal Procyclicality	0.001 [0.004]	0.001 [0.004]	0.001 [0.004]	0.001 [0.004]	0.001 [0.004]	0.002 [0.004]	Fiscal Procyclic.	0.001 [0.004]	0.001 [0.004]	0.001 [0.004]	0.001 [0.004]	0.001 [0.004]	0.001 [0.004]
Oil exporters	0.012 [0.007]	0.012 [0.007]	0.013 [0.007]*	0.011 [0.007]	0.012 [0.007]	0.011 [0.007]	Oil exporters	0.011 [0.008]	0.011 [0.008]	0.012 [0.007]*	0.012 [0.007]*	0.012 [0.007]*	0.013 [0.007]*
Private credit creation	-0.001 [0.018]	-0.002 [0.019]	-0.003 [0.019]	0 [0.018]	-0.007 [0.018]	-0.007 [0.019]	Private credit creation	0.002 [0.019]	0.002 [0.019]	-0.006 [0.018]	-0.009 [0.018]	0.001 [0.019]	0.001 [0.019]
Total Reserve/GDP	0.008 [0.013]	0.015 [0.014]	0.012 [0.052]	0.061 [0.057]	-0.054 [0.027]*	-0.016 [0.095]	Total Reserve/GDP	0.008 [0.013]	0.089 [0.087]	0.013 [0.014]	-0.125 [0.066]*	0.008 [0.013]	-0.013 [0.040]
Monetary Independ. (MI)		-0.01 [0.019]	-0.015 [0.024]			-0.014 [0.028]	PC of MI & ERS	0.022 [0.020]	0.04 [0.030]				
MI x reserves			-0.004 [0.107]			0.046 [0.109]	MI_ERS x reserves		-0.143 [0.152]				
Exchange Rate Stability (ERS)		0.012 [0.007]*		0.021 [0.011]*		0.019 [0.012] <sup>11%</sup>	PC of MI & KAO			-0.032 [0.021]	-0.07 [0.027]**		
ERS x reserves				-0.068 [0.076]		-0.081 [0.072]	MI_KAO x reserves				0.289 [0.133]**		
KA Openness		-0.011 [0.010]			-0.036 [0.012]***	-0.034 [0.012]***	PC of ERS. & KAO					0.011 [0.011]	0.006 [0.015]
KAOPEN x reserves					0.156 [0.059]***	0.161 [0.065]**	ERS_KAO x reserves						0.039 [0.068]
# of Obs.	171	171	171	171	171	171	# of Obs.	171	171	171	171	171	171
Adjusted R2	0.19	0.2	0.18	0.2	0.21	0.21	Adjusted R2	0.19	0.19	0.19	0.2	0.19	0.18

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

**Table 3-3: 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 [0.029]	-0.028 [0.027]	-0.029 [0.029]	-0.047 [0.029]	-0.021 [0.030]	-0.035 [0.030]	Relative Income	-0.033 [0.029]	-0.036 [0.029]	-0.027 [0.029]	-0.024 [0.030]	-0.036 [0.028]	-0.041 [0.031]
Relative Income, sq.	0.055 [0.039]	0.055 [0.039]	0.051 [0.039]	0.073 [0.040]*	0.038 [0.039]	0.054 [0.040]	Relative Income, sq.	0.059 [0.039]	0.06 [0.039]	0.054 [0.039]	0.047 [0.039]	0.055 [0.038]	0.062 [0.041]
Change in US Real Int.	0.143 [0.084]*	0.096 [0.084]	0.156 [0.082]*	0.112 [0.084]	0.139 [0.083]*	0.117 [0.082]	Change in US Real Int.	0.113 [0.086]	0.132 [0.084]	0.139 [0.083]*	0.135 [0.085]	0.135 [0.084]	0.136 [0.085]
World Output Gap	0.079 [0.185]	0.024 [0.176]	0.098 [0.186]	0.009 [0.176]	0.072 [0.187]	0.014 [0.180]	World Output Gap	0.037 [0.180]	0.047 [0.180]	0.082 [0.185]	0.075 [0.188]	0.057 [0.182]	0.057 [0.182]
Trade openness	0.002 [0.005]	0.001 [0.005]	0.002 [0.005]	-0.001 [0.005]	0.001 [0.006]	-0.001 [0.006]	Trade openness	0.001 [0.005]	0 [0.005]	0.003 [0.005]	0.003 [0.005]	0 [0.005]	0 [0.005]
Volatility of TOT*OPN	0.038 [0.017]**	0.027 [0.016]*	0.037 [0.017]**	0.025 [0.017]	0.036 [0.017]**	0.023 [0.017]	Volatility of TOT*OPN	0.034 [0.017]**	0.032 [0.017]*	0.036 [0.017]**	0.036 [0.017]**	0.035 [0.017]**	0.034 [0.017]**
Fiscal Procyclicality	0.005 [0.003]**	0.006 [0.002]**	0.005 [0.003]**	0.006 [0.002]**	0.005 [0.003]**	0.006 [0.003]**	Fiscal Procyclic.	0.006 [0.003]**	0.006 [0.003]**	0.005 [0.003]**	0.005 [0.003]**	0.005 [0.003]**	0.005 [0.003]**
Oil exporters	0.02 [0.009]**	0.021 [0.009]**	0.021 [0.009]**	0.021 [0.009]**	0.021 [0.009]**	0.022 [0.009]**	Oil exporters	0.019 [0.009]**	0.02 [0.009]**	0.021 [0.009]**	0.021 [0.009]**	0.019 [0.009]**	0.019 [0.009]**
Private credit creation	-0.015 [0.007]**	-0.017 [0.007]**	-0.016 [0.007]**	-0.016 [0.007]**	-0.016 [0.007]**	-0.017 [0.007]**	Private credit creation	-0.015 [0.008]*	-0.016 [0.008]**	-0.017 [0.007]**	-0.016 [0.007]**	-0.014 [0.007]*	-0.014 [0.007]*
Total Reserve/GDP	0.017 [0.012]	0.014 [0.012]	0.027 [0.027]	0.075 [0.031]**	0.001 [0.023]	0.055 [0.042]	Total Reserve/GDP	0.017 [0.012]	0.092 [0.037]**	0.018 [0.012]	-0.008 [0.046]	0.013 [0.012]	0.025 [0.030]
Monetary Independ. (MI)		-0.018 [0.013]	-0.015 [0.016]			-0.015 [0.016]	PC of MI & ERS	0.022 [0.012]*	0.041 [0.017]**				
MI x reserves			-0.023 [0.054]			0.042 [0.040]	MI_ERS x reserves		-0.131 [0.066]**				
Exchange Rate Stability (ERS)		0.017 [0.005]**		0.027 [0.007]**		-0.015 [0.016]	PC of MI & KAO			-0.022 [0.013]	-0.029 [0.017]*		
ERS x reserves				-0.082 [0.042]**		-0.089 [0.053]*	MI_KAO x reserves				0.054 [0.081]		
KA Openness		-0.005 [0.006]			-0.008 [0.006]	-0.01 [0.007]	PC of ERS. & KAO					0.018 [0.008]**	0.021 [0.009]**
KAOPEN x reserves					0.037 [0.034]	0.012 [0.060]	ERS_KAO x reserves						-0.019 [0.039]
# of Obs.	198	198	198	198	198	198	# of Obs.	198	198	198	198	198	198
Adjusted R2	0.2	0.25	0.2	0.25	0.19	0.25	Adjusted R2	0.21	0.21	0.2	0.2	0.22	0.21

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

**Table 4-1: 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	-0.088 [0.027]***	-0.086 [0.026]***	-0.085 [0.027]***	-0.086 [0.026]***	-0.079 [0.028]***	-0.08 [0.027]***	Relative Income	-0.097 [0.027]***	-0.081 [0.026]***	-0.087 [0.027]***	-0.085 [0.027]***	-0.087 [0.026]***	-0.089 [0.027]***
Relative Income, sq.	0.096 [0.034]***	0.081 [0.034]**	0.089 [0.034]**	0.086 [0.033]***	0.07 [0.037]*	0.066 [0.035]*	Relative Income, sq.	0.111 [0.035]***	0.081 [0.033]**	0.093 [0.035]***	0.09 [0.035]**	0.08 [0.034]**	0.085 [0.035]**
Volatility of TOT*OPN	0.013 [0.010]	0.018 [0.010]*	0.015 [0.010]	0.015 [0.010]	0.016 [0.011]	0.018 [0.010]*	Volatility of TOT*OPN	0.014 [0.011]	0.012 [0.010]	0.013 [0.011]	0.013 [0.011]	0.018 [0.010]*	0.018 [0.010]*
Inflation Rate	0.201 [0.011]***	0.216 [0.011]***	0.201 [0.011]***	0.207 [0.011]***	0.211 [0.011]***	0.216 [0.011]***	Inflation Rate	0.206 [0.011]***	0.198 [0.011]***	0.201 [0.011]***	0.201 [0.011]***	0.219 [0.011]***	0.218 [0.011]***
M2 Growth Volatility	0.025 [0.022]	0.003 [0.022]	0.027 [0.021]	0.008 [0.021]	0.017 [0.022]	0.001 [0.022]	M2 Growth Volatility	0.02 [0.022]	0.015 [0.021]	0.024 [0.022]	0.024 [0.022]	0.002 [0.022]	0.002 [0.022]
Relative oil price shocks	0.006 [0.003]**	0.004 [0.003]	0.006 [0.003]*	0.003 [0.003]	0.006 [0.003]**	0.003 [0.003]	Relative oil price shocks	0.006 [0.003]*	0.006 [0.003]*	0.006 [0.003]**	0.006 [0.003]**	0.004 [0.003]	0.004 [0.003]
Total Reserve/GDP	-0.014 [0.012]	-0.014 [0.012]	0.005 [0.043]	0.027 [0.030]	-0.028 [0.024]	0.031 [0.056]	Total Reserve/GDP	-0.015 [0.013]	0.053 [0.048]	-0.014 [0.013]	-0.019 [0.048]	-0.014 [0.012]	-0.005 [0.033]
Monetary Independ. (MI)		-0.007 [0.012]	-0.007 [0.017]			0 [0.017]	PC of MI & ERS	0.014 [0.012]	0.034 [0.016]**				
MI x reserves			-0.043 [0.092]			-0.036 [0.092]	MI_ERS x reserves		-0.122 [0.087]				
Exchange Rate Stability (ERS)		0.012 [0.004]***		0.019 [0.006]***		0.021 [0.007]***	PC of MI & KAO			0.003 [0.013]	0.002 [0.018]		
ERS x reserves				-0.056 [0.041]		-0.068 [0.042]	MI_KAO x reserves				0.011 [0.092]		
KA Openness		0.008 [0.006]			0.004 [0.008]	0.003 [0.008]	PC of ERS. & KAO					0.021 [0.007]***	0.023 [0.010]**
KAOPEN x reserves					0.027 [0.039]	0.037 [0.038]	ERS_KAO x reserves						-0.016 [0.052]
# of Obs.	422	422	422	422	422	422	# of Obs.	422	422	422	422	422	422
Adjusted R2	0.56	0.6	0.57	0.59	0.57	0.6	Adjusted R2	0.57	0.57	0.56	0.56	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 East Asia and Pacific and Sub-Saharan Africa are not reported.

**Table 4-2: 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	-0.172 [0.068]**	-0.162 [0.069]**	-0.188 [0.066]***	-0.179 [0.070]**	-0.148 [0.070]**	-0.151 [0.073]**	Relative Income	-0.164 [0.071]**	-0.164 [0.071]**	-0.152 [0.066]**	-0.152 [0.066]**	-0.168 [0.072]**	-0.16 [0.073]**
Relative Income, sq.	0.218 [0.091]**	0.219 [0.089]**	0.237 [0.088]***	0.224 [0.093]**	0.2 [0.093]**	0.208 [0.095]**	Relative Income, sq.	0.21 [0.095]**	0.209 [0.096]**	0.209 [0.089]**	0.21 [0.088]**	0.215 [0.093]**	0.208 [0.094]**
Volatility of TOT*OPN	0.057 [0.025]**	0.055 [0.024]**	0.063 [0.024]***	0.059 [0.025]**	0.054 [0.025]**	0.057 [0.026]**	Volatility of TOT*OPN	0.056 [0.026]**	0.056 [0.026]**	0.053 [0.024]**	0.053 [0.024]**	0.055 [0.025]**	0.055 [0.025]**
Inflation Rate	0.334 [0.035]***	0.325 [0.035]***	0.336 [0.035]***	0.341 [0.036]***	0.326 [0.036]***	0.334 [0.038]***	Inflation Rate	0.341 [0.037]***	0.342 [0.037]***	0.331 [0.034]***	0.327 [0.034]***	0.328 [0.037]***	0.322 [0.037]***
M2 Growth Volatility	-0.045 [0.059]	-0.012 [0.059]	-0.022 [0.057]	-0.056 [0.061]	-0.049 [0.061]	-0.029 [0.063]	M2 Growth Volatility	-0.038 [0.063]	-0.039 [0.063]	-0.023 [0.058]	-0.024 [0.059]	-0.039 [0.062]	-0.043 [0.062]
Relative oil price shocks	0.025 [0.010]***	0.018 [0.010]*	0.021 [0.009]**	0.022 [0.010]**	0.023 [0.010]**	0.019 [0.010]*	Relative oil price shocks	0.028 [0.010]***	0.028 [0.010]***	0.019 [0.010]*	0.018 [0.010]*	0.026 [0.010]***	0.026 [0.010]***
Total Reserve/GDP	-0.036 [0.034]	-0.032 [0.032]	0.032 [0.141]	-0.068 [0.099]	-0.088 [0.067]	-0.092 [0.203]	Total Reserve/GDP	-0.04 [0.035]	-0.056 [0.183]	-0.032 [0.033]	-0.1 [0.159]	-0.036 [0.034]	-0.121 [0.104]
Monetary Independ. (MI)		-0.082 [0.037]**	-0.055 [0.053]			-0.078 [0.059]	PC of MI & ERS	-0.035 [0.039]	-0.039 [0.058]				
MI x reserves			-0.137 [0.298]			-0.081 [0.326]	MI_ERS x reserves		0.028 [0.322]				
Exchange Rate Stability (ERS)		0 [0.014]		0.004 [0.021]		-0.015 [0.023]	PC of MI & KAO			-0.094 [0.038]**	-0.113 [0.059]*		
ERS x reserves				0.051 [0.131]		0.082 [0.136]	MI_KAO x reserves				0.143 [0.327]		
KA Openness		-0.026 [0.019]			-0.042 [0.029]	-0.045 [0.031]	PC of ERS. & KAO					-0.006 [0.025]	-0.033 [0.037]
KAOPEN x reserves					0.13 [0.144]	0.095 [0.152]	ERS_KAO x reserves						0.154 [0.178]
# of Obs.	181	181	181	181	181	181	# of Obs.	181	181	181	181	181	181
Adjusted R2	0.44	0.46	0.46	0.44	0.44	0.44	Adjusted R2	0.43	0.42	0.46	0.46	0.43	0.43

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

**Table 4-3: 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	-0.086 [0.033]***	-0.088 [0.033]***	-0.084 [0.034]**	-0.089 [0.033]***	-0.09 [0.036]**	-0.091 [0.036]**	Relative Income	-0.084 [0.033]**	-0.086 [0.032]***	-0.088 [0.033]***	-0.092 [0.034]***	-0.087 [0.033]***	-0.094 [0.036]***
Relative Income, sq.	0.093 [0.044]**	0.086 [0.044]*	0.091 [0.045]**	0.094 [0.043]**	0.088 [0.052]*	0.085 [0.050]*	Relative Income, sq.	0.091 [0.043]**	0.09 [0.043]**	0.09 [0.043]**	0.097 [0.047]**	0.086 [0.044]*	0.097 [0.050]*
Volatility of TOT*OPN	0.105 [0.017]***	0.101 [0.017]***	0.108 [0.017]***	0.098 [0.017]***	0.107 [0.018]***	0.1 [0.017]***	Volatility of TOT*OPN	0.102 [0.017]***	0.1 [0.017]***	0.101 [0.017]***	0.101 [0.017]***	0.099 [0.017]***	0.097 [0.017]***
Inflation Rate	0.185 [0.013]***	0.196 [0.014]***	0.186 [0.014]***	0.176 [0.013]***	0.204 [0.014]***	0.194 [0.014]***	Inflation Rate	0.181 [0.014]***	0.18 [0.014]***	0.19 [0.013]***	0.19 [0.013]***	0.193 [0.013]***	0.192 [0.013]***
M2 Growth Volatility	-0.022 [0.027]	-0.044 [0.028]	-0.019 [0.027]	-0.025 [0.026]	-0.043 [0.028]	-0.048 [0.028]*	M2 Growth Volatility	-0.025 [0.027]	-0.026 [0.026]	-0.037 [0.027]	-0.036 [0.027]	-0.041 [0.028]	-0.041 [0.028]
Relative oil price shocks	0.003 [0.003]	0.003 [0.004]	0.003 [0.004]	0.002 [0.003]	0.003 [0.004]	0.003 [0.004]	Relative oil price shocks	0.003 [0.003]	0.003 [0.003]	0.003 [0.003]	0.003 [0.004]	0.003 [0.003]	0.003 [0.003]
Total Reserve/GDP	-0.002 [0.013]	-0.008 [0.013]	0.017 [0.044]	0.034 [0.039]	-0.005 [0.025]	0.039 [0.061]	Total Reserve/GDP	-0.002 [0.012]	0.056 [0.052]	-0.002 [0.012]	0.016 [0.053]	-0.008 [0.013]	0.01 [0.038]
Monetary Independ. (MI)		-0.001 [0.015]	-0.002 [0.020]			0.007 [0.020]	PC of MI & ERS	0.007 [0.013]	0.025 [0.019]				
MI x reserves			-0.042 [0.092]			-0.026 [0.096]	MI_ERS x reserves		-0.104 [0.089]				
Exchange Rate Stability (ERS)		0.007 [0.006]		0.015 [0.008]*		0.014 [0.009]	PC of MI & KAO			0.018 [0.015]	0.023 [0.021]		
ERS x reserves				-0.054 [0.051]		-0.053 [0.056]	MI_KAO x reserves				-0.034 [0.101]		
KA Openness		0.013 [0.007]*			0.014 [0.009]	0.011 [0.009]	PC of ERS. & KAO					0.02 [0.009]**	0.024 [0.012]**
KAOPEN x reserves					0.001 [0.041]	0.009 [0.044]	ERS_KAO x reserves						-0.03 [0.058]
# of Obs.	209	209	209	209	209	209	# of Obs.	209	209	209	209	209	209
Adjusted R2	0.67	0.68	0.67	0.68	0.68	0.68	Adjusted R2	0.67	0.68	0.68	0.67	0.68	0.68

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

**Table 5-1: 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	0.013 [0.058]	0.038 [0.052]	0.022 [0.058]	0.048 [0.053]	0.035 [0.058]	0.061 [0.052]	Relative Income	0.018 [0.057]	0.018 [0.056]	0.012 [0.058]	0.017 [0.058]	0.037 [0.051]	0.067 [0.051]
Relative Income, sq.	-0.002 [0.069]	-0.019 [0.062]	-0.018 [0.069]	-0.037 [0.063]	-0.025 [0.070]	-0.051 [0.064]	Relative Income, sq.	-0.005 [0.068]	-0.003 [0.067]	0.001 [0.070]	-0.008 [0.071]	-0.014 [0.061]	-0.059 [0.062]
World Output Gap	0.712 [0.340]**	0.812 [0.303]***	0.663 [0.339]*	0.854 [0.310]***	0.672 [0.330]**	0.791 [0.300]***	World Output Gap	0.81 [0.333]**	0.792 [0.330]**	0.728 [0.340]**	0.71 [0.341]**	0.84 [0.302]***	0.798 [0.296]***
Trade openness	-0.025 [0.009]***	-0.01 [0.009]	-0.021 [0.009]**	-0.019 [0.008]**	-0.021 [0.009]**	-0.012 [0.009]	Trade openness	-0.025 [0.009]***	-0.024 [0.009]***	-0.025 [0.009]***	-0.026 [0.009]***	-0.012 [0.008]	-0.014 [0.008]*
Volatility of TOT*OPN	0.027 [0.024]	0.014 [0.021]	0.021 [0.023]	0.029 [0.021]	0.013 [0.023]	0.015 [0.021]	Volatility of TOT*OPN	0.029 [0.023]	0.032 [0.023]	0.026 [0.023]	0.026 [0.024]	0.014 [0.021]	0.014 [0.021]
Inflation volatility	0.287 [0.014]***	0.304 [0.012]***	0.288 [0.014]***	0.315 [0.013]***	0.28 [0.013]***	0.308 [0.012]***	Inflation volatility	0.293 [0.013]***	0.297 [0.013]***	0.285 [0.014]***	0.285 [0.014]***	0.303 [0.012]***	0.305 [0.012]***
Private Credit Creation	-0.01 [0.014]	-0.011 [0.013]	-0.01 [0.014]	-0.011 [0.013]	-0.012 [0.014]	-0.012 [0.013]	Private Credit Creation	-0.012 [0.014]	-0.009 [0.014]	-0.01 [0.014]	-0.011 [0.014]	-0.011 [0.013]	-0.014 [0.013]
M2 Growth Volatility	0.178 [0.042]***	0.186 [0.038]***	0.183 [0.042]***	0.175 [0.038]***	0.188 [0.041]***	0.186 [0.037]***	M2 Growth Volatility	0.177 [0.041]***	0.165 [0.041]***	0.177 [0.042]***	0.175 [0.042]***	0.186 [0.037]***	0.183 [0.037]***
Fiscal Procyclicality	0 [0.005]	-0.001 [0.005]	0.001 [0.005]	0 [0.005]	-0.001 [0.005]	-0.001 [0.005]	Fiscal Procyclicality	0 [0.005]	0 [0.005]	0 [0.005]	0 [0.005]	-0.002 [0.005]	-0.002 [0.005]
Oil Shock	0.037 [0.006]***	0.044 [0.006]***	0.04 [0.006]***	0.046 [0.006]***	0.034 [0.006]***	0.044 [0.006]***	Oil Shock	0.04 [0.006]***	0.04 [0.006]***	0.037 [0.006]***	0.036 [0.006]***	0.043 [0.005]***	0.043 [0.005]***
Total Reserve/GDP	0.002 [0.027]	0.015 [0.024]	0.059 [0.083]	-0.148 [0.061]**	-0.047 [0.044]	-0.125 [0.098]	Total Reserve/GDP	0.006 [0.026]	-0.154 [0.097]	0.005 [0.027]	-0.053 [0.091]	0.018 [0.023]	-0.125 [0.058]**
Monetary Independ. (MI)		0.036 [0.021]*	0.096 [0.032]***			0.031 [0.030]	PC of MI & ERS	-0.057 [0.021]***	-0.101 [0.031]***				
MI x reserves			-0.136 [0.176]			-0.028 [0.158]	MI_ERS x reserves		0.294 [0.171]*				
Exchange Rate Stability (ERS)		-0.046 [0.007]***		-0.074 [0.012]***		-0.067 [0.012]***	PC of MI & KAO			-0.019 [0.026]	-0.036 [0.036]		
ERS x reserves				0.219 [0.079]***		0.159 [0.079]**	MI_KAO x reserves				0.117 [0.178]		
KA Openness		-0.047 [0.011]***			-0.067 [0.015]***	-0.057 [0.014]***	PC of ERS. & KAO					-0.1 [0.012]***	-0.13 [0.016]***
KAOPEN x reserves					0.122 [0.075]*	0.076 [0.070]	ERS_KAO x reserves						0.235 [0.091]***
# of Obs.	366	366	366	366	366	366	# of Obs.	366	366	366	366	366	366
Adjusted R2	0.67	0.74	0.68	0.73	0.69	0.75	Adjusted R2	0.68	0.68	0.66	0.66	0.74	0.75

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 5-2: 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	-0.019 [0.099]	0.092 [0.094]	0.013 [0.097]	0.089 [0.097]	-0.027 [0.092]	0.102 [0.094]	Relative Income	-0.003 [0.101]	0.002 [0.101]	-0.021 [0.100]	-0.012 [0.101]	0.088 [0.090]	0.094 [0.089]
Relative Income, sq.	0.002 [0.116]	-0.097 [0.109]	-0.047 [0.115]	-0.1 [0.112]	0.029 [0.109]	-0.105 [0.109]	Relative Income, sq.	-0.009 [0.117]	-0.013 [0.117]	0.005 [0.118]	-0.005 [0.119]	-0.084 [0.105]	-0.09 [0.103]
World Output Gap	0.83 [0.601]	1.196 [0.549]**	1.004 [0.597]*	1.117 [0.563]**	0.941 [0.564]*	1.259 [0.556]**	World Output Gap	0.833 [0.604]	0.805 [0.608]	0.842 [0.604]	0.909 [0.617]	1.251 [0.540]**	1.192 [0.530]**
Trade openness	-0.034 [0.020]*	-0.022 [0.019]	-0.019 [0.021]	-0.027 [0.019]	-0.028 [0.019]	-0.022 [0.020]	Trade openness	-0.037 [0.021]*	-0.037 [0.021]*	-0.034 [0.021]	-0.037 [0.021]*	-0.025 [0.018]	-0.021 [0.018]
Volatility of TOT*OPN	-0.019 [0.034]	-0.06 [0.032]*	-0.026 [0.033]	-0.036 [0.032]	-0.032 [0.032]	-0.061 [0.032]*	Volatility of TOT*OPN	-0.022 [0.034]	-0.022 [0.034]	-0.019 [0.034]	-0.023 [0.034]	-0.054 [0.031]*	-0.051 [0.030]*
Inflation volatility	0.281 [0.019]***	0.282 [0.017]***	0.282 [0.019]***	0.297 [0.018]***	0.27 [0.018]***	0.284 [0.017]***	Inflation volatility	0.285 [0.019]***	0.286 [0.019]***	0.281 [0.019]***	0.281 [0.019]***	0.286 [0.017]***	0.288 [0.017]***
Private Credit Creation	-0.052 [0.044]	-0.071 [0.041]*	-0.041 [0.043]	-0.056 [0.042]	-0.062 [0.042]	-0.068 [0.041]*	Private Credit Creation	-0.056 [0.045]	-0.056 [0.045]	-0.052 [0.045]	-0.05 [0.045]	-0.075 [0.040]*	-0.076 [0.039]*
M2 Growth Volatility	0.338 [0.075]***	0.394 [0.069]***	0.349 [0.074]***	0.323 [0.070]***	0.34 [0.071]***	0.38 [0.070]***	M2 Growth Volatility	0.345 [0.076]***	0.332 [0.076]***	0.337 [0.076]***	0.358 [0.078]***	0.373 [0.068]***	0.349 [0.067]***
Fiscal Procyclicality	-0.008 [0.009]	-0.01 [0.009]	-0.005 [0.009]	-0.008 [0.009]	-0.007 [0.009]	-0.008 [0.009]	Fiscal Procyclicality	-0.009 [0.010]	-0.008 [0.010]	-0.007 [0.009]	-0.008 [0.009]	-0.011 [0.008]	-0.01 [0.008]
Oil Shock	0.036 [0.011]***	0.046 [0.011]***	0.043 [0.011]***	0.051 [0.011]***	0.033 [0.010]***	0.047 [0.011]***	Oil Shock	0.037 [0.011]***	0.036 [0.011]***	0.036 [0.012]***	0.036 [0.012]***	0.047 [0.010]***	0.049 [0.010]***
Total Reserve/GDP	-0.016 [0.038]	-0.024 [0.036]	0.095 [0.163]	-0.179 [0.113]	-0.039 [0.072]	-0.089 [0.210]	Total Reserve/GDP	-0.018 [0.039]	-0.142 [0.204]	-0.015 [0.039]	0.114 [0.193]	-0.016 [0.034]	-0.181 [0.107]*
Monetary Independ. (MI)		0.059 [0.043]	0.161 [0.063]**			0.078 [0.062]	PC of MI & ERS	-0.035 [0.045]	-0.069 [0.065]				
MI x reserves			-0.265 [0.343]			-0.205 [0.331]	MI_ERS x reserves		0.225 [0.357]				
Exchange Rate Stability (ERS)		-0.052 [0.016]***		-0.085 [0.024]***		-0.079 [0.024]***	PC of MI & KAO			-0.005 [0.052]	0.035 [0.076]		
ERS x reserves				0.215 [0.150]		0.199 [0.150]	MI_KAO x reserves				-0.273 [0.395]		
KA Openness		-0.072 [0.023]***			-0.099 [0.033]***	-0.082 [0.033]**	PC of ERS. & KAO					-0.133 [0.025]***	-0.177 [0.036]***
KAOPEN x reserves					0.104 [0.151]	0.048 [0.156]	ERS_KAO x reserves						0.29 [0.182]
# of Obs.	158	158	158	158	158	158	# of Obs.	158	158	158	158	158	158
Adjusted R2	0.65	0.72	0.67	0.7	0.68	0.72	Adjusted R2	0.65	0.65	0.64	0.64	0.72	0.73

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

**Table 5-3: 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	-0.009 [0.091]	-0.03 [0.092]	-0.029 [0.093]	0.007 [0.094]	-0.025 [0.095]	0.005 [0.101]	Relative Income	-0.009 [0.092]	-0.007 [0.093]	0.005 [0.092]	0.005 [0.094]	-0.028 [0.092]	-0.013 [0.098]
Relative Income, sq.	0.054 [0.115]	0.081 [0.116]	0.074 [0.118]	0.018 [0.119]	0.097 [0.125]	0.068 [0.131]	Relative Income, sq.	0.052 [0.117]	0.048 [0.118]	0.049 [0.116]	0.048 [0.121]	0.074 [0.117]	0.05 [0.127]
World Output Gap	0.91 [0.436]**	0.859 [0.440]*	0.864 [0.441]*	0.97 [0.441]**	0.836 [0.437]*	1.068 [0.457]**	World Output Gap	0.92 [0.442]**	0.913 [0.446]**	0.907 [0.439]**	0.906 [0.443]**	0.936 [0.442]**	0.928 [0.443]**
Trade openness	-0.019 [0.014]	-0.009 [0.014]	-0.019 [0.014]	-0.014 [0.014]	-0.011 [0.014]	-0.008 [0.015]	Trade openness	-0.018 [0.014]	-0.016 [0.014]	-0.015 [0.014]	-0.015 [0.014]	-0.009 [0.014]	-0.009 [0.014]
Volatility of TOT*OPN	0.05 [0.040]	0.052 [0.040]	0.048 [0.041]	0.067 [0.041]	0.04 [0.040]	-0.067 [0.042]	Volatility of TOT*OPN	0.051 [0.041]	0.053 [0.041]	0.047 [0.041]	0.047 [0.041]	0.05 [0.041]	0.052 [0.041]
Inflation volatility	0.452 [0.023]***	0.439 [0.023]***	0.446 [0.023]***	0.457 [0.023]***	0.439 [0.023]***	0.634 [0.025]***	Inflation volatility	0.452 [0.024]***	0.453 [0.024]***	0.45 [0.023]***	0.45 [0.023]***	0.445 [0.023]***	0.446 [0.023]***
Private Credit Creation	-0.034 [0.018]*	-0.031 [0.019]*	-0.03 [0.019]	-0.029 [0.019]	-0.035 [0.018]*	-0.018 [0.019]	Private Credit Creation	-0.034 [0.019]*	-0.032 [0.019]*	-0.038 [0.019]**	-0.038 [0.019]**	-0.031 [0.019]*	-0.03 [0.019]
M2 Growth Volatility	0.149 [0.051]***	0.206 [0.052]***	0.156 [0.052]***	0.154 [0.052]***	0.202 [0.052]***	0.342 [0.054]***	M2 Growth Volatility	0.153 [0.052]***	0.16 [0.053]***	0.17 [0.052]***	0.169 [0.052]***	0.233 [0.052]***	0.232 [0.053]***
Fiscal Procyclicality	-0.005 [0.007]	-0.007 [0.007]	-0.005 [0.007]	-0.006 [0.007]	-0.006 [0.007]	-0.006 [0.008]	Fiscal Procyclicality	-0.005 [0.007]	-0.006 [0.007]	-0.006 [0.007]	-0.006 [0.007]	-0.009 [0.007]	-0.009 [0.007]
Oil Shock	0.021 [0.008]***	0.021 [0.008]**	0.022 [0.008]***	0.025 [0.008]***	0.017 [0.008]**	0.024 [0.009]***	Oil Shock	0.021 [0.008]***	0.021 [0.008]**	0.018 [0.008]**	0.018 [0.008]**	0.023 [0.008]***	0.023 [0.008]***
Total Reserve/GDP	-0.008 [0.030]	0.005 [0.031]	-0.02 [0.095]	-0.094 [0.093]	0.006 [0.051]	-0.067 [0.136]	Total Reserve/GDP	-0.008 [0.031]	-0.108 [0.117]	-0.01 [0.031]	-0.01 [0.113]	0.001 [0.031]	-0.03 [0.082]
Monetary Independ. (MI)		0.018 [0.032]	0.035 [0.042]			0.033 [0.045]	PC of MI & ERS	-0.008 [0.027]	-0.038 [0.040]				
MI x reserves			0.031 [0.193]			-0.099 [0.215]	MI_ERS x reserves		0.175 [0.197]				
Exchange Rate Stability (ERS)		-0.023 [0.011]**		-0.038 [0.018]**		-0.05 [0.020]**	PC of MI & KAO			-0.059 [0.035]*	-0.059 [0.046]		
ERS x reserves				0.127 [0.117]		0.177 [0.134]	MI_KAO x reserves				0.001 [0.220]		
KA Openness		-0.045 [0.015]***			-0.041 [0.019]**	-0.045 [0.021]**	PC of ERS. & KAO					-0.07 [0.019]***	-0.078 [0.025]***
KAOPEN x reserves					-0.027 [0.089]	-0.059 [0.103]	ERS_KAO x reserves						0.052 [0.126]
# of Obs.	190	190	190	190	190	190	# of Obs.	190	190	190	190	190	190
Adjusted R2	0.8	0.8	0.79	0.79	0.8	0.87	Adjusted R2	0.79	0.79	0.8	0.79	0.8	0.8

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 6: The Impact of External Financing: Less Developed Countries**

<i>Dependent Variable:</i>	<b>Output Volatility</b>				<b>Inflation Volatility</b>				<b>Level of Inflation</b>			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Total Reserve/GDP	0.032 [0.037]	0.04 [0.034]	-0.012 [0.025]	0.003 [0.069]	0.058 [0.065]	0.004 [0.052]	-0.016 [0.034]	0.063 [0.104]	0.117 [0.118]	-0.108 [0.089]	0.048 [0.061]	0.026 [0.173]
Currency Crisis	0.016 [0.014]	0.021 [0.013]	0.013 [0.014]	0.018 [0.013]	0.051 [0.017]***	0.049 [0.017]***	0.052 [0.017]***	0.054 [0.017]***	0.167 [0.030]***	0.147 [0.029]***	0.156 [0.031]***	0.127 [0.028]***
Net FDI inflows/GDP	-0.135 [0.099]	-0.094 [0.098]	-0.112 [0.099]	-0.078 [0.103]	-0.256 [0.067]***	-0.218 [0.065]***	-0.276 [0.067]***	-0.296 [0.067]***	-0.4 [0.252]	-0.441 [0.232]*	-0.221 [0.254]	-0.327 [0.234]
Net portfolio inflows/GDP	0.047 [0.085]	0.049 [0.083]	0.075 [0.078]	0.074 [0.075]	0.219 [0.134]	0.141 [0.130]	0.242 [0.135]*	0.248 [0.134]*	-0.7 [0.263]***	-0.904 [0.242]***	-0.655 [0.263]**	-0.993 [0.240]***
Net 'other' inflows/GDP	0.075 [0.039]*	0.075 [0.038]*	0.077 [0.039]**	0.075 [0.038]*	-0.023 [0.043]	-0.023 [0.042]	-0.038 [0.043]	-0.032 [0.043]	-0.075 [0.086]	-0.061 [0.080]	-0.022 [0.086]	-0.025 [0.078]
Short-term Debt (as % of total external debt)	-0.013 [0.020]	-0.01 [0.020]	-0.007 [0.020]	-0.006 [0.020]	0.047 [0.024]*	0.046 [0.023]*	0.041 [0.024]*	0.041 [0.024]*	0.09 [0.048]*	0.052 [0.044]	0.096 [0.048]**	0.087 [0.044]**
Total debt service (as % of GNI)	0.039 [0.058]	0.043 [0.057]	0.036 [0.057]	0.041 [0.059]	0.114 [0.053]**	0.115 [0.053]**	0.102 [0.053]*	0.105 [0.054]*	0.201 [0.110]*	0.179 [0.103]*	0.218 [0.109]**	0.228 [0.101]**
Monetary Independence (MI)	-0.004 [0.017]			-0.004 [0.018]	-0.01 [0.022]			-0.002 [0.023]	0.108 [0.040]***			0.065 [0.039]*
MI x reserves	-0.02 [0.079]			0.018 [0.082]	-0.12 [0.137]			-0.128 [0.147]	-0.238 [0.245]			-0.169 [0.241]
Exchange Rate Stability (ERS)		0.014 [0.007]**		0.014 [0.008]*		0.012 [0.009]		0.014 [0.010]		-0.063 [0.016]***		-0.061 [0.016]***
ERS x reserves		-0.022 [0.047]		-0.026 [0.053]		0 [0.069]		-0.011 [0.072]		0.162 [0.116]		0.145 [0.116]
KA Openness			-0.019 [0.007]***	-0.016 [0.007]**			0.005 [0.012]	0.011 [0.013]			-0.029 [0.022]	-0.03 [0.021]
KAOPEN x reserves			0.086 [0.039]**	0.076 [0.041]*			0.038 [0.066]	0.007 [0.070]			-0.053 [0.117]	-0.069 [0.114]
Observations	305	305	305	305	321	321	321	321	287	287	287	287
Adjusted R-squared	0.18	0.2	0.19	0.2	0.55	0.56	0.55	0.57	0.72	0.75	0.72	0.76

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

**Table 7: External Financing and Policy Orientation**

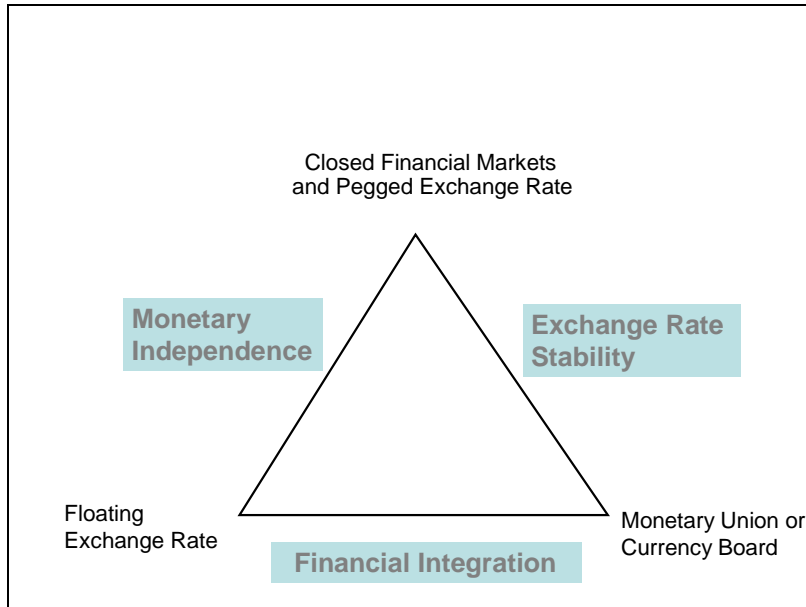
<i>Dependent variable</i>  <i>(Policy Orientation)</i>	Output Volatility						Inflation Volatility					
	Mon. Indep. & ERS		Mon. Indep. & KAO		ERS & KAO		Mon. Indep. & ERS		Mon. Indep. & KAO		ERS & KAO	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Total Reserve/GDP	-0.014 [0.007]*	-0.013 [0.008]*	-0.013 [0.007]*	-0.012 [0.007]*	-0.011 [0.007]	-0.013 [0.008]*	0.053 [0.019]***	0.055 [0.019]***	0.006 [0.024]	0.004 [0.024]	0.046 [0.018]***	0.048 [0.017]***
Currency Crisis	0.033 [0.013]***	0.036 [0.013]***	0.019 [0.015]	0.02 [0.015]	0.015 [0.019]	0.014 [0.020]	-0.436 [0.085]***	-0.49 [0.085]***	0.898 [0.101]***	0.881 [0.102]***	-0.323 [0.137]**	-0.203 [0.131]
Net FDI inflows/GDP	-0.13 [0.107]	-0.148 [0.107]	-0.032 [0.117]	-0.018 [0.115]	-0.22 [0.117]*	-0.219 [0.117]*	-0.709 [0.177]***	-0.755 [0.178]***	0.778 [0.281]***	0.798 [0.284]***	-0.926 [0.157]***	0.128 [0.150]
Net portfolio inflows/GDP	0.032 [0.096]	0.024 [0.110]	-0.017 [0.164]	0.012 [0.164]	0.089 [0.075]	0.094 [0.070]	-0.008 [0.079]	-0.008 [0.080]	-0.227 [0.068]***	-0.248 [0.069]***	-0.016 [0.048]	-0.018 [0.046]
Net 'other' inflows/GDP	0.049 [0.069]	0.049 [0.069]	0.106 [0.043]**	0.108 [0.044]**	0.059 [0.039]	0.053 [0.039]	0.052 [0.027]*	0.051 [0.037]	0.046 [0.034]	0.041 [0.039]	0.053 [0.026]**	0.045 [0.026]*
Short-term Debt (as % of total external debt)	-0.008 [0.019]	0.012 [0.020]	-0.013 [0.020]	-0.028 [0.026]	-0.012 [0.020]	-0.011 [0.023]	0.161 [0.060]***	0.276 [0.080]***	0.161 [0.075]**	0.099 [0.088]	0.151 [0.056]***	0.099 [0.060]
Total debt service (as % of GNI)	0.041 [0.056]	0.107 [0.059]*	0.04 [0.055]	0.032 [0.068]	0.041 [0.058]	-0.003 [0.070]	0.007 [0.028]	0.009 [0.028]	0.003 [0.026]	0 [0.026]	-0.009 [0.023]	-0.008 [0.022]
<i>(Policy Orientation)</i>	0.007 [0.005]	0.021 [0.011]*	-0.006 [0.006]	-0.012 [0.009]	-0.003 [0.006]	-0.016 [0.011]	-0.009 [0.007]	0.005 [0.011]	0.024 [0.012]*	0.012 [0.016]	-0.002 [0.008]	-0.002 [0.014]
<i>(Policy Orientation)</i> x Reserves	-0.021 [0.021]	-0.028 [0.023]	0.007 [0.037]	-0.004 [0.035]	0.013 [0.023]	0.022 [0.023]	-0.009 [0.037]	-0.015 [0.037]	0.069 [0.084]	0.063 [0.086]	0.027 [0.037]	0.027 [0.036]
Net FDI inflow x <i>(Policy Orientation)</i>	0.049 [0.207]	0.081 [0.203]	-0.228 [0.167]	-0.241 [0.163]	0.248 [0.155]	0.218 [0.156]	0.149 [0.227]	0.164 [0.228]	-1.586 [0.307]***	-1.626 [0.310]***	0.14 [0.263]	-0.013 [0.253]
Net Portfolio inflow x <i>(Policy Orientation)</i>	0.109 [0.224]	0.154 [0.233]	0.113 [0.177]	0.08 [0.177]	-0.167 [0.246]	-0.197 [0.264]	1.034 [0.372]***	1.129 [0.374]***	-1.489 [0.376]***	-1.512 [0.380]***	1.4 [0.384]***	0.308 [0.373]
Net 'Other' inflow x <i>(Policy Orientation)</i>	0.052 [0.079]	0.045 [0.080]	-0.168 [0.078]**	-0.169 [0.075]**	0.066 [0.102]	0.082 [0.103]	-0.071 [0.098]	-0.073 [0.099]	0.301 [0.143]**	0.319 [0.145]**	-0.009 [0.125]	-0.004 [0.123]
ST Debt x <i>(Policy Orientation)</i>		-0.04 [0.035]		0.048 [0.032]		0 [0.037]		0.001 [0.048]		0.02 [0.066]		-0.001 [0.055]
Total debt service x <i>(Policy Orientation)</i>		-0.158 [0.105]		0.028 [0.089]		0.185 [0.089]**		-0.235 [0.113]**		0.188 [0.151]		0.082 [0.126]
Observations	305	305	305	305	305	305	321	321	321	321	320	320
Adjusted R-squared	0.18	0.19	0.2	0.2	0.18	0.18	0.57	0.58	0.71	0.7	0.58	0.55

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

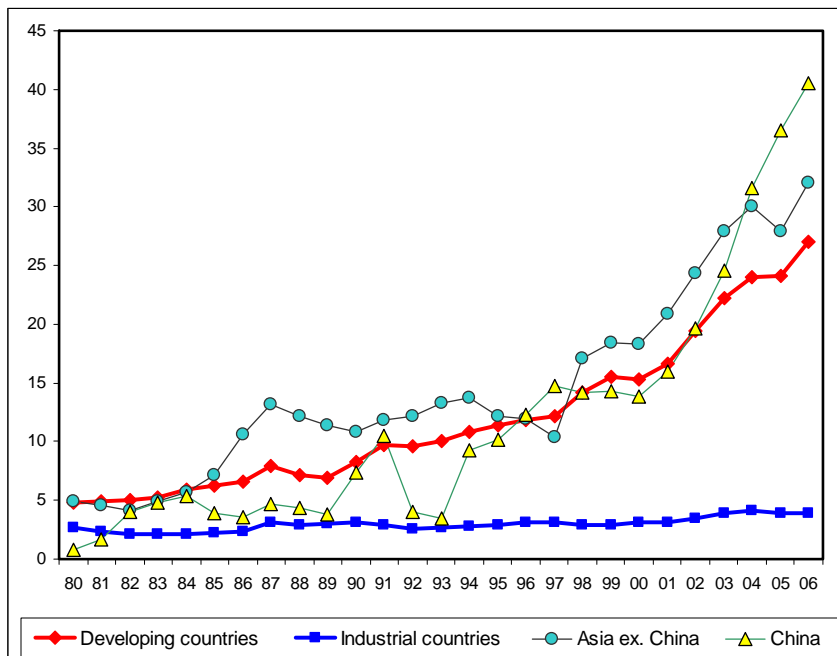
**Table 7 (con't): External Financing and Policy Orientation**

<i>Dependent variable</i>	<b>Level of Inflation</b>					
	<b>Mon. Indep. &amp; ERS</b>		<b>Mon. Indep. &amp; KAO</b>		<b>ERS &amp; KAO</b>	
	(13)	(14)	(15)	(16)	(17)	(18)
Total Reserve/GDP	-0.015 [0.045]	-0.013 [0.045]	0.045 [0.032]	0.041 [0.032]	0.005 [0.038]	0.01 [0.038]
Currency Crisis	0.176 [0.030]***	0.178 [0.030]***	0.164 [0.028]***	0.16 [0.028]***	0.155 [0.028]***	0.151 [0.029]***
Net FDI inflows/GDP	-0.304 [0.283]	-0.318 [0.282]	-0.284 [0.285]	-0.257 [0.284]	-0.431 [0.275]	-0.436 [0.277]
Net portfolio inflows/GDP	-1.041 [0.274]***	-1.034 [0.275]***	0.702 [0.442]	0.732 [0.442]*	-1.116 [0.266]***	-1.107 [0.268]***
Net 'other' inflows/GDP	-0.202 [0.122]	-0.179 [0.124]	0.101 [0.093]	0.095 [0.093]	-0.117 [0.086]	-0.115 [0.087]
Short-term Debt (as % of total external debt)	0.086 [0.047]*	0.05 [0.059]	0.035 [0.044]	0.051 [0.051]	0.056 [0.045]	0.067 [0.048]
Total debt service (as % of GNI)	0.201 [0.107]*	0.262 [0.137]*	0.163 [0.101]	0.036 [0.116]	0.146 [0.103]	0.219 [0.116]*
<i>(Policy Orientation)</i>	-0.009 [0.012]	-0.01 [0.019]	0.049 [0.015]***	0.032 [0.020]	-0.051 [0.014]***	-0.025 [0.024]
<i>(Policy Orientation)</i> x Reserves	0.057 [0.056]	0.056 [0.056]	-0.136 [0.098]	-0.144 [0.099]	0.057 [0.058]	0.044 [0.059]
Net FDI inflow x <i>(Policy Orientation)</i>	0.07 [0.503]	0.017 [0.504]	-0.14 [0.435]	-0.157 [0.432]	0.095 [0.458]	0.151 [0.464]
Net Portfolio inflow x <i>(Policy Orientation)</i>	2.364 [0.784]***	2.325 [0.791]***	-1.908 [0.529]***	-1.945 [0.530]***	1.213 [0.655]*	1.292 [0.679]*
Net 'Other' inflow x <i>(Policy Orientation)</i>	0.341 [0.158]**	0.317 [0.161]**	-0.436 [0.174]**	-0.395 [0.175]**	0.236 [0.204]	0.228 [0.209]
ST Debt x <i>(Policy Orientation)</i>		0.077 [0.076]		-0.042 [0.076]		-0.062 [0.097]
Total debt service x <i>(Policy Orientation)</i>		-0.137 [0.188]		0.391 [0.184]**		-0.248 [0.219]
Observations	287	287	287	287	287	287
Adjusted R-squared	0.72	0.73	0.76	0.76	0.75	0.75

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

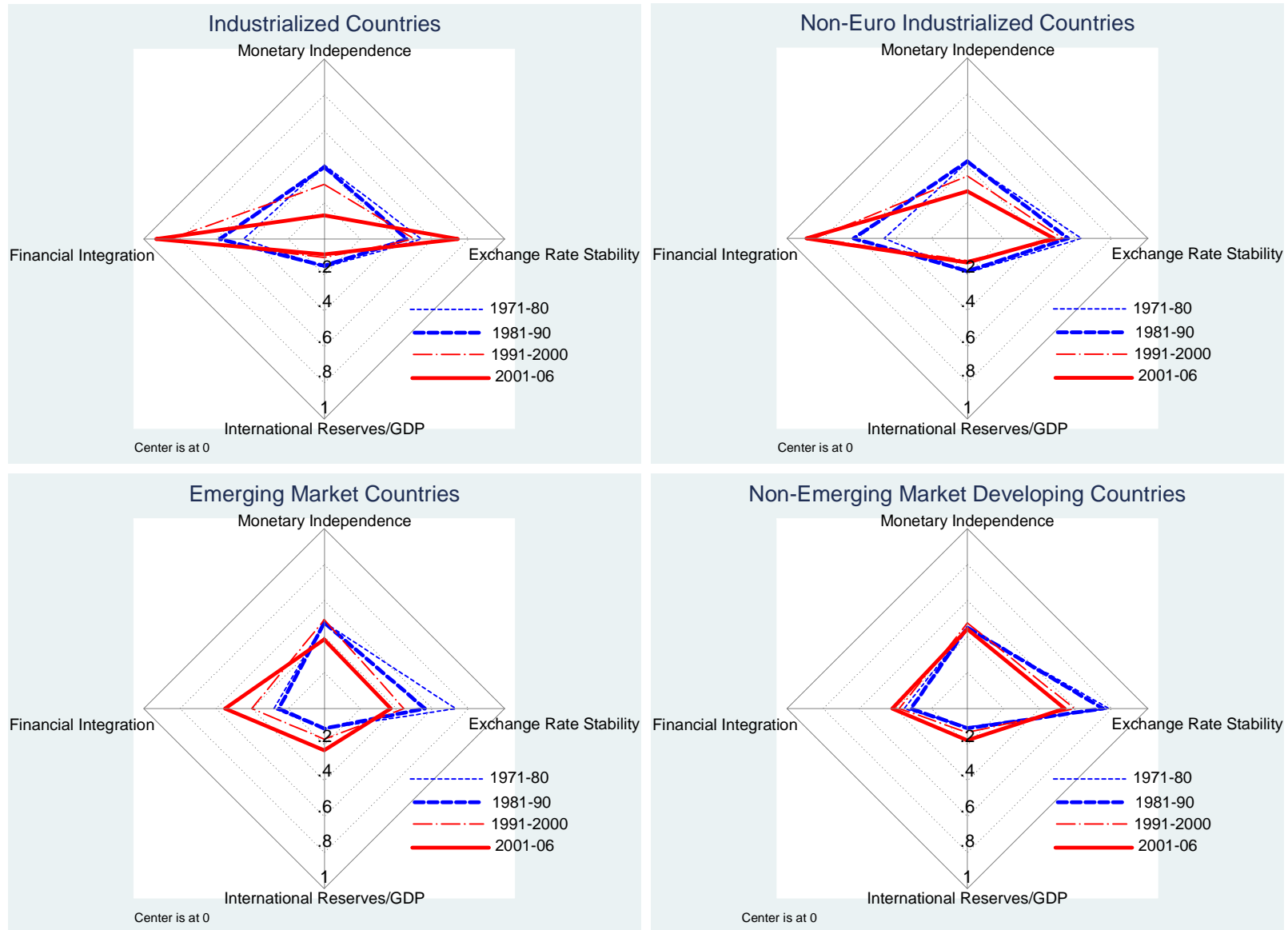


**Figure 1: The Trilemma Framework**

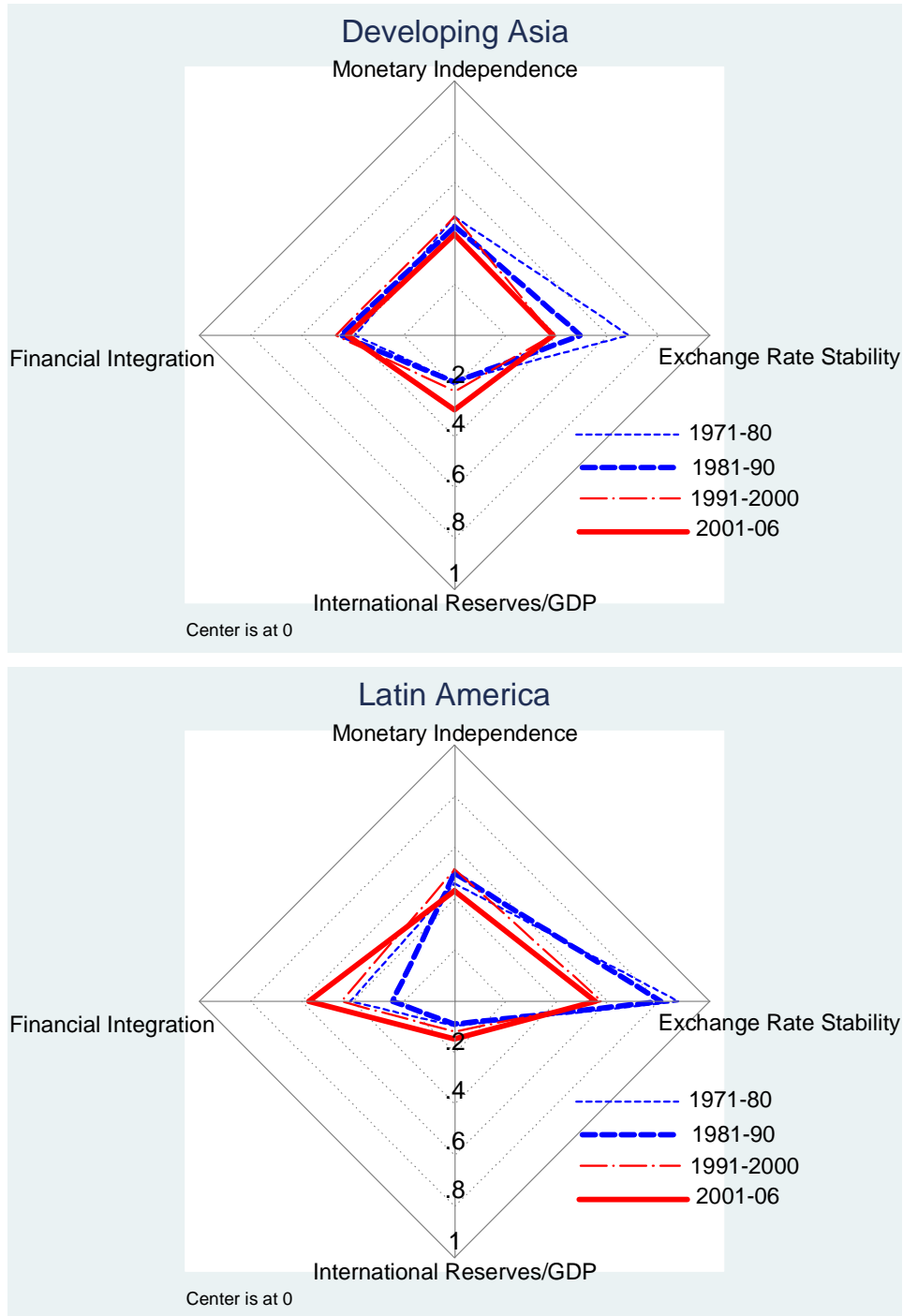


**Figure 2: IR/GDP, 1980-2006**

**Figure 3: The Recent History of Trilemma and International Reserves Configuration**

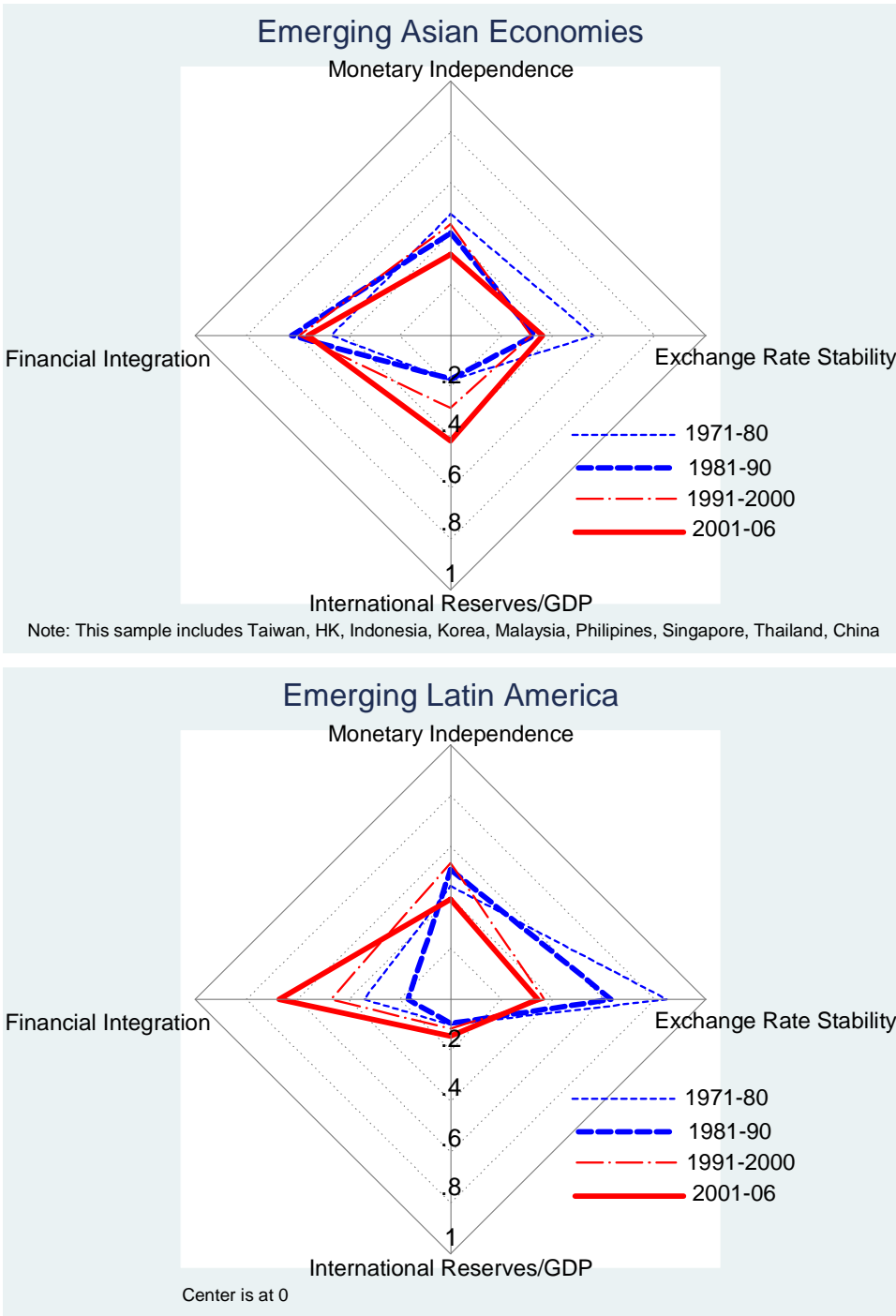


**Figure 4: The Recent History of Trilemma and International Reserves Configuration  
Regional Patterns of Developing Countries**



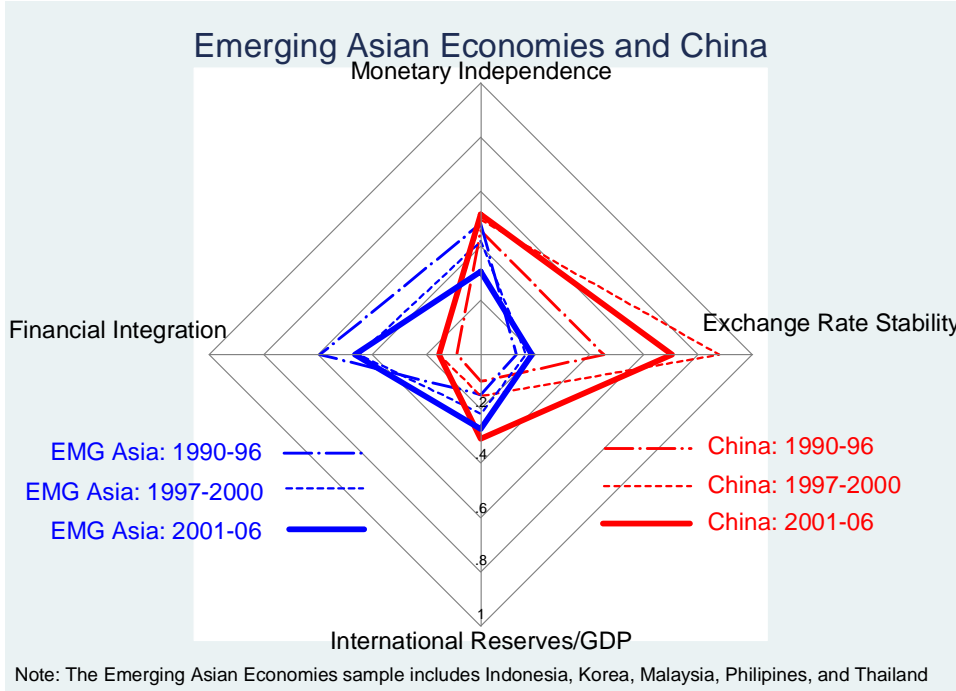
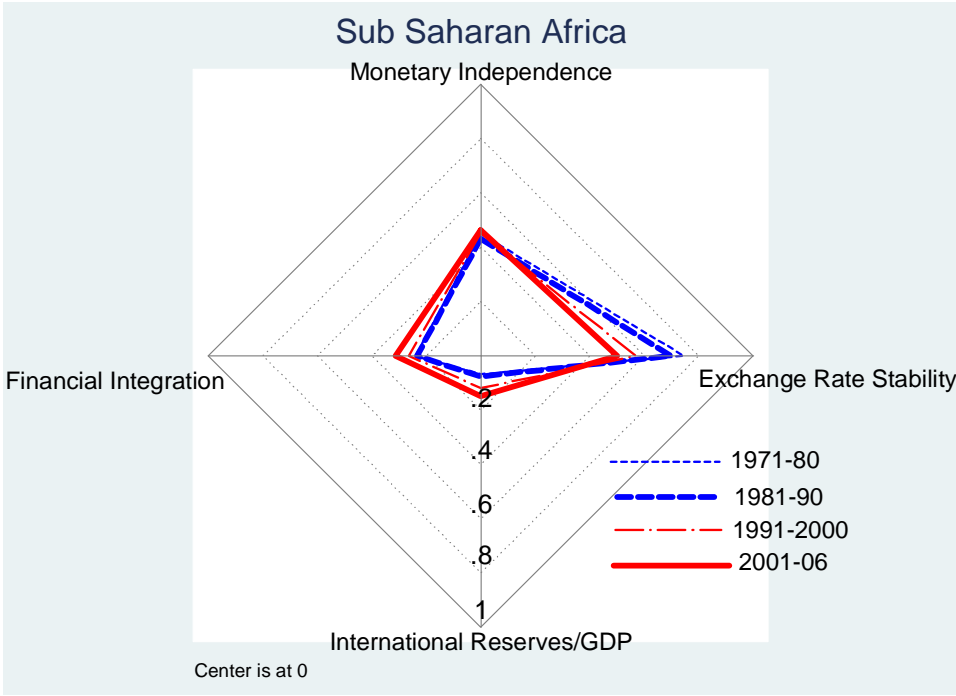


**Figure 4 (con't): The Recent History of Trilemma and International Reserves Configuration: Regional Patterns of Developing Countries**



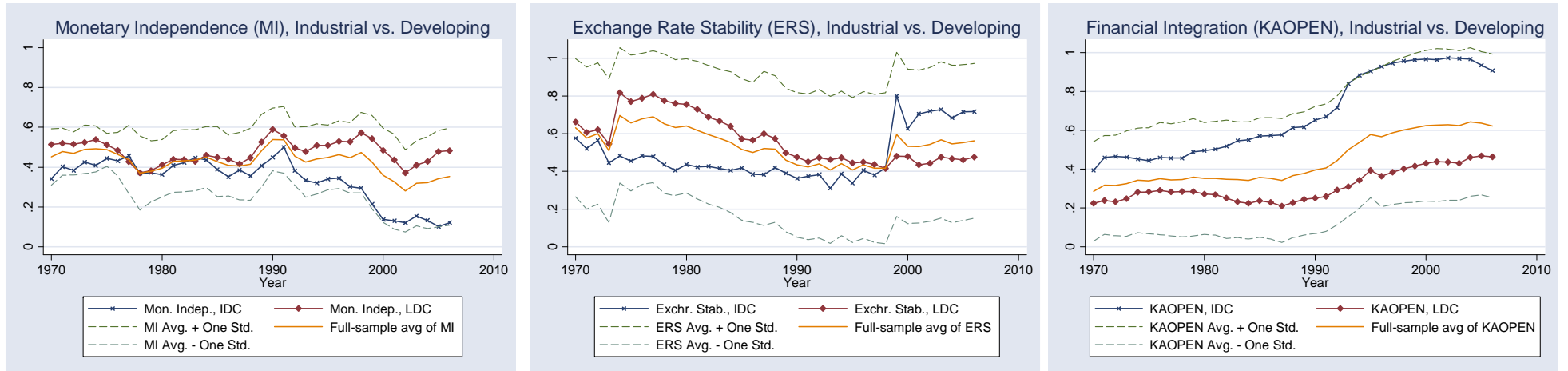
NOTES:  
 "Emerging Asian Economies" include China, Hong Kong, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan, and Thailand.  
 "Emerging Latin America" include Argentina, Brazil, Chile, Colombia, Ecuador, Jamaica, Mexico, Peru, Trinidad and Tobago, and Venezuela.

**Figure 4 (con't): The Recent History of Trilemma and International Reserves Configuration: Regional Patterns of Developing Countries**

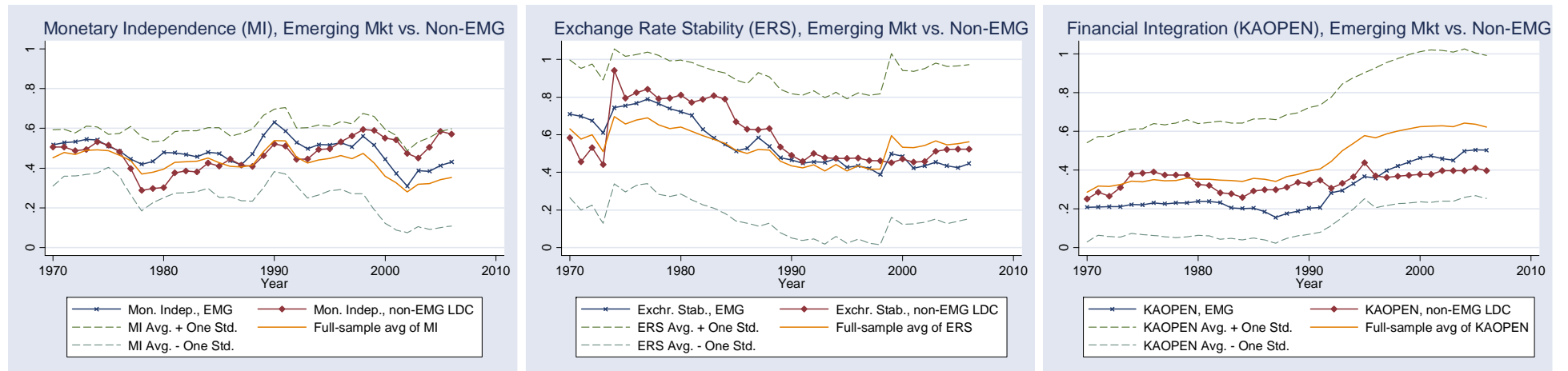


**Figure 5: Development of Individual Trilemma Indexes**

(a) Industrialized countries vs. Developing countries

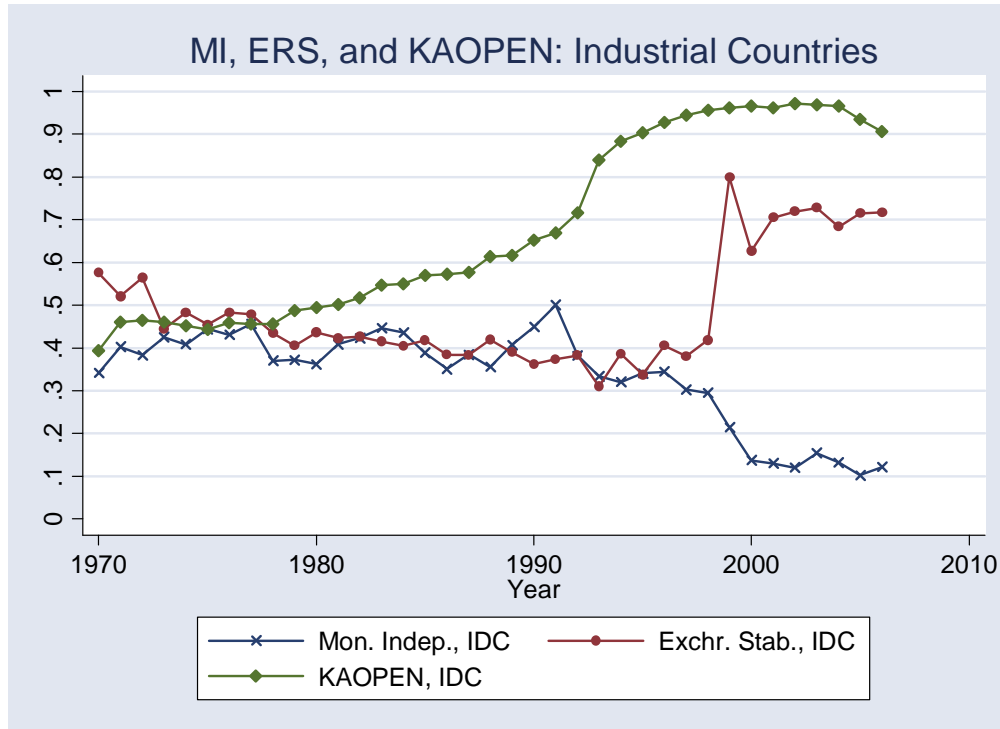


(b) Emerging market countries vs. Non-emerging market, **developing** countries

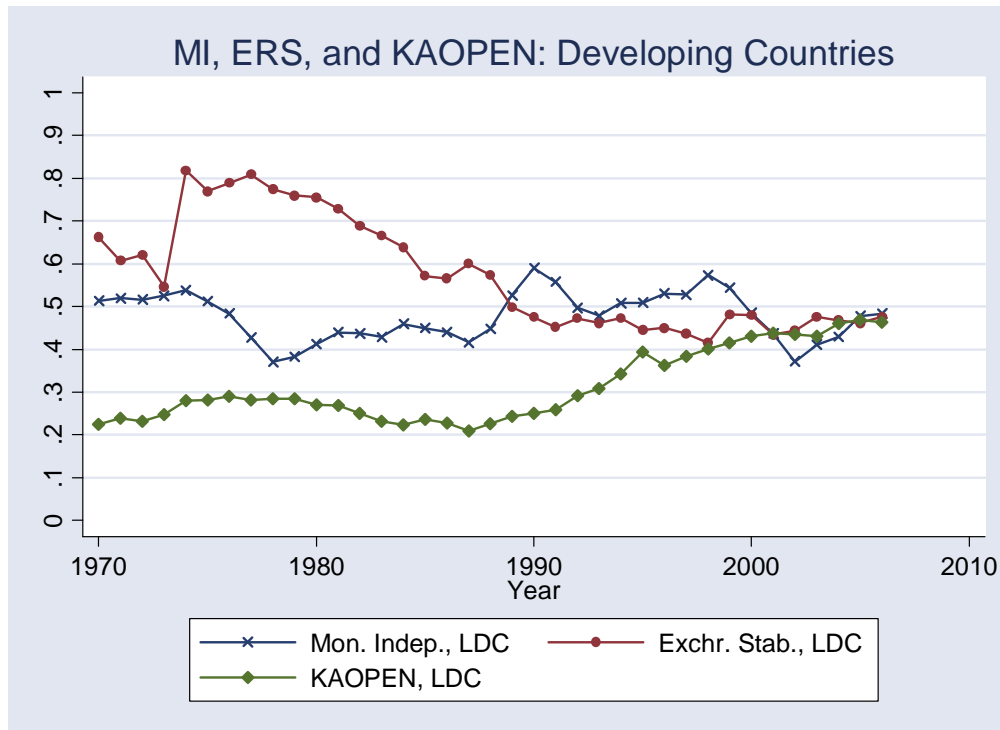


**Figure 6: Development of the Trilemma Indexes**

(a) Industrialized Countries

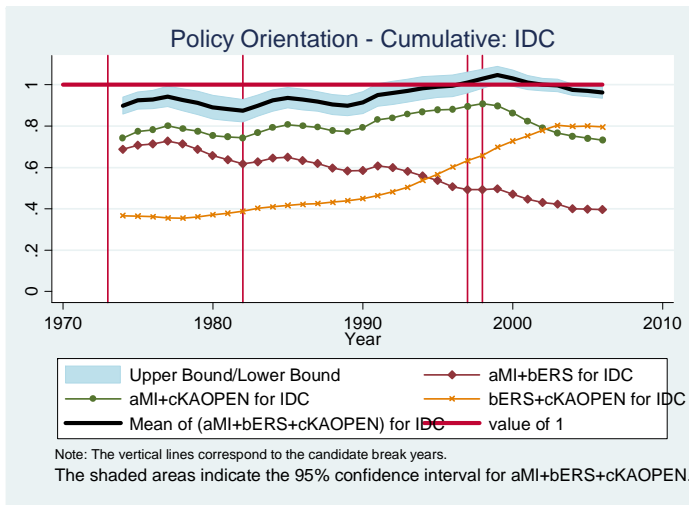


(b) Developing Countries

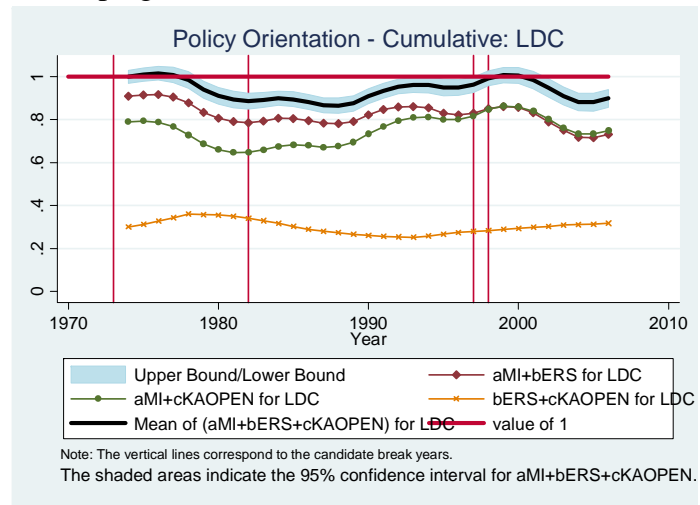


**Figure 7: Policy Orientation for IDCs and LDCs**

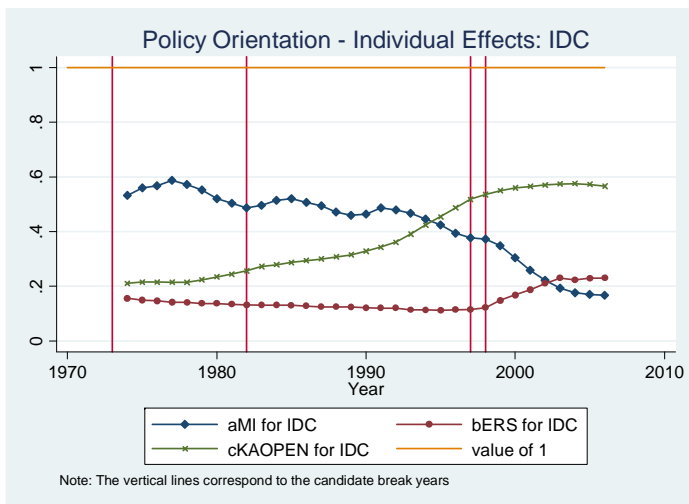
(a) Cumulative Effects:  $\hat{aMI}$ ,  $\hat{aMI} + \hat{b}ERS$ , and  $\hat{aMI} + \hat{b}ERS + \hat{c}KAOPEN$   
 Industrial Countries



Developing Countries



(b) Individual Effects  $\hat{aMI}$ ,  $\hat{b}ERS$ , and  $\hat{c}KAOPEN$   
 Industrial Countries



Developing Countries

