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**Risk factors in international financial crises: early  
lessons from the 2008-2009 turmoil**

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# Risk factors in international financial crises: early lessons from the 2008-2009 turmoil

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## Abstract

This paper analyses the global transmission of the recent economic and financial crisis as a function of macroeconomic factors such as per capita gross domestic product, current-account positions prior to the crisis, exchange-rate regimes, inflation prior to the crisis and financial openness. It finds that large current-account imbalances (both surpluses and deficits) were a risk factor in the current global economic turmoil. It also finds that countries that use currency boards have suffered much more from the crisis than countries with other exchange-rate regimes. Financial openness appears to have increased the risk of experiencing a deep recession, while higher inflation prior to the crisis seems to have mitigated its impact.

**Keywords:** crisis of 2008/9, exchange rate regimes, emerging markets, developing countries

**JEL classifications:** E63, F31, F32

## Introduction

There is a growing body of literature on the various impacts of the economic and financial crisis on countries around the world. Much has been written on its impacts on world trade, on commodity producing countries, on countries which have close trade linkages with the United States, and on countries which rely heavily on remittance flows from developed countries.<sup>2</sup> This paper aims to shed light on the spreading financial turmoil from a different angle: it attempts to examine the international transmission of the subprime crisis in the United States to determine which macroeconomic characteristics, beyond sectoral specialization and trade specialization, make countries more vulnerable to the contagion effects of a global financial and economic crisis. It looks at economic aspects which can be influenced by policymakers, such as the exchange-rate regime, inflation, the current-account balance and capital-account openness. In so doing, it adds to the debate on the choice of exchange-rate regimes, on macroeconomic management, including under- or overvaluation of a currency, and on capital account convertibility.

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<sup>2</sup> For a recent overview of a number of these issues, see Ocampo et al., 2010.

The paper is structured as follows. After a brief discussion on measuring the impact of the crisis on individual countries, it provides a quantitative description of the most important stylized facts of the global spread of the crisis, building on economic data for 181 countries covered by the *World Economic Outlook* of the International Monetary Fund (IMF).<sup>3</sup> It then uses econometric techniques to determine which macroeconomic features helped some countries to be more resilient to the financial and economic crisis than others. This section also looks at the factors that might have played a role in determining whether a country should turn to the IMF to cover financing needs in the recent crisis. The final section seeks to offer tentative explanations for the empirical observations. Other contributions in this book dwell on the wider implications of the findings, though these will also require further research as more data become available.

## **1. Empirical analysis of the crisis**

For determining the negative impact of the crisis, the following three criteria have been used throughout the paper:

1. The change of trend in the GDP growth rate from the average of the years prior to the crisis (2003–2007) to the average of the crisis years 2008–2009. This measure has been chosen because the crisis hit different countries at different points in time. World trade was already severely affected in the last quarter of 2008, and some countries already had trouble financing their foreign deficit that year. However, due to the base effect, this drop is partly reflected in the annual GDP growth rate in 2008 and partly in 2009. Looking only at the growth rate of one of these two years would have distorted the picture.
2. The simple average growth rate of GDP for the years 2008 and 2009. Again, looking at both years together gives a better picture than looking only at 2009 when most of the decline occurred.
3. The fact that a country had to turn to the IMF for borrowing. Especially after the huge wave of criticism of the IMF's policies during the East Asian crisis of 1997–1998, borrowing from the IMF has come to be seen not only as a national humiliation, but also, increasingly, as an economic evil best avoided. Thus, being forced to accept IMF lending can be viewed as a sign that a country has been severely affected by a crisis.

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<sup>3</sup> For this study, Zimbabwe has been excluded from the data set as it is an outlier for a number of the data points considered, and the country's recession is by most accounts largely independent of the global crisis.

Of course, there are other important negative economic and social consequences of the crisis, such as rising unemployment and poverty, and increasing government debt. However, limited availability of up-to-date data on these aspects constrains the analysis here. Unemployment data are often not comparable between countries, and recording of unemployment figures, especially for developing countries and emerging-market economies, are often inexact, as employment in the informal sector is not always well covered. Moreover, the impact of the crisis on the labour market may exhibit different time lags in different countries. In some countries, retrenchment of workers is an easy and quick process, while in others it takes much longer due to the legal regime or conventions. In addition, some countries have passed measures temporarily stabilizing labour markets. Thus data currently available on labour market performance are not an adequate indicator for measuring the impact of the crisis at this particular point in time; its full impact can only be evaluated later.

Reporting of government debt and government budget deficits outside the OECD countries is also not very exact and up-to-date, and the IMF's *World Economic Outlook* therefore provides such data for only a limited number of countries. Similarly, due to the lack of reliable, up-to-date statistics for the incidence of poverty across countries, it is difficult to assess to what extent poverty has increased as a result of the crisis. While there have been a number of estimates (i.e. Chen and Ravallion, 2009), these are necessarily only very rough. These indicators have therefore been omitted from this paper; instead, the paper focuses on the drop in GDP and the extent of IMF involvement.

The analysis in this paper is based on data assembled from various sources. Data on GDP, inflation and current accounts have been taken from the IMF's *World Economic Outlook* database (January 2010). Data on capital-account openness have been derived from Chinn and Ito (2008). And data on exchange-rate regimes have been taken from the IMF's classification of exchange-rate regimes (IMF, 2009) and modified to include an additional group of countries in the European Monetary Union (EMU).<sup>4</sup> Altogether, the sample comprises 179 countries.

## 1.1 Descriptive statistics

Before we turn to a rigorous econometric analysis, it is useful to take a brief look at the data. At the beginning of the crisis, it was often argued by the IMF and financial sector analysts

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<sup>4</sup> The IMF classifies EMU countries as "independently floating". While this might be an appropriate description of EMU as a whole, it is misleading when looking at the performance of individual member countries such as Greece, as that country has a fixed exchange rate with its main trading partners.

that the emerging-market economies and developing countries might be decoupled from developed economies, particularly the United States, and may therefore be able to cope with the turmoil more effectively. While this hope proved to be illusory, at least some emerging-market economies have performed much better than other parts of the world. Asian countries, in particular, have managed to recover very quickly and briskly from the crisis, with parts of Latin America following. In contrast, economic data for most of the members of the Commonwealth of Independent States (CIS) and the new member States of the European Union (EU) have shown few real improvements. Also the United States and the Western European industrialized economies have proved to be laggards, with vulnerable economic recovery (IMF, 2010).

Beyond these regional features, however, the impact of the crisis has clearly varied with the state of development of the economies in question.<sup>5</sup> On examining the different categories of countries, namely low-income countries (GDP per capita below \$975), lower middle-income countries (GDP per capita between \$976 and \$3,855), upper middle-income countries (GDP between \$3,858 and \$11,905) and high-income countries, we found fairly large variations in the fall in the growth between the years 2003–2007 and 2008–2009: high-income countries experienced a drop in the growth rate of 5.2 percentage points,<sup>6</sup> upper middle-income countries saw an almost equally large drop of 4.9 percentage points, while lower middle-income countries saw growth decline by 2.7 percentage points and lower income countries by only 1.2 percentage points. The group of high-income countries was the only category which recorded an average annual negative growth rate for the years 2008 and 2009 of minus 0.7 per cent. This group therefore was solely responsible for the contraction of world GDP in 2009.

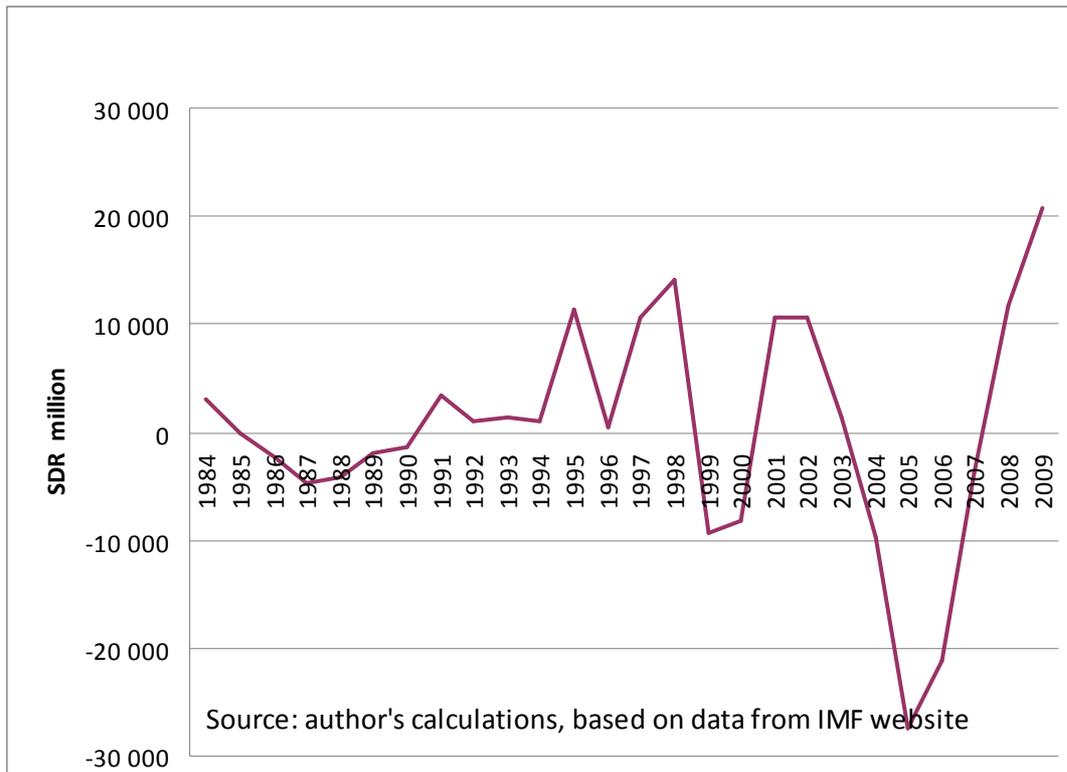
The crisis has also seen a resurgence of borrowing from the IMF. After years of not being able to find borrowers, the IMF has started to lend again, supported by a pledge by its shareholders to provide more funding as part of internationally coordinated crisis-fighting efforts. Net disbursements by the Fund have been higher than at any time since the mid-1980s, with net payouts totalling more than 20 billion in Special Drawing Rights (SDRs) (about US\$ 30 billion) in 2009 (figure 1). Also, the number of countries borrowing from the IMF has risen sharply: out of 179 countries in our sample, 53 received IMF funding in 2009 – a share of almost 30 per cent.

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<sup>5</sup> For descriptive statistics on the impact of the crisis on different economies, see the table in the annex.

<sup>6</sup> All data for each country group refer to simple, unweighted averages for the country group in question.

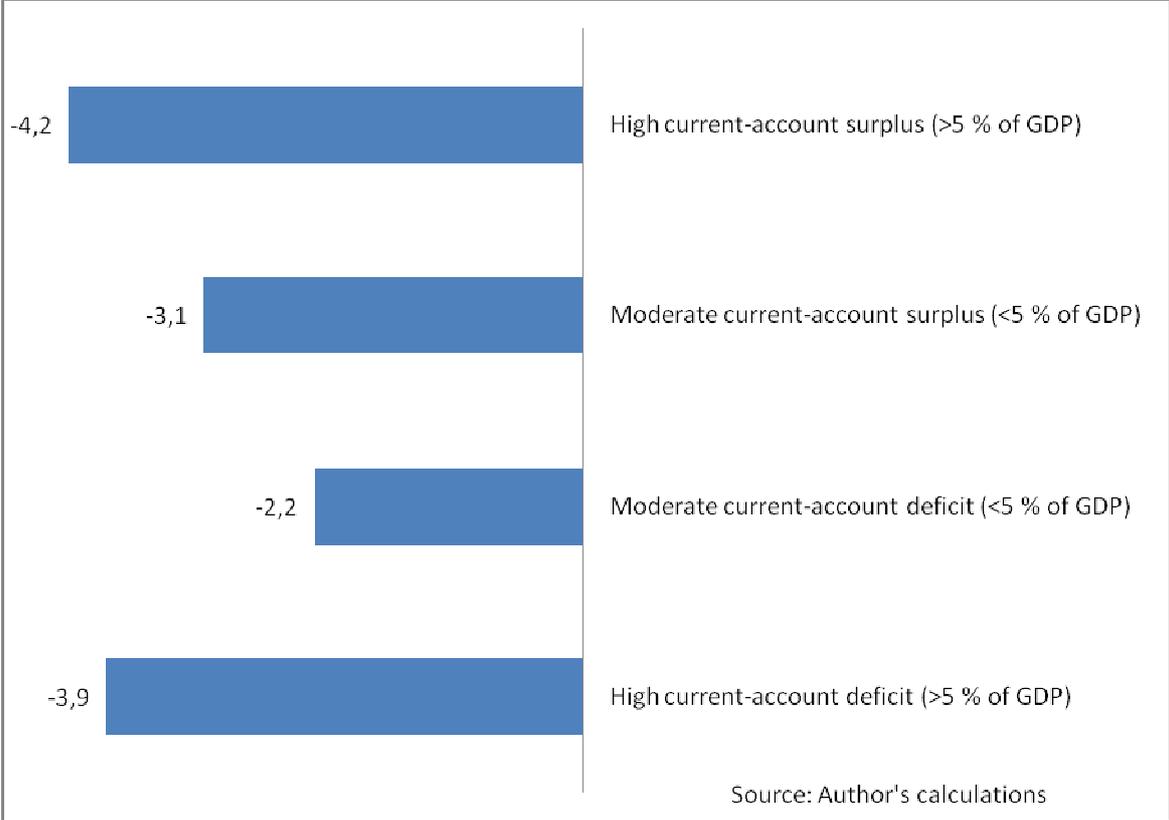
**Figure 1: Net IMF loan disbursements**



The impact of the crisis has clearly varied with the size of the external imbalances of individual countries. Dividing the sample into four country groups according to their current-account positions prior to the crisis (those with a high current-account surplus of more than 5 per cent of GDP, those with a current-account surpluses of less than 5 per cent of GDP, those with a current-account deficit of more than 5 per cent of GDP and those with a current-account deficit of less than 5 per cent of GDP), it can be observed that countries with large-current account imbalances – surpluses or deficits – have been hit harder than those with moderate imbalances. The group with very high surpluses experienced a drop in the growth trend by 4.2 percentage points, followed by an only slightly smaller drop in the growth trend of 3.9 percentage points for the group with very high deficits. In contrast, countries with

moderate deficits and those with moderate surpluses experienced a decline of only 2.2 percentage points and 3.1 percentage points respectively (figure 2).

**Figure 2: Change in GDP growth between 2003–2007 and 2008–2009 by current-account position of countries (Percentage points)**



The exchange-rate regime also seems to have an impact on the vulnerability of a country to the contagion effects of a crisis. After the Asian crisis in the 1990s, the notion of the stable corner solutions (“corner solution paradigm”) came into vogue. According to this proposition, in the long run only two currency regimes would be stable: the completely fixed or the completely flexible exchange rate.<sup>7</sup> Proponents of this hypothesis understood by “completely fixed” any regime which was then seen as providing an irrevocably fixed exchange rate, thereby providing no room for speculation. In addition to dollarization, currency boards and monetary union were also seen as belonging to this category of exchange-rate regimes,

<sup>7</sup> Early proponents include Eichengreen, 1994, and Obstfeld and Rogoff, 1995.

because, in principle, under these regimes the authorities have the necessary means in the form of reserves to prevent any crack in the exchange-rate peg.<sup>8</sup>

In order to get an idea of the initial impact of the exchange-rate regime on the vulnerability of countries, the sample was divided into nine groups, using the IMF's classification of exchange-rate regimes plus a separate group for countries in the EMU.<sup>9</sup> Again, the results are quite revealing. The (small) group of dollarized economies, including countries such as Ecuador, Montenegro and Panama,<sup>10</sup> managed the crisis relatively well: their GDP growth fell by only 0.6 percentage points, and growth continued at an average rate of 3.7 per cent in 2008–2009 – above average in the overall sample. None of these countries had to seek IMF support. However, before taking this result as a strong endorsement of dollarization, it must be borne in mind that the countries which lacked a legal tender of their own had been growing less rapidly in the years prior to the crisis than other countries of similar income levels (see annex table). In addition, abandoning the national currency deprives policy makers of the possibility of domestic financing of investment, as noted in Dullien (2009). Countries having the other types of exchange-rate regimes originally considered as “completely fixed” have performed comparatively badly during the crisis. The group of currency board countries, including Bulgaria and Estonia, but also some smaller Caribbean countries, have been the worst affected. GDP growth there declined, on average, by a whopping 6 percentage points. In addition, these countries experienced a contraction in average annual GDP of 1 per cent in 2008 and 2009.

Interestingly, the exchange-rate regimes that, on average, produced the best outcome during the crisis are those in the “middle ground” which were once seen as not sustainable. Countries which had exchange-rate regimes classified as “conventional fixed peg” (except currency boards, monetary union and dollarization), “pegged exchange rate within horizontal bands”, “crawling pegs” or “crawling bands” saw their GDP growth rates decline by an average of only 3 percentage points, and they achieved an average annual GDP growth rate of 3 per cent in 2008 and 2009, while those with exchange-rate regimes closer to the “corners” saw their

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<sup>8</sup> Of course, the Argentine crisis of 2001-2002, which resulted in its exit from a currency board, showed that such a regime is certainly not an “irrevocably fixed” exchange-rate regime.

<sup>9</sup> The IMF classifies EMU countries as “independently floating”. While this might be an appropriate description of EMU as a whole, it is certainly misleading when looking at the performance of a single member country such as Greece as that country has a fixed exchange rate with its main trading partners.

<sup>10</sup> Countries are counted as “dollarized” if they have adopted a foreign currency. Thus, Montenegro is considered as having a “dollarized” economy even though it uses the euro.

GDP growth rate decline by 3.8 percentage points and recorded an average annual GDP growth rate of only 1.2 per cent.

**Table 1: Impact of the crisis by different exchange-rate regimes**

	<b>Change in GDP growth, 2008–2009 compared with 2003–2007 (Percentage points)</b>	<b>Average annual GDP growth, 2008–2009 (Per cent)</b>	<b>Average annual GDP growth 2003–2007 (Per cent)</b>
<b>Dollarized economies</b>	-0.6	3.7	4.3
<b>Currency board arrangements</b>	-6.0	-1.0	5.1
<b>Free float</b>	-4.2	-0.1	4.1
<b>Managed float</b>	-3.2	3.0	6.2
<b>European Monetary Union</b>	-4.3	-1.3	3.0
<b>Others ("middle ground")*</b>	-3.0	3.0	5.9
* Other conventional fixed peg arrangements, pegged exchange rate within horizontal bands, crawling peg, crawling band. Source: Author's calculations, based on the IMF's World Economic Outlook Database (accessed in January 2010) and IMF (2009)			

## 1.2 Econometric estimates

Descriptive statistics like those above can be misleading. For example, currency board countries as a group also usually have high current-account deficits. The question is therefore whether the factors analysed above have a direct influence on their own, or only an indirect influence. This can only be answered by means of rigorous econometric testing. Thus, as a first step, a regression was run with the change in GDP growth between 2003–2007 and 2008–2009 as the dependent variable, and the current-account balance prior to the crisis (2007), the inflation rate prior to the crisis (2007), GDP per capita, the variable for capital-account openness, a dummy for an IMF programme in 2009 and dummies for the different types of exchange-rate regimes as independent variables. In a general-to-specific-approach,

variables that were not significant, at least at a 10 per cent level, were eliminated. In addition, both the current-account balance and the absolute value of the current-account balance were alternatively included in order to allow for the possibility that large surpluses also make a country vulnerable. The final equation for the change in the growth trend during the crisis reads as follows:

$$\Delta growth = -2.27 - 0.428GDP_{capita} - 0.07|CurrentAccount_{2007}|,$$

where  $\Delta growth$  is the percentage point change in the average annual growth rate between 2003–2007 and 2008–2009,  $GDP_{capita}$  is GDP per capita in current US\$ 1,000, and  $|CurrentAccount_{2007}|$  is the absolute value of the current account in 2007 as a per cent of GDP.

From this it can be observed that only per capita GDP levels and current-account imbalances had a clearly negative influence on the way a country was affected by the crisis (both coefficients are significant at the 5 per cent level), where the impact was measured as a change in the trend growth rate. Countries with higher per capita incomes have been hit significantly harder by the crisis than those with lower incomes. Interestingly, the current-account balance as a per cent of GDP was insignificant in explaining the change in GDP growth, while the *absolute* value of the current-account balance as a per cent of GDP turned out to be highly significant. Hence, not only current-account deficits appear to have contributed to the propagation of the crisis, but also current-account surpluses.

In a second step, a regression analysis was undertaken of the current-account balance prior to the crisis (2007), the inflation rate prior to the crisis (2007), GDP growth rate prior to the crisis (2003 to 2007), GDP per capita, the variable for capital-account openness, a dummy for an IMF programme in 2009 and dummies for the different types of exchange-rate regimes as possible factors influencing the average annual rate of GDP growth in 2008-2009. As before, variables which turned out to be statistically insignificant were eliminated, and both the current-account balance and the absolute value of the current-account balance were tested. The resulting equation reads:

$$\begin{aligned}
\mathit{growth}_{2008\_9} = & 1.69 + 0.16\mathit{growth}_{2003\_7} + 0.05\mathit{CurrentAccount}_{2007} - 0.74\mathit{GDP}_{capita} \\
& + 0.08\mathit{inf}_{2007} - 2.01\mathit{cb}
\end{aligned}$$

Where  $\mathit{growth}_{2008\_9}$  is the average annual growth rate of GDP in 2008 and 2009,  $\mathit{growth}_{2003\_7}$  is the average annual growth rate of GDP during the period 2003–2007,  $\mathit{CurrentAccount}_{2007}$  is the current account position as a per cent of GDP in the year 2007,  $\mathit{inf}_{2007}$  is the rate of inflation in 2007 and  $\mathit{cb}$  is a dummy for the country using a currency board.

All variables were significant at the 5 per cent level, except inflation and the GDP growth rate for the period 2003–2007 which were significant at 10 per cent.

A few of the results are notable. First, again GDP per capita turned out to be a very strong predictor of lower growth in the crisis years, even when controlling for growth prior to the crisis. One reason might be that the crisis originated in some of the most developed countries. Second, the current-account *deficit*, not the absolute value, seems to be a significant variable. A larger deficit prior to the crisis led to lower growth during the crisis years. Third, countries with a currency board in place had a significantly lower growth rate in 2008–2009 (by an annual two percentage points on average), even after controlling for the effects of the huge current-account deficits some of the currency board countries such as Lithuania and Estonia were running prior to the crisis. Third, inflation prior to the crisis seems to have influenced the impact of the crisis, but not in the way that would be predicted by standard theory. In actual fact, a higher rate of inflation prior to the crisis was correlated with a higher growth rate during the crisis (even when controlling for GDP growth prior to the crisis).

Another interesting feature seems to be the lack of any correlation between the depth of the crisis in a country and its request for IMF support. This result would mean first that countries seem to have sought IMF support regardless of the scale of their economic downturn, and second, that the IMF programmes do not appear to have significantly influenced the growth outcomes of those countries compared with other countries having similar characteristics.

In a third step, a probit approach was used to test which characteristics increased the probability of a country seeking IMF support. Again, all variables were initially included and subsequently eliminated. In the end, the probit model for the probability of an IMF programme was estimated (table 2).

**Table 2: Probit model: Probability of IMF intervention**

<i>Variable</i>	<i>Coefficient</i>	<i>Standard error</i>
<i>Constant</i>	-0.575	0.151 (***)
<i>CurrentAccount<sub>2007</sub></i>	-0.056	0.011(***)
<i>GDP<sub>capita</sub></i>	-0.392	0.118 (***)
		*** significant, at 1 per cent level

Only two variables are significant for explaining the need for an IMF programme: the current-account balance and the GDP per capita. The larger the current-account deficit prior to the crisis, the larger was the probability of a country seeking IMF assistance in response to the crisis. In fact, looking at the descriptive statistics, it can be seen that only 2 out of the 53 countries which borrowed from the IMF in 2009 had a current-account surplus prior to the crisis. In addition, the richer a country in per capita terms, the less likely it was to seek IMF intervention. This is an interesting result, as IMF intervention was considered most likely for emerging-market economies. During the crisis, however, the Fund has lent strongly also to lower income countries. None of the exchange-rate regime dummies proved to be significant.<sup>11</sup>

<sup>11</sup> However, some of the exchange-rate regime dummies showed a 100 per cent correlation with no IMF programmes. For example, no dollarized country turned to the IMF in the latest crisis. However, interpreting this fact in economic terms is not straightforward. While proponents of dollarization might claim that this shows the greater stability of dollarized economies, it is just as plausible that dollarized economies lack the channels for intervention through an IMF loan, or that the number of dollarized economies was too small (5 out of 179) to enable a reliable conclusion to be drawn.

Finally, the group of worst performers during the crisis was selected and another probit estimation run on the characteristics of this group. To this end, a threshold of an annual contraction by more than 3 per cent for 2008–2009 was chosen (a total contraction of more than 6 per cent), which produced 12 countries: Armenia, Botswana, Estonia, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Lithuania, Seychelles and Ukraine. The probit estimation for these countries yielded the results presented in table 3, with *KOpen* referring to capital-account openness as measured by the Chinn/Ito index.

**Table 3: Probit model: Probability of a deep recession**

<i>Variable</i>	<i>Coefficient</i>	<i>Standard error</i>
<i>Constant</i>	-2.671	-2.671 (***)
<i>CurrentAccount</i> <sub>2007</sub>	-0.028	0.013(**)
<i>GDP</i> <sub>capita</sub>	0.154	0.857 (*)
<i>growth</i> <sub>2003_7</sub>	0.092	0.055 (*)
<i>KOpen</i>	0.262	0.122 (**)
		*** significant at 1 per cent level ** significant at 5 per cent level * significant at 10 per cent level

Thus again, having a higher GDP per capita generally increases the risk of experiencing a severe recession. A large current-account deficit prior to the crisis is also an important risk factor. Having a relatively open capital account seems to be another risk factor for suffering severe consequences of a global financial and economic crisis. Our regression analysis revealed yet another factor: experiencing very strong growth in the years 2003–2007 (i.e. just prior to the crisis) also seemed to have increased the risk of the crisis plunging a country into a deep recession. This finding hints that a boom prior to the crisis might have led to imbalances, which made the economy in question more vulnerable (as it might have been part

of a boom-and-bust cycle). Finally, having a very open capital account, as measured by the Chinn/Ito index, significantly increased the risk of experiencing a very deep recession as a consequence of the United States subprime crisis.

### **1.3 Summing up the empirical evidence**

Thus, the findings may be summarized as follows:

1. In terms of impact on GDP and GDP growth, the crisis appears to have affected high- and upper middle-income countries more than poorer countries, even though there may have been greater suffering in lower income countries, as a drop in GDP growth might be more severe in an environment without social safety nets and widespread poverty as a result of the crisis.
2. Large current-account imbalances – not only deficits – seem to be an important risk factor for vulnerability to crisis transmission.
3. Currency boards seem to be an additional risk factor, in addition to the impact a currency board might have on the external balance by increasing the current-account deficit.
4. An open capital account appears to exacerbate vulnerability.
5. Inflation, long seen as a prime concern for macroeconomic stability and an important factor in increasing countries' vulnerability to financial and currency crises, does not seem to be as significant a factor as was previously thought.
6. Higher per capita incomes make IMF intervention less likely.
7. IMF programmes cannot be shown to have significant positive or negative effects on the depth of a crisis

## **2. Tentative explanations and conclusions**

From a theoretical point of view, and against the background of the Washington Consensus, these results provide the basis for considerable rethinking. First, the benefits of free global capital flows are very difficult to detect in this data set. Economic textbook theory tells us that open capital accounts can do two things. First, they can help countries which lack capital to import capital to grow faster. They can borrow from abroad, invest and hence boost growth.

As marginal productivity of capital is higher than in countries which are capital-abundant, they can easily use the proceeds from their investments to service their debt. Second, open capital accounts can help countries weather asymmetric shocks. If an unexpected shock lowers national income, borrowing from abroad can be used to smooth national consumption, thus increasing welfare.<sup>12</sup> As long as domestic consumption has an influence on domestic output, this should also help reduce the volatility of overall output. Countries which are more financially open can more easily borrow from abroad, and therefore should be able to withstand a crisis – such as the recent one – better.

However, the data presented in this paper do not confirm this story. Whether importing capital is a sensible strategy for sustainably accelerating economic growth has been disputed for a number of years (see, for example, Prasad, Rajan and Subramanian, 2007). The data set used in this paper raises doubts about the ability of capital inflows to smooth the economic cycle. While an open capital account per se does not seem to have a significant influence on the depth of a crisis for the whole sample, it seems to increase the probability that a global economic and financial crisis can push a country with such an account into a deep recession. Moreover, using the possibility of global capital flows, either as an exporter or an importer of large amounts of capital (as reflected in a large current-account imbalance) clearly and strongly adds to a country's vulnerability to a crisis. One plausible explanation would be that in a financial crisis, such as the current one, access to foreign finance might not be possible due to a sudden increase in risk aversion among investors, thereby hurting countries that have relied on external capital inflows. The significant impact on countries with large surpluses might be explained by the fact that the large surpluses possibly hint at macroeconomic imbalances in these countries prior to the crisis in the form of permanently insufficient domestic demand. With borrowers being cut off from the global financial markets during the current crisis, countries that relied on other countries' demand growth for their own economic growth were hit disproportionately, due to the lack of internal demand growth momentum to make up for the loss of external demand.

The probability of entering a very deep recession might increase in proportion to the openness of the capital account. This is because capital controls are usually geared more towards short-term capital flows, and hence a more open capital account means a larger share of volatile short-term inflows in the overall capital inflows of a country. Given that the benefits of free capital flows do not seem to materialize as promised to the countries which – at least in the

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<sup>12</sup> For a typical detailed explanation, see Feenstra and Taylor, 2008, chap. 17.

textbook model – should profit most from them (because they have made most use of international capital flows), there might be a case for introducing controls and limits on global capital flows.

Of course it may seem somewhat inappropriate to use the recent crisis as evidence against the textbook argument of the cushioning effects of global capital flows. After all, the textbook argument is in general about supply-side shocks to national output, while the origin of the latest crisis has clearly been a financial one. However, given the magnitude of the crisis and the fact that most of the economic crises of the past few decades arguably had financial origins, one has to question the relevance of the argument in favour of insuring against national supply shocks compared to potential shocks created by international capital flows for an individual economy.

If one agrees with the necessity of proactive macroeconomic management to limit current-account imbalances, and the need for bold policy action to counteract potential crises, the other results are rather easy to explain: moderate rates of inflation (instead of low rates) are not necessarily a problem, but might provide more space for monetary policy to implement rate cuts before the zero bound limits further actions. Such a stance could be considered as supporting the conclusions drawn by a recent IMF paper on the optimum rate of inflation (Blanchard, Dell’Ariccia and Mauro, 2010). Currency boards are a danger as they create a false sense of security and make proper macroeconomic management aimed at limiting current-account imbalances virtually impossible.

More puzzling is the fact that IMF involvement does not seem to have any explanatory power for the depth of a recession or a slowdown in growth. This result might be uncomfortable both for the IMF itself as well as its critics. If it turns out to be robust, it would mean that IMF involvement does not necessarily stabilize economic growth (as measured in GDP terms), nor does the conditionality attached to IMF programmes exacerbate the short-term impact of a crisis, as was repeatedly claimed for IMF programmes during the Asian crisis (Stiglitz, 2002). It might also indicate that there has been a change in the way the IMF designs its adjustment programmes so as to reduce their negative short-term impact on GDP growth compared with the IMF programmes of previous decades, as some observers claim (Schieritz, 2010). Turning this evidence against the IMF would imply that its programmes, while not exacerbating the economic situation, have not contributed much towards economic stabilization in the latest crisis.

From an economic policy perspective, this means that emerging-market economies and developing countries should think twice about opening up their capital accounts. Should they decide to open their capital accounts, countries should undertake active macroeconomic management to prevent the emergence of large current-account imbalances, even if this comes at the price of higher inflation. Finally, the results are a clear warning against creating a currency-board framework. Far from providing a stable macroeconomic environment, as some proponents have long argued, empirically such a framework seems to amplify shocks.

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## Annex

**Table A.1: Impact of the crisis, by country categories**

	Number of countries	Number of countries with IMF lending in 2009	Change in GDP growth, 2008–2009 vs. 2003–2007 (percentage points)	Average annual GDP growth, 2008–2009	Average current-account position, 2007	Absolute average current-account position in 2007	Average inflation, 2007	Average annual growth, 2003–2007	Average Chinn/Ito index for capital-account openness
Total sample	179	53	-3.5	2.0	-3.1	10.7	6.1	5.4	0.5
Per capita GDP less than \$976	44	26	-1.2	4.3	-7.0	8.8	8.4	5.4	-0.5
Per capita GDP between \$975 and \$3 855	45	14	-2.7	3.3	-3.5	9.4	6.8	6.1	0.3
Per capita GDP between \$3 856 and \$11 905	42	10	-4.9	1.0	-5.0	13.0	6.3	5.9	0.2
Per capita GDP more than \$11 905	48	3	-5.2	-0.7	2.4	11.7	3.3	4.5	1.8
Current-account surplus of less than 5% of GDP	21	0	-3.1	1.8	2.2	2.2	3.8	5.0	1.2

Current-account surplus of more than 5% of GDP	40	2	-4.2	2.6	15.8	15.8	7.5	6.8	0.4
Current-account deficit of less than 5% of GDP	34	14	-2.2	2.6	-2.4	2.4	6.6	4.8	0.1
Current-account deficit of more than 5% of GDP	84	37	-3.9	1.3	-13.8	13.8	5.9	5.2	0.5
Severe recession	12	6	-11.5	-5.4	-8.6	11.7	5.8	6.1	1.8
IMF lending in 2009	53	53	-2.9	2.2	-12.3	12.9	6.8	5.1	0.1
Dollarized economies	5	0	-0.6	3.7	-7.9	9.3	3.7	4.3	1.4
Economies with currency boards	13	7	-6.0	-1.0	-18.2	27.9	3.9	5.1	0.8
Economies with managed floating currencies	43	17	-3.2	3.0	-5.0	9.8	8.3	6.2	0.6
Economies with free floating currencies	23	4	-4.2	-0.1	-1.4	6.1	3.5	4.1	1.3
European Monetary Union	15	0	-4.3	-1.3	-2.1	6.6	2.2	3.0	2.1
Economies with "middle ground" exchange rate regimes	78	24	-3.0	3.0	-0.1	10.8	6.9	5.9	-0.2
Source: Author's calculations, based on IMF (2009) and the IMF World Economic Outlook database (accessed January 2010).									

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