



CENTRAL BANK OF ICELAND

WORKING PAPERS No. 15

**MONETARY AND EXCHANGE RATE POLICY
IN SMALL OPEN ECONOMIES:
THE CASE OF ICELAND**

by

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November 2001

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Economics Department

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ISSN: 1028-9445

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Abstract

This paper discusses monetary and exchange rate policy and the financial risks that are involved for small open economies in the current environment of less restricted and increased volume of global capital movements. It then goes on to analyze the policy interventions that are available to reduce and manage these risks. The specific case of Iceland is discussed within this framework. While it might be preferable if the problems posed by global financial instability are addressed by reforms in the global financial architecture, significant reforms are not likely to emerge in the near future. In the meanwhile, countries such as Iceland must take responsibility for their own welfare by managing these risks. That entails actions that reduce the likelihood of a crisis occurring and that reduce the costs incurred when the crisis occurs. Tax and regulatory policies (including financial sector regulation and disclosure regulation) can and should be used both to reduce the likelihood of a crisis and to help manage the economy through a crisis. Such regulations can affect short-term capital flows, which have been at the center of recent crises. There are arguments for the use of price-based interventions and controls imposed through prudential banking regulations. But reducing the risks faced by a country requires even more extensive action: it entails focusing on appropriate bankruptcy codes, exchange rate regimes, and designs of financial systems.

Keywords: Financial stability, monetary and exchange rate policy, tax and regulatory policies, Iceland.

JEL Classification: F33, F36, E42.

* In conjunction with Sebago Associates. This paper uses information available at the end of May 2001.

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1. INTRODUCTION

This paper discusses monetary and exchange rate policy in small open economies in the current environment of less restricted and increased volume of global capital movements. The paper pays special attention to the financial risks that are involved for small open economies in this environment and the policy interventions that are available to reduce and manage these risks. The general framework is then used to analyze the specific problems of Iceland and discuss the policy prescriptions that are most applicable to its situation.

Iceland can be said to be an extreme case of a small open economy. It has a population of just less than 300,000, a GDP of only 8½ billion USD in 2000, a foreign exchange market with an average daily turnover of only 40 million USD, and a stock market capitalization that is roughly one-tenth the market capitalization of a moderate-sized U.S. company. The small size, along with fluctuations in natural conditions (fish stocks) and the terms of trade, make Iceland especially vulnerable. But Iceland also has abundant natural resources, a highly educated labor force, developed infrastructure and on the whole relatively prudent economic policies. It has thus managed to produce one of the highest living standards in the world.

The rest of the paper is organized as follows. Part 2 discusses in general terms problems faced by small open economies in the present circumstances. Part 3 then goes on to analyze the key problems faced by Iceland in this connection. Part 4 surveys general principles regarding the policy response and Part 5 discusses the specific policy issues facing Iceland. Part 6 concludes.

2. THE PROBLEMS FACING SMALL OPEN ECONOMIES

The global financial crisis of 1998-1999 brought to the fore the problems faced by small open economies: sudden changes in investor sentiment can impose destabilizing capital flows and high interest rates even on countries that have followed prudent macro-economic policies. The resulting challenges to macro-economic policy are sufficiently severe that few countries seem to have managed them well, and, because of a failure to

manage them well, many have faced significant economic contractions, of varying duration. The problems faced by countries that have not followed sound macro-economic policies, or are at least not perceived as having done so, are all the greater.

Partly as a result of the global financial crisis, a major change in thinking has occurred with regard to both macro-economic policies and structural policies that affect macro-economic stability. The notion that markets are rational, in some sense, has been called into question. Markets may suffer from irrational exuberance (the technology bubble in the U.S.) as well as irrational pessimism,¹ and the swings in sentiments between the two can be rapid and have devastating macro-economic consequences. Moreover, the traditional presumption has been that markets are self-regulating and self-equilibrating. More recently, concerns have been raised about dynamic instabilities. Particular examples will be noted below. Finally, standard models assumed that markets are “thick.” Yet problems of liquidity and thin markets played an important role in the global financial crisis of 1998.

Macro-economic models have identified a number of variables that affect a country’s vulnerability to crisis.² Such studies demonstrate that crises are extremely hard to predict — for instance, according to these studies, the East Asian countries were not *particularly* vulnerable.³ Nonetheless, on the basis of several variables that have been found to increase a country’s vulnerability, Iceland currently does not fare well.⁴

The high volatility in exchange rates among the Yen, dollar, and Euro presents countries trading with these different currency zones additional problems in risk-

¹ See, for example, Robert Shiller, *Irrational Exuberance* (Princeton University Press: Princeton, 2000), or his earlier work, Robert Shiller, *Market Volatility* (MIT Press: Cambridge, 1989).

² See, for instance, Jason Furman and Joseph E. Stiglitz, “Economic Crises: Evidence and Insights from East Asia,” *Brookings Papers on Economic Activity*, 2: 1998 and the studies cited therein, as well as Steven Radelet and Jeffrey Sachs, “What Have We Learned, So Far, From the Asian Financial Crisis? CAER II Discussion Paper No. 37, Harvard Institute for International Development, March 1999, and Graciela Kaminsky, Saul Lizondo, and Carmen Reinhart, “Leading Indicators of Currency Crises,” IMF Staff Papers, Vol. 5, No. 1, March 1998.

³ The difficulties of predicting crises are likely to increase in the future. Earlier crises were related to trade flows (a country’s exports and imports being out of balance over an extended period of time). Today, capital flows are more likely to give rise to crises. Such capital flows are related to investor perceptions, and these are, at best, hard to predict and can be highly volatile.

⁴ For example, Iceland’s large current account deficit, according to these studies, suggests some level of vulnerability to financial crisis.

management. Some economists, such as Ronald McKinnon of Stanford,⁵ believe that volatility in the Yen-dollar exchange rate was the critical factor generating the East Asia crisis. The unprecedented variations in the Euro-dollar exchange rate have similarly been a major factor contributing to the current Argentinean crisis. Markets provide only limited opportunities for firms to protect themselves against this volatility; forward markets extend only a limited time into the future, transactions costs can be significant, and counter-party risk undermines the value of the protection. Many Korean firms believed that they had obtained cover against exchange rate risk, only to discover that when the crisis occurred, the firms from whom they had obtained cover went bankrupt. Similar problems arose in the case of Russia. Moreover, firms typically do not avail themselves of what cover they can obtain, without government compulsion; this problem has been exacerbated by IMF policies in recent years, which has used as a justification for intervention in exchange rate markets the fact that firms have high levels of foreign exchange exposure (a form of moral hazard which has not been sufficiently stressed.)

What matters is not only the country's aggregate exposure, but the exposure of particular firms. Because of limitations in risk diversification, the gains to some firms will not offset the losses to others; a change in the exchange rate can thus have adverse macro-economic consequences even if, in aggregate, net exposures are limited. Wide swings in exchange rates can lead to bankruptcy, or at least corporate distress, and thus problems in the corporate sector can be transmitted to the financial system.

Stabilizing the exchange rate relative to a trade-weighted basket of currencies is clearly preferable to stabilizing relative to a single currency for a country that trades with many countries. For example, Argentina's policy of tying its currency to the dollar has presented it with extremely serious problems, as the euro-dollar exchange rate has changed.⁶ But even trade-weighted stabilization does not fully address the problems facing a *particular* firm, since the trade weights reflect aggregate trade flows – which likely differ from the firm's business. Some firms may therefore find that the prices of their imports may have increased relative to the prices they receive, e.g. on export

⁵ See, for example, Ronald McKinnon, "The East Asian dollar standard, life after death?" *Economic Notes*, vol. 29, no. 1, February 2000.

markets. Again, what matters is not the *average* impact, but the impact on particular firms; and the positive effects on some will not in general offset the adverse effects on others.

Balance sheet effects can be significant and complicate the dynamics of adjustment. In the absence of these balance sheet effects, a devaluation tends to have positive macro-economic effects, as exports are encouraged and imports discouraged. But once balance sheet effects are taken into account, large depreciations may have adverse macro-economic effects, if firms and financial institutions have uncovered positions. The adverse effects on the financial system may undermine the normal trade-adjustments. This happened in East Asia, where exports increased far less than would have been predicted, partly because of the adverse effects on supply caused by the lack of access to capital. These effects were compounded by the high interest rates which in effect eroded many firms' working capital, and their ability and willingness to bear risk. Such high interest rates have become a staple of the monetary policy reaction to a crisis, despite the fact that the evidence that these high interest rates are very effective in restoring, or even stabilizing, the exchange rate is limited at best.⁷

Standard macro-economic models for *small* open economies do not provide a good basis for policy for a number of reasons. First, these models typically assume, in effect, horizontal demand curves for the country's product in international markets, and horizontal supply curves of international capital. But if small open economies really faced horizontal demand curves for their products in a relevant time span, slight changes in exchange rates would result in sufficiently large increases or decreases in aggregate demand to maintain the economy at full employment. Similarly, if countries really faced horizontal supply curves for capital, slight changes in domestic interest rates (given expectations about exchange rate changes) would result in higher expected returns from holding financial assets denominated in the domestic currency than foreign assets, and thus presumably would be able to generate large capital flows into the country, which would then cause an appreciation of the currency. Empirically, however, the impact of

⁶ In response to these difficulties, Economics Minister Domingo Cavallo recently introduced multiple exchange rates for exporters and importers. He had previously announced his intention to tie the peso to a mixed Euro-dollar basket once the Euro reaches parity with the dollar.

increases in interest rates on exchange rates often do not even have the right sign,⁸ and in other cases, the requisite increases in interest rates seem implausibly large – if it is presumed that the supply curve is horizontal.

There are several reasons for this inconsistency with the simple models. One is that lenders care not just about the interest rate, but also about the probability of repayment (default); other investors care more broadly about the general business climate. Higher interest rates, especially in countries with significantly leveraged firms and financial institutions with substantial short-term debt obligations, increase the probability of default, and in any case, contribute to an overall decrease in the pace of the macro-economy and deterioration of the overall business climate. Hence, while the response of foreign investors may be limited or negative, domestic investors will tend to move assets into countries providing a better business climate; in the extreme case, high interest rates contribute to capital flight.⁹ These adverse effects of high interest rates were particularly in evidence in East Asia, but problems of capital flight have been at the center of other financial crises.¹⁰

More generally, changes in monetary policy can affect *expectations* of returns in ways that are markedly different from those on which standard models have focused. Many of those models grew out of the Latin American crisis, where lax monetary policy was viewed as key. High interest rates were viewed as enhancing the “credibility” of good monetary policy. More recent research has questioned this entire line of analysis, asking whether it is credible that a temporary increase in interest rates would lead to a permanent change in the credibility of monetary policy,¹¹ such that the demand *curve* for

⁷ See, for example, Steven Radelet and Jeffrey Sachs, “The Onset of the East Asian Financial Crisis,” in Paul Krugman, ed., *Currency Crises* (University of Chicago Press: Chicago, 2000), pages 145-149.

⁸ See the studies cited in Furman and Stiglitz (1998).

⁹ In East Asia, prior to its crisis, investors were perhaps not as globally diversified as they should have been, given realistic estimates of the risks (including the correlations among them). The crisis—and especially the regional recession which was exacerbated by the high interest rates—forced a re-examination of the risk, and this almost surely played a role in contributing to high levels of capital flight.

¹⁰ See, for example, Michael Dooley, “Indonesia: Is the Light at the End of the Tunnel Oncoming Traffic?” Deutsche Bank Research, Emerging Markets Research, June 1998.

¹¹ See, for example, Allan Drazen and Paul Masson, “Credibility of Policies versus Credibility of Policymakers,” *Quarterly Journal of Economics* (August 1994), pages 735-754; Michael Lewis-Beck, *Economics and Elections* (University of Michigan Press: Ann Arbor, Michigan, 1988); and Michael Paldam, “How Robust is the Vote Function? A Study of Seventeen Nations Over Four Decades,” in Helmut Northrup, Michael Lewis-Beck, and Jean-Dominique Lafay, eds., *Economics and Politics: The Calculus of Support* (University of Michigan Press: Ann Arbor, Michigan, 1991).

assets denominated in the country's currency would *permanently* shift up; that is, implicitly, the standard policy model argues that a movement along a demand curve leads to a shift in the demand curve. One of the reasons that Sweden did not sustain high interest rates during its crisis is that it became apparent that such high interest rates are not sustainable for extended periods, and therefore, it was hard to see what benefit could be obtained by extending these high interest rates for a few more days; but the point is more general.

Markets are much thinner than many of the standard models would suggest. That is why, for instance, the collapse in Russia had such global repercussions. As a fraction of world assets, the collapse should have been viewed as inconsequential; it amounted perhaps to a change in the second or third decimal place. But there were particular institutions trading in these assets, and these same institutions played a large role in certain other markets, e.g. Brazil. It was not as if the collapse in Russia had a *direct* effect on the Brazilian economy, or provided information to investors about markets in Brazil that they previously did not have. Rather, the portfolio effects on *particular* firms lead them to reduce lending to and investment in Brazil, and there was not a thick market of other investors willing to move into the gap. The same point was brought home forcefully by the collapse of Long Term Capital Management and the publicly orchestrated private bail-out: the justification for government intervention was that the collapse of this *single* firm could have global financial repercussions.

Other research has emphasized other ways in which markets, and therefore adjustments to policy changes, differ markedly from those envisaged in standard models.¹² For instance, one of the reasons that exports often do not expand as much as predicted in the short run as a result of devaluation (and may even contract) accompanied by high interest rates (as in typical IMF adjustment programs) is that the tight monetary policy leads to a shortage of finance, so that exporters cannot get access to the funds needed for them to expand production, or can get access only at terms that make expansion relatively unattractive. There is a growing body of literature emphasizing these and other *supply-side* responses to policies that used to be viewed as *demand*

¹² See, for instance, Bruce Greenwald, "International Adjustment in the Face of Imperfect Financial Markets" in Boris Pleskovic and Joseph E. Stiglitz, editors, *Annual Bank Conference on Development Economics 1998*.

management policies; such supply-side effects may even dominate, at least in the short-to-intermediate term. The supply-side effects, in turn, reverberate on demand: In the extreme cases, such as in East Asia, the disturbances led to such an increase in bankruptcy rates that suppliers in the region were viewed as unreliable, and this adverse effect on a critical “quality” dimension more than offset the positive effect from devaluation. Demand for some exports actually decreased. (Note that problems of unreliability and supply-side effects can enter anywhere in the supply chain, so that providing more capital to exporters will not fully address the problem, unless the exporters themselves are allowed to on-lend funds.)

In effect, earlier literature either assumed that market participants were risk neutral or that there were sufficiently good risk markets that risk could be effectively divested. In addition, although information was imperfect, the modeling of beliefs (as they were affected, e.g., by policy) was rudimentary at best. Imperfect information gives risk to imperfect capital markets (credit and equity rationing). Financial institutions play key roles in allocating funds. Under these circumstances, the distributional effects of large price changes (large interest rate or uncovered foreign exchange rate changes) have *real* consequences; they may be the first-order effects; the “substitution” effects on which earlier literature focused may in fact be of secondary importance, especially in the short-to-medium term.

These distributional impacts can be long-lived, creating significant elements of hysteresis. Thus, the huge increases in interest rates in East Asia decreased the value of the assets held by banks, depleted the net worth of debtors, and forced many into bankruptcy. Subsequent lowering of the interest rates did not undo the damage. Policy-makers need to be particularly sensitive to such irreversibilities.

Economic theory has provided some explanations for the high volatility of investor behavior, in terms of information theoretic models of herding¹³ and compensation (implicitly or explicitly) based on relative performance.¹⁴ Empirical work

¹³ See, for example, the discussion in Andrei Shleifer, *Inefficient Markets: An Introduction to Behavioral Finance* (Oxford University Press: Oxford, 2000).

¹⁴ See Barry Nalebuff and Joseph Stiglitz, "Prizes and Incentives: Towards a General Theory of Compensation and Competition," *Bell Journal of Economics*, Vol. 14, 1983, pages 21-43, and Barry Nalebuff and Joseph Stiglitz, "Information, Competition and Markets," *American Economic Review*, Vol. 73, No. 2, May 1983, pages 278-284.

by Shiller¹⁵ and others has documented the magnitude and significance of this high volatility, which is likely to particularly affect small countries. One way of thinking about the stock market of a small country is that the total capitalization of Iceland's stock market at the end of 1999 was roughly \$5 billion (or roughly one-tenth the market capitalization of moderately sized U.S. companies such as Chase Manhattan, Walt Disney, and Chevron).

3. KEY PROBLEMS FACING ICELAND

Iceland is a small open economy, facing many of the problems that other small open economies have faced, especially in the aftermath of capital market liberalization. The country has followed what might seem a prudent monetary and fiscal policy (e.g., structural surpluses). Yet, one of the key *endogenous* variables—the current account deficit—has increased significantly to 7 percent of GDP in 1998/1999 and more than 10 percent in 2000/2001. There is a strong presumption that this deficit is not sustainable. The key issue, however, is not the sustainability, but the process of adjustment and its consequences: Will the elimination or reduction of the trade deficit lead to a marked change in the exchange rate? Will there be a crisis? And will the crisis lead to large and durable macro-economic consequences? The key policy issue, relatedly, is what should be done now to avert a crisis and/or manage its consequences?

The economy has been experiencing a boom, with annual growth of GDP since 1996 in the range of 4 ½ percent to 5 ½ percent. Unemployment has fallen below 2 percent in 1999 from 5 percent in 1995, and down to nearly 1 percent in late 2000. These statistics are, by themselves, all positive. The concern is that the economy is over-heated, and that imbalances from this overheating have, within them, the seeds not just of the ending of the boom, but of a marked contraction.

While there has been some increase in the inflation rate, it has perhaps not been as marked as one might have expected, given the magnitude of the boom in the economy. This restraint is surely partly because of the flow of goods into the country. The current inflation rate of around 5½ percent is not excessively high relative to historical or

¹⁵ Robert Shiller, *Market Volatility* (MIT Press: Cambridge, 1989).

international comparisons. However, it is well in excess of the recently adopted 2½ percent inflation target and can be expected to become even higher in the near term due to the recent weakness of the Icelandic krona. But inflation can *ceteris paribus* be expected to subside once the effects of the exchange rate depreciation have dissipated. Furthermore, recent international experience seems to suggest that the pass-through of exchange rate depreciation into prices has been weakened.

Given recent historical experiences with inflation, the concern about its resurgence is understandable. Yet recent research has thrown into question the three propositions underlying inflation paranoia. First, there is little evidence of any adverse effect on growth or incomes of inflation even at rates substantially higher than those currently prevailing in Iceland; indeed, there is some literature which suggests that pushing inflation down too low can have adverse effects.¹⁶ Second, there is little evidence of the “precipice” model (that inflation, once started, inevitably creeps higher). To the contrary, there is some evidence of reversion, although that could partly be caused by the policy response to higher inflation. Finally, there is little evidence that the costs of a well-managed disinflation are particularly large, e.g. relative to the gains of the boom that preceded and led to the bout of inflation. To the contrary, there is evidence of a convex or nearly linear generalized Phillips Curve.

The best indicator of a serious overheating of the economy is inflation. The recent experience in the United States suggests that changes in technology (the “New Economy”) and globalization may enable a country to operate at a much lower level of unemployment without worries of significant increases in inflation. There can be enormous costs from an excessive focus on inflation—had the inflation hawks’ worry about inflation in the United States been translated into policy, the United States would not have experienced the boom that began in 1993, a boom which both reduced enormously that country’s social problems and played a pivotal role in turning a persistent fiscal deficit into a large surplus. Currently, attention should be more focused on the current account deficit than inflation.

¹⁶ See, for example, George Akerlof, William Dickens, and George Perry, “The Macroeconomics of Low Inflation,” *Brookings Papers on Economic Activity* (1996:1), pages 1-76.

The current account deficit is thus viewed by some as the most serious sign of “overheating” in Iceland. Current account deficits may or may not present a problem for an economy. If the deficit is used to finance private investment goods, presumably the return on those investment goods exceeds the interest costs. By the same token, if those investment goods are financed by foreign credits, the deficit has little impact on the exchange rate: the increased demand for funds to finance the imports is accompanied by an increase in supply. In these circumstances, there will be little evidence that the exchange rate is “overvalued,” e.g., relative to historical norms. By the same token, when the investment opportunities dry up, the economy’s growth will slow down, and imports of investment goods will decline in line with the reduced borrowing from abroad to finance the investments. The current account deficit may quickly shrink, with little disturbance to the exchange rate.

This contrasts markedly with the traditional case of a crisis, where the government has been maintaining the exchange rate at an overvalued level through persistent intervention in the market, which is not sustainable. As it becomes apparent that the reserves being used to sustain the overvalued exchange rate will be exhausted, there is a speculative attack against a currency.

The present current account deficit in Iceland has been associated with a surplus in the government sector. The real exchange rate of the krona appreciated during the upswing of 1996-2000, but by significantly less than in former upswings. The currency was therefore not obviously overvalued in 2000 compared to historical norms, and has weakened significantly since.¹⁷ The current account deficit is therefore not a classical case of one generated by a government deficit and/or overvaluation. Its primary source is a consumption and investment boom in the private sector, with a fall in the savings rate playing a bigger role than the increase in investment. Of the 8.6 percentage point increase in the current account deficit as a percentage of GDP between 1997 and 2000, around two-thirds is explained by a fall in the gross national savings rate and one-third by an increase in the investment rate. (The gross national savings rate fell to a post-war historical low of 13.5 percent in 2000.) The private sector consumption and investment

¹⁷ It was at the 20-year average using relative CPIs but nearly 2 percent over it using relative unit labor costs.

boom was fuelled by a very strong credit boom that was to a significant degree financed by foreign borrowing. This suggests that the recent liberalization of financial markets in Iceland and the opening up of the capital account played a significant role in generating the current account deficit, but short term capital movements were not fully liberalized until the beginning of 1995.

Does the fact that the current account deficit has its roots in the private sector mean that there is no need for government action? Not necessarily. First, it can be argued even in this case that the role of the government is larger than it seems. To the extent that the exchange rate is viewed as pegged, there may be a perception of an implicit government guarantee that boosted capital inflows and thus the credit boom. Furthermore, the banking system is partly government owned and foreign investors have a tendency to assume that the government will bail other major banks out. That in turn will also tend to boost capital inflows and distort the pricing of risk. Moreover, expectations of permanent income and future profit are important determinants of domestic demand and the government plays a role in shaping those. Secondly, in the same way as the government has a role to play to even out business cycles that are generated in the private sector it can have a somewhat similar role vis-à-vis the current account deficit when its primary source is in domestic demand fluctuations.

Under a regime of full capital market liberalization, there is another source of concern. Earlier paragraphs have noted the high volatility of asset prices. A country's currency is an asset, and is subject to this high volatility. While the extreme fluctuations in the dollar-yen exchange rate show that even very thick markets may experience large fluctuations that seem hard to reconcile with changes in underlying fundamentals, this is all the more true in the case of a small country like Iceland.

It may be hard to predict all the factors that might contribute to sudden (justified or unjustified) changes in investor sentiment that might result in marked changes in the exchange rate. As Iceland's economy becomes more diversified, particular pieces of news (e.g., the size of the fishing quotas or the price of fish) are likely to have less marked effects, or at least have less marked effects on the underlying fundamentals. Yet swings in investor sentiment may still be out of proportion to the true importance of such

news on the economy; and, unless the country is somewhat insulated from these swings in investor sentiment, they may to a large extent be self-fulfilling prophecies.

Traditionally, large current account deficits have been associated with a high level of “vulnerability.” As we have noted, this is surely largely because many such instances were the result either of large government deficits and/or government intervention in the exchange rate market, neither of which were by themselves sustainable. Absent these factors, there is no a priori reason that large current account deficits lead to a crisis, rather than to a smooth adjustment, which, again as we noted, may or may not be associated with large adjustments in exchange rates. Yet, investor sentiment is fickle, and the fact that such deficits are believed to be related to crises — and this belief is repeated by seeming authorities on the subject — may itself contribute to the likelihood of a crisis. And if that is the case, one must address the risks which such deficits impose.

To be sure, a succession of current account deficits leads to increasing net external indebtedness. If the capital flows are in the form of debt, if that debt is short term, and if it is denominated in foreign currency, it can lead to increased vulnerability; creditors may suddenly demand repayment. It is as if there is a run on the bank, with two major differences: With a flexible exchange rate, the exchange rate adjusts; reserves are not used up; but, of course, the changes in the exchange rate may themselves have a highly disruptive effect, and the magnitude of the equilibrating adjustment in the exchange rate may be very large, as again East Asia demonstrated. Secondly, since the debt obligations are incurred privately, there is a simple procedure, bankruptcy, for dealing with situations where the debt obligations cannot be met. This limits the liability, and if an effective Chapter 11 provision (which allows a quick resolution to bankruptcy, with a restructuring of claims on the firm but not a liquidation) is in place, may limit downward movements in the exchange rate. Still, the “run” on the currency has systemic effects. Accordingly, there are large externalities associated with this short-term foreign denominated indebtedness, an externality which public policy needs to address. I return to this matter later.

The vulnerability associated with short-term foreign-currency-denominated indebtedness can arise even in the absence of an increase in *net* indebtedness, and it may not arise even with an increase in net indebtedness. That is, a country may have a limited

aggregate exposure, as measured by typical statistics, yet its liabilities may be held in foreign-denominated debt instruments while its assets are in equity. And adverse macro-economic effects can arise if large numbers of firms have large amounts of short-term foreign-denominated debts, even if other firms have what might seem as offsetting amounts of short-term foreign-denominated assets. What matters is the distribution of net liabilities among the firms in the economy.

In studies conducted on vulnerability prior to the East Asia crisis, short-term foreign denominated liabilities did not appear to have significant explanatory power in explaining crises. Since with free convertibility, domestic “money” can be converted into dollars, the entire money supply, not just externally held debt, could be viewed as a “claimant.” Yet regressions since 1997 have shown that the ratio of short-term foreign indebtedness relative to reserves has played a large role. Again, this may partly be so if it becomes part of beliefs and expectations: if everyone believes that a country is more likely to face a crisis when its short-term foreign-denominated liabilities to reserves exceeds a threshold of, say, unity, then it is likely to face a higher likelihood of having such a crisis. And governments would be prudent to avoid exposing the country to this signal of vulnerability.

Iceland has also been experiencing a credit boom. The growth in bank credit has been around or above 25 percent for three years. Evidently, the high interest rates have not sufficed to dampen the demand for credit. This may be because of a belief that the cost of credit may be even higher in the future—indeed, there may be credit rationing in the future, so that credit cannot be obtained on any terms—so that it is *relatively* cheap to obtain credit now. This belief (like many of the beliefs described in previous paragraphs) may be at least partially self-fulfilling. Credit booms are often followed by a “bust,” and after the bust, there is a period of tight, and typically rationed, credit. Indeed, this is true at both the macro- and the micro-level: the pace of expansion of credit for a credit institution is related to the likelihood that it will face problems in the future. Given these beliefs, very large changes in interest rates may be required to dampen the demand for credit; and these changes in interest rates themselves impose enormous stresses on the economy.

Just as we noted earlier the large balance sheet effects of changes in exchange rates, large increases in interest rates can have even more devastating effects, especially on highly indebted firms. While in principle, firms with foreign exchange exposure can obtain cover for their foreign exchange risk, it is far more difficult for firms to obtain insurance against interest rate fluctuations. The maturity structure of debt is concerned not just with risk, but also with “control.” Lenders want to know that they have the right to demand their funds back, e.g., with a change in circumstances. Thus, most borrowers may not be able to limit the extent of their exposure by borrowing long; they simply will have to borrow less. And this will almost inevitably slow the pace of growth of the economy, and impair its allocative efficiency.

This illustrates the marked difference between simplistic models of market economies and more sophisticated, realistic models. In the simplistic models, where markets work perfectly, firms act in a risk-neutral manner and can fully divest themselves of risks (since there are perfect equity markets). Under these assumptions, the risk associated with highly variable interest rates can be ignored. Given the allocative benefits in having market-determined interest rates, any interference in the free working of the market is thus soundly condemned. In fact, capital markets are information intensive, and work markedly differently from this simplistic model. There may be (and often is) both credit- and equity-rationing. Capital (funds) are not allocated as if there were an auction market. Thus, the allocative benefits of highly fluctuating market-determined interest rates are less than in the traditional model. At the same time, there are large costs. Because risk markets are imperfect, the interest rate fluctuations impose large costs; firms will borrow less; the capital market will, in effect, work less efficiently—there will be less of a flow of capital from where its productivity is low to where it is high. The allocative efficiency of the capital market is actually impaired!

The adverse effects are especially marked when the interest rate changes are sufficiently large to force many firms into bankruptcy or distress. Bankruptcy results in the destruction in organizational and informational capital. As we have noted, there are large hysteresis effects. Note not only the irreversibilities, but also the non-linearities: small changes in interest rates are unlikely to throw many firms into distress, but large changes can throw proportionately more firms into bankruptcy.

4. POLICY RESPONSES: GENERAL PRINCIPLES

The central problem facing small open economies is how to manage the risks which they face: how to respond to surges of capital in or out of their country, substantial fluctuations in their exchange rates, or in the exchange rates among their trading partners. The benefits of integration into the global economy are such that no country wants to insulate itself, even though integration brings with it these enormous risks.

Capital market liberalization or flexible exchange rates, or even low inflation or stable exchange rates, are not ends by themselves. The objective of economic policy is to improve economic welfare; we should never confuse means with ends. The central responsibility of macro-policy is maintaining full employment, high growth, and stability. Policy interventions are to be evaluated from this perspective. In the following paragraphs, I discuss a number of alternative policy interventions that should be thought of as part of a country's risk management system.

Policies that limit growth or increase unemployment have high costs associated with them. Those costs are, however, worth bearing if there is a substantial risk that the current boom will lead to a significant economic downturn. But that likelihood, in turn, depends in part on how the government responds, through monetary and fiscal policies, to the threat of a downturn. If East Asia prescriptions (Korea, Thailand, Indonesia) are followed, then society bears enormous costs. China, by contrast, showed that prudent fiscal policy could be used to avert a domestic slowdown, even in the face of a regional recession/depression.

4.1. The Role of Outsiders

But before turning to those issues, I want to emphasize that it is not just problems in the borrowing country that can lead to excessive exposure to short-term foreign exchange risks; regulations (and failures in regulatory oversight) in lending countries may lead lenders to offer terms that are "too good to be turned down." This problem was exacerbated by the original Basle bank standards, which imposed a lower risk weighting on short-term debt than long-term debt.

Other policies in lending countries may contribute to high levels of volatility in capital flows. For instance, many U.S. institutions are allowed to invest only in investment grade securities. Thus, when rating agencies abruptly downgrade a security, institutions have to sell the security from their portfolio, causing a rapid fall in the price – and ensuring that the rating agencies’ concerns are self-fulfilling.

The limited progress made in the reform of the international financial architecture since the beginning of the Asian crisis suggests that borrowing countries will have to rely on their own risk management strategies in order to prevent crisis and mitigate their consequences.

4.2. The Need for A Broad Based Approach to Risk Management

Many of the problems confronting small open countries today are a result of capital market liberalization, which has exposed them to large risks—the risk of investors in or outside their country suddenly changing their sentiment and pouring money into their country or pulling it out—at the same time that it has limited some of the actions which they can take to control these risks. Quite naturally, then, policy discussions focus on interventions in the flow of short-term capital. Risk management strategies, however, must extend beyond merely imposing restrictions/taxes on capital flows. Bankruptcy policy and exchange rate management are two other key dimensions. Currently prevalent bankruptcy codes are not well-designed for handling systemic problems. Elsewhere, I have argued for a “super-Chapter 11” which would not only reduce the social costs of bankruptcy and increase the speed with which problems get resolved, but may also help stabilize exchange rates (as the extent of transfers abroad in the event of a crisis will be limited).¹⁸

Interventions (e.g. in the flow of short-term capital) can all be justified in terms of the theory of *externalities* — anything that contributes to the likelihood of systemic crashes imposes costs on others, and therefore should be “controlled,” either through regulation or taxation. The costs are borne both in the form of underutilization of

¹⁸ Marcus Miller and Joseph Stiglitz, “Bankruptcy Protection Against Macroeconomics Shocks: The case for a ‘super Chapter 11’,” Centre for the Study of Globalisation and Regionalisation, University of Warwick, April 1999. A super Chapter 11 would allow an especially quick corporate reorganization

resources and in the form of public expenditures. These costs were particularly evident in the East Asia crisis, where *all* borrowers had to bear the costs associated with the increase in interest rates (whether they had speculated on a foreign exchange position or not), and where the macro-economic policies undertaken to counter the crisis had seriously adverse effects on virtually every part of society, including workers, firms, and the government. Moreover, since governments are likely to engage in bail-outs (supported by the IMF), those engaging in risky activities do not even bear the full *private* costs of their action.

In ascertaining the impact of various interventions, one should separate out the impacts at the margin, which are related to incentives, with distributional (infra-marginal) changes. Thus, an incremental investment tax credit (or some of the other measures described) have effects at the margin that differ from the effects on average, which relate to changes in asset prices of existing assets and to changes in exchange rates.

This is especially important once one recognizes that there are real, aggregate (and allocative) consequences of these distributional effects. Moreover, as noted above, recognizing the distinctive features of capital markets, these distributionally related allocative effects may well dominate the kinds of allocative effects (“Harberger” triangle dead-weight losses) on which traditional analyses have focused, and which by most accounts are at most of second-order importance.

4.3. Capital Market Liberalization

4.3.1. Assessing the Costs and Benefits

Full capital account liberalization has been widely vaunted as improving the allocative efficiency of capital markets, thereby contributing to an increase in income and growth. Moreover, it is argued, the risk diversification that can follow from the “globalization” of capital markets means that capital flows from abroad can offset volatility at home, helping to stabilize the economy. That is why capital market liberalization was recommended for countries in East Asia, which, given their high savings rate, did not

through restructuring of liabilities when there is a major macroeconomic disturbance that was likely to have played a role in the firm’s bankruptcy.

really need an increase in the overall flow of capital. None of these alleged benefits had any empirical support, however, and broader economic theories, taking into account imperfections in risk and information markets, suggested that there were good reasons that capital market liberalization would have adverse effects.

In particular, Dani Rodrik of Harvard has shown empirically that capital market liberalization is not related to economic growth or investment.¹⁹ Long-term investments cannot be based on funds that can flow into a country or out overnight. Moreover, as countries have become sensitive to the risks associated with inadequate reserves *relative to short-term indebtedness* (not just relative to import flows, as previously had been the case), they have had to put aside more reserves as short-term indebtedness has increased. In effect, this means that if a firm in a small open economy borrows \$100 million short-term from a U.S. bank, paying, say, an annual interest rate of 15 percent, the country must put aside \$100 million in reserves, say held in U.S. Treasury securities. From a macro-perspective, the country is borrowing from the U.S. at 15 percent, and lending at 5 percent or so; it is hard to see how such a financial operation could help create economic growth. This example illustrates a key point of economic policy: *capital flows, especially short term flows, give rise to large externalities, and it is the responsibility of government to try to address these externalities*, much as it would do given any other set of externalities, such as those arising out of pollution. The issue of the best way to address these externalities, whether through price or quantity measures, is discussed below.

Short-term flows (as other forms of portfolio flows) may have adverse effects for other reasons, in particular because of their effects on exchange rates (the “Dutch disease” problem). Indeed, recently, Russia’s president’s chief economic adviser has argued that Russia has been hurt by these capital flows because of this effect.

While the growth benefits of capital market liberalization are dubious at best, there is clear evidence concerning the adverse effect on the risk facing a country. Moreover, the contention that short-term flows are stabilizing is simply empirically incorrect, and was known to have been incorrect before the crisis: short-term capital flows are pro-cyclical, not countercyclical, and thus almost inevitably exacerbate, not

¹⁹ Dani Rodrik, “Who Needs Capital Account Convertibility?” Princeton International Finance Section symposium, February 1998.

dampen, fluctuations.²⁰ The instability of these flows contributes to overall economic instability; capital market liberalization is systematically related to more frequent and deeper crises. Moreover, the evidence is that these crises have long-lasting effects, with growth slower for five years or more after the onset.²¹

4.3.2. Interventions and How Well They Have Worked: Chile, Malaysia, and China

Restrictions on capital inflows, such as those of Chile imposed during much of the 1990s, not only attenuate these instabilities (though not eliminating them) but also give a country somewhat greater freedom in the pursuit of monetary policy, thereby allowing it to better manage the macro-economy. The gains from these macro-economic benefits far outweigh the “Harberger triangles” associated with any allocative distortions from the lack of perfect capital mobility.

Similarly, restrictions on capital outflows in the case of Malaysia did not have the adverse effects predicted, and enabled Malaysia to manage the economic crisis better than would otherwise have been the case, thereby leaving less of a legacy of public indebtedness and private sector disorganization. (Lower interest rates than otherwise would have obtained meant that Malaysia did not have to rely as much on fiscal policy to restart the economy, and therefore, on this account, did not have to run as large budget deficits. Moreover, the lower levels of corporate and financial distress meant that Malaysia did not have to expend as much “recapitalizing” its banking system.) Malaysia’s downturn was shorter and involved a smaller decline in output than in other countries, though part of that was due to the fact that prior to the crisis, it had used regulatory policies to keep foreign exchange exposure not only of its financial institutions, but also of its corporations, in check.

China has shown that restrictions on capital markets, appropriately designed, need not have an adverse effect on foreign direct investment. China remains the world’s second largest recipient of foreign direct investment next to the United States; arguably,

²⁰ See W. Easterly, R. Islam, and J.E. Stiglitz, “Shaken and Stirred: Volatility and Macroeconomic Paradigms for Rich and Poor Countries,” Michael Bruno Memorial Lecture, given at the XII World Congress of the IEA, Buenos Aires, August 27, 1999, and sources cited therein.

²¹ Gerard Caprio, “Safe and Sound Banking in Developing Countries: We’re Not in Kansas Anymore.” *Research in Financial Services: Private and Public Policy* (9:1997), pages 79-97.

the improved macro-economic stability facilitated by the restrictions makes investment in the country more attractive.

But Chile, Malaysia, and China are not as fully integrated in the global economy as is Iceland, and therefore, it might be argued, it is not apparent that interventions that worked well would be as effective, or have as few adverse side effects. Yet, there is no a priori reason that tax and regulatory interventions (some of which are described at greater length below) are substantially harder to impose than in other areas of economic activity; and there are compelling grounds for doing so, given the magnitude of the externalities associated with these unstable flows.

4.3.3. The Objectives and Alternative Forms of Capital Market Interventions

To the extent that the objective of capital market restrictions is enhanced stability, these restrictions do not have to be 100 percent effective to accomplish their objectives. A dam does not stop the flow of the water from melting mountain snow to the ocean, but it can stabilize the flows, converting what would be deathly and property-destroying floods into a source of wealth creation. This is true even if some of the water spills over or around the dam.

Capital market restrictions, or as I prefer to refer to them, interventions, can take a variety of forms: disclosure requirements, tax laws, banking and financial sector regulations, direct controls. These interventions can be combined. As in other arenas, there is some argument for market- or price-based mechanisms, such as Chile's effective tax on capital inflows. Malaysia converted its controls on outflows into taxes. Iceland does not face the problem that many developing countries have regarding high levels of corruption associated with different forms of exchange rate controls. Nonetheless, as discussed below, there is some preference for price-based mechanisms in the current environment.

Many forms of intervention can be administered at reasonable cost, with limited evasion and untoward side effects, as both Chile and Malaysia have demonstrated. At the same time, both countries paid enormous attention to the details of the interventions, and Chile made adaptations in response to changing environments.

Given popular (albeit often misguided) mantras against intervention in capital markets, it appears that some forms of intervention (such as taxes and banking regulation) are not only more acceptable; some may even be viewed in an overall positive light.

4.3.4. Disclosure Requirements

Disclosure requirements may alert the government to actions taken to manipulate the market; at the same time, such disclosure requirements may reduce the private returns to speculative activities. It is important that such disclosure requirements be comprehensive, lest more speculative transactions migrate to arenas with less restrictive disclosure requirements, which are typically arenas in which regulation is also weaker.

A steady flow of information makes a large revision in beliefs — of the kind that are often associated with crises — less likely, and may set in motion stabilizing adjustment processes. Thus, if there is widespread information about the net exposure of a country (the amount of its short term foreign denominated liabilities that are outstanding) and there is a belief that such exposure is a critical factor in increasing the likelihood of a crisis, it is likely that as such indebtedness increases, the interest rate charged will increase. And this will serve to dampen the increase in indebtedness.²²

At the same time, it is important to recognize that transparency does not inoculate a country against crises, a belief to which one might have been led by some of the rhetoric early in the global financial crisis. The last set of crises occurred in Finland, Sweden, and Norway, countries with reputations for the highest degree of transparency.

Disclosure requirements may be enforced not only through traditional sanctions, but also can be designed to be largely self-enforcing, e.g., by requiring “registration” of debt contracts or derivatives if they are to be enforceable under law or to have priority in the event of bankruptcy.

²² It is worth noting that the recognition that such aggregate information is of relevance is tantamount to a recognition of the inadequacy of the standard competitive model; for in that model, prices themselves convey all the relevant information. Participants in the market do not need to know—and indeed have no interest in—the aggregate amount of steel being sold, or being sold to a particular country.

4.4. Exchange Rate Policy

A general consensus now exists that fixed exchange rate systems are undesirable. Not only are they unlikely to be sustained, but if they are sustained, they can impose enormous costs on the economy, as Argentina has amply demonstrated, with double-digit unemployment for more than a half decade. The fixed exchange rate has left it exposed to risks of changes in the exchange rate of its trading partners, with adverse shocks coming from the depreciation in Brazil and in Europe.

Nonetheless, there is little evidence that had Thailand not had a fixed exchange rate system, it would have *avoided* the crisis. In the years prior to the crisis, its exchange rate likely would have appreciated, making the subsequent decline all the greater. Note the critical role that the absence of capital controls played in the crisis. The only way the country could respond to the flow of capital into the country was to raise interest rates, to prevent inflationary pressures. Reducing public expenditures made little sense, given the high returns to investment in infrastructure and education. (Such a policy would have meant in effect that the country would have chosen to invest in empty office buildings rather in these public investments.) Increasing taxes was not politically feasible. The only option was thus a restrictive monetary policy. But the high interest rates simply drew more capital into the country. In short, in the absence of capital controls or other interventions, the dynamics of adjustment were, in effect, unstable. (Some have argued that the fixed exchange rate system gave investors a false confidence. The argument is then that, had there been a flexible exchange rate system, investors would have been aware of the risk of the uncovered exposure, and they would therefore have limited that risk. There may be some validity in that claim, but it rests on an underlying hypothesis of investor irrationality. Rational investors would have surely recognized that there is no such thing as a truly fixed exchange rate; it is only that under some exchange rate regimes, there are few, but large, adjustments. The risks posed by such changes are precisely the kind of risks that insurance markets are designed for. Rational investors would have obtained cover. If, in fact, there was widespread sentiment that the probability of an adjustment was low, then the cost of the cover would have been accordingly low. The fact that they did not obtain cover can be interpreted as reinforcing the increasingly strong presumption concerning investor irrationality. But once one

recognizes this investor irrationality, then one also recognizes that there may be large changes in exchange rates—in investor sentiment—unrelated to fundamentals, as we have already noted.)

More generally, countries with flexible exchange rate systems may still face crises. There is little evidence to suggest that relying on market-determined prices eliminates the possibility of sudden changes in those prices (“crises”). Sudden changes in prices occur in many asset markets (e.g., stock market crashes) with completely flexible prices. (See discussion above.)

While there is a presumption in favor of flexibility, a question remains regarding whether there should be a “clean” or “dirty” float. Advocates of free markets *ought* to believe in a clean float: markets should determine this price freely, just as they do other prices. Yet it is remarkable how many free marketeers still believe in some form of intervention in the exchange rate. There are two arguments for why this might make sense. First, considerable evidence exists regarding excess volatility in asset prices.²³ Secondly, changes in exchange rates have systemic effects, of an order of magnitude larger than, say, changes in the price of a single stock or a price of a single commodity. The problem arises from the dangers of attempting to sustain an overvalued exchange rate. The record of exchange rate interventions throws into question the ability of bureaucrats — whether at the national or international levels — to improve upon the market. But we suspect that the possibility of doing so may be greater the thinner the market.

4.5. Trade Deficits and Policies Designed to Alleviate the Deficit

Historically, crises have been associated with large trade deficits, which in turn have been associated with overvalued exchange rates. As noted earlier, however, recent crises have been associated with the capital account. Yet, as the Thai experience shows, the accounting identities linking the capital and trade accounts can reflect complicated lines of causality. With flexible exchange rates, massive inflows of capital can lead to an appreciation of the currency, and this can lead to a trade deficit. The existence of the

²³ See footnote 1 above. The contention, however, remains a subject of some controversy. See, for instance, Robert Hall’s Ely Lecture at the 2001 American Economic Association meetings.

trade deficit can lead to anxieties about the country's overall economic stability, and thus contribute to instability of capital flows, and thus of the exchange rate. More broadly, under flexible exchange rates, the exchange rate is an endogenous variable; one cannot "complain" about the exchange rate, but rather about the policy variables that lead to exchange rates being "too high." And typically, those policies are adopted for good reason; the exchange rate consequences are side effects. One has to look at the entire policy mix. Thus, high interest rates may be used to sterilize a capital inflow and to prevent the economy from overheating; but those high interest rates may themselves contribute to an appreciation of the currency (under certain circumstances.) Concerns about this adverse consequence thus lead one to consider alternative ways of dampening the economy, e.g., fiscal constraints. In many instances, though, the returns to public expenditures, especially investments, are very high, and there may be strong resistance to raising taxes, especially when the government already has a fiscal surplus. In these circumstances, there is a need to broaden the set of interventions being considered, e.g., taxes on short-term capital flows, or on the particular forms of investment which may be giving rise to the "boom."

While traditionally, it was believed that trade deficits originating out of an imbalance of private sector savings and investment should not be a problem — since the private sector would not borrow unless the expected return exceeded the interest charged, so that by definition, the trade deficit would be sustainable — this is no longer believed to be true. First, markets may suffer from irrational exuberance (bubbles); *expected* returns drive investment, and if those expected returns are not realized, a crisis can occur. Secondly, markets may believe that there is an implicit (or explicit) government guarantee. IMF bail-outs may have exacerbated these problems.

Thus, under flexible exchange rate systems, the existence of a large trade deficit does not necessarily imply that the country should engineer an exchange rate depreciation. The exchange rate is endogenous. The relevant questions are (1) What policies would lower the exchange rate, thereby reducing the likelihood of a crisis, and (2) will a change in the exchange rate necessarily lead to a reduction in the trade deficits? There are two approaches to answering these questions, one focusing on absorption, the other on relative prices.

Under the absorption approach, one focuses on how the country can increase savings or reduce investment. If the government is running a large budget deficit, a simple policy prescription exists: reduce the budget deficit. The United States now has a large trade deficit, but a fiscal surplus. Similarly, Thailand had a fiscal surplus. As previously noted, it made little sense for the government, with the high returns to public investment, e.g., in education and infrastructure, to cut back on these investments, and it was politically unattractive, and perhaps not feasible, for there to be substantial increases in taxes given the fiscal surplus. Stimulating private savings has proven extraordinarily difficult; there is little evidence of significant interest elasticities, so that standard tax inducements are unlikely to have large effects on saving. There may be large negative effects on saving from social insurance programs, though these effects remain controversial. On the other hand, there may be circumstances in which there appears to be excessive investment, e.g. in real estate, and a tax designed to decrease such investment will improve the current account position. By the same token, there may be excessive investment in consumer durables, especially if consumers believe that there may be changes in prices or the availability of credit in the future. (See the above discussion.) The same argument can be made about imported consumer durable goods and the exchange rate, that is if consumers deem the exchange rate to be temporarily high, they will speed up their purchase of imported consumer durables. Again, tax policies can be used to reduce this investment. These policies may lead to both an improvement in the allocative efficiency of the economy and its stability—at the same time that the trade deficit is reduced.

The absorption approach emphasizes that if the economy remains at full employment, unless either domestic savings is increased or domestic investment is reduced, the trade deficit will remain unchanged, regardless of changes in the exchange rate. Indeed, the exchange rate adjusts to make sure that this happens. Thus a tax on imported consumption goods may lead to a decrease in the demand for those goods at any given exchange rate, but as the demand for foreign currency is reduced, the currency appreciates, and this effect offsets the initial effect. The net result is a change in the exchange rate, a lower level of both imports and exports, and no change in the trade

balance. (In the previous paragraph, we analyzed several ways by which either aggregate savings can be increased or investment lowered.)

Nonetheless, such interventions may be desirable, because of their impact on portfolios (real wealth). If domestic firms or households have large net obligations abroad that are denominated in dollars, the appreciation of the currency can have a positive effect on their balance sheet. These balance sheet changes, in turn, can have a positive effect both on aggregate demand and aggregate supply. There may be other short run supply-side effects, e.g. as the cost of imported inputs is reduced, for firms with contractual output prices, profitability increases. If the supply-side effects exceed the demand side effects, then domestic savings will increase, and the trade balance will be reduced.

Such interventions can be WTO-consistent, by simply imposing excise taxes on commodities in which imports have a relatively high share; this is especially easy for a small country, like Iceland. Since the country does not produce automobiles, for example, an excise tax on automobiles is *de facto* (though not *de jure*) a tax on imported goods.

Temporary taxes may be particularly effective (if the short-term nature of the tax can be made credible.) Households then not only substitute against the taxed commodity, but know that if they postpone the purchase for, say, a couple of years, the cost of purchase will be lower; in the meanwhile, consumption levels of *services* may not be reduced much, as increases in domestic expenditures on maintenance can be used to sustain the level of services procured from existing assets.

4.6. Financial Systems

Major collapses, with longer-lasting effects, are especially associated with the vulnerability of the banking system, which is one of the reasons that it is important for the government to play a role in prudential regulation. While the recent emphasis on risk management systems is welcome, a broader “portfolio” approach to regulation is required, especially given the high levels of volatility associated with asset prices in small open economies. A bank that might have looked as if it were acting prudently, with high levels of collateral requirements, will find that the value of the collateral collapses in the

event of a crisis. While risk-based capital adequacy requirements are important, the risk adjustments are far from adequate. Inadequate risk adjustments can actually lead to greater risk exposure, especially when accompanied by imperfect accounting practices (where assets are not marked to market). Furthermore, rigid enforcement of capital adequacy requirements can be self-defeating, not only failing to improve the balance sheet of the banks, but also contributing significantly to an economic downturn. Indeed, it has been shown that excess reliance on capital adequacy standards is Pareto inefficient. Other regulations are an important part of the regulatory “portfolio” with emphasis on different parts changing as circumstances change. For instance, speed limits (limiting the pace of expansion of banks) and limits on the exposure to different risks can play an important role.²⁴ Particularly relevant in this connection are limits on the exposure to foreign exchange risks. Here, one must not only be attentive to the mismatch of liabilities and assets of the banks, but also of the entities to whom they lend. Thus, restrictions on the exposure of most domestic firms (who rely heavily on domestic borrowing) can be effected through the banking system. Malaysia showed that this could be done successfully, and other countries are moving in that direction.

The design of the financial system should take into account the risks associated with systemic failure. The fact that real estate prices are highly volatile means that real estate lending is especially risky. Separating out such lending from other lending may thus reduce the “contagion” effect of a collapse in real estate prices, and the benefit of doing so may exceed the cost in terms of risk reduction from diversification (the effect which has been most often emphasized in the argument for the creation of broad-based financial institutions.) The separation of commercial lending from investment lending may reduce the conflict-of-interest problems that can lead to excessively risky lending, and again, the benefits of that can outweigh any small gains from economies of scope, the gains from which have been most recently emphasized.

²⁴ Speed limits are restrictions on the rate at which banks can increase their lending. Experience in the United States (in the savings and loan debacle) and elsewhere show that banks which increase their lending most rapidly are most prone to crisis. This may be partly because banks cannot manage expansion beyond some rate; their ability to hire additional personnel to do the requisite screening and monitoring is limited. It may also be because banks with low or negative net worth are more willing to undertake the risks of rapid growth. It may be because those willing to expand most rapidly are those most optimistic about the future, and they genuinely believe that the loans are good loans; but with deposit insurance (whether

Many of the most recent crises have been related to the collapse of real estate bubbles. Governments can, and should, also try to dampen investments in real estate when there appears to be a real estate bubble, and these investments are a major contributing factor to the trade deficit (through exchange rate effects). Though it may in many circumstances be difficult to ascertain with certainty whether there is such a bubble, there are a number of indicators, and policy can adjust, e.g., to increase taxes or collateral requirements, as the evidence mounts. This is a policy I would have recommended, for instance, for Thailand. In a sense, one might argue that it tried to do this, through the traditional instrument of increasing the interest rate. But what matters is not the interest rate paid on government bonds (the instrument that monetary authorities typically focus upon), but the interest rate borrowers pay and the amount of credit that is available. An increase in the former interest rate may not translate one-for-one into an increase in the latter, and may not result in a significant reduction in credit availability. Again, Thailand illustrates the point: the higher interest rate attracted more foreign funds into the country, which provided more liquidity to the financial system as a whole. Investment in real estate was not significantly dampened. Alternatively, the government could (should) have used tax policy, e.g., increasing the tax on capital gains. Such a tax, levied in a mark-to-market manner, would have increased the fiscal surplus (thus increasing domestic savings) and decreased real estate investment (since it would both reduce the return and increase the liquidity demands required of real estate developers). Bank regulation/policy could (should) also have been used, e.g., an increase in collateral requirements, restrictions in bank lending to real estate, and bringing within the embrace of regulatory control not just banks but other financial institutions. Just as financial market liberalization had contributed to the real estate boom (before liberalization, banks were limited in the amount of speculative real estate lending), a reversal of these policies most likely would have brought the boom under control, and if done early enough, and in the right manner, could have done so without a major collapse.

Korea's crisis was associated with highly leveraged firms, not with a speculative bubble or an overvalued exchange rate. Korea's crisis brings home a key point: its firms

implicit or explicit) it is taxpayers who pay for their excessive exuberance, and they are not subjected to the kind of market discipline that they might be without that deposit insurance.

had been highly levered for an extended period of time, yet it had avoided major economic downturns. The reason is that the government played a key role in risk absorption, a role which financial market liberalization made increasingly difficult for it to perform. Rapid liberalization had forced changes in some parts of the system, while not giving time for other parts of the system to adapt. The Korean experience thus highlights the importance of a *systemic* view towards risk management. Better bank regulation—ensuring that borrowers with high debt equity ratios pay correspondingly higher interest rates—might have mitigated the exposure, but it may well be that outright restrictions might need to be imposed. Note that Korea’s rapid economic growth was based on a high debt policy, so that policies aimed at limiting leverage, while they would have limited risk, also would have reduced growth. The adverse effects would be mitigated if effective equity markets were developed. But relatively few countries have been able to finance a significant fraction of new investments through equity markets, and this is especially problematic in developing countries, where legal structures typically provide insufficient protections for minority shareholders.

4.7. Tax Policy

Tax policies can supplement these regulatory efforts. For instance, in countries with a corporate income tax, differential treatment can be afforded borrowing in domestic and foreign currency. Evasion, through the use of derivatives, can be controlled by requiring entities taking the tax deduction to declare derivative positions, with undeclared derivative positions not being enforceable in court, or being given junior priority in the event of bankruptcy. The resulting counter-party risk would mean that these exposures become effectively irrelevant in the event of a crisis; in any case, there will be strong incentives in place for the disclosure of derivative positions.

4.8. Responding to Crises – Limiting Exposure, Stronger Bankruptcy Codes

No matter how well-designed the crisis prevention policies, crises will occur, and it is important to have a strategy planned out in advance for addressing the crisis – including legal frameworks, such as laws that allow the imposition to taxes on capital outflows and that provide for a “super 11” bankruptcy procedure.

Many of the policies described earlier not only serve to reduce the likelihood of a crisis, but also enhance the ability to respond to the crisis and reduce the costs. A major problem in addressing crises in recent years has been high levels of country short-term foreign indebtedness. This has put countries in a dilemma: if they allow the currency to depreciate, there are adverse net worth effects on those with uncovered positions; if interest rates are increased to prevent a depreciation (which, as we have seen, may or may not be effective), all firms that have short term debts are impacted, and overall economic activity of the economy is hurt. The policies described above which limit exposure thus give a country greater room for maneuver: the stimulatory effects of depreciation can be obtained without the adverse net worth consequences.

5. POLICY ISSUES FACING ICELAND

The overall policy framework of the previous section can be used to frame some of the key policy issues facing Iceland today, as set out in Section 3. The large current account deficit may or may not be a *real* problem, but it represents a risk, and it would therefore be prudent to take actions to reduce it. The current account deficit has been associated with a credit boom financed by foreign borrowing. The conjunction of an economic upswing that began in 1996 and the very recent liberalization of financial markets laid the foundations for the foreign financed credit boom. It was in turn fuelled by the policy of exchange rate stability and explicit and implicit government guarantees of the banking system. The increased degree of competition for market shares among financial institutions that accompanied the start of the privatization process in 1998 gave the credit boom a further boost. All these issues have to be addressed in order to reduce the risks that the Icelandic economy is facing. But in assessing what actions to take, one needs to balance the costs and the benefits, and the nature of the risks. Below I discuss in turn exchange rate and monetary policy, possible responses to the current account deficit, policies aimed at stabilizing capital flows and limit the risk exposure of the financial system, and measures to reduce credit growth. The policy prescriptions aim at addressing specific externalities that are discussed in each case.

The policy of a soft exchange rate peg that Iceland followed until the end of March this year contributed to capital inflows, the credit boom and the current account deficit as explained in Part 3. The externality here arises from the fact that actors do not assign a correct probability to exchange rate depreciation. That leads to actions that will prove to have been suboptimal once it emerges that the Central Bank can no longer defend the peg. Furthermore, the optimal currency area criteria suggest that Iceland is better suited for a flexible exchange rate than a fixed one. The recent move to inflation targeting and a floating exchange rate was therefore a good step. The 10 percent depreciation of the currency from the time of the regime shift to the middle of May coupled with the weak net foreign exchange position of the Central Bank suggests that the former system had become unsustainable, although there is probably also the usual element of overshooting involved. The Central Bank has not intervened in the foreign exchange market since the regime shift although it reserves its rights to do so. But the effects of foreign exchange interventions in all but the short run are not well established. Those who believe that there are longer run effects are arguing, in effect, that a movement along the demand curve results in a shift of the demand curve, and although there are models in which that might be the case (e.g. where the action of the central bank provides a signal) those instances are unusual, and the conditions seem not to be relevant here. (When exchange rate markets are very thin, there may be a role for exchange rate intervention to dampen out fluctuations; that there is a role for government is a testimony to the extent of market failures in exchange rate markets. The real problem, however, is the difficulties governments have in distinguishing between attempts to smooth fluctuations from attempts to maintain the exchange rate at a nonequilibrium level. The frequency of mistaken interventions is sufficiently great, at potential great costs, is sufficiently great that it suggests great caution in intervention.)

The very significant depreciation of the Icelandic krona since 2000²⁵ will reduce the current account deficit, even if it part of it might be reversed in due course and the real depreciation will turn out to be smaller due to increased inflation.²⁶ The depreciation

²⁵ The Icelandic krona was 18 percent lower in value in the middle of May 2001 than on average during 2000.

²⁶ “J-curve” effects may mean that the short-run effect of depreciation may actually worsen the current account deficit in the very short run.

and the increased volatility of the exchange rate after the regime shift will take away the incentives for speeding up the purchase of imported consumer durables that was discussed before. Measures aimed at curbing the credit boom and limiting the foreign exchange exposure of sectors without natural hedges will also reduce the current account deficit. But it is not certain that these factors are sufficient to bring the current account deficit back to a sustainable level. To the extent that the current account deficit relates to high levels of expenditure on consumer durables (cars), it would seem inappropriate to address this problem by trying to increase the fiscal surplus, so long as it appears that there are high-return public expenditures. Doing so would be tantamount to allowing low-return investments in automobiles to crowd out high return public investments. This is particularly the case since, in general, there are significant social costs from automobiles that are not reflected in private costs. Alternatively, there are a variety of ways of directly discouraging purchases of automobiles and other imported consumer durables, some of which are described in Part 4.

The most important *preventive* actions relate to stabilizing capital flows, through the use of a portfolio of interventions—tax, disclosure, and regulatory, and particularly through the banking system, along the lines discussion in Part 4. The Icelandic authorities have already taken some measures along these lines. In 1999, the Central Bank imposed a minimum liquidity requirement on credit institutions that imposes limits on the maturity mismatch that these institutions can have. The rules had the beneficial effect of improving the short-term net foreign asset position of the banking system. The net foreign exchange exposure of the banks has been limited to 30 percent of their capital base. But international experience indicates that if the sectors that the banks lend to have net foreign exchange exposures that are not naturally hedged by foreign currency earnings, these can turn into problems for the banks in times of distress. In recent years, these uncovered positions have increased in Iceland as borrowers have been tempted by the high interest rate differential to take foreign loans. The Icelandic authorities should therefore give consideration to expanded rules that take the risks of these uncovered positions into account. In a sense, this can be viewed as simply part of good risk management. Banks should charge interest rates corresponding to the risks posed by different loans, and part of that risk assessment entails understanding the exposure of the

firm to exchange rate fluctuations. In principle, then, the bank should be charging interest rates to the borrower to reflect these risks. Policies calling attention to these risks would encourage banks to do so. But even were banks to charge interest rates fully commensurate with the risks posed to the bank, there would be an argument for government intervention, because of the systemic risks posed by aggregate exposure, and because of the likelihood of government bailouts, should a crisis develop. Similarly, the government may be induced to pursue interest rate or direct exchange rate interventions because of large aggregate exposures, the cost of which to society may be large, and only partly borne by those who have borrowed abroad. Such regulations could be implemented in a simple way: all those borrowing from government-insured institutions would be required to disclose all foreign-denominated debts (what matters is not who holds the debt, so much as what happens to the value of the debt should the exchange rate depreciate). Not doing so would be considered fraud, and subjected to severe penalties. All long-term contracts with provisions that make them callable would be treated as short-term. All derivative and future positions involving foreign exchange would also have to be declared (enforceable both through stringent *criminal* fraud laws and by a policy which makes undeclared derivatives not enforceable in court). Reasonable netting provisions, including those covering foreign exchange receivables, would have to be introduced. The objective should not be perfection: the real concern is with large exposures, and so long as massive evasions are avoided, these policies should succeed in limiting the scale of exposures. (Firms could be allowed to declare their *expected* foreign exchange receipts that they were hedging; they then would be required to disclose the receipts when they occur.)

While globalization and liberalization have undermined the extent to which Central Banks can control credit flows, it has not eliminated it, nor has it altered the responsibilities of government to ensure the safety and soundness of the financial system. The information, which is at the heart of the banking system, is highly local, and a disturbance to the banking system will still have large macro-economic effects. As noted in Part IV, there are a number of actions which regulators can undertake to increase the stability of the financial system, e.g., not only regulating the exposure of the banks directly, but also indirectly, through the exposure of the firms to which they lend. Speed

limits (limitations in the rate of expansion of credit) may be desirable, especially given the record that so many failures are related to excessively rapid accumulations of credit. Each of these interventions can take a number of different forms, e.g. price (taxes or increased capital requirements related to the rate of increase in outstanding credit) or direct controls.

Indirect controls to reduce the rate of expansion of credit, such as an increase in capital adequacy requirements, may also be appropriate at the current time. But the use of capital adequacy requirements must be kept in perspective. It is a mistake to rely too much on such capital adequacy regulations, especially given the inadequacy of risk adjustments. As noted elsewhere, not only is such a policy likely to be Pareto inefficient, it may actually lead to increased risk taking, i.e., be counterproductive. Moreover, it is not a well-targeted instrument, and therefore may not be very effective in reducing the particular forms of credit that present the most serious problems for the Icelandic economy. It is far better to rely on a portfolio of instruments.

Moreover, if the economy moves into a downturn, excessively rigid implementation of capital adequacy standards may exacerbate the downturn. It puts into place a downward accelerator. As the economy weakens, banks may fall below the capital adequacy standards, and as they contract loans to be meet those standards, macro-economic conditions worsen still further. There is some evidence that this downward spiral occurred in some of the Asian economies.

Moreover, in more normal times (neither the current boom, nor a significant downturn) high capital adequacy standards may put Icelandic banks at a disadvantage relative to international banks. Local banks have played a central role in the most successful countries, channeling funds to small and medium sized businesses that the international banks tend to ignore. Appropriate policy entails balancing regulatory oversight with internal incentives. Capital adequacy requirements play a role both as buffer and as incentive. There is nothing magical about a capital reserve ratio, like 8 percent, in either the buffer or incentive role. While international convention may require that 8 percent capital be maintained, the Government should contemplate more flexible policies including a credit line for subordinated debt or equity that can, in limited

circumstances, supplement (at “high cost”) the bank’s ordinary equity, and be accompanied by tightened supervision.

Above we discussed the possible desirability of speed limits. A factor that seems relevant in Iceland (but not in many other countries in which there has been rapid expansion of credit) is competition for market share. There may be strong organizational and individual incentives, especially associated with changes in regimes, for firms to compete aggressively for market share. Dominant firms may be able to get more than a proportionate share of profits, e.g. through brand name recognition, or market power. Especially when some of the risks of such rapid expansion are publicly borne, as a result of implicit or explicit insurance, there may be large discrepancies between social and private costs.²⁷ Managerial incentives work in similar ways, with those who succeed in obtaining a dominant position for their firm reaping disproportionate rewards, especially with compensation schemes that are based on relative performance.²⁸ This may have been particularly important in the case of managers of state banks, where the downside risk of rapid expansion was borne by the public, and there may have been particularly large up-side private potential associated with managerial rewards under privatization (where compensation of top management is routinely related to the *size* of the organization).

Speed limits (as well as other measures designed to control the rate of expansion) can be implemented in the form either of regulations, taxes, or a combination, e.g., higher capital adequacy ratios for banks which are expanding at a rate greater than some threshold level, higher deposit insurance premiums on banks which expand at a rate greater than some threshold level, and/or absolute limits on the rate of expansion, at least without prior approval of the regulatory authority, entailing a higher level of scrutiny.

²⁷ Even without some form of public insurance, there will be some discrepancy, since some of the profits of one firm come at the expense of rivals, and some may come at the expense of consumers (when some of the profits are associated with the exercise of market power).

²⁸ See Barry Nalebuff and Joseph Stiglitz, "Prizes and Incentives: Towards a General Theory of Compensation and Competition," *Bell Journal of Economics*, Vol. 14, 1983, pages 21-43, and Barry Nalebuff and Joseph Stiglitz, "Information, Competition and Markets," *American Economic Review*, Vol. 73, No. 2, May 1983, pages 278-284.

6. CONCLUSIONS

Small open economies are highly vulnerable to currency and financial crises. Such crises have become increasingly frequent, with higher costs, over the past quarter of a century, and have affected countries following a variety of policies, e.g., exchange rate regimes. While “bad” economic policies may enhance the probability of a crisis, even countries praised for their economic policies are vulnerable. Countries need to manage these risks; risk management entails actions that reduce the likelihood of a crisis occurring and that reduce the costs incurred when the crisis occurs. A wide range of instruments is available as part of such a risk management strategy. Underlying the use of these instruments are some general principles. Because of the high costs of crises, government action is warranted — one cannot just “leave it to the market.” The economic costs of the underutilization of resources and broader costs associated with the risks accompanying crises far outweigh the Harberger triangles associated with the allocative distortions that might arise from many of these instruments. The distributive consequences of large changes in prices (interest rates, exchange rates) are not only disruptive to society more broadly, but to the economy: issues of distribution cannot be separated from issues of overall efficiency. There can be large effects on aggregate supply as well as aggregate demand.

Tax and regulatory policies (including financial sector regulation and disclosure regulation) can and should be used both to reduce the likelihood of a crisis and to help manage the economy through a crisis. Such regulations can affect short-term capital flows, which have been at the center of recent crises. There are arguments for the use of price-based interventions and controls imposed through prudential banking regulations. Tax interventions can be used to address both inflows and outflows. More broadly, such interventions can be designed in ways that make them implementable at reasonable cost and effective in stabilizing flows and do not have significant untoward side effects (such as the dampening of foreign direct investment or increasing the level of corruption.) But reducing the risks faced by a country requires even more extensive action: it entails

focusing on appropriate bankruptcy codes, exchange rate regimes, and designs of financial systems.

While it might have been preferable if the problems posed by global financial instability had been addressed by reforms in the global financial architecture, significant reforms are not likely to emerge in the near future. In the meanwhile, countries such as Iceland must take responsibility for their own welfare, for the stability and well-being of their macro-economies. The reform and policy agenda described here provides a framework within which that can be done.

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