Paper presented at the United Nations Conference on Trade and Development (UNCTAD)/Intergovernmental Group of Twenty-Four on International Monetary Affairs and Development (G-24) for the XVIII Technical Group Meeting of the G-24, Geneva, Switzerland, March 8-9th, 2004; paper revised, May 2004.

TRIP WIRES AND SPEED BUMPS:

MANAGING FINANCIAL RISKS AND REDUCING THE POTENTIAL FOR FINANCIAL CRISES IN DEVELOPING ECONOMIES

May 3, 2004

Ilene Grabel*
Associate Professor of International Finance
Graduate School of International Studies
University of Denver
Denver, Colorado, USA
Email: igrabel@du.edu
Phone: 01/303/871-2546; FAX: 01/303/871-2456

---

* I am grateful to George DeMartino, Randall Dodd, Guillaume Arias, and K. Kanagasabapathy for critical reactions to this paper, and to Rob Parenteau and Jamie Galbraith for reactions to related work. I thank Vladimir Zhapov for excellent research assistance.

Abstract:

This paper investigates the shortcomings of the "early warning systems" (EWS) that are currently being promoted with such vigor in the multilateral and academic community. It then advocates an integrated "trip wire-speed bump" regime to reduce financial risk and, as a consequence, to reduce the frequency and depth of financial crises in developing countries.

Specifically, this paper achieves four objectives.

First, it demonstrates that efforts to develop EWS for banking, currency and generalized financial crises in developing countries have largely failed. It argues that EWS have failed because they are based on faulty theoretical assumptions, not least that the mere provision of information can reduce financial turbulence in developing countries.

Second, the paper advances an approach to managing financial risks through trip wires and speed bumps. Trip wires are indicators of vulnerability that can illuminate the specific risks to which developing economies are exposed. Among the most significant of these vulnerabilities are the risk of large-scale currency depreciations, the risk that domestic and foreign investors and lenders may suddenly withdraw capital, the risk that locational and/or maturity mismatches will induce debt distress, the risk that non-transparent financial transactions will induce financial fragility, and the risk that a country will suffer the contagion effects of financial crises that originate elsewhere in the world or within particular sectors of their own economies. It argues that trip wires must be linked to policy responses that alter the context in which investors operate. In this connection, policymakers should link specific speed bumps that change behaviors to each type of trip wire.

Third, the paper argues that the proposal for a trip wire-speed bump regime is not intended as a means to prevent all financial instability and crises in developing countries. Indeed, such a goal is fanciful. But insofar as developing countries remain highly vulnerable to financial instability, it is critical that policymakers vigorously pursue avenues for reducing the financial risks to which their economies are exposed and for curtailing the destabilizing effects of unpredictable changes in international private capital flows.

Fourth, the paper responds to likely concerns about the response of investors, the IMF and powerful governments to the trip wire-speed bump approach. The paper also considers the issue of technical/institutional capacity to pursue this approach to policy. The paper concludes by arguing that the obstacles confronting the trip wire-speed bump approach are not insurmountable.

Keywords: Trip wires and speed bumps; financial instability and crisis; reduction of financial risks.

1. INTRODUCTION

This paper begins from the assumption that it is in the interest of developing countries to take steps to curtail the financial risks to which they are exposed. This is because these risks so often culminate in costly and painful financial crises. Toward this end, the paper proposes "trip wires and speed bumps" as means to curtail the types of financial risks to which developing economies are exposed. I argue that the trip wire-speed bump approach presented here has a far greater ability to curtail financial risks (including the potential of these risks to induce crises) than do the "early warning systems" (hereafter, EWS) that are currently being promoted with such vigor in the multilateral and academic community [e.g., Goldstein, Kaminsky and Reinhart, 2000; and see below for further references].

The financial turbulence of the past three decades has stimulated a great deal of research into both the etiology and the prevention of financial crises. Unlike the situation of the 1970s and early 1980s, recent research has not been stimulated by the collapse of currency pegs or by efforts to predict exchange rate changes in wealthy countries. The chief catalyst for recent research has been recurrent, severe, costly, and contagious financial crises in the developing world.[1] The first of these recent crises occurred in Mexico in 1994-95 (with contagion in several countries in South America). Next came the crisis in East Asia in 1997-98. This crisis began in Thailand in the summer of 1997 and rather quickly engulfed the economies of the Philippines, Indonesia, and Malaysia. Within months the crisis spread to South Korea, Russia and Brazil. Turkey experienced a financial crisis in early 2001, and Argentina has experienced several rounds of crisis since then. With only the exception of Malaysia during the East Asian crisis, these crises were followed by large bailouts from the IMF, painful programs of economic reform, and severe economic and social dislocation.

In large measure, the financial crises mentioned above are the result of the decision to liberalize external and internal financial flows in the developing world from the 1980s onward. For the purposes of this study, the link between financial crisis and financial liberalization in the developing world will be assumed rather than demonstrated. This is because the link between financial liberalization and financial crisis has been explored convincingly in numerous recent works, such as Arestis and Demetriades [1997], Arestis and Glickman [2002], papers in Chang, Palma, and Whittaker [2001], Crotty and Lee [2001], Eatwell and Taylor [2000], Grabel [2003a, 2003b, 2003e, 1996], Singh and Weisse [1998], Weller [2001], Williamson and Mahar [1998], Wyplosz [2001].[2]

---

[1] The case of the European currency crisis of 1992-93 is a notable exception in the recent literature as this crisis involved wealthy countries. Like the financial crises in the developing world over the last decade, the European currency crisis stimulated a rather large body of etiological research. (Section 2 below briefly discusses research on the European currency crisis and the currency crises in wealthy countries in the 1970s.)

[2] Certainly, other analysts present alternative views on the etiology of financial crises in developing countries. For instance, some explain it as the product of widespread cronyism and corruption in developing countries, others as the outcome of policy mistakes (such as the mistaken decision to maintain a soft or a hard currency peg), and others as the outcome of a rational self-fulfilling prophecy. Concise and somewhat critical reviews of this literature appear in Eichengreen [1999:App.B] and Arias [2003]. More extensive critiques appear in the studies of the link between financial crisis and financial liberalization (see above for citations), and also in Chang [1998] and Grabel [1999].

The significant economic and social costs associated with recurrent financial crises has stimulated a large volume of research (and associated policy advocacy) into the matter of whether financial crises in developing countries can be prevented or mitigated through models that predict currency, banking and generalized financial difficulties. The most important of these efforts involves the development of EWS. The work of Goldstein, Kaminsky and Reinhart [2000] is the gold standard of such efforts (though see also Berg and Patillo, 1998; Edison, 2000; Frankel and Rose, 1996; Goldstein, 1997a; Hardy and Pazarbasioglu, 1998; IMF 2001; Kamin and Babson, 1999; Kaminsky, Lizondo, Reinhart, 1997; Kaminsky and Reinhart, 2000; Sachs, Tornell, Velasco, 1996).

The financial turbulence of the last decade has also reinvigorated study of certain types of capital controls as a tool for reducing the likelihood of and/or mitigating the effect of financial crises on developing economies [see Epstein, Grabel, and Jomo K.S., 2003, and references therein]. In this connection, recent discussions of capital controls in Chile, Colombia, Malaysia, China, India, Singapore, and Taiwan Province of China (POC) are quite relevant to the discussion of trip wires and speed bumps.

This study has several objectives.

First, it will establish that efforts to develop EWS for banking, currency and generalized financial crises in developing countries have not met with success. This failure mirrors the failure of similar efforts to predict currency turbulence in the 1970s and 1980s. It will be argued that recent efforts to predict crisis through EWS have failed because they are based on faulty theoretical assumptions and on the incorrect view that the mere provision of information can reduce financial turbulence in developing countries.

Second, against the current crop of proposals for EWS, the paper will advance an approach to managing financial risks (including the risk of financial crisis) through trip wires and speed bumps. The trip wire-speed bump approach is initially developed in Grabel [1999, 2003a, 2003b], and is elaborated further in Chang and Grabel [forthcoming 2004:ch. 9].[3] In this paper, the approach is developed more fully than in any of these works.

Trip wires are indicators of vulnerability that can illuminate the specific risks to which developing economies are exposed. Among the most significant of these vulnerabilities are the risk of large-scale currency depreciations, the risk that domestic and foreign investors and lenders may suddenly withdraw capital, the risk that locational and/or maturity mismatches will induce debt distress, the risk that non-transparent financial transactions will induce financial fragility, and the risk that a country will suffer the contagion effects of financial crises that originate elsewhere in the world or within particular sectors of their own economies. It will be argued that trip wires are a necessary tool for ascertaining the unique vulnerability (or combination of vulnerabilities) that confront individual developing economies. It will be argued further that trip wires must be linked to policy responses that alter the context in which investors operate. In this connection, it will be argued that policymakers should link specific speed bumps that change behaviors to each type of trip wire.

[3] Accordingly, parts of the discussion in sections 2 and 3 below draw heavily on Grabel [1999, 2003a, 2003b]. Section 3 draws modestly on Chang and Grabel [forthcoming 2004:ch 9.].

Third, it will be argued that the proposal for a trip wire-speed bump regime is not intended as a means to prevent *all* financial instability and crises in developing countries. Indeed, such a goal is fanciful at best. But insofar as developing countries remain highly vulnerable to financial instability, it is critical that policymakers vigorously pursue avenues for reducing the financial risks to which their economies are exposed and for curtailing the destabilizing effects of unpredictable changes in international private capital flows. It is in this context that the trip wire–speed bump approach is presented.

Fourth and finally, the paper will respond to likely concerns about the response of investors, the IMF and powerful governments (namely, that of the USA) to the trip wire-speed bump approach. The paper will also consider the issue of technical/institutional capacity to pursue this approach to policy. The paper will conclude by arguing that the concerns anticipated should not be seen as insurmountable obstacles confronting the trip wire-speed bump approach.

2. A BRIEF REVIEW OF EFFORTS TO PREDICT FINANCIAL TURBULENCE

The current project to predict financial crises in developing countries through EWS has its roots in two previous research agendas. These earlier projects are etiological studies of the currency crises that followed the collapse of the Bretton Woods-era pegged exchange rates and the crisis in European currency markets in 1992. In what follows, we focus on the current EWS project. But before moving to the EWS models, we reflect briefly on its intellectual antecedents.

2.1. Intellectual pre-history of EWS models: Etiological efforts from the 1970s to the European currency crisis of 1992-93

Theoretical and empirical treatments of the etiology of currency crises is not a new area of research in macroeconomics. The starting point for theoretical treatments of the subject is Krugman's seminal 1979 paper on the circumstances that lead to the collapse of fixed/pegged exchange rate regimes. Krugman maintains that such regimes collapse under the pressure of weak fundamentals—to wit: excessively expansionary monetary and/or fiscal policies or persistent balance of payments deficits render fixed/pegged currencies untenable. Extensions of Krugman [1979] are legion; in these elaborations, weak fundamentals play a central role in triggering currency crises. The earliest extensions of Krugman (termed first generation models) focus on the role of monetary and/or fiscal imbalances in speculative attacks against a multiplicity of exchange rate regimes; later extensions (termed second generation models) center on the possibility for multiple equilibria and self-fulfilling attacks on a currency following the deterioration of fundamentals.[4]

The European currency crisis of 1992 reinvigorated efforts to understand the causes of currency crises; important works in this regard include Eichengreen and Wyplosz [1993], Eichengreen, Rose, Wyplosz [1995] and Rose and Svensson [1994]. Neither the work in the post-Krugman

[4] The vast theoretical literature on currency crises is reviewed in Arias [2003], Eichengreen [1999, App. B], Goldfajn and Valdés [1997], and Kaminsky, Lizondo, Reinhart [1997]. Many reviews of the literature correctly point out that the differences between the first and second generation models of crises are far less important than their architects suggest (e.g., this point is made by Eichengreen [1999] and Arias [2003]).

tradition nor the work of the Europeanists attempted to develop explicit predictors of financial crisis.

2.2. From etiology to crisis prediction: The Mexican crisis of 1994-95 to the current EWS models

It was not until the Mexican crisis of 1994-5 that orthodox economists moved beyond the project of uncovering the causes of crisis and began to elaborate predictors of financial crisis in developing economies. Official efforts to understand the Mexican crisis were very much guided by the view that crises could be prevented through the provision of accurate and timely information about conditions in developing economies. The central role of information in crisis prevention was indeed the main message of the June 1995 Group of Seven Summit held in Halifax in the wake of the Mexican crisis. At Halifax, the IMF was urged to encourage the prompt publication of economic and financial statistics and to identify regularly countries that did not comply with the institution's new information standards (standards that eventually became the IMF's Special Data Dissemination Standard).[5] The current project by orthodox economists to develop EWS builds directly on the IMF's failed efforts to prevent crises in East Asia through the provision of information through the Special Data Dissemination Standard.

2.2.1. The underlying, general logic of EWS

The underlying, general logic of EWS is rather straightforward. Crisis prevention requires two things: good predictors (embodied in EWS) that fill information gaps; and an open, liberalized regime in which agents are free to reallocate or liquidate their portfolios in response to problems made apparent by EWS. Hence, the self-regulating actions that rational agents take in response to EWS will prevent the predicted event from coming to fruition (or at least will mitigate its severity). The underlying logic of the EWS is summarized in figure 1.

<<FIGURE 1 HERE>>

The EWS approach assumes that once a dangerous economic tendency is revealed, rational private economic actors will change their behaviors in a manner that ultimately stabilizes markets.

2.2.2. Brief review of EWS models

Economists that develop predictors of crisis propose two broad types of predictors—the "regression" or "probit" approach associated with Frankel and Rose [1996] and the more frequently discussed EWS (often termed the "signal extraction") approach associated with Goldstein, Kaminsky and Reinhart [2000].[6]

---

[5] See Eichengreen and Portes [1997] and the papers collected in Kenen [1996] for a summary and evaluation of the decisions taken at the Halifax Summit. These works also discuss the recommendations of the Rey Committee (formed at Halifax) and the decisions taken at the 1996 G7 Summit (in Lyons) on crisis prevention and the need for information dissemination.

[6] General descriptions of these two approaches draw on Edison [2000], Goldstein, Kaminsky and Reinhart [2000], and Sharma [1999].

The regression approach estimates the probability of a currency or a banking crisis and identifies the variables that are statistically correlated with crisis. Econometric work by Frankel and Rose [1996] exemplifies this approach to crisis prediction [see also Sachs, Tornell and Velasco, 1996]. For example, Frankel and Rose [1996] conclude that currency crashes occur when foreign direct investment dries up, when currency reserves are low and falling, when domestic credit growth is high, when Northern nominal interest rates rise, and when the real exchange rate is overvalued by 10%.

The EWS approach compares the behavior of a variable before a crisis with its behavior during normal times. A variable is then taken to be useful if it displays anomalous behavior before a crisis but does not provide false signals of an impending crisis in normal times. When a variable exceeds or falls below a certain threshold, it is said to issue a signal that a crisis may occur.

Goldstein, Kaminsky and Reinhart [2000] is the point of departure for all efforts to develop EWS [reviews and extensions appear in Abiad, 2003; Berg and Patillo, 1998, 2000; Edison, 2000; Hardy and Pazarbasiouglu, 1998; Hardy, 1998; Hawkins and Klau, 2000; IMF, 1998:ch. 4; Kamin and Babson, 1999].[7] Goldstein, Kaminsky and Reinhart [2000] find that there is a systemic pattern of empirical abnormalities leading up to most currency and banking crises in developing economies over a sample period ranging from 1970-95. For currency crises, they find that the best predictors using monthly data are appreciation of the real exchange rate (relative to trend), a banking crisis, a decline in stock prices, a fall in exports, a high ratio of broad money (M2) to international reserves, and a recession. Among the annual predictors of currency crises, the two most reliable predictors are a large current account deficit relative to both GDP and investment. For banking crises, they find that using monthly data the most reliable predictors of crisis (in descending order of importance) are appreciation of the real exchange rate (relative to trend), a decline in stock prices, a rise in the M2 money multiplier, a decline in real output, a fall in exports, and a rise in the real interest rate.[8] Among the annual predictors of banking crises, the most reliable are a high ratio of short-term capital inflows to GDP and a large current account deficit relative to investment. They find that in most banking and currency crises, a high proportion of the monthly leading indicators—on the order of 50-75%--reach their signaling threshold. In other words, when a developing economy is moving toward a financial crisis, many of the leading indicators signal a crisis.

Goldstein, Kaminsky and Reinhart [2000] show that there is a wide divergence in the performance across leading indicators; warnings usually appear ten to eighteen months prior to the onset of crisis. The authors remain firm in their view that the EWS can make apparent an economy's vulnerability to crisis. They do make clear, however, that the system does not speak to the timing of a crisis.

---

[7] Goldstein, Kaminsky and Reinhart [2000] draw on the "signals methodology" elaborated in Kaminsky and Reinhart [1999] and other related work by these authors, e.g., Goldstein [1997a], Kaminsky, Lizondo, Reinhart [1997], and Kaminsky and Reinhart [2000]. The description of the authors' empirical findings is taken from Goldstein, Kaminsky and Reinhart [2000:ch. 8].

[8] Note that they find that banking crises in developing economies are harder to predict using monthly data than are currency crises.

At present, the Bank for International Settlements utilizes an EWS model. The IMF employs two EWS models, and also monitors the EWS utilized by numerous private firms (such as the Credit Suisse First Boston Emerging Markets Risk Indicator, Deutsch Bank Alarm Clock, and Goldman Sachs GS-Watch) [see IMF, 2001]. Much mention is made in the business press of the Damocles model developed by economists at Lehman Brothers-Asia [see Subbaraman, Jones and Shiraishi, 2003]. The Damocles model relies on ten predictors of financial crises (many of which figure into the Goldstein, Kaminsky and Reinhart model). Indeed, all of the new EWS are very close cousins of the model developed by Goldstein, Kaminsky and Reinhart [2000].

2.2.3. The empirical performance of EWS (and other predictive) models

The empirical performance of crisis predictors (both of the EWS and the less frequently discussed regression/probit models) is rather dismal. Numerous empirical tests (many indeed conducted by proponents) conclude that predictive models would not have provided ex-ante signals of the events in Mexico or East Asia.

For example, Flood and Marion [1999], Hawkins and Klau [2000], and the IMF [1998:ch. 4] conclude that all predictive models have a mixed record of success. Goldfajn and Valdes [1997] and Hardy and Pazarbasioglu [1998] are less ambiguous: the former study concludes that exchange rate crises are largely unpredictable events, a result they demonstrate in the case of the currency crises in Mexico and Thailand; the latter study concludes that the East Asian banking crises would not have been predicted by the usual macroeconomic predictors. Eichengreen's [1999] survey of predictive models concludes that they have remarkably poor power [see also IMF 2001; Eichengreen, Rose and Wyplosz, 1995]. His assessment is worth quoting at length: "If investors, with so much at stake, cannot reliably forecast crises, then it is hard to see why bureaucrats should do better…Their [predictors] track record is not good. Models built to explain the 1992-93 ERM crisis did not predict the 1994-95 Mexican crisis. Models built to explain the Mexican crisis did not predict the Asian crisis" [p. 84].

Several studies test a comprehensive battery of crisis predictors; these studies, too, fail to offer empirical support to the predictors project. In a test of nearly all existing predictors (both of the regression and the EWS variety), Berg and Patillo [1998] find that some models perform better than guesswork in predicting the East Asian crisis. But they find that none of these models reliably predicts the timing of the crisis (that is, whether there would be a crisis in 1997). This is because false alarms, in almost all cases, always outnumber appropriate warnings. Edison [2000] also concludes that predictive models issue many false alarms and miss important crises. Sharma's [1999] review of the empirical performance of predictive models concludes that they would not have predicted the events in East Asia (a conclusion echoed by Corbett and Vines [1998]). Sharma sums up the matter definitively: "the holy grail of crisis prediction may be intrinsically unattainable" [p. 42].

The most prominent advocates of predictors remain unshaken by the weight of discouraging empirical evidence. Goldstein [1997a], for example, concludes that preliminary tests of the predictors he develops indicate that they would have predicted the Thai crisis. Goldstein, Kaminsky and Reinhart [2000] conclude that their EWS model performs quite well, not only in tracking currency and banking crises in developing economies over the 1970-95 sample period,

but also in anticipating most of the countries affected by the East Asian crisis (particularly as regards currency crises in the region).[9] To their credit, the authors clearly acknowledge that their EWS is prone to many false alarms and would have missed some important crises: the best indicators send a significant share of false alarms on the order of one false alarm for every 2-5 true signals (see ch. 5).

As regards the recent difficulties of Argentina, there is no evidence that EWS models would have predicted the collapse of the currency peg. Indeed, the general bullishness of the international investment and policy community on the Argentine economy from the inception of its currency board in 1991 and up until a few months before its collapse in 2002 suggests that EWS were not providing indications that the country was heading toward crisis.[10]

The empirical shortcomings of the EWS project are clear, even to some of its most ardent participants. What is not clear is why efforts to refine existing predictors and to develop new ones proceeds despite the resounding empirical failure of this enterprise. This failing suggests the need to develop other strategies for reducing financial risks in general, and for reducing the risk of financial crisis in particular. Section 3 below presents one such approach.

2.2.4. Why have existing predictive models failed to achieve their principal objective of curtailing the risk of financial crises by predicting them?

I argue that the failings of existing predictive models stem from the fact that they are based on six misguided initial assumptions. Recall that the general economic logic of EWS models begins from the presumption that the provision of accurate and timely information about an economy's vulnerability is ultimately market stabilizing, provided that investors are able to adopt appropriate defensive postures in response to this information (see figure 1). In my view, this view is indefensible on several grounds.

2.2.4.i.) The informational prerequisites for EWS are simply unreasonable in the developing economy context. The success of EWS depends very much on the accuracy and availability of information about a range of economic conditions. But these informational prerequisites cannot be accommodated in the developing economy context. Problems of data inaccuracy are to be expected. Indeed, identification of precisely this problem motivated the IMF's creation of the Special Data Dissemination Standard. But identification of the problem has not solved it.

False and missed alarms are likely as long as the integrity of data are compromised. And false alarms are obviously no small matter insofar as they can trigger real crises by causing an investor panic. Moreover, governments have a strong "incentive to deceive" (i.e., to mis-report data) once an EWS is in place, and this incentive deepens as a country enters crisis territory. Paradoxically, then, the introduction of predictors is likely to reduce the quality of reported data.[11]

---

[9] They acknowledge that their EWS would neither have predicted difficulties in Indonesia during the Asian crisis, nor Argentina's difficulties following the Mexican crisis.

[10] Indeed, numerous IMF reports on Argentina during the 1990s extolled the virtues of the country's currency board and made a case for its export to other developing countries [see Grabel 2000, 2003c].

[11] I discuss the relevance of this issue in the context of the trip wire-speed bump approach in section 3 below.

We know that the quality of economic data is far from ideal, even in wealthy countries like the USA. The Federal Reserve and various departments of the US government issue ex-post adjustments of data as a matter of course. For example, the dating of business cycles is always subject to ex-post adjustment; the accuracy of data on US productivity has been the subject of much discussion over the last few years. The need for ex-post revision (and/or disputes about methodology) may cause little problem when the matter at stake is the dating of recessions (or calculating productivity growth), since this news is unlikely to affect behaviors in consequential ways. But inaccurate data reporting in the context of predicting crisis is another matter entirely. In this context, inaccuracies are not benign.

2.2.4.ii.) The interpretation of predictors is endogenous to the economic environment. The EWS model presumes that the interpretation of predictors is a science rather than an art. The former implies that the determination as to what constitutes a "dangerous reading" is independent of the economic climate and the state of expectations. In contrast, I argue that the interpretation of predictors is far more art than science. The determination as to what constitutes a dangerous level for some set of predictive variables is endogenous to the economic environment. The interpretation of the consequences of a rising current account deficit is an example of the endogeneity of the interpretation of crisis predictors. A rising current account deficit may be taken as a sign of an impending crisis and a reflection of underlying economic fragility, or may be taken as a reflection of a country's strength and desirability to investors.

2.2.4.iii.) EWS models are predicated on the false notion that crises in developing countries have the same etiology. This is simply not the case. The etiology of every crisis is at least slightly different. Thus, we have no reason to expect that a standard EWS model based on a static set of crisis predictors would be appropriate for the job. For example, the root causes of the European, Mexican, East Asian, and Argentinean crises remain distinct. Therefore, it comes as no surprise that predictors developed after each crisis failed to predict the next one [Corbett and Vines, 1998].

2.2.4.iv.) Refining existing EWS models will not end the pattern of recurrent crisis in developing economies. The problem lies with the creation of highly liberalized, internationally integrated financial markets that render developing countries particularly vulnerable to crises. The refinement of EWS models assumes that crises are a consequence of informational inadequacy rather than a fundamental, structural feature of the liberalized financial and regulatory environment that has been promoted in developing countries over the last two decades. Economies with internationally integrated, liquid, liberalized financial systems are inherently crisis prone, as recent events have well shown. Several empirical studies show that financial liberalization in developing countries is a strong (and, in some cases, the best) predictor of banking, currency and/or generalized financial crises [Corbett and Vines (quoting Wyplosz), 1998; Demirgüc-Kunt and Detragiache, 1998; Weller, 2001]. Empirical evidence that links financial liberalization and financial crisis is also reviewed in Arestis and Demetriades [1997], Arestis and Glickman [2002], Brownbridge and Kirkpatrick [2000], papers in Chang, Palma, and

Whittaker [2001], Crotty and Lee [2001], Grabel [2003a, 2003e], Palma [1998], Singh and Weisse [1998], and Williamson and Mahar, 1998.[12]

2.2.4.v.) Economists have never succeeded in predicting economic turning points. Finally, it bears mentioning that efforts at divining market swings have never met with much success. The spectacular failure of the hedge fund, Long Term Capital Management, a fund managed by Nobel Laureates and other distinguished economists, demonstrates that even pioneers of elaborate risk management models cannot anticipate market shifts with great accuracy.[13] Developing economies simply cannot afford to bear the costs of failed efforts at crisis prediction through EWS (namely, false signals that trigger investor panics, or missed signals).

2.2.4.vi.) We know that investors can respond to new information in a manner that is either market stabilizing or market destabilizing. By making agents aware of fragilities in the economy, predictors of crisis may induce market-stabilizing or destabilizing changes in behavior. Given the herd-like behavior of investors and the inherent instability of liquid, liberalized, internationally integrated financial markets, rational economic actors are just as likely to engage in destabilizing behavior in response to information on problems in the economy as they are to engage in market-stabilizing behavior. In the game of musical chairs, no one wants to be the last one left standing, as John Maynard Keynes noted long ago. We simply cannot predict with certainty whether agents will respond to the information provided by predictors in a market-destabilizing or stabilizing manner. Indeed, investor panic seems a likely response to warnings of dire circumstances ahead.

The general, underlying logic of this critical view of predictive efforts is summarized in figure 2.

<<**FIGURE 2 HERE>>**

At best, predictors of crisis have indeterminate effects on macroeconomic stability in the context of the current environment of liberalized, internationally integrated financial markets in which investors are free to take defensive actions in response to new information (changes in market sentiment, etc.).

Ironically, there is reason to expect that the presence of an EWS might promote higher levels of financial instability in developing countries. This may be termed the "predictor credibility paradox." The paradox may be introduced if the presence of an EWS induces a heightened level of confidence among economic actors, such that they may be apt to engage in riskier financial arrangements, provided that the EWS does not provide an indication of looming difficulties.

3. A PROPOSAL FOR TRIP WIRES AND SPEED BUMPS

This paper responds to the failure of current efforts to reduce the likelihood of financial crises by predicting them through EWS. I maintain that the trip wire-speed bump approach has the potential to reduce the specific financial risks that national policymakers deem most important to their own economies.

---

[12] Financial liberalization is a variable that rarely figures into EWS models. Kaminsky and Reinhart [1999] are an exception among orthodox economists in this regard.

[13] I thank James Crotty for bringing this point to my attention. See Lowenstein [2000] on the failure of Long Term Capital Management.

3.1. Contrasting trip wires-speed bumps and EWS

The trip wire speed-speed bump approach differs from EWS in several critical ways.

3.1.1. Trip wires are diagnostic tools only.

In contrast to the EWS approach, the information provided by trip wires is understood to have a rather narrow value as a diagnostic tool. Thus, unlike predictors in the EWS models, trip wires themselves are not expected to curtail financial risks and stabilize markets. Trip wires are necessary--but not sufficient--to the task of curtailing financial risks.

3.1.2. The trip wire-speed bump approach rests on the idea that specific, targeted changes in policy and/or behavior are necessary to curtail particular financial risks as soon as they are identified.

In contrast to the EWS, trip wires and speed bumps do not rest on the assumption that the self-correcting actions of private actors or private rating agencies will prevent identified financial risks from culminating in a financial crisis. Indeed, the trip wire-speed bump approach begins from the assumption that the actions of private actors in response to information about financial vulnerabilities can trigger additional financial instability (for instance, as investors run for the exits at the first sign of trouble; see figure 2).

The trip wire-speed bump approach calls upon regulators to activate gradual speed bumps at the first signs of vulnerability. It is these behavioral and/or regulatory changes that can reduce financial risks and prevent them from culminating in financial crises. Thus, and unlike the EWS, the warning signaled by a trip wire does not itself carry the full weight of crisis prevention. Instead, it triggers a series of regulatory actions that alter investor behavior in ways that avert crisis.

Note that there is precedent for the trip wire-speed bump approach in US stock markets and futures exchanges. Within these markets, automatic circuit breakers and price limits are used to dampen market volatility and stabilize extreme market swings. Regulatory authorities also have discretionary authority to stop trading or temporarily close an exchange or the trading in one particular security or derivative.[14] We return to this point in section 4.6.

3.1.3. Problems of informational inadequacy are not nearly as damaging to the success of trip wires and speed bumps as they are to EWS.

The adequacy of the information used in trip wires is quite obviously an important matter. But it is not nearly as significant a concern as it is for EWS. This is because the goal of a trip wire is not to "predict crisis," but to identify a risk of looming difficulty that warrants regulatory response. In this approach, the regulatory response bears the principal weight of ensuring stability, while under the EWS approach, information must do the full job.

---

[14] I thank Randall Dodd for raising this point.

In a trip wire-speed bump approach, regulators monitor trip wires constantly. So close to the ground, regulators are well positioned to monitor the quality of the information they gather—indeed, they are in a far better position to do so than distant market actors or rating agencies (who must rely in part on the reporting of these regulators—see section 4.3 below). Moreover, the gradual, early activation of speed bumps can reduce the cost of regulatory error associated with incorrect information. Under this approach, it is true that incorrect information may induce over- or under-regulation; but under the EWS, incorrect information is apt to induce sudden, dramatic reactions of private actors that inaugurate economic instability and crisis.

A government's incentive to deceive under an EWS (see section 2.2.4.i above) evaporates under a trip wire-speed bump approach. Under the EWS, the government has an incentive to misreport the value of important economic variables, and to exaggerate the quality of the government's data collection (so as to achieve and maintain credibility). Under the trip wire-speed bump approach, the officials who monitor the trip wires have no such incentive, since they are themselves the agents who will use the information they produce. Moreover, they now have an incentive to assess carefully the quality of the data they report, and to take account of this quality when activating and calibrating speed bumps. For instance, where data quality is known (or suspected) to be poor speed bumps would be imposed earlier than otherwise.

3.2. Trip wires

It is possible to envision a variety of trip wires that measure the types of financial risks that confront individual economies. Before proceeding, I note two caveats about the trip wires presented below.

First, the trip wires proposed here are illustrative, only. They are neither exhaustive nor definitive. It is hoped that this paper will stimulate discussion of how these trip wires can be refined by national or regional policymakers (or by the G-24).

Second, the financial risks identified below are of differential relevance to particular developing countries. National policymakers are in the best position to design specific trip wires that speak to their own economy's unique vulnerabilities. For instance, many developing countries do not confront the risk of portfolio investment flight because they receive very little (or no) international portfolio investment. Indeed, over the last 13 years, eight middle-income countries have accounted for 84% of total net flows of portfolio investment to the developing world; and ten large, middle-income countries received 70% of the FDI flows that went to the developing world in 2002 [World Bank, 2003]. But the risk of flight is highly consequential for the small number of developing countries that receive the majority of these flows. Other developing countries are far more vulnerable to sudden, significant declines in inflows of bi- or multi-lateral loans or private remittances. These risks require a different set of trip wires.

In what follows, I suggest trip wires that focus on particular financial risks. Among the most significant of these risks are the risk of large-scale currency depreciations, the risk that investors and lenders may suddenly withdraw capital, the risk that locational and/or maturity mismatches will induce debt distress, the risk that non-transparent financial transactions and other financing

strategies will induce financial fragility and inter-sectoral contagion, and the risk that a country will experience cross-border contagion.

3.2.1. Trip wires for currency risk

Currency risk refers to the possibility that a country's currency may experience a sudden, significant depreciation.[15] Currency risk can be evidenced by the ratio of official reserves to total short-term external obligations (the sum of accumulated foreign portfolio investment and short-term hard-currency denominated foreign borrowing); and the ratio of official reserves to the current account deficit.

3.2.2. Trip wires for fragility risk

Fragility risk refers to the vulnerability of an economy's private and public borrowers to internal or external shocks that jeopardize their ability to meet current obligations. Fragility risk arises in a number of ways. Borrowers finance long-term obligations with short-term credit, causing maturity mismatch. This leaves borrowers vulnerable to changes in the supply of credit, and thereby exacerbates the ambient risk level in the economy. A proxy for maturity mismatch could be given by the ratio of short-term debt to long-term debt (with foreign-currency denominated obligations receiving a greater weight in the calculation).

Fragility risk also arises when borrowers contract debts that are repayable in foreign currency, causing locational mismatch. This leaves borrowers vulnerable to currency depreciation/devaluation that may frustrate debt repayment. Locational mismatch that induces fragility risk could be evidenced by the ratio of foreign-currency denominated debt (with short-term obligations receiving a greater weight in the calculation) to domestic-currency denominated debt. In general, we might think of the dangerous interactions between currency and debt market conditions as introducing the possibility of inter-sectoral contagion risk.

Fragility risk is also introduced whenever economic actors finance private investment with capital that is either highly subject to reversal, is highly vulnerable to changes in the price at which additional funds are forthcoming, or is highly vulnerable to changes in the value of the underlying collateral that supports the investment. For instance, commercial real estate often serves as collateral for bank loans. A decline in real estate prices can then undermine bank balance sheets. This type of fragility risk raises the specter of inter-sectoral contagion. Trip wires that illuminate the fragility risk associated with particular financing strategies are discussed below in the context of flight risk.

Finally, fragility risk is introduced whenever economic actors finance their projects with highly risky, non-transparent financial instruments, such as derivatives or off-balance sheet activities, more generally. For example, in the case of derivatives the sudden necessity to meet collateral requirements often requires the selling of some other securities (often not in an area yet hit by

[15] Of course, rapid currency appreciation can also cause problems from the perspective of export performance. Though this is beyond the scope of this paper, the trip wire-speed bump approach could also address this "trade risk."

turmoil).[16] This forced selling spreads turmoil to other sectors of the financial system, and ultimately can inaugurate difficulties in the economy as a whole.

The risk that arises from off-balance sheet activities such as derivatives is not amenable to trip wires precisely because data on these activities are not readily available. For this reason, it is my view that these activities have no place in developing economies because they introduce far too much financial risk (e.g., foreign exchange exposure) to financial systems that are already quite vulnerable. Indeed, research on the East Asian crisis illuminates the important role that off-balance sheet activities played in the crisis [see Dodd, 2001; Neftci, 1998; Kregel, 1998]. Thus, financial regulators in developing countries might consider banning the use of these activities altogether. An alternative direction for policy towards derivatives is to mandate their transparency, such that these transactions appear on firm balance sheets. See Dodd [2002] for discussion of transparency and other aspects of prudential financial regulation vis-à-vis derivatives in developing economies. With transparency it would be reasonable to think about the development of appropriate trip wires (and speed bumps) for derivatives.

3.2.3. Trip wires for flight risk

Lender flight risk refers to the possibility that private, bi-, or multi-lateral lenders will call loans or cease making new loans in the face of perceived difficulty. An indicator of lender flight risk is the ratio of official reserves to private and bi-/multi-lateral foreign-currency denominated debt (with short-term obligations receiving a greater weight in the calculation).

Portfolio investment flight risk refers to the possibility that portfolio investors will sell off the assets in their portfolio, causing a reduction in asset prices and increasing the cost of raising new sources of finance. Vulnerability to the flight of portfolio investment can be measured by the ratio of total accumulated foreign portfolio investment to gross equity market capitalization or gross domestic capital formation.

Lender and portfolio investment flight risk often creates a self-fulfilling prophecy that deflates asset and loan collateral values, induces bank distress and elevates ambient economic risk. In addition, lender and/or portfolio investment flight risk can interact with currency risk to render the economy vulnerable to financial crisis (causing inter-sectoral contagion).

3.2.4. Trip wires for cross-border contagion risk

Cross-border contagion risk refers to the threat that a country will fall victim to financial and macroeconomic instability that originates elsewhere. This threat has been amply demonstrated in recent years, of course. It would seem that a trip wire-speed bump approach must take account of this risk. Fortunately, this mechanism is well suited to the task: a trip wire is activated in "country A" whenever crisis conditions emerge in "country B" or whenever speed bumps are implemented in "country B," assuming that policymakers in country A have reason to expect that investors would view countries A and B in a similar light (correctly or incorrectly).

[16] I thank Randall Dodd for raising this point.

3.3. Speed bumps

Speed bumps are narrowly targeted, gradual changes in policies and regulations that are activated whenever trip wires reveal particular vulnerabilities in the economy. (See table 1 for a summary of the trip wires and speed bumps presented here.)

<<TABLE 1 HERE>>

The trip wire-speed bump strategy is straightforward. It would be the task of policymakers within their own countries to establish appropriate thresholds for each trip wire, taking into account the country's particular characteristics (e.g., size, level of financial development, regulatory capacity) and its unique vulnerabilities (e.g., existing conditions in the domestic banking system, stock market, corporate sector, etc.). Critical values for trip wires and the calibration of speed bumps would be revised over time in light of experience, changes in the economy, and improvements in institutional and regulatory capacity.

Sensitive trip wires would allow policymakers to activate graduated speed bumps at the earliest sign of heightened risk, well before conditions for investor panic had materialized [*cf.* Neftci, 1998; Taylor, 1998]. When a trip wire indicates that a country is approaching trouble in some particular domain (such as new short-term external debt to GDP has increased over a short period of time), policymakers could then immediately take steps to prevent crisis by activating speed bumps. Speed bumps would target the type of risk that is developing with a graduated series of mitigation measures that compel changes in financing and investment strategies and/or dampen market liquidity.

Trip wires could indicate to policymakers and investors whether a country approached high levels of currency risk or particular types of fragility or flight risk. The speed bump mechanism provides policymakers with a means to manage measurable risks, and in doing so, reduces the possibility that these risks will culminate in a national financial crisis. Speed bumps affect investor behavior *directly* (e.g., by forcing them to unwind risky positions, by providing them with incentives to adopt prudent financing strategies, etc.) and *indirectly* (by reducing their anxiety about the future). Together, their effects mitigate the likelihood of crisis. Those countries that have trip wires and speed bumps in place would also be less vulnerable to cross-country contagion because they would face lower levels of risk themselves.

3.3.1. Specific speed bumps for the risks revealed by trip wires

Speed bumps can take many forms. A range of possible speed bumps that correspond to the specific financial risks illuminated by trip wires is presented below.

3.3.1.i.) Speed bumps for currency risk. Currency risk can be managed through activation of speed bumps that limit the fluctuation of the domestic currency value or that restrict currency convertibility in a variety of ways. The fluctuation of the domestic currency might be managed through a short-term program of sterilized intervention.

Historical and contemporary experience demonstrates that there are a variety of means by which currency convertibility can be managed. For instance, the government can manage convertibility by requiring that those seeking access to the currency apply for a foreign exchange license. This

method allows authorities to influence the pace of currency exchanges and distinguish among transactions based on the degree of currency and financial risk associated with the transaction. The government can suspend or ease foreign exchange licensing as a type of speed bump whenever trip wires indicate the early emergence of currency risk.

The government can also activate a policy of selective currency convertibility, if trip wires illuminated the emergence of currency risk. Specifically, a speed bump might allow the currency to be convertible for current account transactions only. It is important note that the IMF's Articles of Agreement (specifically, Article 8) provide for this type of selective convertibility.

Another type of speed bump might allow the government to curtail (but not eliminate) the possibility that non-residents will speculate against the domestic currency by controlling their access to it. This can be accomplished by preventing domestic banks from lending to non-residents and/or by preventing non-residents from maintaining bank accounts in the country. The Malaysian government took precisely these steps in the aftermath of the Asian financial crisis. It restricted foreigners' access to the domestic currency via restrictions on bank lending and bank account maintenance and by declaring currency held outside the country inconvertible.

3.3.1.ii.) Speed bumps for lender flight risk. Policymakers would monitor a trip wire that measures the economy's vulnerability to the cessation of foreign lending. If the trip wire approached an announced threshold, policymakers could then activate a graduated speed bump that precluded new inflows of foreign loans (particularly those with a dangerous maturity and/or locational profile) until circumstances improved.

Alternatively, a speed bump might rely upon the tax system to discourage domestic borrowers from incurring new foreign debt obligations whenever trip wires indicated that it would be desirable to slow the pace of new foreign borrowing.[17] In this scenario, domestic borrowers might pay a fee to the government or the central bank equal to a certain percentage of any foreign loan undertaken. This surcharge might vary based on the structure of the loan, such that loans that involve a locational or maturity mismatch incur a higher surcharge. Surcharges might also vary based on the level of indebtedness of the particular borrower involved, such that borrowers who already hold large foreign debt obligations face higher surcharges than do less-indebted borrowers. This tax-based approach would encourage borrowers to use (untaxed) domestic sources of finance. Surcharges might also vary according to the type of activity that was being financed by foreign loans. For instance, borrowers might be eligible for a partial rebate on foreign loan surcharges when loans are used to finance export-oriented production.

Note that policymakers in Chile and Colombia employed several types of tax-based policies to discourage foreign borrowing during much of the 1990s. Consistent with the trip wire-speed bump approach, the level and scope of these taxes were adjusted as domestic and international economic conditions changed. For instance, in Chile, foreign loans faced a tax of 1.2% per year (payable by the borrower), and all foreign debts and indeed all foreign financial investments in the country faced a non-interest bearing reserve requirement tax during this time. In Colombia,

[17] Tax-based speed bumps on foreign borrowing are discussed in Chang and Grabel [forthcoming 2004:ch. 9].

foreign loans with relatively short-maturities faced a reserve requirement tax of 47%, and foreign borrowing related to real estate transactions was simply prohibited.[18]

3.3.1.iii.) Speed bumps for portfolio investment flight risk. If a trip wire revealed that a country was particularly vulnerable to the reversal of portfolio investment inflows, a graduated series of speed bumps would slow the entrance of new inflows until the ratio falls either because domestic capital formation or gross equity market capitalization increased sufficiently or because foreign portfolio investment falls. Thus, a speed bump on portfolio investment would slow unsustainable financing patterns until a larger proportion of any increase in investment could be financed domestically. *I emphasize the importance of speed bumps governing inflows of portfolio investment because they exert their effects at times when the economy is attractive to foreign investors, and so are not as likely as outflow restrictions to trigger investor panic.* Though not a substitute for outflow controls, inflow restrictions also reduce the frequency with which outflow controls must be used, and their magnitude.[19]

Consistent with the trip wire-speed bump approach, Malaysian authorities twice imposed temporary, stringent restrictions over portfolio investment in the 1990s. The first such effort was in early 1994. At that time, the Malaysian economy received dramatic increases in the volume of private capital inflows (including, but not limited to, portfolio investment). Policymakers were concerned that these inflows were feeding an unsustainable speculative boom in real estate and stock prices and were creating pressures on the domestic currency. In this context, policymakers implemented stringent, temporary inflow controls. These measures included restrictions on the maintenance of domestic currency-denominated deposits and borrowing by foreign banks, controls on the foreign exchange exposure of domestic banks and large firms, and prohibitions on the sale of domestic money market securities with a maturity of less than one year to foreigners. Reaction to these measures was rapid and dramatic, so much so that authorities were able to dismantle them as planned in under a year (as they achieved their goals during this time). The immediate, powerful reaction to these temporary controls underscores the potential of speed bumps to stem incipient difficulties successfully.

The Malaysian government again implemented stringent controls over capital inflows and outflows in 1998 during the East Asian crisis. This effort involved restrictions on foreign access to the domestic currency, on international transfer and trading of the currency, and on the convertibility of currency held outside of the country. The government also established a fixed value for the domestic currency, closed the secondary market in equities, and prohibited non-residents from selling local equities held for less than one year. By numerous accounts, these rather stringent measures prevented the further financial implosion of the country – a notable achievement since the country was also gripped by a severe political and social crisis during this time. Comparing the situation of Malaysia to other countries that were party to the East Asian crisis, studies find that the country's capital controls were responsible for the faster recovery of its economy and stock market as well as the smaller reductions in employment and wages [Kaplan and Rodrik, 2002]. The latter achievements were possible because capital controls

[18] See Grabel [2003b, 2003d] for further details on tax-based policies in Chile and Colombia; and see Epstein, Grabel and Jomo K. S. [2003] and Chang and Grabel [forthcoming 2004:ch.10] for details on policies toward foreign borrowing in other developing countries.

[19] Outflow controls can play a useful role in some circumstances as suggested by Malaysia's experience in 1998.

provided the government with the ability to implement reflationary economic and social policies uninhibited by the threat of additional capital flight or IMF disapproval.

As discussed in the context of speed bumps on foreign borrowing, policymakers in Chile and Colombia adjusted restrictions on portfolio investment during much of the 1990s as domestic and international circumstances warranted. Consistent with the trip wire-speed bump approach, many other developing countries (such as China and India) have adjusted their restrictions on portfolio investment as circumstances warranted. (For details, see Grabel [2003b], Epstein, Grabel and Jomo K. S. [2003], and Chang and Grabel [forthcoming, 2004:ch.9]).

3.3.1.iv.) Speed bumps for fragility risks. The fragility risk that stems from excessive reliance on inflows of international portfolio investment or foreign loans could be curtailed by the speed bumps that focus on these types of flight risks (see above). The fragility risk from locational and/or maturity mismatch could be mitigated by a graduated series of speed bumps that requires borrowers to reduce their extent of locational or maturity mismatch by unwinding these activities, or by imposing surcharges or ceilings on them whenever trip wires revealed the early emergence of these vulnerabilities. Recall that speed bumps for off-balance sheet activities necessitate legislating their transparency.

3.3.1.v.) Speed bumps for cross-border contagion risks. A trip wire-speed bump program that reduces currency, flight and fragility risks would render an individual economy far less vulnerable to cross-border contagion. This is because well-functioning trip wires and speed bumps would reduce levels of financial risk in the economy, and as a consequence, mollify anxious investors. Moreover, trip wires and speed bumps would increase the resilience of an economy to a speculative attack were it nevertheless to materialize.[20] This certainly helps to account for the resiliency of the Chilean, Malaysian and other economies during recent financial crises. (See section 3.2.4 above for further discussion of trip wires and speed bumps for cross-border contagion.)

3.3.2. Considerations in the design of speed bumps

There are several guidelines that might guide the design of speed bumps in particular countries.

Speed bumps that govern *inflows* are preferable to those that govern outflows because measures that target outflows are more apt to trigger and exacerbate panic than to prevent it.[21] This does not mean that outflow controls are not useful during times of heightened vulnerability, especially if the government uses the "breathing room" garnered by temporary outflow controls to make changes in economic policy or to provide time for an investor panic to subside. Indeed, Malaysia's successful use of temporary controls on outflows in 1994 and again in 1998 shows

[20] The reduction in financial risks associated with trip wires and speed bumps would also increase the economy's resilience to external shocks.

[21] The same argument regarding inflow versus outflow controls pertains to speed bumps that compel investors to unwind risky positions. It is preferable to employ speed bumps that provide incentives to change new financing behavior rather than those that force investors to unwind existing positions (as the latter can trigger a crisis in other sectors).

that temporary outflow controls can protect the economy from cross-border contagion risk in a time of heightened financial risks.

Graduated, modest, and transparent speed bumps can address a financial risk before it is too late for regulators to take action. Such speed bumps are also less likely to cause an investor panic.

Finally, should speed bumps be automatic (i.e., rule based) or subject to policymaker discretion? Automatic speed bumps have the advantage of transparency and certainty, attributes that may be particularly important to investors. They also have lower administrative costs. But discretionary speed bumps have advantages, too. They provide regulators with the opportunity to respond to subtle and unique changes in the international and domestic environment. However, discretionary speed bumps have higher administrative costs and require a greater level of policymaking capacity.

The most prudent answer to the question of discretion is that there is no single, ideal framework for speed bumps in all developing countries. In general, the best that can be said is that speed bumps should be largely automatic and transparent in their operation, though this does *not* mean that regulators could or even should be expected to eliminate all discretion in the activation of speed bumps. It is the task of national policymakers to determine the appropriate balance between automatic and discretionary speed bumps, particularly in light of their assessment of immediate technical capacities.

4. THE FEASIBILITY OF THE TRIP WIRE-SPEED BUMP APPROACH

In what follows, I anticipate and respond to a number of likely concerns raised by skeptics of this approach.

4.1. Concern #1: A trip wire-speed bump program cannot reduce the unpredictability and volatility of cross-border and/or cross-currency capital flows. Therefore the utility of this approach is questionable.

This approach to policy responds precisely to the volatility and lack of predictability of cross-border capital and currency flows in largely unregulated global financial markets. Rather than trying to do a better job of predicting what cannot be predicted (i.e., financial flows in unregulated global financial markets), this approach *manages and "domesticates" otherwise unruly flows.*

4.2. Concern #2: The activation of trip wires and speed bumps might ironically trigger the very instability that they are designed to prevent.

This is usually referred to as the "Lucas critique." However, the Lucas critique does not take account of the possibility that if an economy is less financially fragile by virtue of a trip wire-speed bump program, then investors and lenders will not be so likely to rush to the exits at the first sign of difficulty. Moreover, an economy in which financial risks are curtailed (by trip wires and speed bumps) will be more resilient in the face of investor/lender flight risk.

The EWS magnifies the problem highlighted by Lucas because this mechanism is crude and blunt. The trip wire-speed bump approach entails moderate and graduated responses to small changes in conditions. The activation of speed bumps is therefore not apt to trigger market anxiety in the same way as an EWS announcement of pending crisis.

4.3. Concern #3: The trip wire-speed bump proposal is unnecessary because private investors and credit rating agencies can do a better job of identifying financial vulnerabilities than can governments.

There is no reason to expect that private investors will identify financial risks as they emerge, and engage in behaviors that curtail these risks. Moreover, the panicked responses of private foreign and domestic investors to identified risks can actually aggravate—rather than ameliorate—financial instability. Indeed, we saw precisely this dynamic unfold in all of the recent financial crises in developing countries.

The experience of the East Asian crisis provides no basis to expect that trip wires and speed bumps are unnecessary since private credit rating agencies provide useful diagnostics on emerging financial vulnerabilities. Indeed, evidence shows that assessments by private credit rating agencies failed to highlight emerging problems in Argentina, Turkey, East Asia and Turkey [see Reisen, 2002; Goldstein, Kaminsky, Reinhart, 2000:ch.4].

By contrast, there is ample evidence that policymakers in a large number of developing countries have effectively curtailed particular financial risks in their own economies by modifying existing financial regulations and even implementing new ones as circumstances warranted. Indeed, Epstein, Grabel and Jomo K.S. [2003] show that from the 1990s to early 2003 policymakers in Chile, Colombia, China, Taiwan POC, India, Singapore and Malaysia tightened existing regulations and implemented new ones when financial vulnerabilities were identified. The success of these strategies illustrates the broader potential of a trip wire-speed bump approach.

4.4. Concern #4: Trip wires and speed bumps will not achieve their objectives because economic actors will evade them.

Policy evasion (in any domain of policy) cannot be ignored. In the case of trip wires and speed bumps, financial innovation may provide a means for some economic agents to evade these polices. However, the middle-income countries that have the most to gain by trip wires and speed bumps are also in the best position to enforce them. It is also important to acknowledge that a degree of policy evasion does not imply policy failure [see Grabel, 2003b]. This is clearly illustrated by the achievements of numerous financial controls in South Korea, Chile, Colombia, Malaysia, China, Taiwan POC, and Singapore. It is imperative that the particular speed bumps adopted be consistent with national conditions, including state/regulator capacity.

4.5. Concern #5: Many developing countries do not have the technical policy-making capacity that is necessary for the success of trip wires and speed bumps.

It is certainly true that policy-making capacity differs dramatically across developing countries. Those developing countries (generally speaking, middle-income countries) that have the highest

levels of policy-making capacity are certainly in the best position to utilize trip wires and speed bumps. This is, in some sense, a happy coincidence because policymakers in these same countries have the most to gain by curtailing many of the financial risks that are targeted by trip wires and speed bumps.

It also bears mentioning that the technical prerequisites for operating trip wires and speed bumps are no greater than those that are demanded of policymakers that operate in an environment of liberalized, internationally integrated financial markets. Moreover, technical capacity can be acquired. Support for increased education and technical training of financial policymakers by the Bretton Woods institutions could be fruitful, particularly in smaller, low-income countries where financial policymakers may have had less opportunity to develop high levels of capacity. Regional cooperation among developing countries and/or the leadership of middle-income countries is another avenue for increasing the capacity of smaller, low-income countries to design and utilize trip wires and speed bumps that are most germane to their economies.

4.6. Concern #6: The negative reaction of the Bretton Woods institutions, the US government and/or international investors is an obstacle to the implementation of trip wires and speed bumps.

It is certainly true that these actors have individually and collectively been quite corrosive of policy autonomy in developing countries over the last two decades. But there are several reasons to be cautiously optimistic about the political feasibility of a trip wire-speed bump program.

First, recent studies (by academics, policymakers and even the IMF) have concluded that certain types of financial controls in developing countries have enabled developing countries to manage the challenges and opportunities associated with global financial integration [Grabel, 2003b; Grabel, 2003e; Epstein, Grabel and Jomo K. S., 2003; Prasad, Rogoff, Wei, and Kose, 2003; Ariyoshi et al., 2000].

Second, the position of negotiators for Chile and Singapore in their individual discussions with the USA on bilateral free trade agreements is heartening. In these negotiations, these representatives vigorously defended their countries' rights to activate temporary financial controls during times of financial crisis. Though the Bush administration steadily refused this point, the final agreements reached did incorporate these rights, though in attenuated forms (e.g., under certain circumstances US investors have the right to sue either country for losses incurred as a consequence of the capital controls).[22] On a related note, the assertiveness and the expression of solidarity among many developing countries at the Cancun WTO talks in September 2003 may signal a greater resolve to press the case that new types of trade and financial policies are needed at the present time.

Third, there may be reason to expect that foreign investors value financial stability in developing countries. Indeed, there is no empirical evidence that foreign investors shun developing countries that have well functioning financial controls in place, provided that they also offer investors attractive opportunities and an environment of economic growth. It may be the case

[22] For instance, investors can sue for losses only when restrictions on the sale of bonds and FDI extends beyond six months. For other financial assets, the "cooling off period" is twelve months.

that in the post-Asian, post-Argentinean crisis environment, developing countries with well functioning and transparent financial controls might have a comparative advantage in attracting international private capital inflows.

Fourth, as mentioned in section 3.1.2., circuit breakers and price limits in US stock markets and futures exchanges are utilized effectively by regulators. This suggests that the broader trip wire-speed bump approach presented here may ultimately be accepted as a necessary evil even by advocates of liberalized markets, since it appears that play an important, beneficial role even in the most advanced financial markets in the world.

4.7. Concern #7: Countries that implement trip wires and speed bumps will face increased capital costs and lower rates of economic growth.[23]

Contrary to the predictions of orthodox economic theory, there is no unambiguous empirical evidence of a tradeoff between speed bumps and increased capital costs or reduced economic growth.[24] This may be because although foreign investors value the liquidity associated with unregulated financial markets, they may come to favor economies that give them less reason to fear financial crisis (since during sudden crises liquidity is jeopardized). For this reason, developing economies as a whole might find it substantially easier and less costly to attract private capital flows if they reduced their vulnerability to crisis through collective implementation of trip wire-speed bump policies. In short, and contrary to orthodox economic predictions, the "hurdle rate" (the anticipated return sufficient to induce investment) might actually decline following the imposition of regulations that, in the first instance, reduce investor freedoms to liquidate their holdings.

4.7. Summary

Critics are likely to advance many arguments against the feasibility and utility of a trip wire-speed bump approach. Upon examination, I find these arguments unconvincing.

Trip wires and speed bumps represent one new direction for managing the financial risks that are identified by national policymakers. The chief advantages of this approach are that it can target only those risks that policymakers deem most important, it can be implemented gradually, it is transparent, and it provides a way for developing countries to pursue international financial integration without increasing the likelihood of financial crises.

---

[23] Discussion in this subsection borrows heavily from Grabel [2003b].

[24] See Edwards [1999] for a dissenting view on capital costs in Chile during its financial controls of the 1990s. See Epstein, Grabel and Jomo K. S. [2003] for a critical response to Edwards.

REFERENCES

Abiad A (2003). Early-warning systems: A survey and regime-switching approach. IMF Working Paper 32.

Arestis P and Demetriades P (1997). Financial development and economic growth: Assessing the evidence. *Economic Journal*, May: 783–799.

Arestis P and Glickman M (2002). Financial crisis in Southeast Asia: Dispelling illusion the Minskyian way. *Cambridge Journal of Economics*: 237–260.

Arias G (2003). Currency crises: What we know and what we still need to know. C.E.F.I. Working paper, 13 November.

Ariyoshi A et al. (2000). Capital Controls: Country Experiences with their Use and Liberalization. IMF Occasional Paper 190.

Berg A and Pattillo C (1998). Are currency crises predictable? A test. IMF Working Paper, November.

Berg A and Pattillo C (2000). The challenges of predicting economic crisis. *IMF Economic Issues*, 22.

Brownbridge M and Kirkpatrick C (2000). Financial regulation in developing countries. *Journal of Development Studies*, October: 1–24.

Chang H-J and Grabel I (2004). *Reclaiming Development: An Alternative Economic Policy Manual*. London, Zed Press.

Chang HJ, Palma G and Whittaker H, eds. (2001). *Financial Liberalization and the Asian Financial Crisis*. Basingstoke, Hampshire, Palgrave.

Corbett J and Vines D (1998). The Asian crisis: competing explanations. Working Paper Series III, July, Center for Economic Policy Analysis.

Crotty J and Lee K (2001). Neoliberal restructuring in Korea: 'Miracle' or disaster? Paper presented at the conference on Financialization of the world economy, University of Massachusetts and Political Economy Research Institute, December.

Demirgüc-Kunt A and Detragiache E (1998). Financial liberalization and financial fragility. Working Paper 83, International Monetary Fund.

Dodd R (2002). Derivatives, the shape of international capital flows and the virtues of prudential regulation. WIDER Discussion Paper 93.

Dodd R (2001). The role of derivatives in the East Asian financial crisis. Derivatives Study Center/Financial Policy Forum, Special policy report 1, 14 August, www.financialpolicy.org.

Eatwell J and Taylor L (2000). *Global finance at risk*. W. W. Norton & Co.

Edison H (2000). Do indicators of financial crises work? An evaluation of an early warning system. Board of Governors of the Federal Reserve System. International Finance Discussion Papers, July.

Edwards S (1999). How effective are capital controls? *Journal of Economic Perspectives*, 1999, 13 (4).

Eichengreen B and Portes R (1997). Managing financial crises in emerging markets, in Maintaining Financial Stability in a Global Economy. A symposium sponsored by the Federal Reserve Bank of Kansas City, August: 193–225.

Eichengreen B and Wyplosz C (1993). The Unstable EMS. *Brookings Papers on Economic Activity*: 51–124.

Eichengreen B, Rose R and Wyplosz C (1995). Exchange market mayhem: the antecedents and aftermath of speculative attacks. *Economic Policy,* October: 249–312.

Eichengreen B and Toward A (1999). *New International Financial Architecture: A Practical Post-Asia Agenda*. Washington, D.C.: Institute for International Economics.

Epstein G, Grabel I and Jomo KS (2003). Capital management techniques in developing countries: An assessment of experiences from the 1990's and lessons for the future. Paper prepared for the XVIth Technical Group Meeting of the Group of Twenty-four, Port of Spain, Trinidad and Tobago, February: 13–14.

Flood R and Marion N (1999). Perspectives on the recent currency crisis literature. *International Journal of Finance and Economics*: 1–26.

Frankel J and Rose A (1996). Currency crashes in emerging markets: An empirical treatment. *Journal of International Economics*, November: 351–368.

Goldfajn I and Valdés R (1997). Are currency crises predictable? IMF Working Paper, WP/97/159, December.

Goldstein M (1997a). Presumptive indicators of vulnerability to financial crises in emerging Economies. In: Basu P*, ed. Creating resilient financial regimes in Asia: Challenges and policy Options*. Oxford University Press: 79–132.

Goldstein M, Kaminsky G and Reinhart C (2000). *Assessing Financial Vulnerability: An Early Warning System for Emerging Markets*. Washington, DC: Institute for International Economics.

Grabel I (1996). Marketing the Third World: The Contradictions of Portfolio Investment in the Global Economy. *World Development*, 24(11): 1761–1776.

Grabel I (1999). Rejecting Exceptionalism: Reinterpreting the Asian Financial Crises. In: Michie J and Smith J, eds. *Global Instability: The Political Economy of World Economic Governance*. London: Routledge: 37–67.

Grabel I (2000). The Political Economy of 'Policy Credibility': The New-Classical Macroeconomics and the Remaking of Emerging Economies. *Cambridge Journal of Economics*, 24(1): 1–19.

Grabel I (2003a). Predicting financial crisis in developing economies: astronomy or astrology? *Eastern Economics Journal*, 29 (2): 245–260.

Grabel I (2003b). Averting crisis: Assessing measures to manage financial integration in emerging economies. *Cambridge Journal of Economics*, 27 (3): 317–336.

Grabel I (2003c). Ideology, power and the rise of independent monetary institutions in emerging economies. In: Kirshner J, ed. *Monetary Orders: Ambiguous Economics, Ubiquitous Politics*. Ithaca, Cornell University Press: 25–52.

Grabel I (2003d). The Revenue and Double Dividend Potential of Taxes on International Private Capital Flows and Securities Transactions. World Institute for Development Economics Research (WIDER)/United Nations University, Helsinki, Finland, WIDER Discussion Paper 83.

Grabel I (2003e). International private capital flows and developing countries. In: Chang HJ, ed. *Rethinking Development Economics*. London, Anthem Press: 325–345.

Hardy D (1998). Are banking crises predictable? *Finance and Development*, December: 32–35.

Hardy D and Pazarbasioglu C (1998). Leading indicators of banking crises: Was Asia different? IMF Working Paper, June.

Hawkins J and Klau M (2000). Measuring potential vulnerabilities in emerging market economies. Bank for International Settlements. Working Papers, October.

IMF Economic Forum (2001). Anticipating crises: Model behavior or stampeding herds. 1 November.

IMF (1998). Financial crises: Characteristics and indicators of vulnerability. *World Economic Outlook*, May: 74–97.

Kamin S and Babson O (1999). The contributions of domestic and external factors to Latin American devaluation crisis: an early warning systems approach. Board of Governors of the Federal Reserve System. International Finance Discussion Papers, September.

Kaminsky G and Reinhart C (1999). The twin crises: the causes of banking and balance-of-payments problems. *The American Economic Review*, June: 473–500.

Kaminsky G and Reinhart C (2000). On crises, contagion and confusion. *Journal of International Economics*: 145–168.

Kaminsky G, Lizondo S and Reinhart C (1997). Leading indicators of currency crises. IMF Working Paper 79, July.

Kaplan E and Rodrik D (2002). Did the Malaysian capital controls work? In: Edwards S and Frankel J, eds. *Preventing Currency Crises in Emerging Markets*. Chicago: University of Chicago Press: 393–441.

Kenen P, ed. (1996). From Halifax to Lyons: What has been done about crisis management? *Princetion Essays in International Finance*. Princeton University: Department of Economics, October.

Kregel J (1998). Derivatives and global capital flows: applications to Asia. *Cambridge Journal of Economics*: 677–692.

Krugman P (1979). A model of balance-of-payments crises. *Journal of Money, Credit, and Banking,* November: 311–325.

Lowenstein R (2000). *When genius failed: The rise and fall of long-term capital management*. NY: Random House.

Neftci S (1998). FX short positions, balance sheets and financial turbulence: An interpretation of the Asian financial crisis. Working Paper, Center for Economic Policy Analysis, New School University.

Prasad E et al. (2003). *Effects of Financial Globalization on Developing Countries: Some Empirical Evidence.* http://www.imf.org/external/np/res/docs/2003/031703.htm.

Reisen H (2002). Ratings since the Asian crisis. WIDER Discussion Paper 2.

Rose A and Svensson L (1994). European exchange rate credibility before the fall. *European economic review*, May: 1185–1216.

Sachs J, Tornell A and Velasco A (1996). Financial crises in emerging markets: the lessons from 1995. *Brookings Papers on Economic Activity*: 147–215.

Sharma S (1999). The challenge of predicting economic crises. *Finance and Development*, June: 40–42.

Singh A and Weisse B (1998). Emerging stock markets, portfolio capital flows and long-term economic growth: micro and macroeconomic perspectives. *World Development*, 26 (4): 607–622.

Subbaraman R, Jones R and Shiraishi H (2003). Financial crisis: An early warning system, Lehman Brothers Asia (available by email: ascorpcomm@lehman.com).

Taylor L (1998). Capital market crises: liberalization, fixed exchange rates and market-driven destabilization. *Cambridge Journal of Economics*.

Weller C (2001). Financial crises after financial liberalization: Exceptional circumstances or structural weakness? *Journal of Development Studies*, 38(1): 98–127.

Williamson J and Mahar M (1998). A survey of financial liberalization. *Essays in International Finance.* Princeton University: Department of Economics, November.

World Bank (2003). *Global development finance 2003*. Washington, DC.

Wyplosz C (2000). How risky is financial liberalization in the developing countries? Paper presented at the Technical Group Meeting of the Group of Twenty-four and the UNCTAD, Geneva, Switzerland, 14–15 September.

Table 1. Key financial risks confronting developing countries; and Examples of Associated trip wires and speed bumps.

KEY FINANCIAL RISKS	**EXS. OF TRIP WIRES** Trip wires measure the types of financial risks that confront individual economies.	**EXS. OF SPEED BUMPS** Speed bumps are narrowly targeted, gradual changes in policies and regulations that are activated whenever trip wires reveal particular vulnerabilities in the economy.
Currency risk Investors flee currency, inducing sudden, dramatic depreciation	Ratio of official reserves to total short-term external obligations (the sum of accumulated foreign portfolio investment and short-term hard-currency denominated foreign borrowing). OR Ratio of official reserves to the current account deficit.	Limit the fluctuation of the domestic currency value. OR Restrict currency convertibility in a variety of ways (e.g., foreign exchange licensing, selective currency convertibility, controls over non-resident access to the domestic currency).
Flight risks		
Portfolio investment Portfolio investors sell off a country's assets, causing a reduction in asset prices and increasing the cost of raising new sources of finance.	Ratio of total accumulated foreign portfolio investment to gross equity market capitalization or gross domestic capital formation.	Graduated series of speed bumps would slow the entrance of new inflows until the ratio falls either because domestic capital formation or gross equity market capitalization increased sufficiently or because foreign portfolio investment falls. OR Outflow controls can be employed.
Lender Private, bi-, or multi-lateral lenders call loans or cease making new loans in the face of perceived difficulty.	Ratio of official reserves to private and bi-/multi-lateral foreign-currency denominated debt (with short-term obligations receiving a greater weight in the calculation).	Preclude new inflows of foreign loans (particularly those with a dangerous maturity and/or locational profile) until circumstances improved. OR

		Use the tax system to discourage domestic borrowers from incurring new foreign debt obligations (e.g., surcharges based on maturity/locational structure of loans, level of indebtedness of particular borrowers, or type of activity financed by foreign loan).
Fragility risks (in gen'l) Shocks that jeopardize the ability of private and public borrowers to meet current obligations.		
Locational mismatch Proliferation of debts that are repayable in foreign currency.	Ratio of foreign-currency denominated debt (with short-term obligations receiving a greater weight in the calculation) to domestic-currency denominated debt.	Locational and/or maturity mismatch could be mitigated by a graduated series of speed bumps that require borrowers to reduce their extent of locational or maturity mismatch. OR Impose surcharges or ceilings on financing strategies that involve loc./maturity mismatch whenever trip wires reveal the early emergence of these vulnerabilities.
Maturity mismatch Proliferation of long-term debts financed with short-term credit.	Ratio of short-term debt to long-term debt (with foreign-currency denominated obligations receiving a greater weight in the calculation).	See speed bump for locational mismatch above.
Off-balance sheet Proliferation of financing strategies that involve risky, non-transparent financial instruments.	This type of fragility risk is not amenable to trip wires precisely because data on these activities are not readily available.	Policy options: Ban the use of non-transparent instruments in developing countries. OR Mandate the transparency of these instruments so that

		trip wires and speed bumps can be devised.
Cross-border contagion risk Guilt by association: threat induced by crisis abroad	Trip wire is activated in "country A" whenever crisis conditions emerge in "country B" or whenever speed bumps are implemented in "country B," assuming that policymakers in country A have reason to expect that investors would view countries A and B in a similar light (correctly or incorrectly).	See discussion of trip wire for cross-border contagion risk (left column). Note: Well-functioning trip wires and speed bumps would reduce levels of financial risk in the economy, and as a consequence, mollify anxious investors. Moreover, trip wires and speed bumps would increase the resilience of an economy to a speculative attack were it nevertheless to materialize