Financial Regulatory Reform: Using Models of Cooperation to Evaluate Current Prospects for International Agreement

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Abstract. We detail several models that help to understand the prospects for cooperation on regulatory reform in the current crisis. A first model, which focuses on parameter uncertainty, shows that gains from coordination increase as the global economy becomes less certain, because coordination allows policymakers to control for the variability of spillover effects from foreign countries. A second model, in which regulation faces a tradeoff between maintaining stability and enhancing the competitive position of the national financial sector, also implies greater incentives to coordination in the current environment, because there has been a common shock to confidence that leads countries to put a greater weight on financial stability. Coordination is defined here as the choice of harmonized regulation of financial institutions. Finally, however, a club model of how agreements are actually reached suggests that the size of the G20 may be a problem (as well as the heterogeneity of its members), because greater numbers decrease the probability of agreement.

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1. Introduction

The suddenness and severity of the global financial crisis that originated In the US sub-prime mortgage market, and the fact that regulatory failures permitted it to happen, have led to calls for sweeping financial reform. Two G20 summit meetings have already been held to address the short-term effects of the crisis as well as to consider longer-run regulatory reforms, one in Washington in November, 2008, and the second in London in April, 2009. The countries represented reached some agreement on short-run responses as well as related work plans for international institutions—in particular, plans to augment the resources of the IMF and development banks. However details of regulatory reforms are still largely to be

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worked out. It is not clear to what extent countries will be willing to agree on far-reaching reforms in this area, or whether such reforms will be coordinated or taken independently on a country-by-country basis. In this paper, we draw on several models to identify the forces at work—both the incentives for cooperation and the reasons it may not occur. Based upon this work, we then provide our conclusions concerning the prospects for international agreement on increased financial regulation.

The current financial crisis has had many characteristics of earlier financial crises as well as some unique developments. Three characteristics in particular merit note. First, this is a financial crisis that originated with, and spread widely throughout, developed countries, and involved failures of large financial institutions, lack of oversight and weak regulatory mechanisms. Second, in response to the crisis, the extent of governmental activism and the size of policy stimulus have been unprecedented in many countries. Third, and most relevant to this article, calls for international cooperation have been widespread and the G20 was substituted for the G7/G8 as the forum for cooperation. Much of the immediate short run impetus for cooperation during this crisis came from the attempt to alleviate negative spillovers. Countries negatively affected by the spillovers from the United States sub-prime market felt that poor regulation in the United States had contributed to their severe losses and their economic downturns, and thus coordinated stimulus and reform should be on the international agenda.

As we explain in the course of the article, cooperation can be expected to increase in times of uncertainty and crisis. Furthermore, regulatory harmonization becomes relatively more attractive when there is a common shock to confidence, while in normal times countries are more concerned with maintaining the competitive positions of their financial sectors. The composition of the negotiating group is also important for the prospects of reaching agreement, however. From the beginning of G5/G7 summitry in 1975, international policy cooperation has been an oligopolistic game among a small group of countries with similar economies. That the framework for international cooperation is oligopolistic is reasonable. In an atomistic world of a large number of equally sized countries it is difficult to imagine cooperative solutions. In reality, there are a small number of large participant countries as well as many other countries of smaller scale. Each country has the option of cooperating in various ways, acting singly, for example in providing fiscal stimulus, adopting higher-than-minimum regulatory standards, or being a free rider and benefiting from the policy decisions and resources of other countries. However, because of the increasing clout of those left out—the large, fast-growing "emerging market" countries--a decision was made to shift the forum for discussing responses to the crisis from the G7 to a larger group of countries—the G20. The G20 includes the major holders of international reserves (China's $2 trillion is the world's largest, and Saudi Arabia's reserves are also vast), and their presence was essential for agreement to be reached to expand the IMF's lending capacity. However, the addition of these more heterogeneous countries to the G7 will complicate the task of

reaching agreement on financial regulation, especially since many of the new countries have much less developed financial sectors.

The crisis has displayed failures in financial regulation and supervision in a number of countries, but not all were equally affected nor were similar weaknesses common throughout different systems. These patterns have not yet been subject to a comparative analysis of any depth. Nonetheless, as a result of the crisis itself many official and academic proposals have emerged for reforming the regulatory and supervisory architectures. Indeed, the G20 summits held in Washington in November, 2008, and in London in April, 2009, had as their objective to make progress in these areas. Despite calls by some leaders, in particular British Prime Minister Gordon Brown and French President Nicolas Sarkozy, to redesign the regulatory framework, very little of substance on regulatory issues has so far emerged from the G20 meetings. Instead, the summits have delegated the detailed work to the Financial Stability Forum (FSF), the Basel Committee on Banking Supervision (BCBS), the Organisation for Economic Cooperation and Development (OECD) and the International Monetary Fund (IMF). In this paper, using models that explain the incentives for cooperation and the ability to reach agreements, we review the relevance of the Washington and London summits and examine the prospects for the future of international regulatory reforms.

2. National Regulatory Policies and International Coordination

The literature on international policy coordination is vast and multifaceted. It developed from an examination of the macroeconomic and exchange rate policy options for countries under fixed and floating exchange rates facing different types of economic challenges such as balance of payments constraints and global oil price shocks and subject to domestic macroeconomic tradeoffs between unemployment and inflation. The key lesson from this literature is that spillovers between countries may make policy coordination mutually beneficial; that is, two countries can both be better off if they take policy decisions jointly—with concern for the welfare of both—rather than each pursuing its own goals independently. The size of those gains is an empirical issue, and the standard estimates for macroeconomic policy coordination (monetary and fiscal policies) are that they involve gains of less than 1 percent of GDP (Meyer and others, 2002; McKibbin, 1997). While not negligible, the modest size of these potential gains, associated with the fact that they are uncertain and agreement on joint policies would involve negotiating costs, suggests that in normal times international coordination should not be at the top of the policy agenda (and indeed, since the mid 1980s it has not been). This conclusion is reinforced if credence is given to the suggestion that coordination may be harmful in some circumstances: for instance, if there is an existing inflationary bias and cooperation prevents using exchange rate appreciation to dampen inflationary pressures, or because international meetings deflect attention and resources from domestic responsibilities.

A factor not taken into account in much of the mainstream literature is the uncertainty concerning the effects of policies (Meyer and others, 2002). Uncertainty enters into decision making in several ways in addition to simply providing a range of quantitatively different, possible outcomes. As shown in Ghosh and Masson (1994), model uncertainty may provide an additional incentive to coordinate. The intuition is as follows: if there are spillover effects of policies, and these effects are uncertain, then accounting for the possibility of very unfavourable impacts on other countries when deciding on policies may enhance mutual welfare. Clearly in this situation independent policymaking would not do so, but policy coordination—in the sense of joint maximization of some criterion that adds together the welfare of the individual countries—would properly take into account uncertainty about both the foreign and domestic effects of policy. Note that uncertainty here refers to the impacts of policy (i.e. multiplicative, or model, uncertainty), not just the existence of additive errors that makes outcomes to some extent stochastic. It also needs to be distinguished from disagreement over the economic effects of policies—which often accompanies uncertainty. On the latter, Frankel and Rockett (1988) demonstrate that if countries disagree on which model correctly describes the world economy, they are unlikely to reach agreement to cooperate; or if they do, cooperation is unlikely to lead to an improvement of welfare if the correct model is chosen randomly from a set of respected empirical macro-models.

This model uncertainty is especially prevalent in the current crisis. It exists in part because there are competing models of financial systems, for example between the bank-based European and more capital-markets-based Anglo-Saxon models (see Atkins, 2008; Hall, 2009; Parker, Tait and Hall, 2009; and Mahbubani 2009), and competing monetarist and Keynesian models of the the macroeconomy. Continental European states (especially Germany, but also by extension the ECB) are considerably more monetarist than their Anglo-Saxon counterparts. Furthermore, there are disagreements among countries over exchange rate models with implications for the extent they are willing to countenance depreciation as a policy tool (see Garnham, 2009). Both Switzerland and the United Kingdom have been accused of wrongly using competitive devaluations as a policy response to this crisis.

Ghosh and Masson (1994) go on to show that the gains from coordination accrue when it is the transmission effects of policy, not their domestic effects, that are uncertain. Consider a simple example where each country's inflation rate depends positively on both its own and the foreign country's money supply growth (m and m^*, respectively), plus a random error u (with expected value zero) that represents a common inflationary shock to the two countries. Assume in addition that there is only one objective, to keep the expected inflation rate at zero, and that monetary policy is set each period after the inflation shock is observed. Let us write each country's inflation rate (the two countries are assumed to have the same coefficients) as

$$p=am+bm^*+u \qquad (1)$$

The coefficients a and b are both positive, with $a>b$. Each country's objective is to minimize

$$L=Ep^2 \tag{2}$$

Now if the coefficients a and b are both known, each country can perfectly hit its target, with a value of the loss function of zero, as it has one target and one instrument. Whatever the foreign country does (which is assumed to be observed), the home country can offset its effects on its own inflation rate. Note that the inflation shock is common to the two countries. Then acting independently, both countries would set their policies such that

$$m=m^*=-u/(a+b) \tag{3}$$

This policy setting gives a zero value for the loss function, which cannot be improved by cooperation between them.

The same is not true if the coefficients a and b are to some extent random, however, even if the policy chosen by the foreign government remains observable. Assume that the two coefficients are drawn from distributions with mean and variance (A,V_a) *and* (B, V_b), respectively. , Now, as Brainard (1967) showed for a closed economy, it is not sufficient to have as many instruments as targets, because both the mean and variance of deviations from the target for inflation matter for welfare. Here, if each country minimizes its loss function independently, this will produce a Nash equilibrium with

$$m=m^*=-u/(A+B+V_a/A) \tag{4}$$

Each country takes into account the uncertainty in the domestic effects of its own policies in setting them optimally, but not their uncertain effect on the foreign country.

Consider instead the cooperative solution, where the two monetary policies are chosen to minimize an equally-weighted average of the two countries' loss functions. In this case, the optimal policy will be

$$m=m^*=-u/[A+B+(V_a+V_b)/(A+B)] \tag{5}$$

It can easily be shown that if the domestic effects are known ($V_a=0$) but the transmission effects are uncertain ($V_b>0$) then the loss sustained by each of the countries is lower than if they chose their policies independently, as in the Nash equilibrium.

This again accords with intuition; if countries are closed, or the transmission effects of policy are known, then uncertainty provides no particular incentive for coordination. The current crisis has precisely highlighted the uncertainty concerning the international transmission of financial shocks. Whereas the problems of the US

sub-prime mortgage market were well recognized, the extent that the collapse of that market could have major effects throughout world financial markets has been a surprise to virtually all analysts and policymakers. The nature of financial spillovers is not yet fully understood, and the response of many has been to call into question the benefits of financial globalization.

This model can shed light on the decisions which treasuries and central banks face during the current crisis, if we reinterpret the objectives of the authorities as being to minimize output losses, and the shock to be a financially-induced negative output shock. While during the 1970s and 1980s inflation was the dominant problem, that is clearly not the case now. Thus with respect to this discussion on policy coordination and uncertainty, it would be more relevant to replace inflation p by output growth y, with everything else unchanged. This revised model would imply that increased uncertainty about the potential stimulative impacts of their domestic policies may lead to greater gains from coordination than usual. Thus, the model demonstrates why the crisis has provided a new impetus for cooperation. This calculus will appear later in terms of a model with a variable number of participants since the shape of the cost-benefit curves can change according to the number of countries involved.

Uncertainty and lack of uniform standards also pervade the regulatory and supervisory fields. Foreign financial rules may not work as well in practice as they may appear to do. Regulations may not be enforced equally across countries or sectors, the legal frameworks may differ (for example, hedge funds are regulated in some countries but not others), and accounting standards are not everywhere the same. In this current crisis which had its genesis in the United States sub-prime markets, US financial regulations have been seen not to be effective and the dispersion of accountabilities to state and federal agencies created additional uncertainty that was only understood *ex post* to be of systemic relevance. Yet a substantial international cooperation industry reviewed, monitored, forecast and analyzed international financial trends. As Masson and Pattison (2009, 24-25) point out, the IMF's *Global Financial Stability Report* indicated in 2007 that the economic impact of the housing slowdown had been limited and there were some signs of stabilization. Similarly in a report issued in September, 2006, the Financial Stability Forum, while noting some concerns, indicated that the outlook was broadly supportive of stability. Most international organizations did identify some risks to stability but could not translate these into estimates of a severe downturn or formulate concrete international policy recommendations linked to those risks.

The current climate of uncertainty fuels a demand for policy cooperation, as the above literature on uncertainty suggests. Whether the current hospitable climate lasts long enough for agreement to be reached remains to be seen. It needs to be remembered that the Nash equilibrium—with independent policy making—results from each country's best response to the other country's policies. If there is no enforcement mechanism, then, cooperation may break down as each reverts to its

own best policy in the hope that the other countries will nevertheless honour the cooperative agreement.

3. Types of International Cooperation

There are many forms of policy cooperation, some of which institutionalize coordination and thus may provide some form of punishment for those that do not honour agreements. Sometimes punishment may involve only "naming and shaming" countries that do not comply with international norms, and sometimes the implicit punishment may just be that nations are seen to be less relevant and have less credibility or prestige among their international counterparts. One reason the BIS has been successful is that central bank governors as well as bank supervisors meet regularly. Thus misleading information, lack of commitment, or poor follow-through will not go unnoticed by other members. Cooperation takes place in various ways through existing institutions, or *fora* for discussion such as the G20 or G7/8 summits, and meetings at the BIS, OECD or IMF. Cooperation can consist simply of regular discussions either within international institutions or on an *ad hoc* basis, through coordinating minimum standards (such as the BCBS does for certain minimum financial regulatory requirements); involve agreement on how to share burdens on various policy initiatives; be accompanied by monitoring adherence to international codes and standards; or take the form of loans from institutions such as the IMF to individual countries or central banks that come with conditions to cooperate internationally. Inherent in this description is a hierarchy of increasingly complex forms of multilateral, international cooperation. Coordination can take many forms ranging from simple information sharing through more complex agreements.

Rarely is economic cooperation on macroeconomic or regulatory issues carried out under legal agreements or treaties (except to create the international organizations described above). Rather it is done through soft law whereby each nation agrees to bring international minimum standards into local law, (see Giavanoli,, 2000, 33), or agrees to a joint communiqué issued by leaders or finance ministers laying out a policy response to a particular problem. The European Union is a special case since it has developed over the past 50 years a body of legal agreements, treaties, regulations and precedents adopted by supranational bodies like the European Commission and the European Court of Justice. In contrast, the summit meetings of the G7, G20, and others, as well as the discussions at the OECD and BIS are non-binding and do not have a legal basis for enforcement.

Much is *not* done through multilateral means. Countries often use bilateral agreements such as swap lines between central banks, or seek bilateral agreements where a multilateral agreement would be too difficult to negotiate. This latter point illustrates that achieving a multilateral agreement is not easy. In some cases smaller coalitions are used to reach initial agreements between two or three major countries which can then be extended to many other countries through multilateral institutions or working groups. This was how the original Basel Capital Accord was created as it

could not be negotiated *de novo* by the entire Basel Committee on Banking Supervision (Pattison, 2006).

Ensuring the success of cooperative agreements requires the commitment and follow-through of participating countries, even to the extent of ensuring that terms mean the same to each country. There are many agreements that have never been implemented, that were reneged on, or where domestic follow-through never happened. The fact that in large parts of the world international accounting standards are not respected in practice, and adherence to minimum standards and domestic laws is haphazard, is a major inhibiter to multilateral cooperation. There are few clear success stories on a broad multilateral basis involving a large number of countries. This is also partly because the pre-conditions for success are so demanding. The Bretton Woods Agreement may be viewed as a temporary success in the post Second World War era but even it was possible only because the war limited the attendance of many countries that would have complicated decision making. The Plaza Agreement and Louvre Accord of 1985-87 resulted from a temporary, but widespread, consensus that the US dollar was overvalued, and after it had depreciated, that stabilization was in order. However, since that time the G7 has seldom succeeded in reaching agreement on exchange rate matters. Even after agreement, monitoring is not easy, nor is enforcement. Many decisions would have been taken by nation states in any event without international coordination since the decision would have been in the country's best interest. Thus it is difficult empirically to assess the benefits of cooperation.

Cooperation in the field of financial regulation only began in 1975 and flourishes today principally within the committees of the BIS. Prior to this date the fixed exchange rate regime, controls on international capital flows, and other inhibiting factors (such as the extent of domestic financial regulation) limited many of the risks to international banking. There appear to have been a number of motivations and incentives for cooperation starting in the mid-1970s. The original impulse came from the failure of Bankhaus Herstatt and resulted in an international Concordat to deal with the responsibilities of home and host countries. In the 1980s the incentives to complete the Basel Capital Accord were twofold: first, to effect improvements to minimum regulatory standards on a broad international basis; and second, to create a level playing field as Japanese banks were capturing a disproportionate share of international business because of their higher leverage and lower capital requirements (Fratianni and Pattison, 2001a).

4. International Financial Cooperation and This Financial Crisis: The London Summit of 2009

The crisis has involved severe financial spillovers from one country to another. Moreover, weaknesses in national financial systems have exacerbated their negative effects. As a result, many of the proposed initiatives that were announced at the April 2009 London Summit relate to strengthening international financial cooperation.

There were to be three prongs to the internationally coordinated response: a) putting in place monetary and fiscal stimulus to engineer an economic recovery from the global recession; b) strengthening the oversight, regulation and supervision of financial systems; and c) expanding the resources of the IMF and the multilateral development banks to mitigate unfavorable effects on the poorer developing and emerging market countries.

The summit was most successful in getting agreement on c), though details of which countries will provide the financing, and on what terms, remained to be worked out when this was being written. The emerging market countries in the now-prominent G20 naturally want to have their importance reflected in the operations of the international institutions whose finances they are augmenting. As for a), the national fiscal stimulus packages and massive central bank easing that had already been announced were viewed as being an adequate response, disappointing those who expected that there would be a show of international cooperation in providing further stimulus. As for b), agreement took the form of procedural steps and broad principles rather than concrete measures.

For instance, one of the initiatives was the creation of the Financial Stability Board (FSB) as a replacement for the FSF, giving it a revised and expanded mandate. In addition its membership was extended from the FSF to include all G20 member states, Spain, and the European Commission. Membership in the FSB requires member countries to work towards the maintenance of financial stability, implement international financial standards including 12 "key" international standards and codes, and to submit to peer reviews such as the IMF/World Bank Financial Sector Assessment Program reports (FSAPs)—something that the United States had heretofore refused to do.

Other proposed improvements emanating from the London Summit related to the establishment of supervisory colleges for significant international financial institutions, strengthened cross-border crisis management processes and strengthened prudential regulation. The latter would involve revised minimum capital requirements, capital buffers, expanded information gathering powers for national supervisors, and amendments to the scope of regulation such that systemically important institutions would be brought, in some manner, into the regulatory tent.

Another initiative emerging from the summits was an ambitious program to control cyclicality in the financial system and which has led to a preliminary report by the Financial Stability Forum, (see FSF, 2009). Progress on addressing this problem will require significant efforts from various bodies, including the BCBS, another BIS Committee - the Committee on the Global Financial System (CGFS), the International Accounting Standards Board (IASB), the Financial Accounting Standards Board (FASB), as well as implementation in each national jurisdiction. The recommendations are technically complex, and many of them involve analytical issues for which there remain a high degree of empirical uncertainty including a lack of good data covering a suitable number of representative countries.

5. Cooperation and Trade-Offs Between Financial Goals

There are good reasons why international agreement on common regulatory reform does not occur easily. In this section, we present a model in which regulation is aimed at several objectives. Cooperation may help reach those objectives, in particular when there is a common shock to confidence, and if financial globalization is far advanced.

The regulation of a *domestic* financial system involves a number of trade-offs such as that between financial stability – a low or zero failure rate for major financial institutions, and eliminating negative spillovers from the financial to the real sector – and economic efficiency, competition and healthy risk taking. The international context introduces further trade-offs. One fundamental example is between *domestic* financial stability and creating a *competitive advantage* for the country's financial firms, say from a less regulated system relative to competitors. A globalized world introduces a further complication, due to the fact that each country, especially if it hosts a major financial centre, contributes to *international* stability, which benefits everyone, that is, is an international public good. But as with other public goods, because all the benefits are not captured by a country producing it, it may be underprovided.

Dailami and Masson (2009, section VIII) develop a two-country model in which each country's choice of the extent of regulation involves a trade-off between financial stability and competitiveness for its financial industry. The objectives of each national regulator are to improve competitiveness, C, and maintain financial stability, S. Regulation affects both C and S. Competitive advantage is proportional to the difference in regulation in the two countries, while stability depends positively on both the home country's regulation and the foreign country's, but the latter with a weight, γ, less than one. The assumption that $\gamma<1$ reflects a number of possible factors: not all financial services and products are traded, and there are structural differences between financial markets. A pertinent example of the latter is the mortgage market: mortgages originated in the United States have different features and bear substantially higher risks compared to those in a number of other countries.

Each country has a utility function assumed to be linearly dependent upon C, competitiveness, plus a quadratic term composed of deviations of domestic financial stability from an assumed target level. The methodology compares the Nash equilibrium for independent regulatory policy choices to a cooperative solution where a common level of regulation, R, is chosen to maximize joint utility in the two countries.

The model can be summarized by three equations for each country:

$$C_i = \alpha\,(R_j - R_j) \tag{6}$$

$$S_i = R_i + \gamma\, R_j - u_i \tag{7}$$

$$U_i = C_i - \beta\,(S_i - S^*)^2 \tag{8}$$

where S^* is some target level of financial stability; financial stability is in addition subject to a (negative) confidence shock u.

5.1 Normal Times: No Cooperation

Maximizing utility independently yields the following equation for regulation in each country:

$$R_i = \frac{1}{1+\gamma}\left(S^* - \frac{\alpha}{\beta}\right) + \frac{1}{1-\gamma^2}\left(u_i - \gamma u_j\right) \tag{9}$$

This model demonstrates that in normal times there is too little regulation by both countries. The reason is that each country does not take into account the welfare impact of its actions on the other country; each tries to get a competitive advantage. This reduces the amount of regulation—the negative term in the first set of brackets. Regulation will be lower by an amount that depends directly on the negative effect of regulation on competitiveness, and inversely on the weight of stability on the objective function and the impact of foreign regulation on domestic stability.

The basic conclusion about under-regulation is supported by the unfolding of the current crisis. It is clear that regulation is an international public good that is under-provided, since some of the benefits and costs spill over to other countries. Since the opening of international financial markets in the 1980s, many countries would seem to prefer to free ride on others' regulations and have less stringent regulation themselves, benefiting from being more internationally competitive. To counteract this tendency, the post-war period also saw an initial drive for international standards beginning with the Basel Capital Accord negotiated in the 1980s to bring more highly leveraged Japanese financial institutions into alignment with the capital ratios in other financial markets.

The European Commission of the European Union implemented its First Banking Coordination Directive in 1977 to remove barriers to trade in financial services and to set minimum European standards. This was supplemented by later modifications to the Banking Directive as well as a host of Directives requiring minimum prudential regulation. Having removed the barriers to trade in financial services, the European Commission viewed it necessary to have minimum standards to prevent a competitive "race to the bottom" in regulation as countries attempted to gain competitive advantages.

5.2 Cooperative Solutions

Countries will realize, usually as a result of some shock, that a cooperative solution is superior to independent policy formulation. In this model the solution is arrived at by choosing R, regulation, to maximize the equally-weighted average of the two countries' utility functions. The cooperative solution results in higher regulation as

the solution is not reduced by each country seeking a competitive advantage from lower regulation relative to the other. It yields the following level of regulation:

$$R = \frac{1}{1+\gamma} S^* + \frac{1}{1+\gamma} \frac{u_1 + u_2}{2} \tag{10}$$

The solution does depend upon the average of the two shocks that affect the two countries. If the two shocks are the same, the cooperative solution unambiguously results in higher levels of welfare for both countries since as noted above the Nash equilibrium clearly involves an under-provision of regulation. In this case there are always gains from coordination. Where the shocks are different things are more complicated, but some interesting results can be obtained.

5.3 Lessons for Globalization: Differing Shocks

Where the two shocks differ the results fall into different buckets. If the shocks are somewhat similar the result that cooperation is beneficial will still hold. If they are very different, for example the shock to one country is large and the shock to the second country is small, there may be no gains from coordinating for the first country as it is not importing the shock from the other country, while there are costs to coordination. There could still be gains for the second country, but an agreement between the two is unlikely.

As globalization proceeds, the coefficient γ would approach unity. This has an impact on the solutions for independent policymaking. In fact, as $\gamma \rightarrow 1$, the first order conditions become indeterminate. The two countries' reaction functions cannot be solved for the level of regulation in each country. Yet there remains a trade-off between competitiveness and stability. In this case, harmonization would be required to prevent a race to the bottom, which is the fear of regulatory competition that was noted above. This situation clearly inspired cooperation in the EU, given the creation of the Single Market for financial services; in the European Union, the regulatory framework for the "global" (that is, EU) market is provided by European law, forcing some harmonization of regulation.

6. The Optimum Club for International Financial Cooperation

The model examined in the previous section looked at the gains from cooperation in a two-country model with conflicting objectives between countries, since each wants to gain competitive advantage. Here we take a different approach to look at the process of reaching solutions when the number of "club" members expands beyond two. International financial organizations such as the BIS, IMF or OECD can be thought of as clubs set up to create a public good to benefit their members to the exclusion of non-members. We consider the difficulties countries may face in trying to forge agreement in as large a grouping as the G20, or indeed in larger groups such as the United Nations. However the analytical challenges begin earlier with smaller groupings of countries. The G20 summits began as the G5 and became the G7 and

then G8. The Group of Ten is another grouping focused on financial matters, and whereas the BCBS is based upon the G10 it has an expanded membership. As noted above, some important financial agreements have been forged between the United Kingdom and the United States and then generalized through the BCBS to a larger grouping of countries. The G20 includes many of the major industrial and developing countries, including the G8 and the major emerging market countries, but they have divergent income levels and degrees of financial development.

While the G7/G8, G10 and G20 may be used for different purposes, and their summit meetings receive particular attention, many commentators have noted that they each confront political issues due to restricted membership. Bayne (2005, 26) points out that "no serious decisions can be taken without involving a wider circle of countries." He also points out that summits with a small number of participants undermine international institutions with larger, and in some cases worldwide, membership. However, there are many issues that need prior resolution among a smaller number of participants, when larger groupings would simply doom any prospects of success.

The politics of these groups is as relevant as the economics. However the economics of cooperation are likely to trump the political desire of reaching a multilateral solution. Fratianni and Pattison (1982, 2001b) examine the market for cooperation, essentially the supply and demand for cooperation as the number of participants changes. This is based on a model by Olson (1973).

This model assumes that the costs of formation of a club, or international organization, are small relative to the potential benefits, which seems to be the case in practice. The operating costs of bodies such as the OECD or BIS are not large. Each potential member, *i*, evaluates the net gain from membership and attempts to maximize it. $B_i = b_i/b_t$ represents each country's share of total club benefits b_t, and similarly for costs $C_i = c_i/c_t$ The costs and benefits are a function of the extent of international cooperative actions Q. Q will vary from organization to organization. For example the European Union offers different types of cooperation from the IMF or OECD. A country needs to make a decision to join a club and therefore attempts to maximize net benefits - the difference between the benefits to country *i* and the costs of the organization, *c,* which are shared.

The optimum amount of cooperation for an individual country is reached where

$$(B_i/C_i)(db_t/dQ) = dc_t/dQ \tag{11}$$

The left hand side of equation (11) represents the marginal benefit from cooperation and the right hand side the marginal cost. In the 1982 paper the marginal benefit was labeled the marginal policy contribution (MPC). The intercept of the MPC schedule depends upon B_i/C_i and the slope is a function of Q, but is expected to fall rapidly. For example in moving from the G5 to the G7 the MPC was small as Canada and Italy were added. However the MPC would be much higher for the addition of

China. The MPC curve will be flatter or even positive the greater the degree of externalities. On the other hand the marginal cost curve, MC is rising steeply as each additional member raises the costs and difficulties of reaching agreements.

Thus there is an important difference between the optimum cooperation for the club or organization as a whole and the decision for individual countries. For an individual country the optimum is reached at a smaller number of participants than for the club as a whole, where the optimum would be reached where marginal costs and benefits were equalized for the entire club. However the marginal calculations for the larger countries would prevent an effective organization becoming that large (assuming that they could veto new members).

This model illustrates several "club like" properties of international organizations that make cooperation more difficult. First, large countries have a strong incentive to set up a club to manage negotiations and to appropriate the benefits with a small number of other large members. Secondly, in an atomistic world of a large number of equally sized countries there would be little economic incentive to set up cooperative structures. As Olson put it (1973, 24), "But what matters most is *not* how much of the collective good will be provided if some is provided, but rather whether *any* of the collective good will be provided." Third, for smaller countries there is tendency to free ride, since the interests of the larger countries are already taken care of; the smaller ones need not make a contribution as their input is of little interest to the larger countries.

There is another observation that can be derived from the shape of the marginal cost curve. Note that it is to be expected that the marginal costs of reaching agreement will rise dramatically as countries are added. These are not only logistical and organizational costs but the negotiating costs of reaching a bargain across a larger number of disparate countries. These costs range from translation costs, problems of comprehension of common issues, as well as monitoring and enforcement over a large number of countries. Also each additional country brings new issues to resolve that may conflict with the interests of coalitions of other members, and brings complex domestic political needs which must be squared with international negotiations (see Frey, 1984). As noted above if countries cannot be excluded from the benefits of club actions, there is a strong incentive for smaller countries to become free riders. Thus the most likely clubs to be established will have a small number of members where agreement on important issues can more easily be reached. Fratianni and Pattison examine the equilibrium conditions and also the impact of alternative decision rules on the optimum size of clubs. As decision rules change from majority voting, to qualified majority, and to unanimity, the equilibrium outputs diminish in quantity. Club outputs could be international agreements, minimum regulatory rules and similar decisions. With a unanimity rule fewer of these would be reached compared to a majority vote. They also examine (2001b) how this model is consistent with the growth of regional integration since regional groups allow countries to replicate the benefits of clubs for smaller countries that could not be achieved through larger multilateral organizations.

This model illustrates many of the aspects of postwar cooperation, ranging from the success at Bretton Woods because the war kept many likely members from participating, through the creation of a global economy with a larger number of large and growing participants that erode the oligopoly position of the original large countries that set up the governance framework of the postwar world. Thus cooperation becomes less and less likely. This model requires one or more large countries to forge ahead with international cooperation. But the risks of an atomistic world were noted earlier. Fratianni-Pattison assert that cooperation requires an oligopoly. Ferguson (2004, 32-34) states that power is not a natural monopoly, and raises the question: "What if the world is actually heading for a period where there is no hegemon? What if, instead of a balance of power, there is an absence of power?" The structure of the international community in terms of number of significant players and the changing "market shares" of these do make cooperation less likely. Similar to Fratianni-Pattison (2001b) he notes how regionalism is one possible outcome, but for the larger powers, "one can imagine the world's established powers – the United States, Europe, China – retreating into their own regional spheres of influence" (Ferguson, 2004, 38). The difference is that Fratianni-Pattison model countries have an economic incentive to recreate regional oligopoly power that allows clubs to be created that cannot be achieved at the multilateral level.

One of the unique features of the politics of this crisis is how the Group of 20 has been mobilized to replace the G7/G8. Yet some of the new members have exchange control, poor regulation, or a history of financial difficulties. Thus the incremental contribution of many of these additional countries may be small[2] whereas the political and negotiating tasks of reaching an agreement expand geometrically. In practice, incremental members are not equal. For example, China, Saudi Arabia and a number of other countries bring important benefits to the expansion of the G7/G8 that a Venezuela or Argentina does not. Yet all of these countries bring different economic models, different political agendas and negotiating requirements. Even within the G7/G8 and within the European Union there are fundamental differences of views on financial issues, for example French and German opposition to the Anglo-Saxon framework for financial markets. This model also shows that the MPC curve becomes flatter or even could be positive if externalities are large enough. However they would still need to confront the sharply rising Marginal Cost curve. Nevertheless, the externalities from this crisis were large enough to provide an incentive towards a larger base of cooperating countries because of the severe spillovers.

The solution to this problem within international organizations has been found in coalition building and in having flexible international solutions that can accommodate many different countries. Thus the original Basel Capital Accord was reached in a bilateral bargain between the United States and the United Kingdom,

[2] Except, as noted above, for the contributions to international organizations and potentially for achieving global reflation.

and then offered to Japan. Once this agreement was achieved it was agreed by the BCBS. Pattison (2006) provides an analysis and extension to the Basel 2 agreement. In both cases the regulatory models were extended to approximately 100 countries. Even here the dynamics were such that agreement of the smaller countries was motivated by a strong economic incentive for them to comply with international standards in order to gain access to international financial markets. Thus there can be other mechanisms that drive agreements to a larger number of participants.

7. Conclusions and Observations on the Current Crisis

In sum, prospects for international regulatory reform are subject to numerous opposing forces. These opposing forces include trade-offs domestically and internationally among the objectives of financial policy, namely international competition between financial centres and financial stability. Uncertainty may play a further important role in stimulating an appetite for international coordination, on the maxim "if we don't hang together we will all hang separately." However, we have also examined an opposing force related to the size of groupings of countries attempting to reach agreement, such that the likelihood of reaching collective agreements declines with the number of countries involved.

The magnitude and severity of the crisis have galvanized leaders into action, and have raised the stakes on doing nothing. This may overcome the reluctance of governments hosting the major financial centres (and offshore centres) to give up the competitive advantages they enjoy. But in part because of the evident mistakes made by US and European financial regulators, the process of negotiation has moved to a wider set of countries than just the G7 or G10, which have lost legitimacy. The size of the G20 has, however, lowered the chances of agreement on major reforms. Furthermore, because of the complexity of the issues and the fact that reforms need to be tailored to individual country circumstances, agreement on reform is unlikely to happen quickly (if at all). It could thus be that before agreement is reached, resumption of growth will have dissipated the urgency countries now feel to agree on fundamental reforms. Also, it is almost assured that an international agreement at the G20 level would not be adhered to by all of the member countries. It is possible that adherence would be limited to a core group of larger countries that had similar economic systems and a larger economic stake in the outcome agreed by the G20.

This crisis has illustrated that when countries face a common shock to confidence, the welfare gains from harmonization become larger, and it is more likely that countries would agree to cooperate to reinforce the regulatory framework. Thus, the current crisis may provide powerful incentives to coordinate, if countries can reach agreement on the details. However it is one thing to convene a conference and formulate multilateral standards and agreements. It is another to have national legislatures, government and regulatory bodies embody the international agreements into domestic laws and to enforce them. Once the crisis is over governments may well no longer possess the political will to finish the job.

Events have already shown that the effective club is likely to be a subset of the G20, not the whole membership. The composition of the key group may shift from issue to issue. Britain, the host for the April G20 summit relegated Australia, Russia and Canada to the second division prior to the meetings, see Parker (2009). This crisis has also illustrated the essential trade-offs in the competitive model whereby the United Kingdom, host to the major European financial centre, clashes with France, Germany and others (see Parker, Tait and Hall, 2009).

We have discussed the role of uncertainty in the cooperation process. The fact that a large international financial cooperation industry was unable to detect leading indicators of the crisis either in domestic terms or its international transmission may argue for enhanced scrutiny and surveillance, but does not augur well for reliance on international organizations to signal imminent systemic financial crises. Given the importance of large countries as in the Fratianni-Pattison model discussed earlier, it is perhaps more surprising that major weaknesses in large countries could not be detected and assimilated into the policy framework. But this can be understood if the largest countries have a veto over the decisions of international organizations. This latter factor illustrates why IMF reform is important. Finally, even with appropriate detection, arriving at the appropriate policy response domestically, taking into account international spillovers, is not easily achieved. Thus, the prospect for effective cooperation is not encouraging, even in the short run of the crisis period itself.

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