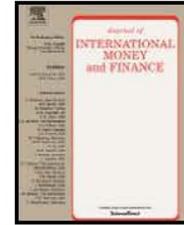




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International coordination of central bank policy



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ABSTRACT

This paper surveys the current state of the literature on international monetary policy coordination. It relates recent policy discussions to the lessons from the literature. It proposes several avenues for future research.

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1. Introduction

In recent years, there has been increasing interest in international monetary policy cooperation, and, in general, coordination of central bank policies. In September 2010, Guido Mantega, the Brazilian finance minister, commented that “we are in the middle of a currency war”,¹ referring to the depreciation of the major currencies against those of Brazil and other emerging markets. As Fig. 1 shows, the trade-weighted dollar depreciated more than 15% from early 2009 until September 2010. Subsequently, the dollar began to appreciate, which brought further protests from policymakers in emerging markets. In April 2014, Raghuram Rajan, the governor of the Reserve Bank of India, complained about the “initiation of unconventional policy as well as an exit whose pace is driven solely by conditions in the source country,” specifically aiming his remarks at monetary policy in the U.S. and other industrial countries that “hold interest rates near zero for long, as well as balance sheet policies such as quantitative easing or exchange intervention, that involve altering central bank balance sheets in order to affect certain market prices.”² Olivier Blanchard, Jonathan Ostry and Atish Ghosh of the

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¹ See [Financial Times](#), 2010.

² See [Rajan](#), 2014.

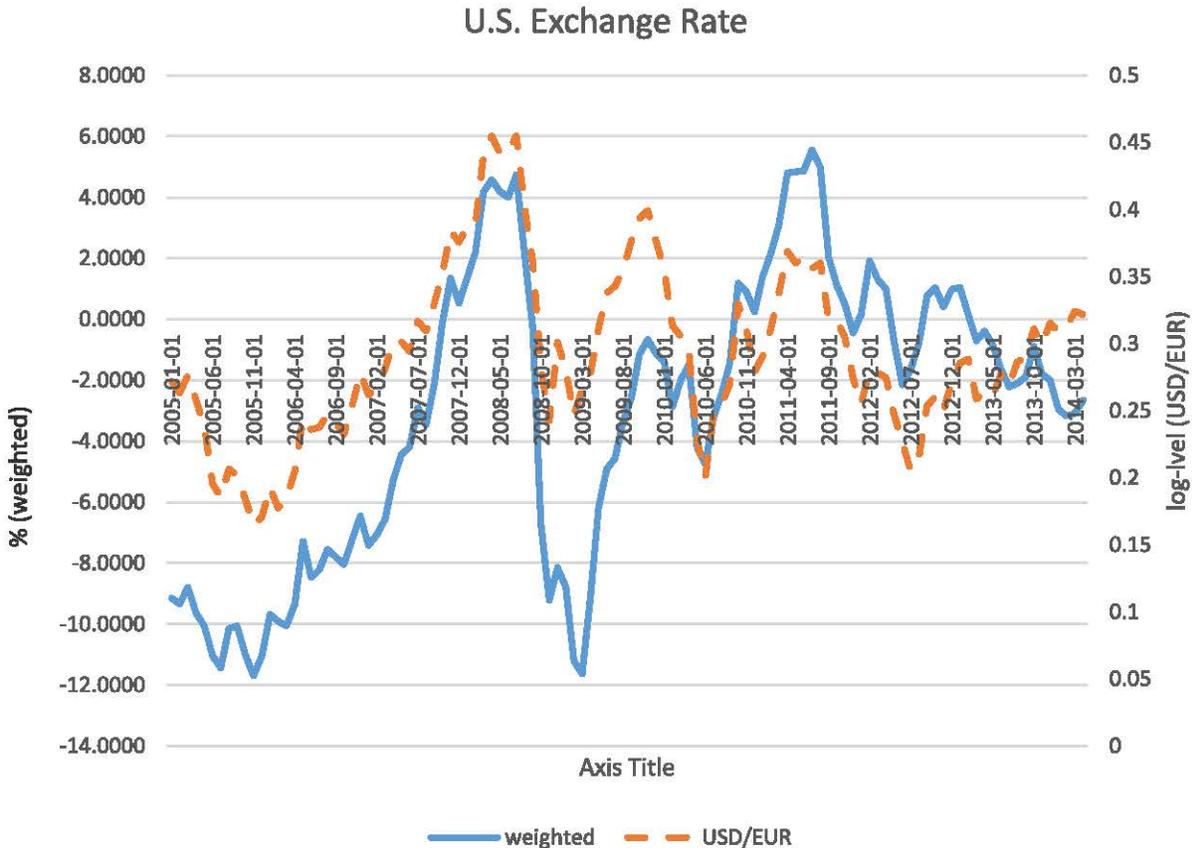


Fig. 1. The vertical axis on the left side measures the trade-weighted dollar index in percentage terms. The vertical axis on the right side measures the log of the dollar/euro exchange rate. Both exchange rates are expressed in dollars per foreign currency, so an increase represents a depreciation of the dollar.

International Monetary Fund comment “if large players in the global economy are responsible for significant adverse spillovers across a swath of smaller countries, this needs to be acknowledged as well, and feasible remedies considered.”³

Even with this increasing concern about the spillovers from monetary policy, little new research has emerged on this topic. This essay’s primary goal is to provide suggestions for directions for future research on this important topic. A secondary goal is to point out the disconnect between the recent policy discussion and what the existing academic literature tells us.

Clearly much of the recent concern about the need for monetary policy coordination stems from the recent behavior of the dollar. Fig. 1 plots the dollar exchange rate relative to the euro and a trade-weighted basket. Much of the initial concern about the external effects of U.S. monetary policy stems from the large depreciation of the dollar index from early 2009 until late 2010. Much of the commentary has attributed this depreciation to the aggressively expansionary policy of the Federal Reserve.

However, it is informative to consider this depreciation in light of the dollar fluctuations before and during the global financial crisis. The depreciation of the dollar in 2009–2010 in effect exactly reversed the dollar appreciation that began in August 2008. By September 2010, the effective dollar exchange rate was at approximately the same point as in August 2008. On the other hand, the 2009–2010 dollar depreciation mirrors the sustained dollar depreciation from late 2005 to early 2008. The relevant question is whether the fluctuations of the dollar can be laid entirely at the doorstep of monetary policy in 2005–2008 and 2009–2010, or whether other forces were at work.

³ Blanchard, Ostry and Ghosh (2013).

The dollar/euro exchange rate has not followed exactly the pattern of the dollar index. Like the dollar index, there was a depreciation of the dollar relative to the euro from 2005 to 2008, an appreciation during the height of the global financial crisis, and then a subsequent depreciation. However, the depreciation of the dollar relative to the euro came to a halt in late 2009, and the dollar appreciated from 2009 until the end of 2010, before beginning to depreciate again. The subsequent dollar appreciation beginning in 2011 is usually attributed to the European debt crisis.

While monetary policy in the U.S. clearly has a very important role in driving the exchange rate (and euro area monetary policy is an important determinant of the dollar/euro rate as well), there are circumstances that drive monetary policy. The 2005–2008 and 2009–2010 periods are often described as times when investors' "search for yield" drove them to move their capital overseas, much of it to emerging markets, in order to generate a higher return. The period of dollar appreciation during the global financial crisis as well as during the European debt crisis is often called a flight to safety, where the dollar is considered a "safe haven."

What does it mean for the dollar to be a safe haven, and why does this lead to a dollar appreciation? It is not plausible that the phrase refers to a case in which U.S. real assets – equities, property, etc. – are perceived to be less volatile than similar foreign assets. Most likely such a change in risk would lead to an increase in the value of those assets, but not necessarily an increase in the value of the dollar. That is, the price of U.S. stocks would rise, but that would not require a dollar appreciation – their price would rise in dollar terms if there is a flight to safety by both U.S. and foreign investors. There is no reason for the dollar to appreciate unless the U.S. stocks provide more of a safe haven to foreign investors than to U.S. investors. If the exchange rate stays constant, the increase in the price is the same for U.S. investors that value returns in dollars and foreign investors that value return in foreign currency.

The term does not seem applicable to foreign exchange risk, either. If foreign exchange risk increased, the incentive increases for U.S. investors to reduce their foreign exposure, but at the same time, foreign investors would want to reduce their U.S. exposure. That is, for a foreign investor concerned about foreign exchange risk, the U.S. dollar is not a safe haven – the investor's own currency is devoid of foreign exchange risk.

During the height of the global financial crisis in late 2008, banks in the U.S. and throughout the world found themselves in need of dollars. The traditional source of very short term funding for banks, the repo market, dried up as banks no longer accepted assets as collateral that had previously been considered admissible. Banks and other financial institutions clamored for dollar assets to balance their short-term funding that came in the form of dollar loans. It was most likely this need for dollar liquidity that led to the "safe haven" appreciation of the dollar. During times of illiquidity, investors are willing to accept a lower yield on dollar assets because they provide a liquidity return. When interest rates are set by central banks, or are at the zero lower bound, this lower yield is reflected in an expectation of a dollar depreciation. That is, the demand for liquid dollar assets leads to an immediate dollar appreciation. Investors that hold these dollar assets are willing to accept the inevitable dollar depreciation that will occur as the liquidity crisis passes because they value the dollar for its liquidity services.⁴

The flip side of times of safe haven is a time where there is search for yield. The term "search for yield" at first glance seems silly. Are there times when investors do not want yield? Or does this mean that there are times when investors would like to take on more risk so they can achieve higher yield? I believe the answer is that when there is no great need for low-yielding dollar assets that can be used as collateral, investors do not value liquidity services as highly. They would like instead to get higher yield. They forego short-term dollar assets and Treasury bills, which has the opposite effect on the value of dollar that the safe haven effect has.

My point is that much of the fluctuation of the dollar between 2005 and the present is not directly attributable to monetary policy, but instead to the market's demand for dollars as an asset that provides a liquidity yield. It is surely true that the expansionary policy pursued by the Fed during and after

⁴ See [Bianchi and Engel \(2015\)](#) for a model and exposition.

the crisis helped to ease the liquidity crunch and made it safe for investors to search for yield. This does not absolve the Fed from any responsibility for the international spillovers from its policies, but it does suggest that the spillover effects be considered in light of the shocks that led to their policy actions. We need to consider the source of the shocks to understand how another course of action by the Fed may have influenced the global economy, and to understand better the consequences of policy cooperation. The aim of this piece is not to answer these questions, rather merely to pose them.

These safe haven and search for yield effects bear directly on the recent policy concerns of Mantega, Rajan and the IMF. During times of search for yield, emerging markets must deal with surges of capital flows into their markets. Those flows are quickly reversed during safe haven times. It is not the monetary policy itself that leads to these flows, nor are they directly the result of U.S. monetary policy. If Federal Reserve policy could be designed in order to eliminate these effects, that might stem these capital flows in both directions, but it is not clear that such policies would be optimal from either the standpoint of the U.S. or the emerging markets. These are concerns that research needs to address.

My remaining remarks are divided into two sections. Most of my focus is on directions for research: What shocks should we be looking at? What are the distortions in the markets and how can policy relieve those distortions? What are the incentives of policymakers? What exactly does “coordination” mean? Does it mean monetary policy determined by a global policymaker, for instance? What is the potential scope of central bank policy cooperation?

The second section of my remarks focuses on how the current state of knowledge may inform the policy debate. One aspect of this discussion focuses on the implicit desire of policymakers to minimize or eliminate spillovers. Rajan (2014) states, “In its strong form, I propose that large country central banks, both in advanced countries and emerging markets, internalize more of the spillovers from their policies in their mandates, and are forced by new conventions on the ‘rules of the game’ to avoid unconventional policies with large adverse spillovers and questionable domestic benefits.” Is it in fact a goal of optimal policy cooperation to internalize more of spillovers?

2. Research on monetary policy coordination

I believe that the New Keynesian approach to monetary policymaking has been successful and influential in how we think about optimal monetary policy. The key contribution of this approach has been to clarify the aims of policy. The approach tries to pinpoint the distortions in markets that lead to a need for monetary policy intervention, and assess the relative importance of different distortions. Ultimately the goal of policy, according to this approach, is to maximize welfare of households. I believe such an approach is likely to be beneficial in thinking about the potential gains from policy cooperation. There is an older literature that postulates ad hoc objectives for policymakers, and assesses the potential gains in that framework. These descriptive objective functions may actually be reasonable descriptions of the goals of actual monetary policymakers. But we can get a deeper understanding of what policy can achieve if we can characterize what the objective function for policymakers should look like if their aim is to maximize welfare. In particular, we are interested here in how optimal policymaking differs when the monetary authority aims only to promote the interests of households in its own country versus policy that is set to optimize global welfare.

While some progress has been made on these questions in the open-economy monetary policy literature, there is much work left to be done. The analysis is undoubtedly difficult, but the reward is a better-informed policy debate.

2.1. Sources of shocks

With a few exceptions, the recent literature has examined economies in which the underlying shocks that drive business cycles are productivity shocks and “cost-push” shocks. This reflects the focus (pre-crisis) of the closed-economy literature, which in turn has reacted to the real business cycle literature in which productivity shocks are given a primary role.

Financial sector shocks have been partly or perhaps primarily responsible for most of the recent (past 30 years) major global macroeconomic events. Here I include the Latin American debt crises and “sudden stops”, the Japanese depression, the Asian financial crisis of 1997–1998, the dot.com bubble,

the global financial crisis and the European debt crisis. Only recently have open economy macroeconomic models of optimal monetary policy begun to include these shocks, and the role of cooperation versus non-cooperation in response to these shocks has been little explored.

Productivity shocks do not have the feel of the type of shock that monetary authorities need to deal with. Optimal policy in these cases is procyclical. The economy does not respond enough to a positive productivity shock, so it needs a boost with expansionary monetary policy. Real world policy situations are ones where monetary policy is countercyclical.

Moreover, when Mantega refers to a currency war, he is alluding to the problem of competitive devaluations. When a country falls into a recession, one way to boost demand is to devalue the currency to encourage foreign demand. This type of policy is “beggar-thy-neighbor” because it switches demand from foreign goods to domestic goods, thus transmitting the recession abroad. However, when shocks are to productivity, non-cooperative monetary policy produces a somewhat different problem. When monetary policy is expansionary, it is insufficiently expansionary under non-cooperation (that is, with standard parameterizations of technology and preferences). Monetary expansion increases the supply of the good to the world, which lowers its price, worsening the country’s terms of trade. When there is insufficient cooperation, the country acts like a monopolist to limit the deterioration in the terms of trade. So, monetary policy is procyclical, but insufficiently procyclical when the policymaker has a strategic interest in the effect of policy on the terms of trade.

Cost-push shocks seem more like a real world shock. They lead to a supply-side recession, and a tradeoff for monetary policymakers concerned with inflation and full employment.

Neither type of shock is exactly analogous to the type of shock that actual policy needs to respond to. In the first place, many recessions seem to be caused by a lack of aggregate demand. It is the policymaker’s desire to boost aggregate demand that leads to competitive depreciations. Second, the shocks themselves are distortionary, unlike a productivity shock. Even if prices were flexible, the outcome would be worse than in the absence of the shock. So a simple New Keynesian model in which the only distortions are price stickiness and monopoly distortions is insufficient. Financial shocks may directly distort the economy, but perhaps monetary policy can mitigate the effects of temporary shocks. Real world recessions, with some exceptions, are ones in which output is below potential and inflation is below target, and the required monetary policy is an expansion. Our models should accord an important role to shocks with these characteristics.

The New Keynesian literature has explored other types of shocks – investment shocks, preference shocks, monetary policy shocks – but these have not been incorporated to a great extent in the literature on policy coordination. A recent exception is [Coenen et al. \(2010\)](#), which compares economic performance under cooperation and under a Nash policy game for several of these sources of economic shocks.

But perhaps we need to consider more unconventional shocks. News can have an effect that looks like an aggregate demand shock. Bad news about future productivity, for example, may depress current demand. [Corsetti et al. \(2011a\)](#) consider how news affects global monetary policy in a framework of optimal cooperation, but do not compare those policies to optimal non-cooperative policies. Pure news “shocks” themselves may not be distortionary, but when there is private information, news can exacerbate the information distortion, as in the models of [Bacchetta and van Wincoop \(2006, 2013\)](#). It may be enlightening to consider monetary policy in such a framework. One particular source of private information is the information that the policymaker itself has about its own intentions. Policymakers may find it difficult to signal their intentions, even with direct announcements, in a non-cooperative world, but that may be a problem that is relieved under cooperation. At least under cooperation, the goals and intentions of each policymaker should be revealed to other policymakers.

Another type of shock that has received recent prominence is the uncertainty shock. Uncertainty shocks can have effects that are very much like aggregate demand shocks. That point has been made in the closed economy by [Basu and Bundick \(2012\)](#) and [Leduc and Liu \(2012\)](#). The effects of uncertainty shocks in emerging economies has been examined by [Carriere-Swallow and Cespedes \(2013\)](#), but to my knowledge, no study has considered optimal monetary policy under cooperation or not in the presence of uncertainty shocks. Indeed, it is possible that monetary policy itself is a source of uncertainty, and perhaps cooperation can reduce that uncertainty.

Some recent literature has examined financial market shocks and international propagation, as well as the role of optimal monetary policy. See, for example, [Dedola and Lombardo \(2012\)](#) and [Kolasa and Lombardo \(2014\)](#). But the literature has not addressed the gains from cooperation when there are financial shocks.

2.2. Distortions

The most basic New Keynesian models have two main sources of distortions – price stickiness and monopolistic distortions. Staggered price setting offers the rationale for stabilizing inflation. When price setting is not synchronized, inflation leads to undesirable misalignment of relative prices. Time-varying monopoly power in goods markets and labor markets can lead to a role for monetary policy to stabilize output. But there may be other distortions that need to be considered for monetary policy.

Some of my own research has focused on the pricing to market distortion. When firms set different prices for the same (or very similar) goods in different locations, the allocation of goods to consumers is inefficient. When prices are sticky in local currencies, monetary policy may want to stabilize exchange rates in response to this distortion. [Devereux and Engel \(2003\)](#), [Corsetti and Pesenti \(2005\)](#), [Engel \(2011\)](#) and [Rodriguez-Lopez \(2011\)](#) all consider the role of pricing to market in monetary models of the open economy.

During the global financial crisis when the dollar appreciated from 2008 to 2009, European firms found that selling in the U.S. became much more profitable. In the analysis of Rodriguez-Lopez, this would lead also to entry of firms into the U.S. market that previously found exporting unprofitable. Why should European firms expand at the expense of U.S. firms when the underlying shock is not related to firm productivity or taste for the firms' products? Such a reallocation of resources is inefficient from a global standpoint, because the European firms gained a cost advantage not because of more efficient production but simply because the dollar strengthened. When the dollar appreciates but the dollar prices of their goods sold in the U.S. adjust slowly and the firms' costs (such as wages) remained fixed in euros, the profit margins of the European firms expand. The academic work on optimal monetary policy cooperation under pricing to market points to this inefficiency as a target of monetary policy. But how does optimal cooperative policy differ from non-cooperative policy? Do individual policymakers have an incentive to target these distortions? In the model of Devereux and Engel, an optimal policy under coordination and one under a Nash non-cooperative game are identical. But that result clearly owes to special assumptions in the Devereux–Engel model such that there is no strategic element in monetary policy decisions.

Much of the literature on optimal policy in open economies has assumed perfect financial markets, in which agents can trade in a complete market of state-contingent claims. Recent literature has examined some aspects of monetary policy under incomplete markets, but usually either by examining monetary policy from a positive rather than normative standpoint or from the standpoint of finding the optimal cooperative policy. This literature includes [Benigno \(2009\)](#), [Corsetti et al. \(2011a, 2011b\)](#), [Bhattarai et al. \(2013\)](#) and [Benigno and Romei \(2014\)](#).

The literature, particularly [Corsetti et al. \(2011b\)](#), makes clear that one goal of monetary policy under cooperation is to mitigate the effects of incomplete asset markets on risk sharing. There are other goals of monetary policy as well, and they may conflict with the risk sharing goal. For example, when one country enjoys productivity growth, monetary policy should aim to expand output in that country relative to the rest of the world. But in the presence of incomplete financial markets, that expansion may also raise consumption relative to other countries, in conflict with the risk-sharing objective.

To what extent does policy differ when there is no cooperation? [Benigno \(2009\)](#) examines the gains from cooperation relative to self-oriented inflation targeting. But the literature has not characterized the goals of a policymaker whose only interest is the welfare of its own households. Do they care about risk sharing? We know from the work of [Benigno and Benigno \(2003\)](#), for example, that there is an incentive to influence the terms of trade in the country's favor, but how is that traded off against other objectives? Does market completeness, or more generally richer asset markets that enhance the opportunity for risk sharing, reduce the benefits of cooperation?

The literature on monetary policy cooperation versus non-cooperation has not yet addressed how various financial market distortions affect policy rules. The literature has certainly explored how

financial market policies such as asset requirements or capital controls might respond in the face of credit constraints, balance sheet constraints, banking distortions or the inability to commit to repayment of debt (that is, the possibility of default). The currency denomination of debt may also play a role in exacerbating or mitigating financial market distortions. But how do these distortions influence the incentive for cooperation in monetary policy? For example, would a mutual monetary expansion that lowers interest rates help ease credit constraints?

An important source of distortion that is highlighted in policy discussions but which has achieved little attention in the academic literature on monetary policy is the role of current account imbalances. In particular, there may be an externality from acquiring too much external debt, as in [Bianchi \(2011\)](#). The externality is a pecuniary one that arises primarily in times of crisis. During those times, each domestic holder of foreign debt may try to reduce their foreign exposure in order to solidify their own balance sheet. But the collective effect of that action is a real depreciation that undercuts the value of collateral for all domestic borrowers. Should monetary policy target current account imbalances? If so, are the incentives of the self-oriented policymaker in conflict with the goal of globally efficient allocation of resources? Each country may try competitively to devalue their currency in order to achieve a stronger net external debt position, which may be counterproductive.

Some recent literature ([Cook and Devereux, 2013](#); [Fujiwara et al., 2009](#)) has examined optimal cooperative monetary policy when interest rates are at the zero lower bound. Again we can ask whether there are gains from cooperation, and how non-cooperative policy would differ.

It seems like some of the concern among policymakers in emerging markets about the depreciation of the currencies of the industrialized world stems from an infant industry or Dutch disease type of distortion. Currencies of these countries may appreciate either from monetary expansion in the industrialized world, or because of a run-up in commodity prices generated by a boom in demand for natural resources. The currency appreciation harms the nascent manufacturing and industrial sector in these economies. If there is genuinely an infant industry distortion, then the emerging market countries may want to use policy to offset the appreciation. Whether this calls for monetary policy cooperation is an open question.

Finally, an issue that has not been addressed at all in the literature but is of great practical importance are distortions that arise from poor policymaking. I have noted that one goal of cooperative policymaking is to share risk. But should households in one country be made to share the negative consequences of poor policy decisions in another country? This issue has been raised prominently regarding the extent to which the European Central Bank should act as lender of last resort to stabilize the banking system or government finances of some Eurozone member countries. On the one hand, no policymaker is perfect, so policy mistakes seem like an appropriate subject of insurance, just as drivers are insured against accidents even when they are at fault. On the other hand, as with any insurance, incentives can be distorted, and policymakers may be tempted not to invest as much effort into optimal policymaking if the risks of bad policies are shared. In any case, it may be politically very difficult to get the citizens of one country to bear any of the burden of bad policy choices in another country.

2.3. *Modeling policymaking*

This last point raises the question of how we model policymaking. The New Keynesian literature assumes policymakers have the ability to commit to policy, and their objective is to maximize the welfare of households.

One consideration is that this approach may credit policymakers with too much omniscience. How is policy affected when there are limits to the monetary authority's knowledge? In particular, what are the implications of this for coordination? Will coordination improve the decision process? If policymakers disagree on the appropriate model, will they converge under cooperation, and if they converge, will it be to a better model than either used previously?

In the international trade literature, policymakers are often characterized as having competing objectives. To some extent they may target welfare of households, but political considerations may come into play. In order to win a majority of votes, or to increase campaign contributions, the policymaker may consider objectives that are not in line with maximizing overall welfare. These considerations

have not been picked up in the optimal monetary policy literature. It is unclear, moreover, how international monetary policy cooperation would influence the tradeoffs. For example, if cooperation helps to make the economy more efficient, the policymaker may have an incentive to free ride on foreign policymakers' credibility so that he can pay more attention to political considerations.

Why can policymakers credibly commit to a set of monetary policy rules? Is the ability to commit enhanced by cooperation? Chari et al. (2013) suggest that it might be. In their scenario, each country's central bank does not have the ability to commit to a monetary policy rule, and so suffer from the well-known inflation bias that arises under lack of commitment. However, when a group of countries come together and can set a monetary policy mutually – especially in a currency union – they achieve some level of commitment because the group as a whole does not have the incentive to respond *ex post* to country-specific shocks that might be overly expansionary if each country sets policy on its own.

A related familiar argument is that a country that lacks the ability to credibly commit to a monetary policy rule can gain commitment by attaching itself to a country with monetary policy credibility. This may come in the form of fixing the exchange rate to the credible country, but perhaps some other form of cooperative arrangement could achieve the same effect.

On the other hand, cooperation could reduce the ability to commit. There could be many competing objectives for monetary policy, but one way that a central bank may establish credibility is to announce a clear objective and then visibly use policy to target that objective. It is better, in this case, to announce a simple inflation target instead of multiple objectives, because it is easier to monitor whether the central bank is using policy to achieve its stated objective. When many countries get together to cooperate on monetary policy, it may be more difficult to announce a clear objective that can be easily verified. Credibility of all may be undermined.

There is a certain degree of disconnect between the meaning of monetary policy cooperation in the academic literature and what it means in practice. In academic research, monetary policy cooperation means that a single policymaker chooses monetary policy for all countries to maximize some weighted average of welfare in all countries. Cooperation means finding the globally optimal set of monetary policy rules. In practice, however, cooperation means that policymakers come to the table and, in effect, make the case for the set of global policies that would most benefit their own constituents. A better description of policy cooperation in practice is that of a bargaining game. The bargaining power of each country in this game then becomes important. One way to interpret the recent policy discussion is that international policy really is implicitly set by such a game. However, the emerging markets may believe they have too little say in this implicit agreement, which is to say they may perceive themselves as having too little weight in the bargaining game.

2.4. *The scope for cooperation*

So far, all of my discussion has centered on monetary policy cooperation. There is a reason why it makes sense to focus on central bank cooperation as opposed other types of economic policy cooperation. Central banks in many countries have been able to achieve a large degree of independence from direct political pressures. It is at least thinkable that monetary policy decision makers could cooperate, because they have the ability to follow through on a policy commitment.

Finance ministers may meet in an international forum and make pronouncements about the goals of fiscal policy, but they have little power to commit to follow through on these plans. Fiscal policymaking in all countries is the outcome of complex and cumbersome political processes. While it may be useful for academic research to characterize optimal fiscal policies, under cooperation or without cooperation, this line of research seems purely academic. At the very least, a useful approach would need to take into account political economy considerations.

However, even monetary policy may need to take into account political consequences when it comes to international cooperation. The legal mandate of the Federal Reserve, for example, is to stabilize domestic inflation and employment. If Congress perceived that international cooperation interferes with that legal mandate, they could interfere with Federal Reserve independence.

In fact, this may not be purely a matter of perception, or misperception. We know that policy coordination will lead to an improvement in world welfare, but this does not guarantee there will be a

Pareto improvement. That is, a global policymaker that maximizes some weighted average of countries' utilities may not follow a plan that delivers greater welfare for every country than would occur under non-cooperation. An interesting line of research would be the optimal design of a cooperative agreement. Is there some way to compensate potential losers, or even those countries that stand to gain less than others? If not, how should the welfare of each country be weighted in an optimal plan?

Moving beyond monetary policy, one important area for cooperation is in macro-prudential policy. This has been addressed recently in Engel (2012) and Jeanne (2014). This is a large topic – too large to address adequately in this space. An example of the problems that might arise in an international context is the incentive that financial institutions may have to shift activity from more highly regulated to less regulated countries. This may occur through an actual shift in economic activity, so more lending occurs in the less-regulated country, or it may happen through balance-sheet gimmicks.

The Basel III agreement introduces a “reciprocity” rule that comes into play when one country imposes higher capital requirements than are required by Basel III. In essence, the financial institution is required to hold a weighted average of the capital required in the countries in which it does business. This does not eliminate the incentive to shift activity, however.

There are two types of spillovers that arise when there is lack of cooperation on policies that regulate financial institutions. If financial regulations are successful in reducing bank failures and other sorts of financial crises, the problem is that a wave of bank failures in a less regulated country can have negative consequences in other countries. Second, as has been implicitly noted, countries with tighter financial regulations may suffer consequences if banks move activity to other countries. Worthy projects in the more highly regulated country may be passed up in favor of less worthy projects that are subject to less regulation.

There are many other areas of central bank policy that are natural targets for cooperation, including policies for bailouts of financial institutions, deposit insurance, banking union, etc. For example, Acharya (2003, 2009), Dell'Ariccia and Marquez (2006), Morrison and White (2009), and Kara (2014) consider the implications for cooperation in banking regulation when there are cross-border spillovers in risk management.

3. What the literature tells us about cooperation

Have the Federal Reserve and other developed countries been engaged in a currency war on emerging markets?

In the first place, as Ostry and Ghosh (2013) note, the direction of spillovers from expansionary monetary policy in the U.S. or other countries is not even clear. In the standard story of competitive devaluations, a monetary expansion in the U.S. can have negative effects on other countries because of dollar depreciation. The depreciation makes U.S. goods cheaper, so consumers and firms may switch demand from foreign goods to the U.S. There is an effect that works in the other direction, however. Expansionary U.S. monetary policy aims to increase output and employment, which will drive up demand by U.S. consumers and firms. That increase in demand falls on both domestic goods and foreign imports, creating a positive spillover.⁵ The size of the two effects will depend in part on the degree of exchange-rate pass-through. When import prices are not much affected by exchange rate changes, the expenditure switching effect will be small, and the aggregate demand effect may dominate.

The discussion in the introductory section above points to another channel for positive correlation between dollar depreciation and output in emerging markets. During times of “search for yield”, when the “safe haven” motive is attenuated, capital flows from the U.S. to emerging markets. The capital inflows into emerging markets work to appreciate their currencies and should have expansionary effects on output. As capital flows into the emerging markets, loans should become cheaper, and equity prices increase, both of which encourage investment. Indeed, I believe this may be the mechanism that concerns Rajan. The problem arises because, first, these inflows may come at the wrong time. Expansion

⁵ Frankel (1988) makes this same point. Interestingly, Franke's paper has a title very similar to that of Ostry and Ghosh.

is not desirable if the economy is near full employment and facing inflationary pressure. Second, these inflows may be short-lived. There may be a mismatch between short-term foreign loans and long-term local investment projects, so when the capital flows back out again, investment projects that have been undertaken may be expensive to complete.

The question is whether these spillovers necessitate policy cooperation. It is a misconception that the aim of policy cooperation should be to minimize or eliminate spillovers. Though the literature on this is far from clear or complete, we can infer that there are plausible reasons why optimal cooperation may not attempt to mitigate spillovers. It is inevitable in a globalized economy, even when markets are efficient, that shocks in one country will have impacts on other countries. For example, the innovation of new ways to mine shale oil in the United States has increased the global supply of oil, benefiting some countries but perhaps harming many oil exporting nations. These “pecuniary externalities” are the normal consequences of market equilibrium and do not represent true externalities that policy needs to address – unless they magnify other existing market distortions.

In the first place, the literature has shown that non-cooperative policy may produce the same degree of spillovers as cooperative policy, and the gains from cooperation may be small. This point is made forcefully by [Obstfeld and Rogoff \(2002\)](#), although there are some qualifications offered by [Benigno and Benigno \(2003\)](#).⁶ Suppose that optimal policy in one country calls for monetary expansion that depreciates the country’s currency. If that does indeed lead to negative spillovers, the foreign country can respond with its own expansionary monetary policy. There is not necessarily a need for cooperation even though there are spillovers. [Benigno and Benigno \(2006\)](#), in a simple model, design a set of monetary policy rules that each country could follow, in which they target domestic objectives, but achieve the goals of optimal monetary cooperation.

Second, it seems plausible that cooperative policy should aim to spread the effects of some types of idiosyncratic shocks, rather than to bottle them up within their country of origin. If there is some sort of distortionary shock that leads to a downturn in one economy, the risk sharing motive would encourage spreading the pain to other countries. In other words, under a cooperative agreement, countries would be willing to accept more spillovers from abroad in return for having other countries share in their downturns.

This risk sharing principle does not fully describe the aims of cooperative policy, of course. In fact, in some cases, it may enhance global efficiency to reduce spillovers. In the case of a negative productivity shock in one country, most of the decline in output should occur in the country that has become less productive if resources are to be allocated efficiently. Even in this case, optimal policy does not eliminate spillovers, because it does not eliminate the motive to share the consumption risk across households in different countries.

The central issue is whether the optimal non-cooperative policy leads to more spillovers than under cooperative policy. Unfortunately, the academic literature has not established a clear answer. There may be gains from cooperation even if cooperation means more spillovers.

Underlying the complaints about unconventional policy is a concern about capital flows. However, the policy discussion on this issue is quite muddled. Some commentators point to the large U.S. current account deficits prior to 2007 as an underlying cause of the global financial crisis. The capital flows from the U.S. to emerging markets after the crisis stabilized have a benign side, from this viewpoint, because they served to reduce the U.S. deficit. If the deficit was a problem, reducing the deficit seems like a solution, not another problem. Emerging market policymakers also lodged complaints when it appeared the Fed was beginning to wind down its quantitative easing policy, and capital began to flow back to the U.S. Perhaps the problem is not the size of the imbalances, but the changes in directions of capital flows. Indeed, [Rajan \(2014\)](#) says, “Recipient countries are not being irrational when they protest both the initiation of unconventional policy as well as an exit whose pace is driven solely by conditions in the source country. Having become more vulnerable because of leverage and crowding, recipient countries may call for an exit whose pace and timing is responsive, at least in part, to the conditions they face.”

⁶ See also [Devereux and Engel \(2003\)](#).

4. Conclusions

It is unfortunate that research has not caught up with policy concerns about spillovers from monetary policy and the gain from monetary policy coordination. Perhaps the lack of activity on the research side arises because it does not seem plausible that central banks would actually undertake cooperation. The Federal Reserve has a domestic mandate to target inflation and employment.

But it is important in an increasingly globalized world to understand how foreign economies influence the domestic economy. An optimal policy aimed at inflation and employment will increasingly need to take into account the impact of events in other countries, including the effects of foreign monetary policy. It may ultimately be the case that greater stability and growth at home depends on international coordination.

At the very least, it is important to know the answers to the questions that have been raised in the recent international discussions. What are we losing by foregoing cooperation? If there was cooperation, what would be different? Would spillovers always be smaller? Or is it inevitable, and even desirable, that the impact of shocks in one country be spread internationally?

With a firmer basis in economic theory, economists could contribute more productively to the policy debate.

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