The Taxation and Regulation of Financial Institutions

Michael Keen

Comments welcome

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Abstract: The crisis has prompted many countries to rethink, and several already to reform, the taxation of financial institutions. The underlying issues, however, have received almost no attention in the public finance literature. This lecture explores the possible purposes and broad design of distinctive tax measures for financial institutions, focusing especially on the potential role of corrective taxation, and—an especially neglected topic—its merits relative to traditional forms of regulation, in addressing the challenges posed by the potential failure of systemically important institutions.

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I. INTRODUCTION

The economic and financial crisis that erupted in 2008 is likely to have two lasting legacies: one is an exacerbation of the increase in public debt, projected to increase by an average of almost 40 points of GDP in advanced economies by 2015; and the other is fundamental reform of policy towards the financial sector. This paper is concerned with a key aspect of the latter (though the former, these days, is never far behind)—the potential role of tax policy in addressing the distinct challenges posed by financial activities.

This has been much to the fore in recent policy debates—most recently in the meeting of G-20 leaders at end-June 2010. It has also been much in our minds at the IMF, having been asked to prepare a report on the issue for that meeting. This paper is not a defense of that report[2] (at least, not consciously), the mandate for which—to review options for the financial sector to make a "fair and substantial contribution" to the costs of public intervention in its support—was in some respects quite narrow. It does though draw on some of the thoughts underlying the analysis and proposals. The purpose, nonetheless, is more general: to reflect on the basic question: what do we want the taxation of the financial sector to look like in the coming years?

This proves to be not only a largely neglected question but also a difficult one. One reason for this is that in this case all three elements of the Musgravian triptych are to the fore:[3] Stabilization, because financial sector failures and crises can so evidently jeopardize macroeconomic performance; allocation, because of the centrality of financial intermediation to the efficient allocation of savings and investment; and distribution, because of the possibility that very large transfers will be needed to avert the wider economic damage than the unmitigated failure of large financial institutions can do. Sadly, Musgravian clarity in cutting through the consequent complexities will not be found in what follows. The best we can hope for is some of the interest and enthusiasm he brought to our discipline.

The next section of the paper reviews what the existing public finance literature has to say on this—which does not take very long. Section III considers the key challenges in the area, and how tax measures might be used to address them. Section IV examines corrective taxation as a response to the challenges posed by systemically important financial institutions more closely, and Section V then compares taxation and regulation as means to this end. Section VI concludes.

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[2] IMF (2010a).

[3] Musgrave (1959).

II. PUBLIC FINANCE WISDOM—THERE ISN'T MUCH

Countries have already taken—and continue to take—quite dramatic initiatives in the taxation[4] of financial institutions; some temporary, others, more interestingly, permanent; some with proceeds earmarked to some fund, others not: Box 1 summarizes the most prominent of measures adopted or officially proposed.[5]

Box 1. New Taxes on Financial Institutions

- In the ***United States***, the Obama administration has proposed a Financial Crisis Responsibility fee. Still under legislative consideration, this was initially envisaged as a charge of 15 basis points on the liabilities of large financial institutions less (for banks) Tier 1 capital and insured deposits. This is calibrated to meet the legislative obligation to recover the remaining costs of the TARP over 2011-2020. (The wider financial reform legislation has at some points included a further charge linked to a resolution fund—as of this writing, it does not).
- The ***United Kingdom*** plans to introduce a permanent bank levy with similar base, to be levied (from 2011) at a rate of 0.07 percent, halved for wholesale borrowing of duration more than one year.
- ***France*** and ***Germany*** have announced their intention to introduce broadly similar charges, with proceeds in the latter case feeding a resolution fund.
- ***Sweden*** has implemented a stability fee on banks' liabilities, the rate to rise to 0.036 percent and the revenue accumulating in a fund intended to amount, after 15 years, to around 2.5 percent of GDP.
- ***France***, and the ***United Kingdom*** have adopted temporary taxes on bonuses in the financial sector, and ***Italy,*** a permanent one.
- The ***European Commission*** has proposed a network of resolution funds, financed by a tax on financial institutions.

One striking aspect of this, and the wider debate (and this is perhaps the main point of this paper) is that it has been almost entirely unguided by the public finance literature on the topic—because there isn't any. We have a well-developed workhorse model of the firm, moderating its investment decisions in light of the tax treatment of its financing decisions, but that firm, happily choosing its capital stock K and producing $F(K)$, is not recognizable as a financial intermediary. Similarly, much of our empirical knowledge is for nonfinancial companies: since financial companies are 'different' in some way we have chosen not to think about very much, much empirical work starts by excluding them from the data set.

[4] The word 'tax' is used throughout the paper to mean any compulsory contribution, avoiding the incomprehensibly delicate shading of 'levy,' 'contribution,' 'fee,' 'assessment,' and 'charge.' Usage of the last of them can be particularly confusing, since capital requirements are sometimes referred to as 'capital charges.'

[5] Appendix 2 of IMF (2010a) provides more detail (other than the U.K. bank tax, which is more recent).

Thus when we came to prepare our report for the G-20, there was almost nothing for us to draw on.

One aspect of this is that whereas public finance economists have made a powerful and largely successful case for tax and pricing measures to play a leading role in dealing with a whole range of externality problems—from climate change to the use of plastic bags—in the financial area the field has been left clear for the regulatory apparatus of various forms of capital requirements. But if the problem is that banks tend to hold less capital than is socially optimal, why not instead give them a tax incentive to hold more? I will return to this issue later—the point for the moment simply being that when one looks around the intellectual battlefield on which the proper policy response to financial sector externalities is being debated, public finance economists, with rare and recent exceptions,[6] have been largely absent without leave.[7]

Instead, public finance economists—in so far as they have focused on financial issues at all—have stressed neutrality as a guiding principle for tax policy, both between the financial sector and the rest of the economy and in choice of financing methods. This does lead to powerful insights.

If one had asked the typical tax economist, even after the onset of the crisis, what were the main tax issues of concern in relation to financial sector, I suspect they would have highlighted two:

- One is the tax incentive at corporate level (and, in some countries, for personal mortgages) to borrow rather than finance by equity. Though there is consensus that this in itself did not trigger the crisis,[8] it is hard to ignore if one believes excess leveraging to have been a key problem. This may be so, it should be stressed, even for financial institutions, despite the direct restrictions on their capital ratios: they commonly maintain some buffer over regulatory requirements, implying scope for taxation to affect decisions at the margin, and the use of hybrid instruments—counting as debt for tax purposes but equity for regulatory ones—suggests a keen eye for tax advantages. (Needless to say, however, we seem to have no empirical knowledge of the extent of any such effects); and

[6] I have in mind Shackelford, Shaviro, and Slemrod (2010); and IMF (2010a).

[7] There is an exception in Sinn (2003, forthcoming), though he does not consider the potential use of tax instruments in dealing with financial failures and crises.

[8] Hemmelgarn and Nicodeme (2010); IMF (2009); Lloyd (2009); and Slemrod (2009) all reach much the same conclusion.

- The other is the imperfect treatment of financial services under the VAT, not least in the EU. While this rapidly becomes a somewhat dry topic, the essence is that the provision of financial services paid for in the form of some margin rather than an explicit fee is commonly taxed only by charging VAT on the inputs used to produce them and not giving any form of refund or credit. This means that business users pay too much tax (in the sense that the normal crediting mechanism of the VAT would wipe out such input VAT, leaving business decisions undistorted) while final consumers pay too little (because the value added by the financial institutions is not taxed). Whether that means the financial sector as a whole is over- or under-taxed, and too large or too small, is theoretically ambiguous. There is debate too as to whether the consumption of financial services should be taxed at all, and if so, whether there is a case for a reduced rate.[9] It is important, nevertheless, that estimates commonly find that moving to a 'proper' VAT would increase revenue.[10] The likely implication, if one accepts as a benchmark a world in which financial services are subject to VAT at the same rate as the generality of goods and services, is that the financial sector is "too large." The importance of this is in suggesting that one does not have to appeal to any externality argument to suggest that measures reducing the size of the financial sector would be appropriate: they might be warranted simply as a response to an existing tax distortion.

These insights coming from a focus on neutrality—the potential importance of addressing debt bias and improving the VAT—are important. Before looking for fancy new tax instruments, including some specifically designed to discourage some types of borrowing, we should look to address existing tax distortions. This crucial point has, unfortunately, had little impact on the policy debate—perhaps because it does not answer politicians' need for something more dramatic. That should not stop us from pressing it. But the deeper intellectual challenges arise in asking the question that the public finance literature has ignored: whether one needs to go further than neutrality and adopt measures specifically targeted at distinct problems posed by the financial sector. That is the focus in the rest of this paper.

III. Financial Failures and Crises: Challenges and Options

A. A Dilemma

The distress and potential failure of a systemically important institution during the crisis faced governments with a dilemma. One option—the Lehman strategy—was to let outright failure occur and live with whatever the consequences might be. The alternative—as with

[9] See for instance Boadway and Keen (2003) and Lockwood (2010).

[10] Genser and Winkler (1997), Huizinga (2002).

AIG and in many other cases—was to use public funds to support it, or at least its creditors, acting as a circuit breaker to limit the damage to the wider economy.[11] The difficulty was that either choice was likely to prove extremely costly.

Take first the costs of intervening to support the financial sector, whether in the form of capital injections, asset purchases or guarantees. As of end-2008, the fiscal costs incurred for direct interventions, net of amounts recovered, averaged about 2.8 percent of GDP in advanced G-20 countries, and substantially more in those most affected by the crisis.[12] These net fiscal costs may indeed ultimately prove very modest, as outlays are recovered from asset sales and from charges for guarantees and the like. The fiscal exposures at the height of the crisis, however, were huge: including guarantees, amounts pledged average about 17 percent of GDP of the same countries. So not too much comfort should be taken if ex post fiscal costs prove negligible: maybe we just got lucky this time around.

Such fiscal costs are of course transfers from the generality of taxpayers to those associated with financial institutions, so are not pure waste: the corresponding output loss would depend on the deadweight and any other costs associated with making them. These, however, may be very large. One reason for this is that the marginal distortionary cost of raising the public funds needed, or borrowing, is likely to be especially high in the crisis times when it is needed. Others, however, are even more fundamental. One is the equity aspect, with strong public resistance to transferring resources to a group that—rightly or wrongly—is seen as having 'caused' the problem and, in any case, so prosperous as not to merit support by common standards of vertical equity. Another, at the heart of much of the current debate, is that bailout is liable to create an expectation of future bailouts that becomes a source of distortion in itself: the 'too-big-to fail' problem that arises when in effect, the expectation of a public subsidy to prevent the unmitigated failure of a systemically important institution enables it borrow at a lower rate, and take riskier positions, than it otherwise would. Which, in turn, makes future bailouts more likely...

And then there are the output losses from the playing out of financial crises. There is little doubt that these can be huge. The size of the contingent liabilities, just mentioned, that governments were willing to take on in the hope of avoiding or limiting them is itself a sign of this. While it is difficult to disentangle cause and effect in the relationship between banking and wider crises, Hoggarth and Saporta (2001) report that banking crises in advanced economies have been associated with cumulative output losses in the order of 15–25 percent of GDP; and IMF (2010a) put the cumulative output loss at, already, around 25 percent of GDP in the recent systemic crises in advanced countries.

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[11] The desire to avoid large output losses may not be the only reason for bailouts: regulatory capture and political influence, though not examined here, can also have a role: see for example Shull (2010).

[12] The figures in this paragraph are from IMF (2010a).

Similar difficulties can arise, of course, in relation to nonfinancial sectors whose health is particularly important to that of the wider economy: automobiles, in some cases, come to mind. What is different about the financial sector is not the nature but the sheer scale and commonality of the dilemma: ultimately, a functioning banking and payments system is fundamental to the working of a modern economy in a sense that automobiles are not. A prime focus of reform must thus be to ease this basic policy dilemma.

B. Policy Options

Governments have a wide range of instruments that can be used to this end. A large program of regulatory reform, involving for instance tougher capital requirements, is indeed under way. There is wide recognition too of the need to improve resolution mechanisms: systems, that is, for winding down failed institutions in a prompt and orderly fashion that limits damage to the wider economy. This means acting faster and differently than in conventional bankruptcy proceedings: acquiring assets and imposing haircuts on creditors over the weekend, for instance, so as to provide at least some confidence and cash to those creditors, and then settling up for the difference later when those assets are finally sold. The question here is whether tax measures may also have a constructive role to play.

C. What Role for Tax Measures?

A natural starting point is with the three potential roles that tax measures are traditionally seen as having.

User fees

These may be appropriate to pay for public services provided to these institutions. The case for this is perhaps clearest in relation to resolution mechanisms. These are costly, not only in the staffing and other needs of whatever authority is entrusted with implementation but in the up-front resources needed for the interventions themselves; a back-up credit facility from government is also likely to be needed. All of this, arguably, should be charged to financial institutions and treated like them as a cost of doing business like any other. This does not mean that the proceeds need to should be paid into some dedicated fund: in terms of direct economic impact, they could just as well go into general revenues.[13] What is important is that the institutions perceive themselves (and are perceived by others) as paying for a service they receive.

Once this is accepted, a host of design issues arise—such as whether the proceeds should feed a dedicated resolution fund or pass to general revenues. These are discussed in IMF (2010a), and will not be pursued here.

[13] There may though be important differences in how these financial arrangements are interpreted: IMF (2010a).

Revenue-raising

Equity concerns have been prominent in the public debate, with a strong sense that the financial sector should not only pay for the direct costs of the support it enjoyed but also perhaps make a contribution to reflect the wider social costs that financial failures and crisis create.[14]

This sense is not always well-articulated. No doubt part has been a desire for retribution that, reprehensible or not, tax policy is not well-suited to deliver: it cannot distinguish those with from those without responsibility for the crisis (whatever that might mean, beyond the criminal); and, even if it could, many of the most important players, personal and corporate, have by now left the scene.[15]

Beyond this, however, is the argument that the financial sector should help pay to clean up the fiscal and other costs of the mess its failings create. Revenue extraction in itself calls for deploying the most efficient tax instrument available, the ideal—leaving aside for the moment corrective motives and pre-existing tax distortions—thus being to tax rents arising in the financial sector. This also answers the incidence question implicit in this fairness form of polluter pays argument: who exactly is 'the financial sector'? It is, in this context, the owners and—given evidence that they have earned substantial rents[16]—the managers of financial institutions.

These considerations suggest some form of tax on the sum of profits and wages in financial institutions: what IMF (2010a) call a 'Financial Activities tax' (FAT). Profits for this purpose would need to be defined somewhat differently than for those of the corporate income tax, the base of which includes a normal return to equity. There are several ways this could be done. One is by allowing a deduction not only for interest but also for a notional return on equity: an Allowance for Corporate Equity (ACE)-type arrangement.[17] Taxing only the super-normal element in remuneration is harder, and more arbitrary methods—taxing only the earnings of some top quantile of employees—would likely be needed.

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[14] In thinking about this it should be recognized that the financial sector has been a substantial contributor to tax receipts, paying 20-25 percent of all corporate tax revenue prior to the crisis. This seems to reflect very high profitability, since there are signs that average effective tax rates appear to have been lower than in most sectors (Markle and Shackelford, 2010).

[15] Shackelford, Shaviro and Slemrod (2010) make this point especially powerfully.

[16] Philippon and Reshef (2008) estimate that in the US rents have in recent years accounted for 30–50 percent of the wage differential between the financial sector and the rest of the economy.

[17] There is a case for going further and allowing a deduction for interest too only at a notional rate, so eliminating the tax distinction between debt and equity: see Kleinbard (2007).

But a case can be made, also on efficiency grounds, for including all remuneration in the base. The FAT then becomes the combination of a neutral tax on profits and a tax at the same rate on all wages—which is essentially a tax on value added. In this form, the FAT could serve to correct some of the failings of current VATs noted above.

And the potential revenue yield is significant: the base of a FAT including only higher levels of remuneration might average about 2 percent of GDP in the OECD countries, and that of one including it all ('FAT1') about 4.7 percent.[18] There are of course many detailed design issues to be faced. FAT1 is not quite as clever a fix for the VAT problems noted above as it may seem, since it does not avoid the charging of tax on business use. Not the least of the merits of the idea, however, is that as the taxation of the financial sector comes sharply into focus—and as many countries, facing the severe fiscal problems noted at the outset, intensify their search for reasonably efficient sources of additional revenue—it may reinvigorate languishing efforts, in the EU in particular, to reform the VAT treatment of financial services.

Pigovian taxation

The third potential role for taxation is the Pigovian: to alter prices so as to better align private decision-making with wider economic and social considerations.

In practice, there is substantial overlap between the corrective motive for taxation and the two others just mentioned. In particular:

- Though the motive of corrective taxes is not to raise revenue, the fact is that, unless offsetting measures are taken, that is what they do. When looking for a "fair and substantial contribution"—which presumably means that the tax paid[19] by the financial sector revenue bear some acceptable relation to the costs of failure and crisis, it thus becomes important to ask what relation the revenue from such a tax would bear to those costs. Only if it is less, for instance, would the case for a FAT as an additional source of revenue arise;

- A corrective tax looks very like a user charge when the technical structure of the externality is such that marginal and average damage are the same: for then the revenue raised by the tax exactly covers the damage. Take deposit insurance, for example. The standard rationale for this is a way of preventing bank runs. But it can also be rationalized as a way to correct for the failure that results when bank owners, protected by limited liability and borrowing from retail depositors who ignore this

[18] These figures, from IMF (2010a) are for a range of OECD countries for which suitable data are available.

[19] 'Remitted,' in the sense of Slemrod (2008), may capture the tone of much of the public debate—which is, at best, unclear on the intended incidence—better than does 'paid.'

possibility of bankruptcy, take on excessive risk. Offsetting this requires that the deposit insurance premium raise exactly the amount needed to restore depositors in the event of failure. Whether we call that premium a user charge for the service of deposit insurance service or a corrective tax is then largely semantic;

- A user fee that is not actuarially fair—when payments are not matched by expected benefits to the payer of exactly the same value—will induce changes in behavior intended to alter the balance between payment and benefit. And, if that is the case, the structure of the fee should be designed so that those induced changes in behavior are, if at all possible, intrinsically desirable. This means, for instance, that a charge to finance a resolution mechanism of the type described above might reasonably not only reflect the systemicness of an institution—on the grounds that this shapes the cost of the service—but also seek to reduce it; and

- Where might super-normal earnings in the financial sector, and referred to above as a prime target for revenue-raising, come from? One possibility, especially for systemically important institutions, is that they reflect the expectation of future bailouts. So while there may or may not be an equity case for soaking up some of these returns as tax revenue, there is likely to be a corrective case for taxing them in order to limit the adverse incentive effects of such expectations.

All this makes policy design messier, and almost certainly less coherent, than the traditional classification of motives might suggest. But it is helpful, nevertheless, to ask where a primarily corrective concern might ultimately lead one—and in the process return to some of these complexities.

IV. CORRECTIVE TAXATION

The first step in thinking about corrective taxation is to decide exactly what it is one wants to correct. Since the very existence of the financial sector arises from incomplete markets and imperfect information, financial sector externalities and market failures that might rationalize corrective taxation abound. Some of these externalities may be good—there is substantial evidence that a deep financial system enhances growth.[20] While these clearly need to be borne in mind, the focus of the policy debate has been on the possibility of bad ones.

An exhaustive listing of such externalities and market failures, even if it were possible, would be tedious. Some seem of limited relevance to the recent crisis—this would include, for instance, the main corrective argument put forward for a financial transactions taxes: that

[20] Levine (2005).

excess short-term trading, particularly technical trading, leads to excess volatility.[21] What has been central to the current debate, of course, are those associated with the failure and distress of systemic institutions.

Nor will I attempt here a review of these systemic externalities.[22] Importantly, these operate both across financial institutions and between the financial sector and the rest of the economy. As an example of the former, the sale of assets by one troubled institution can so reduce asset prices as to weaken the solvency of others, for instance—a 'firesale externality' that illustrates how the prevalence of collateral and other constraints (including from regulatory structures themselves) can mean that pecuniary externalities have very real effects in financial markets. The obvious example of the latter—external effects on the real economy—is the tightening of financial conditions facing credit-constrained nonfinancial firms. For each of these externalities, one can conceive of a corrective tax (or subsidy): to protect asset prices in the first case, to support the provision of credit in the latter. And indeed the crisis has seen many policy interventions of this form, even if they are not commonly characterized as Pigovian taxes.

Here though I want to concentrate on the big picture dilemma sketched above.[23] That dilemma, recall, was the choice between, on the one hand, allowing the failure of important institutions to go unmitigated—unleashing what I will call a *failure externality*—and, on the other, as being perceived as willing to protect creditors, to some degree, and so unduly favoring risk-taking and expansion by such firms—which I will call the *bailout externality*. In these circumstances, optimal policy needs to address a weighted sum of these two considerations, the weights depending on how likely bailout is perceived to be.[24] To see what a corrective tax policy might look like, consider each of these externalities in turn, in the context—this being the simplest and most familiar case—of a systemically important bank, though broadly similar considerations will apply to other financial institutions.

Take first the failure externality. The expected cost of this depends on two things: the probability of the institution falling into distress or failure, and the wider economic costs that arise if the consequences of this are unmitigated. Policy can act on both of these:

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[21] Whether taxing transactions would indeed reduce volatility is far from clear: see for instance Matheson (2010).

[22] Excellent accounts are in Bank of England (2009) and Wagner (2010).

[23] The discussion that follows draws on the analysis in Keen (2010).

[24] A prime object of policy may indeed be to change these weights. Addressing this requires investigating the bailout decision itself, which, for brevity, we shall not do here..

- The first component is the more straightforward. One obvious way to reduce the chances of failure is by encouraging higher capital ratios—or, equivalently, given the equity base, by discouraging borrowing.[25] Others include reducing the riskiness of assets held or the maturity mismatch between assets and liabilities;[26] and

- The second component is less well understood. A central issue here is to identify the determinants of the large output losses that, as seen above, are associated with financial crisis. One, no doubt, is the (in)effectiveness of resolution regimes stressed above; improvements in this area are in effect aimed at reducing failure externalities. Beyond this, the extent of loss is likely to be greater for 'more systemic' institutions. Putting actionable flesh on the relevant notion of systemicness is far from easy, however, and remains an active area of enquiry.[27] One aspect often stressed is sheer size. This has the merit—not least for tax purposes—of simplicity, though there are those who doubt if simply splitting institutions to smaller clones really helps. Other attributes, such as interconnectedness or the contribution that the distress of an institution makes to the likely distress of the overall financial system, are more complex. They also depend on an institution's similarities with and linkages to other financial institutions in ways that may be beyond its sole control (and dependent on the decisions of others that it cannot observe)—a more complex setting than is faced in correcting, for example, environmental externalities. Once we have better notions of systemicness, we will, no doubt, have better ideas on how we might tax it.

The bailout externality is somewhat simpler, at least conceptually. To the extent that creditors expect to be bailed out in the event of distress, this will be reflected in the rate at which the bank can borrow from them. Several papers have tried to estimate this, by looking at differences in credit ratings that are provided with and without public support, and at the impact of particular events (such as the EU summit commitment to support large financial institutions). Reviewing and extending these studies, IMF (2010a) estimates that this subsidy has been in the order of 10–50 basis points, averaging around 20 bp.

While these considerations point to a number of attributes that a corrective tax policy might focus on, to fix ideas[28] it is helpful to focus on one of the key dimensions of behavior that

[25] Throughout this discussion it is borrowing from wholesale lenders that is in mind; issues arising from the myopia of retail depositors are assumed to be handled by deposit insurance. The discussion also leaves aside the important question as to precisely how the capital ratio should be defined for these purposes.

[26] Perotti and Suarez (2009) argue for a tax on maturity mismatch.

[27] See for instance Acharya et al (2010); Adrian and Brunnermeier (2009); and, less formally, IMF-FSB-BCBS (2009).

[28] Several papers have argued for the corrective taxation on financial institutions. Perhaps closest to the discussion that follows are the informal arguments of Kocherlakota (2010), Shin (2010), Weder di Mauro

(continued)

they suggest is likely to be distorted as a consequence of the two externalities above. Both suggest that, absent intervention, banks are likely to choose capital ratios that are lower—equivalently, a level of borrowing that is higher—than is socially optimal. In the case of the failure externality, the bank tends to borrow too much, for any given level of equity, because it fails to internalize the wider benefit that a higher capital ratio conveys by making their failure, and hence the realization of aggregate output losses, less likely. In the case of the bailout externality, it tends to borrow too much because the impact of the higher probability of failure is not fully reflected in higher borrowing costs.

The optimal tax on borrowing would equate the private marginal cost of borrowing to the social marginal cost that these two externalities imply. Simple calibrations give a very broad sense of how large these charges might be. For the failure externality, taking an institution whose unmitigated failure would cause an output loss of 2 percent of GDP, for example, the corrective tax associated with the failure externality might plausibly be in the order of 40 basis points. For the bailout externality, the corrective tax will typically exceed the interest subsidy noted above. This is because what matters for the corrective tax is not the average cost of the externality, but the marginal; and the latter will reflect not only the cost of extending the subsidy to another euro of bank borrowing but also the marginal impact of additional borrowing in reducing the benchmark 'no intervention' interest rate relative to which it applies, hence increasing the subsidy.[29] Taking account of both components, it is thus not difficult to arrive at a corrective tax on wholesale borrowing in other order of 50 basis points [30].

These are of course highly speculative and preliminary figures. It is noticeable, however, that one quite readily arrives at rates noticeably higher than those of the bank charges that have been adopted or proposed. The rate initially proposed for the Financial Crisis Responsibility fee in the U.S.,, for example, was 15 basis points; those proposed and adopted in the U.K. and Sweden, for example, will rise to only around 4 basis points. The difference of magnitude no doubt reflects the rather differing motivation of these taxes: the FCR and the Swedish charge, in particular, are aimed primarily at recovering the costs of past and future interventions rather than correcting behavior.

Of interest too, as noted earlier, is how the revenue that such taxes would raise compares with the cost of the externalities to which they are addressed. In a strict sense, of course, the answer is not well-defined, since corrective considerations tie down only the marginal rate of

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(2010) and the more formal treatment in Acharya et al (2010). Somewhat different optimal tax arguments are in Huang and Ratnovski (2009), Jeanne and Korinek (2010) and Korinek (2009).

[29] This reflects an assumption that creditors take no haircut in the event of bailout—which is not a bad approximation for many recent events.

[30] This is not a weighted average of those mentioned in connection with each externality because that for the bailout externality is driven by extraneous estimates not within the model.

tax, not the average rate. In a more pragmatic spirit, however, one can simply imagine the corrective tax to be imposed as a proportional tax on wholesale deposits, so that the average and marginal rate coincide. Two points then emerge.

First, the component of the optimal tax related to the bailout subsidy more than covers the expected cost of bail out. It is thus not equivalent to actuarially fair insurance, raising more revenue than this would imply. The reason is as above: this part of the tax reflects not only the direct increase in the cost of the subsidy as a bank increases its borrowing—expanding the base to which the subsidy is applied—but also the indirect increase through the increase in the effective rate of subsidy as creditors are insulated from the increased likelihood of bailout being needed that it implies.

The part related to the failure externality, on the other hand, seems unlikely to cover the full costs of the associated output loss. This is so even leaving aside the possibility that the output losses are so large that banks could not pay even their expectation and remain solvent (as stressed by Haldane (2009)). It arises because the corrective tax reflects the impact of borrowing on the probability of failure at the margin, not the overall probability; and the most plausible assumptions on the pattern of asset returns suggests that this leads to less than full recovery of the costs. The interest of this is that it suggests that the optimal corrective tax may not be enough to provide what some might think a fair and substantial contribution—creating a role for an additional tax to that end, such as the FAT.

V. TAXATION OR REGULATION?

All this supposes that taxation is the policy instrument chosen to address these externalities. But should it be?

The alternative in the context above would be to impose directly on the institution of concern a requirement that it hold at least some minimum amount of capital. This indeed has been the dominant approach in dealing with financial stability, with risk-adjusted capital requirements a key pillar of the Basel agreements. It is also at the heart of reform strategies towards Basel III, with higher capital requirements, tightening of restrictions on what may be regarded as equity for regulatory purposes, and the adoption of (un-risk adjusted) leverage ratio requirements all in prospect.

In the simplest world, of course—with perfect information, flexibility and certainty—the choice between tax and regulation is of no real consequence. Leaving aside second order conditions and the associated issue of implementability—though this may be important if one sees financial markets as inherently unstable—anything that can be achieved by one can be achieved by the other. But once these conditions fail, as they surely do in practice, the choice between the two instruments becomes a substantive one.

One point before turning to some of the considerations that then arise in comparing the two approaches. Given the dominance of the regulatory approach, and the huge institutional machinery and knowledge that has been built up to implement it, it may seem that, whatever the conceptual merits of corrective taxation may be, there is no realistic prospect of its acquiring a central role in practical policy. But things are not quite so cut and dried. The focus of established regulatory regimes is microprudential—on, that is, the failure of individual institutions. What the crisis has exposed, and reform efforts center on, is the need for effective macroprudential policies—focused on risks to the overall financial system. And in one aspect of this the choice between tax and regulation arises very sharply: in the comparative merits of imposing an additional capital requirement on systemically important institutions[31] or instead subjecting them to some additional tax to discourage unduly low capital ratios. Here policy makers have a cleaner sheet of paper to work on.

Many considerations will shape the proper balance between tax and regulatory measures in this setting. Here are some of them.[32]

Income effects—public and private buffers

In thinking about corrective taxation it is usual to abstract from the income effect of the tax, if need be by adopting the convenient fiction that the revenue raised is returned to the payer as some magical lump sum. One could imagine something similar in the present context, with the income effect of a corrective tax offset—given the difficulty of doing this in truly lump sum fashion—by, say, reducing the corporate tax on financial institutions to which it applies.[33] That though would of course create its own practical difficulties, as indeed would other compensating measures. And public sensitivities may in any event resist compensation, explicit at least.

Supposing then that no such offsetting takes place, taxation will differ fundamentally from capital regulation in its impact on private and public finances. For any given capital ratio supported by policy, taxation (at least of a simple proportional form) will reduce the net surplus of the institution by more than does regulation—which is presumably why the financial sector generally prefers regulation. Conversely, of course, taxation does more to bolster the public finances.

[31] As examined, for instance, in Bank of England (2009) and IMF (2010b).

[32] This discussion also draws on IMF (2010a).

[33] An alternative and perhaps more attractive form of broad offsetting might be by providing some allowance for a notional return on Tier 1 capital, in the spirit of the ACE above.

In this sense, taxation tends to strengthen public 'buffers' to deal with failure and crisis, whereas regulation is more conducive to private buffers. Whether buffers are best placed in the public or private sectors depends, in particular, on the nature of the shocks they are intended to protect against. When shocks are not strongly (or are negatively) correlated across institutions, public buffers can have a useful risk-pooling role: taxation can then in effect economize on the reserves need to deal with institutional failures. This benefit disappears, however, when shocks are strongly positively correlated across institutions. What this suggests, in very broad terms, is that, in this respect, taxation has the advantage in dealing with microprudential risks while regulation, leaving institutions better placed to weather and respond quickly to systemic crises, may enable a more robust response to macroprudential concerns.

Uncertainty

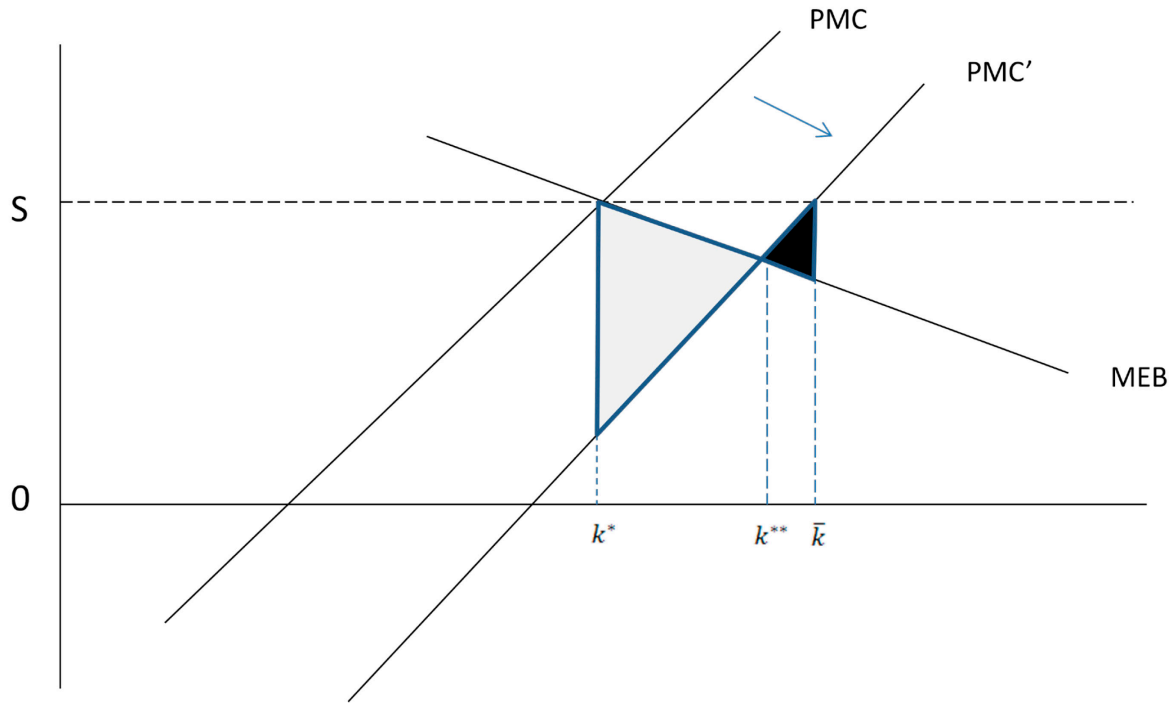
Taxation and regulation will lead to different outcomes when policy has to be set before the environment to which the bank will react is known, and this can lead to a systematic preference for one over the other—a general point stressed by Weitzman (1974).

Figure 1 illustrates what this might mean. Here *PMC* is the private marginal cost of increasing the capital ratio *k*, upward-sloping because the higher is the initial capital ratio the less a further increase does to reduce the chance of failure;[34] *MEB* is the marginal external benefit from doing so, reflecting the failure and bailout externalities above. Ex ante, the optimum at k^* can be implemented either by a subsidy to the capital ratio at the rate *s* (equivalent, for a given level of bank equity, to a tax on either borrowing or loans) or simply by imposing k^* as a minimum capital requirement. Suppose, however, that prospects turn out worse than expected, so that *PMC* shifts down. With the subsidy in place, the bank now moves to the higher capital ratio, at $\bar{k}$. Under regulation, however, it does nothing: even though it is free to increase its capital ratio, it will choose not to, because the private marginal cost of doing so is positive.[35]

[34] Failure is assumed to be some impose some cost—perhaps literal bankruptcy cost, loss of ego-rent or reputation—on bank owners

[35] Unless, of course, the shock is big enough to turn $PMC(k^*)$ negative.

Figure 1



Taxation in this case encourages a degree of prudence that may seem welcome. It is also the case, however, that it leads to an over-shooting of the capital ratio, the new optimum being at k^{**}. In general, neither taxation nor capital regulation achieves full ex post efficiency. What matters in standard welfare terms is which comes closer, as indicated by the relative size of the two triangles of inefficiency shown in the figure: cross-hatched for regulation, red for taxation. As drawn, taxation wins. But this need not be the case.

What matters for the comparison between the two instruments, as Weitzman (1974) elegantly demonstrates, is (for uncorrelated additive shocks to each) whether *PMC* is steeper than *MEB* or vice versa. The determinants of this in terms of the underlying model turn out to be complex. Clearly, if the externalities are small enough, taxation will dominate (the *MEB* curve then being horizontal, at zero); and conversely if they are 'large' enough. The notion of magnitude here, however, is somewhat subtle, since it is the impact not on the level of costs or benefits that matters, but the slope. If the sole concern is the failure externality—as would be the case if the government were credibly committed not to bailout—then it turns out (albeit reflecting the simplicity of the underlying model) that it is sufficient for regulation to be preferred that the external costs of failure exceed the private—which one might plausibly suppose to be the case for the kind of institutions at issue. Matters are more open, it seems, in relation to the bailout externality.

The unresponsiveness of instruments implicit in this comparison is no doubt restrictive. Tax and regulatory instruments could both be conditioned, for instance, on the changing risk outlook. To the extent that this is imperfectly done, however, elements of the argument above will remain.

Asymmetric information

Financial institutions will differ in ways that are relevant to the externalities which policy seeks to address—such as the riskiness of their positions, the quality of their management—but which are better known to themselves than to policy makers. Effective policy design needs to reconcile the benefits of the differential treatment this calls for with the need to achieve overall financial stability objectives.

This likely calls for a more subtle approach than either the linear tax or simple capital requirements assumed so far. Suppose, for example, that banks differ in their unobserved ability to manage risk. Optimal policy in this case might involve a minimum capital requirement, to limit the social risks from less able banks, tempered with the possibility of hold less capital if some additional tax is paid—the tax in effect serving to screen out the more able banks. This is turn could be implemented as a nonlinear tax, with an increasing marginal rate on the bank's borrowing. Importantly, proportional taxation and a single capital requirement in such circumstances will both be very blunt tools.

Institutional issues

Practical considerations loom large in the comparison of the two approaches, and may ultimately be decisive.

The most clear-cut of these arise in relation to international cooperation, some degree of which, given the sophistication and mobility of financial institutions and their operations, is clearly helpful if policy is not to be undermined by arbitrage and avoidance. Here there is much greater precedent and political support for effective coordinated action on financial regulation than on taxation. While there is important international cooperation on tax matters—in the structure of double tax agreements for instance, and to some extent in relation to recent actions on tax havens—there is simply none on fundamental tax policy issues that is comparable to the adoption of Basel by over 100 countries.

Other aspects are more debatable. Regulation may offer more scope for the use of established specialist knowledge and 'soft' supervisory information. Even if that is so, however—and the taxation of complex financial institutions may not be as mechanical and judgment-free as is sometimes supposed—it is not clear that it is necessarily an advantage. Perhaps tax administrators, with their differing priorities and career plans, would be less vulnerable to capture.

VI. CONCLUDING

Much of what is said above is speculative and, no doubt, overly simplistic. That, to a large extent, is the point.

The rethinking of policies towards the financial sector prompted by the crisis raises public finance issues, centered around the relative merits of taxation and regulation, that have barely been recognized, let alone addressed. The purpose here has certainly not been to suggest that the regulatory apparatus be thrown away and replaced by tax measures. Far from it. There are very good reasons indeed not to do so, not only practical—international cooperation is likely easiest to achieve with this approach, for example—but also conceptual, for example in protecting against the most catastrophic outcomes. But taxation may have a useful adjunct role, for instance in addressing both efficiency and equity concerns raised by any perception that creditors will be bailed out in the event of an institution's failure, and/or in honing policy to deal with asymmetries of information. The mantra of neutrality that has underpinned such thought as has been given to financial sector taxation remains important, since current tax systems deviate from this in ways that run counter to financial stability—notably in the pervasive biases toward the use of debt finance. Beyond that, however, the possibility of a constructive role for a distinct tax treatment of the financial sector, as a supplement to regulation, needs to be considered more seriously than it usually has been. Not the least of the reasons for this is that politicians are already acting.

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