

## TAXATION AND THE FINANCIAL SECTOR

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*In the aftermath of the recent financial crisis, a variety of taxes on financial institutions have been proposed or enacted. The justifications for these taxes range from punishing those deemed to have caused or unduly profited from the crisis, to addressing the budgetary costs of the crisis, to better aligning banks' and bank executives' incentives in light of the broader social costs and benefits of their actions. Although there is a long-standing literature on corrective, or Pigouvian, taxation, most of it has been applied to environmental externalities, and the externalities that arise from the actions of financial institutions are structurally different. This paper reviews the justifications for special taxes on financial institutions, and addresses what kinds of taxes are most likely to achieve the various stated objectives, which often are in conflict. It then critically assesses the principal taxes that have been proposed or enacted to date: financial transactions taxes, bonus taxes, and taxes on firms in the financial sector based on size, bank liabilities, or excess profits.*

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### I. INTRODUCTION

**A** looming global catastrophe ... daunting problems in measuring the marginal social damage caused by significant economic activities ... international cooperation undermined by divergent national interests ... concerns that tax-based solutions will undermine economic growth ... accusations of self-serving experts misrepresenting, or even doctoring, the evidence ...

But enough about global warming. Although the topic of this paper is the role of taxation in restructuring the financial sector, many of the same issues arise (with the possible exception of the last). Moreover, a long tradition of examining tax instruments for addressing pollution externalities, as a substitute for or supplement to regulation,

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can be brought to bear in assessing how taxation of the financial sector should respond to the dangerous spillover effects that, as the recent financial crisis made all too clear, can result from failure by particular firms. Until recently, however, academics and policymakers have given far less attention to the possible role of tax instruments in the financial than the environmental realm, reflecting direct regulation's predominant role in addressing financial sector issues. Indeed, the public economics literature's engagement with this sector, whether one looks for theoretical modeling or detailed empirical study, is startlingly sparse.

Tax policy has already reacted to the financial crisis in several disparate ways. A number of countries enacted stimulus packages that included tax cuts. In some countries, these were coupled with tax rate increases, designed to address already-large fiscal imbalances that the financial crisis had only made worse.<sup>1</sup> The United Kingdom enacted a one-time 50 percent tax on bankers' bonuses, rationalized partly on the ground that it would induce banks to build up capital rather than paying excessive compensation to insiders. There also have been a number of significant proposals. For example, in the United States, the Obama Administration has proposed a bank fee on non-depository liabilities in excess of \$10 billion, characterized as a way to help cover the direct fiscal cost of the TARP bailout. The Group of 20 Finance Ministers and Central Bank Governors (the G-20) asked the International Monetary Fund (the IMF) to issue a report on, "... the range of options countries have adopted or are considering as to how the financial sector could make a fair and substantial contribution toward paying for any burden associated with government interventions to repair the banking system."<sup>2</sup>

In this paper, we examine the role of taxation in the financial sector. We first look backward, at the role of the tax system in bringing about the last financial crisis, and at proposals to penalize institutions or individuals who may have contributed to the crisis. Then we look forward to the tax system's potential role in a restructured financial system. Here, going beyond the focus of the Obama Administration and the G-20 on simply paying for the specific cost of past or potential future bailouts, we examine what might be the features of an optimal Pigouvian corrective tax system that addresses market failures giving rise to externalities. Relatedly, we address the possible tradeoffs between pure Pigouvian taxation and seeking revenue from the financial sector, such as to endow a resolution fund to be used in future crises. Along the way, we discuss the crucial differences between the well-studied case of pollution externalities and the much less-studied application of corrective externality taxation to the financial sector. We close by briefly examining several alternative tax proposals that have recently been enacted or proposed. An appendix to the paper discusses an accounting legacy of the crisis that may affect financial firms' propensity to repeat the risk-seeking behavior that gave rise to the crisis in the first place.

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<sup>1</sup> Hemmelgarn and Nicodème (2010) list the EU-27 countries' tax cut and tax increase measures.

<sup>2</sup> *Leaders' Statement: The Pittsburgh Summit*, 2009, "Strengthening the International Financial Regulatory System," Item 16, <http://www.pittsburghsummit.gov/mediacenter/129639.htm>. See an interim report at the International Monetary Fund (2010).

## II. LOOKING BACKWARD

### A. Did Income Tax Systems Help Cause the Last Crisis?

As Acharya and Richardson (2009, p. 195) note, “[t]here is almost universal agreement that the fundamental cause of the [2008–2009 financial] crisis was a combination of a credit boom and a housing bubble.” During the boom-and-bubble period, numerous financial firms placed huge, highly leveraged bets against a sector-wide decline in housing prices.<sup>3</sup> This left them facing potential or actual insolvency when housing prices collapsed, with effects that were transmitted to the broader world economy by mechanisms that we discuss below.

In assessing why the boom and bubble occurred and why financial firms made such risky bets, most observers have agreed — though with a few dissenting voices — that income tax systems<sup>4</sup> were not a major proximate cause (Hemmelgarn and Nicodème, 2010; International Monetary Fund, 2009; Lloyd, 2009; Shaviro, 2009a; Slemrod, 2009). Instead, more promising lead suspects include the following: (1) mortgage originators who had no stake in the borrowers’ ability to pay, (2) borrowers who accepted easy credit, such as through back-loaded subprime mortgages that financed home purchases that they could not afford, (3) opaquely structured securitization that neither sellers, buyers, nor rating agencies fully understood, (4) the rating agencies’ eagerness to make money by offering AAA ratings to risky issuances by paying clients, (5) the existence of “heads we win, tails you lose” incentive structures for financial firms and their managers, (6) capital-adequacy regulations that were riddled with loopholes that financial firms increasingly learned to exploit, (7) financial institutions’ use of derivative financial instruments to ramp up and concentrate, rather than offload and diversify, their downside risk exposure, and (8) failed risk management models that underweighted the possibility and impact of a national decline in U.S. real estate prices.

The general consensus that taxation did not play a primary role in causing the crisis exists even though, in many respects, “... the tax system’s ‘fingerprints’ [were] all over the ‘crime scene’” (Shaviro, 2009a, p. 3). For example, in many countries, albeit in varying degree, income tax rules may have encouraged both excessive corporate leverage and highly leveraged home ownership. Income taxes may also have contributed to pervasive governance problems in publicly traded companies, and to the proliferation of non-transparent financial instruments that played a key role in prompting the crisis.

A key reason for not discerning greater income tax causation of the crisis is that these flaws generally have existed for decades, and the timing of the crisis cannot be linked to any notable expansion of them. Hence, there not only is no “smoking gun,” but also

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<sup>3</sup> As the recent federal civil case against Goldman Sachs highlights, others placed large bets on such a decline.

<sup>4</sup> We focus on income taxation, but note that financial institutions pose challenging problems for a value-added tax (VAT) as well, such that they invariably receive special treatment that is generally preferential and always non-neutral. Whether these distortions also pushed in the wrong direction, with respect to making a financial crisis more likely, has not been explored.

little broader reason to believe that income taxation's causal role went beyond pushing in the wrong direction by generally exacerbating biases that existed in any event. This observation does not, however, rule out the possibility that the tax biases served, in effect, as extra gasoline intensifying the explosion once other causes lit the match. For example, declining real estate prices would not have created such widespread mortgage default risk had not loan-to-value ratios been so high (often reflecting tax incentives for leverage).

Whether taxation's background role in intensifying the financial crisis was great or small, however, its already well-known flaws take on new importance if they affirmatively point in the wrong direction, rather than merely departing from the usual tax policy prescription of neutrality. Corporate debt bias, for example, though typically criticized for inducing increased bankruptcy costs or distorting firms' responses to asymmetric information problems (Shaviro, 2009b), may be worse than was previously thought if publicly traded firms would be prone to adopting excessive leverage, from a social standpoint, even in the absence of tax considerations. Moreover, the widespread bias in favor of owner-occupied housing (often with additional incentives for leverage) looks even worse from the perspective of 2010 and afterwards than it did before. Risk externalization may also have been effectively encouraged by an incoherent system of taxing capital income that creates tax arbitrage opportunities, often exacerbated by derivatives, while regulatory responses may have been undermined by tax regimes that draw strong distinctions between financial institutions that are classified either as banks, insurance companies, or dealers even when they perform overlapping functions (Kleinbard, 2003).

As we discuss below, a number of potentially complicated and ambitious new taxes on the financial sector are currently being discussed. While the recent financial crisis shows how important it is to consider whether such instruments might help to improve incentives, reform efforts should not unduly focus on the exotic and new at the expense of the familiar and old. Addressing undesirable incentives within the existing income tax may be as or more important as creating new tax instruments.

## **B. Should Those Responsible Pay Up?**

We turn now from the relatively abstract question of how structural aspects of countries' income tax rules may have contributed to the financial crisis, to the very tangible and emotionally salient question of whether particular ongoing business enterprises, or even flesh-and-blood individuals, should be blamed and punished for what happened during the crisis or how they unduly profited in the run-up to the crisis. Sentiments of blame, retribution, or the assignment of responsibility for past harm are widespread in the current political environment, and have been expressed by leaders and experts — not just, say, in the popular press.

Thus, President Obama, in announcing his Administration's bank fee proposal, emphasized his "... commitment is to recover every single dime the American people are owed," and said his "... determination to achieve this goal is only heightened when

I see reports of massive profits and obscene bonuses at the very firms who owe their continued existence to the American people...” (Office of the Press Secretary, 2010). Likewise, Columbia University’s Jeffrey Sachs, in expressing his support for a financial transactions tax, told a U.K. audience that the so-called “Robin Hood” tax would properly burden a financial sector that was “under-taxed,” “out of control,” and enjoying huge profits at the expense of the general public. As things stood, he argued, “[b]ankers are brazenly smirking as they pocket large amounts of our money” (Elliott, L., 2010).

A number of different motives may underlie seeking to punish (or at least to scale back the rewards enjoyed by) those who are considered responsible for the financial crisis. Retribution, or at least making wrongdoers pay for the harm they caused, may be considered good in itself. Or it may be thought to provide an instructive lesson that might help to restrain similar misbehavior in the future. Finally, widespread public perceptions that banks and bankers have unduly guided and profited from recovery measures — reflecting that, as Illinois Senator Richard Durbin put it, they “... are still the most powerful lobby on Capitol Hill” and “... frankly own the place” (Yakabuski, 2010) — can harm confidence in public institutions, acceptance of needed policies, and the political careers of incumbents. Addressing such perceptions is therefore potentially a high political priority, arguably for reasons both good and bad.

While some of these issues lie outside our areas of expertise, we offer three comments. First, for individuals whose actions, while working in the financial sector, may have helped cause the crisis, punishment for wrongdoing other than breaking specific laws that were in existence at the time generally is unlikely, given legal bars and social norms against *ex post facto* punishment. This lack of punishment is not entirely to be regretted, given how the political power to impose *ex post facto* punishment could potentially be misused.

Second, using nominally prospective taxes to punish wrongdoing institutions (or rather, the people associated with such institutions) for past acts runs into two distinct types of difficulties under the theory of tax incidence. In illustration, suppose that a bank fee like that proposed by the Obama Administration, or a financial transactions tax like that proposed by Jeffrey Sachs, is enacted, not just to address market actors’ incentives on a forward-looking basis — although, as we will discuss below, this is an important rationale for both proposals — but also in response to banks’ past wrongdoing. In either case, banks would have to remit money to the government that — all else equal — would reduce their profitability, and thus the value of their shares.

Suppose initially that the banks actually bear this tax in the form of reduced profitability (until the banking sector shrinks), rather than being able to pass it on to transactional counterparties such as their customers. This would adversely affect the value of the banks’ shares, imposing a transition loss on their shareholders at the time when the tax was announced (or became more fully anticipated). These, however, may not be the same shareholders as those who benefited from the earlier run-up in stock prices that may have resulted from the banks’ increasing their profits through socially reckless “heads we win, tails you lose” bets or other misconduct.

Alternatively, some or the entire incidence of the new tax might fall on the banks' transactional counterparties after it takes effect. For example, depositors might face higher fees or lower interest returns, or customers of the banks' stock dealer businesses might face higher transaction costs. Even if this was appropriate in terms of properly aligning people's incentives, it would clearly have no retributive rationale. The precise nature of the tax will affect who ends up bearing its burden. For example, a tax levied only on large domestic financial institutions is more likely to be borne by these institutions' shareholders, as this set of institutions will be less likely to successfully recoup the tax liability by raising its prices given that competitors (small domestic and foreign) do not face the same tax.

Third, a tax that, as a political matter, was most easily rationalized or sold on retributive grounds (especially given banks' political power) might independently prove to have desirable features from an efficiency standpoint. Properly aligning incentives is only one example of how this could happen. Purely backward-looking taxes are inherently non-distorting with regard to future decisions,<sup>5</sup> other than to the extent that they influence perceptions of future policy — admittedly, an important potential consideration. Moreover, if it were to turn out that existing financial firms enjoy rents, a tax on those rents is in principle non-distorting (and would be borne by the firms' shareholders, though not necessarily those on hand when any earlier wrongdoing occurred).

### III. LOOKING FORWARD

#### A. Lessons of the Financial Crisis

Whether or not income taxation played a significant role in causing or exacerbating the 2008 financial crisis, new tax instruments might conceivably be part of the regulatory response to lessons learned about how to reduce the chance of future crises. To evaluate this possibility, it is useful to begin by reviewing how the financial sector's economic and regulatory structure may have contributed to events.

As noted above, the financial crisis emerged as a consequence of numerous financial firms' potential or actual solvency when housing prices collapsed at the end of the boom-and-bubble period, leaving these firms with huge losses on their highly leveraged bets against such a decline. In the case of a different set of firms, this might have mattered only to their shareholders, creditors, and employees. However, because of the important role that financial firms play in the United States and world economy, the distress ended up being transmitted far more broadly. Accordingly, an inquiry into the possible tax policy implications of lessons learned requires examining two distinct questions: why the firms made these risky bets (and conceivably might do so again), and why the systemic effects of their losses proved so large and widespread.

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<sup>5</sup> Backward-looking taxes are, however, not the least distortionary way to raise revenue in comparison to an appropriately designed Pigouvian tax.

## B. Incentive Problems in the Financial Sector

Varying explanations have been offered for financial firms' so widely following "nickels in front of a steamroller" strategies, under which one earns extra-normal returns most of the time but occasionally experiences dramatic losses (Duarte, Longstaff and Yu, 2005). For example, some have blamed irrational exuberance and herd behavior, arguably key components of asset price bubbles, as discussed, for example, by Shiller (2005). Whatever role such factors played, however, it is clear that key actors also had economic incentives to behave as they did.

With limited liability at the entity level, shareholders of financial firms could potentially benefit from placing risky bets on the real estate market under which they would capture profits on the upside but escape bearing losses on the downside. For example, A.I.G., by writing tens of billions of dollars worth of insurance against mortgage defaults that would occur in large numbers if and only if housing prices steeply declined, "... guaranteed that the very problem being insured against — a systemic decline — would prevent the underwriters of the insurance from making good when the problem materialized" (Acharya and Richardson, 2009, p. 206). This potentially created expected firm-level profits even if the bets, analyzed properly in light of the tail risk, had a negative expected return. And this is true even without factoring in the chance of some kind of government bailout in the event of a steep housing market decline.

Making things worse, financial firms' managers frequently had economic incentives to follow the "nickels in front of a steamroller" strategy even if the expected return to shareholders was negative. Reflecting the widespread quest for "alpha," the ability to generate extraordinary expected returns, and the rarity of true alpha, firms designed high-powered incentive compensation schemes that in practice rewarded the creation of "fake alpha" — investments that earned apparently extraordinary returns in normal circumstances but that bore substantial tail risk (Rajan, 2008).

Thus, in the period leading up to the financial crisis, "... bankers were increasingly paid through short-term cash bonuses based on volume and on marked-to-market profits, rather than on the long-term profitability of their bets" (Acharya and Richardson, 2009, pp. 206–207). Managers also could anticipate not being held personally liable for the consequences of making bad decisions, so long as one could claim that they reflected a defensible business judgment. These incentives evidently were so compelling that, even as the housing market began to decline in mid-2006, many financial firms kept on placing multi-billion dollar bets on the real estate market that generated millions of dollars in immediate bonuses for the managers who were placing them.

The incentive problems associated with limited liability and high-powered yet overly short-term and otherwise poorly designed executive compensation packages are not, of course, limited to the financial sector. However, three key factors appear to have made the social payoff here especially toxic. First, financial firms may have technological "advantages" over others in placing huge, negative-return bets on which others bear much of the downside. Especially in the modern financial world with its wide range of multi-billion dollar, unregulated derivatives markets, and with the spread of techniques

for evading regulatory oversight, such firms are well-positioned to place huge bets, with only limited capital, that are difficult for others to observe, much less understand and evaluate.

Second, for reasons we discuss below, the downside of insolvency from the realization of tail risk often was not as bad for financial firms and their managers as in other sectors of the economy. Banks with federal deposit insurance, and other financial firms that had implicit insurance from the prospect of being bailed out, if necessary, such as on the ground that they were “too big to fail,” could take undue risks with the knowledge that, if they become insolvent, they might have their capital replenished and be allowed to continue operating.

Third, if proper incentives were fully in place, banks and other financial firms would likely be *more* cautious than other types of firms in accepting tail risk, not less. As we discuss next, their fundamental business model can make even the mere suspicion, among investors and other counter-parties, that they face insolvency risk potentially a self-fulfilling prophecy. This danger creates both firm-level and industry-wide sensitivity to risk that is not generally matched in other sectors of the economy. Since this is tied to their broader role in the economy, we discuss it further in the next section.

### C. Broader Economic Role of the Financial Sector

When managers of publicly traded companies make costly errors, such as by placing risky bets that end up generating huge losses, it is always bad news for somebody. For example, a given firm’s shareholders, creditors, employees, and customers may be adversely affected if managerial recklessness leads to insolvency. Often, though, the broader macroeconomic harm is limited. Moreover, many of the adversely affected parties may have some ability and incentive to protect themselves, thus further limiting the need for government intervention.

Financial firms are in some respects different, however, reflecting their broader economic role and the consequent harm that they can do even to people who are not in a contractual relationship with them. Ex post, this can lead to the compelling policy reasons for financial rescue that helped to motivate the massive government interventions of 2008 and 2009. It also greatly matters ex ante, however, because it is desirable to minimize the chance that neither costly bailouts nor the macroeconomic harm that they seek to contain will ever be realized.

Fundamentally, banks — and increasingly, other financial firms that are legally classified as dealers, traders, or insurance companies — supply the liquidity that both consumers and businesses need, by providing payment systems that are generally needed for non-cash transactions to occur. They do so by intermediating between two distinct groups with mismatched preferences (Elliott, D., 2010b). The first consists of investors with savings that they want to invest in a safe and highly liquid manner, permitting them to withdraw cash whenever they like. The second consists of businesses that want to use this pool of savings to fund investment projects that may be riskier and are more long-term, requiring a relatively illiquid commitment of funds.



Without the intermediating function, "... depositors would have to accept the near-zero or even negative return that [otherwise] would be available" (Elliott, D., 2010b, p. 2). Business investors, meanwhile, would face relative capital scarcity and have to pay much higher interest rates "... if the only funding sources were pension plans and others with truly long-term investment horizons" (Elliott, D., 2010b, p. 2). But at least in the short run, banks' role in supplying payment systems is potentially even more important. A wide range of ordinary business and consumer transactions rely on these systems, and potentially will not take place if they are disrupted.

To perform their intermediating role between depositors and business investors, financial firms must be able to meet the depositors' ongoing cash demands, despite having loaned funds that therefore are not readily available in the short term (and may require fire sales to access). Keeping a reasonable amount of capital on hand helps, and can ensure that, under normal conditions, both random and specifically predictable variations in investors' daily cash withdrawal demands will pose no problem for a given financial firm. Even the best-managed bank in the world, however, makes promises of immediate cash access to its investors that it simply cannot keep if too many of them act on these promises at the same time.

This phenomenon is known, of course, as a run on the bank. While it should never happen to any well-managed bank with adequate capital in hand under ordinary circumstances, it can happen to any bank, anywhere and at any time, if something triggers a sudden flood of investor withdrawal requests. For example, a run may result from the spread of concern among investors that a given bank has lost money on its investments and might face long-term insolvency even when it is able to realize the cash value of its investments. What is more, an investor need not believe that the bank is long-term insolvent in order to have reason for demanding immediate liquidity. All she needs to believe is that enough other investors will believe it is potentially insolvent — or, like her, will anticipate others believing this (or believing that it will be believed).<sup>6</sup> An externality among investors — the race to the bank that triggers the run on the bank — thereby potentially triggers the broader external harm from disappearing liquidity to a national or world economy.

Against this background, two seemingly contradictory facts about the risk of bank runs (or the need for similarly disruptive fire sales) hold simultaneously. First, there is no surer way to trigger a bank run than by generating large losses that become publicly known — such as by reason of having made huge and risky bets involving tail risk that is realized when an asset bubble collapses. Second, even a sound and well-managed firm may be subject to a bank run, while even one that is unsound — if it can conceal

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<sup>6</sup> The potential for infinite regress brings to mind Keynes' famous comment about the stock market as a beauty contest in which one is rewarded for predicting whom others will pick as the most beautiful, leading to a situation "... where we devote our intelligences to anticipating what average opinion expects the average opinion to be" (Keynes, 1936, p. 156) The run-on-the-bank reverse beauty contest looks for anticipation of failure, rather than success, and is only an exceptional, rather than a regular, phenomenon given that it has no effect on investment returns under ordinary circumstances.

its losses and keep on bringing in new investors — may indefinitely postpone the day of reckoning. Bernard L. Madoff Investment Securities LLC might be (seemingly) flourishing to this day if the financial crisis had not triggered cash demands from its investors that exceeded its on-hand liquid capital.

To clarify thinking about this, suppose initially that there were just one financial firm, with transparent finances, supplying liquidity for the entire world economy. If this firm failed, the resulting economic harm would go beyond the specific cash loss to creditors (such as depositors) to include the lost surplus from transactions that depended on the liquidity it had been supplying — potentially leading to the vast welfare loss associated with a global recession or depression. Given the assumed transparency, a bank run would be triggered as soon as the firm incurred losses — or perhaps even risked incurring them — but otherwise would likely require some other sort of extraordinary triggering event (for example, a currency crisis).

Add nontransparent company finances and a multiplicity of financial firms, and the problem gets a lot more difficult. Now beliefs about firm solvency that could trigger a bank run are potentially more volatile, and new information about one firm may affect beliefs about others. For example, if one firm's losses come to light, investors may conclude — with considerable reason, though it would not matter even if they were wrong — that others are likely to have suffered losses as well, whether from following similar strategies or from counterparty risk in their transactional interrelationships.

In short, there is substantial potential for inter-firm contagion. However, the determinants of such contagion (both who spreads it and who contracts it) are complex and multifaceted. Relevant factors may include firm liquidity, actual and apparent solvency and riskiness, the complexity or opacity of a given firm's financial positions, its size or market share, its interconnectedness with other firms, and beliefs about its managers (including about their acumen, honesty, and political clout).

Explicit deposit insurance, and softer expectations that important (such as “too big to fail”) financial firms will be rescued out if necessary, help to reduce bank runs and the associated harms, but do so in exchange for worsening the firms' investment incentives by making losses less painful to the managers and shareholders. The prospect of rescue conditioned on the risk of major economic distress also may cause firms actually to prefer large prospective calamities to small ones. As Weder di Mauro (2010, p. 1) points out, “. . . a driver does not have an incentive to be involved in a big accident [rather than a small one], a financial institution does.”

Even where these government backups are operating, however, substantial harm beyond the bailout cost may result when financial firms suffer losses, both from interim uncertainty about the scope of coverage and delay in restoring lost liquidity. If, at the same time, perceived wealth and therefore consumer demand are independently plunging, due to the collapse of the same asset bubbles that triggered the financial firms' losses, the liquidity shock may end up doing even greater harm than it would have otherwise — although it may also end up being mistakenly over-blamed for the jointly caused macroeconomic harm.

#### **D. Optimal Government Response to Financial Firm Externalities: Available Tools and the Role of Taxation**

As we saw above, excessive and unwise risk-taking by financial firms triggered large losses that had huge negative externalities that extended not only to the federal government's bailout costs, but to the massive social costs of triggering or worsening a global recession. Financial firms that were crippled by the realization of tail risk imposed these costs on society not just directly but through a process of contagion that undermined the financial sector generally. Looking forward, one would like to prevent current and future financial firms and their managers from similarly imposing harm on the rest of society.

The good news is that we have sharp theoretical tools for analyzing the optimal social response to externalities, deployed most prominently in the economic literature concerning environmental externalities from pollution and climate change. In environmental policy, no less than government intervention in the financial sector, the traditional approach was regulatory command, in the form of requiring or banning particular behavior by private actors. This approach came to be criticized, however, by economists who, building on the work of Arthur Pigou (1928), argued that it made too little use of market mechanisms that could improve efficiency in the achievement of regulatory objectives.

In theory, regulatory command can achieve optimal results if regulators have the right incentives and sufficient information. Thus, suppose they could design limits on pollution emission which ensured that firms would pollute only when the correctly measured benefits of doing so, compared to all alternatives, exceeded the social harm. In practice, however, even if centralized regulators have the right incentives to seek optimal rules, they often lack the particularized information about firms' alternatives that would be needed to prescribe by general rule the socially optimal decision in each case. Firms are likely to have better information about their own choices, and thus may be expected to do a better job of optimizing if a mechanism can be found for properly aligning their incentives. Hence the case for using another tool, Pigouvian taxation, when it can be properly designed.

Suppose that regulated firms know much more about the costs of changing pollution than does the regulator. Ordinarily, they may have incentives not to reveal that information. If, however, they are charged a pollution tax, equal to the expected marginal harm that they cause through their actions (Kaplow and Shavell, 2002), they will use that information to optimize pollution decisions that the regulator would have gotten wrong by reason of its being effectively "... compelled to treat firms the same when in fact they differ ..." in dimensions that it cannot observe (Christiansen and Smith, 2009, p. 2).

Thus, consider global warming. An enforceable carbon tax, set properly and applying globally, would give businesses the incentive to set carbon emissions at exactly the right level, given the tradeoff between the value consumers place on the associated economic production and the costs imposed by changing the world's climate. Obviously, in practice, even if all countries (and the relevant political actors in each country) were

willing to cooperate fully, setting the tax price properly would be extremely difficult.<sup>7</sup> In principle, however, assuming a particular answer to the set of valuation questions, there is a “correct” carbon tax per unit of carbon emission, applying uniformly across the world because all carbon is identical.

A perfectly functioning carbon tax of this kind eliminates all need for the use of regulatory command with respect to carbon emissions. Unfortunately, however, things are not always so simple (or rather, the complications are not always confined to valuing an output that at least is globally uniform). Consider alcohol consumption, which, at moderate levels may “... be fairly harmless while heavy drinking by some individuals generates large and progressively-increasing externalities” (Christiansen and Smith, 2009, p. 6). Thus, a uniform tax per unit of alcohol consumed would fail to generate the Pigouvian optimum. Moreover, while in principle one could try to differentiate the tax appropriately, applying non-linear taxes (even to the same consumer) based on a full assessment of the broader circumstances, in practice this may be infeasible or overly costly to implement. These difficulties may cause the use of regulatory command, such as restrictions on where and when alcohol can be sold, to be preferable to attempting full reliance on Pigouvian taxation.

### *1. Pigouvian Taxation of the Financial Sector*

In principle, this analysis clearly applies to a financial firm that makes investments with significant downside risk. Thus, it is worth asking what costs an optimal Pigouvian tax would require the firm to take into account. Relevant items would include the expected costs to (1) uninsured counterparties from firm insolvency, (2) taxpayers and beneficiaries of government programs, present and future, who would be worse off to the extent the government offered explicit or implicit insurance coverage, and (3) anyone else directly or indirectly affected by the heightened prospect of runs on the bank (at the same firm or elsewhere) and/or of the negative economic consequences from the associated harm to the liquidity function that banks and other financial firms serve in facilitating transactions that generate surplus.

Unfortunately, an optimal Pigouvian tax on financial firms could not, like an optimal carbon tax, simply apply a simple flat rate to a distinct output. There is no single activity whose aggregate sum equals expected harm. Indeed, many distinct aspects of financial institutions’ activities may have negative externalities, including those that affect:

- liquidity (the lack of which may lead to fire sales)
- solvency

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<sup>7</sup> The obstacles to setting the carbon tax properly would include (1) the broad empirical uncertainty in climate models, (2) the difficulty of measuring the welfare cost even of determinate climate effects, and (3) questions of how to make tradeoffs between the welfare of individuals in very different circumstances (such as people in rich versus poor or advanced versus under-developed countries, or the members of current versus future generations), if any distributional effects are not offset by any other policy, including tax, changes.

- riskiness
- complexity (opacity)
- size or market share
- interconnectedness

Thus, both the activities of a firm and various aspects of its relations with other firms may matter.<sup>8</sup> And even once an activity is identified, the optimal corrective tax (or subsidy) is unlikely to be uniform. Rather, it seems likely to be, not only firm-activity-specific and firm-size-specific, but also state-specific.

If the insurance protection that the government offered was so certain, comprehensive, and instantaneous as to eliminate the associated harms that were discussed above (such as lost liquidity from bank runs that spread outwards via contagion), a correctly priced insurance fee might come close to being a full Pigouvian tax. However, any gaps, delays, or uncertainties in the coverage that caused runs on the bank still to be possible would mean that the fee fell short of covering all the social harm from risky investments. In addition, even if bank runs and liquidity loss were now impossible, inter-firm contagion would permit one firm's actions to affect the expected cost to the government of providing insurance coverage to other firms.<sup>9</sup>

In practice, the precise downside risk attributes of a particular financial firm's overall investment position are unlikely to be fully observable by tax authorities. Thus, an actuarially fair risk-adjusted fee structure not only would fall short of giving financial firms the right social incentives at the margin when they make investment choices, but is unlikely to be entirely feasible. Therefore, the key incentive problem that gave rise to the 2008 financial crisis — excessive risk-taking by firms and managers that did not face the entire downside — will likely remain even if a fairly well-designed tax instrument is adopted.

For two distinct reasons, therefore, the tool of regulatory command is likely to continue being necessary, in addition to any tax instruments that are adopted. First, expected social harm, other than the purely pecuniary to the government as insurer, is multi-dimensional and difficult to measure. Second, even that pecuniary harm cannot be measured entirely accurately through a risk-adjusted fee. Thus, the classic tax-

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<sup>8</sup> Some recent work has tried to quantify the marginal damage, but the formulas are too complicated to offer a plausible basis for actual legislation; see, for example, Adrian and Brunnermeier (2008).

<sup>9</sup> Even if the social harm could be reduced to the fiscal cost of supplying insurance protection, the government would hold a risky position, as the insurer of all financial firms, if their various investment risks (such as from betting against a downturn in real estate prices) were correlated. Thus, even with an actuarially fair fee the insurance fund would have a large positive balance when tail risk was realized less frequently than expected, and would leave the government with financial exposure under the opposite scenario. Governments that, like the United States, face long-term fiscal gaps that raise serious questions about long-term policy sustainability (see, e.g., Auerbach and Gale (2009) and Shaviro (2007)) — and that are otherwise also taking “long” betting positions on the performance of their national economies through their tax and transfer systems — might reasonably consider this a detriment, unless fully reflected in the pricing for the insurance coverage.

*or*-regulation debate is surely beside the point with respect to financial institutions, because regulation of the financial sector both is not going away, and should not. In particular, capital adequacy regulations will surely continue to be necessary (Elliott, D., 2010a), and indeed must presumably be improved and made harder to avoid given their failure in many cases during the period leading up to the financial crisis. Given, however, the multi-dimensional character of systemic risk, multiple tax and/or regulatory instruments are likely to be needed.

A risk-adjusted tax or fee for government insurance coverage, even if imperfect, clearly can play a positive role within this framework of multidimensional response, by addressing one of the central externalities when such coverage is provided. It might improve financial firms' incentives to a degree if it tended to go up when they increased riskiness in observable ways. Moreover, setting the fee at the right (average) level for financial firms as a whole, even if it was not correct at the margin case-by-case, would have the advantage of eliminating the net subsidy to the sector that otherwise would exist by reason of the insurance coverage. All else equal, this net subsidy otherwise would cause the financial sector to be too large.<sup>10</sup>

The following are some key principles to keep in mind when designing such a tax or fee:

- It should recognize the wide variety of activities that come under the umbrella of the financial sector. Otherwise, financial firms could use excluded activities to impose downside pecuniary risk on the government.
- It should be derivative-proof, so that its intended incentive effects could not be skirted by the creation of derivative products that constructed the same financial positions while avoiding its application.
- Its applicability should not depend on the arbitrary designation of what type of institution was undertaking an action — an important design element given that financial institutions with different designations often perform overlapping functions and sell overlapping products. Thus, to the extent feasible it should be activity-based but not institution-based, applying automatically to any firm that performed the banking-type functions (time intermediation and providing payment systems) that give rise to the need for insurance protection.
- Relatedly, it would properly address predominantly non-financial firms with financial units, such as GMAC Financial Services (now Ally Financial), GE Finance, or GE Capital.
- The link between firms paying the tax and those getting government insurance coverage need not be absolute. Suppose that a given predominantly non-financial firm that also conducts financial activities is not expressly covered, but to a degree performs banking functions. This role might cause it to have implicit govern-

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<sup>10</sup> Note that many, such as Krugman (2010), argue that the financial sector is too large for reasons wholly apart from the subsidy.

ment insurance coverage if bailout was a possibility, and also might cause its failure, if permitted to occur, to yield the same negative externalities as a bank run at a covered institution.

- International coordination is desirable, since negative externalities can easily cross borders.<sup>11</sup> Given the realities of international politics, however, the instrument should be robust to imperfect international coordination.
- With multiple tools being used to address financial sector externalities, any evaluation of the consequences of new tax legislation must be made in the light of the regulatory environment, which is itself in flux.<sup>12</sup> For example, a tax aimed at large institutions must be evaluated in the light of regulations designed to limit firm size.
- The cyclical — counter or pro — nature of any state-specific tax is potentially important. All else equal, the tax or fee should be designed so as not to trigger liabilities that sap funds just when the financial firms, and the system as a whole, are most fragile.
- Given negative externalities apart from the pecuniary cost to the government of providing insurance coverage, the amount raised by a well-designed tax or fee could exceed expected payouts under the coverage. Moreover, if the government creates a resolution fund to make insurance payouts as needed and decides to credit that fund with the revenues received, it should not cease to collect the tax even if the fund reaches a predetermined size that is considered big enough to meet any expected obligations. The need to address financial firms' risk-taking incentives is ongoing and entirely separate from that of whether, in the aggregate, they are paying for the full expected value of their insurance coverage.

Given that even imperfect Pigouvian taxation could improve incentives to a degree, insofar as it was able to put a price on some aspects of externality-imposing behavior, we next examine several alternative tax proposals that have recently been made or discussed regarding the financial sector.

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<sup>11</sup> In this regard, think of Iceland, whose financial institutions are (actually *were*) large and imposed costs that crossed the ocean.

<sup>12</sup> If the quantity regulation of an activity that generates a negative externality is set optimally, then any tax set at a rate less than or equal to the marginal social damage will raise revenue, but will not alter behavior from the social optimum. Such a tax is attractive because it raises revenue with no distortion rather than because of its Pigouvian incentives. A tax set at a rate in excess of the marginal social damage collects further revenue, but at the cost of moving the equilibrium from the social optimum, with too little of the externality-generating activity. If the quantity regulation is set too laxly, a tax at a rate below the implicit marginal social damage implied by the regulation will raise revenue with no marginal effect, while a tax in excess of that amount (but not greater than the actual marginal social damage) will both raise revenue and affect activity in the right direction. If the quantity regulation is set too strictly, a tax raises revenue without affecting behavior; neither would a subsidy offset the sub-optimal level of activity, although it would incur a revenue loss.

#### IV. TAX PROPOSALS

In this section we apply the preceding analysis to assess recent proposals for new taxes on financial institutions or certain financial activities. We focus on four proposals: a financial transactions tax, a tax on bonuses, and two types of taxes on financial institutions: an excise-tax-like levy that might fall on excess profits, and the financial activities tax (FAT) discussed by the IMF in its preliminary response to the G-20 request noted in the introduction.

Before getting to the details, a few words of background are in order. First, the proposals generally have multiple motivations and objectives. Thus, although the effect on the incentives of financial institutions and other market participants are of concern (a la Pigouvian taxes), revenue-raising and retributive motivations are also apparent. Second, although in theory (meaning absent administration, implementation, and political economy issues) an appropriate Pigouvian tax would be highly complex, in practice only relatively simple policies are on the table.

##### A. Financial Transactions Tax (FTT)

The idea of a tax on some set of financial transactions has been around for a while, and certainly predates the policy reform agenda triggered by the recent financial crisis. In a world without derivatives, the tax base would be the amounts for which specified financial assets were sold. Modern versions of the proposal also include in the tax base the notional value or spot price of the assets referenced in transactions involving derivative securities.

Some proponents of an FTT eye the revenue potential, which looks large relative to the required rates of tax. The economic arguments in support of imposing such a tax center instead on its ability, by increasing the costs of financial asset transactions, to reduce speculative and technical trading that increases financial markets' volatility and susceptibility to bubbles. These issues are certainly related to the financial crisis, and are therefore worth taking seriously. Although a comprehensive review of the literature is beyond the scope of this paper, we think it fair to say that theoretical studies have not led to conclusive results about the veracity of the claimed benefits, and that the empirical literature also does not support the claim that an increase in transaction costs (through higher taxes or other mechanisms) generally improves market functioning (Hemmelgarn and Nicodème, 2010). Instead, its main effects may include (1) raising the costs of capital for entities issuing new securities, (2) through its downward effect on trading volume, reducing liquidity and price discovery, while also potentially increasing short-term price volatility, and (3) displacing securities trades from taxed to untaxed venues (Matheson, 2010).

An FTT is an unlikely candidate as a retributive tax, given its uncertain incidence, as well as its likely ineffectiveness at retrospectively targeting those who caused, or profited from, the recent financial crisis. Thus, in the end its principal appeal may lie in the large amount of revenue it can raise, relative to the tax rate, if not so widely avoided



(such as by using derivatives or moving securities trades to untaxed venues) that even in this respect it ends up being merely a “damp squib” (Honohan and Yoder, 2010, p. 23).

To say that an FTT (if sufficiently airtight) might raise substantial revenue, relative to its tax rate, is merely another way of saying that its tax base is at least nominally large. Supporters often tie this feature to the oft-quoted tax policy mantra favoring “broad-based, low-rate” taxes over narrow-base, high-rate taxes. But the logic behind this mantra does not apply to any and all broad-base taxes, regardless of their underlying efficiency properties. Thus, for example, economically well-informed proponents of retail sales taxes generally agree that “broadening” the base by including business-to-business sales, rather than just those to consumers, and thus creating a gross receipts (or turnover) tax, would reduce, rather than increase, economic efficiency, by generating a cascading tax on economic production by multiple non-integrated firms.

The FTT similarly imposes a cascading tax, largely on business-to-business sales. While the cascading base allows a lower rate to raise more revenue than would an equal-rate tax on, say, income, that is simply because it penalizes the use of separate firms. We thus are skeptical that the case for an FTT is any stronger than that for a gross receipts tax,<sup>13</sup> although we note that the latter instrument has recently come back in fashion as a revenue-raising tool for certain U.S. states.

## B. Bonus Tax

Both the United Kingdom and France recently introduced temporary taxes on bonus payments to employees in the financial sector. Under the British levy, called the Bank Payroll Tax, bonus payments in excess of £25,000 were taxed at a rate of 50 percent on a temporary basis; the measure expired as of April 5, 2010. The French tax was similar in rate and threshold, and applied to bonuses paid during the 2009 accounting year. In May of 2010, Senator Jim Webb (D-VA) offered an amendment to the U.S. financial reform bill under debate that would impose a one-time, 50 percent tax on bonuses of more than \$400,000 paid to executives of Fannie Mae, Freddie Mac and other financial institutions that got at least \$5 billion from the Troubled Asset Relief Program Congress approved in 2008. The proposed bonus tax would apply to income generated for work in 2009 and paid in 2010.

If expected to recur, a tax on bonuses is an invitation to avoidance, given the difficulty of ascertaining and monitoring what part of compensation is in fact a “bonus.” This is of course not an issue for a tax applied retroactively, i.e. before the characterization had tax liability implications. As a one-time, ex post measure, it has the economic advantage of being non-distorting. Of more political salience but uncertain economic accuracy, it could be perceived as exacting a penalty from those individuals whose

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<sup>13</sup> One could possibly argue for some kind of FTT as a form of presumptive tax on tax-noncompliant businesses in the informal sector, especially if it is creditable against income tax or VAT liability. But this is a separate objective from those that we address in this paper.

mistakes helped precipitate the crisis and who nevertheless profited in its build-up and from the taxpayer-financed bail-outs that accompanied it. However, a retrospective tax on bonuses is certainly a blunt instrument for assessing a tax on this kind of culpability.

The retrospective nature of the British and French bonus taxes made the placement of the obligation to remit the amount due critical to its incidence, as there can be no ex post adjustment of market prices in reaction to a one-time tax. Because both the British and French bonus taxes were to be remitted by the employer, the burden would be likely to be borne by shareholders, rather than by the employees who received the bonuses,<sup>14</sup> and thus did not assign penalties across individuals according to culpability, even if one assumes that receiving a bonus is a good proxy for culpability.

### C. Levies on Financial Institutions

On January 14, 2010, the Obama Administration proposed a levy of 0.15 percent on a base equal to liabilities, excluding deposits subject to assessments by the Federal Deposit Insurance Corporation (for banks) and certain liabilities related to insurance policies. The fee would apply only to firms with consolidated assets that exceed \$50 billion, of which there are about 60 firms. The Administration estimated that such a fee would collect \$90 billion from 2011 to 2020, which would go into general revenues to offset the estimated cost of the 2008 bailout fund, and then expire. The Senate bill initially contained a provision collecting \$50 billion from financial firms and setting the money aside to fund future bailouts. On March 31, 2010, the German government announced plans to introduce a levy on banks with a base of liabilities excluding capital and deposits, and a rate that depends on some measure of systemic risk; details of the risk-varying premium have not yet been released. In contrast to the U.S. proposal, the revenue from the levy would be paid into a stability fund that would finance a resolution regime for systemically relevant banks. The French government has announced it will soon release its own plan, and on April 1 German Chancellor Merkel said that Germany and the United Kingdom would work together to propose a bank levy to the G-20 countries. However, news reports suggest that there is substantial opposition to such a levy, including from Australia, Brazil, Canada, and Japan (Davis, 2010). In addition, there are proposals before the U.S. Congress for a systemic dissolution fund, facilitating the liquidation of large and significant financial institutions that become insolvent, and funded by a variable assessment fee. The rate would depend on several factors, possibly reflecting some measure of risk, but the relevant details have not yet been settled or announced.

These proposals differ on a number of dimensions:

*Is the base uninsured liabilities, or does it also include insured deposits?* The former base provides a disincentive for banks to fund risky lending and investments with less stable funding. Insured deposits presumably are safe in this respect, but, on the other

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<sup>14</sup> We assume that the employment contracts between affected financial firms and the employees who received bonuses did not provide that compensation would be adjusted to reflect new firm-level taxes such as the bonus tax.

hand, one still does not want banks to make risky bets with these funds based on a “heads we win, tails you lose” rationale.

*Is the rate risk-weighted or flat? If it is risk-weighted, what are the risk factors and how are they measured?* The Pigouvian logic supports the use of risk weighting to flexibly measure the marginal social damage of the activities of a financial institution. But here the devil is in the details, and the difficulty of measuring risk factors accurately and transparently.

*Is the tax remitted entirely ex ante, or are there also ex post claw-backs within the resolution process?* The former would reduce the pro-cyclicality of the levy, except to the extent that any risk weighting triggers higher tax liability just when financial institutions are most fragile.

*Are the revenues paid into a resolution fund, or do they go into general revenues? If the former, do the revenues effectively constrain the size of future bailouts?* This is not relevant to the incentive effects and efficiency properties of the tax unless the designation of such a fund affects the credibility of a bail-out. More crucial is whether the premiums need not be paid once the fund reaches a certain amount. This would almost certainly be inappropriate, as the social cost of risky behavior does not go to zero when the fund reaches an essentially arbitrary size.

*How does a liability tax interact with mandated regulatory capital?* Maintaining regulatory capital is costly because it limits the amounts of funds that the bank can invest. Moreover, the amount of required capital is increasing in the riskiness of the bank. Similarly, a tax on the bank’s liabilities is a tax on invested funds and it can be structured to be increasing in the riskiness of the bank, e.g., exempting insured deposits is an example of taking the bank’s risk into account in determining the base for the liability tax. Thus, raising the amount of required regulatory capital and levying a liability tax are substitutes for reducing bank risk and should be coordinated.

The IMF (2010) report proposes a new tax on financial institutions, called a Financial Activities Tax (FAT), whose base is profits (in excess of a “normal” return) plus worker compensation above a per-employee threshold.<sup>15</sup> The report argues that this would approximate taxing rents, and therefore invokes the efficiency arguments for rent taxation.<sup>16</sup> Kleinbard and Edgar (2010) stress that the recent extraordinary profits in the financial sector must have been due to either luck or temporarily successful risk-taking, and that either account would suggest the identification of a low-distortion tax base.<sup>17</sup> They argue that such an excess profits tax would also mitigate risk-taking that is

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<sup>15</sup> Kleinbard and Edgar (2010) suggested a similar levy, with a similar justification.

<sup>16</sup> They also argue that, appropriately designed, it could offset the usually favorable treatment afforded financial institutions under a VAT. While this argument does not directly apply to the United States, which does not have a VAT, the consumption value of financial services (such as those provided on low-interest, low-fee personal checking accounts) typically also escapes income taxation, both in the United States and elsewhere.

<sup>17</sup> This argument addresses the fact that a tax on pure profits or rents in *any* sector has desirable efficiency properties, but in practice it is difficult to separate pure profits or rents from the normal return to capital, and so designing a non-distorting tax is difficult. If one can assert that most of the observed return in a given sector is rent or pure profit, then the potential distorting effect per dollar raised is arguably low.

socially excessive because, as discussed earlier, the losses from bad outcomes are often borne by people other than shareholders.<sup>18</sup> In effect, apparently extraordinary profits serve as a proxy for identifying inappropriate tail risk. From this perspective the FAT could be considered a backup, for flaws in the regulations designed to limit risk-taking. To date, however, as stressed elsewhere in this paper, the optimal coordination of tax and regulatory policies has not been adequately addressed.

IMF (2010) notes several non-trivial issues of implementation that would need to be worked out before introducing a FAT. To these we might add the difficulty of establishing a “perimeter” for its application. Predominantly non-financial corporations with significant financial operations would presumably not be subject to the FAT, in order to minimize the administrative and compliance costs. However, leaving similar activities out of the FAT base would encourage migration of these activities to “non-financial” firms, thus distorting the structure of the true financial sector and potentially undermining advancement of the regulatory aims.

## V. CONCLUSIONS

Multiple motives underlie the recent flurry of proposals to levy new taxes on financial institutions or their transactions: (1) a desire for retribution or recompense from parties deemed to have caused, and/or profited from, the recent crisis, (2) a desire to align private incentives with the social cost of activities that demonstrably have potentially catastrophic external contagion effects, so as to reduce the likelihood of future crises, and (3) a desire to raise revenue to offset the government fiscal imbalances exacerbated by the cost of dealing with the financial crisis and subsequent recession. The appropriate tax scheme greatly differs depending on the motive, although most proposals seek to serve more than one.

Economic analysis can clarify what design elements are more likely to achieve which goals. The theory of incidence is relevant for ascertaining whether the burden of new taxes will actually fall on those intended to bear the burden, and cautions that — political rhetoric aside — burdens are not borne by legal entities such as corporations, but by people. Backward-looking taxes cannot be shifted, and thus the remitter of the tax is crucial, but for forward-looking taxes the scope of the tax matters as well as the alternatives the market participants have to the taxed activity. The large literature on Pigouvian taxation is helpful, but has mostly been applied to environmental externalities, which are different in important ways from the type of negative externalities generated by financial activity. For example, the latter are likely to be institution-specific and state-specific. Measuring the marginal cost is difficult — although perhaps no more

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<sup>18</sup> In view of the argument of Domar and Musgrave (1944), such a tax would reduce risk-taking only given that the tax treatment of losses is punitively asymmetric. Otherwise, a tax on profits might induce decision makers to increase pre-tax risk positions in order to restore the after-tax positions they had in absence of the tax. Note also that ex post increases in the generosity of the tax treatment of losses is a form of taxpayer bail-out.

so than in the case of climate change — and thus the theoretically optimal Pigouvian levy is difficult to calculate, may be difficult to administer and monitor, and is difficult to implement in a transparent and explainable way. Simple versions of the theoretical optima should perhaps be designed, but they are likely to be imperfect.

It is true that taxes, as opposed to most regulations, raise revenue, and many countries affected by the financial crisis are in a dire long-term fiscal situation. Yet taxes on financial institutions and activities are not the only way to raise revenue. Thus, as usual, the issue is whether these ways of raising revenue are less damaging (or even more supportive) to the economy, with more favorable equity consequences, than likely alternatives.

We conclude that, with regard to financial transaction taxes, the answer to this question is no. The efficiency cost is likely to be high relative to the revenue raised, given the lack of any good evidence that it improves incentives or addresses externalities in any clearly identifiable respect. The allure of its low rate relative to revenue potential is illusory, and its incidence is uncertain.

One-time, backward-looking taxes on bonuses above a threshold have minimal efficiency costs, and might even be approximately on the mark in assessing a retributive penalty if collected from employees rather than firms. Forward-looking bonus taxes would be difficult to administer, however, and the case that they would improve incentives is hard to make.

A graduated tax on the uninsured bank liabilities of large financial institutions would potentially provide a socially desirable disincentive for risky investment backed by less stable funding. Penalizing larger corporations would be desirable insofar as they pose larger systemic risks to the economy, although the relationship between size and such risk is not entirely clear. Such a tax would likely be borne by shareholders and other constituencies of the larger institutions at the time when enactment first became generally expected. Loosely tying the revenue from such a tax to a resolution fund would not necessarily add substantiality to the credibility of pledges about how and when to make use of such a fund (for example, if rescue was expected in any event), and could be damaging if it led to dismantling of the tax once the fund had reached an arbitrarily determined size.

A tax on financial firms' profits in excess of a normal return (plus worker compensation above a per-employee threshold) has potential appeal despite historical skepticism in the literature concerning the general merits of excess profits taxes. In this setting, an excess profits tax could be rationalized either as primarily reaching rents or as indirectly indicating the presence of tail risk that is an externality from the firms' (or their employees') standpoint. However, the merit and applicability of these arguments remain uncertain, and imposing such a tax would also pose various design challenges, including whether and how to apply it to what are effectively financial firms nested inside larger firms outside the recognized financial sector.

Future research should be directed toward sharpening the applicability of the Pigouvian framework to the case of financial sector externalities. In particular, the optimal coordination of regulation and corrective taxation should be explored in more depth.

U.S. Treasury Secretary Geithner describes the Administration's proposed fee as being designed to "complement" regulatory policies (Geithner, 2010), and the remarks that any new tax should "... be coordinated with ..." regulation, recommending a "... more holistic approach" (IMF, 2010, p. 26). How these unexceptionable goals are best achieved should be high on the research agenda.

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#### APPENDIX: AN ACCOUNTING LEGACY OF THE CRISIS

Even if income taxes were not a major proximate cause of the financial crisis, they will play a key role going forward in the decisions of most financial institutions because many of the tax deductions associated with the losses during the crisis have yet to result in any cash tax savings. The realized tax losses of many such firms were large enough to fully offset all profits in the year generated and the carryback years. Such losses now are being carried forward to potentially offset tax liability in future profitable years.

Besides reducing future tax payments, these net operating loss carryforwards can strengthen the financial institution's current balance sheet and regulatory capital. The carryforwards create deferred tax assets that are included on the balance sheet and in the computation of Tier 1 capital, the key measure used by regulators to assess a financial institution's capital adequacy.<sup>19</sup> Furthermore, expenditures and losses, which have been expensed for book purposes but not yet deducted for tax purposes, also qualify as deferred tax assets. Of particular note for tax purposes, the bad debt reserve for the portion of a U.S. bank's loan portfolio that it does not expect to collect is not deductible (because a tax deduction is only permitted when a specific loan is deemed uncollectible and removed from the portfolio) but, instead, the product of the bad debt reserve and the tax rate is recorded as a deferred tax asset. The logic is that the bank will pay fewer taxes in the future when the uncollectible loans are charged off.

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<sup>19</sup> See Graham, Raedy and Shackelford (2010) for a detailed discussion of deferred tax assets and other aspects of the accounting for income taxes.



However, to the extent that a firm is not expected ever to realize the tax savings represented by the deferred tax asset, a valuation allowance must be established. The valuation allowance is a “contra-asset,” which reduces the balance of the gross (or total) deferred tax assets. If the firm cannot establish that it anticipates future taxable income from one of four sources,<sup>20</sup> then a valuation allowance is required. The valuation allowance can be costly for financially constrained companies, the very firms for which future taxable income is uncertain, because it reduces the firm’s net deferred tax assets, accounting earnings, and equity.

Therefore, financially constrained companies face incentives to minimize their valuation allowance. Among the four sources of income that can enable a firm to avoid a valuation allowance, generating expected future taxable income is the most important means of establishing that the firm will eventually utilize the tax deductions and thus does not need to establish a valuation allowance. One way to increase expected future taxable income and thus reduce the valuation allowance is to shift to riskier investments. Because of the limits on the refundability of losses, riskier investments with the same expected income generate more expected taxable income, enabling the corporation to book a smaller valuation allowance. By booking a smaller valuation allowance, the firm boosts current accounting earnings, assets and equity. In summary, the accounting rules encourage many of the banks that suffered the greatest losses from the financial crisis (and thus have the largest deferred tax assets) to take more risks than they would absent financial reporting incentives.

Regulators provide even stronger incentives for weak financial institutions to engage in excessively risky undertakings, because they further restrict the use of deferred tax assets as a source of regulatory capital. Regulators accept deferred tax assets, net of the valuation allowance, as Tier 1 capital, but banks can only use future taxable income to the extent that taxable income is expected in the next 12 months. This restriction for regulatory capital purposes can be important. Lindo (2009) reports that a study by the Federal Reserve Board found that, for financial accounting purposes, most banks do not require invoking a valuation allowance if they anticipate taxable income in the next two to six years, and some banks accept taxable income within 10 years as sufficient to avoid recording a valuation allowance. Thus, the more restrictive 12-month rule for regulatory capital purposes means that some banks avoid the valuation allowance for book purposes but nonetheless have the deferred tax assets disallowed for regulatory purposes. Furthermore, regulators do not permit deferred tax assets to exceed 10 percent of Tier 1 capital. Accordingly, even if taxable income is anticipated within the next 12 months, deferred tax assets will be disallowed to the extent they exceed 10 percent of Tier 1 capital. Finally, if the 10 percent of Tier 1 capital rule is binding, any action that reduces Tier 1 capital (e.g., repaying TARP funds) has an additional adverse impact on Tier 1 capital because it also reduces the permitted deferred tax assets.

Not surprisingly, banks have repeatedly lobbied the Federal Reserve Board to lift or limit these two additional regulatory restrictions, as yet to no avail.<sup>21</sup> Given that these bank holding

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<sup>20</sup> The four sources are (1) future reversals of existing taxable temporary differences, (2) future taxable income, (3) taxable income in carryback periods, and (4) the existence of tax planning strategies.

<sup>21</sup> However, in December 2009, state life insurance regulators did relax their treatment of deferred tax assets by shifting from a 12-month taxable income requirement to a 36-month taxable income requirement, and from a limit of 10 percent of capital and surplus to a limit of 15 percent of capital and surplus. The immediate impact was to boost the capital of life insurers by \$11 billion by permitting previously disallowed deferred tax assets to count for regulatory purposes.

companies can enhance their regulatory capital simply by qualifying their deferred tax assets for inclusion in Tier 1 capital, it seems plausible that rearranging their affairs, including shifting to riskier investments, will be an attractive, relatively low-cost means of capital enhancement for years to come for many U.S. banks. The impact of inducing the largest U.S. banks (whose risky endeavors contributed to the financial crisis) to engage in riskier behavior than they might otherwise have preferred, due to the financial reporting and regulatory incentives surrounding the deferred tax assets, merits attention from policymakers.