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Benefit-Cost Paradigms in Financial Regulation

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Abstract. This paper builds on contributions to a Conference on Benefit-Cost Analysis of Financial Regulation, held at the University of Chicago, to show how benefit-cost analysis (BCA) of financial regulations should be conducted. Our major themes are that (1) on theoretical grounds, BCA should be easier for financial regulation than for other areas of regulation where it is already used, such as health and safety regulation; (2) while many needed valuations for BCA of financial regulation do not yet exist, those valuations are theoretically measurable; (3) once regulators commit to using BCA, economists will have incentives to work on supplying those valuations; (4) BCA will improve financial regulation and make it less vulnerable to judicial challenge; and (5) the specific protocols or paradigms of BCA will differ across different areas of financial regulation.

Introduction

Nearly all U.S. regulatory agencies use benefit-cost analysis (BCA) to evaluate proposed regulations. The Environmental Protection Agency (EPA), for example, uses BCA to evaluate regulations that require factories to reduce emissions. The Occupational Safety and Health Administration (OSHA) uses BCA to evaluate regulations that require workplaces to install safety devices for workers. The National Highway Traffic Safety Administration (NHTSA) uses BCA to evaluate fuel economy standards. Yet a striking exception to this pattern occurs in the area of financial regulation. The major agencies with jurisdiction over financial activities—including the Securities and Exchange Commission (SEC), the Commodity Futures Trading Commission (CFTC), and the Federal Reserve Board—have almost never used formal BCA to evaluate financial regulations.

Yet there is no reason to believe that BCA would be appropriate for environmental or workplace regulation and not for financial regulation. Indeed, BCA would seem more appropriate for financial regulation where data are better and more reliable, and where regulators do not confront ideologically charged valuation problems like those concerning mortality risk and environmental harm. The benefits and costs of financial regulation are commensurable monetary gains and losses, and so can be easily compared. This does not mean the burden of proving benefits exceed costs should lie exclusively or even primarily with regulators as opposed to the regulated; burdens should be based on a broader assessment of where benefits and costs will tend to lie. For example, we (Posner and Weyl, 2013c) have advocated pre-approval

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regulation of new financial derivatives that would place burdens of proving the benefits of innovation on the proposing party.

EPA and the other agencies have been using BCA since 1981, when President Reagan ordered all regulatory agencies to use BCA for major regulations—those with a yearly economic impact of at least $100 million. President Reagan's order excluded the so-called independent agencies, including most of the financial agencies. Over the last 30 years, the agencies that use BCA have obtained considerable experience in the methodology, and have refined their techniques and adopted consistent assumptions, under the guidance of the OMB and particularly OIRA. Over time, useful protocols have been developed. Consultancies in the private sector have grown up to provide institutional support to these analyses through subcontracting. The agencies perform and report their BCAs for all major regulations, which enables academics and other outsiders to offer criticism and suggestions for improvement. While BCAs today are far from perfect, they are fairly sophisticated and useful exercises. EPA's recent climate regulations, for example, depend on sophisticated computer modeling of the climate to provide a basis for projections of the economic harm from climate change.

By contrast, the financial regulatory agencies have not developed protocols for evaluating financial regulations. While they do provide explanations, as are required by law, and these explanations often involve economic analysis of some sort, there has been no rigorous effort to compare benefits and costs, at least publicly. It may well be that they use models internally, but there is no evidence that they use benefit-cost analysis.

The reason that the non-financial regulators issued BCAs, while the financial regulators generally have not, is that all presidents since Reagan have required only non-financial regulators to issue BCAs, possibly because their legal authority to boss around independent agencies is ambiguous. (The one major exception is the Office of the Comptroller of the Currency, which is an office in the non-independent Treasury.) In principle, a president can fire the head of the EPA if she refused to perform BCAs, while he has no such authority over the chair of the SEC. Meanwhile, agencies were rarely understood to be legally required to perform BCAs, so regulated entities were rarely able to persuade courts to strike down regulations that failed BCAs. Courts generally require agencies to perform a rigorous analysis of the potential effects of regulations, but not to perform a BCA.

But in recent years this has changed. In a number of cases, the D.C. Circuit has made clear that it expects financial regulatory agencies to perform BCAs for some of their regulations, and that it will strike down regulations that fail BCAs, at least under certain conditions. The financial regulatory agencies have scrambled to develop protocols that would enable them to perform high-quality BCAs. But so far they have failed to develop such protocols. The academic literature on BCA focuses on non-financial regulations, and so has been no help. And while the general principles of BCA apply to all types of regulation, there are distinctive valuation problems that arise in financial regulation that do not arise in other areas of regulation. As a result, the financial regulatory agencies face a risky and hostile legal environment even as they finalize numerous regulations under the Dodd-Frank Act.

The purpose of the paper is to draw on the work of the participants at a conference on Benefit-Cost Analysis of Financial Regulation, held at the University of Chicago in October 2013, to outline how financial regulatory agencies should perform BCA for financial regulations. On the cost side, regulators must estimate the administrative and opportunity costs of compliance for firms, as well as reductions in markets' ability to supply services valued by the economy. The former is usually relatively straightforward to compute, though the latter may be more challenging. In particular, financial firms supply information, insurance products and consumer credit that are valued by consumers in ways that may be difficult to measure. Three of the panels in the conference investigated these costs and, as discussed below, generally found evidence that they are smaller than might have been thought. As a result, we suggest a paradigm under which the primary costs of regulation are those directly to firm profits.

We argue that the benefits of financial regulation lie primarily in reducing bailout costs to the public (and creditors), lowering the chance of a systemic crisis, reducing other harmful speculative activity, and avoiding wasteful racing for information. In specific areas of policy, a subset of these benefits is likely to be focal and others less central or harder to quantify. For example, in regulation of banks and other systemically important financial institutions the first two benefits are crucial while the others are harder to measure, and so should be generally ignored unless strong evidence can be brought to bear. Based on this view, we provide an outline of how a BCA might proceed along these lines for a version of the Volcker rule.

I. Background

A. Benefit-Cost Analysis in U.S. Government Regulation

BCA is a method for evaluating a project or regulation based on economic principles. Typically, the regulator considers a range of regulations and calculates the benefits and costs of each. The cost is the financial cost of complying with the regulation, which may involve buying and installing new equipment like scrubbers, hiring workers to perform tasks like cleaning up spills, or reducing production. Benefits are usually avoided costs for specific third parties or for the general public—for example, the avoided cost of medical treatment, avoided mortality, avoided harm to property caused by pollution, and so on. The benefits and costs are discounted to present value. A regulation should be approved only if the benefits exceed the costs, and ideally the regulation with the best benefit/cost ratio should be chosen.

Before 1981, U.S. regulatory agencies used BCA sporadically, mainly for construction projects and occasionally for environmental regulations. It is not entirely clear how regulators evaluated regulations when they did not use BCA. Most likely, they relied on rough intuitions about benefits and harms, while avoiding extreme outcomes that could result in significant economic disruption like factory closings. One common approach, known as feasibility analysis, required agencies to adopt the strictest regulation that did not cause excessive job loss (Masur and Posner, 2010). After President Reagan's executive order in 1981, most regulatory agencies (excluding independent agencies like most of the financial regulatory agencies) began to use BCA for major regulations. Despite the initial widespread hostility to Reagan's order, all subsequent presidents have renewed it.

Under the executive orders of Reagan and his successors, agencies perform BCAs and submit them to OIRA, an office in OMB. OIRA was directed to return the regulations to agencies if the BCA was poorly conducted or showed that the regulation was not cost-justified. There is a great deal of controversy over whether OIRA really did block inefficient regulations or not (Hahn & Dudley 2006). A few statutes also have been interpreted to require agencies to conduct BCAs; if they fail to, the regulation may be rejected by a court.[2]

B. Financial Regulation

1. Financial Regulation Before *Business Roundtable*

As noted above, financial regulations are not subject to OIRA review, with the important exception of the OCC. Financial regulations are subject to judicial review, but traditionally judicial review of financial regulation has been exceptionally deferential.[3] One of the core functions of the regulatory agencies is to set minimum capital requirements for financial institutions. Getting these requirements right is extremely important: if they are too strict, they may stymie lending and economic growth; if they are too weak, they allow banks to take on too much risk, which can lead to a financial crisis. Yet there has been hardly any judicial review of minimum capital regulations. Very few cases exist, probably because banks need to maintain good relations with regulators, and so prefer not to challenge their orders in court.

One notable example of judicial review took place in the case, First National Bank of Bellaire v. Comptroller of the Currency (697 F.2d 674 [1983]). After conducting several examinations of the Bank, the Comptroller determined that the Bank was insufficiently capitalized, and ordered it to raise capital. The Comptroller's expert had conducted a qualitative analysis and quantitative analysis. The qualitative analysis found that the Bank's assets, earnings, liquidity, and management to be "basically strong." The quantitative analysis revealed that the Bank's capital-adequacy ratio was 5.28 percent, which was below the 7.0 percent that the expert believed appropriate, and that it was near the bottom of the Bank's peer group (First National Bank, 697 F.2d at 685-686). However, the Court held that this did not prove that the Bank's operations were unsafe or unsound. An expert witness for the Bank testified that a safe capital-asset ratio could be as low as 4 percent. And the Court found it relevant that the ratio for all banks in 1979 was 5.45 percent, and that a higher ratio prevailed in the 1930s when numerous banks failed. The Court concluded that the Comptroller's order was arbitrary and capricious under the APA.

The Court did not give serious consideration to whether the 7.0 percent target level was reasonable; it did not address the costs or the benefits of higher capital requirements. But nor did the Comptroller. There was simply no way to evaluate the Comptroller's reasoning; and perhaps that is why the court vacated the order.

In response to the Bellaire decision, Congress enacted the International Lending Supervision Act of 1983 (12 U.S.C. § 3907), which provided that the determination of capital requirements lies in bank regulators' discretion. Congress made clear that it intended to eliminate

[2] See Corrosion Proof Fittings v. EPA (947 F.2d 1201 [1991]) for the classic case.
[3] For background, see Conroy 1995; Bartlett (this issue); Gordon (this issue).

judicial review of regulators' capital adequacy determinations, and in FDIC v. Coushatta (930 F.2d 1122 [1991]), the Court of Appeals for the Fifth Circuit so held. In that case, the FDIC had ordered another bank to raise capital, and the Court rejected the bank's arguments that the order was arbitrary and capricious, holding that the ILSA's grant of discretion to regulatory agencies superseded the normal arbitrary and capricious standard of the APA.

In a later case, Frontier State Bank Oklahoma City v. FDIC (702 F.3d 588, 596-97 [2012]), a Court explained why judges should not second-guess regulators' determinations of capital requirements. "The amount of capital a bank needs to weather uncertainty is a subjective judgment dependent on an informed analysis of the magnitude and likelihood of the attendant risks…. Reasonable minds will differ as to appropriate capital levels because they reasonably differ on their assessment of the attendant risks." The Court evidently believed that regulators rely on intuition or hidden factors that they could not be expected to articulate in an objective fashion.

As a result, regulatory agencies have not needed to worry that courts will reject capital adequacy regulations under the APA. As an example, in 1985 the FDIC issued capital adequacy regulations that raised the minimum capital-assets ratio to 6 percent for primary capital and 5.5 percent for total capital (Federal Deposit Insurance Corporation, Capital Maintenance, 50 FR 11128-01 (1985)). The FDIC gave a number of general reasons, arguing that risk in the banking system had increased in recent years as a result of the deregulation of interest rates, competition to supply financial services had intensified, bank profits had declined, and various economic shocks had struck. It did not estimate the compliance costs for banks, or the benefits for the economy from the reduction of bank risk. Thus, it gave no reasons why the ratios should be 6 and 5.5 percent rather than 6.5 and 6 percent, or any other pair of numbers.

The Office of the Comptroller of the Currency, unlike the other financial regulators, is a regular agency, not independent, and thus it must perform BCAs. But its BCAs are wholly inadequate. In 2008, it issued revisions of its capital adequacy regulations along with an accompanying BCA that failed to quantify any of the expected benefits of the regulation. And while it did quantify the trivial administrative costs to banks of implementing the regulations, it ignored the much larger opportunity costs (Office of the Comptroller of the Currency 2008).

2. The *Business Roundtable* Decision

In Business Roundtable, an industry group challenged the SEC's rule 14a-11, known as the proxy access rule. Rule 14a-11 required that prior to board elections, public corporations must place on the proxy statement a limited number of candidates for director positions nominated by certain large shareholders. The purpose of rule 14a-11 was to loosen management's control over the firm's directors. Shareholders are generally permitted to nominate directors, but without proxy access they typically face insurmountable costs to informing other shareholders of their nominations. With proxy access, these costs are reduced, creating a realistic possibility that outsiders can challenge management-nominated directors, and thus impose some discipline on management.[4]

[4] For helpful background on the rule, see Fisch 2013.

There is no question that the SEC possessed the legal authority to issue this rule, both under older statutes and under the Dodd-Frank Act. The D.C. Circuit struck down the rule because it was "arbitrary and capricious" under the Administrative Procedure Act, based on the SEC's failure to consider the rule's effect on "efficiency, competition, and capital formation," as required by the Exchange Act and the Investment Company Act of 1940.[5]

The Court objected to the SEC's failure to justify Rule 14a-11 with a rigorous cost-benefit analysis. The SEC justified the rule based on its expectation that the rule would reduce the cost to shareholders of nominating and electing their own directors by allowing them to avoid some of the costs of printing and postage that would be necessary in normal proxy contests. This cost reduction would in turn improve board performance, and hence corporate performance, by raising the probability that a poorly performing board will be replaced. On the cost side, the SEC acknowledged that the corporation would incur additional disclosure, printing, and mailing costs; and that management could be distracted by challenges from disgruntled shareholders. Without estimating the monetary value of these benefits and the costs, the SEC concluded that the rule was cost-justified.

The Court rejected the cost-benefit analysis because the benefits and costs were not monetized, and the SEC failed to provide a justification for the failure to monetize costs and benefits. It also made a number of specific criticisms. The SEC had discounted the claims that companies would incur costs opposing shareholder-nominated candidates because bad-faith opposition would violate the director's fiduciary duties, but in doing so it failed to consider that some shareholder-nominated candidates might be worse than the board's candidates, in which case the board would be required to oppose them. The SEC also claimed that the cost of the rule would be low because elections would be infrequent, but failed to recognize that therefore the benefits would be low.[6] The SEC selectively cited empirical studies that supported the proxy access rule and discounted studies that suggested it would not be cost-justified. The SEC refused to consider commenters' argument that the rule would enable union and state pension funds to gain concessions by threatening boards with candidates who would act in the interests of unions and pension funds rather than shareholders as a whole. The SEC's estimate of the number of election contests was internally inconsistent. And the SEC refused to consider special factors involved in the application of the rule to investment companies.

Legal commentators have criticized the opinion.[7] Many of the complaints center on whether the Court acted consistently with legal precedent, but the focus of the criticism is that the Court put an excessive burden on the SEC—a burden so large that it will hardly ever be able to issue regulations. There are already so many bureaucratic and legal hurdles faced by the SEC that it simply cannot issue many regulations that are in the public interest.[8] Accordingly, it focuses on the low-hanging fruit and thus there is good reason to believe that the regulations it

[5] See 15 U.S.C. §§ 78c(f), 80a-2(c) (1934).
[6] Id. The Court does not discuss the possibility that once directors believe that they can be replaced, their performance will improve, so that shareholders will not challenge them with outside nominations. But the SEC does not appear to have considered this possibility, either.
[7] See, e.g., Hayden & Bodie 2012. Coates 28 & n.109 (2014) summarizes the response and cites the literature.
[8] See Fisch 2013 for description of these hurdles.

does issue are presumptively in the public interest. The Court's standard imposes additional requirements that would make such regulation impossible.

These pragmatic arguments are understandable, and even proponents of BCA need to recognize that if it is excessively costly to perform a BCA, then agencies should not be required to use it, or should be permitted to use a summary version that minimizes decision costs. To see why, assume that an agency can improve a BCA by doing additional data collection and analysis, and that as the investment in the BCA increases, the marginal benefits (in the form of accuracy) decline, as is surely the case. If a Court demands excessively good BCAs, then agencies will run out of resources without being able to regulate, even though a less than perfect BCA may still produce an acceptable level of error. The complaint against Business Roundtable is that it imposes excessively high standards, apparently confirmed by a subsequent event study that suggests that the proxy access rule was in fact socially beneficial (Becker et al. 2012).

The problem with this argument is that the SEC's analysis *was* in fact extremely crude. Although some of the Court's criticisms were unfair, the bottom line is that the SEC did not monetize the expected benefits and costs of the rule, and therefore had no basis for claiming that the rule complied with a benefit-cost analysis, and hence served the public interest. Rather than criticize the D.C. Circuit for striking down the proxy-access rule, and assert that it should not have required the SEC to comply with a BCA, we argue that the SEC should rise to the challenge posed by the Court, and offer BCAs that would survive judicial scrutiny.

Business Roundtable does not spell the end of all financial regulation. As we have seen, much financial regulation—including capital-asset regulation—does not fall under the APA's arbitrary and capricious standard, and so is not governed by that case. But certainly a large portion of financial regulation is at risk. And even more could be subject to BCA if a proposed bill were enacted by Congress.[9] Moreover, there are good reasons for financial regulators to use BCA even if they are not required to do so by Congress or the courts. We turn to those reasons now.

C. The Case for BCA

The debate about BCA has raged for decades. In the 1970s, economists debated whether BCA reliably advances a correct moral principle like the Pareto efficiency, Kaldor-Hicks efficiency, or a suitable social welfare function. After President Reagan's executive order, the debate was taken up by policy analysts and law professors. We can only provide a brief summary of the case for BCA in the space allotted to us.

BCA is a decision-procedure, which is justified if and only if its use by regulators advances the public good, however defined (Adler & Posner 2006) Early research pointed out that BCA does not systematically advance Pareto efficiency or Kaldor-Hicks efficiency, but this work was largely beside the point. The relevant question is (1) whether some other decision-procedure would work better at advancing (2) the relevant public good.

[9] Financial Regulatory Responsibility Act of 2013, which was cosponsored by Senators Crapo and Shelby.

Early researches rarely defined what that other decision-procedure would be. But if one looks at what agencies actually did, one saw two basic approaches. The first, which might be called "intuitive balancing," involved weighing, in a non-rigorous way, the likely positive and negative effects of a regulation, without using valuations, much as an ordinary person might evaluate the morality of a proposed course of action. The second was the more formal but still somewhat vague "feasibility analysis," where the agency adopted the strictest regulation consistent with avoiding excessive job loss, where "excessive" was left undefined.

BCA is superior to intuitive balancing because measuring and quantifying possible outcomes is superior to not measuring those outcomes. A regulator will simply have no idea how much harm a pollutant does to people's lungs, or how much harm a higher price for automobiles will harm consumers, unless it measures these effects. Nor will the regulator be able to balance in a rigorous way unless the outcomes are put on a common metric. BCA uses money as that metric. BCA is superior to feasibility analysis because feasibility analysis excludes morally relevant effects of regulations, such as the harm to consumers through higher prices. Moreover, feasibility analysis is arbitrary because it does not specify the threshold at which job loss is tolerable or intolerable.

Critics of BCA argued in reply that (1) many outcomes (like death, or environmental damage) cannot be given monetary values; (2) the money metric distorts evaluations by giving excessive influence to the wealthy; and (3) BCA assumes a utilitarian social welfare function, which is not a plausible representation of the common good.

None of these arguments have prevailed in public debates. Economists have developed a number of admittedly imperfect ways for valuing outcomes that are not normally monetized. They seem to be good enough. While it is true that the money metric distorts evaluations, the distortion is likely to be small for most regulations; it can be (and sometimes is) corrected by adjusting valuations (as is done with valuation of mortality risk); and if outcomes systematically harm the poor, redistribution can correct for this. And while BCA does assume a utilitarian social welfare function and ignores deontological constraints that play an important role in public morality, it is simply a tool for enabling the government to accomplish the uncontroversial task of promoting the common good, which seems to be a roughly utilitarian (or welfarist) goal. Where BCA deviates from public morality (for example, in incorporating anti-social preferences), it can be corrected.

In addition to this general defense of BCA, defenders have pointed out a number of second-order advantages.

Transparency. BCA enhances transparency by forcing agencies to clearly specify the empirical basis of their regulations. Principals can verify the BCA by obtaining the information on which the agency relied—typically from public sources or independent contractors who conducted surveys. This makes it difficult for agencies to issue regulations on ideological, political, or other improper grounds.

Limiting gaming. When regulators issue rules that do not reflect a BCA evaluation, it is sometimes hard to understand what goal those rules advance. This makes it easy for regulated

entities to "game" the rules: to take actions that violate the spirit while complying with the letter. Rules are harder to circumvent when the justification behind them is clear. If a rule is justified clearly by BCA principles, then regulators can respond flexibly to gaming by updating the rule, using interpretive guidance documents, so that it more fully embodies the underlying justification.

Consistency across regulatory agencies. Regulatory agencies often have overlapping jurisdictions, and so a risk arises that they may regulate firms inconsistently. While they can and do coordinate with each other, coordination is not always easy. This seems to be a major problem now in the way CFTC and SEC treat differently the threats from high speed trading and speculation. Similarly, OCC and FDIC have different and conflicting emphases on the importance of traditional prudential regulation versus addressing systemic risk. As Cochrane (this issue) emphasizes, one of the worst problems with regulation thus far has been this inconsistency. Each agency has promoted its own aims: consumer protection, micro-prudence, etc., each often at the expense of other agencies and without taking into account the ways that different rules may interact with each other. Much of this incoherence would be reduced, and stronger conversations across agencies could be created, by forcing them to use a consistent BCA protocol.

Avoiding regulatory shopping. On different issues, different regulators are strict to different degrees. During the lead-up to the crisis this led to shopping by institutions for the regulators that were most favorable and consequent competition by regulators to weaken rules to attract regulated parties. This is a particularly worrying issue given the vagueness of definitions under Dodd-Frank; derivatives can easily move from being swaps to being securities based on minor reclassifications. Forcing all agencies to use consistent standards for judging welfare effects of various actions and products would make arbitrage much harder.

Motivating regulators with a sense of mission. Some government agencies have clear missions that attract passionate, committed, and highly competent people. The military is an obvious example; so is the EPA, which protects people from environmental harm, and the Justice Department, which attracts top lawyers who want to make their name sending criminals to jail, breaking up cartels, and so on. The financial agencies (perhaps with the exceptions of the Fed and the Consumer Financial Protection Bureau) have had less success attracting top talent, partly, we suspect, because their mission is less well-defined. Part of the benefit of developing principles for a financial BCA is that it will help clarify the nature of bad financial behavior, and hence the missions of the financial agencies.

II. BCA and Financial Regulation

The question now is whether these defenses of BCA, which have largely carried the day for other areas of regulation, carry over to financial regulation. We argue that the same justifications for standardized, centrally monitored BCA for non-financial regulations apply to financial regulation.

A. Objections to BCA in Finance and Some Responses

The objections to BCA for financial regulation are diverse. We briefly describe them here and our responses.

No welfare standards exist and are accepted in finance. As discussed by Weyl (2013), when antitrust analysis first took its economic turn in the late 1970s, empirical analysis of mergers and certainly of other anticompetitive conduct was in its infancy. Weyl argues that because of the large incentives that the economic-based regime of regulation created for consulting services and expert witnesses, a large literature providing details of how to analyze these issues grew up. In follow-on work with James Evans, Weyl is investigating this claim empirically. Similar things are plausibly true of BCA in environmental, health, and safety (EHS) regulation. It is hard to imagine how the field of environmental economics could have institutionalized itself without the financial support coming from damage assessments and BCAs in environmental regulation. Thus it is putting the cart before the horse to suggest that detailed empirical methods should exist on these issues when almost no public push has been made to create such methods. Evans and Weyl suggest this shift is already starting to occur within finance thanks to Dodd Frank and that a strong BCA framework would spur this forward. In the absence of BCA, on the other hand, much of this same expertise will be directed to gaming the spirit of existing rules on issues like capital, again as documented by Weyl.

Valuations in finance are harder to quantify. Cochrane argues that issues in finance are inherently harder to quantify than in other areas. This is far from obvious. Most losses in finance are by their nature financial and thus far less controversial and dependent on subjective valuations than are issues in EHS regulation. Furthermore, compared to the field of industrial organization that underlies the well-developed BCAs in antitrust policy, issues are far less industry-specific and fragmented because most financial institutions face basically similar market structures and issues. As such, ex-ante, one would think that quantification is easier using an economic framework in finance than in these other fields. BCA is particular well-suited to areas where centralized expert analysis tends to outperform decentralized, fragmented analysis; the question is not how hard quantification is but whether uncoordinated private agents will outperform centralized standards. Finance, like medicine (for the reasons we discuss in our other paper) seems like an area ideally suited to this because of the lack of subjective idiosyncratic valuations and unobserved heterogeneity, as well as the very complexity of the issues involved mathematically (as emphasized by Hansen). Finally, models of valuation in finance are far better developed than in areas covered by EHS and antitrust regulation, where large components of valuation are subjective and require difficult demand estimation. Models of risk-preferences, which are the only central subjective component in finance, are far more fully developed.

Analyses will be incomplete and neglect too many relevant issues. As Gordon, and to a lesser extent Cochrane, emphasizes, BCA analyses are likely to leave out many of the complicated and harder-to-quantify factors that may be important in judging financial regulation. This is certainly true, but also applies at least as strongly to EHS and antitrust. The former neglects all sorts of quality-of-life effects and the latter neglects crucial dynamic effects on innovation that may be even more important than the static effects on which policy typically rests; see Weyl and Tirole (2012) on the latter point. However, this is not really an argument against BCA; one would have to believe that alternative decision-making procedures would be more likely to address these issues and this seems implausible. Forcing explicit accounting for

each factor makes clearer what is neglected, not forcing it to be neglected, and stimulates the development of methods that allow these to be analyzed, as illustrated by Carpenter's contribution. Absent BCA we would expect more subjective and unaccountable criteria to be used in decision-making that would be much more likely to follow a single, inconsistent-across-agencies consideration (Sunstein, 2000; Kahneman, 2011).

BCA mandates will shut down regulation because of resource burden. Bartlett (this issue) and Gordon (this issue) worry that BCA will shut down regulation because BCAs are too difficult for agencies to perform. Critics of *Business Roundtable* have made a similar point. However, exactly the same argument was made when President Reagan ordered regulatory agencies to perform BCAs in 1981, and thousands of regulations have been issued and approved since then. BCA persuaded the Reagan administration to regulate chlorofluorocarbon emissions in order to halt the expansion of the ozone hole, and to push for a treaty regime that compelled other countries to do the same. Today, BCA has played an important role in climate regulation despite the extraordinary uncertainties associated with greenhouse gas emissions.

However, we acknowledge that the standard in *Business Roundtable* placed too much of the burden on the agencies, given their current administrative capacity and funding. The decision presumes that it is the responsibility of the agencies to quantify all factors, including potential costs raised by parties, rather than requiring parties to supply evidence for the costs they believe should be cognized. Such burdens are incommensurate to the resources available to each side under current agency funding and may also be inconsistent with a reasonable judgment of where on average benefits and costs will lie in an individual rule-making.

For example, in the sphere of financial innovation where a strong case can be made that most recent advances have been harmful rather than beneficial, we would rather see burdens lying with regulated parties. We have advocated pre-approval regulation of new financial derivatives (Posner and Weyl, 2013c) under which an applicant would be required to persuade an approval authority that the benefits of an innovation exceeded its costs. It would be impractical and undesirable for burdens to rest primarily on the private sector in all, or even most, other matters. More broadly, though, we believe burdens should be calibrated to mobilize the maximum number of analytic resources and reach, on average, the best possible decisions. In the interest of both issues, particularly because of the powerful consulting industry that has developed to support private party filings in areas like antitrust, it is unlikely that placing all burdens on the agencies is optimal.

None of this, however, speaks to the value of BCA, only to what agents should have the responsibility to provide relevant evidence. Optimally setting burdens on parties and agencies, while an important problem, is clearly separable from whether and how BCAs should be conducted.

Finance is central to the economy, "social and political," and "non-stationary." In a recent paper, Coates (2013) offers these reasons against BCA of financial regulation. We are skeptical. Coates doesn't explain why it matters for BCA whether an area of regulation is central to the economy or not, but in any event antitrust regulation, which is also central to the economy, has been successfully subjected to BCA principles. His next point, which is that financial

regulation targets groups of people, while non-financial regulation does not, is wrong. All types of regulation target groups of people and must therefore anticipate how those people might change their behavior in response to regulation. In particular, antitrust regulation is profoundly political in that it influences the concentration of financial and economic influence and thus the ability of firms to effectively coordinate their attempts to lobby the state. Environmental regulation not only elicits responses from firms, but environmental organizations like Sierra Club, which choose lobbying and litigation strategies based on the regulatory status quo. Finally, Coates' claim that the underlying regularities that financial agencies seek to control are less "stationary" or more unstable than the underling regularities that other agencies seek to control may well be true; but, if so, this is a problem for *regulation*, not for *BCA*. The problem here is that investment banks can often easily circumvent regulations by redesigning financial instruments—while it is harder to redesign plants in order circumvent environment regulations. But if regulation can never block bad behavior but instead just causes bad behavior to take new forms, then regulation is a waste of money and should be abandoned. We doubt that Coates really takes this view; we don't. In any case the degree of such non-stationarity is precisely the sort of factor economic analysis is good at quantifying; it underlay, for example, Nobel laureate Robert Lucas's work on econometric forecasting. Increased work on BCA will improve that clarity of debate on this issue as well as others.

B. Principles for BCA of Financial Regulations

The substance of a regime of financial BCA comes from the core principles that define the primary benefits and harms possible from regulation and the private activities that they regulate. Once the usually easy-to-quantify compliance costs of regulations are added to these, a workable basis for benefit-cost analysis exists.

We organized our discussion around four fundamental themes that we see as the central factors BCA must account for: the externalities of excessive risk-taking by financial institutions, the value of information provided by markets, the capacity of markets to either mitigate or exacerbate risks, and the benefits and costs of increased credit availability to consumers. In each of these areas the conference participants made important contributions both to furthering knowledge and distilling the state of the art in the economics literature. We now extract the crucial lessons from each paper and formulate them into simple doctrines that can serve as a foundation for BCA in practice.

1. Capital and Risk

Lars Hansen begins the analysis of capital regulations by reinforcing our basic point that in complex environments, complex policies are not typically optimal.[10] Complex environments are often sensitive to over-fitting. Policies and mechanisms accommodated to all the complexities of a particular situation are likely to be extremely sensitive to even small changes in that setting and most complex environments are not only complex, but highly variable. What is needed, therefore, is not complexity but rather robustness. Simple, even naïve, principles that are hard to game and perform tolerably well in a wide range of circumstances are actually much

[10] Hansen was unable to publish his paper; our discussion is based on his oral presentation at the conference.

more likely to succeed in complex environments than are rules that uses a range of details to fit features of a particular set of circumstances.

John Cochrane builds off of this basic point to highlight a number of the complexities that arise in the context of financial regulation and to which policies must be robust. One of these is the fact that many existing policies are sub-optimal and often in ways that are inconsistent with other existing policies. Interventions that sensitively rely on other policies being set optimally or on controlling the full policy environment are unlikely to succeed. Cochrane highlights another costs of complex and detailed rules: by raising the costs of compliance they increase barriers to entry, leading to consolidation and thus market power. This concentration has several harmful effects: it raises prices and reduces efficiency for the standard industrial organization reasons; it reduces the collective action problem of the concentrated firms in capturing regulators; and it increases the ability of large firms to claim they are too big to fail and thus encourages them further to take excessive risk. Cochrane thus emphasizes the importance of identifying and focusing on the most central market failures rather than trying to address all potential concerns and of establishing clear and consistent standards for evaluating the magnitude of these concerns and the extent to which they are addressed or exacerbated by regulations.

Anat Admati provides a clear account of the nature of the most important market failure in finance. The equity holders of banks and their agents have excessive incentives to take on debt and other commitments to make payments that risk throwing them into bankruptcy. The reason is that the equity holders and usually employees of a bank receive the upside of financial risk, but its downside ends up either with bondholders or with governments that feel obliged to aid these bond holders to avoid the spread of panic throughout the banking system that could trigger a run in the spirit of Diamond and Dybvig (1983). Because bond holders typically have less say in a bank's governance than do equity holders who have voting rights, this tends to lead banks and their agents to act in an inefficiently risk-seeking manner, especially when the government is asleep at the wheel in its role of restricting banks behavior. The more indebted a bank becomes, the stronger is the incentive to gamble because the larger is the downside absorbed by the taxpayer or bond holders relative to the upside absorbed by the owners and employees. That is, the larger debt is, the more the bank is gambling with other people's money.

This fundamental principle applies not only to debt itself but also to a variety of other actions that banks take. For example, offering insurance against another firm's default by selling a credit default swap (CDS) does not sound like leverage, but it exposes the bank to a potentially very large loss (based on a commitment to pay) while offering it a small gain. It is particularly attractive to a bank's equity holders and managers to concentrate all such losses into cases when the bank will be in default anyway, because in that case they do not bear the loses. Thus the bank will have an interest in ensuring that the correlation of their positions is extremely high: uncorrelated risks have no value to them, but correlated ones allow them to dump losses onto the public. These incentives are precisely the opposite of those that would be pursued by an individual attempting to prudently minimize risks while increasing returns and thus the simple and perhaps fundamental objective of public policy towards institutions that could potentially create a run should be, along a variety of dimensions, to ensure that they behave in a risk-averse rather than risk-seeking fashion. Capital regulations, as Admati argues, play an important role in achieving this goal, but so do other attempts to reduce speculation and increase insurance in

markets, as we discuss in the next section. Thus, regulations that apply to capital and regulations that apply to these other activities must be consistent. Benefit-cost principles provide a key way of ensuring consistency.

2. Speculation and Insurance in Markets

Thus banks will tend to have a socially harmful incentive to ignore or even magnify their exposure to risk while pursuing maximal returns in the market. A primary dimension along which policy should be judged is the ability to limit this dumping of losses onto creditors and the state. However, as Gabrielle Gayer, Tzachi Gilboa, Larry Samuelson and David Schmeidler argue in their contribution, there are other potentially excessive sources of speculation.

Many individuals in financial markets effectively gamble with one another based on divergent views they hold about the economy and assets within it. Unless it systematically causes asset prices to better reflect information that is relevant to economic decisions (more on which in the next section), such gambling is a negative-sum game. As Weyl (2007) and Simsek (2013a,b) argue, it increases the risk faced by both agents, which is harmful because they are risk averse, and can at most benefit one of the agents who makes more money at the expense of the other agent. Of course, both individuals in such a bet are consenting adults and restricting them from engaging in such a gamble may be viewed as paternalistic, though it is a form of paternalism that most societies throughout history have engaged in. Gayer et al. do not argue that such negative-sum gambles should be counted as a social loss, but they are open to this possibility. However, they do argue that such a gamble should not be counted as a social gain, as are trades in the market between two individuals who achieve mutual benefit from a trade either by exchanging goods and services or by offering insurance to one another against risks they face. Even if one does not recognize all loses from such trade, this introduces a sound, economic foundation for a fundamental distinction recognized by most lay people between speculative gambling in markets and hedging that is used to insure against risks. For an argument that the losses from such negative-sum speculation should be counted as social costs to figure in benefit-cost analysis see Brunnermeier, Simsek and Xiong (2012).

In his contribution, Darrell Duffie emphasizes that the externalities of risks in systemic institutions and the social costs of negative-sum speculation suggest a basic principle that financial regulation should attempt to lean against market forces seeking to increase and concentrate risk in the financial system and should view as benefits any role the system can play in reducing and diffusing these risks. He argues that the attempt to reduce risk at banks is on firmer and clearer philosophical grounds than the potentially paternalistic motives about which Gilboa et al. are also ambivalent. Posner and Weyl (2013c) also emphasize that agency problems in the monitoring of investments made by professional investment managers may create other inappropriate speculative motives. However Duffie highlights that, in practice, much of the precise foundation of the benefits of such risk-reduction may be moot because the larger difficulty will be informational: determining when various types of trades are risk-increasing rather than risk-reducing. The basic difficulty faced by the regulator is that in order to determine whether the purchase of a particular asset increases or decreases the risk faced by the purchaser, it must know the entire portfolio of that purchaser.

This empirical difficulty is addressed by Ing-Haw Cheng and Wei Xiong. They emphasize that the standard classifications of market participants into the categories of "speculators" and "hedgers" by government agencies align very poorly with the economically relevant distinction, reducing versus increasing risk, emphasized above. In particular, they use transactional data to show that many so-called hedgers in commodity markets appear to take bets on prices of commodities that are insensitive to their current exposure, and sensitive to prices, in manners that seem inconsistent with risk-averting behavior by net producers and highly consistent with taking positional bets based on a view they have about where prices are likely to go. Conversely, many "speculators" simply facilitate the genuine insurance hedging behavior of market participants over time or across markets. Thus, rather than basing evaluations of hedging and speculation behavior on the names agents are given or how they register with agencies, BCA of financial regulation should base them on empirical data regarding the agents' actual positions and how their actions are likely therefore to affect their exposure to risk, as emphasized by Duffie. However, Cheng and Xiong show how to empirically use information available to the agencies to identify behavior that may not be risk-averting and thus is likely to call for regulatory action or at least reclassification. Thus, regulators may well be able to overcome some of the informational difficulties Duffie raises.

3. Information from Markets and Regulation

One important source of information that regulators rely on is the markets themselves and important potential cost of regulation is impeding this flow of information. Market prices reflect a wide range of information gathered by diffuse individuals about future events and regulation may limit the ability of individuals to incorporate their information into market prices.

Eric Budish, Peter Cramton, and John Shim emphasize the dark side of markets' tendency to incorporate information.[11] In particular, as emphasized by Hirshleifer (1971), there may be excessive incentives to invest in acquiring and incorporating information into prices. Individuals continually seek to be faster than other individuals in achieving this goal, even if this additional speed does little to benefit actual economic decisions. An individual able to beat others to a lucrative piece of information can make a significant arbitrage profit even if there is no decision that needs to be made in the interval between the these two individuals affecting the market price. These economic decisions are the only reason society gains from this additional information and thus any investment in acceleration beyond the horizon of this decision is wasteful. Budish et al. focus on a particularly extreme version of this acceleration, where large profits can be made based on acceleration at the millisecond level. This allows them to quantify the potential waste created by this acceleration of trading and to propose a sensible reform, a frequent but not continuous auction, to clear markets efficiently without allowing the high-frequency race to persist. But the principles and methods they highlight offer a powerful and more general method for evaluating the potential profits, and therefore waste, that can arise from accelerating the pace of markets beyond what agents making real economic decisions can create social value from incorporating into their decisions.

[11] As with Hansen, Budish et al. were not able to produce a paper for this volume. This discussion is based on their oral presentation and on their paper, Budish et al. (2013).

Their method is to study the failure of correlation between markets that should move closely together (the price of an identical stock or currency in two different cities at the same moment, for example) at very short time intervals. This lack of correlation creates a profit opportunity from buying the cheaper and selling the more expensive of the two assets. Because the time over which these trades occur is so small, any social benefit of incorporating the information is likely to be miniscule. Furthermore most of the profits obtained through such trading are dissipated through wasteful expenditures to obtain the profits: on computers, on fiber links between the cities (hundreds of millions of dollars were spent shortening the Chicago-New York connection by milliseconds) and on talented staff. While the Budish et al. analysis applies only to these very short-term arbitrages, similar methods could be applied to very small arbitrages or very rapid imperfect arbitrages, all of which are unlikely to bring much if any social value. Revenue eliminated from these sources should not be counted as a social cost, therefore. In fact, an important benefit of regulations that limit frequent and trivial arbitrages is to eliminate this revenue so as to avoid the costly waste it encourages.

If some information acquisition in markets has proved to be a significant cost, Thomas Philippon's contribution emphasizes that many of the claimed benefits of financial innovation and arbitrage in creating useful information are illusory. As markets continually accelerate, innovative financial products proliferate and arbitrage expands its profitability, Philippon finds these activities have brought few or no gains in terms of allowing asset prices to actually predict the future more accurately (over time horizons relevant to decision making) and therefore offer valuable additional information to businesses and policy-makers. In fact, Philippon finds that as the financial sector has increasingly been consuming a larger fraction of GDP it has actually grown less efficient in providing capital to business while it has gotten no more accurate in predicting future asset prices and therefore allocating capital to the most deserving projects. Thus, regulations limiting innovation may not limit the valuable production of information and efficient allocation of capital. While Budish et al. show that the costs of excessive information acquisition in unregulated markets may be much greater than they appeared, the benefits of information acquisition seem likely to be much smaller than they appeared. Thus the benefits of regulation aimed at stopping the former and the costs of regulation that unintentionally limits the latter are likely larger and smaller than hoped and feared respectively.

Matt Spitzer and Eric Talley emphasize that not only markets, but regulations themselves can bring important information benefits that should be recognized in BCA. New regulations are effectively experiments whose outcome provides valuable information to future regulators about the effectiveness of various interventions. Thus while one might be concerned that a regulatory intervention might limit information flow from the markets, regulators should also take into account what they and the markets will learn from trying out new forms of regulation and learning about them. Given the limited information that markets appear to provide as discussed above, the informational benefits of regulatory experimentation itself may be at least as great as the costs of regulation in limiting information flow through the markets. Thus many, especially novel, regulatory interventions may actually on net bring a benefit by increasing rather than retarding information. This reinforces Weyl's argument that rigorous, BCA and economics-based regulation may stimulate the production of research that is useful for improving such regulation.

4. Evaluating and Regulating Consumer Credit

Perhaps the most important other concern about regulation is the limit it can place on the supply of credit to consumers and firms. Much regulation prior to the crisis, in fact, as emphasized by Cochrane, was actually aimed at increasing access to credit by encouraging risk-taking behavior by financial institutions. Such a regulatory approach is inconsistent with many of the principles outlined above and thus the social value of consumer access to credit is a crucial cost to weigh in BCA against the regulatory benefits described above.

As Jonathan Zinman argues, however, the benefits of additional consumer credit are far from clear in existing literature. The most prominent theories of why credit may be under-supplied rely either on failures of regulation or asymmetric information. Yet as Cochrane emphasizes, regulators have bent over backwards to make credit available and significant recent evidence indicates that asymmetric information may actually lead to credit being oversupplied because of advantageous selection (see, for example, Einav et al., 2012). Much other theory and evidence also points to credit being oversupplied. Present bias among consumers may lead them to over-borrow, especially for tempting items. Imperfect credit monitoring can create externalities across lenders and lead to overleverage of consumers. Deceptive designs of credit products may also lead to excessive credit. All of these forces suggest that that, if anything, credit supply is likely to be too loose rather than too tight on net. This contrasts sharply with the common assumption that credit is undersupplied that underlies much of the analysis justifying regulatory actions to subsidize credit. While Zinman highlights some specific, targeted interventions that may be useful in correcting the balance of credit in both directions, broad interventions to increase credit supply seem unlikely to bring social benefits and may bring some social harm. In regulatory actions targeted directly at consumer credit, balancing and estimating the broad range of issues Zinman raises is likely to be crucial for determining the benefits and costs of policies. However, in other areas of regulation that touch only in an indirect and limited way on the supply of credit and are not targeted at specific problems, to a first approximation we believe that BCA should disregard any external costs of regulations that limit credit unless compelling, case-specific information is available. Of course, costs to firm profits must be taken into account, but there does not seem to be significant net external benefit of increasing access to credit and thus direct effects on consumer credit should not be considered.

In areas directly related to the targeted regulation of consumer credit, Sumit Agarwal, Souphala Chomsisengphet, Neale Mahoney and Johannes Stroebel take up Zinman's last point about the deceptive design of consumer financial products. Recent regulations have aimed to reduce hidden or deceptive fees and many have argued that an unintended cost of such regulations may be a "waterbed effect" whereby pushing down these fees interest rates or other fees rise in response. They provide a simple theoretical framework that can be used to calculate the net consumer welfare effects of fee-reducing regulation in this context. This provides an important basis for BCA of such regulations to consider the indirect costs of such regulations. In other (Agarwal et al. 2014), they show that in practice one example of such regulation, the 2009 CARD Act regulating credit, appears to have had almost no significant waterbed effect, leading nearly all of the fee reduction to be real rather than just apparent. This suggests that direct regulation of consumer financial products to address some of the concerns Zinman raises may not have the severe offsetting, unintended consequences that some may have feared. On the other hand, beyond the transfer that such regulations create between firms and consumers, which

should not typically be counted in a BCA, the only social gain from such regulations is reducing the cost of, and therefore increasing access to, credit for consumers. Again we believe that such benefits are minimal and thus that they should not be included in BCAs. As a result, we take the Agarwal et al. argument as a useful framework and an important structural point about regulation, but it does not directly suggest or refute costs that should be included in BCAs.

On the other hand, Omri Ben-Shahar and Carl Schneider argue that many more indirect approaches to regulation, which were popular especially prior to the crisis, are much more costly, especially compared to direct regulation, than was thought. Ben-Shahar and Schneider argue that disclosure regulations, which have often been thought to be a particularly safe form of regulation because they merely inform consumers rather than restrict their behavior, are often counterproductive because they overload consumers with information that leads them to disregard even more valuable information. Ben-Shahar and Schneider argue that this tax on consumers' attention and thus on the amount of information from other sources absorbed, should be recognized as a cost of mandated disclosures. Because disclosures are, like the information produced by markets, useful only if they actually lead to changes in behavior, disclosures may be over-produced not just under-produced by the market and certainly by naïve regulators focused on consumer sovereignty rather than good decision-making. Together the Agarwal et al. piece and the Ben-Shahar and Schneider piece suggest that direct restrictions on consumer products or nudges that are easy for consumers to process may be much more valuable than are tools for "consumer empowerment" that are likely to be ignored. Furthermore the severe limitations they emphasize on consumer cognitive capacity reinforce Zinman's message that consumer credit is if anything likely to be over-supplied.[12] This in turn reinforces the fundamental principle we have emphasized throughout: that BCA should focus on measuring the benefits regulations bring in increasing the extent to which agents throughout the financial sector act like rational risk-averters.

C. Goals for Implementation

Thus we can distill the message coming out of all the papers as follows:

1. It is crucial in a complex world for regulation to be based on simple and robust principles. The most fundamental of these is that agents taking on risk in the financial sector often causes externalities. In particular, two external harms are most prominent: the fact that losses in states of default are likely to be absorbed by taxpayers, rather than agents controlling the firm, and thus should be counted as social loss; and the fact that such losses may lead to a disorderly bankruptcy precipitating a run in the case a bailout cannot be arranged quickly enough. A primary goal of BCA for financial regulation should be to quantify the impact of any regulation on the expected losses in bailout states and the probability of such losses triggering a crisis. The latter of which must be multiplied by the social loss associated with the crisis as we discuss in Posner and Weyl (2013b).

[12] We are thus skeptical that BCA should take into account loss-of-confidence and innovation costs in the consumer credit sector as Carpenter (this issue) argues, but we agree that it is an empirical question warranting additional research.

2. Agents, driven by differences in beliefs, may also engage in speculation that is, at least in aggregate, socially wasteful. Such speculation should at least not be counted as a benefit of allowing markets to operate unfettered simply because there is demand for it and there is a strong argument to be made that it should be treated as a cost that regulation can help eliminate. Empirical strategies for measuring such increase in risk are available based on the behavior that would be expected from a rational risk-averse agent. Sound economic models, rather than historical classifications, should be used to determine the extent and size of zero- or negative-sum speculation.
3. The reduction in information supplied by markets as a result of regulation is likely to be minimal and may even be beneficial and there are potential informational benefits of experimenting with new regulation. Reductions in revenue from extremely short-lived or small arbitrages should not be allowable costs in BCA as they create little or no social value. Regulations that eliminate the cost of creating such revenue will thus tend to be desirable.
4. The other potential concern, the reduction of credit to consumers, may actually be a benefit. Thus, while direct losses of profits created by regulations that end up restricting credit should be recognized and the reduction in credit itself should not be counted as a benefit, neither should reduction in consumer credit count as a cost in most BCAs except targeted regulations that are directly designed to address clearly-measured market failures. Direct and targeted regulation of this credit supply seems likely to outperform indirect regulation via disclosure or aggregate increases in credit availability.

These principles provide a clear, simple and coherent paradigm for financial regulation in much the same way that the trade-off between life and health versus productivity does for EHS regulation and that the trade-off between anti-competitive agreements and efficiency-enhancing economies of scale do in antitrust. While these other regulatory regimes consider a wide range of additional costs and benefits, as we also believe BCA for financial regulation should (as discussed above), all focus on central factors and deemphasize other considerations (such as quality-of-life benefits in EHS regulation and impacts on dynamic entry into the industry in antitrust). The goal is to simplify regulation, so that regulators can manage it and regulated entities can predict it.

So too in BCA for financial regulation, in each area of financial regulation the primary emphasis in the BCA should be on a specific trade-off that is central to that area. For regulation of banks and other systemically important financial institutions, regulation should focus on the trade-off between the benefits of risk-reduction for these institutions and the costs of reduced profits, with the other potential benefits of regulation deemphasized. For regulation of high-speed trading, the focus should be on information externalities. For regulation of new derivatives, the focus should typically be on the social costs of speculation. And for consumer protection, the focus should be on the risks of undersupply of credit to consumers, although, as we have seen, we suspect these risks are typically low.

The key step is to institutionalize these principles, which we discuss in Part III.

D. Outline of a Sample Analysis

To illustrate the practical implications of our conclusions, we now briefly consider how an analysis of the benefits and costs of a stylized version of the Volcker Rule banning proprietary trading by banks might proceed. Costs would be straightforward to compute. They would simply be the profits, net of all generated costs (labor, site, capital investments, etc.) earned by the relevant banks' proprietary trading groups in an average year. This average could be determined using historical data.

The two primary benefits of such a rule would be 1) the reduction in losses in states of the world where the bank had to be bailed out and thus the losses were absorbed by the taxpayer and 2) the increase in the chance that a collapse could occur before a bailout could be arranged, causing an economic crisis such as the one triggered by Lehmann Brothers' collapse. The first benefit should be judged on the basis of a financial model employing historical data. The simplest metric for calibration would be the amount of losses, at the bottom of the market in late 2008, that resulted from banks' proprietary trading operations. All of these losses were essentially absorbed by TARP, at least when valued at the market prices during the slump. Eventually TARP and other government policies managed a sufficient recovery that the losses actually became gains, but losses should be valued at market prices at the time of the loss. These losses, passed on to the government in this default state, must be multiplied by the hazard rate of such a state on an annualized basis to compare them against annualized profits on the benefit side from proprietary trading. This hazard rate can again be estimated from historical data, particularly the data collected by Reinhart and Rogoff (2009). Note that netting out these publicly-absorbed losses eliminates the subsidy to the firm from the net costs of the regulation and thus *does not* illegitimately count profits that derive only from this subsidy as a cost of the regulation. Only profits net of this implicit subsidy (profits arising from inherent complementarities between proprietary trading and market making, for example) count as costs and if profits are less than the implicit subsidy the rule will be net beneficial.

The chance of an actual failure that is not bailed out successfully can be judged based on credit default swaps currently traded in the market and the effect of reductions in proprietary trading that have occurred historically (for various reasons such as take-over bids or internal reorganizations) on these. Event studies in the markets, based on changes in the CDS values when new leadership came to banks either from a position within the firm in proprietary trading or from a more conservative part of the bank less likely to engage in proprietary trading would be valuable. So too would evaluations of changes in the chance of default based on financial models of the distribution of payoffs in proprietary trading. These would generate an impact of the proprietary trading ban on the chance of a unsupported default. Then the impact of such an unsupported default on the chance of a crisis would have to be estimated. Again historical data would be useful here. A reference class of defaults of banks of similar size relative to the economy as a whole could be formed in the Reinhardt and Rogoff data and from it calculated the chance of such a disorderly bankruptcy triggering a crisis could be calculated. This in turn would be multiplied by the social cost of a crisis. In Posner and Weyl (2013b) we argue that $1-2 trillion for the social cost of a crisis is appropriate.

Coates (2013) argues that our other studies cast doubt on this figure by a large margin. The numbers that Coates cites as credible range up to $300 trillion, based on a hypothetical

discussion by the Bank of England's governor Andrew Haldane. While there is clearly significant room for debate on these issues, treating hypothetical upper bounds that are meant for the purposes of illustration as serious estimates obviously exaggerates greatly the range of uncertainty. $300 trillion is more than half of the world's wealth (Piketty and Zucman, 2014) or the equivalent of 30 million American lives at standard statistical value of human life. It seems almost impossible to imagine that the cost of this crisis is of this magnitude. Reasoning seriously about these numbers in this manner makes much clearer what assumptions are needed to justify the Volker Rule or its removal. The same is true for other key parameters, such as the chance of a potential default requiring a bailout as discussed above: probabilities that are much greater or much less than the roughly 2% per year emerging from the Reinhardt and Rogoff analysis are inconsistent with the number of crises over the last several hundred years at a high level of statistical significance.

The basic calculation would weigh these two benefits of eliminating proprietary trading from the banks' balance sheets against the cost to profits. A number of subsidiary benefits discussed above should also be analyzed in a more superficial way. Revenue earned in proprietary trading that is extremely short-term or based on large volumes of very small arbitrages should be heavily discounted or simply subtracted entirely from the cost to account for wasteful racing and informational arbitrage. Some effort might be made to weigh the costs of reducing insurance provision and benefits of reducing gambling facilitation to counterparties with which the bank's proprietary traders interact; however we suspect these would be quantitatively small compared with the main benefits and costs.

Finally, second-order, ripple effects should also be given some weight. Expenditures by banks to evade the rule and costs of enforcing it should be estimated; these should be divided by the probability that the rule will actually accomplish its goals, because if it does not then the enforcement costs will be magnified relative to the net gain from the rule having its intended effect. Costs from related speculative activity flowing to other unregulated institutions should be considered. Benefits of simplified resolution of the bank in the case it is not liquidated should be recognized based on recent experiences with firms like Lehmann Brothers.

As Coates notes, the valuations needed to perform this BCA are not easily determined. Existing studies are sparse; data are often scarce; and, because financial markets change rapidly, historical patterns can be only roughly predictive of future behavior. Regulators would need to fund additional studies before they could do high-quality BCAs, and so in the interim would need to rely largely on informed guesswork.

However, simply quantifying guesswork itself is likely to prove highly informative and to indicate where future research is most useful. Even if we accept the wide ranges of uncertainty Coates attributes to the cost of a crisis, it is possible that the Volcker Rule is justified even at the low end of this range. In this case, we would have learned that this uncertainty is not germane to the BCA of the Volcker Rule and that it should be approved in any case. It is also possible that the change in this parameter makes all the difference and thus new research in this area would be of particularly high value. Despite the extent of very great uncertainty about the statistical value of a human life, for example (ranging from just over a million dollars to tens of millions of dollars for a median income American; see Viscusi and Aldi, 2003) even limiting it to this range

has been powerful in eliminating some wasteful regulations and ensuring other beneficial ones overcome opposition. We expect the same to be true of key parameters in financial regulation.

III. Institutionalizing Financial BCA

If we can provide financial regulators with several protocols or blueprints for conducting financial BCAs, we will have made a great deal of progress. Simply drawing their attention to the relevant benefits and costs, and giving them a rough guide for calculating them, is a start. But we cannot expect financial regulators to produce high-quality BCAs of financial regulations unless they are given proper incentives and institutional support.

Regulators tend to do what they have done in the past unless given a strong external push to act differently. It was not until President Reagan issued his executive order in 1981 that the non-financial agencies took BCA seriously. *Business Roundtable* may well push financial regulators to conduct better BCAs, but so far the evidence is not encouraging. More likely, regulators will use indirect methods to regulate (for example, interpretive guidance) that evades judicial review, or possibly just stop regulating in certain areas.[13] And, as we have seen, some types of regulations are not subject to the heightened scrutiny illustrated by that case.

We can see two possible methods for encouraging regulators to use BCA. First, Congress could pass a law requiring that they do so. Such a bill has in fact been proposed by Senator Shelby. We are nervous about such an approach for reasons given by Bartlett (this issue): judicial enforcement of BCA is premature given the very limited knowledge so far as to how BCA of financial regulations should be conducted. Second, the president could issue a new executive order that requires financial regulators to conduct BCAs and backing it up with meaningful threats to block regulations that fail BCAs. However, it is not clear that the president has the legal authority to do this. Moreover, since he cannot fire regulators at independent agencies, it is not clear that an executive order would affect behavior as emphasized by Bartlett. Perhaps a combination of these approaches, in which OIRA was legislatively given some authority to reject BCAs that were not up to standard even at independent agencies, would be desirable.

Regulators can also be encouraged with better institutional support. Here, we believe that clear progress can be made. One possible approach is for the president to create a department within OIRA and give it the specific mission of coordinating BCA among the financial agencies. Working with the financial regulators, this department would draft a protocol for conducting benefit-cost analysis of financial regulations, analogous to OMB Circular A-4. The protocol would include common valuations, as discussed above, plus best practices for gathering data, using peer review, discounting, presenting information, and so on.

Another possible approach is for the president to order the Office of Financial Research to conduct these tasks. The OFR is a new office in Treasury; it was created by the Dodd-Frank Act. Its mission is to "improve the quality of financial data available to policymakers and to facilitate more robust and sophisticated analysis of the financial system."[14] Clearly, OFR could

[13] See CFTC press release 2013.
[14] http://www.treasury.gov/initiatives/ofr/about/Pages/default.aspx.

fund studies so as to improve valuations needed for financial BCRs, and it could help financial regulators use BCAs along the lines that we have suggested.

Conclusion

This paper lays out a framework and research program for improving benefit-cost analysis of financial regulations. Financial regulators can use this framework as a basis for collaboratively producing benefit-cost protocols, and for funding peer-reviewed research into valuations that are recurrently used in regulatory analysis.

While this paper was in process, John Coates (2013) released a working paper that is highly critical of BCA of financial regulations. We responded to some of his criticisms in Part II.B. Here we want to address his major argument, based on his case studies, which is that regulators should do "conceptual" BCAs but not "quantified" BCAs because the relevant valuations are too difficult to determine. Our view is that his case studies just show that economists have not yet spent enough time estimating valuations. As we argued before, if regulators were required to engage in BCA, they would be forced to pay for more studies, and economists would have incentives to conduct more of them. The fact that there are currently only limited studies means very little, only that financial BCA is at an early stage today, just as antitrust and environmental BCAs were at an early stage in the 1970s.

We also see very little difference between "conceptual BCA" and "quantified BCA." Quantified BCA just is conceptual BCA with the numbers filled in where they exist—and it is almost always true that some relevant numbers exist (such as compliance costs) even when all do not. Furthermore conceptual BCA almost always implicitly uses numerical bounds: if the cost of a crisis were really, as Coates suggests it might be, on the order of hundreds of trillions or even quadrillions of dollars, *any regulation that had any chance of reducing a crisis no matter how costly would be desirable*. A "conceptual" BCA rejecting this conclusion must implicitly be rejecting these preposterously large numbers. Furthermore even if financial regulators used conceptual BCA, that would be a radical advance over current practice. Thus, we see Coates as more a supporter than critic of financial BCAs. The major question is how to force regulators to gather more data and do more rigorous analysis. We agree with Coates that judicial review may be an excessively clumsy instrument for providing such an incentive. But we believe that there is clearly a lot of room for institutional development and improvement in the executive branch.

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