

# The Political Economy of Transparency: What makes disclosure policies effective?

by

Archon Fung  
David Weil  
Mary Graham  
Elena Fagotto



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Archon Fung  
David Weil  
Mary Graham  
Elena Fagotto

Archon Fung, Mary Graham and David Weil are co-Directors of the Transparency Policy Project at the A. Alfred Taubman Center for state and Local Government, John F. Kennedy School of Government. Archon Fung is Assistant Professor of Public Policy at Harvard University's John F. Kennedy School of Government. Mary Graham is a Fellow at the John F. Kennedy School of Government and a Visiting Fellow at the Brookings Institution in Washington, D.C. David Weil is Associate Professor of Economics at Boston University and a Research Fellow at the Taubman Center for State and Local Government. Elena Fagotto is the Senior Research Associate for the Project.

This is the twelfth paper in a series dedicated to understanding innovation in the public sector. The Roy and Lila Ash Institute for Democratic Governance and Innovation fosters excellence in government around the world in order to generate and strengthen democracy. Through its research, publications, curriculum support, global network, and awards program, the Ash Institute explores critical issues in democratic practice and effective governance. By engaging a broad, global community in which knowledge is shared, by generating and supporting research and curriculum materials, and by highlighting exemplary government programs, the Institute serves as a catalyst for successfully addressing many of the world's most pressing concerns and, in turn, improving the lives of its citizens.

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## I. Introduction

Transparency systems have emerged in recent years as a mainstream regulatory tool, an important development in social policy. Transparency systems, as we define them, are government mandates that require corporations or other organizations to provide the public with factual information about their products and practices. Disclosed information is structured for comparability and updated at regular intervals. Transparency systems always have regulatory purposes and such purposes vary widely. Systems have been designed to protect investors, improve public health and safety, reduce pollution, minimize corruption, and improve public services.

In the United States, nutritional labeling, public school report cards, restaurant grading systems, campaign finance disclosure, toxic pollution reporting, auto safety and fuel economy ratings, and corporate financial reporting are among scores of transparency systems created by federal and state legislators. Internationally, infectious disease reporting, food and tobacco labeling, and multi-national financial reporting are among the disclosure systems designed to further nations' shared aims.

A single idea unites these otherwise disparate systems. It is that public intervention to require the disclosure of factual information by companies, government agencies, and other organizations can create economic and political incentives that advance specific policy objectives. The rationale for government intervention starts with the premise that market and political processes are characterized by information asymmetries that stand in the way of furthering health, safety, investment choices, quality services or other public priorities. Such imbalances are inevitable because manufacturers, service providers, and government agencies always have exclusive access to some information about their products and practices and always have compelling reasons to keep much of it confidential. In addition, many kinds of information that are not secret in this way are nevertheless largely inaccessible.

Of course, journalists, representatives of consumer groups, and competitors often have countervailing interests in ferreting out some of this missing information and making it widely available in news stories, rating systems, and advertising. But such efforts cannot fully correct asymmetries because private parties cannot compel disclosure. As a result, shoppers, employees, investors, and community residents may make choices that do not further their economic welfare, health or safety. Without enough information, they inadvertently invest in companies with hidden liabilities, buy cars with high rollover rates, visit hospitals where medical errors occur frequently, or eat foods that contribute to heart disease or cancer.

When individuals cannot themselves restore information imbalances and when public disclosure can further a compelling policy objective, government often intervenes. Government-mandated disclosure plays a unique role in supplementing and correcting the private provision of socially relevant information. First, only government can *compel disclosure* by restaurants, factories, or schools. Second, only government can *require comparable metrics, format, and timing*. Third, only government can *create systems backed*

*by deliberative democratic processes.* Legislative, regulatory, and judicial processes provide government- mandated transparency systems with legitimacy and accountability.

Los Angeles County's restaurant grading system, adopted in 1997, provides a simple example of how legislated transparency can improve public health. Restaurants are required to display in their windows government grades of A, B, or C. The grades reflect restaurants' scores on an inspector's 100-point checklist that includes points off for rodent droppings, twice-served food, lapses in employee hand washing, and so on. Policy makers hope that customers will change their dining choices by selecting restaurants with higher grades, creating market incentives for those with low grades to improve their hygiene.

Early research suggests that this grading system has been highly effective. Researchers have found significant revenue increases for restaurants with high grades and revenue decreases for C-graded restaurants. They also have found measurable increases in restaurant hygiene in Los Angeles County and a consequent significant drop in hospitalizations due to food-related illnesses. Overall, more informed choices by consumers appear to have improved hygiene practices, rewarded restaurants with good grades, and generated economic incentives that stimulated a new kind of competition among restaurants (Jin and Leslie, 2003). This transparency system illustrates how new information that fits easily into existing customer routines can alter their choices. Grades are available at the time and place of decision, provide a simple format for comparability, and provide information customers want. Already attuned to protecting their establishments' reputations and sensitive to even small shifts in business, restaurant managers can observe and react to customer responses.

Not all transparency systems work so well, however. In 1999, the U.S. Institute of Medicine reported the astonishing fact that more Americans died from medical errors in hospitals than from automobile accidents, between 44,000 and 98,000 people each year. Some hospitals were 10 times safer than others. The Institute strongly recommended that serious errors be systematically disclosed to the public in order to create incentives for hospitals to improve patient safety and compete to reduce errors. Nonetheless, state-mandated disclosure systems aimed at disclosing medical errors and improving patient safety have so far proven ineffective for at least three reasons. First, metrics have proven problematic. Distinguishing between adverse events and medical errors can require extensive investigation and expert judgment. Second, as a practical matter, information has remained inaccessible and patient choices have remained limited. Key records such as disciplinary actions against doctors have sometimes remained scattered in county courthouses. Even when information is available in hospital report cards, surveys suggest that most patients don't pay attention to it. They continue to rely instead on advice from their doctors and opinions of family and friends in choosing hospitals. While disclosure of medical errors may be relevant and timely, it is not yet compatible with the way patients are accustomed to making choices that may be very limited in practice. The fact that hospital stays are often unplanned, unique events where patients are constrained by location and insurance requirements

makes it harder to make full use of information about errors. Finally, accurate disclosure of mistakes has proven extremely difficult to enforce. Medical errors usually occur when few people are present. Patients, nurses, and even doctors may be unaware of them. Thus, at a time when improving health care quality is perceived as a major policy goal, transparency systems have failed to provide a meaningful way of furthering that goal.

More public information, then, is not necessarily better. Transparency systems, inevitably products of political compromise, can be constructed in ways that fail to advance policy goals. They can cause disclosers to over-emphasize some public goals at the expense of other, more important, ones. They can confuse information users so that their choices become counter-productive. They can be captured by narrow interests or grow outdated as markets and priorities change. Or they can simply waste resources because information that takes time and resources to produce is then simply ignored. Our analysis suggests that transparency systems offer great promise as innovative social policy but create difficult challenges for government, business, and the public.

In earlier work, we have analyzed the design and dynamics of transparency systems, based on analysis of 12 mature, prominent government-mandated systems in the United States. We have concluded that transparency systems with varied goals share common architectural characteristics, dynamics, and obstacles. We have suggested structural characteristics that support workable policies (Graham, 2001). We have concluded that transparency systems, always imperfect political compromises, must improve over time in scope, accuracy, and use in order to be sustainable. We have suggested that they can be improved by strengthening user intermediaries, encouraging effective enforcement, taking advantage of regulatory synergies, and complementing market interactions (Fung, Graham, Weil, 2002).

This paper, the third in a trilogy that analyzes transparency systems as innovative social policy, explores the most important and difficult question concerning such policies: Do they work? By that we mean: Can they effectively advance their regulatory objectives? We develop our account of effectiveness by examining the design and impacts of a subset of eight diverse transparency systems that are relatively mature, are backed by strong public mandates, create incentives for change through a variety of market and collective-action mechanisms, have received substantial scholarly scrutiny, and contribute to a robust cross-cutting analysis of transparency effectiveness. For this paper, we offer analysis of systems created by Congress or state legislatures in the United States. Whether our framework also proves helpful in analyzing the effectiveness of international transparency is a subject of current work.

Our account of transparency system effectiveness develops three central ideas. First, our analysis finds important differences between policy effects and policy effectiveness, and recognizes various levels of effectiveness. Transparency systems may have effects without being effective. They have *effects* when they alter choices of information users and disclosers in observable ways. They are *effective*, however, only when they alter choices in ways that significantly further policy objectives. Like other regulatory

mechanisms, transparency systems may also be effective on balance while producing some unintended effects. For example, toxic pollution disclosure has led manufacturers to reduce their overall releases of harmful chemicals even though some may have substituted unlisted but perhaps more toxic chemicals and others have made only "paper" changes in estimating techniques or definitions. Likewise, financial disclosure has contributed to efficient investment choices and improved corporate governance even though some companies have created "off-balance-sheet" entities to inflate reported profits. Nutritional labeling has encouraged food companies to create brand extensions of healthy products but sometimes labels have also led dieters to buy "low fat" but high calorie products. Our framework also recognizes effectiveness as a *continuum*. Transparency systems are *highly effective* when they change the choices of information users and disclosers in ways that significantly advance policy objectives. Such systems are *moderately effective* when they alter the choices in less significant ways that nevertheless advance such objectives.

Second, our analysis develops the idea of a transparency system "action cycle." We describe how new information can result in behavior changes by users that in turn lead to behavior changes by disclosers. Transparency systems introduce new information into existing complex patterns of decision-making by buyers and sellers, community residents and institutions, voters and candidates, and other participants in market or collective action processes. For purposes of understanding the impact of new information, we can characterize such decision-making as a predictable cycle in which information users act to advance their diverse goals based upon limited facts. Their actions create incentives for information disclosers to improve their products or services. And such improvements in turn reduce risks to the public or result in fairer or more efficient services. Transparency systems are effective only when they introduce new information in ways that influence this action cycle to produce behavioral changes in line with public policy expectations. Thus, the seemingly simple requirement of information disclosure requires an exceedingly complex chain of events to produce effective policy. Transparency systems compel target organizations to produce new information; users must perceive, consider, and act on such information; and target organizations must perceive, consider, and act on user responses in ways that further policy objectives.

Third, our analysis develops the idea that transparency policies are generally effective only when the information they produce becomes *embedded* in everyday decision-making routines of users and disclosers. No matter how accurate or relevant new information is, it cannot provide a foundation for a successful transparency system unless it is made available at a time, place, and in a format that fit in with the way consumers, investors, employees, and home buyers make choices as information users and the way corporations, government agencies, and other organizations make decisions as information disclosers. In cost-benefit terms, information becomes embedded when parties perceive that the benefits of its collection and use clearly outweigh the costs. *Thus, when transparency systems provide highly relevant and accessible information that users incorporate into the considerations that determine their actions, we say that information becomes embedded in users' decision-making processes. When such systems produce user responses that disclosers incorporate into management decisions, we say that those responses become*

*embedded in organizations' decision-making processes.* Assuming that information is accurate, this double-sided embeddedness becomes the most important condition for transparency systems' effectiveness. This finding suggests the importance of asking at the outset what information consumers or business managers want and how these users and disclosers make and alter the choices that public officials hope to influence. Since the way that individuals and organizations act varies widely, this finding further suggests that transparency systems need to be tailored to take account of the culture, education, and priorities of intended audiences.

## **II. Information and Regulation**

Perhaps surprisingly, in the past, federal and state governments have rarely placed priority on providing ordinary citizens with systems of factual information to help them minimize risks and choose high quality public services. Traditionally, government officials have collected vast amounts of factual information about risks and performance from manufacturers, government agencies, and other organizations to help frame or enforce minimum standards or financial incentives to reduce risks or improve service quality (Breyer, 1993). But such information has been intended for expert use. In principle, there has been a right of public access to much of this information. In practice, however, most information has made a one-way trip to Washington or state capitals where most of it has remained scattered in government files. Ordinary citizens have been passive beneficiaries of actions by politicians and experts tasked to protect their interests by drawing on this information.

Nonetheless, the idea of employing public communication as a regulatory tool has deep roots in U.S. policy. A generation ago, Congress began to mandate product warnings such as "keep out of the reach of children" and "fasten your seat belt." These mandates rested on a foundation of common law duties of manufacturers to warn product users about foreseeable harm. Warnings were designed to change choices. But they did not provide transparency. Like rules and financial incentives, they were based on experts' analysis of information gathered from private sector organizations and public agencies. They did not provide ordinary citizens with facts to make their own informed choices (Zeckhauser and Marks 1996).

Even earlier, however, Congress did on rare occasions create regulatory transparency systems to supplement the government's minimum standards, often in response to public scares and in circumstances when conventional regulation did not seem sufficient. After muckraking journalists described filthy conditions in large meatpacking plants and alleged that adulterated foods were causing deaths and injuries, Congress required accurate labeling of ingredients in the Food and Drug Act of 1906. After millions of Americans lost their savings in the stock market crash of 1929, the Securities Act of 1933 and the Securities and Exchange Act of 1934 required companies that sold stock to the public to reveal detailed information about their officers, earnings, and liabilities in order to reduce risks to investors. Both food labeling and corporate financial reporting have been expanded significantly in recent years as transparency systems have become mainstream policy tools.

Then, in the 1960s, the emerging idea that the public had a “right to know” whatever information had accumulated in government files helped lay the foundation for the wider use of transparency systems.<sup>1</sup> Union demands for information about workplace hazards and citizen groups’ demands for information about toxic risks inspired local “right to know” laws (Baram, 1984; Ashford and Caldart, 1985; Hadden, 1989). Local actions were followed in 1966 by the federal Freedom of Information Act that established the public’s right of access to any information in the hands of executive branch agencies unless disclosure threatened national security, personal privacy, trade secrets, or other specified interests. That law was strengthened in the 1970s and 1990s, and now requires the electronic disclosure of public records.

Only in recent years, however, have transparency systems emerged as an important third wave of modern regulatory innovation. In the 1960s and 1970s, a time of optimism about the capacity of government to solve public problems, regulatory innovation emphasized rules and penalties. In the 1980s, a time of unusual optimism about the capacity of market mechanisms to solve public problems, regulatory innovation embraced taxes, subsidies, and trading systems. From the mid-1980s to the present, a time of optimism about advances in communication and information technology, regulatory innovation has emphasized transparency systems.

Transparency systems’ paths to impact on target organizations differ fundamentally from those of other regulatory strategies. Standards-based regulatory systems send unambiguous signals to regulated parties concerning whether, when, and sometimes how and how much to change their practices. Market-based systems using taxes, subsidies, or trading regimes provide greater latitude in the *responses* chosen by target organizations but also send unambiguous signals. They are directed toward specific activities such as pollution emission levels and feature a specific, usually quantitative expression of a desired outcome. Policy makers set tax formulas, subsidy levels, and quantities of traded units, for example (Ellerman et al. 2000). Transparency systems, by contrast, do not specify whether, when, or how organizations should change practices. Instead, they rely on responses to new information by users and disclosers to create market or political incentives for change. These responses are by nature somewhat unpredictable and ambiguous. While users’ actions themselves further policy goals to some degree, most transparency systems feature more ambitious goals. They explicitly aim to change organizations’ practices – encouraging development of healthier foods or safer cars, for example.

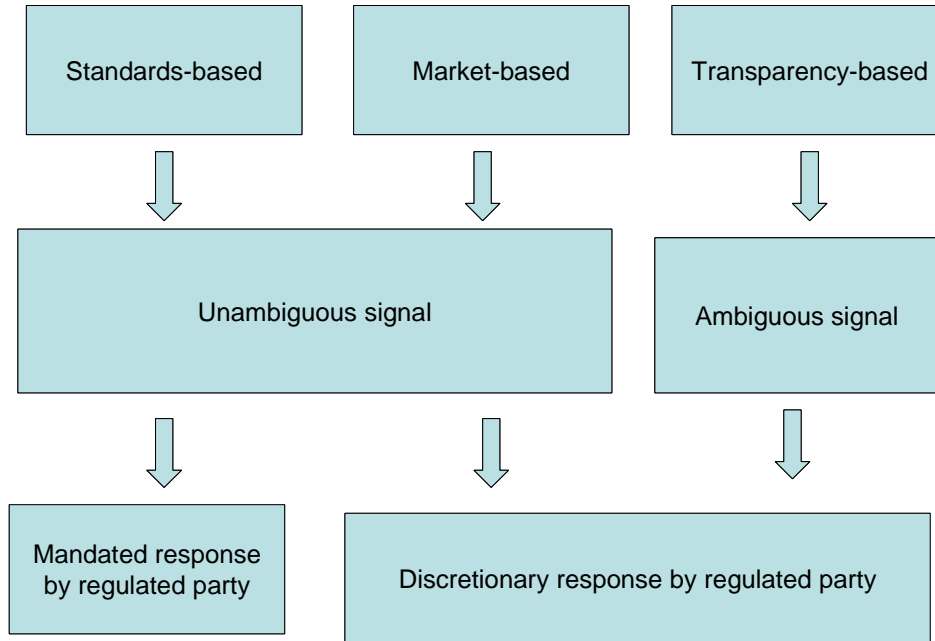
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<sup>1</sup> The recognition of the public’s “right-to-know” is but one of the facets of the broader “rights revolution” described by Sunstein and others as the period between the New Deal and the 1980s, when Congress created “legal entitlements to freedom from risks in the workplace and in consumer products, from poverty, from long hours and low wages, from fraud and deception, from domination by employers, from one sided or purely commercial broadcasting, and from dirty air, dirty water, and toxic substances” (Sunstein, 1990, pp. 12-13).



These differences between standard-based, market-based, and transparency-based regulatory systems are captured in Figure 1 below:

**Figure 1: Signals and Responses under Three Types of Regulation**



### III. Transparency Effects, Effectiveness, and the Action Cycle

Our analytical framework begins by distinguishing transparency systems that have *effects* from those that are *effective*. When systems alter the behavior of individuals and organizations in observable ways, we say that they have effects, recognizing that effects are often unintended by and may be antithetical to the aims of policy makers. When systems alter the behavior of individuals and organizations in ways that significantly advance policy objectives, we say they are effective. Our framework, then, seeks to explain why some transparency regulations (i) lack effects while others (ii) have *effects* yet fail to advance policy objectives, while still others (iii) are *effective*.

To illustrate these differences, consider the case of nutritional labeling, mandated by Congress in 1990 to reduce risks of heart disease, cancer, and other chronic illnesses. If shoppers chose cookies based only on price and taste, additional information provided by nutritional labeling lacked effect. If shoppers used nutritional labels to buy cookies that were low in calories but high in saturated fats, nutritional labeling had effects but would not be effective since lowering risks of heart disease, cancer, and other chronic diseases depends heavily on reducing consumption of saturated fats. On the other hand,

if enough shoppers used newly required labels to choose cookies that were low in saturated fat, labeling might well become effective in reducing risks of disease.

Our central claim is that the best way to understand why some transparency policies work and others do not is to assess whether and how the information produced by those policies becomes integrated into decision-making routines and consequent actions of information users and disclosers. Ours is an inductive, backward-mapped approach that begins not with the perspective of policy makers but with the perspective of information users and disclosers (Elmore, 1979). These participants in markets and political processes have diverse interests, resources, and capabilities. However, they use their resources and capabilities to advance their goals under a variety of constraints. Some constraints reflect individuals' or organizations' limited capacity to process information, including limitations of risk comprehension and language proficiency. Others reflect limitations created by external factors that limit choice. Because individuals and organizations have many decisions to make and little time in which to make them, they often establish routines that focus their attention on those sources of information that have proven most useful in the past. For example, such information users might rely on cognitive short-cuts such as brands, advertising, or advice from trusted people to make choices about products and services (Gigerenzer et al., 1999; Gigerenzer and Selten, editors, 2001; Hutchins, 1995; Klein, 1998). Information disclosers, in turn, might rely on surveys, sales data, or managers' perceptions to ascertain preferences of customers, employees, or community residents. From this starting point, we assess the effects of government-mandated information by the extent to which both users and disclosers find new information useful in the pursuit of their own ends and so incorporate it into their decision-making routines.

Our perspective challenges the commonly-held notion that more public information is always better. Just as John Stuart Mill and Justice Oliver Wendell Holmes argued that exchange of information would create a beneficial marketplace of ideas, contemporary proponents of transparency contend that provision of information will generate many kinds of benefits.<sup>2</sup> Their central intuition is that placing information in the public domain itself spurs its socially constructive use.

Our analysis of cases suggests, however, that simply placing information in the public domain does not mean that it will be used, or used wisely. In practice, information cannot be separated from its social context. Individuals and organizations simply ignore information that is costly to acquire or that lacks salience for decisions. They often inadvertently use information in ways that fail to advance their own aims. (Kahneman, Slovic, and Tversky, editors, 1982; Kahneman and Tversky, editors, 2000). The process of providing to the public usable information that reduces risks and

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<sup>2</sup> "[...] the ultimate good desired is better reached by free trade in ideas, [...] the best test of truth is the power of the thought to get itself accepted in the competition of the market" Justice Holmes; *Abrams v. United States*; In dissent; 250 U.S. 616; 630; 1919. See also Mill, 1989.

improves services is, therefore, anything but automatic. Whether and how new information is used to further public objectives depends upon whether and how it is incorporated into complex chains of comprehension, action, and response.

In transparency systems, those chains of action and response have two primary actors: those who potentially use new information produced by transparency policies to improve their choices; and those who are compelled by public policies to provide that information and whose behavior policy makers hope to change. These information *users* and *disclosers* are typically connected in a general action cycle that has six main parts:

### Figure 2: Transparency Action Cycle

(1) transparency system  $\Rightarrow$  (2) new information  $\Rightarrow$  (3) user's perception/ calculation  $\Rightarrow$  (4) user's action  $\Rightarrow$  (5) discloser's perception/calculation  $\Rightarrow$  (6) discloser's response.

(1) A transparency system (2) compels corporations, government agencies, or other organizations to provide information about their practices or products to the public at large. (3) If this information is useful to some consumers, investors, employees, community residents, or other individuals or groups they may incorporate it into their ordinary decision-making processes (4) in ways that alter their actions. The original disclosers of information, in turn, may recognize (5) in the changed choices of information users opportunities to advance their interests (6) to which they may respond.

This action cycle explains the effects and effectiveness of transparency policies across a wide range of policy domains. *A transparency system has effects when the information that it produces enters the calculus of users and they consequently change their actions and when information disclosers notice and respond to user actions. It is effective when discloser responses significantly advance policy aims.*<sup>3</sup>

This description suggests multiple points at which information can fail to spur action and at which action can fail to spur reaction or can provoke perverse responses. We discuss several of these characteristic sources of failure in section VI below. First, however, we consider what is required for this action cycle to generate effective outcomes.<sup>4</sup>

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<sup>3</sup> Zeckhauser and Marks (1996, p. 33) refer to this as the consumer and manufacturer effect: "Consumers increase their demand for products possessing the newly posted characteristic and sellers increase their production of such products..."

<sup>4</sup> It is important to note that transparency policies must be sustainable in order to be effective. In earlier work, we have suggested that transparency policies usually start as relatively weak political compromises and must improve over time in scope, accuracy, and use in order to avoid becoming useless or counter-productive. They must adapt and grow stronger as political priorities, market characteristics, and scientific knowledge

#### IV. Information Embeddedness and User Decisions

The fundamental feature of transparency systems is that they release information into the public domain by compelling corporations or other organizations to disclose information about their activities that they would not otherwise provide. The action cycle described in Figure 2 places information users as first movers in the sequence of actions and reactions.<sup>5</sup> Users of transparency systems have diverse interests. They may include consumers, voters, employees, suburbanites, inner city residents, competitors, organizations representing businesses or consumer interests, legislators, government agencies, and regulators themselves. They may be casually or intensely interested in new information. Their goals may or may not coincide with those of policy makers. The next analytic step is to explain what factors influence whether and how users incorporate such information into their actions.

Whether and how users respond to new information depends on how easily it fits into their accustomed ways of making choices. Cognitive psychologists and economists have provided insights into the bounded rationality of choice (e.g. Simon, 1982, 1997). They suggest that users of information act rationally to advance their various, usually self-interested, ends. However, because they have limited time and cognitive energy, they do not seek out all of the information necessary to make optimal decisions. Instead, they seek out information to make decisions that are good enough, using time-tested rules of thumb.<sup>6</sup> Only information that penetrates these sometimes severe economies of decision-making affects users' calculations and actions.

Transparency systems can alter decisions only when they take into account these demanding constraints. Such systems must provide pertinent information that enables users to substantially improve their decisions without imposing significant additional costs. For transparency systems to be effective, we suggest that it is necessary *but not sufficient* that information become embedded in existing decision-making processes. Conflicting preferences, cognitive challenges, and other factors may still keep users from taking action based on new information that furthers policy objectives. We discuss those obstacles in the next section.

We have found three factors that influence the likelihood that information will become embedded in users' decision-making: the

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change and as interest groups invent new ways to game the disclosure system. Drawing on our cases, we have analyzed obstacles to sustainability as well as factors that promote sustainable policies. Only a subset of policies improves over time along those core dimensions and develops information that has utility to potential users. Thus, sustainability is a necessary pre-condition to effectiveness. In this paper, we take sustainability for granted and focus instead on effectiveness (Fung, Graham, and Weil 2002).

<sup>5</sup> Note that this contrasts with our model of sustainability where the discloser initiates the sequence of events that lead information to either improve or stagnate under a transparency policy (Fung, Graham, and Weil, 2002).

<sup>6</sup> This is often referred to as “satisficing” in the literature by Simon 1982, 1997).

information's perceived value in achieving users' goals; its compatibility with decision-making routines; and its comprehensibility.

First, information must have perceived *value* to users in significantly advancing their goals. Many transparency policies provide facts that can substantially reduce health and safety risks or otherwise improve important choices. Nutritional labeling, automobile rollover ratings, and restaurant hygiene rankings, for example, enable consumers to better act on their existing preferences for healthy food, safe cars, and clean restaurants. However, if consumers have few real choices or do not believe there is anything more they need to know, new information is likely to be ignored. Requirements that employers clearly label hazardous substances in their workplaces have had little impact in part because workers have very constrained choices about where to work (exit) and /or a limited ability to change workplace conditions (voice).<sup>7</sup>

Second, information needs to be *compatible* with users' decision-making routines. Compatibility ordinarily includes three elements: format, timeliness, and location. Hurried shoppers, who will probably only glance at food labels, need a format that allows them to note calories or fat content in seconds. Home buyers, who may not know much about toxic pollution, need information when and where they are pondering a purchase. Sometimes, designers of transparency systems use grades or other rating systems to simplify presentation of complex facts. In principle, restaurant hygiene grades and auto rollover ratings provide valuable information at low cost. They fold data and expert interpretation into simple normative signals. Users who want to question those signals can delve beneath the rating for more information. (Rating systems that lack access to underlying facts would not constitute transparency systems as we define them.) It is worth noting, however, that rating systems often involve two sets of trade-offs: they choose simple presentation over accurate communication of complex facts; and they provide normative judgments by experts instead of users. Much depends on whether the character of needed information is amenable to ratings, whether there is a broad consensus about normative issues, and whether rating organizations are widely trusted.

Users represented by agents present a special case. Transparency systems must present information to agents in a way that fits in with *their* routines. Thus, travel agents acting for clients are more likely to pay attention to government-required airline safety and on-time data if it is prominently displayed on popular web sites. Community groups acting for neighborhood residents are more likely to note bank lending patterns if such information is posted in banks, mailed to such groups, and presented in formats that provide quick and easy reading and measures of comparability. Likewise, parents acting

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<sup>7</sup> User preferences are often refined over time given repeated and cumulative decisions. However, sometimes intensive education, training, or widely publicized crises have an unusual influence on users' preferences, and an accompanying transparency system can help users act on those modified preferences.

for their children are more likely to consider new information about school performance if it is sent home with re-enrollment forms.<sup>8</sup>

Compatibility in the timeliness of information must be situation-specific. When choice occurs in advance of action, information needs to be available when commitments are made, as when home purchase contracts precede possession and employment decisions precede start dates. When choice and action coincide, however, information at time and place is crucial. Grades in restaurant windows and fuel economy ratings on new car stickers provide examples of such compatibility. Often, however, information is not made available at compatible times and places. School report cards and information on toxic releases are not available in real estate offices. Campaign finance disclosures generally are not available in real time; and hospital safety ratings are not available in doctors' offices.

Even if information is valuable and compatible with routines, it is unlikely to become embedded in users' everyday choices unless it is also *comprehensible* to them. Comprehensibility is a product of the congruence of the character of new information with the ability of users to understand it. Limitations in vocabulary or math skills, for example, can reduce the likelihood that information will become embedded in choices. Nutritional information is valuable to some shoppers and conveniently provided at point of purchase. But its chances of becoming embedded in shopping routines is limited by the fact that most shoppers in the United States do not comprehend what is meant by "protein," "carbohydrate," or "calorie."

One reason comprehension problems are of concern is that they may lead to unintended discriminatory effects. Since ability to understand and use risk information varies with such factors as age and educational background, transparency systems may benefit some groups in the population more than others.<sup>9</sup> For example, research suggests that the old, the young, new immigrants, and individuals with relatively low levels of education are less able to understand and use nutritional labels to reduce risks of disease than those who are better educated and more proficient in English. Even if the median user does not face cognitive limitations, the distributional impacts of transparency systems may be significant.

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<sup>8</sup> Additional problems arise when the goals of individual users and their collective agents are not congruent. For example, agents may have incentives to exaggerate information in order to pursue their aims (e.g. local environmental groups may exaggerate the threat posed by toxic releases in order to expand membership in their organization) even though the distortions lead users to take less than optimal actions (e.g. move from homes because of misperceptions of the toxic risks they face). We discuss this problem in Section VII.

<sup>9</sup> Research by Viscusi, for example, found that although young people tend to have a higher risk perception of lung cancer associated with smoking, their smoking behavior does not differ from that of the overall population (Viscusi, 1991). Studies suggest that workers' ability to understand hazardous chemicals' information for self-protection improves with education (Kolp et al., 1993; and OSHA, 1991). Research on the impact of food labeling found that after the introduction of mandatory disclosure, sales of salad dressings with high fat content declined more in supermarkets in high-income areas than in others. (Mathios, 2000).

Simple formats and trusted intermediaries can influence whether new information is comprehensible. If policy makers combine complex auto road-test results and probabilities into simple 5-star rollover rankings, such results may be more accessible to buyers. If policy makers disclose information in technical formats, business or government agency representatives, journalists, and consumer groups may simplify them. Environmental groups have combined disclosed data concerning toxic pollution to rank factories' performance and make it electronically searchable by zip code. Research groups have re-organized complex campaign finance disclosure data and provided information in user-friendly websites. *Consumer Reports* and other publications have ranked product safety and performance. The American Heart Association authorizes food companies to place their seal of approval on heart-healthy soups and cereals. Some large employers analyze hospital safety data and provide rankings of hospitals and physicians. Of course, when third party rankings are controversial or self-interested, consumer searches for reliable information may become more difficult, not easier.

Overall, the *cost* of acquiring and using new information must be sufficiently low to justify users' efforts in relation to expected benefits. To state it another way, users may be more willing to invest time and effort in integrating new information into their choices when they perceive substantial and immediate gain. Car buyers who value safety may ferret out safety rankings even though they are not available in auto showrooms. Home buyers who value school quality may be willing to invest time in searching newspapers, magazines, or web sites for rankings and in determining which rankings they should trust. Investors making important decisions about their retirement savings may be willing to seek information about the financial risks of publicly traded companies even if that means paying experts or wading through technical data. In general, though, our analysis suggests that if users must pay a substantial cost in terms of either time or material resources to acquire information generated by transparency systems, they are unlikely to embed that information into their everyday choices (Weil, 2002).

## V. Information Embeddedness and Discloser Decisions

As noted earlier, when information produced by transparency systems causes users to introduce new responses into their decision calculus and those responses in turn change disclosers' decision calculus, we say that new information has become *embedded in user and discloser decision-making processes*. Highly effective transparency policies, then, are doubly embedded. Though the organizational context of disclosers' decisions differs from the individual context of many users, disclosers' decisions can be understood using analytic concepts that parallel our account of user embeddedness. Disclosers are more likely to incorporate user responses into their decisions if those responses have *value* in relation to disclosers' goals, are *compatible* with the way they make decisions, and prove *comprehensible*.

First, to become embedded in disclosers' decisions, users' changed choices must be perceived to have substantial *value* in relation to disclosers'

core organizational goals. For private sector entities, core goals often include improving profitability, market-share, and reputation. For public agencies, goals often include gaining constituency support, legitimacy, and trust. For public companies goals might include reducing toxic pollution to maintain their reputations but not in response to community residents' decisions to move elsewhere, which are unlikely to affect profitability. Likewise, elementary schools with poor report cards might make improvements in response to drops in enrollment but not in response to students' failures to get jobs after high school, which are unlikely to affect community support or trust.

Second, user responses must be *compatible* with the way in which managers receive, process, and act on new information in order to become embedded in disclosers' decisions. Disclosers can make changes only if they can discern user signals from the information noise that surrounds them and have the capacity to respond. Compatibility failures may reflect mismatches in process or mismatches in timing and resources. Candidates may have no way of discerning voter dissatisfaction with their disclosed sources of financing when no feedback process exists. Hospitals may have no way to discern the character and degree of patients' concerns about medical errors when no error-tracking process or patient-response mechanism exists. Auto manufacturers may be unable to respond quickly to drops in sales of cars with high rollover ratings because their design cycle is three to four years, creating a timing mismatch. Small food manufacturers may be unable to respond quickly to shoppers' interest in healthier products and cash-strapped schools may lack the capacity to respond quickly to parent demands for smaller classes or extra-curricular activities due to lack of resources.

In one particularly interesting variation on the theme of compatibility, we note that disclosers frequently anticipate rather than respond to user actions. Manufacturers promised to make drastic reductions in toxic pollution nearly a year before their toxic releases were first disclosed to the public. Food companies began introducing new lines of healthy products well before nutritional labels were required. Public companies tightened corporate governance and improved disclosures before legislation that responded to the Enron/WorldCom scandals took effect in 2003 and 2004. Likewise, government officials have taken anticipatory action to improve schools, drinking water quality, or other services in anticipation of the public's response to new transparency systems. These anticipatory reactions suggest that managers concerned with protecting market share or reputation often do so by attempting to predict the behavior of their customers, employees, or investors.

Third, user responses must be *comprehensible* to disclosers in order to become embedded in disclosers' decisions. Even if user responses have value and are compatible with discloser decision processes, they may be misunderstood. Chemical companies may not be able to discern that negative publicity about toxic releases means that communities are concerned mainly about carcinogens. Food manufacturers may believe that declining sales of their high-sugar cereals mean that a competitor's advertising is more effective than theirs whereas shoppers want healthier choices. Studies have shown that many retailers conduct relatively rudimentary analysis of point-of-sale data (Fisher et al., 2000).



Overall, the cost to disclosers of integrating information on user responses into management decisions must be sufficiently low to justify their efforts in relation to expected benefits, defined in their own terms. Disclosers may be more willing to invest time and effort on marketing research when they perceive clear opportunities to beat the competition or avoid reputational damage. Disclosers may even take action to anticipate user responses in order to protect their reputation or competitive position.<sup>10</sup> Occasionally, disclosers may even change the way they make decisions. In general, however, transparency systems themselves rarely change disclosers' routines, just as they rarely change users' routines. To become embedded in managers' decisions, users' responses must be valuable, compatible, and comprehensible in the context of existing management priorities and tools.

## **VI. Obstacles to Effectiveness: Preferences, Biases, and Games**

Even transparency systems that manage to embed new information in users' and disclosers' decision routines may fail to become effective, however. Users or disclosers may consider such information but decide, on balance, that new data does not justify changes in decisions. Or they may act on new information in ways that further their own priorities but do not further policy objectives. Alternatively, users and disclosers may attempt to further their own and policy-makers' priorities but fail to do so because they misunderstand the new information. Our research suggests that lack of congruence between participants' and policy makers' goals and misinterpretations by users and disclosers are the main obstacles to the effectiveness of transparency systems that have managed the difficult task of embedding new information in everyday choices.

### ***Congruence of User and Discloser Goals and Actions with Policy Objectives***

As we have discussed, both users and disclosers employ information to advance their own aims, which may or may not be identical to or even consistent with public policy goals. Effective transparency systems tap into user goals that are consistent with public goals. Users' choices then create sufficient pressures to encourage disclosers to take actions that coincide with public goals, even if discloser goals are different.

The goals of most information users are likely to be substantially congruent with policy goals of transparency systems since, in principle, such systems are created to protect users' interests. Both public officials and car buyers generally aim to use rollover ratings to reduce risks of death and injury. Both public officials and patients generally aim to use hospital report cards to reduce deaths and injuries from medical errors. Sometimes, however, public goals and the goals of at least some users do not coincide. If such lack of congruence translates into users' action or inaction that weakens or distorts signals to disclosers, system effectiveness is likely to be weakened as well. The

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<sup>10</sup> This is analogous to deterrent effects under standards-based regulatory systems.

public goal of nutritional labeling was to reduce risks of heart disease and cancer. Many shoppers' private goals, as it turned out, were to lose weight. When dieters focused on cutting calories but not saturated fats, they complicated the signal to disclosers who were considering whether or not to introduce products that were low in saturated fats. The public goal of so-called Megan's laws, which require disclosure of the place of residence of convicted sex offenders, was to enable community residents to avoid proximity to offenders or increase their watchfulness, if they believed that was necessary. However, some users employed the information to carry out vigilante attacks.

Disclosers' goals are less likely than users' to be congruent with the goals of transparency systems. In our stylized action cycle, disclosers alter their behavior primarily to satisfy external demands -- market pressure or political action by users. Disclosers voluntarily advertise favorable news about their activities. Government-mandated disclosure generally forces them to reveal unfavorable news about public risks or faulty performance that would not otherwise be made public. (Indeed, that is the primary justification for government intervention.) Both in deciding what to disclose and in deciding how to respond to users' pressures, disclosers usually have to weigh conflicting interests. They seek to avoid reputational harm but they also seek to minimize use of resources and maximize competitive advantage. Because all transparency systems represent political compromises, loopholes frequently provide disclosers with unintended opportunities to maximize their own interests and minimize harmful disclosures. As a result, disclosers may respond to users' actions in counterproductive ways, from policy makers' perspective. Thus, while many disclosers act in good faith, some under-report or hide risks or performance problems.

In a recent example with national and international consequences, large and well-respected public companies such as Enron and WorldCom manipulated disclosed earnings to gain investors. Long-standing government-mandated transparency required publicly traded companies to disclose quarterly earnings. In the 1990s, however, when investors became obsessed with quarterly earnings, companies sometimes took extreme actions to meet investors' expectations. Enron, WorldCom, and others placed substantial expenses "off balance sheet" instead of justifying the zigs and zags in quarterly earnings. When that was discovered in 2001 and 2002, a number of companies declared bankruptcy and new disclosure rules were enacted to close loopholes. Likewise, some companies engaged in "paper reductions" to reduce reported toxic pollution. A common concern raised about school report cards is that administrators and teachers may alter curricula and pedagogical methods in response to parents' concerns without necessarily improving underlying educational methods (Meier, 2000; Committee on Appropriate Test Use, 1999).

Sometimes, of course, the goals of at least some disclosers do coincide with public policy goals. In a notable example, many food companies ultimately favored government-mandated nutritional labeling. Such labeling helped them justify charging higher prices for healthier foods and helped them improve their corporate images. Some companies favored government-mandated organic labeling for similar reasons. In other situations, the goals of particular executives within disclosing organizations may be served by

transparency. Environmental, safety, or financial officers within companies may be able to use required transparency, with its reputational risks, to gain supporters for improvements in practice that they have advocated without success in the past.

However, congruence between policy makers' goals and disclosers' goals is not necessary. In order for a transparency system to be effective, what is needed is *congruence between policy goals and actions of users and disclosers*. At best, transparency policies trigger user actions that cause disclosers to advance some public good—such as lowering risks to public health—in the course of furthering primary private goals such as maximizing profit, expanding market share, protecting brand reputation, or maintaining public trust. In this way, transparency policy works as a "visible hand" that can harness private incentives for public ends.

### ***Misinterpretations by Users and Disclosers***

Even when goals are congruent, however, there can be many slips between users' and disclosers' intentions and their actions. Thus, a second kind of obstacle concerns inaccurate interpretation of new information. Some misinterpretations are the result of cognitive problems. In a generation of research that developed the tenets of behavioral economics, economists and psychologists have found that some common shortcuts used to process new information can lead to systematic cognitive distortions. For example, most people tend to overestimate risks due to rare cataclysmic events or risks they hear often repeated while underestimating more frequent risks such as auto accidents and heart disease (Kahneman and Tversky, 1996; Kahneman, 2003). Researchers suggest that people have particular difficulty linking low probability risks and day to day decisions such as labor market or product choices (Viscusi and Magat, 1987; Viscusi and Moore, 1990; Hammit et al., 1999). Other misinterpretations by users are the result of failure to accurately interpret scientific information or transparency system metrics. For example, journalists, often an important category of information users, widely misinterpreted factory managers' disclosed pounds of toxic pollution as equivalent to public risks, leading to headlines about "worst polluters" that encouraged managers to reduce total pounds of chemicals rather than risks from toxicity and exposure. Whatever their cause, users' misinterpretations can lead to over or under-reactions that in turn trigger discloser responses that waste resources or counter public policy goals.

Disclosers, too, can misinterpret new information in ways that create barriers to transparency effectiveness. We have discussed the importance of disclosers' comprehension of users' market choices or political preferences to the embedding of that information in routine corporate or government agency decisions. However, sometimes disclosers embed misunderstood information in decision-making. Restaurant managers may focus on employee hand-washing when patrons responding to government-imposed grades were more concerned about rodent droppings or stale food. Banks may increase lending to relatively prosperous businesses or residents in inner city areas while community groups were more concerned about targeting struggling businesses and low-income residents. As noted earlier, manufacturers may reduce pounds of toxic

chemicals released into the air and water while community residents have specific concerns about reducing exposure to chemicals that cause cancer or serious neurological damage. When misunderstood information becomes embedded in disclosers' decision-making, it can create a systemic distortions that impede transparency effectiveness.

In summary, lack of congruence in goals and actions and misinterpretations of new information can reduce the effectiveness of transparency systems, even if information becomes embedded in routines. Sometimes such distortions mean that new information does more harm than good in terms of furthering specific public policies. These gaps between effect and effectiveness can be reduced by designing transparency policies that produce accurate and easily understood information. As a practical matter, however, many gaps become evident only after transparency systems have operated for some time and their action cycles can be evaluated. Mid-course corrections therefore become essential. Including architectural provisions that provide analysis of loopholes and misunderstandings, and providing for periodic updating of metrics, increases the chances that obstacles will not cripple a promising transparency system.<sup>11</sup>

## VII. Evaluating the Effectiveness of Transparency Systems

In order to better understand why some systems prove more effective than others, we have analyzed eight systems and reviewed existing literature to gauge their impact on key policy outcomes. As noted earlier, we have chosen these systems because they are relatively mature, are backed by a strong public mandates, create incentives for change through a variety of market and collective-action mechanisms, have received substantial scholarly scrutiny, and contribute to a robust cross-cutting analysis of transparency effectiveness. Each represents a substantial regulatory innovation in its own policy domain.<sup>12</sup>

Based on these studies, we have placed transparency systems in three broad groups according to their effectiveness:

- *Highly effective*: The transparency system has changed behavior of most users and disclosers in a significant way and in the direction intended by policy makers;
- *Moderately effective*: The transparency system has changed behavior of a substantial portion of users and disclosers in the intended direction but has also left gaps in behavior change and/or generated unintended consequences;
- *Ineffective*: The transparency system has failed to appreciably change the behavior of users and disclosers or has changed behavior in directions other than those intended.

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<sup>11</sup> The capacity to undertake such ongoing improvement will, in turn, be affected by the factors related to sustainability discussed in Fung, Graham, and Weil, 2002.

<sup>12</sup> We describe each of these policies more fully in Fung, Graham, and Weil, 2002.

Table 1 provides an overview of the eight transparency systems we studied. Table 2 provides our assessment of the degree to which new information becomes embedded in users' and disclosers' decision-making, summarizes intended and unintended effects, and summarizes the literature on each policy regarding its effectiveness.<sup>13</sup>

### ***Highly Effective Transparency Systems***

Several well-known transparency systems have contributed to significant, long-term behavior changes by users and disclosers in the direction intended by policy makers. We summarize here the evidence of effectiveness for three such systems. Although these systems have encountered problems and required major adjustments over time, evidence suggests that they share core strengths. They have generated information that users and disclosers have incorporated into their decision-making routines and actions. They have tapped into users' goals and provided information that users want. Each provides layers of information for different users through government-created metrics and/or intermediaries' interpretations. Finally, these systems illustrate the versatility of transparency policies. They influence market transactions, political action, or both.

#### **a. Reducing Risks to Investors**

The U.S. system of corporate financial reporting has proven highly effective in reducing hidden risks to investors and improving corporate governance. The information it provides has become strongly embedded in the decision-making of investors and intermediaries, and investor responses, in turn, have become strongly embedded in companies' decision-making. As in many other countries, companies whose stock is publicly traded in the United States must disclose their profits, losses, and financial risks in standardized formats and at regular intervals. Initially adopted in the 1933 and 1934 Securities and Exchange Acts after millions of investors lost their savings in the stock market crash of 1929, this system has been characterized by episodic improvements, often in response to crises that have revealed disclosure flaws or new attempts to game the system. The latest crisis – the corporate scandals of 2001-2003 – has shown the system's continuing vitality: crisis demonstrated investors' reliance on required information and the high costs to firms caught gaming the system, and triggered new laws to strengthen disclosure in order to keep pace with changing markets and public priorities. Over time, the United

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<sup>13</sup> Because the action cycle is more complex for information-based regulation than for rule-based or financial-incentive-based measures and because relatively few researchers have recognized the need to rigorously evaluate transparency policies, effectiveness literature is variable. Some researchers have undertaken direct analyses of user and/or discloser responses to new information. Others have focused on one link in the chain of events that leads to effectiveness: discloser compliance with information requirements, user understanding of new information, or responses by investors, consumers, or other subsets of users.

States has developed the world's most exacting and most studied system of mandatory financial reporting.

The purposes of this transparency system have remained constant: to protect investors from hidden risks, provide them with needed information to make investment decisions, and improve corporate governance. As noted earlier, required information has become highly embedded in the decision processes of both users and corporations. Institutional and individual investors use key indicators from quarterly and annual reports to inform stock purchases and sales. Securities' analysts, brokers, financial advisors, and other intermediaries translate these reports into user-friendly data for clients. Internet-based systems customize information to suit the needs of investors and search-facilitating technologies improve its readability. Comparability and reliability are strengthened by detailed rules and interpretations issued by the federal Securities and Exchange Commission (SEC), by the conventions of highly trained accountants, by independent auditing, and by SEC enforcement. Company managers, in turn, have become accustomed to tracking investor responses to their financial disclosures as a routine practice and respond to perceived investor concerns.

While some economists have questioned the need for and effectiveness of a mandated financial reporting system (Stigler, 1964; Benston, 1973), a growing literature suggests that such reporting has been effective both in reducing investor risks and in improving corporate governance. Research suggests that financial reporting limits investors' risks by reducing investment errors and costs of identifying appropriate investment opportunities (Simon, 1989; Botosan, 1997) as well as by generally reducing information asymmetries between more and less sophisticated investors (Bushman and Smith, 2001; Greenstone et al., 2004). Research also concludes that public reporting reduces firms' cost of capital (Botosan, 1997) and attracts the attention of analysts who may then recommend the stocks for purchase (Lang and Lundholm, 1996).

The literature also suggests that reporting improves corporate governance by reducing information asymmetries between shareholders and managers, encouraging managerial discipline, reducing agency costs, supporting enforceable contracts, and disciplining corporate compensation (Bushman and Smith, 2001; Healy and Palepu, 2001; Ball, 2001). Analyses of foreign companies that adopt the more rigorous U.S. disclosure rules conclude that they experience market benefits. Newly disclosed information reduces investor errors in achieving their investment goals and improves companies' stock liquidity and access to capital, explaining why some foreign companies voluntarily adopt such rules (Leuz and Verrecchia, 2000). Comparative studies also have concluded that investors are less likely to buy stocks during financial crises in countries with relatively low transparency and that investors leave less transparent markets for more transparent ones during crises (Gelos and Wei, 2002).

#### **b. Improving Restaurant Food Safety**

Government grading of restaurants provides a very different kind of example of a highly effective transparency system. A bold disclosure system

adopted by Los Angeles County in 1997 requires managers to post in their windows government-determined letter grades, ranging from A to C, that reflect the results of hygiene inspections. Early research suggests that grades have become quickly embedded in customers' decision-making. Restaurant managers, in turn, have incorporated the changed choices of customers in their decisions about hygiene. Publicly posted hygiene grades reduce search costs for consumers and provide restaurants with competitive incentive to improve. Restaurant grades are available *when* users need them: at the time when they make a decision about entering an establishment. Grades are available *where* users need them: at the location where purchase of a meal will take place. And they are available in a *format* that makes complex information quickly comprehensible. Restaurant grades also promote comparison-shopping in situations where most consumers have real choices. Most importantly, the information tells consumers something that they want to know and couldn't easily find out for themselves—the comparative cleanliness of restaurants. Restaurant managers, in turn, have both marketing and regulatory incentives to pay attention to customers' perceptions of food safety. The cumulative effects of customer responses create market incentives to improve hygiene while more general reputational threats and the prospect of further regulatory actions also heighten attention to food safety. A similar system has been adopted in North Carolina, where grades are also published in newspapers, magazines, and on the web. Other jurisdictions, such as New York City, disclose full inspection reports on the Internet.

Research has suggested that the Los Angeles transparency system is highly effective. Researchers have found significant effects in the form of revenue increases for restaurants with high grades and revenue decreases for C-graded restaurants. More importantly, they have found measurable increases in hygiene quality and a consequent significant drop in hospitalizations due to food-related illnesses. Overall, more informed choices by consumers appear to have improved hygiene practices, rewarded restaurants with good grades, and generated economic incentives that stimulated competition among restaurants (Jin and Leslie, 2003).

### **c. Reducing Discrimination in Mortgage Lending**

Required disclosure by banks of their mortgage lending practices has proven highly effective in improving access to mortgages by minority groups and inner-city residents. The Home Mortgage Disclosure Act (HMDA), enacted in 1975 and significantly strengthened in 1989, requires banks to disclose information on mortgage lending by race, gender, census tract, and income level in order to reduce discrimination in lending. Mandated information has become highly embedded in the decision processes of both information users and banks. National and local advocacy groups have used the information to put pressure on banks to make more loans to minorities, women, and in inner-city areas. Groups have compiled public cases against particular banks in specific communities and negotiated with those banks to improve their practices. Bank regulators, another significant group of users in this system, have used disclosed information to promote new rules to fight discrimination in access to credit, monitor improvements in lending, and tighten enforcement.

This is an instance where a transparency system works synergistically with conventional regulation to promote fairness in an important public service. Under the Community Reinvestment Act, regulators use disclosed data as one factor in approving banks' requests for mergers or acquisitions. This regulatory requirement creates added incentives for banks to respond to the demands of advocacy groups. Interestingly, banks themselves have also employed government-mandated lending data to identify important new market opportunities in inner-city communities. Some institutions even specialize in financial products specifically targeted at low-income clients.

Initially, disclosures and the press reports they spurred demonstrated to a wide audience that discrimination was a common practice. Disclosures also helped to provide the impetus for stronger regulation of bank practices (Schafer and Ladd, 1981; Munnell et al., 1996). Researchers have observed that financial institutions have tended to improve their lending to meet communities' needs prior to merger applications (Bostic et al, 2002). Research also suggests that this transparency system has improved access to mortgage loans by minority groups during the 1990s and contributed to increases in home ownership for all racial groups (The 25<sup>th</sup> Anniversary of the Community Reinvestment Act, 2002; Bostic and Surette, 2001).

### ***Moderately Effective Transparency Systems***

Many transparency policies have proven moderately effective, characterized by more limited changes in discloser behavior, or by mixed responses that advance public policies and counter regulatory aims. Three important systems, nutritional labeling, toxic pollution reporting, and disclosure of workplace hazards, illustrate how transparency can further policy objectives but also can encounter practical problems that limit effectiveness. These policies do not completely embed the information they produce into the decision-making processes of users and disclosers. In addition, lack of congruence between users' and policy makers' goals as well as misinterpretations of data produce weak user responses. Discloser changes in practice, in turn, have been variable.

#### **a. Reducing Risks of Disease through Nutritional Labeling**

Nutritional labeling has helped health-conscious consumers to reduce risks of heart disease, cancer, and other chronic diseases and has encouraged some food companies to introduce healthy-product brand extensions. However, the effectiveness of such labeling has been limited because many consumers do not understand or use the labels, and users have competing priorities (price and taste, for example). Food companies generally have not improved the healthfulness of their basic product lines but have responded by introducing brand extensions. Beginning in 1994, the U.S. Congress required producers of packaged foods to label amounts of fat, protein, carbohydrates, and other nutrients in products sold within the United States. The purpose of nutritional labeling was to reduce heart disease, cancer, and other chronic diseases that remain the causes of most early deaths in the United States. Medical research



had established that over-consumption of saturated fats, sugar, and salt could increase risks of these illnesses. Congress intended new labels both to change shoppers' habits and to encourage companies to market healthier products. The law required that labels use standardized formats, metrics, and recommended consumption levels to promote comparability.

Despite its ingenious design, this transparency system, available on every can of soup, candy bar, and box of cereal, has not become strongly embedded in most consumers' decisions. Researchers have found that some shoppers, especially those who are well-educated and interested in health, have understood and responded to new information by changing purchasing habits. But most shoppers have not changed their behavior in response to labels (Derby and Levy, 2001; Mathios, 2000). Many consumers do not consider nutritional information relevant to purchasing goals, the scope of nutritional disclosure has remained limited, and labeling has not kept pace with new science.<sup>14</sup> Even though nutritional information is available when and where consumers need it, the label itself has not proven comprehensible to many consumers. The meaning of terms like "protein" and "saturated fat" and the use of percentages and serving sizes remain perplexing to many, especially to less educated, older, and young shoppers. Confusion about how low-fat foods (which may be high in calories) relate to weight loss has also frustrated dieters. Research highlights that consumers tend to over-emphasize fat content relative to total caloric intake when dieting (Derby and Levy, 2001; Garretson and Burton, 2000).

Receiving mixed signals from consumers about their interest in healthy products, company responses have been conservative. Analyses suggest that food companies have tried to anticipate consumers' responses to nutritional labels and have reacted strategically, in ways that are only partially congruent with the aims of nutritional labeling policy. Most companies have continued to market traditional high-fat, high-sodium, high-sugar products, sometimes adding positive ingredients such as fiber or introducing brand extensions of low-fat or low-sodium products (Moorman, 1998).

Whether nutritional labels have improved public health remains uncertain. Americans reduced their fat consumption during the early 1990s but did not reduce total calorie intake, leading to concerns about obesity (Derby and Levy, 2001). Per capita fat consumption increased markedly between 1997 and 2000 and sugar and calorie consumption continued to rise (1999-2000 Healthy Eating Index).

## **b. Minimizing Toxic Pollution**

Legislated disclosure of toxic pollution has also proven only moderately effective in reducing toxic chemical releases. Information has not become embedded in decision-making by home owners and community residents. Companies' reported reductions of releases have been uneven and,

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<sup>14</sup> For example, there are no nutritional information requirements on foods that make up about half of the American food budget – fast food, restaurant food, and food from delis or mom and pop stores. We have discussed the system's failure to improve in our analysis of the sustainability of transparency systems (Fung, Graham, and Weil, 2002).

due to faulty metrics, may not have improved public health. In 1986, in the aftermath of a chemical accident that killed more than 2000 people in Bhopal, India and reports of smaller accidents and near-misses in the United States, Congress required manufacturers to disclose annually how many pounds of toxic chemicals they released to the air, water, or land, chemical by chemical and factory by factory. Initially enacted as a public “right to know” measure, this transparency requirement soon became viewed by regulators as one of the federal government’s most effective pollution-control devices. Executives of some major companies announced plans to reduce toxic pollution radically and reported releases declined substantially during the next decade.

Nonetheless, data concerning toxic releases remains minimally embedded in the market decisions of most potential users of such information. Most home buyers, renters, job seekers, consumers, and investors remain unaccustomed to considering toxic chemical releases when they decide what neighborhood to live in, where to send children to school, where to work, or what companies to buy stock in. In contrast to experience with the transparency system for home-mortgage lending, furthermore, advocacy groups have not for the most part incorporated toxic release data into their core strategies.

However, while information has remained relatively disembodied from market transactions and community action, it did become quickly and strongly embedded in important regulatory and administrative processes, particularly in actions by Congress and federal regulators. Existing goals and decision processes made these officials highly responsive to the new information. Federal environmental regulators had been urging stricter regulation of toxic chemicals for more than a decade and had been struggling with the lack of reliable information to support their efforts. Enforcement officials welcomed information that provided a better basis for their actions. (Graham, 2002)

Anticipated reputational and regulatory threats quickly embedded newly disclosed information into manufacturers’ routine decision processes. Some companies sought to reduce their emissions by engaging in pollution prevention strategies while others substituted chemicals or changed accounting practices in ways that improved reports without necessarily improving public health.

However, researchers have suggested that the effectiveness of this transparency system has been more limited than it appears. National news coverage created time-limited investor responses (company stock prices declined) to the first round of disclosures of surprisingly high levels of toxic releases by many publicly traded companies (Hamilton, 1995; Konar and Cohen, 1997). In addition, firms with large amounts of toxic releases became more forthcoming in disclosing environmental data in their 10K forms (Patten, 2002). There is, however, little evidence of long-term market response by potential users of the information, including home-buyers and renters, employees, and consumers. Data have had no apparent effect on housing prices and have not stimulated the expected community response to pressure polluters (Bui and Mayer, 2003). On the other hand, initial responses by those involved in making new pollution rules – especially legislators, regulators, environmental groups, lobbyists – did help to strengthen incentives for

companies to reduce toxic releases, in the form of stricter laws and regulations (Graham, 2002; Graham and Miller, 2001). Many targeted companies, especially those with national reputations to protect, made commitments to long-term reduction of toxic releases in response to the first shocking disclosures and took some specific actions to minimize such releases. The effectiveness of these actions in reducing toxic pollution remains uncertain. Researchers have found that some decreases reflected changes only in reporting procedures, that substituted chemicals were not necessarily less toxic, and that reported decreases and increases of releases varied widely by state, industry, and year (Bui, 2002; Graham and Miller, 2001). It remains unclear whether this transparency system ultimately will contribute to improved public health.

### **c. Reducing Health and Safety Risks in the Workplace**

Required disclosure of workplace hazards is another transparency system that has proven only moderately effective. Information has remained minimally embedded in employees' decisions and only moderately embedded in employers' decisions. In 1983, the federal government instituted an important new transparency system to improve workplace safety. New regulations required manufacturers to disclose to employers characteristics of hazardous chemicals they sold and to include substance names, hazards, and manufacturers' identities on warning labels. The government required employers, in turn, to disclose hazard information to workers. The new rules required employers to post material safety data sheets wherever hazardous chemicals were used, describing characteristics, hazards, precautions, and emergency measures. The purpose of this new hazard communication system was to reduce risks to workers by facilitating self-protection and by encouraging employers to substitute less hazardous chemicals for more hazardous ones. Government regulators estimate that three million workplaces are subject to this transparency requirement.

Researchers have found contradictory evidence that this system, which imposed substantial new reporting burdens on employers and manufacturers, has improved worker safety. Despite its compatibility with workers' goals of limiting their own risks or seeking higher wages to compensate for them, new information about chemical hazards has not become embedded in most employees' routine decision-making. Accessible only within the workplace and in disaggregated form, information has not been available at a *time, place, and format* to inform job seekers' decisions. For workers already on the job, data sheets were often too *complex* to be comprehensible and lacked indicators of *comparability* of the magnitude of health and safety risks.<sup>15</sup> In addition, the

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<sup>15</sup> Indicative of this problem is that Congress undertook in the late 1980s a supplemental effort to provide risk information to workers to supplement perceived deficiencies in the Hazard Communication Standard (the High Risk Occupational Disease Notification and Prevention Act of 1987). The Act was introduced because of Congressional concerns that the original Hazard Communication Standard failed to provide adequate information or protection to employees. Although the Act did not pass after several attempts, its sponsors cited similar concerns about the inability of workers to translate information into action (Arnett, 1992).

quality of required safety training has varied widely from workplace to workplace. Small workplaces often lacked the capacity to interpret chemical information and provide employees with sufficient training (GAO, 1992).

Exercising broad discretion permitted by regulators, employers have produced information sheets that vary widely in quality, detail, and technical vocabulary. Research on the quality of data sheets has shown that only 51% of analyzed sheets were partially accurate in all their sections (Kolp et al., 1995). Workers were generally able to understand only around 60% of the information in such sheets (Hazard Communication, 1997; Kolp et al., 1993). The high *cost* of understanding information has discouraged workers from using it to change work habits. Even in cases where workers seemed to comprehend safety information, they used it only in a limited fashion (Phillip et al, 1999). It should be noted that all of the documented cases of the impact of training and disclosure on information occurred within unionized establishments where unions potentially played a key third party role as user intermediaries (Weil 2004; Fagotto and Fung, 2003). The absence of unions in more than 90 percent of private sector workplaces raises questions about the generalizability of these results to nonunion workplaces.

Nonetheless, chemical hazard information has become embedded in some employers' decision-making processes. Limited evidence suggests that the awareness of risks associated with certain chemicals has led some employers to switch to safer substances. One analysis found that 30% of surveyed employers switched to safer chemicals in response (GAO, 1992). Concerns about potential liability claims by customers and/or workers also may have fueled some switching in the use of chemicals (Arnett, 1992). In addition, material safety data sheets became a useful tool for the exchange of information between manufacturers and corporate users of hazardous chemicals so that some chemical manufacturers have extended their use to non-hazardous chemicals. Overall, the hazard communication system appears to function better as a tool to exchange information among chemical producers and chemical users than as a device to help employees to protect themselves at work, avoid dangerous workplaces, or demand higher pay in light of increased risk.

### ***Ineffective Transparency Systems***

Ineffective transparency systems lead to little or no lasting change in the behavior of users or disclosers in furtherance of policy objectives. Some transparency systems prove ineffective because pre-existing decision processes of would-be information users resist the incorporation of new information, because users face a very limited set of choices and so cannot act on new information, or because users' goals differ from those of policy makers. Other systems prove ineffective because disclosers fail to respond to user signals or respond in ways that actually exacerbate the public problem that the system seeks to address.

### **a. Reducing Medical Mistakes**

Despite wide differences in hospital safety, early transparency systems have not proven effective in reducing medical errors. In 1999, the National Institute of Medicine reported that medical errors in hospitals created a major public safety problem, claiming between 44,000 and 98,000 lives a year and causing tens of thousands of serious injuries. The national transparency system that the Institute recommended to address these differences was not adopted by Congress. But a variety of state-mandated hospital and doctor report cards were adopted in the 1990s, notably in New York and Pennsylvania. These state transparency systems were intended to reduce errors by informing patients about the relative safety of hospitals. Early research suggests, however, that such systems have not yet become embedded in patients' decision-making. Problems related to timely access to information, difficulties in comprehending its meaning, and limited choices have minimized patients' use of information. Metrics have proven particularly problematic. Some evaluations of report cards found they had low predictive accuracy and were based on data with internal inconsistencies (Green and Wintfeld, 1995). Some physicians have criticized report cards as overly focused on mortality rates and inaccurately risk-adjusted. In addition, hospital managers, concerned about liability issues and unaccustomed to monitoring patient responses to safety, have had strong incentives to avoid providing information about patient safety and have had limited institutional mechanisms for learning from past mistakes in order to improve future safety (Graham, 2002).

Most research to date has found state patient safety transparency systems to be ineffective. Several studies have found that few patients were aware of report cards or used the information to choose hospitals or physicians (Schneider and Epstein, 1998; Marshall et al., 2000; Mukamel and Mushlin, 2001). Despite mandatory disclosure, friends and family have remained the principal sources of information about medical care (Robinson and Brodie, 1997). Mandatory disclosure has not prompted patients to stop using hospitals with high mortality rates or increase use of hospitals with good rates (Chassin et al., 1996), although some evidence suggests that hospitals and physicians with good report cards have experienced market share growth in some geographical areas (Mukamel and Mushlin, 1998). Other studies have suggested that few doctors discussed report cards with their patients and that some report cards may have created a disincentive to operating on severely ill patients (Schneider and Epstein, 1996). One analysis of the impact of report cards on cardiac surgery in New York and Pennsylvania suggested that they were associated with an increase in procedures performed on healthier patients and an increase in patients with more severe conditions treated at higher quality hospitals (Dranove et al., 2003). Limited user choice and discloser capacities for change may be important factors in these results. Many decisions about hospital use are one-time, unplanned events characterized by serious time, resource, and geographical constraints, as well as by prior commitments to health plans and doctors. With two-thirds of American hospitals in some kind of financial difficulty and with information about adverse events traditionally decentralized in morbidity and mortality conferences, hospital managers have rarely improved practices based on responses to newly mandated transparency.

Medication errors, the most common medical errors, continue to increase rapidly.

#### **b. Reducing Disruptions Due to Major Plant Closings and Layoffs**

The use of a transparency system to alert workers of impending plant closings has proven ineffective in limiting workers' and communities' dislocation costs. In response to a wave of high-profile plant closings in the mid-1980s, Congress passed the Worker Adjustment and Retraining Notification Act (WARN) in August 1988. WARN requires employers to provide advance notice of plant closures or large scale layoffs to affected workers and local communities. The information is relatively straight-forward: employers must provide affected employees with 60 days notice of a closing involving 50 or more workers at a single workplace and involving one-third of the workforce as a whole (GAO, 2003). The law sought to improve post-layoff outcomes for displaced workers as well as provide communities facing significant impacts from large-scale closures with time to make adjustments or find alternative solutions with employers.

In practice, it is not clear that this transparency system has materially affected the decision-making processes of workers facing the prospect of layoffs. Many of the workers that the law was designed to assist (that is, employees of large facilities, particularly in the manufacturing sector) did not often face the need for a job search.<sup>16</sup> Notice of layoff in and of itself provided little assistance to them in how to find new employment, and certainly had no effect on the availability of other options. Further, the 60-day notice required by WARN starts running when workers are still employed, limiting the amount of time available for job search. Thus the capacity of individuals to engage in full job searches upon notification is highly constrained. The required information may also come too late for unions, community groups, or other intermediaries to change the decision to close. Third parties also may lack capacity and /or experience to facilitate job search (GAO, 2003). Finally, the objectives of users, third parties, and disclosers may prove quite diverse in the face of closures, leading them to pursue different strategies in the face of information about the imminent event. Not surprisingly, there are few documented cases of employers' changing closure or mass layoff decisions in the wake of community- and/or union-notification of the impending closure (Gerhart, 1987; Gordus, et al., 1981; U.S. Secretary of Labor's Task Force on Economic Adjustment and Worker Dislocation, 1986).

Studies of WARN's impact on reemployment prospects of displaced workers consistently show limited impacts. Several studies have found that WARN has only modest impact on the provision of advanced notice information beyond what had been voluntarily provided prior to the Act

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<sup>16</sup> Indeed, in many of the industries with large scale closings that led to passage of WARN—for example, automobiles, steel, rubber, textiles—a significant percentage of workers had been employed by the company facing closure for much if not all of their work life (Levin-Waldman, 1998). Although WARN in theory provides these workers information on impending closures, their lack of prior experience in job search limits the utility of advanced notice as several studies of reemployment suggest.

(Addison and Blackburn 1994; 1997; Levin-Waldman 1998). In those cases where new information has been provided, workers have done somewhat better in finding new employment in the immediate wake of displacement. However, for those who do not find jobs immediately following closures or layoffs, spells of unemployment tend to be longer than workers who were not notified. Thus, if there are effects on reemployment—one of the principal objectives of WARN—they are modest and restricted to a subset of workers.

### **VIII. Conclusion: Transparency's Domain**

Our analysis suggests that transparency systems must meet two challenging conditions in order to be effective. First, they must *embed* information into the ordinary decision-making and action processes of information users and disclosers. Second, the responses of both users and disclosers must ultimately be *congruent* with policy objectives. Unlike many proponents who view transparency as automatically producing public benefits, we suggest a more measured analysis. As we have seen from a review of eight important cases, conditions for effectiveness are quite demanding and therefore not easily met. Many transparency systems fail to embed information and produce congruent actions because they are poorly designed. However, sometimes even the best-designed systems fail to embed information or create incentives that translate private actions into public benefits. In such situations, transparency is an inappropriate regulatory tool. We offer a three-tiered framework for understanding which kinds of policy problems are appropriate for regulation by transparency.

In one category of policy problems, new information can be easily embedded into the routines of users and those users would be likely to act in ways that spurred reactions from information disclosers that advanced public aims. In such cases, the implementation of well-designed transparency policies might shift the behavior of disclosers in socially beneficial directions. Such situations exhibit three characteristics. First, would-be information users systematically make suboptimal choices from a social perspective because they lack certain salient information. Second, if they had this information, users would have the will and capacity to change their behavior accordingly. Third, their new choices would cause information disclosers to alter their behavior in ways that would make behavior more congruent with policy intentions. Corporate financial disclosure, restaurant hygiene grading, and mortgage-lending reporting represent such transparency systems. Disclosure of hospitals' medical mistakes or broader measures of relative quality may represent another such area of promise. Patients, employers, and insurance companies lack information about patient safety and have strong incentives to find safe providers. Hospitals have economic and reputational reasons for responding to patients preferences. The ineffectiveness of transparency efforts to date may be due more to the novelty of these programs, design and enforcement weaknesses, and political resistance than to problems in the underlying processes of patient choices and hospital response to appropriate information, constraining though those are.

In a second category of policy problems, transparency by itself proves insufficient to generate effective policy outcomes but can be designed to work in tandem with other government actions to embed information in action cycles that produce congruent behaviors by disclosers. In this category, transparency requirements can generate relevant information but that information may not be easily embedded into the pre-existing cycles of user choice and discloser response. In mortgage lending, for example, bank transparency generated highly salient information that allowed community organizations to identify the ways in which local banks discriminated against certain groups of borrowers or against particular neighborhoods. Those organizations, however, may have lacked the power to successfully demand that those banks alter their behavior. An appropriate background of forceful regulatory rules against discrimination by financial institutions altered the action cycle in ways that embedded information into the strategies of users and responses of disclosers. Similar synergistic regulatory provisions might improve the effectiveness of many other transparency systems.

For a third category of policy problems, even well-designed and supported transparency systems are unlikely to be effective either because it is difficult to embed policy-relevant information into users' routines due to lack of choice or other insurmountable obstacles, because the goals and actions of users are incongruous with those of policy-makers, or because it is difficult to bring discloser actions in line with policy goals. In the case of factory closure transparency, for example, the need to keep impending closure decisions confidential because of the negative business ramifications of early release of that information and the significant period of time many communities need to prepare for plant closings almost preclude finding an advanced disclosure period compatible with the inherent needs of disclosers and users. In product markets where consumers emphasize price or styling over health or safety concerns, transparency systems, without related educational efforts, are likely to waste time and resources with little public gain.

Even in the first category of problems for which transparency systems are most promising, however, there are daunting challenges to making such policies effective. Some of these challenges concern designing policies in ways that produce information that will—by virtue of its salience to users, validity, timeliness, accessibility, and ease of use—become embedded in their routines of decision and action. The discussion above offers guidance regarding the most important aspects of embeddedness. Other challenges, discussed in our paper on transparency system sustainability, concern maintaining the will to improve those policies as conditions evolve and to prevent them from being captured by narrow interests. Transparency systems have demonstrated extraordinary promise in furthering important public priorities but they can realize that promise only if they are used as part of a disciplined process that sets priorities, assesses probable impacts, and provides architecture to minimize unintended consequences and promote mid-course corrections.

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## IX. Tables

**Table 1**

### **Information Disclosure Systems: An Overview of the U.S. Policies Analyzed in the Paper, Organized by Effectiveness Level**

	<b>DISCLOSURE SYSTEM</b>	<b>YEAR</b>	<b>INFORMATION DISCLOSED</b>	<b>PRIMARY DISCLOSERS</b>	<b>PRIMARY USERS</b>
<b>HIGHLY EFFECTIVE</b>	Corporate Financial Disclosure	1933, 1934	Financial characteristics of companies	Public companies	Investors & financial intermediaries
	Restaurant Hygiene Quality Grades	1997, Los Angeles County	Letter grades reflecting hygiene inspection results	Restaurants	Consumers
	Mortgage Lending Reporting	1975, expanded in 1989 (FIRREA)	Lending by census tract, race, gender, income level.	Banks and other lending institutions	Community groups, regulators
<b>MODERATELY EFFECTIVE</b>	Nutritional Labeling	1994	Nutrients in most processed foods	Food companies	Consumers
	Toxic Release Reporting	1986	Amount of toxic releases	Manufacturers	Regulators, environmental groups
	Workplace Hazards Disclosure	1983, expanded in 1987	Information on hazardous material present in the workplace	Manufacturers, employers	Workers, employers
<b>INEFFECTIVE</b>	Patient Safety Disclosure	1990, New York; 1992, Pennsylvania	Mistakes in patient treatment	Hospitals and health care providers	Patients, major health care purchasers
	Workers Notification Of Plant Closing	1988	Plans of large scale termination/ facility closings	Large companies	Affected workers and communities

Table 2

Transparency policy evaluation of embeddedness and effectiveness

Disclosure System	Information	Embeddedness in Users' Decisions	Embeddedness in Disclosers' Decisions	Summary of effects (intended, unintended)	Literature Review
Corporate Financial Disclosure	Quarterly and annual company reports of assets, liabilities, risks to investors.	STRONG: Reports widely used by individual and institutional investors, securities analysts, financial planners, competitors, and others.	STRONG: Companies track investor responses through stock price.	<p><u>INTENDED</u></p> <ul style="list-style-type: none"> <li>-reduces investors' errors</li> <li>-protects unsophisticated investors</li> <li>-creates incentives for improved corporate governance</li> <li>-lowers cost of equity capital</li> </ul> <p><u>UNINTENDED</u></p> <ul style="list-style-type: none"> <li>- inequities between sophisticated and unsophisticated investors.</li> </ul>	<ul style="list-style-type: none"> <li>• Comparison of new stock issues in 1923-28 and 1949-55 suggests that mandatory disclosure requirements adopted in 1934 had no important effects on the quality of new securities sold to the public. (Stigler, 1964)</li> <li>• Analysis of share prices before and after the 1934 Securities Act suggests that mandated disclosure had no measurable effects on the share prices or on investor risk. (Benston, 1973)</li> <li>• Analysis of stock prices on regional exchanges before and after mandatory disclosure finds that variance of returns lessened substantially after disclosure Required, suggesting that investor risk was reduced even though mean returns did not change. (Simon, 1989)</li> <li>• Study of financial analysts' data suggests that more informative disclosure policies decrease the dispersion among analyst forecasts, leading to greater accuracy in forecasting. (Lang and Lundholm, 1996)</li> <li>• Analysis of 1990 annual reports suggests that greater disclosure is associated with lower cost of equity capital. (Botosan, 1997)</li> <li>• Literature review concludes that financial disclosure creates incentives for improved corporate governance, informing executive compensation, contract management, and shareholder and board monitoring. (Bushman and Smith, 2001)</li> <li>• Comparison of securities returns before and after the enactment of 1964 disclosure requirements for firms traded over the counter shows positive abnormal returns for disclosing firms. Evidence suggests that mandatory disclosure can be an effective measure to reduce activities that do not maximize shareholder value. (Greenstone, Oyer, and Vissing-Jørgensen, 2004)</li> </ul>
Restaurant Hygiene Quality Cards	Restaurant cleanliness inspection data	Restaurant choice from consumers YES	Owners improve restaurant cleanliness YES	<p><u>INTENDED</u></p> <ul style="list-style-type: none"> <li>-improvement in hygiene quality</li> <li>-improvement in physical infrastructure of restaurant</li> <li>-increase in restaurant revenues</li> <li>-reduction in number of hospitalizations for food-borne illnesses</li> </ul>	<ul style="list-style-type: none"> <li>• Mandatory disclosure led to average increase in restaurant hygiene quality of 5.3% (based on point score) whereas voluntary disclosure increased it by 3.9%. The improvement of hygiene quality is reflected in a reduction of the number of hospitalizations for food-related illnesses. Restaurants under mandated disclosure also improved physical structure of buildings (longer term investment effects). Mandatory grade cards increased restaurants' revenue by 3.3%, voluntary disclosure generated a 2.6% increase. For mandatory disclosure, authors find a 5.7% increase in revenue for A grade restaurants, a 0.7% increase for B grade, and a 1% decrease for C grade. In the case of voluntary disclosure, A grade revenues increased by 3.3%, difference for B and C grades not significant from A grade. The reduced impact on revenues in the case of voluntary disclosure might stem from the fact that residents are fully informed about the system, or might assume that no grade card posted means restaurant did not undergo an inspection. (Jin and Leslie, 2003)</li> </ul>

Disclosure System	Information	Embeddedness in Users' Decisions	Embeddedness in Disclosers' Decisions	Summary of effects (intended, unintended)	Literature Review
Mortgage Lending Reporting	Lending statistics	Bank choice NO Community groups pressure YES Regulators use data to pass new rules and tighten enforcement YES	Banks improve lending practices YES	<p><u>INTENDED</u></p> <ul style="list-style-type: none"> <li>- knowledge base to assess existence and dimensions of lending discrimination</li> <li>-expanded access to credit for minorities</li> <li>-special CRA programs for neighborhoods</li> </ul> <p><u>UNINTENDED</u></p> <ul style="list-style-type: none"> <li>-community group abuse of CRA regulation in M&amp;A time to strike "good deals" with banks (Sunshine regulation)</li> </ul>	<ul style="list-style-type: none"> <li>• Federal Reserve study using HMDA data to evaluate the existence of mortgage discrimination. Minority applicants have weaker financial characteristics than white ones (less wealth, liquid assets, and income). They have higher loan to value ratio and have to apply for private mortgage insurance to obtain loans. However, when minority and white applicants with same financial characteristics are compared, rejection rates of minorities are 7 to 8 percentage points higher. Race proved to be an important explanatory factor in mortgage lending decisions both for institutions with the largest number of loans to minorities (5 percent of institutions accounted for 50% of applications) and for remaining institutions. (Munnell, Tootell, Browne, and McEneaney, 1996)</li> <li>• Research found impact of CRA, HMDA difficult to quantify. Especially in 90s these regulation might have increased access to mortgage credit for low income-minority families, since banks introduced new mortgage programs. Furthermore, lenders are sensitive to the distribution of their loan portfolio. Finally, Congress empowered the Dept. of Housing and Urban Development to create new affordable housing goals for Fannie Mae and Freddie Mac. However, most of the increase in lending to minorities happened for banks that were not subject to CRA. However, since authors found that changes in family characteristics do not explain the increase, they conclude this should be attributed to laws on fair lending, good economic cycle, and low interest rates. (Bostic and Surette, 2001)</li> <li>• From 1993 to 2000 the number of home purchase loans made to black borrowers increased by 94%, to Hispanics by 140% and to other minority borrowers by 92%. Minority borrowers represented 25% of total home purchase lending in 2000, as opposed to 17% in 1993. Home purchase loans to lower income borrowers (with incomes less than 80% of MSA median income) and/or lower income communities increased by 77% (571,000 loans) from 1993 to 2000. The study attributes part of the increase to the expansion of government backed lending, especially loans insured by the Federal Housing Administration (FHA). In 2000 minorities represented 40% of home purchase mortgages insured by FHA, as opposed to 22% in 1993. (The 25<sup>th</sup> Anniversary of the Community Reinvestment Act, 2002)</li> <li>• The higher the percentage of mortgage originations for low and moderate income individuals in a given year, the greater the probability that the institution will acquire another bank the following year. The authors found that moving from the 25th to the 75th percentile of the distribution of CRA lending is associated with a 0.8 percentage point increase in the likelihood of making an acquisition in the following year. (Bostic, Mehran, Paulson and Saldenberg 2002).</li> </ul>

Disclosure System	Information	Embeddedness in Users' Decisions	Embeddedness in Disclosers' Decisions	Summary of effects (intended, unintended)	Literature Review
Nutritional Labeling	Nutrients in packaged foods	VARIABLE: Labels on products at point of purchase; consumer understanding, use of complex information variable	STRONG: Companies anticipated consumer responses. Labeling contributed to introduction of low-fat, low-sodium brand extensions.	<p><u>INTENDED</u></p> <p>-some consumers increase label use</p> <p>-producers introduce low-fat, low-salt brand extensions</p> <p><u>UNINTENDED</u></p> <p>-misinterpretation of nutritional information</p> <p>-label use, comprehension varies with education, income, age</p> <p>-consumer confusion: recent decline in purchase of low-fat and low-cholesterol products.</p>	<ul style="list-style-type: none"> <li>• Survey data suggests label use increased after mandatory labeling but 70 % of adults wanted labels that were easier to understand. (Kristal et al., 1998)</li> <li>• Purchase, survey data suggest that producers anticipated consumer responses by adding "positive" nutrients without reducing "negative" nutrients in base brands and reducing "negative" nutrients without adding "positive" nutrients in brand extensions when labels were introduced, creating a more highly segmented market. (Moorman, 1998)</li> <li>• Analysis of label and scanner data suggests that sales of highest-fat salad dressings declined after mandatory labeling was introduced. (Mathios, 2000)</li> <li>• Survey data suggest consumers using labels focus on products' fat content. Due to variety of factors, consumers have reduced intake of calories from fat from 41.1% during 1977-78 to 33.6% in 1995 but have not reduced caloric intake overall. Fat-modified products gained significant market share 1991-1995, both before and after mandatory labeling was introduced. (Derby and Levy, 2001).</li> </ul>

Toxic Release Reporting	Volumes of Toxics emitted	Residential choice NO Regulators to draft new rules YES Some environmental NGOs used data to fight pollution and inform the public YES	Managers clean up act YES	<p><u>INTENDED</u></p> <p>-reduction in emissions -more informed public-limited -media coverage</p> <p><u>UNINTENDED</u></p> <p>-panic in communities, -panic in companies -drop in stock prices -amplifier pollution reduction for firms that had been targeted by press and had highest abnormal market returns -targeted firms reduced emission more than (untargeted) largest emitters.</p>	<ul style="list-style-type: none"> <li>• There were 134 mentions of TRI-related stories by journalists for 1989; Media focused on firms accounting for larger share of pollution. Investors reaction to the publication of TRI information caused an average loss of \$4.1 million in stock market value on day 0. The effect of the information was more dramatic for firms that had also received media coverage of their releases, with average abnormal returns of -\$6.2 million on day 0. (Hamilton, 1995)</li> <li>• Of a sample of 40 firms with highest press coverage and highest abnormal returns, 32 reduced their TRI/\$ revenue, 8 firms increased emissions. Firms also reduced their TRI/\$ revenue ranking in their industry. Average firm in sample reduced emissions by 1.84 pounds per thousand \$, whereas an industry-weighted sample of other firms reduced by 0.17 pounds. The top 40 in terms of abnormal return were compared to the 40 largest emitters (only 11 firms were the top 40 and in the 40 largest emitters). It was found that top 40 reduced TRI emissions more than 40 worst polluters. (Konar and Cohen, 1997)</li> <li>• Steep declines in TRI emissions between 1987-88. Since 1988 emissions have declined more steadily. Off site transfers declined until 1990 but increased significantly from 1991, when off-site transfers started to include recycling and energy recovery. Stock market analysis shows that abnormal returns were not significant in days -1 and 0 of the event study, in any of the years. The average abnormal returns were negative and statistically significant in day 1 from 1990-1994. They were not significant in 1989. Over a 0-5 day window, abnormal returns were significant only in 1992 and 1994. (Khanna, Quimio, and Bojilova, 1998)</li> <li>• Reduction in emissions and transfers between 1990 to 1996 1.5 to 2.2 times more than the general TRI trend and 1.3 to 19 times greater than other companies in their same industry sector. Facilities that received negative press reduced emissions more than other facilities. For example, one facility reduced emissions of a chemical that was cited in the press by 86%, and overall facility emissions by 64%, whereas emissions at other facilities owned by the same company stayed the same. Decline in hazardous substances release from 7800 in 1994 to 5,400 in 1999. A study of four states with similar industry composition found that releases had declined by 60% from their peak year (1992). Episodic releases of TRI chemicals from manufacturers and releases of substances above reportable quantities declined by 68% from their peak year (1990). (EPA, 2000)</li> <li>• In 1988-1999 reported releases dropped by more than 50%, harmful chemicals releases declined even more and recycling improved (since 1991 recycling increased by 12%). But the rate of decline slowed down after the first 5 years of reporting. From 1988 to 1993 total releases decreased by 37%, an average of 7% per year. From 1993-1998 total releases fell by 10%, average of 2% per year. Reduction is not a national phenomenon but rather a media-industry-facility specific phenomenon. TRI emissions decreased, but toxic waste increased. Air releases decreased dramatically (-61%). Surface water releases down by 66% (trend varied a lot year by year). Land disposal of toxic chemicals increased because of higher costs of recycling. Facilities with large amount of emissions have been more successful at reducing them. There are large variations by industries, with significant reduction from chemical manufacturers, and increase in food and primary metal sector. New industries (reporting for the first time in 1998) increased their releases, by 5% (with metal mining and electric utilities driving the increase). (Graham and Miller, 2001)</li> <li>• Emissions beyond 1 mile circle around property have no effect on property values. Property values increase as a result of TRI info release, within the 1mile distance, results suggests that perceptions are even more favorable for risks within 0.5 miles. (Oberholzer-Gee and Miki Mitsunari, mimeo 2002)</li> <li>• TRI releases fell by 78.37% from 1988 to 1995. Differences in TRI emissions attributable to variation in stringency of state regulations of TRI emissions shows that states with additional regulations (but no numeric goals) clean up more than states that have no additional TRI type regulations (i.e. states that have only federal level regulation). However states with stringent regulations, with numeric goals for reduction of TRI, don't reduce emissions more rapidly. Evidence is inconclusive on the impact of state regulations on TRI abatement. (Bui, mimeo</li> </ul>
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<b>Disclosure System</b>	<b>Information</b>	<b>Embeddedness in Users' Decisions</b>	<b>Embeddedness in Disclosers' Decisions</b>	<b>Summary of effects (intended, unintended)</b>	<b>Literature Review</b>
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Workplace Hazards Disclosure	Hazardous chemical information	Workers understanding UNCLEAR Workers self protection UNCLEAR	Employers switched to less hazardous chemicals YES	<p><u>INTENDED</u></p> <p>-workers were able to establish causal links between exposures to chemicals and injuries/illnesses</p> <p>-information available to treat exposed workers</p> <p>-some workers take improved safety measures</p> <p>-employers switched to safer chemicals</p> <p><u>UNINTENDED</u></p> <p>-Workers find safety information too complicated because of language, education level is important</p> <p>-Some workers don't react to the information, lack of choices</p> <p>-Wide differences in implementation across workplaces</p>	<ul style="list-style-type: none"> <li>• Joint labor-management training proved effective in improving workers' understanding of safety information. Participants in the special training program perceived the training as helpful, that perception grew overtime. Workers responded they had changed work practices, especially they read labels, were more aware of dangers, avoided hazardous areas and used protective equipment. 54% of supervisors had changed their own practices in response to the training program. 30% of workers reported that working conditions had improved following the training. The program had also increased the level of concern and responsiveness of managers and unions. Joint labor-management training program had positive impact on employees' behavior. More interactive training delivery to smaller groups were key factors for success. (Robins, Hugentobler, Kaminski, and Klitzman, 1990)</li> <li>• Out of a sample of 91 union workers from 13 different manufacturing plants and one trade union located in Maryland, 80% of workers had seen MSDS before survey, 45% had been trained on it. 2/3 had requested MSDS. 80% changed behavior in response to MSDSs. 50% of workers reported MSDSs to be helpful. 2/3 found MSDS to be confusing. Education found to have impact on understanding. (ATKerney/Centaur Division study, 1991)</li> <li>• For 91 tested workers, 2/3 of info in MSDS is comprehended. 80% of surveyed workers had seen an MSDS before survey, only 45% had seen it during training. 2/3 requested information on the chemicals with which they work, but only, 2/3 of these workers found MSDS they received in response difficult to comprehend. 80% of workers receiving chemical hazard information of any type reported changing behavior, and 50% reported MSDS are helpful in preventing or responding to emergency situation. Workers had troubles understanding difficult vocabulary, and layout of MSDS can be confusing. Differences in educational level important factor impacting understanding. Workers with college education scored higher. (Kolp, Sattler, Blayney, and Sherwood, 1993)</li> <li>• Evaluation of 150 MSDS showed 83% of MSDS provided specific chemical names for all the listed ingredients. Of 134 MSDS with identifiable chemical components, 37% reported accurate health effects, 47% were inaccurate and 16% partially accurate. 76% of MSDS had accurate first aid information. 47% of MSDS had accurate information for personal protective measures, 22% had inaccurate information on this topic. 47% had accurate info on exposure limits, 16% had inaccurate values. Only 11% of reviewed MSDS were accurate in all the four dimensions. 51% of MSDS were partially accurate in all 4 areas. (Kolp, Williams, and Burtan, 1995)</li> <li>• According to three studies on the comprehensibility of material safety data sheets (MSDSs), workers understand on average 60% of the information reported. A 1990 study by the Printing Industries of America found that employees with 15+ years of education understand only 66.2% of MSDS education. (Hazard Communication, 1997)</li> <li>• Evaluation of MSDS understanding gave mixed evidence. Out of a sample of 160 workers (69% with high school education, some with some college education and 95% of sample had undergone training on MSDS) 39% found MSDS difficult, 46% disagreed. 90% of workers said MSDS were satisfactory to very satisfactory in providing information. 3/4 of workers changed work habits following disclosure of MSDSs. But workers' frequency of usage was low: 1/3 used MSDS half/all of the time, the rest rarely to never used them. Workers reported easy access to MSDS. (Phillip, Wallace, Hamilton, Pursley, Petty, and Bayne, 1999)</li> </ul>
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Disclosure System	Information	Embeddedness in Users' Decisions	Embeddedness in Disclosers' Decisions	Summary of effects (intended, unintended)	Literature Review
Patient Safety Disclosure, New York & Pennsylvania	Ratings of doctors and hospitals for cardiac surgery	WEAK: Patient decisions based on doctor-recommendation, word of mouth, health plan coverage.	VARIABLE: Most doctors and hospitals unaccustomed to tracking safety data and responding to patients' concerns.	<p><u>INTENDED</u> -Some evidence that hospitals improved mortality rates after report cards introduced.</p> <p><u>UNINTENDED</u> -Some hospitals shifted to treating less sick patients, a possible explanation of improved mortality rates. -Patients continued to select hospitals, doctors with less good safety records.</p>	<ul style="list-style-type: none"> <li>• Analysis of New York hospital data suggested that the dissemination of information on surgery outcomes resulted in an improvement of surgery results from 1989 to 1992. Authors found a decrease in the actual mortality rate and an increase in average patient severity of illness. (Hannan et al., 1994)</li> <li>• Evaluation of New York's report cards found predictive accuracy of the disclosure model low, internal inconsistencies in data and mortality rates imperfect metric. (Green and Wintfeld, 1995)</li> <li>• Study found no movement of patients away from hospitals with high mortality rates. Nor did patients move to hospitals with low rates (Chassin et al., 1996)</li> <li>• Survey of cardiologists' and surgeons' opinions on Pennsylvania report cards found large awareness of disclosure system among physicians, however, less than 10% discussed about report cards with more than 10% of their patients. Physicians criticized report cards for absence of quality indicators other than mortality, inadequate risk adjustment, and data unreliability. Cardiologists reported increased difficulties in finding surgeons to treat severely ill patients. Majority of surgeons confirmed they were less willing to operate on such patients. (Schneider and Epstein, 1996)</li> <li>• Patient survey found that 20% of respondents were aware of Pennsylvania's report cards, but only 12% knew about it before surgery. Fewer than 1% knew the correct rating of their surgeon or hospital and reported that information had a moderate or major impact on their selection of provider. (Schneider and Epstein, 1998)</li> <li>• Study of New York report cards found no evidence that provider-profiling limited procedure access for elderly or increased out-of-state transfers. (Peterson et al., 1998)</li> <li>• Hospitals and physicians with better reported outcomes showed higher growth in market share in some geographical areas. Correlation is stronger for surgeons than for hospitals, but it tends to decline over time. (Mukamel and Mushlin, 1998)</li> <li>• Survey of hospitals' CEOs in California and New York found report cards are generally rated as fair or good by hospitals, with respondent in large/high volume hospitals more knowledgeable of cards. Hospitals with higher mortality rates were more critical of report cards. (Romano et al., 1999)</li> <li>• Analysis of empirical evidence on impact of hospital performance data suggested that consumers and purchasers rarely searched out the information and did not understand or trust it. Reporting had small, although increasing, impact on their decision making. Small portion of physicians and larger portion of hospitals used the data. (Marshall et al., 2000)</li> <li>• Literature review found little evidence of report cards' impact on patients' choice of provider or health plan, perhaps due to inability of providers to rapidly respond to shifts in demand, information already incorporated in consumers' choices, and problems with report cards' quality and credibility. (Mukamel and Mushlin, 2001)</li> <li>• Analysis of the impact of report cards on cardiac surgery in New York and Pennsylvania showed evidence of selection behavior by providers, leading to an increase of procedures performed on healthier patients. Sorting among patients caused delays in the execution of surgery. Authors also find increased matching of patients with hospitals, with patients with more severe conditions being treated in higher quality hospitals. (Dranove et al., 2003)</li> </ul>



Disclosure System	Information	Embeddedness in Users' Decisions	Embeddedness in Disclosers' Decisions	Summary of effects (intended, unintended)	Literature Review
Workers Notification of Plant Closing	Employer intention to close plant or layoff large number of workers	Third parties organized of communities or workers. NO	Notify communities and workforce early in order to prepare them for major plant closings NO	<p><u>INTENDED</u> -very limited intended effects because many employers fail to notify workers</p> <p><u>UNINTENDED</u> -limited ability to react to shifts even given notification -different protection in unionized vs. non-unionized workplaces -wide disparities across communities</p>	<ul style="list-style-type: none"> <li>• A comparison of Displaced Worker Surveys conducted in 1988, 1990, and 1992 (WARN was implemented in 1989) shows little impact of WARN in workers' notification. Both before and after WARN was passed, there is very limited formal notice (less than 15% of displaced workers reported receiving formal notice). Authors observe a decline in workers receiving informal notice, balanced by an increase in the number of workers receiving no notice at all. Workers displaced because of plant shutdown more likely to receive notice than workers displaced because of layoffs. Workers in areas with lower unemployment rate more likely to receive notice. Overall WARN legislation does not seem to have affected workers' notification trends, this study confirms previous work by authors which used only 1 year post notification data. This can be hardly attributed to employers' ignorance, they often deliberately chose certain firm sizes to avoid compliance with WARN, some sought legal advice before deciding if complying or not. Another reason for limited impact could be that firms with less than 100 employees (35% of workforce at time of study) do not need to comply. (Addison and Blackburn, 1994)</li> <li>• Analysis of Displaced Worker Surveys shows limited impact of WARN in reducing unemployment. Comparison of escape rates from unemployment for notified and non-notified workers for 5 years retrospective 1988 and 1990 Displaced Worker Surveys shows that escape rate is higher for notified workers who passed from one work to the other (0 days unemployed). This could be explained by the fact that notified workers have benefited from an additional period to search for a new job, from notification to displacement. However, considering that on the job search is less productive than off the job and correcting for this difference, the escape rates for notified and non-notified workers become similar. Notified workers conduct less intensive search in notification period than non-notified workers do after leaving their jobs. (Addison and Blackburn, 1997)</li> <li>• Assessing the impact of WARN is difficult because there are problems of data consistency across surveys of recordkeeping. States have no figures on how WARN works and how it is affecting population. Only 2 states had information on replacement wage rates. Not enough data to assess effectiveness of WARN, states should do better recordkeeping. There is no enforcement mechanism, other than law suits by workers, a federal agency monitoring WARN performance and handling enforcement would be appropriate. (Levin-Waldman, 1998)</li> <li>• A GAO's assessment of WARN's implementation found that 2001 there were 1.75 M job losses through extended mass layoffs. In 2001 employers provided notice for an estimated 36% mass layoffs or closures that qualified for WARN (717 out of 1974). Employers provided notice for 46% of plant closures and 26% of mass layoffs. Remaining ones are subject to WARN, but notice was not provided (maybe they provided other-non WARN-notice, or pay en lieu of notice). 2/3 of notices provided were on time. Employers have problems applying WARN because it's hard to calculate the layoff threshold. Courts (only enforcers of WARN, since there is not an enforcement agency) have applied WARN provisions inconsistently, which creates confusion. Educational materials by DOL are not widely available. Problem of lack of DOL guidance. (GAO, 2003)</li> </ul>

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John F. Kennedy School of Government  
Harvard University  
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