Corruption and Reform? The Emergence of the 1906 *Pure Food and Drug Act*

THIS VERSION: April 12th, 2004

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Abstract

We argue that a nuanced combination of the traditional and revisionist hypotheses for regulation explains the origins of the *Pure Food and Drug Act*. Regulation was desired for its potential to tilt the competitive playing field in favor of particular producers as well as to improve consumer information about product quality. Muckraking journalism, by making the issue of food and drug quality emotionally salient to consumers, played a key role in harnessing diffuse consumer interests and ending political stalemate over regulation. Corruption in the courts or in the administration of state regulation does not appear to have been a major factor behind the emergence of federal food and drug regulation. We also find that because neither producers nor consumers were able to fully shape the institutional setting in which regulation was enforced, neither group obtained the benefits from regulation that it had anticipated. To fully understand regulation, an eclectic approach is warranted that considers not only the interest group motivations for regulation, but also the institutional constraints that limit what these groups can obtain.

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I. Introduction

The late nineteenth and early twentieth centuries witnessed the birth of the American regulatory state. During this period, federal regulatory authority over banking, insurance, transportation, competition, and interstate trade in food and drug products expanded considerably. Explaining this growth of government authority is major task for social scientists and has been the source of much scholarly debate. Economists, historians, and political scientists have yet to arrive at a consensus regarding the causes and consequences of this expansion of federal regulatory activity.

Broadly speaking, there are two views of the emergence of the federal regulatory state. One view argues that regulation expanded during this time as a partial response to market failures that arose in an increasingly specialized and complex modern economy (Keller 1981). According to this "traditional view," public minded reformers interested in improving consumer welfare lobbied for food and drug regulation, antitrust legislation, and other federal regulations. While this account is widely supported by a large historical literature, it fails to explain why regulation, as opposed to the court system, was needed to improve consumer welfare. The answer, according to Glaeser and Schleifer (2003), is that the tort system failed to function effectively as a mechanism for resolving market failures. Glaeser and Schleifer refine this traditional view by arguing that subversion of the justice system through legal as well as corrupt means motivated reformers to seek regulation as the solution to these market failures.

In contrast the "revisionist view" of the rise of the regulatory state argues that rent seeking on the part of special interests (for instance, big business) was the driving force behind government regulation during this period (Kolko 1963). Taking their cue from Stigler's (1971) "capture" theory of regulation, proponents of this view maintain that regulation was sought by special interests to serve their private objectives and to cripple the competition, often at the expense of economic efficiency. Hence, while the traditional view emphasizes the efficiency-enhancing role of Progressive Era regulation, the revisionist view highlights its potentially harmful aspects.

This paper contributes to this debate by exploring the emergence of federal food and drug regulation in early twentieth century America. In 1906, the federal government enacted the *Pure Food and Drug Act*, the first federal law that gave regulators

unprecedented authority over interstate trade in food and drug products. The central issues examined in this paper are the timing and actual nature of early federal regulation of food and drugs. An examination of the origins of this law is important because the agency entrusted with enforcing this law has had an enduring influence over industries it regulates. The Food and Drug Administration (FDA)—the federal agency spawned by this law—continues to regulate interstate trade in food and drugs.[1] Hence, an analysis of the origin of this law may inform the larger debate about the origins of the modern federal regulatory state.

We argue in this paper that a nuanced combination of the traditional and revisionist (*i.e*. Stiglerian) stories explains the emergence of federal food and drug regulation in early twentieth century America. Specifically, we find that while a desire on the part of particular producer interests to tilt the competitive playing field was an important driving force behind the adoption of the *Pure Food and Drug Act*, enactment of this legislation would not have been possible without the last minute onset of widespread consumer interest in federal food and drug regulation. Thus, the formation of a coalition of producer and consumer interests was critical for the adoption of regulation. We also find that because neither producers nor consumers were able to entirely shape the agency that was charged with enforcing this law or the legal environment in which enforcement took place, neither group ultimately benefited from regulation in the ways that they had initially anticipated. Hence, while a combination of the revisionist and traditional views may furnish an adequate explanation for why this regulation arose, neither view provides a complete account of the ultimate effect of policy. A more eclectic approach that takes into account not only the interest group motivations for regulation, but also the ability of these groups to influence the institutional environment in which regulation is enforced, is needed to fully understand the causes and consequences of regulation.

In the 40 years after the Civil War, falling transportation costs combined with technological change in the production and development of food and drugs profoundly

[1] Until the late 1920s, the organization that we know today as the FDA was the Bureau of Chemistry, an agency within the federal Department of Agriculture. In 1927 the regulatory

affected producers, consumers, and bureaucratic officials. The introduction of new products altered competitive conditions in these industries, creating new sets of winners and losers. Technological advances that increased the complexity of many products also gave rise to asymmetric information problems regarding product quality and created opportunities for cost-saving deception by firms. In such an environment, regulation of the industry was desired because of its potential to improve consumer information about product quality (traditional view), but also in order to tilt the competitive playing field in a Stiglerian fashion (revisionist view). In response to these developments, state governments adopted laws that regulated product quality but also strategically advantaged local and regional producers who faced new competitive pressures. More national producers and interest groups, in contrast, sought federal legislation, either to create uniform regulatory standards, or to thwart more aggressive state regulation. As we will show, however, competing interests, with different assessments of their benefits from federal regulation, prevented the formation of an effective political coalition in favor of regulation. Hence, although food and drug bills were proposed in Congress throughout the 1880s and 1890s, Congress did not enact a federal food and drug bill until 1906.

Key to explaining the timing of federal food and drug regulation is muckraking journalism that created a sense of "crisis" about the quality of food and drugs. In our context, it is important to note that the *Pure Food and Drug Act* was enacted by Congress following a flurry of investigative journalism about various aspects of the food and drug trade. Beginning in the 1880s and peaking around 1910, muckraking journalism became a common feature of inexpensive and widely circulated magazines. In articles published in these periodicals, muckraking journalists exposed dishonest business practices, political corruption, and slum conditions in urban areas (Hays 1957; Weibe 1967). Historians have suggested that by highlighting important social and economic "problems" to a broad audience, muckraking helped trigger reform legislation that limited opportunities for political corruption and curbed unscrupulous business practices.[2] The sense of "crisis"

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portion of this agency was re-named the Food, Drug and Insecticide Administration. In 1930 its name was shortened to the Food and Drug Administration.

[2]Although the muckrakers themselves were often ideologically-motivated social reformers, it is clear that muckraking was also profitable: it has been estimated that by around 1905, each of the

created by muckraking about the quality of food and drugs raised the perceived benefits of enacting federal food and drug regulation and lowered the cost of bringing diverse interest groups together. Indeed, we believe that by galvanizing relatively unorganized consumer interests, muckraking journalism about the quality of food and drugs played an important role in determining the timing of regulatory reform (Higgs 1987; Carpenter and Sin 2002). Our interpretation of the emergence of federal food and drug regulation therefore suggests that while special interests from industry were the major players behind regulation, the support of reformist consumer interests was critical in getting federal food and drug regulation enacted, affecting both the timing and content of policy.

Subversion of the judiciary or of the state regulatory process was not a major motivation for federal regulation. Some scholars maintain that concerns about "corruption"—which they define as the undue influence of business groups over the enforcement of state regulation or over the judiciary due to business's superior access to political power—motivated Progressive reformers to seek federal regulation of industry and to lobby for laws that curtailed the influence of business over government and the justice system (McCormick 1981; Glaeser and Schleifer 2003). An examination of testimony to Congress on proposed food and drug bills during the 1890s and early 1900s as well as other primary and secondary sources reveals little evidence of this kind of corruption in the judiciary or in state governments regarding the enforcement of state pure food regulations. "Corruption" was alleged but of a different kind: businesses were accused of cheating consumers on product quality and taking advantage of informational asymmetries to obtain dear prices for shoddy items. While muckrakers did highlight industry's influence over the press and over regulation, the available evidence suggests that concerns about how businesses were deceiving consumers about the quality of their products played a more significant role in generating political support for federal food and drug regulation.

The key constituencies involved in the struggle for food and drug regulation included ideologically motivated Progressive reformers, state regulators, federal regulators, incumbent firms producing "old" goods and entrant firms producing "new"

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main muckraking periodicals had expanded its circulation to approximately 500,000 to 1,000,000 readers (Reiger 1932; Chalmers 1974; Filler 1976).

goods, the muckraking press, and consumers. These parties had conflicting incentives for federal regulation of product quality. Differences in the private returns from obtaining federal regulation shaped the composition of the political constituency that lobbied on behalf of regulation as well as the nature of the political conflict surrounding proposed pure food and drug bills. Muckraking journalism about the quality of food, drugs and meat in 1905 and 1906, by creating a sense of crisis, increased the perceived net benefits of regulation, brought these diverse interests together, and made it possible for Congress to enact a federal food and drug law.

II. The market for food and drugs in late nineteenth and early twentieth century America[3]

Two important developments characterized the market for food and drugs in the late nineteenth and early twentieth century America. The first was the introduction of new and cheaper substitute products that threatened to erode the dominant position enjoyed by old products. Changes in the competitive playing field gave rise to trade wars among rival elements of the food and drug trade, which in turn generated a demand for regulation from certain producers who wanted to use regulation to disadvantage competing products (Wood 1986). The second was scientific advance that made it possible for manufacturers and distributors of food and drug products to alter or adulterate their goods in ways that consumers could not easily perceive. Asymmetric information about product ingredients and product quality created concerns that there was a "lemons" problem in the market for many food and drug items (Akerlof 1970). Because consumers could not easily detect many forms of food and drug adulteration even after consumption, market forces could not guarantee the delivery of quality food and drug items (Darby and Karni 1973; McCluskey 2000). Hence, there was a potentially productive role for product quality regulation by scientific experts, who had a comparative advantage in judging the quality of food and drug items.

Expanding markets combined with advances in food manufacturing and processing gave rise to several new food products in late nineteenth century America. Oleomargarine, the first viable butter substitute, was introduced to the American market in the early 1870s. Invented in 1869 by the French chemist, Mège-Mouries,

oleomargarine (margarine) quickly became popular among working-class households because it was considerably cheaper than butter (Dupré 1999). Declining transportation costs and the development of the refrigerated rail car made it possible for large meat packinghouses located in Chicago, St. Louis and other mid-western cities to slaughter cattle centrally and ship prepared beef carcasses (known as "dressed beef") to eastern markets. By the 1880s, sales of "dressed beef" rivaled sales of locally slaughtered meat in New York, Boston, and other cities on the east coast (McCurdy 1978; Yeager 1981; Libecap 1992). Advances in chemistry gave rise to a new form of baking powder—alum based baking powder—that was considerably cheaper than traditional cream of tartar baking powders. Improvements in canning and preserving technology made it possible to expand both the geographical and temporal distances between the production and consumption of fruits, vegetables, meats, and seafood. These advances in food manufacturing and processing during the late 1800s gave rise to new and cheaper food products, many of which challenged the dominant position enjoyed by producers of older products.

As a consequence of these developments, conflicts among competing factions of the food trade became common during the late nineteenth century (Wood 1986). Dairy producers, threatened by the growing popularity of oleomargarine, slandered oleomargarine as "the greasy counterfeit" and sought regulations at the state and federal level to stem the growth of the oleomargarine trade. Local butchers, in concert with disgruntled cattlemen, charged that dressed beef was unsafe, and lobbied for meat inspection and antitrust to disadvantage the large Chicago packinghouses. A long and protracted battle emerged between the cream of tartar baking powder interests and the alum-based baking powder interests, each of whom charged that the other product was dangerous to health and attempted to obtain regulation that disadvantaged the other product. Similar conflicts also arose among "straight" and "blended" whiskey producers, each claiming that the other product was impure and unsafe for consumers. The arrival of newer, cheaper substitute products stimulated a demand for regulation on the part of certain producer groups who desired regulation as a way of shifting demand away from competing products.

[3] This section draws heavily from Wood (1985, 1986), Young (1989), and Goodwin (1999).

As food production moved out of households and into impersonal markets, and as foods became increasingly sophisticated as a result of advances in manufacturing and processing, it also became increasingly difficult for ordinary consumers to discern product quality and composition. Concerns about the quality of food products—specifically about the ingredients contained in foods, as well as in the nutritional value of foods containing chemicals, preservatives, and other manufactured components—began to be expressed by chemists, home economists, public health officials, and other reform-minded individuals. The late 1800s witnessed a burgeoning literature on how food was "adulterated" (*i.e*. cheapened through the addition of impurities) and "misbranded" (*i.e*. improperly labeled with respect to product contents) by manufacturers and distributors in an effort to obtain dear prices for cheap items, and on the consequences of food adulteration for health and longevity. "We buy everything, and have no idea of the processes by which articles are produced, and have no means of knowing beforehand what the quality may be," wrote Ellen Richards, one of the leaders of the home economics movement, in her 1885 book entitled *Food Materials and Their Adulteration*. "Relatively we are in a state of barbarous innocence, as compared to our grandmothers, about the common articles of daily use" (quoted in Strasser 1989, p. 255). Asymmetric information about food ingredients thus gave rise to the perception that there was a "lemons" problem in the markets for many food and drug items.

Studies conducted by analytical chemists employed in state and federal public health and agricultural departments during the 1880s and 1890s did reveal a surprising degree of food adulteration. According to a 1902 Senate Report, which surveyed the findings of several adulteration studies conducted during the prior two decades, food adulteration and misbranding was reasonably common (US Senate 1902). Numerous independent studies found that milk was watered down or skimmed without warning. Others found butter to be cheapened by the addition of oleomargarine. Cotton-seed oil was often added to lard that was marketed as "pure leaf lard." Glucose and chemical preservatives were frequently added to canned and prepared goods without indication on product labels. In his 1887 book, *Food Adulteration and Its Detection*, J.P. Battershall, a chemist employed by the US Public Health Department, documented the various ways that food manufacturers and distributors adulterated their wares in order to reduce costs

in ways that consumers could not detect. Awareness of these as well as similar findings fueled concerns among reformers that food was being deceptively marketed, and that consumers were not receiving value for their money.

Claims were also made that adulterated food posed health risks, but the available evidence was much more mixed, largely because understanding about the basics of human nutrition was very primitive at the time, even among leading physicians and public health officials. In testimony to Congressional hearings on food adulteration in the late 1890s and early 1900s, physicians and scientists disagreed about the nutritional value of preservatives like borax, and salicylic acid, about the effects on human digestion of alum based as opposed to cream of tartar based baking powders, and about the health risks associated with the consumption of artificial sweeteners like glucose (US Senate 1899-1900). Charges that particular food products were poisonous and could lead to death were largely unsupported, since there was little evidence of widespread poisonings resulting from the consumption of dressed beef, canned fruits, vegetables and meats, or other manufactured and processed food items. For instance, during the Spanish American War, the large meat packing firms were accused of selling the army spoiled meat, but subsequent investigation into the issue failed to provide evidence of spoilage that could be attributed to the meat packers (Young 1989).[4] Most of the scientific debate thus centered on the more subtle consequences of food consumption on digestion and nutrition. In retrospect, it appears that adulterated food was more of a threat to the pocketbook than to health and that many experts at the turn of the century shared this point of view. Nevertheless, since there was little conclusive information about the impact of adulterated food and drugs on health, there were opportunities for deception on the part of disingenuous competitors. Fears that adulterated foods were dangerous in addition to being fraudulent were therefore closely felt by many consumers.

Reputation mechanisms of course played a role in reducing consumer uncertainty about food quality. Product branding proliferated as producers of canned and processed foods like Swift, the National Biscuit Company, and H.J. Heinz worked to establish

[4] Under the Dodge investigation of 1899, it was determined that the canned meat supplied to the army by the meat packers was identical to the meat they sold to the general public, and that no

reputations for providing high quality products (Strasser 1989). Retail grocery chains like A & P and Krogers also emerged in the late 1800s, partly in response to the need to assure consumers of the quality of foodstuffs (Kim 2001). However, reputation mechanisms may have been insufficient to guarantee the quality of every aspect of food quality, since some of the dimensions of quality that many consumers were concerned about (for instance, the nutritional value of foods or the precise ingredients contained within foods) could not be easily verified by consumers, even after consumption. In general, it was not possible for consumers to know if the foods they ate were harmful or healthful, or if chemical preservatives or low quality ingredients had been added to their food. Hence, market-based solutions to the asymmetric information problem, which rely on *ex post* verifiability of product quality, may not have been sufficient to guarantee the delivery of those dimensions of quality that had "credence" characteristics (Darby and Karni 1973; McCluskey 2000). This sentiment was expressed by a member of the 49th Congress (1885), who made the following argument in a speech to the House on the need for pure food regulation:

> In ordinary cases the consumer may be left to his own intelligence to protect himself against impositions. By the exercise of a reasonable degree of caution, he can protect himself from frauds in under-weight and in under-measure. If he can not detect a paper-soled shoe on inspection, he detects it in the wearing of it, and in one way or another he can impose a penalty upon the fraudulent vendor. As a general rule the doctrine of *laissez faire* can be applied. Not so with many of the adulterations of food. Scientific inspection is needed to detect the fraud, and scientific inspection is beyond the reach of the ordinary consumer. In such cases the Government should intervene (*Congressional Record*, 49th Congress, 1st Session, pp. 5040-5041).

Concerns about food quality therefore also generated a demand for food regulation. Progressive reform groups—most notably, women's groups like the General Federation of Women's Clubs (GFWC), the Women's Christian Temperance Union (WCTU), as well as leaders of the home economics movement and public health officials—lobbied for regulations that banned the sale of adulterated and misbranded food products. "[T]he quality of foodstuff should be a question of paramount interest to every Housewife," wrote Isabel Churchill, a women's club member from Denver,

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harmful preservatives were present in their canned meat. Storing unrefrigerated meat under

Colorado. “It therefore behooves [women] to thoroughly away to the need… for pure food legislation.” Producers of higher quality items also desired regulation because they felt that it would potentially help them create a market for their products. Regulation by “experts” made sense to advocates because chemists and other scientists employed in laboratory-based government agencies had a comparative advantage over consumers in detecting food adulteration. In response, during the last two decades of the nineteenth century, state governments began to enact “pure food” and “pure dairy” laws that outlawed the sale of adulterated foods, and that gave officials employed in state pure food agencies the authority to seize adulterated and misbranded products and prosecute manufacturers and dealers who violated these regulations (US Senate 1900-01).

State governments were generally first in enacting laws regulating the food industry, although not without exception. Some of these laws were clearly designed to advance special producer interests in industry at the expense of consumers and producers of competing products. For instance, regulations enacted by state governments that required oleomargarine to be colored differently than butter, that prohibited the use of oleomargarine in boarding houses, prisons, or in restaurants, or that tightly regulated or even prohibited its sale were enacted primarily to benefit dairy farmers who wanted to shift demand away from a powerful substitute. The 1886 *Oleomargarine Tax* enacted by Congress was also largely a piece of special interest regulation aimed at placating butter interests and disadvantaging oleomargarine producers. This law required oleomargarine producers to mark and stamp their product in various ways, imposed an internal revenue tax of 2 cents per pound on all oleomargarine produced within the United States, and levied a fee of $600 per year on oleomargarine producers, $480 per year on oleomargarine wholesalers, and $48 per year on oleomargarine retailers (US Senate 1900-01; Lee 1973; Dupré 1999).

Other food regulations enacted during the late nineteenth century had more mixed motivations. The 1891 *Meat Inspection Act*, for instance, reflected the objectives of multiple interest groups (Libecap 1992). On the one hand this law was enacted to satisfy a coalition of cattlemen and local butchers in eastern markets, who wanted regulation that would stem the growth of the “dressed” meat trade and disadvantage the large Chicago

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tropical conditions was found to be the more likely culprit.

packers. On the other hand, by requiring inspection of cattle and hogs destined for interstate and foreign commerce, this law catered to the large packers who wanted to create markets for their meats in foreign countries.

Finally, other food regulations enacted during this period had public interest motivations. In particular, the general pure food and dairy laws enacted by state governments during the last two decades of the nineteenth century were aimed at improving the accuracy of product labels. While the content and form of these laws varied somewhat from state to state, in general the goal of these regulations was to ensure that mixtures and impurities that were added to products be indicated clearly on product labels. In so doing, these state pure food laws helped solve a lemons problem in the market for many food products. This action benefited certain consumers, who desired better information about product quality, as well as higher quality producers, who felt that regulation would help them segment the market for their wares (Law 2003).

By the 1890s it became clear that state governments were not optimally positioned to systematically regulate the content of food labels. This was for three reasons. First, regional specialization in food production combined with the expansion of interstate trade in food products made it increasingly difficult, if not impossible, for state governments to regulate goods produced out-of-state. Although state governments had the authority to regulate goods produced within their borders and goods sold within their borders, states had no authority over the production of goods in other states. Without the ability to regulate production in other jurisdictions, it was difficult for states to adequately enforce their own pure food laws without putting undue pressure on retailers, who were often themselves the victims of misrepresentation on the part of out-of-state wholesalers and manufacturers (US Senate 1900-01, pp. 111-112). This enforcement problem was compounded by the fact that states did not have the right to regulate the sale of goods produced in another state and sold in “original and unbroken packages.” By shipping goods in an “original and unbroken package,” out-of-state manufacturers and distributors could circumvent a state’s pure food regulations (US Senate 1899-1900, p. 529-530). Thus, the interstate nature of the food trade made it difficult for states to adequately enforce their own food laws.

Second, the pure food laws enacted in many states were often not enforced. Although nearly every state enacted a pure food law between 1880 and 1900, only half of these state laws entrusted enforcement to a particular state agency (Law 2003). The pure food laws enacted by the remaining states were essentially window-dressing laws that had little bite. Narrative evidence presented by Goodwin (1999) suggests that enforcement was limited or even non-existent in those states that did not have an enforcement agency. While there is some evidence that lax enforcement in some states may have been in response to pressure from particular food manufacturers (Okun 1986), a close examination of Congressional testimony on proposed food and drug bills and other contemporary sources does not suggest that "corruption" of state regulators by industry interests played a systematic role in undermining state efforts. Regulation was lax in many states not because manufacturers deliberately made it so, but rather because government in general was small and budgets were limited.[5] As a result, pure food regulations in many states did little to solve the asymmetric information problem regarding product ingredients.

Finally, in testimony to Congress, manufacturers and distributors engaged in interstate trade in foodstuffs also complained that compliance with several different state regulations was costly. These manufacturers and distributors desired a uniform federal pure food law because they felt that it would reduce compliance costs and because a national law might preempt more onerous state regulation. For instance, according to the director of a large Chicago wholesaler (US Senate 1899-1900, p. 73):

> The various states throughout this country… have passed pure-food laws, and in the distribution of merchandise—some kinds of merchandise—I find that at times errors are very likely to crop up in the shipping of goods in these states on account of the lack of uniformity, as the law of one State differs from the law of another, so that for the last ten years the merchants and manufacturers of Chicago have been clamoring for a national pure-food law, in the same manner that we clamored for a national bankruptcy act. It requires a lawyer for each State to know what the requirements are in each state in order to know the rules that prevail in them.

[5] It is possible that no budget and/or enforcement agency was provided precisely because of industry opposition to state regulation in the first place. However, in the absence of more information on the nature of enforcement at the state level, this can only be a conjecture.

A similar sentiment was expressed by the president of a large syrup manufacturing firm, also located in Chicago who, in his testimony to Congress, said (US Senate 1899-1900, p. 73): "I think that [a national pure food law] is the better plan if we are to have pure food. It would be well to have them all alike. As it is now every State has different ideas, and we have to put different formulas on goods going into different states. It is very complicated and annoying." Hence, there was a growing demand on the part of large manufacturers and distributors for a federal pure food law since a federal law would reduce compliance costs and thwart more aggressive state regulation.

Of course, as Wood (1986) and Young (1989) have noted, general pure food bills had been introduced in Congress since the early 1880s. Interest in a national pure food law emerged contemporaneously with interest in state pure food regulation, yet for the last two decades of the nineteenth century, only state governments managed to enact general pure food laws. It was not until 1906 that a federal law regulating interstate trade in food products managed to gain the assent of Congress. What explains the delay at the federal level?

III. Interest group politics and the building of an effective political constituency

Since Stigler (1971), economists have generally argued that regulation is the outcome of pressure from interest groups. Regulation is valuable to interest groups because of its potential to deliver rents to particular parties, often at the expense of economic efficiency. Politicians supply regulation because these groups can offer votes and/or campaign contributions in exchange. Although much of the literature focuses on how specific organized producer interests benefit from policies that establishes entry barriers and increases the profits of these producers, more general theories show that regulation may deliver benefits to both producer and consumer groups (Peltzman 1976). Indeed, in an environment where there is competition among pressure groups for political influence, regulation may actually be "efficient" in the sense that it will either minimize the deadweight losses of wealth transfer when markets are perfect, or correct market failures when markets are imperfect (Becker 1983).

Although competition among pressure groups may create efficiency enhancing regulation when markets are imperfect, there is no guarantee that such regulation will emerge. As Libecap (1989) notes, conflict among interest groups about the distribution of the gains from regulation may preclude the formation of an effective coalition in favor of regulatory change. This conflict may arise because the various players disagree about the size of the gains and how these gains will be divided among the players; because there is uncertainty about how regulation, once enacted, will be administered; or because it is difficult to make side-payments to compensate those parties that are made worse off by regulation. As the number of interested parties increases, it may also become more difficult to forge an effective coalition in favor of regulation. Accordingly, even regulations that have the potential to increase the size of the total pie may fail to be enacted.

Regulation may also fail to be enacted because the incentive to lobby for product information provisions will vary across interest groups. Since not all interest groups that stand to benefit can capture enough of the benefits to offset the costs of lobbying, an effective political coalition may not emerge. Producer interests who perceive that regulation of product information will deliver commercial advantages have the greatest incentive to lobby on behalf regulation since they expect to capture a large share of the benefits through increased profits. However, other producers who believe that regulation will be used to their disadvantage also have a strong incentive to lobby against such policies. Federal bureaucrats whose power and prestige are increased by an expansion of authority also have an incentive to lobby in favor of regulation. At the same time, however, state regulators who wish to preserve their regulatory authority also have a strong incentive to resist an expansion of federal regulation.

Although consumers may be the one group for which regulation of information about product quality may be unambiguously beneficial, consumers also face the weakest incentive to organize. Since consumers are a large and heterogeneous group, they face the highest collective action costs (Olson 1965). Further, the private benefits of regulation of product quality information will likely be very small for most consumers because the pecuniary and health risks associated with the consumption of adulterated or misbranded foods were generally quite low. Those consumers most likely to lobby on behalf of

regulation were ideologically motivated Progressive reformers, because for them the private returns from were slightly higher than for less ideologically concerned individuals. However, since these reform-minded individuals represented only a small fraction of all consumers, their influence typically was insufficient to tilt the political balance in favor of federal regulation. Hence, the different incentives faced by producers, consumers, and bureaucrats to lobby for regulation made it difficult to build an effective political constituency in favor of regulatory reform.

Pure food laws that regulated the content of product labels had the potential to solve an asymmetric information problem regarding product ingredients. Progressive reform groups who either wanted to avoid consuming adulterated foods or avoid paying a premium for adulterated foods stood to benefit regulation because they were unable to easily distinguish “pure” from “impure” food items. Producers of “pure” foods also desired regulation because they wanted a mechanism that would help them distinguish their goods from competitors. At the state level, a coalition of interests representing both consumers and producers was generally able to obtain pure food regulations that gave officials in state government agencies the authority to regulate the content of product labels.

Nationally, however, it was much more difficult to build an effective political constituency in favor of a pure food law. At the federal level, a larger number of interest groups was involved than at the state level. These interests included multiple producers, with different perceptions about the benefits of regulation, as well as different bureaucratic interest groups, who also had varying stakes in federal regulation. Because regulation had the potential to tilt the competitive playing field and create or destroy commercial advantages, producer interests faced the greatest incentive to either support or resist pure food regulation. Conflict among different producers therefore tended to dominate discussions over proposed pure food bills. Bureaucrats at the state and federal level also had a strong incentive to engage in the political battle over federal food regulation. Although many state officials believed that the federal government was in a better position to monitor interstate trade in food products, others did not want to yield regulatory authority to the federal government. Finally, although consumers who wanted better information about product quality stood to gain from pure food and drug regulation

at the federal level, the collective action costs of organizing a consumer-interest lobby were so substantial that widespread consumer interests were not part of much of the debate. Consequently, since those interests who had the strongest incentive to engage in the political battle over pure food regulation were also those interests who most sharply disagreed about the desirability of federal regulation, Congress reached a political stalemate over pure food regulation between 1890 and 1905.[6]

A. Narrative evidence on the political stalemate

A brief examination of the fate of several proposed pure food bills illustrates how conflict between competing producer and bureaucratic interests over the potential distribution of gains and loses created by pure food regulation generated a political stalemate over federal pure food regulation.[7] It also reveals the efforts of various competing industry groups to mold regulation to their private benefit. Consider, for instance, the Paddock Bill, one of the earlier federal pure food initiatives. Reported favorably from the Senate Committee on Agriculture and Forestry in 1890, the Paddock Bill was a general pure food law aimed at protecting producers and consumers against commercial fraud in food products (*i.e*. adulteration and misbranding) and improving the reputation of American food products abroad. After failing to take it up in 1890 and 1891, the Paddock Bill was re-introduced to the Senate in a weakened form in March of 1892. Paddock, who was a senator from Nebraska, claimed widespread support from ordinary citizens, state legislatures, wholesale grocery and drug associations, boards of trade, and farm organizations. He also attempted to assure cottonseed oil producers (who objected to the bill, fearing that it will be enforced in a way that prevented the use of cottonseed oil in lard) that the bill would not discriminate against them. Since 1888, corn and hog producers had been waging a trade war against "adulterated" lard, or lard to which cottonseed oil had been added. As a result of their efforts, Congress nearly enacted the Conger Bill in 1888, a law that would have placed a discriminatory tax on sales of adulterated lard (Lee 1973). Fearful that any future pure food law would be enforced in a

[6] Johnson and Libecap (2003) examine some of the problems of coalition formation and stability within the political process.

[7] This discussion borrows heavily from Anderson (1958) and Young (1989).

way that discriminated against the use of adulterated lard, cottonseed-oil interests, through their Congressional operatives, managed to prevent the Paddock bill from becoming law. After passing the Senate, the Paddock bill was blocked by a coalition of cottonseed oil and food manufacturing interests in the House. Although Paddock claimed to have support from ordinary citizens, widespread consumer interest did not emerge at this time because most consumers did not perceive that the benefits of pure food regulation to be high relative to the costs of becoming political organized. Hence, organized producer interests were able to prevent the Paddock bill from becoming law.

Attempts on the part of industry to mold regulation for private gain also explain the failure of Congress to enact pure food regulation in the 1890s. Several pure food bills that were quite similar to the Paddock Bill were introduced during the late 1890s (for instance the various versions of the Brosius Bill, as well as the Allen and Hansborough Bill) but in each of these cases, regulatory reform was stalled as a result of in fighting between the two major baking powder interests. Producers of cream of tartar baking powders wanted the regulations to be written in a way that put alum-based baking powders at a competitive disadvantage. Through William Mason of Illinois, chairman of the Senate Committee on Manufactures, cream of tartar interests attempted to impose their agenda on negotiations over pure food regulation. Indeed, Mason himself vowed to fight for a complete prohibition on the use of alum based baking powders. Producers of alum based baking powders wanted assurances that the regulations would not be enforced in a way that discriminated against their product. In particular, they objected to the provisions of the law that would have required labels to contain a statement of the names of the residual products left after food was prepared, a provision that was inserted at the request of the cream of tartar baking powder interests who had Mason in their pocket. Hence, according to Anderson (1958, p. 135), by 1900 “[t]he situation had reached a point where, no matter how the bill was phrased, it would encounter opposition from either of the two great camps of baking powder producers.” As before, competing producer interests dominated the debate because the perceived private returns from obtaining or blocking regulation were larger for producer interests than for other interests.

Conflict among straight and blended whiskey producers also contributed to political gridlock over efforts to secure a pure food law in the early 1900s. Two types of whiskey were produced in America in the early twentieth century: "straight" (distilled) whiskeys, produced in Kentucky, Maryland, Virginia and Pennsylvania, and cheaper "blended" (rectified) whiskeys, produced in Illinois, Indiana, and Ohio. Straight whiskey interests, who were the incumbent producers, viewed blended whiskeys as "impure" products and sought regulation that would disadvantage blended whiskies, which were rapidly gaining market share.[8] Partly as a consequence of the close relationship between Dr. Harvey Wiley, chief of the USDA's Bureau of Chemistry, and straight whiskey interests, pure food bills were drafted to require that "mixtures, compounds, combinations, imitations or blends" (read: blended whiskey) be "labeled, branded, or tagged, so as to show the character and constituents thereof."[9] Concerned that this clause would force blended whiskey manufacturers to disclose valuable trade secrets, the trade organization that represented blended whiskey producers (the National Wholesale Liquor Dealers' Association) consistently voiced opposition to the pure food laws that were introduced in Congress and managed to block early versions of the Hepburn and McCumber bills from being considered in the House and Senate.

Disagreement over whether pure food regulation should include medicines, in particular, drugs that were not listed in the *United States Pharmacopoeia* (USP) or the *National Formulary* (NF), also generated political opposition to federal regulation. Selected Progressive reform groups, in particular women from the WCTU, wanted patent medicines and proprietary nostrums to be regulated, because patent medicines often contained copious quantities of alcohol and other potentially addictive substances. Additionally, organized medicine, represented by the American Medical Association (AMA), also desired regulations that limited the availability of "quack" drugs and forced drug manufacturers to disclose the presence of alcohol, narcotics, and other addictive substances in medicine, partly because of the health risks posed by patent medicines, but also because patent medicines, by posing as a substitute for physicians' services, were a

[8] The available estimates suggest that by the early 1900s, blended whiskey outsold straight whiskey by a ratio of three to one. See Young (1989, p. 166).

competitive threat to physicians. The stance organized medicine took toward patent medicines was also reflected by the fact that in the early 1900s, the AMA banned patent medicine advertising in its major publication, the *Journal of the American Medical Association (JAMA)*.

Newspapers that were dependent on patent medicine advertising as a source of revenues, patent medicine manufacturers (represented by the Proprietary Association), as well as other drug producers including the National Wholesale and Retail Druggists Association lobbied against proposed pure food and drug regulations that would include drugs not listed in either the *USP* or *NF*.[10] These groups resisted regulation because they feared that the federal government would begin to regulate the therapeutic claims they made about their products. Indeed, throughout the preceding decades, the Proprietary Association and its allies was able to block the introduction of state and federal drug formula disclosure bills and to restrict the coverage of drugs in early draft pure food laws to those listed in the *USP* or *NF*. According to the Proprietary Association's committee on legislation, legislation that defined drugs more broadly "would practically destroy the sale of proprietary remedies in the United States" (quoted in Young 1989, p. 169). As a result, drug manufacturing interests fiercely resisted any proposed pure food and drug regulation that defined drugs beyond medicines listed in the *USP* or *NF*, and several draft pure food bills were scuttled during the early 1900s, including versions of the Hepburn-McCumber bill.

Conflict also arose among bureaucrats at the federal and state level regarding who should enforce a federal pure food law, and who should have authority to set food standards. Beginning in 1887, the Bureau of Chemistry began to publish several high profile studies documenting the nature and extent of food adulteration in the United States. Under the leadership of Dr. Harvey Wiley, the Bureau of Chemistry began to develop a reputation for its analysis of food adulteration in America. By the mid-1890s it became clear that the Bureau of Chemistry, a department within the USDA, would

[9] According to Young (1989, p. 167), Wiley "abominated" blended whiskey and "leagued with the distillers to plot ways of checkmating the blenders' stratagems."

[10] Patent medicines were in fact among the most important sources of newspaper and magazine advertising revenues during this period. See Young (1967).

become the agency responsible for enforcing a federal pure food and drug law. Federal officials within the Bureau of Chemistry faced a strong incentive to lobby for federal pure food regulation since they would capture the benefits of regulation through an expansion of their regulatory mandate. Regulators from some states opposed federal regulation, partly because it had the potential to make them redundant, but also because they were suspicious that federal regulators (specifically, Harvey Wiley) would not be independent of certain manufacturing interests with whom Wiley had ties. On the other hand, the Association of Official Agricultural Chemists (AOAC) as well as regulators from other states were solidly behind Harvey Wiley and the Bureau of Chemistry. Jockeying among bureaucratic interest groups thus also contributed to political stalemate over regulatory reform (Coppin and High 1999).

B. Econometric analysis of Senate voting in 1903

One way to empirically illustrate how disagreements among the interest groups led to political stalemate over pure food regulation is to estimate voting regressions of the determinants of Congressional voting over the different pure food bills proposed in the late nineteenth and early twentieth century. By correlating Congressional voting on proposed pure food bills with variables that capture the influence of different groups, we can illustrate how conflict among competing producer interests generated political stalemate over regulatory reform. Unfortunately, roll call data on Congressional votes on the various pure food bills introduced prior to 1905 is scarce. In many instances, the bills never reached a vote. In most instances when the bills did reach a vote, a roll call was not taken. Prior to the February 21st, 1906 Senate vote on the bill that became the *Pure Food and Drug Act*, we were only able to find one recorded roll call vote of interest to us: the March 3rd, 1903 Senate vote on whether or not to consider the Hepburn/Hansborough Bill. Hence, for our empirical analysis, we examine how different interest groups shaped Senate voting on March 3rd, 1903.

By 1903 the main interests that were engaged in the debate over pure food and drug regulation were: (i) patent medicine manufacturers and organized medicine, who opposed and supported the Hepburn/Hansborough bill because it extended regulatory authority over drugs not included in the *USP* or the *NF*; (ii) food manufacturers who used

preservatives and glucose, who feared that regulators would target their items unfairly; (iii) straight and blended whiskey manufacturers, who, as noted earlier, took opposing sides on the pure food issue; (iv) large food manufacturing firms engaged in interstate trade, who desired federal regulation in order to reduce regulatory compliance costs; and (v) consumer-oriented Progressive reform groups who desired regulation in order to improve the informational accuracy of product labels.[11] In our regression framework, we include variables that capture the influence of these interest groups in each state. Descriptive statistics for the variables we use to proxy for the influence of these groups are shown in Table 1.

In light of our discussion on how different groups faced a different incentive to lobby for or against regulation, we predict that the coefficients on the producer interest variables should have a significant impact on Senate voting but the coefficients on the consumer-oriented reform group variables should not be significant. The reform-interest variables should be less significant determinants of Senate voting than the producer interest variables because the interests these groups claimed to represent (consumers) had the weakest incentive to lobby on behalf of regulation. On the other hand, producer interests had the strongest incentives to lobby for or against pure food and drug regulation since these groups stood to gain or lose the most from regulation.

Table 2 displays logistic regression estimates of the factors shaping Senate voting on whether or note to consider the Hepburn/Hansborough Bill. Since the two reform group variables are nearly collinear, we estimated the regressions separately for each reform interest variable. In column (1) the urbanization rate is used to proxy for reform interests while in column (2) the white female literacy rate proxies for reform interests. Overall, the regression results appear to be consistent with the qualitative evidence presented earlier on the configuration of producer interest over food and drug regulation because of its potential to pivot the competitive playing field.

[11] By 1903, there was no longer any substantial debate among bureaucratic interests regarding who should enforce the federal pure food law. By this time, the AOAC and the interest groups representing state regulators was in more or less unanimous agreement that enforcement of a federal pure food and drug law should be placed in the USDA's Bureau of Chemistry. See Anderson (1958).

Other things equal, an increase in the size of the patent medicine industry had a negative and statistically significant effect on the probability that a senator would vote in favor of pure food and drug regulation. Additionally, an increase in the number of physicians per capita had a positive and significant effect on the likelihood a senator would vote in favor of pure food and drug regulation. In states where blended whiskeys were produced, senators were less likely to vote for regulation while in states where straight whiskeys were manufactured, senators were more likely to vote for pure food regulation. An increase in the number of food manufacturers who used preservatives (proxied by membership in the National Food Manufacturers Association or NFMA) had a negative but statistically not significant influence over the likelihood that a senator would vote in favor of pure food regulation. Finally, reform interests (proxied by either the urbanization rate or the white female literacy rate) had a positive but statistically insignificant impact on the probability that a senator would vote in favor of regulation.

The regression results are consistent with the qualitative evidence on how different groups aligned over the issue of pure food and drug regulation. Those producer interests who perceived that regulation would disadvantage their products (patent medicine makers, blended whiskey producers, and firms who used preservatives) opposed regulation while those who felt that regulation would place them at a competitive advantage and who played a role in shaping the features of the proposed food and drug bill (organized medicine, straight whiskey makers) supported it. The fact that the coefficients for our proxies for patent medicine interests and blended whiskey interests are both negative and highly significant suggests that opposition by these two groups played an important role in blocking regulatory reform. While the coefficients on the reform interest variables are both positive, neither coefficient is statistically significant. This fact is consistent with the view that consumers faced the weakest incentive to organize in favor of pure food and drug regulation at this time. Overall, we interpret these regression results as implying that producer rather than reform interests were the critical constituencies shaping Senate voting in 1903.

IV. The role of muckraking in breaking the political deadlock

Among scholars of regulation it is often noted that regulatory reform frequently follows a "crisis," where the crisis can take the form of either an actual event, or the revelation of some event or series of events that highlight the need for some kind of collective solution. The specific role that these crisis-like events play in bringing about regulatory reform, however, remains somewhat vague. Some scholars focus on the effect that crises have in focusing public attention on a particular "problem" or "market failure." Others argue that crisis-like events also make it costly for opponents of regulation to continue to block regulatory reform. Through both channels, crisis-like events can therefore help break political deadlock over regulation.

Muckraking journalism became a common feature of many widely distributed periodicals during the late nineteenth and early twentieth centuries. Several factors contributed to the rise of muckraking journalism during this period. On the one hand there were changes in the nature of American society and the American economy—for instance, the rise of "big business," rapid urbanization, massive rates of immigration, the strengthening of urban "political machines"—that gave rise to reform movements that sought to curb or control the influence of big business over political and economic affairs (Hays 1957; Wiebe 1967). Many of these Progressive reformers were writers and journalists, who believed in the "power of the pen" to inform readers of social and economic problems and to persuade ordinary citizens of the need for reform. On the other hand there were technological and organizational developments that made it possible for these writers and journalists to reach a larger audience than ever before. The adoption of high-speed presses and the perfection of halftone photoengraving reduced production costs and improved the quality of illustrations. Declining postal rates during the 1880s and 1890s lowered the cost of distributing periodicals throughout the nation. The growth of a national market for consumer products and the sale of magazine and periodical space to national advertising companies made it possible for periodicals to be sold to consumers at extremely low cost (often less than 10 cents per copy). Owners of periodicals like *McClure's*, *Cosmopolitan*, *Colliers Weekly*, *Everybody's*, and *Munsey's* soon discovered a profitable combination in the marriage of low cost, high distribution, advertising-intensive magazines with sensational journalism that exposed readers to important social and economic problems (Chalmers 1974; Filler 1976). Hence, muckraking journalists like

Samuel Hopkins Adams, Ray Stannard Baker, Henry Demarest Lloyd, Lincoln Steffens, Charles Edward Russell, Ida Tarbell, and Upton Sinclair were hired by these periodicals to write articles exposing unscrupulous business practices, slum urban conditions, and political corruption.

A. Muckraking as a crisis-like event

Scholars ranging from Anderson (1958), Young (1989), and Carpenter (2001) argue that muckraking journalism between 1904 and 1906 was important in ending the political stalemate over food and drug regulation. According to these authors, two major "crisis-like" revelations occurred during these years that made it possible for pure food and drug regulation to be pushed through Congress. One was the publication of Upton Sinclair's *The Jungle*, which exposed unsanitary conditions in Chicago meat packing plants and generated public outrage over the quality of meat.[12] In the most highly cited part of his book, Sinclair revealed how the large meat packers deceived consumers about the quality of their products. He discussed how "potted chicken" contained no chicken at all; how meat that had turned sour was rubbed with soda to remove the smell; how moldy sausage rejected from Europe found its way back into the American market; and how meat was contaminated on the slaughterhouse floor.

The direct result of Upton Sinclair's muckraking was the 1906 *Meat Inspection Act*, which strengthened the USDA's authority to inspect meat destined for interstate and international commerce. What is less well known, however, is that the real effect of Upton Sinclair's muckraking was to shift public attention away from the monopolistic aspects of the meat trust and toward the issue of meat quality. Between 1891 (when the first federal meat inspection act was enacted) and the early 1900s, interest in the meat packing industry was largely focused on the anticompetitive effects of the meat packing trust.[13] During this period, claims were made that the trust was responsible for low cattle prices and for rising retail prices of meat.

[12] Curiously, Sinclair's main objective in writing *The Jungle* was to provoke outrage over industrial working conditions, rather than to reveal deception on the part of the meat packers regarding product quality. See Young (1989, p. 252).

[13] A notable exception that we mentioned earlier was the embalmed meat scandal during the Spanish American War. However, since the Dodge Commission failed to provide convincing

The muckraking journalist Charles Edward Russell, in an article published in *Everybody's* in 1905 entitled "The Greatest Trust in the World," most forcefully articulated this perspective. Nevertheless, an investigation by the newly created Bureau of Corporations found no evidence of the trust's ability to control prices (Bureau of Corporations 1905). Russell and others charged that the meat trust used its political influence to corrupt the Bureau of Corporations, but in the wake of Upton Sinclair's muckraking about the unsanitary conditions of meat packing plants and what the meat packers added to sausage, concerns about the trust's anticompetitive behavior or its influence over the Bureau were eclipsed by concerns about the quality of meat.[14] The 1906 *Meat Inspection Act* significantly expanded the USDA's authority to inspect the slaughtering, packing, and canning of meats and to regulate the content of product labels but it did not directly deal with the issue of competition.

The other "crisis-like" revelation was a set of articles published in *Colliers Weekly* that (i) revealed the how patent medicine manufacturers were using their power over the press to defeat state regulation, and (ii) alerted the public to the dangers associated with the use of patent medicines. In an article entitled "The Patent Medicine Conspiracy against the Freedom of the Press," Mark Sullivan revealed the influence of patent medicine industry over the press and over state regulation. Published by *Colliers* on November 4, 1905, Sullivan described how the patent medicine industry used its advertising contracts with newspapers to block state regulation of the industry. According to Young (1989, p. 198-199):

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evidence that the spoiled meat was due to negligence on the part of the meat packers, interest in tighter meat inspection regulation fizzled out.

[14] In response to the Bureau of Corporations' report on the meat trust, Russell (quoted in Yeager, 1981, p. 188) wrote:

> Have we heard before of a Government department thus palpably and openly seeking to defend a lawless combination, and misstating, coloring and distorting the facts about it? Or have we ever before had advice from a Government bureau to consumers not to complain of the prices they pay, and to produces not to complain of the prices they get? How does it happen that this defense is issued just at the time when it is most needed for the packing interests? And how does it happen that the document had this peculiar aspect of the astute legal mind, making a difficult argument this airy skimming of dangerous facts, this agile turning of bad corners, doubling and twisting in and out among the air-holes.

> [Sullivan] unearthed the "red clause" that proprietary advertisers had come to insist upon in their contracts with newspapers. He secured the minutes of a Proprietary Associate meeting at which Frank J. Cheney, maker of Hall's Catarrh Cure, reported on the clause he had devised, requiring the cancellation of all advertising should the state in which the newspaper was located enact a law to restrict or prohibit the manufacture or sale of proprietaries. Cheney boasted of how he had used the clause in Illinois to energize newspapers into defeating a tax on patent medicines threatened by the legislature. Cheney's fellows learned the lesson quickly, and "muzzle-clauses" proliferated. Sullivan secured pictures of such contracts, and also of letters sent to the press by proprietary producers when danger threatened.

Sullivan showed to how patent medicine manufacturers used their power over the press to prevent state regulation of their products. This revelation of this type of "corruption"—the inappropriate influence of business over state government regulation due to business's superior power or political influence—may have helped fuel consumer demand for federal food and drug regulation.

More important than Sullivan's piece, however, was a series of articles written by Samuel Hopkins Adams, also published in *Colliers* in the autumn of 1905, which documented the dangers associated with the indiscriminate use of patent medicines and the widespread presence of alcohol and opiates in these drugs. "Gullible America," wrote Adams (quoted in Carpenter 2001, p. 269), "will spend this year some seventy-five million dollars in the purchase of patent medicines. In consideration of this sum it will swallow huge quantities of alcohol, an appalling amount of opiates and narcotics, a wide assortment of varied drugs ranging from powerful and dangerous heart depressants to insidious liver stimulants; and, far in excess of all other ingredients, undiluted fraud."

While Sullivan's article did raise concerns about a certain type of "corruption" on the part of the patent medicine industry, and while Upton Sinclair's book also raised public interest in food regulation more generally, Carpenter (2001) argues that it was Adams's muckraking about the low quality of patent medicines that was truly pivotal in generating consumer support for pure food and drug regulation and in weakening Congressional opposition to regulation. Muckraking about another type of "corruption"—in this case, patent medicine manufacturers taking advantage of asymmetric information to sell consumers low quality (and possibly even hazardous)

drugs—therefore played an even more important role in ending the political stalemate over federal food and drug regulation. Carpenter (2001, p. 269) writes:

> It was Adams who struck the decisive blow against adulterated medicines in his *Collier's Weekly* series in October 1905. In two articles, "The Great American Fraud", and "Peruna and the 'Bracers'", Adams outlined the severity of drug adulteration by compiling a list of adulterated medicines and enumerating deaths and injuries associated with their use. Adams's contribution was to explain medicinal adulteration as a problem of consumer information.

The effect of Adams's muckraking about patent medicines on the progress of regulatory reform was dramatic. By making the public aware of the dangers of patent medicines, Adams informed individuals of the widespread public benefits of regulation and therefore provided consumers with a stronger incentive to lobby actively for food and drug regulation. Hence, muckraking journalism, by making the issue of food and drug adulteration emotionally salient, served as a coordinating device through which diffuse consumer interests were harnessed. As a direct result of Adams's writings, Congress was inundated with petitions from women's groups and other consumers throughout the country who demanded regulation of patent medicines. Harvey Wiley, chief of the USDA's Bureau of Chemistry, supplied chemical analyses of patent medicine groups to women's groups who desired more evidence of the dangers of patent medicines. Adams's articles were reprinted in the *JAMA* and distributed to physicians throughout the country, who in turn lobbied Congress for regulation. Muckraking increased the perceived benefits of food and drug regulation, provoked widespread consumer interest in food and drug regulation, and made it costly for politicians to continue to block regulatory reform. The stalemate over federal food and drug regulation was therefore broken. Muckraking by Adams about a different type of "corruption"—businesses cheating consumers into purchasing largely worthless products—thus played a very significant role in bringing about federal food and drug regulation.

B. The "manufacture" of crisis

Given the productive role that crisis-like events can play in raising the perceived benefits of regulation to ordinary consumers and inducing relatively unorganized interest groups to lobby for regulation, it is important to ask from where crises come. If crisis-like

events make it difficult for politicians to continue to block regulatory reform, do self-interested actors have an incentive to "manufacture" crisis-like events in an effort to end political deadlock? Muckraking journalists obviously had an incentive to "manufacture" crisis-like events, partly because they shared the objectives of Progressive reformers, but also because crisis-like revelations served to raise their own prestige and influence through increased newspaper and magazine sales. Hence, it is not too surprising that journalists like Samuel Hopkins Adams, Mark Sullivan and Upton Sinclair were key players in this drama.

Self-interested bureaucrats who were positioned to capture the benefits of an expansion of federal regulatory authority also had an incentive to "manufacture" crises. In our context, some of Dr. Harvey Wiley's efforts to build an effective political coalition in favor of food and drug regulation might be interpreted as attempts to "manufacture" crises. Indeed, since Wiley's agency (the Bureau of Chemistry) was the organization that would be empowered to enforce a federal food and drug law, it is not surprising that Wiley, more than any other individual in the federal bureaucracy, tirelessly strove to drum up political support for a federal food and drug law. For instance, during the early 1900s, Wiley conducted a series of experiments on USDA employees (who became popularly known as the "poison-squad") on the effects of preservatives on human digestion. These "poison-squad" experiments gained some notoriety, but failed to generate a broad consumer-based coalition in favor of pure food regulation. Wiley also spoke regularly at women's club events about the extent of food and drug adulteration and its consequences for human health. While these efforts did lay the groundwork for close cooperation between the Bureau of Chemistry and certain groups that became useful once public interest in food and drug regulation was aroused, they did not on their own provoke widespread public interest in federal food and drug regulation, perhaps because his audience consisted largely of Progressive reformers, who represented a relatively small fraction of consumers.

Wiley was undoubtedly acquainted with muckraking journalists, and he even provided some chemical analyses for them, but without muckraking journalism, it was unlikely that his efforts to "manufacture" a crisis would have succeeded. Wiley and other pro-regulation activists certainly seized upon the opportunity presented by muckraking to

forge an effective political coalition in favor of regulation, but it is unlikely that they would have been able to generate widespread consumer support without muckraking, partly because Wiley was not a disinterested observer. Hence, while opportunistic behavior on Wiley's part may have contributed to the building of an effective pro-regulation constituency, muckraking journalism was the vehicle that motivated ordinary consumers to join Progressive reformers in their quest for a federal food and drug law.

C. Econometric evidence on the impact of muckraking on Senate voting

We can empirically evaluate the role that muckraking journalism about patent medicines played in breaking the political deadlock over pure food and drug regulation by examining the factors that shaped Senate voting in 1906 on the bill that became the *Pure Food and Drug Act*. In our empirical analysis of Senate voting in 1903 (the pre-muckraking period) we found that patent medicine and blended whiskey interests had a negative and statistically significant influence on the probability that senators would vote in favor of considering the Hepburn/Hansborough bill, while reform interests had a positive but statistically insignificant influence on Senate voting. If muckraking journalism about patent medicines (which began around October 1905 with the publication of Samuel Hopkins Adams's articles in *Colliers Weekly*), by provoking widespread consumer interest in favor of regulation, played an important role in breaking the political deadlock over regulatory food and drug regulation, then in an empirical examination of Senate voting in the post-muckraking period (after October 1905), anti-regulation producer interests should be less likely to have a negative and significant influence over Senate voting, and Progressive reform interests should have a positive and significant influence over Senate voting. Anti-regulation producer interests should be less significant because muckraking should have made it more costly for politicians representing these groups to continue to oppose regulatory reform. Reform interests should become significant factors influencing Senate voting if muckraking, by increasing the perceived benefits of food and drug regulation, galvanized consumer-oriented groups to actively pressure Congressmen for pure food and drug regulation.

Table 3 presents logistic regression estimates of the factors shaping Senate voting on February 21st, 1906 on the bill that became the *Pure Food and Drug Act*. As before, in

column (1) Progressive reform interests are proxied by the urbanization rate while in column (2) they are proxied by the white female literacy rate. The coefficients representing blended whiskey and patent medicine interests are no longer statistically significant, while in column (2), the coefficient representing reform interests is positive and significant. The regression results roughly conform to our predictions regarding the role that muckraking journalism played in breaking the political deadlock over regulatory reform. By making the issue of food and drug quality emotionally salient, muckraking provoked unorganized consumer interests to lobby for regulation, and made it more costly for politicians representing anti-regulation business groups to continue to block regulation. In our regression framework, this is suggested by the fact that our proxy for reform interests (in column 2) is now positive and significant, while our proxies for patent medicine interests and blended whiskey interests are no longer significant.

Another way to investigate the role of muckraking in building an effective political constituency in favor of regulatory reform is to examine the factors that influenced whether a particular senator weakened his opposition to pure food and drug regulation in the post-muckraking period. If muckraking journalism about the dangers of patent medicines or about corrupt practices on the part of patent medicine makers made it costly for senators to continue to oppose regulation, then senators located in states where patent medicines were important should have been more likely to weaken their opposition to pure food and drug regulation. Additionally, if muckraking journalism galvanized pro-consumer sentiment in favor of regulation, then senators located in states where reform interests were important should also have been more likely to weaken their opposition to pure food and drug regulation.

Fifty-seven senators were present for both the March 1903 vote on whether to consider the Hepburn/Hansborough bill and the February 21st, 1906 vote on the *Pure Food and Drug Act*. Hence, for our analysis of how muckraking about patent medicines weakened Senate opposition to regulation, we restrict our attention to these senators who were present for both votes. To measure whether a senator weakened his opposition to pure food and drug regulation between 1903 (pre-muckraking) and 1906 (post muckraking), we created a “vote-switching” variable called SWITCH which equals 1 if a

senator switched his vote from "no" to "yes") between 1903 and 1906, and 0 otherwise.[15] We use the same independent variables as before to proxy for the influence of producer and reform groups.

Table 4 presents regression estimates of the factors influencing whether or not a senator switched his vote from "no" to "yes" between 1903 and 1906. Collinearity problems (possibly due to the reduced sample size) made it impossible to estimate this as a logistic or probit regression. Hence, we present linear probability model estimates in the table. The coefficient on the patent medicine variable is positive and significant, implying that muckraking about patent medicines made it more costly for senators representing patent medicine manufacturing interests to continue to oppose food and drug regulation. These senators were therefore more likely to switch their votes in favor of regulation. Additionally, the coefficients on the reform interest variables are both positive and significant. This suggests that, by galvanizing consumer interest in favor of pure food and drug regulation, muckraking also weakened political opposition to pure food and drug regulation. In states where reform interests were important, senators were therefore more likely to switch their votes.

Overall, the regression results are roughly supportive of our hypothesis regarding the role of muckraking in helping to build an effective political constituency in favor of food and drug regulation. Muckraking about patent medicines brought widespread consumer interest to bear on politicians who resisted regulatory reform, and made it costly for politicians representing special producer interests to continue to block food and drug regulation. Hence, by broadening the pro-reform constituency to include ordinary consumers, muckraking journalism ended the political stalemate over food and drug regulation and helped determine the timing of regulatory reform.

V. Enforcement of the *Pure Food and Drug Act* and the long term benefits of regulation

Given that a mixture of consumer and industry interests were involved in the struggle for federal food and drug regulation, it is worth asking which view of regulation

[15] We also construct other measures of weakening Senate opposition to food and drug regulation and find similar econometric results.

goes further in explaining the longer-run effects of federal food and drug regulation. Was federal regulation, once enacted, enforced in a way that benefited these special interests from industry, at the expense of competitors and overall economic efficiency? Or did enforcement of the *Pure Food and Drug Act* ultimately produce benefits for consumers and improve the efficiency of food and drug markets?

It is difficult to address these issues because few scholars have systematically analyzed the impact of the *Pure Food and Drug Act* on the markets for food and drugs. Nevertheless, what we do know about the actual enforcement of this law suggests that neither the revisionist nor traditional view on its own is satisfactory. The evidence on early enforcement of the act (under the stewardship of Dr. Wiley) suggests that certain industry groups were favored, which at least superficially would appear to be consistent with the revisionist view. According to Coppin and High (1999), Wiley attempted to enforce the law in ways that favored straight whiskey makers and that advantaged manufacturers that did not use preservatives in their foods. However, controversy surrounding Wiley's enforcement efforts, and Wiley's resignation from the Bureau of Chemistry in 1911 prevented these groups from obtaining any long-run benefits from the enforcement of this law. While certain industry interests may have "captured" Wiley, their influence did not extend to his successors or to the Bureau more generally. Indeed, the personnel of the Bureau and its leadership in the post-Wiley period largely consisted largely of professional bureaucrats, whose interests were not closely aligned with industry. Hence, because those pro-regulation industry groups who stood to gain most from regulation did not ultimately shape the organization that was empowered to enforce regulation, these groups did not realize large benefits in the way of reduced competition from substitute products. This weakens the argument in favor of the Stiglerian view.

Did consumers then capture the benefits of regulation? The evidence from the post-Wiley period suggests that, while the Bureau of Chemistry did attempt to enforce the *Pure Food and Drug Act* in ways that improved the quality of food and drugs and reduced asymmetric information about food and drug quality, the Bureau was not always successful in achieving these objectives. Because the Bureau was a relatively small organization with limited resources, and because the *Pure Food and Drug Act* was written in a way that was difficult to enforce in the courts, the only reliable mechanism

through which the Bureau could achieve compliance with the law was by offering benefits to compliant firms in the way of quality certification and/or direct technical advice on how to improve product quality (Law 2004). Effective enforcement, when it happened, generally yielded socially beneficial outcomes; the Bureau's certification efforts reduced asymmetric information about the quality of certain products, and as a consequence of offering direct technical assistance to firms, the quality of many foodstuffs increased dramatically (Robinson 1990; Young 1992).

These efficiency-enhancing outcomes are more consistent with the traditional than the revisionist view of regulation. Certain producers did benefit from these enforcement efforts (since these producers captured the benefits from the Bureau's expertise) but not in the most obvious (*i.e*. Stiglerian) way. Nevertheless, it is notable that these enforcement successes could only be achieved when industry also stood to gain from the Bureau's expertise.[16] When industry could not benefit from the Bureau's actions, effective enforcement was unlikely since it was difficult for the agency to prosecute manufacturers in court. Indeed, it was for precisely this reason that the patent medicine and proprietary nostrum industry—the industry whose products provoked widespread consumer interest in favor of food and drug regulation in the first place—was never successfully regulated. The fly-by-night nature of much of the nostrum industry, combined with the fact it was extremely difficult for the Bureau to successfully prosecute patent medicine manufacturers in court, rendered the Bureau powerless to regulate the misleading therapeutic claims that firms made about their products.[17] Accordingly, while consumers did benefit from enforcement of the *Pure Food and Drug Act*, they did not benefit in the way that they had originally anticipated—through improved information about drug quality and safety.

[16] It is also noteworthy that those industry groups that benefited from the Bureau's expertise were different from those groups that anticipated that the *Pure Food and Drug Act* would tilt the competitive playing field to their advantage. See Law (2004).

[17] The evidence from the Bureau's enforcement work from 1907-38 shows that patent medicines and proprietary nostrums were seized more frequently than any other product for violating the misbranding provisions of the *Pure Food and Drug Act* (Law 2004). However, the Bureau was largely unsuccessful in prosecuting the manufacturers of these products in court because, under the Sherley Amendment (1912) to the *Pure Food and Drug Act*, the Bureau had to prove fraud in order to obtain a conviction.

The larger lessons that emerge from this brief examination of enforcement are as follows. Without the ability to shape the organization that enforces regulation and the legal environment in which enforcement is actually conducted, interest groups may ultimately fail to obtain the full benefits from regulation. The impact of regulation therefore may not conform neatly to the predictions of either the traditional or revisionist hypotheses.[18] Because those producer interests who initially sought regulation for private gain did not shape the composition of the Bureau of Chemistry and the incentives it faced, enforcement of the *Pure Food and Drug Act* did not dramatically change competitive conditions to their advantage. While Stiglerian motivations may have prompted these groups to seek regulation, the outcomes were largely non-Stiglerian. Similarly, because those consumer groups who lobbied for regulation did not anticipate that the *Pure Food and Drug Act* would be so difficult to enforce in the courts, regulation also failed to significantly improve the quality of information about patent medicines. Hence, the "public interest" was not advanced in the market that mattered most to these consumer interests.

The Bureau's enforcement efforts did produce some gains for consumers and certain food producers, but the margins along which these gains were realized were not anticipated by those interest groups that lobbied actively on behalf of regulation in the first place. Thus, an appreciation of the interest group forces that lead to regulation is not sufficient to understand the ultimate effect of regulation on economic outcomes.

VI. Conclusion

Advances in food and drug manufacturing and processing during the late nineteenth century combined with the emergence of a national market for these products altered the food and drug trade in ways that affected producers, consumers, and bureaucrats. Technological changes in the industry made it possible for manufacturers to alter their products in ways that consumers could not easily detect. Technological advance also led to the introduction of new, substitute products that challenged the market positions enjoyed by producers of older products. In such an environment,

[18] A similar point is made by Krueger (1990) in her analysis of the US Sugar Program.

regulation of food and drugs was desired to improve consumer information about product ingredients, but also because of its potential to pivot the competitive playing field in favor of particular producers. Hence, we argue in this paper that a combination of the traditional and revisionist views of regulation explains the emergence of the 1906 *Pure Food and Drug Act*

Conflict over the distribution of rents that would be created by federal regulation created a political stalemate over federal pure food and drug regulation. State governments began to systematically regulate food labels during the late nineteenth century but in a setting where food and drug products crossed state borders, state governments were not the most efficient regulatory unit. Although it was widely agreed that federal pure food regulation had the potential to improve the efficiency of food and drug markets, disagreements among producer groups, bureaucratic interests, and reform interests regarding the specifics of a federal pure food and drug law created deadlock over regulatory reform at the federal level. These disagreements arose because producers of competing products feared that regulation would be enforced in ways that would disadvantage their products and because bureaucratic interests also disagreed over which level of government should have authority over the industry. We present evidence on how these conflicts among competing interests were reflected in Congress and on the role of specific producer interests in blocking a federal pure food and drug law.

Muckraking journalism about the quality of food and drugs ended the political stalemate over federal regulation. By raising awareness about the dangers of patent medicines and of the undue influence of patent medicine makers over the press and over state regulation, muckraking induced unorganized consumer interest to lobby actively for pure food and drug regulation and made it costly for political officials to continue to block federal regulation. We argue in this paper that by increasing the perceived benefits of federal food and drug regulation to consumers, muckraking journalism was the vehicle that prompted ordinary consumers to join Progressive reformers in their push for a federal food and drug law. The results of an empirical investigation of the interest group determinants of Senate voting on the 1906 *Pure Food and Drug Act* as well as the factors influencing the weakening of Senate opposition to food and drug regulation between 1903 (the pre-muckraking period) and 1906 (the post muckraking period) are consistent

with this view. Hence, our analysis of the origins of federal food and drug regulation reconciles the traditional and revisionist explanations for Progressive era regulation.

Concerns about the patent medicine industry using its influence over the press to block state regulation may have contributed to the building of an effective pro-regulation constituency, but it would be difficult to argue that awareness of "corruption" arising from business's superior access to political authority or political power was a major factor driving the emergence of federal food and drug regulation. This is for three reasons. First, testimony to Congress on proposed food and drug bills does not provide much evidence suggesting that business groups unduly influenced state regulators or the courts. Second, a general demand for food and drug regulation among select producers, bureaucrats, and Progressive reform groups was felt long before Mark Sullivan published his article in *Colliers Weekly* revealing the patent medicine industry's influence over the press and over state regulation. Third, although we cannot test this directly, it would appear that Samuel Hopkins Adams's articles about the dangers of certain patent medicines and Upton Sinclair's writings about the unsavory and disingenuous practices of the meat industry probably played a more significant role in generating widespread consumer interest in food and drug regulation than Mark Sullivan's article on muzzle clauses in patent medicine advertising contracts or Charles Edward Russell's claim that the beef trust had captured the Bureau of Corporations. If awareness of "corruption" did motivate federal regulation, it was "corruption" of the kind unearthed by Adams or Sinclair: the discovery that certain businesses were systematically taking advantage of asymmetric information about product quality to deceive consumers into paying high prices for cheap (and possibly even dangerous) goods. The emergence of federal food and drug regulation may therefore have had more to do with concerns about "corruption" due to asymmetric information than "corruption" resulting from unequal access to political power.

A cursory examination of the enforcement of this law suggests that because those producer and consumer interests that sought regulation did not control either the organization that was charged with enforcing the law or the legal environment in which enforcement took place, none of these groups obtained the benefits from regulation that they had initially anticipated. Those producers who sought regulation for private gain did

not obtain the benefits they anticipated in the way of reduced competition from substitute products, because, after Wiley's departure, they could not influence the Bureau. Those consumers who lobbied for regulation because of its potential to improve the quality of information about patent medicines also failed to achieve their objective because they did not anticipate that the legal environment would render the Bureau largely powerless to regulate the therapeutic claims that patent medicine manufacturers made about their products. Hence, to fully understand the origin and impact of regulation, it is necessary to appreciate not only the factors that motivate interest groups to seek regulation, but also the organizational and institutional constraints that limit the benefits that these groups are ultimately able to obtain.

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Table 1: Descriptive statistics for voting regressions

Variable	Mean	Standard Deviation
Dependent variable		
Vote in 1903 (Yes=1)	0.32	0.46
Vote in 1906 (Yes=1)	0.71	0.46
Producer interest variables		
Value of patent medicine production per capita ($)	0.67	0.84
Number of physicians per 1,000 in 1900	1.63	0.53
Number of NFMA firms per 100,000	0.13	0.22
Gallons of blended whiskey per capita	0.46	1.83
Gallons of straight whiskey per capita	0.44	1.69
Large food manufacturing indicator	0.48	0.50
Consumer interest variables		
Urbanization rate	0.37	0.23
White female literacy rate	0.94	0.07

Notes: Each dependent variable and the large food manufacturing firm indicator variable are binary. Voting data as well as information on the number of NFMA firms in each state is taken from the *Congressional Record*. The value of patent medicine production per capita is in dollars and is taken from the 1905 *Special Reports of the Census Office: Manufactures, Part II*. The urbanization rate in 1900 is taken from the *Historical Statistics of the United States*. The white female literacy rate in 1900 and the physicians per 1,000 persons in 1900 are taken from the 1900 *Census of Population*. The large food manufacturing indicator variable is a binary variable that equals 1 in states that have food manufacturing firms that produce in excess of $1,000,000 of output and 0 otherwise. Blended and straight whiskey production per capita is included to measure the influence of blended and straight whiskey manufacturers. Blended whiskey and straight whiskey were produced in different states (blended whiskey was produced in IL, IN, and OH while straight whiskey was produced in KT, MD, VA, and PA). Blended producers were opposed to regulation while straight producers were in favor of it. Hence, to proxy for the influence of blended and straight whiskies, I created two variables. Blended whiskey production per capita is the gallons of distilled liquor production in 1904 per capita for IL, IN, and OH and 0 otherwise. Straight whiskey production is equal to the gallons of distilled liquor production in 1904 per person for KT, MD, VA and PA, and 0 otherwise. Information on gallons of distilled liquor is taken from the 1905 *Statistical Abstract of the United States.*

Table 2: Logistic regression estimates of the factors shaping Senate voting on pure food and drug regulation in 1903

	(1) Vote in 1903 (Yes=1)	(2) Vote in 1903 (Yes=1)
Constant	-1.58	2.87
	(0.81)	(0.99)
Value of patent medicine production per capita	-0.93**	-0.83**
	(0.45)	(0.42)
Number of physicians per 1,000 persons in 1900	0.81*	0.95*
	(0.48)	(0.50)
Number of NFMA firms per 100,000 persons	-0.39	-0.10
	(1.12)	(1.12)
Gallons of blended whiskey production per capita	-10.51***	-10.18***
	(0.27)	(0.28)
Gallons of straight whiskey production per capita	0.30	0.25
	(0.30)	(0.32)
Large food manufacturing firm indicator	-0.42	-0.27
	(0.54)	(0.54)
Urbanization rate in 1900	0.48	
	(0.69)	
White female literacy rate in 1900		-4.92
		(4.42)
McFadden-R^2 statistic	0.13	0.15
LR-statistic	14.30**	16.04**
Number of observations	88	88

Notes: Standard errors are in parentheses. Statistical significance at the 10, 5 and 1 percent levels denoted by *, ** and *** respectively.

Table 3: Logistic regression estimates of the factors shaping Senate voting on pure food and drug regulation in 1906

	(1) Vote in 1906 (Yes=1)	(2) Vote in 1906 (Yes=1)
Constant	0.33	-14.98***
	(0.83)	(5.00)
Value of patent medicine production per capita	-0.23	-0.29
	(0.35)	(0.40)
Number of physicians per 1,000 persons in 1900	0.10	0.25
	(0.53)	(0.54)
Number of NFMA firms per 100,000 persons	0.73	0.63
	(1.21)	(1.30)
Gallons of blended whiskey production per capita	-0.03	-0.03
	(0.15)	(0.14)
Gallons of straight whiskey production per capita	0.27	0.43**
	(0.18)	(0.21)
Large food manufacturing firm indicator	-0.85	-1.38
	(0.62)	(0.93)
Urbanization rate in 1900	2.26	
	(1.76)	
White female literacy rate in 1900		17.97***
		(5.44)
McFadden-R^2 statistic	0.06	0.18
LR-statistic	6.12	19.00***
Number of observations	89	89

Notes: Standard errors are in parentheses. Statistical significance at the 10, 5 and 1 percent levels denoted by *, ** and *** respectively.

Table 4: Linear probability estimates of the factors influencing the weakening of Senate opposition to pure food and drug regulation between 1903 and 1906.

	(1) SWITCH	(2) SWITCH
Constant	-0.05	-1.23*
	(0.15)	(0.62)
Value of patent medicine production per capita	0.21**	0.20**
	(0.09)	(0.09)
Number of physicians per 1,000 persons in 1900	0.03	-0.008
	(0.12)	(0.11)
Number of NFMA firms per 100,000 persons	-0.41	-0.31
	(0.32)	(0.34)
Gallons of blended whiskey production per capita	0.02	0.02
	(0.05)	(0.04)
Gallons of straight whiskey production per capita	-0.03	-0.03
	(0.02)	(0.02)
Large food manufacturing firm indicator	-0.01	-0.01
	(0.17)	(0.16)
Urbanization rate in 1900	0.49*	
	(0.28)	
White female literacy rate in 1900		1.50**
		(0.70)
Adjusted-R^2 statistic	0.17	0.17
F-statistic	2.69**	2.62**
Number of observations	57	57

Notes: Standard errors are in parentheses. Statistical significance at the 10, 5 and 1 percent levels denoted by *, ** and *** respectively.