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1 Regulatory Regimes: The Interdependence of Rules and Regulatory Structure

William P. Albrecht, Corinne Bronfman, and Harold C. Messenheimer

We consider the regulatory structure of the U.S. securities, futures, and options markets. Much of this regulatory structure has been in place for some time. The Securities and Exchange Commission (SEC), which oversees the securities markets, was established in 1934. The Grain Futures Act of 1922 and the Commodity Exchange Act of 1936 form the underpinnings of the 1975 statute establishing the Commodity Futures Trading Commission (CFTC) to oversee trading in futures and options on futures.

Many of the regulations that the CFTC and the SEC enforce are as old or older than the agencies themselves. One does not have to be a zealous deregulator to recognize that at least some of them are outdated and that at least some of the complaints about them are justified. These complaints generally fall into four broad areas: (1) the requirements imposed by the CFTC and the SEC entail unnecessary duplication and inconsistencies; (2) the level or type of regulation is inefficient (costs are greater than benefits); (3) regulation or the review procedures of a regulatory authority are an impediment to innovation; and (4) differential regulation of similar entities has resulted in an "unlevel" playing field.

In recent years, unhappiness about financial regulation has led more than one critic to call for a merger of the CFTC and the SEC. Recently there has

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The authors have been employed recently by the Commodity Futures Trading Commission. The views expressed in this paper are their own and do not necessarily reflect those of the commission or of its staff.

even been a call for consolidation of all agencies concerned with federal financial regulation in a single cabinet-level department.[1] The result of the political debate on the issue of consolidation has been preservation of the status quo. The academic debate has noted that, while dual regulation may impose costs, competition between or among regulators may also benefit market participants by providing them with a choice.[2]

In this paper, we focus specifically on the question of efficient regulation and how the regulatory structure affects regulators' incentives to act efficiently or inefficiently. To analyze the issues, we develop a model of regulation that describes the scope and the goals of an efficiency-seeking regulator with perfect information. We then relax the assumption of efficiency seeking and characterize the behavior of a regulator who has additional arguments in his or her utility function. We extend the model to this more realistic regulator and examine the constraints and incentives that affect that agency's behavior. We use the model to analyze the impact of different regulatory structures on the extent and scope of regulation. In particular, we examine the effect of the number of regulators on the level of regulation. We conclude that regulatory competition is likely to lead to a more efficient level of regulation than will occur with a single regulator when substitute products are involved. We find that the opposite holds in the case of complements. This leads to the conclusion that the desirability of combining the CFTC and SEC depends in part upon whether the products they regulate are substitutes or complements.

We begin by providing a background for our model with a brief discussion of the rationale of regulation, the structure and function of a regulatory agency, and regulatory incentives.

1.1 Background

1.1.1 The Rationale of Regulation

The goals of efficient regulation of securities and futures markets may be summarized under the following three headings: (1) customer protection, (2) financial system integrity, and (3) market price integrity. Customer protection includes protection from fraud and default. The potential for fraud and default raises investors' perceived costs of transacting much like a tax on trading would increase the cost of transacting. Regulation seeks to reduce those costs through a system of rules and regulations, governing, for example, registration,

1. Sandner, (1993). Under the proposal, the following federal agencies would be consolidated: Office of the Comptroller of the Currency, Office of Thrift Supervision, the Federal Deposit Insurance Corporation, the CFTC, the SEC, the Securities Investor Protection Corporation, the Pension Benefit Guaranty Corporation, and certain regulatory functions nonessential to their primary operations performed by the Federal Reserve Board and the Department of Labor.

2. Ed Kane has been the most prolific and articulate proponent of this view. See, for example, Kane (1984, 1988).

record keeping, and disclosure. Of course, by prescribing and proscribing specific behaviors, such regulations impose their own costs on market participants.

The second goal of regulation is financial system integrity. The possibility of a systemic problem, such as a bankruptcy of one brokerage house with a domino effect on other market participants, imposes a taxlike cost on market participants that can be thought of as an additional cost of transacting. Regulators attempt to reduce this taxlike cost by imposing, for example, capital requirements and minimum margins.[3]

The third goal is market price integrity. Market participants enjoy timely information about price relationships in futures and cash markets. And they use this information to make their plans. Consequently, "wrong" price signals, resulting from, say, manipulation or market fragmentation, harm market participants by misinforming them about market fundamentals. As with the other goals of regulation, this potential harm imposes a taxlike cost on market participants. Regulations that prescribe or proscribe certain behaviors to reduce this harm include position limits, position reporting, and trade practice restrictions.

Regulation will be efficient with respect to each of these goals when the marginal reduction in the anticipated cost from the various harms discussed above just equals the marginal cost imposed by the regulation. While our analysis is generalizable to all the harms discussed above, we simplify by focusing on a single aspect of regulatory concern: fraud. Much of our financial regulatory system is intended to protect against fraud. But why are specialized regulations and a specialized agency necessary for financial services? For most crimes such as robbery and murder, a general statutory prohibition suffices—as it does for fraud in the sale of many goods and services.

Fraud, especially in financial services, is often difficult to detect.[4] When one customer's order is filled at a worse price than that of another customer, it may or may not be fraud. When a broker takes the other side of his customer's order, it may or may not be fraud. When an agent loses money when trading a client's account over which she has discretionary power, it may or may not be fraud. In short, financial fraud is harder to detect than crimes such as robbery or murder. It is also harder to detect than some other types of fraud. When, for example, something advertised as peanut butter turns out to be guano, there is no problem in detecting the fraud.

Because of the difficulty of knowing when certain types of financial fraud have occurred, regulators have prescribed and proscribed various activities by those who engage in financial transactions on behalf of others. These prescriptions and proscriptions are designed to increase the costs of committing fraud and to make it easier to detect. Requiring floor brokers to execute orders in the order in which they are received makes it less likely that one customer will be

3. Ensuring the survival of weak firms is not the purpose of regulation addressing financial system integrity.

4. For a more complete analysis, see Albrecht and Messenheimer (1993).

favored over another. Requiring an audit trail for trades makes it easier to catch those who violate the rule concerning the order of execution. And, since market participants realize that detection is more likely because of the rule, it serves also to deter fraud. Presumably, then, the peculiar nature of financial fraud justifies the existence of independent regulatory agencies such as the CFTC and the SEC.

In actual practice, three functions of the CFTC and the SEC have evolved. One is to write specific regulations to supplement the various provisions of the statute(s) each agency is charged with implementing. A second function is to monitor or audit compliance with these regulations by the exchanges and regulated firms. A third function is to enforce compliance with both the statute and the commission's regulations. These three functions are the means by which a specialized financial regulatory agency actually goes about deterring fraud.

1.1.2 Regulatory Incentives

Writing an efficient set of regulations, given the imperfect information available to the agency, would be difficult even if there were strong incentives to adopt such a set of rules. The real incentives, however, are quite different. In large measure, this is because those who enact the legislation the agency implements and who oversee the agency's performance are often much less interested in economic efficiency than in their own political well-being.

One result of this interest in their own political well-being is to give regulators an incentive to protect the agency from blame if something goes wrong. They do not want to have to explain such an event to Congress. The preferred way of protecting the agency is to have enough regulations in place to cover every conceivable form of fraud or other undesirable behavior. Thus, even if something does go wrong, the agency can point out that one of its regulations has been violated and that it should not be blamed for what has happened. This point of view is particularly strong among staff members who are responsible for writing rules.

Another very strong incentive is to make it easy to catch violators by requiring many records to be kept and by prohibiting any behavior that might conceivably facilitate fraud—without paying much attention to cost. This incentive is particularly strong among staff members who are responsible for enforcing rules.

For the purpose of establishing a useful benchmark, we initially assume that regulators, irrespective of the regulatory structure, are motivated solely by efficiency.[5] The benchmark so established will be used to evaluate how closely real regulatory structures containing real regulators are able to approach it.

5. This benchmark is relevant to the extent one feels that efficiency *should* be the regulatory objective. Other regulatory objectives might be equity (or fairness). To enforce equity in order that the unsophisticated have access to capital and futures markets, while being protected from possible abuses, SEC and CFTC regulators emphasize protection of the small investor and customer in their rule making. Our focus on efficiency is intended to encourage advocates of equity and fairness to consider trade-offs with efficiency.

1.2 A Model of Regulation

We develop the benchmark diagrammatically in figures 1.1 and 1.2. Firms organize to facilitate transacting. We call this facilitation "transaction services," the quantity of which we represent by Q. Q, for example, could be thought of as containing the qualities of immediacy, standardization of contract terms, and guarantee of performance provided by futures exchanges. Assume initially that there is no regulation of Q. For simplicity, assume also that the per unit cost of providing Q is constant as indicated by the horizontal supply curve S.

The demand curve D for transaction services has the usual properties. It is downward sloping with respect to price. Again, if we think of Q as having the qualities of immediacy, standardization of contract terms, and guarantee of performance, then price can be thought of as the sum of the bid-ask spread, the exchange fee, and the clearing fee. The lower this price, everything else being equal, the greater is the quantity of Q demanded. The demand curve's location and slope depend on the prices of substitutes and complements as well as other relevant states of nature. For example, the demand for transaction services provided by exchanges depends, in part, on the price of the over-the-counter transaction services. And the demand for transaction services provided for risk-shifting products depends on the price of transaction services in capital markets.

Demanders know they face some prospect of fraud when purchasing Q. For example, in an exchange-type market, immediacy is provided by liquidity suppliers who stand ready to buy or to sell from the other market participants. While serving as an intermediary, the immediacy provider has ample opportunity to commit fraud through dishonest sales or trade practices (say by trading at the same time as a customer's order and taking the best fill). Whatever the particular source of the prospective fraud, demanders' behavior is altered *relative to no fraud* because their expected return is reduced and uncertainty increased. Their valuation of prospective fraud imposes a taxlike increase in the price paid for Q, which for simplicity we treat as a constant, per-unit tax. This unit taxlike valuation of prospective fraud by demanders is denoted by T_F, which serves to shift the demand curve faced by suppliers from D to $D - T_F$ in figure 1.1. Instead of the honest amount of equilibrium transaction services Q_u, Q_0 emerges in the presence of fraud.

Referring to figure 1.1, we see that regulation has the potential to reduce two losses that exist relative to "no threat of fraud." First, there are losses represented in the lightly shaded Harberger triangle.[6] The triangle represents the potential gains from trade that are forgone because of the taxlike wedge im-

6. Harberger (1959). Harberger measured the welfare cost of monopoly as the loss in consumer surplus because of the restriction on output and the higher price at which the reduced output was sold. His approach was subsequently applied to the analysis of tariffs. The Harberger triangle in this study arises through the distortion in trading behavior because of the presence of fraud, which has an impact on behavior similar to that of a tax.

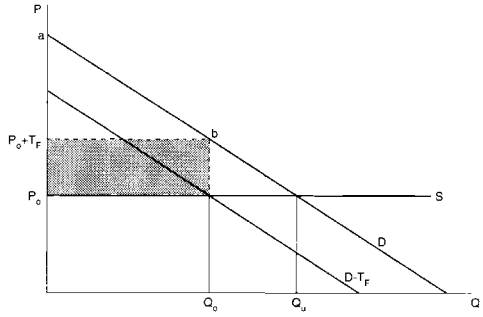

Fig. 1.1 Prospective valuation of fraud (T_F) modifies behavior like a tax

posed between demanders and suppliers of Q. The other loss associated with T_F is represented by the darkly shaded Tullock rectangle.[7] This economic loss arises because resources devoted to deception are diverted from potentially productive uses. For example, resources devoted to trade practice fraud could be diverted to providing improved transaction services, say by providing increased liquidity. Resources devoted to sales practice fraud could be diverted to the provision of honest Q (or some other honest endeavor that promotes gains from trade). Therefore, the Tullock rectangle is recognized as being, not a mere transfer from demanders to crooks, but a real economic loss in terms of wasted resources.[8]

Thus, we see that the total of the economic losses caused by fraud are the sum of the areas of the shaded triangle and rectangle. Looked at differently, the remaining gains from trade, in the presence of fraud and absent regulation, are the consumer surplus triangle $a(P_0 + T_F)b$ in figure 1.1. The potential role for regulators to improve efficiency is clear from the figure. They can simply impose rules that reduce the threat of fraud and so reduce the demanders' prospective valuation of it. By imposing and enforcing a set of rules, they shift the demand curve $(D - T_F)$ toward the demand curve D; that is, by reducing the taxlike fraud premium, they reduce the losses represented by the Harberger triangle and Tullock rectangle. Looked at differently, by reducing the taxlike fraud premium, they increase the gains from trade represented by the consumer surplus triangle.

7. The extensive literature on rent seeking as an economic loss began with Gordon Tullock's article "The Welfare Costs of Tariffs, Monopolies, and Theft," first published in the *Western Economic Journal* in June 1967. That essay and many of the important contributions since are collected in Buchanan, Tollison, and Tullock (1980) and Rowley, Tollison, and Tullock (1987).

8. The rent-seeking literature is divided on the proportion of the rectangle that is an economic loss (Tullock 1980). The opportunity cost of resources devoted to fraud could be greater than, less than, or equal to this rectangle. The exact proportion is not relevant to our analysis, but for simplicity we will follow Posner (1975) and assume that the rent-seeking loss from fraud is cqual to the area of the rectangle.

1.2.1 The Impact of Costs on Regulatory Initiatives

Regulation, of course, is not costless, and efficiency-seeking regulators would take into account both the direct and the indirect costs imposed. *Direct costs* are imposed by regulators when rules designed to reduce the fraud premium prescribe or proscribe certain behaviors. For example, regulators may prescribe record-keeping rules that increase the probability of detecting fraud, or they may proscribe certain trade practices to increase the cost of committing fraud; in so doing, they also increase the cost of providing immediacy. *Indirect costs* are the rent-seeking activity that is generated because of the potential to influence regulation. Once an agency is charged with writing rules, interest groups will spend considerable resources to influence the writing of the statute that is to govern the rule writing. And once the statute is enacted, further resources will be spent to influence the rule writers. Inasmuch as interest groups seek to obtain differential advantage via the political-regulatory process, these resources are wasted.[9]

The overall effect of the reduction in fraud and increase in costs is shown by the example in figure 1.2. The figure illustrates a case where regulation reduces the prospective valuation of fraud to T_R, and simultaneously increases the unit cost of providing Q by T_C. T_C is a per-unit taxlike cost imposed on suppliers. It includes direct costs of regulation as well as additional rent-seeking costs. Since T_C is less than $(T_F - T_R)$, Q will increase to Q_R, and consumer surplus will increase to triangle $a(P_R + T_R)b_R$.

It is obvious that, in the case where potential regulation would increase T_C more than T_F would be reduced, there is no set of regulations that will produce a triangle larger than $a(P_0 + T_F)b$ in figure 1.1. In that case, any existing (efficiency-seeking) regulators of Q would simply choose the null set of regulations. There would be no need for a specialized regulatory agency.

Recall that we sought in this section to establish an efficiency benchmark. We have now done so. The goal of efficiency-seeking regulators is clear from figure 1.2: they should choose the set of regulations that maximizes the consumer surplus triangle. Put differently, they should minimize the combined losses associated with prospective fraud and regulatory costs, that is, minimize the sum $(T_R + T_C)$ in figure 1.2. Put still differently, they should choose the set of regulations that maximizes equilibrium Q. By maximizing Q, the regulators will maximize gains from trade enjoyed by market users.

What if the regulator does not choose the efficient set of regulations? How can outcomes be characterized when the regulator over- or underregulates? After all, regulation cannot be defined in homogeneous units. Consider regulations, for example, that prescribe certain behaviors such as registration and record keeping. Even something as simple as registration cannot be defined in

9. Again the reader is referred to the rent-seeking literature, much of which is contained in Buchanan, Tollison, and Tullock (1980) and Rowley, Tollison, and Tullock (1987).

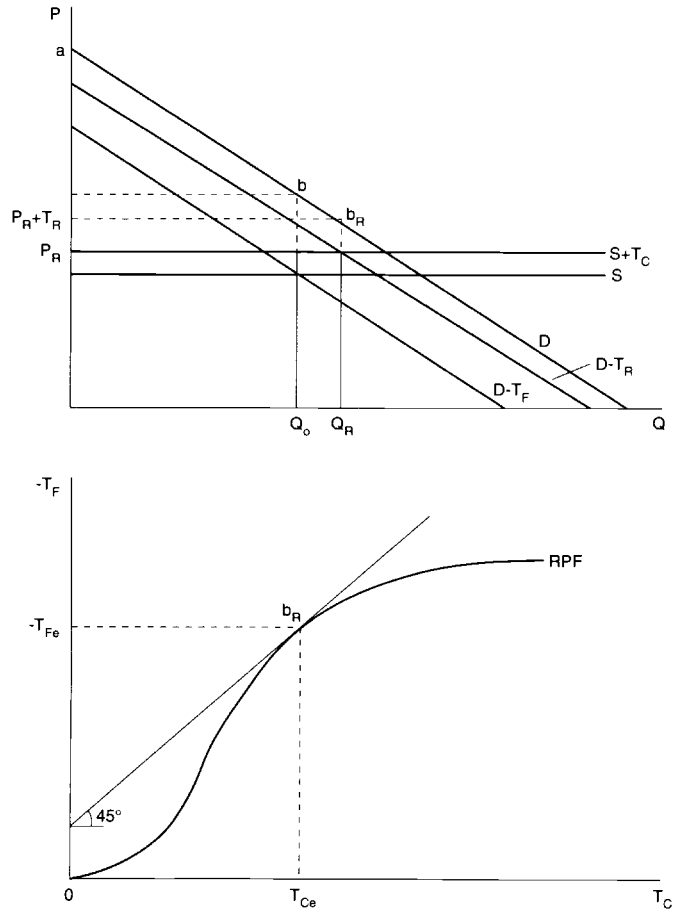

Fig. 1.2 Efficient regulation: *top*, supply and demand; *bottom*, cost of regulation and cost of fraud

homogeneous units. Who is to be registered? What are the criteria for acceptance of a potential registrant? How much information is required of a registrant? How often, and to what extent, will the information be updated and reviewed subsequent to registration? Similar remarks apply to various regulations that proscribe certain behaviors. In what sense, then, may we think of there being more (or less) regulation if we cannot measure it?

We assume that the regulator will attempt to choose the least costly set of regulations for each quantity of prospective fraud reduced.[10] We call this the *correct approach.* By this assumption, each incremental regulatory action,

10. We justify this assumption when we evaluate the incentives of regulators in section 1.2.2.

which further circumscribes or frees behavior in some fashion, changes prospective fraud (ΔT_F) and the unit cost (ΔT_C) of providing transaction services such that the ratio $(-\Delta T_F)/(\Delta T_C)$ is maximized among the remaining regulations. For example, a new registration requirement reduces prospective fraud, say by reducing the likelihood that crooks will enter, but it does so only by increasing the unit cost of transaction services. And it is the most effective possible change in regulation as long as the ratio is maximized and the regulator is using the correct approach. This is illustrated by the regulatory production frontier in the lower half of figure 1.2. When the marginal unit cost of regulation T_C and the marginal amount of fraud reduced are equivalent, the regulator achieves efficiency. The efficient set of regulations R imposes cost T_{Ce}. Points labeled b_R in the upper and lower halves of figure 1.2 are equivalent.

Assuming that the regulator follows the correct approach, we can derive possible equilibria for different levels of regulation. These are shown graphically along the locus in figure 1.3. These equilibria reflect market adjustments to the two unit taxlike effects of changing regulation: the change in the prospective valuation of fraud by demanders, and the change in the unit cost of providing Q. Q_0 and P_0 are the market price and quantity when regulation is zero. Q_R and P_R are the market price and quantity when regulation is R. The locus of regulatory equilibria (LORE) is the schedule of market price and quantity for each level of regulation. Between points 0 and e, as the level of regulation is increased from zero to R, the prospective valuation of fraud is being reduced faster than the unit cost of providing that level of regulation increases. Thus, Q and consumer surplus are increasing over that range. As the level of regulation increases above R, the unit cost of providing Q increases faster than the prospective valuation of fraud is reduced. Thus, Q and consumer surplus are decreasing. The efficiency-seeking regulator (with perfect information) will choose level of regulation R. Market participants adjust to point e in figure 1.3. At this point, consumer surplus and Q are maximized.

Underlying LORE are the demand and supply curves that reflect the trading

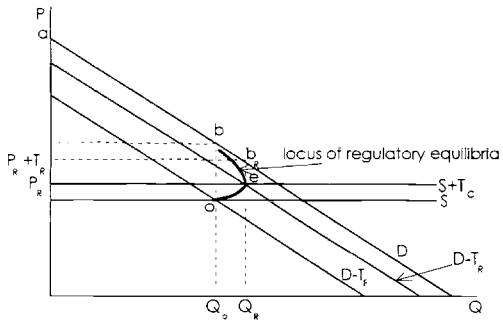

Fig. 1.3 Locus of regulatory equilibria (LORE)

public and the trading technology. It follows that LORE will differ according to the structure of the particular market being regulated, as the point at which costs increase more rapidly than benefits will not occur at the same point in all markets. This suggests that arguments to "level the playing field" across different markets, by making the regulatory approach and magnitude consistent, are not arguments for efficiency.[11]

1.2.2 The Incentives of Regulators

Even well-intentioned regulators are not generally motivated solely by efficiency. They may believe that reducing fraud always enhances efficiency; or, in a world of imperfect information, they may not know whether their regulations are overly burdensome. They may also enjoy the power and perks of their position. Therefore, we now consider the arguments that may plausibly enter a regulator's utility function and how they affect the level of regulation. We model the regulator of market i as having a utility function of the form

$$U^{R_i} = U(\overset{+}{Q_i}, \overset{+}{R_i}, \overset{-}{T_{F_i}}), \tag{1}$$

where the signs over the arguments indicate the signs of the first partial derivatives. We can write the utility function in this form because each of the arguments is a function of the amount of regulation chosen by the regulator.[12] Q, the volume of trade, is a good proxy for the present value of the regulators' money income and prestige.[13] R, the number and the comprehensiveness of the regulations enacted by the regulator, is a good proxy for the regulator's power and perks. T_F is the per-unit fraud tax, the public "bad" that the regulator would like to reduce. The regulator's marginal utility decreases as Q increases ($U_{QQ} < 0$), decreases as R increases ($U_{RR} < 0$), and decreases as fraud increases ($U_{TT} > 0$).

While the costs of regulation are not included explicitly in the formulation above, they do enter into the demand and supply equilibrium constraints that are embedded in it. Q_1 is determined in equilibrium by demanders and suppliers in market 1 and substitute/complement markets. dQ_1/dR_1 is determined by the change in the valuation of prospective fraud, the change in costs imposed in market 1, and relevant feedback effects among other markets. The regulator chooses R_1 to maximize his or her utility, taking into account the expected

11. Stephen Schaefer (1992) reaches a similar conclusion in his analysis of capital requirements and arguments in support of "functional" regulation to ensure that banks and securities firms are regulated equally. He demonstrates that there may well be valid reasons for higher capital requirements on banks.

12. The particular specification has the advantage of being simple. More important, by focusing attention on the incentives of regulators, it provides a framework for an analysis of regulatory structure.

13. In general, the prestige of an agency is directly related to its size, the size of its budget, and the number of high-salary positions in the agency, which, in turn, are a function of the size and importance of the industry it regulates. Furthermore, the expected value of a regulator's postregulatory income is also a function of the size of the regulated industry.

adjustment of participants in market 1 and all related markets. The question is whether a utility-maximizing regulator will have a tendency to overregulate, underregulate, or (as if led by an invisible hand) to seek efficiency.

The first-order condition for the regulator's utility maximum is

$$U_{Q_1}\frac{dQ_1}{dR_1} + U_{R_1} + U_{T_{F_1}}\frac{dT_{F_1}}{dR_1} = 0. \tag{2}$$

Assume that $(dQ_1/dR_1) > 0$, so that the regulator has the potential to increase efficiency with more regulation. Will it be in her self-interest to do so? Consider the signs of each of the terms in the marginal-utility expression for the regulator:

$$U_{Q_1}\overset{+}{\frac{dQ_1}{dR_1}} + \overset{+}{U_{R_1}} + \overset{-}{U_{T_{F_1}}}\overset{-}{\frac{dT_{F_1}}{dR_1}} = MU_R. \tag{3}$$

The terms on the left of equation (3) all tend to increase the regulator's utility as she increases R_1, which suggests that regulators have very little incentive to underregulate. And if, by some fortuitous circumstance, a regulator stumbled onto the efficient point ($(dQ_1/dR_1) = 0$), that agent would be motivated to keep increasing regulation, since

$$U_{Q_1}\overset{0}{\frac{dQ_1}{dR_1}} + \overset{+}{U_{R_1}} + \overset{-}{U_{T_{F_1}}}\overset{-}{\frac{dT_{F_1}}{dR_1}} > 0. \tag{4}$$

This is demonstrated in figure 1.4, where the LORE derived in figure 1.3 is replotted in Q_1, R_1 space. The regulator has the utility function posited above, and chooses level of regulation R_0 where the marginal rate of substitution of Q_1 for R_1 along indifference curve U_0 is tangent to the locus of regulatory equilibria. Contrast indifference curve U_0 with the indifference curve of an efficiency-seeking regulator. Recall that the efficiency-seeking regulator does not have R as a direct argument in her utility function, and neither does R enter it indirectly through prospective fraud. Therefore, the efficiency-seeking regulator will have horizontal indifference curves and choose the efficient quantity of regulation R_e where indifference curve U_e is tangent to the LORE. We see that more realistic regulators will have a natural tendency to overregulate, for example, by the amount $R_0 - R_e$ in figure 1.4.

1.3 Regulatory Competition and Its Implications for Regulatory Structure

If there were only a single market, a regulator would need to consider only the impact of the regulation on market 1. For this regulator, the marginal rate of substitution (*MRS*) between Q_1 and R_1 is

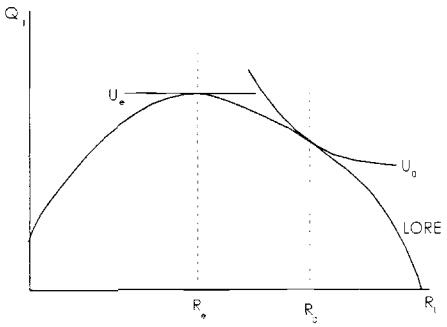

Fig. 1.4 Incentives of regulators and regulatory outcomes

$$\frac{dQ_1}{dR_1} = MRS_{RQ} = -\frac{U_{R_1} + U_{T_1}\dfrac{dT_{F_1}}{dR_1}}{U_{Q_1}}. \tag{5}$$

The first-order condition for an efficiency-seeking regulator is defined by the condition that $dQ_1/dR_1 = 0$ at the utility maximizing point. Thus, in the case where the regulator does not derive utility from reduced fraud or increased regulation, the numerator of *MRS* would be zero. In terms of figure 1.4, the regulator would have horizontal indifference curves such as U_e, and choose regulatory vector R_e where Q_1 would be maximized and efficiency attained. More generally, however, equation (5) shows that a regulator will trade off more regulation for a reduced level of transaction services. The regulator who gets utility from regulation and from decreasing fraud will increase regulation beyond the efficient point, that is, beyond where $dQ_1/dR_1 = 0$.[14] As the level of regulation is increased, $dQ_1/dR_1 < 0$, until, at some point, the extra utility gained from a small increase in regulation and reduction in fraud is offset by the extra utility lost from decreasing transaction services.

Now suppose that there is another market where the products traded are reasonably close substitutes (complements) with those traded on market 1. With substitute (complement) markets, a change in regulation in market 1 will affect the demand for transaction services in market 2. And a change in regulation in the substitute market 2 will affect the utility of the regulator of market 1. Holding R_1 constant, we differentiate regulator 1's marginal rate of substitution of R_1 for Q_1 with respect to a change in R_2.

14. We note additionally that a very zealous regulator could be characterized by a first-order condition > 0 even at the point where $dQ_1/dR_1 < 0$ so long as $U_{R_1} >> 0$ (large) and $dT_{F_1}/dR_1 << 0$ (that is, changing by a lot). These results show that, under plausible assumptions about regulatory behavior, regulators will have an incentive to choose more than the efficient amount of regulation.

$$\frac{d\left(\frac{dQ_1}{dR_1}\right)}{dR_2} = \frac{\left(U_{R_1} + U_{T_{F_1}}\frac{dT_{F_1}}{dR_1}\right)U_{QQ}\left(\frac{dQ_1}{dR_2}\right)}{U_{Q_1}^2} \tag{6}$$

Notice that the marginal rate of substitution will decrease or increase depending on whether markets 1 and 2 are substitutes or complements. We know that the two terms in parentheses in the numerator are positive, the denominator is positive, and U_{QQ} is negative (by assumption). Our characterization of regulatory behavior, that is, that regulators tend to overregulate, means that dQ_1/dR_2 is positive when markets 1 and 2 are substitutes and negative when they are complements. An increase in R_2 raises the fraud-adjusted price of transaction services in that market. Therefore, some demanders will shift to market 1 when they are substitutes, implying that $dQ_1/dR_2 > 0$. We illustrate this effect in figure 1.5.

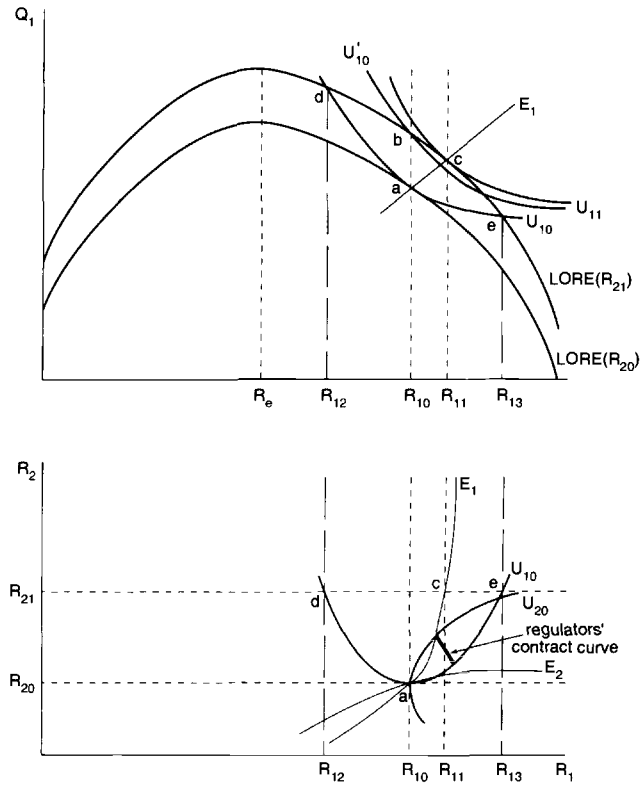

Fig. 1.5 Substitute markets: *top*, LORE shifts outward when the other regulator increases regulation; *bottom*, the potential gain to the regulator from overregulation

In the top panel, the regulator chooses R_{10} so as to maximize utility given LORE as a constraint. Initially, regulator 1 is at point a on indifference curve U_{10}. When the regulator in the substitute market increases R_2 from R_{20} to R_{21}, LORE in market 1 shifts upward ($dQ_1/dR_2 > 0$), and regulator 1 will find increased utility U'_{10} at point b. Because the markets are substitutes, if increased regulation in market 2 has the effect of decreasing Q_2, there will be an increase in Q_1, and regulator 1's marginal rate of substitution will decrease (increase in absolute value). We can also demonstrate diagrammatically these interactions between the two regulators.

Refer again to the top panel of figure 1.5. After the increase in regulation in market 2, the regulator of market 1 will increase regulation from R_{10} to R_{11} so as to put herself on indifference curve U_{11} at point c. These responses of regulator 1 are replotted in R_2, R_1 space in the lower panel of figure 1.5.[15]

In the lower panel, E_1 is regulator 1's independent adjustment response to the quantities of regulation chosen by regulator 2. Similarly, E_2 is the independent adjustment response of regulator 2 to quantities of regulation chosen by regulator 1. If the two regulators exhibit Cournot-Nash behavior, they will be in equilibrium at point a. Notice that indifference curve U_{10} in the upper panel through points a, d, and e is redrawn in the lower panel of figure 1.5. Similarly we draw an indifference curve for regulator 2 through point a. If the regulators recognize their interdependence, they will have an incentive to engage in cartellike behavior so as to move to the regulators' contract curve. Because movement toward the curve results in increased regulation and decreased Q in both markets, market participants are worse off relative to the independent adjustment equilibrium.[16]

To derive algebraically the slopes of the regulators' response curves shown in figure 1.5, we totally differentiate the first-order condition (equation [2]) for the regulator of market 1 (R_1 can be thought of as an implicit function of R_2).

$$(7)\quad \left[U_{1Q_1Q_1}\left[\frac{dQ_1}{dR_1}\right]^2 + U_{1Q_1}\frac{d^2Q_1}{dR_1^2} + U_{1R_1R_1} + \left[\frac{dT_{F_1}}{dR_1}\right]^2 U_{1T_{F_1}T_{F_1}} + \frac{d^2T_{F_1}}{dR_1^2}\,U_{1T_{F_1}}\right] dR_1 + U_{1Q_1Q_1}\frac{dQ_1}{dR_1}\frac{dQ_1}{dR_2}\,dR_2 = 0$$

15. We note that, since information is imperfect, shifts in the pattern of trade between markets are a noisy signal. An increase in volume could represent a vote of confidence in the regulatory environment, or a flight from a less-efficient regulatory regime.

16. However, over-regulation may serve as an incentive to innovation elsewhere. The futures markets have seen a huge growth in the cash foreign exchange market and a far lower growth in their markets. Some of the rules of trading on a contract market make it difficult for large institutional traders to accomplish their trades at minimum price impact. They find it more cost-effective to use a market where private negotiation of trades is not prohibited, as it is under the open and competitive requirements of the Commodity Exchange Act.

Assuming that regulators exhibit Cournot-Nash behavior, the slope of the regulator of market 1's response curve is given by

$$(8)\qquad \frac{dR_2}{dR_1} = -\left[U_{1Q_1Q_1}\left[\frac{dQ_1}{dR_1}\right]^2 + U_{Q_1}\frac{d^2Q_1}{dR_1^2} + U_{R_1R_1} + \left[\frac{dT_{F_1}}{dR_1}\right]^2 U_{1T_1T_1} + \frac{d^2T_{F_1}}{dR_1^2}U_{1T_1}\right] \div \left[U_{1Q_1Q_1}\frac{dQ_1}{dR_1}\frac{dQ_1}{dR_2}\right] > 0.$$

Similarly, the slope of the response curve of the regulator of market 2 is

$$(9)\qquad \frac{dR_2}{dR_1} = -\left[U_{2Q_2Q_2}\frac{dQ_2}{dR_2}\frac{dQ_2}{dR_1}\right] \div \left[U_{2Q_2Q_2}\left[\frac{dQ_2}{dR_2}\right]^2 + U_{Q_2}\frac{d^2Q_2}{dR_2^2} + U_{2R_2R_2} + \left[\frac{dT_{F_2}}{dR_2}\right]^2 U_{2T_2T_2} + \frac{d^2T_{F_1}}{dR_2^2}U_{2T_2}\right] > 0.$$

We can now see that regulator 1's response curve (E_1) would be vertical if she were efficiency seeking, since in that case $dQ_1/dR_1 = 0$. By similar reasoning, regulator 2's response curve (E_2) would be horizontal if he were efficiency seeking ($dQ_2/dR_2 = 0$). Notice also that the slope of regulator 1's (2's) response curve will be less (greater), the greater is the change in her marginal utility directly via R (the level of regulation) and T_F (the amount of fraud) from changing regulation.

Interactions between the two regulators occur when at least one of them is not efficiency seeking, that is, when writing regulations or reducing fraud are arguments in at least one regulator's utility function. As the quantity of transaction services in market i changes because of a change in the level of regulation in market j, the behavior of an efficiency-seeking regulator will not change. Formally, $dR_i/dR_j = 0$ holds so long as $dQ_i/dR_i = 0$. As we saw in figure 1.5, however, the situation is quite different when we have a regulator who values fraud reduction and the articulation of rules in and of themselves. In the case of substitute markets, this kind of regulator will face a relaxed constraint when the other regulator increases regulation. She will enjoy a positive externality (her LORE in figure 1.5 shifts upward) and increase regulation in her own market. Similarly, if the other regulator reduces regulation, she will be further constrained and decrease regulation in her own market.

The direction of the interactions is just the opposite in complement markets, as is illustrated in figure 1.6. In the top panel, the regulator chooses R_{10} so as to maximize utility, given LORE as a constraint. Initially, the regulator is at point a on indifference curve U_{11}. When the regulator in the complement market increases R_2 from R_{20} to R_{21}, LORE shifts downward, and regulator 1 finds herself with reduced utility U'_{10} at point b. Because the markets are complements, if increased regulation in market 2 results in a decrease in Q_2, Q_1 will

also decrease. Because regulator 1's marginal rate of substitution will, therefore, have increased (decreased in absolute value), she responds by decreasing regulation from R_{11} to R_{10} to put herself on indifference curve U_{10} at point c. The corresponding responses of regulator 1 are replotted in R_2, R_1 space in the lower panel of figure 1.6.

As in figure 1.5, E_1 is regulator 1's independent adjustment response to the quantities of regulation chosen by regulator 2. Similarly, E_2 is the independent adjustment response of regulator 2 to quantities of regulation chosen by regulator 1. If the two regulators exhibit Cournot-Nash behavior, they will be in equilibrium at point c. Indifference curve U_{10} through points d, c, and e is redrawn in the lower half of the figure. Similarly, we draw an indifference curve for regulator 2 through point c. If the regulators recognize their interdependence, then they will have an incentive to engage in cartellike behavior so as to move to the regulators' contract curve. But by so doing, they actually make market

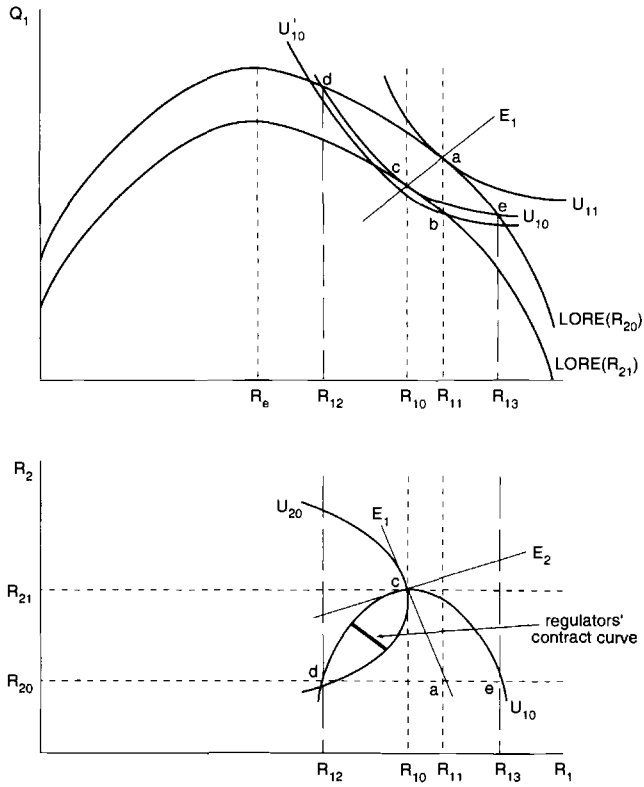

Fig. 1.6 Complementary markets: *top,* LORE shifts inward when the other regulator increases regulation; *bottom,* the potential gain to the regulator from underregulation

Table 1.1 **Taxonomy of Regulatory Collusion Relative to Cournot-Nash Equilibrium**

When the Markets Are Substitutes

	Regulator 1	
	Enjoys regulating and reducing fraud, $U_1 = U_1(Q_1, R_1, T_{f1})$	Only enjoys increasing Q, does not regulate for any other reason, $U_1 = U_1(Q_1)$
Regulator 2		
Enjoys regulating and reducing fraud, $U_2 = U_2(Q_2, R_2, T_{f2})$	both move further from efficiency	regulator 1 efficient, regulator 2 constrained from moving further from efficiency
Only enjoys increasing Q, does not regulate for any other reason, $U_2 = U_2(Q_2)$	regulator 2 efficient, regulator 1 constrained from moving further from efficiency	both regulators are efficient

When the Markets Are Complements

	Regulator 1	
	Enjoys regulating and reducing fraud, $U_1 = U_1(Q_1, R_1, T_{f1})$	Only enjoys increasing Q, does not regulate for any other reason, $U = U_1(Q_1)$
Regulator 2		
Enjoys regulating and reducing fraud, $U_2 = U_2(Q_2, R_2, T_{f2})$	both move closer to efficiency	regulator 1 efficient, regulator 2 constrained from moving further from efficiency
Only enjoys increasing Q, does not regulate for any other reason, $U_2 = U_2(Q_2)$	regulator 2 efficient, regulator 1 constrained from moving further from efficiency	both regulators are efficient

Note: The cells in the matrices represent predicted departures from/moves toward efficiency when the regulators collude.

participants better off relative to the independent adjustment equilibrium. So we see opposite effects when regulators collude, depending on whether the markets regulated are substitutes or complements.

We now summarize our results and apply them to the question of whether there is a regulatory structure that will encourage efficiency-seeking regulation. As mentioned in the introduction, various proposals to consolidate financial regulation in one agency have recently been advanced. Because a merger greatly decreases the costs of collusion, we have summarized the different collusive outcomes in table 1.1 for both substitute and complement markets for the case where the regulators are efficiency seeking and for the case where they have more of a tendency to overregulate.

The table provides a taxonomy of the effects of regulatory collusion relative to the Cournot-Nash duopoly equilibrium. The upper panel shows the results for substitute markets, the lower for complement markets. We see that only in the case of substitute markets does collusion lead to a worse outcome. But casual empiricism would suggest that this is the situation relevant to regulatory structure. Inasmuch as consolidation of the CFTC and SEC into one agency reduces the cost of collusion, it increases the departure from efficiency. Rules are not independent of the regulatory structure.

One other aspect of regulatory competition that cannot be captured in our static model deserves mention. Financial markets are highly innovative, in terms of the development of new products and new trading structures. This innovation poses a problem for a regulator concerned with the appropriate level of regulation (and this is true whether the regulator is efficiency seeking or departs from efficiency). As markets evolve, the appropriate level of regulation is likely to evolve as well. To fine-tune regulation, however, the regulator must maintain accurate information about the workings of the market it regulates. It is almost taken as axiomatic that the regulator's information lags market practice (see, e.g., Hu 1993). The magnitude of this lag will depend on the ability of the regulator to acquire information from market participants.

It is also possible that regulatory competition could result in an increase in the decentralized production of information in a Hayekian sense. Say, for example, in seeking to avoid a "crisis" the CFTC imposed regulations that were overly burdensome relative to efficiency and to SEC regulations. The resulting out-migration of business and decline in innovation would serve as a signal to the CFTC to reevaluate its regulations with respect to that "crisis." Separate regulators will react to the unique circumstances of their own markets. On the other hand, a consolidated regulatory authority will likely result in a more generalized approach, and it might be less responsive to changes in one market's circumstances. On this, Fischel (1989) has said:

> [R]egulatory bodies, like the organized exchanges they regulate, compete to supply rules and regulations that facilitate the provision of transaction services. To the extent that one regulatory body does a poor job in providing such rules and regulations, investors will shift to other exchanges governed by different and superior rules where substitute financial products are traded. Thus, competition among regulatory agencies creates an incentive to provide rules and regulations that benefit investors and at the same time limits the size of the regulatory tax that any agency can impose. (118)

Kane (1984) best sums up the view that the process of regulatory competition itself overwhelms any short-run losses reflected in criticisms of existing regulatory structure.

> [I]n the long run, competition among financial regulators lowers the level of the regulatory tax by fostering efficiency in the production of regulatory services. Much as in other kinds of competition, regulatory competition is

guided by an invisible hand to produce subtle and long-run benefits that are imperceptible to uncritical observers. Even though regulatory overlaps impose avoidable short-run costs, they facilitate a generalized form of market entry and exit that promotes dynamic or evolutionary optimality. Duplicate regulatory function and overlapping administrative boundaries provide opportunities for the entry and exit of regulatees. Regulated firms (especially new entrants into regulated and substitute markets) shrink the domains (and therefore the budget resources) of regulators whose response to the evolving needs of the marketplace proves short-sighted or inflexible. (369)

1.4 Conclusion

Our analysis is based on the belief that the goal of regulation should be efficiency. First, we provided a framework that characterizes efficient regulation in financial markets. Second, we formulated a model of regulatory behavior that takes into account the incentives of regulators. We focused particularly on these incentives because we believe they are central to the regulatory outcome, whereas much of the current discussion of regulatory reform seems to assume implicitly that significant changes in this outcome can be achieved without regard to these incentives. Last, we developed a framework for predicting the impact of regulatory structure on efficiency.

Our results suggest the following general principles about regulatory structure and regulatory competition. A change in the structure of financial services regulation would reduce some costs, such as those associated with duplicative or inconsistent regulations. It may also increase other costs due to (increased) overregulation. Competition between regulators of substitute markets increases efficiency, whereas such competition decreases efficiency in the case of complementary markets. Collusion between regulators of complement markets increases efficiency, whereas such competition decreases efficiency when the markets are substitutes. The question of optimal regulatory structure, therefore, depends on the incentives facing regulators, and the degree of complementarity or substitutability of the products to be regulated. In any event, rules are not independent of the regulatory structure.

Our analysis does not automatically lead to the conclusion that a merger of the CFTC and the SEC would be beneficial or detrimental to the cause of efficiency. There is first of all the question of whether the markets the two agencies regulate are primarily substitutes or primarily complements. Even if they are substitutes, the case where regulatory competition can lead to greater efficiency, the savings from reducing duplication and inconsistency may be greater than the risks of overregulation brought about by elimination of competition through the merger. Then there is the question of the production of knowledge under alternative regulatory regimes. If the "regulatory net burden" can perform the function of a price faced by regulators, will the reactions of market

participants result in the production of information in a Hayekian, decentralized sense? Or are we extending the knowledge argument too far? Thus, even if one were to accept our model and believe that the markets are primarily substitutes, one would still need to know the relative costs and benefits of alternative regulatory structures.

Our own view is that the markets are substitutes and that the costs of merger would be high and the benefits low relative to the current structure and relative to alternative reforms. If we were to array the possible number of regulators along the real number line from zero to plus infinity, one regulator would probably be the number we would be least likely to choose, at least from the perspective of prospective efficiency. That, however, is at least another paper.

Other proposals for reform of the regulatory structure have been made, such as the proposed merger of all financial regulatory agencies under a cabinet-level superregulator, mentioned in footnote 1. While duplicative and inconsistent regulation might be eliminated, it is not clear that this new regulatory structure is necessary to accomplish that goal. The framework developed herein can be readily extended to analyze this proposal. The authors of the proposal maintain that the new structure will lead to "consistent" regulation across market centers; however, our analysis has suggested that a level playing field will not result in an efficient level of regulation across markets that differ in their principal users and in their structure. More important, this paper has demonstrated that the incentives of regulators are the principal determinant of the rules that are enacted. How would the incentives of the superregulator be different than those of an individual agency head? Would the merger lead to a more efficient level of regulation across all markets, or would it increase log-rolling and other voting inefficiencies within the superagency? Any proposed change in regulatory structure should first and foremost be evaluated in terms of its impact on regulatory incentives.

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Comment

Edward H. Fleischman

In his paper (chap. 7 in this volume), relating to the likely more important obverse of our present topic—competition and collusion of regulatory regimes in the transnational sphere—Lawrence J. White concludes one section with the statement that "the real-world imperfections of government have yielded numerous instances of the regulatory process's being used for abusive purposes and reaching inefficient outcomes. . . . These abuses . . . point toward . . . the value of frequent reassessments of the motives, methods and outcomes of existing regulatory regimes." Proceeding from an awareness born of experience as well as academic study, I think that the paper by Albrecht, Bronfman, and Messenheimer can be seen—and should be received gratefully—as just such a reassessment.

The heart of the proposition presented to us is that "the question of optimal regulatory structure . . . depends on the incentives facing regulators, and the degree of complementarity or substitutability of the products to be regulated. In any event, rules are not independent of the regulatory structure."

That rules are not independent of regulatory structure I accept and agree. Laying incentives aside for a moment, I think it fair to summarize the paper as suggesting that it is the degree of complementarity or substitutability of the

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products and services regulated by financial regulators that is crucial to utilization of the framework put forward in the paper for predicting the impact of regulatory structure on efficiency.

That the paper's model speaks in terms of a single or a unitary good produced and regulated in each of two markets, while in fact the products and services produced in the financial markets and regulated by the financial regulators are in each market multiple and often distinct from one another, should not derogate from the validity of the paper's conclusion—*except* that that very multiplicity and differentiatedness shreds the key distinction between substitute and complementary markets.

The domestic financial markets are neither wholly or distinguishably substitutable nor wholly or distinguishably complementary; rather, they partake of complementarity and substitutability in varying and ever-changing degrees, as product and service mix in either (assuming that there are only two) reacts on and affects product and service mix in the other—in part, I understand, reflecting internal and external marketplace constraints and regulatory constraints—but the very complexity of the mix fractionalizes the impact of either competition or collusion among regulators on efficiency. Again, the inquiry into what he calls "government failure" (i.e., regulatory inability to effect [or affect] efficiency) is part of White's presentation.

My mention of the possibility of multiple (i.e., more than two) markets and my references to White's presentation on the transnational issues suggest not only the existence of other financial markets and other financial regulators in the *domestic* economy, but more important, of course, also the existence of markets abroad, which are increasingly easily substitutable and which tend to be much less regulated than their analogs here. If the thesis of the present paper proves itself by its applicability in the international sphere, I question whether the implications of that proof strengthen or weaken the robustness of its applicability to the activities of individual regulatory regimes here at home.

Well, I do want to return to incentives. The paper assumes regulators motivated solely by efficiency, although extending somewhat to take into account the regulators' own view of their utility function. I suggest, respectfully, that that assumption is simply too thin.

In a recent book focusing on the SEC, the author seeks to apply rational choice theory to the dynamics of SEC policymaking, that is, to regulatory incentives in one financial regulatory agency. In that author's words, "The formal and informal structures and procedural rules that guide bureaucratic behavior are critical to policy outcomes because they create incentives for action."

That author selects from the rational-choice literature the approaches to studying regulatory incentives that focus on the relationships between the regulator and its oversight, enabling, appointing and auditing institutions: the Congress, the president, the General Accounting Office. I would suggest looking in another direction as well. Regulators are institutions, but they are institutions comprising individual people—people who care not only for their respective

institutions but for themselves. Career safety and enhancement are even stronger incentives than institutional policy preservation and enhancement, and often those incentives are intertwined.

I once spoke of the principal commandment for government regulators (omitted from the decalogue only by an unnoticed and erroneous touch on the delete key): Thou shalt expand thy jurisdiction with all thy heart, with all thy soul, and with all thy might. That commandment is not only institution-directed; it reflects the psychology of personal incentive: "My agency is growing; I am more important." "My division is getting new powers/new funds/new programs; I am advancing in stature." "The markets we regulate are increasing in volume and importance; I have prospects for more career satisfaction as well as more career advancement." And, negatively, as the present paper points out in the context of the self-protection of regulators in having enough regulations in place to cover every conceivable form of fraud or other undesirable behavior: "Although I may get no gold stars and no promotions for efficiency, my agency will be tarred and feathered in Congress and the press, and I will be subject to career termination or its equivalent in civil service or political exile, if any form of fraud or other undesirable behavior [which may include merely behavior resulting in market volatility—as though volatility were not inherent in markets] actually slips through the net of agency prohibitions."

In my experience, personal incentives are key to regulators' construction and implementation of policy, and self-protection is usually a stronger incentive than efficiency promotion.

So I take the present paper's thesis warily, and with deep-seated reservations, though with sufficient respect for all three of its authors to know that it merits further consideration.

In an interview last August, Albrecht put some of his thoughts underlying the present paper into layman's language. He was quoted as saying "Regulatory structure is not an end in itself, but only a means of arriving at a sensible system of rules. The best structure is that which gives regulators the ability and the incentives to create appropriate rules. . . . What regulators *do* is a lot more important than *how many* agencies there are." To that, we can all say amen.

Authors' Reply

Economists and attorneys all too often appear to operate on separate planets. Not only do they speak different languages, but they observe different realities. One of the great pleasures we get in dealing with Ed Fleischman is that he lives on the same planet we do. He is an attorney who not only understands economics but also listens to economists and is listened to by economists. We can only wish that some of his fellow attorneys at the SEC had listened to him more carefully.

Unfortunately (or perhaps fortunately), understanding economics is not always the same as understanding economists. We economists spend a lot of time constructing our own planet with its own language, which only we understand. We oversimplify reality in order to be able to construct abstract and internally consistent models. But there is a method to our madness. In oversimplifying reality, we try to gain insight into the real world.

Fleischman has reacted, we believe, to our simplifying assumptions in the way that most noneconomists would. In so doing, he appears to have missed the purpose of these assumptions, and, thus, he appears not to realize that our insight into the real world is actually quite similar to the substance of his comments. But even absent that realization, we think (as usual) that he has made some points worth considering.

We turn first to what we think he has missed. Our simplification of reality involved three abstractions. Our first abstraction established an efficiency benchmark by which we judge how well regulators are doing. The source of Fleischman's concern seems to lie in our second abstraction regarding the incentives of regulators. He says that "laying incentives aside . . . , it is the degree of complementarity or substitutability of the products . . . regulated . . . that is crucial to . . . predicting the impact of regulatory structure on efficiency." He misses our main point, which is that first and foremost regulators' incentives matter. Not only do they matter, but we characterize these incentives exactly the way Fleischman does. Their natural tendencies are to expand their turf and to be risk averse. This is the essence of our second abstraction from reality: that regulators act as if they have a utility function encompassing these tendencies.

Our third abstraction from reality is intended to gain insight into what regulators' incentives imply for efficiency over alternative regulatory structures. We assume that there are just two financial products being regulated, each one under the jurisdiction of its own regulator and, alternatively, both products under the jurisdiction of a single regulator. Fleischman critiques that this is not representative of the real world. We agree. But that is not our point. Our point is that *the incentives of regulators are relevant to efficiency.* This relevance means that, if the regulated products are substitutes, then regulatory collusion will increase harm to market users of those products. And if the regulated products are complements, regulatory collusion will actually increase the welfare of these market users.[1]

To us, this story seems to be quite rich in its implications for the design of regulatory structure that seeks to maximize the welfare of market users. This richness is not diminished by the fact that the real world is much more complex than that in our story. By emphasizing regulatory incentives in our route to regulatory reform, we can reduce the abilities of regulators to impose excessive regulatory net burdens. We can reduce government failure.

1. This result in the context of firms was analyzed years ago by Cournot ([1838] 1897) and by Allen (1938). We thank Lawrence White for calling these cites to our attention.

This, of course, is easier said than done. And in criticizing our third abstraction, Fleischman has raised some interesting empirical issues. "Domestic financial markets . . . partake of complementarity and substitutability in varying and ever-changing degrees, . . . reflecting internal and external marketplace constraints and *regulatory constraints*" (emphasis added). We agree. But we do not believe that this detracts from our conclusion. Clearly, financial innovation is not independent of regulatory structure; it is endogenous to a large extent. If regulators have an incentive to approach efficiency (say because existing substitute products are under separate jurisdictions), then individuals in the market will enjoy an incentive to create complementary instruments. On the other hand, if a monopoly regulator has an incentive to depart from efficiency (say because substitute products are under its jurisdiction), then individuals in the market will have an incentive to avoid excessive regulatory net burdens. Innovation will seek substitute products beyond the reach of the regulator. Of course, these substitutes may include those beyond domestic borders.

Fleischman thoughtfully questions the robustness of our conclusions to "the existence of markets abroad, which are increasingly easily substitutable and which do tend to be much less regulated than their analogs here." Our view is that foreign competition is indeed beneficial. Since regulatory incentives matter, foreign competition tends to reduce the ability of domestic regulators to depart from efficiency.

Rules, nonetheless, are not independent of regulatory structure. Regulators internationally have the same tendencies as our own: to expand their turn and to be risk averse. In other words, they act as if they have a utility function encompassing these tendencies. If regulated products tend to be substitutes internationally, then, internationally, regulators would like to collude to increase their power. But in so doing, they would increase government failure. Domestic regulatory competition raises the cost to regulators of forming such an international cartel of regulators. A domestic regulatory monopoly, on the other hand, would lower that cost. Our monopoly regulator would be like a dominant "regulatory firm" in an international cartel of regulators, increasing their potential to reduce the efficiency of regulation worldwide.

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