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ABSTRACT

Increasing complexity of regulation over time is a regular empirical phenomenon whenever political processes attempt to control economic activity. In this paper it is argued that a tendency toward increasing complexity of controls is probably inherent in most efforts to regulate, and that the great likelihood that it will occur should be taken into account in initial policy formulation. Economic policy analyses may be correct as formulated on the assumption that the initial policies will be adopted and not be altered, but be wrong if it is recognized that increased complexity may be an inevitable cost of the policy.

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The Political Economy of Controls: Complexity

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In analyses of economic policy formulation and implementation in many fields, one often encounters comments, and usually criticisms, regarding the complexity of regulations and controls. Indeed, calls for reform often center on the desirability of simplification, and criticisms are often directed at the complexity of policies. In import policy, for example, economists have long since appealed for "transparency," by which they mean that simple and readily understandable border measures, tariffs, are preferred to more opaque measures such as quotas and hidden protection through standards or other measures.

It is the purpose of this paper to argue that a tendency toward increasing complexity of controls is probably inherent in most efforts to regulate, and that the great likelihood that it will occur should be taken into account in initial policy formulation. Economic policy analyses may be correct as formulated on the assumption that the initial policies will be adopted and not be altered, but be wrong if it is recognized that increased complexity may be an inevitable cost of the policy.

We start by citing a variety of instances in which complexity has been noted. We then turn to a

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[1]We are indebted to Robert H. Bates for a helpful discussion of some of the issues raised in this paper.

consideration of the reasons why there may be a systematic and explicable tendency for it to occur. Next, we attempt to document increasing complexity with reference to two particular sets of policies - American income tax law and U.S. sugar policy. Finally, we speculate on ways in which the costs of complexity may better be taken into account in formulating policy advice.

To the extent that increasing complexity of regulation over time is a regular empirical phenomenon whenever political processes attempt to control economic activity, there are important ramifications. Certainly, the increased complexity of former communist planning apparatuses was an important factor contributing to their mounting inefficiency over time. Likewise, the proliferation of controls and regulations, with its attendant deadweight costs, has been an important element in bringing about attempts at policy reform in many countries, and the ultimate downfall of the ancien regime in Eastern Europe and the Commonwealth of Independent States (CIS). It seems fitting, in a collection of essays in honor of Karsten Laursen focussing on problems of economic policy formulation for growth, to explore the ubiquitous nature of the phenomenon, and its implications for policy changes and growth.

1. Examples of Trends toward Increased Complexity

Some years ago, Jagdish N. Bhagwati (1978) and Anne O. Krueger (1978) delineated Phases of exchange control regimes. These regimes were characterized as starting in Phase I, where a relatively simple and straightforward set of rules and regulations governed administration of import, export, and foreign exchange licensing. However, in their analysis, regimes gravitated to Phase II, which was characterized by a proliferation of rules and regulations, and an increasing complexity of the overall trade and payments regime. Phase III could, but need not necessarily, follow. If it did follow, it consisted at a minimum of the tidying up of the regime as political reaction to the complexity of the system could force a change. If Phase III also resulted in a continuing liberalization of the trade regime, Bhagwati and Krueger opined that Phases IV (continuing liberalization) and V (a fully liberalized regime) might follow, although they noted that a reversion to Phase I or II was an alternative outcome.

The delineation of Phases was intended as a descriptively useful device for permitting comparisons across countries, and Bhagwati and Krueger were careful to insist that there was nothing inevitable or even presumed about the sequencing of Phases. Empirical results for countries covered in the analysis, however, revealed that there seemed to be a strong tendency for Phase I to be followed quickly by

Phase II, which in turn was sooner or later followed by Phase III. Phase III was often nothing other than an effort to "reform" the regime by simplifying it.[2] Bhagwati and Krueger characterized many countries' experience as "cycling" back and forth between Phases II and III.

Somewhat later, in a comparative study of agricultural pricing policies, Krueger, Maurice Schiff and Alberto Valdés mentioned the typology as a potentially useful device for analysis. However, it was not expected to be generally applicable, and it was left to individual authors' discretion whether or not to use the phase characterization. Surprisingly, it was found useful by most researchers on agricultural pricing policies, as is reflected in the individual country studies (Krueger, Schiff and Valdés, 1991a, 1991b, and 1991c), and again, the progression through phases with increased complexity of agricultural pricing regimes was a frequently noted phenomenon. Reform episodes in most countries centered on attempting to simplify and streamline agricultural pricing policies.

To take an example from a completely different field, Michel Crozier (1975) pointed out that better-trained French decision-makers in the 1950s made worse

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[2]See the description of phases in Krueger (1978, pp. 22-28), the chronology of each of the countries included in the project on pp. 28-36, and the chart providing a visual tracking of phases on p. 38.

economic and social decisions than did their predecessors in the 1890s.[3] He concluded that the reason for this phenomenon was "the tremendous increase in the level of complexity of the system and its dramatic overload . . ."

The U.S. tariff code provides yet another case in point. In 1790, the U.S. tariff code "consisted of a single sheet of rates posted at U.S. Custom Houses; now our tariff code occupies two hefty volumes with 8,753 different rates, a blizzard of arbitrary discriminations against and among products.[4]

There are many more examples, including such diverse fields as auto emissions standards, food and drug safety regulation, and provisos in foreign aid legislation. In sections 3 and 4, we illustrate this complexity in two particular cases.

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[3]Crozier (1975), p. 15.

[4]Bovard (1991), P. 6. Bovard also reports that regulations governing labelling to indicate country of origin have become increasingly complex as issues have arisen about the size of the marking, problems that arise when the commodity that must be labelled is very small, and the size of other items on the label (as, for example, when "American Sports" is the brand name printed in large letters and "Made in Sri Lanka" appears in 1/4 inch print at the bottom). See Bovard, pp. 15-21.

2. Controls and Complexity.

Once we began examining other markets and other areas for analyses of complexity, it became clear that increasing complexity of regulation over time, or, in the language of Phases discussed in the previous section, Phase II development, may be a central feature of controlled and regulated markets. Regulation can be undertaken either by stating a general purpose and giving bureaucrats wide discretion in governing the regulated, or it can be effected by setting forth rules and procedures that are to be followed and then providing legal or quasi-legal processes for their interpretation and enforcement. Although there are a variety of interesting issues that arise in choosing between these alternatives, the tendency toward complexity is nonetheless present in either case, and we therefore do not address the question of the mechanism of regulation in what follows.

There appear to be three distinct reasons why complexity grows over time. They are: 1) issues of equity in administering controls; 2) bureaucratic self-interest; and 3) market responses to controls which thwart intentions of decision-makers. Although some of these mechanisms have been noted in a variety of contexts, their interactions have been overlooked. Yet it is through these interactions that, we believe, increasing complexity over time becomes inevitable

once a control has been initiated.[5] Here, we address each in turn, and then consider interactions between them.

Equity in Administration of Controls. Fairness is a powerful political argument. To be sure, the purpose of controls is sometimes to achieve equity. However, whenever regulations are announced, those who perceive themselves disadvantaged by them understandably make as strong a case as they can politically for relief.[6] The result is often that complexity arises in addition to that which would have resulted had the initial goals initially been met.

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[5]Once complexity has increased sufficiently, however, there may be decisions to make fundamental changes, such as reorganization, "reform," changing the mandate of an agency, or deregulation. See Noll (1985), pp. 12-14 for a discussion. While some reorganizations and reforms may in fact increase complexity (see the discussion of the U.S. income tax below), they may also represent a reaction to the excess (inefficiency) costs of complexity. Discussion of the difficult issues surrounding motives, intentions, and beneficiaries in the case of fundamental changes is well beyond the scope of this article.

[6]Political scientists would view this phenomenon as "redistributive politics," seeking to understand outcomes in terms of pressure groups. However, most lobbying groups appeal to fairness in making their claims, and elected officials who set the criteria are in part enabled to legislate changes on the stated rationale that they are "fair."

Import licensing regimes provide a good example. Usually, uniform across-the-board allocation rules for import licenses were initially decreed in response to balance-of-payments difficulties in developing countries in the 1950s. For example, they sometimes were imposed by restricting each importer to a certain fraction of his allocation in a preceding time-period, normally the previous year.

Although this rule seems fair, there are many who can point to ways in which they are disadvantaged. Those whose self-interest is adversely affected by them will be quick to point them out, and to seek redress. A first set of inequities discriminates "unfairly" among producers: those who had large inventories at the start of the base period and therefore imported less than "normal"; those whose level of activity is expanding rapidly; those new entrants whose businesses and therefore imports started up during the year; and those with factories closed due to strikes for substantial parts of the year, to name just a few obvious cases. There are also "obvious" instances of inequities across groups of consumers; "essential" foods and medicines should manifestly be favored relative to "luxuries"; spare parts and raw materials are thought to deserve "preferential" treatment over finished consumer goods (except of the essential kind already mentioned), and so on.

Most of these claims are, in large part, reasonable although it may be noted that those who are favored by the allocation rule (presumably the inverse of the groups mentioned above) are likely to remain silent. Thus, politicians and bureaucrats must contend with a host of claimants seeking amendment to the allocation rules or procedures. The usual response is to increase the number of categories of license applicants. With each additional category, however, others find themselves disadvantaged relative to some who are "horizontally" in a relatively similar position.

Over time, therefore, the complexity of licensing procedures increases as adjustments are made to take into consideration the "fairness" of existing rules with respect to those who complain. Each adjustment, however, generates new claimants for additional amendments, and so the process goes.[7] On grounds of fairness alone, therefore, simple rules are likely to be amended over time.

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[7] Underlying all this seems to be the fact that there are no two agents in identical positions with respect to lifetime earnings, income relative to expenses, and assets. Any attempt to categorize agents must therefore find some close to the dividing line with respect to one attribute who can make a case that other aspects of their circumstances should render their treatment better than someone else who is excluded or included in a particular category.

Self-Interest of Bureaucrats and Intermediaries. Once complexity has begun to increase, additional bureaucrats are normally required to administer the system.[8] As the size of the bureaucracy increases, the number of individuals within the bureaucracy with a vested interest in seeing the system becomes no less complex over time increases.[9]

In addition, however, as regulations grow more difficult to understand, an industry of middlemen springs up who specialize in interpreting the rules for those affected. In so doing, they lower the social costs of rules, but develop interests of their own in the complexity of those rules. J. R. Kearl (1983) has shown that these specialists will also have a vested interest in having the rules change at specified intervals.[10]

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[8]See Quandt (1983) for a model of this process.

[9]See the discussion of the U.S. income tax below, where the evolution of the income tax preparation industry is noted. In the case of American sugar regulation, it is apparent that the amount of investment of time and effort needed to learn the rules is sufficiently large so that their simplification would result in a major loss of human capital for those administering the system.

[10]The optimal interval will be sufficiently long so that the intermediaries can have a comparative advantage in learning and interpreting the rules, and sufficiently short so that it will not pay those governed by the rules to learn them for themselves.

International trade lawyers, income tax preparers, and agents handling customs and other import regulations are examples of such specialized intermediaries, but there are many more. It will be noted below that there has even developed a group of intermediaries knowledgeable about the sugar regime. In developing countries, large groups of "expediters" handle everything from getting goods through customs to freight shipments, airline reservations, obtaining the relevant licenses and permits, and arranging railroad transport.

Often these intermediaries are themselves former bureaucrats. The knowledge of the regulations gained in administering them is also the best training one could receive for becoming an intermediary and assisting private parties in minimizing the costs of those same regulations. The steady turnover of employees and relatively low pay in some sectors of government service, compared to positions in the private sector, is evidence of this. This fact also helps explain the "revolving-door" from government office to industry lobbyist found in Washington (and in other countries). Such government officials have a financial interest in ensuring that the regulatory schemes become no less complex over time because the value of their knowledge would be diminished.

Market Responses to Regulation. By definition, regulations are imposed on economic activity to induce behavior that would otherwise not take place or to

restrict behavior that otherwise would. In either case, regulation is designed to interfere with private profit maximization. Not surprisingly, therefore, market responses to regulation normally consist of finding least-cost means of compliance with, or of thwarting, the regulations. Sometimes, the market response can generate a result different from that intended or be considerably more costly than anticipated; in such cases, revision of the regulation is prompted by perception of its effects.[11]

Those deciding upon and administering the system often find some aspects of the market response unsatisfactory, if not even counterproductive to the initial intention. Additional regulations are often introduced in an effort on the part of supporters of regulation to thwart market responses. Often, if not inevitably, these additional measures increase the complexity of regulation.

In India, for example, once import licensing was established and differentiation among claimants had begun, the authorities attempted to facilitate the

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[11]It is reported that when auto emission standards were introduced in the U.S., new vehicles were improved (as the regulators intended) but their costs and therefore prices increased. In response, consumers postponed purchases of new cars, and the average age of cars on the road increased. Since old cars generate more pollutants into the air than new cars, the net effects of regulation may have been to increase pollution, even though the direct effect on new cars was to reduce it.

imports of capital goods and to restrict the imports of consumer goods. As the profitability of obtaining consumer goods imports increased, a number of enterprising businessmen included specifications for a variety of imported goods intended for resale in their applications for imports for building new factories. The response of the authorities was to require the submission of blueprints of factories prior to granting an import license. Additional engineers were hired by the government to inspect these blueprints, with considerable increases in required documentation in applications and in delays in processing license applications.

However, as scrutiny increased, so did the profitability of "burying" imports of items not legally importable within goods that could be imported. Requirements for technical specifications, proof that goods were not domestically available, and other submissions increased over time, largely in an effort to circumscribe the scope of legal evasion of the regime.

There are other sorts of market responses. If particular products are regulated, the market tends to find unregulated substitutes. The regulators respond by subjecting those substitutes to regulation as well, with an attendant increase in complexity. For example, it is well known that imports of fabrics of unregulated materials, such as ramie, increased greatly in the mid-1980s in response to restrictions

on imports of goods made of cotton, wool, and other regulated fibers under the Multifiber Arrangement. This increase, in turn, forced a new set of regulations covering textiles and apparel made of ramie.

Loopholes often give rise to (legal) market responses. A lower tariff on mens' vests than on mens' jackets prompted foreign exporters to ship "vests" to the U.S. market with pieces of cloth which were then sewn on in the U.S. as sleeves. Regulations were amended but, in the process, became increasingly complex. The emergence of smuggling networks and of other evasions of the regime also prods those deciding upon regulation to intensify enforcement and alter regulations in ways that make them more complex.

Interactions. Each of the three mechanisms identified here has been discussed in one context or another in the literature, although the dynamic aspects of this tendency have received little notice. Yet in fact, it is probably in the interaction of the three mechanisms that the tendency for complexity to increased over time is most pronounced.

Market reactions to regulation induce changes in regulation; they in turn prompt outcries from those who believe the changes are "unfair" to them and their pressure results in further amendments; the resulting increase in complexity increases the size of the bureaucratic corps administering regulations and also the equilibrium number of intermediaries. Their

greater number increases their influence in perpetuating complexity. Greater complexity increases the social cost of regulation and in addition provides greater opportunity for market reactions which reduce at least the private cost. But those market reactions induce further regulatory changes by the decision-makers and bureaucrats.

These sequences can best be seen by resort to concrete example. We now turn to the U.S. income tax code in the next section.

3. U.S. Income Tax Regulation.

No description can do justice to the complexity of the U.S. income tax laws. The U.S. Federal Income Tax Code must be one of the most complex regulatory structures ever devised, yet the income tax laws started out very simply. Here, we attempt to capture the growing complexity by use of a few quantitative indicators. These indicators are certainly inadequate; they focus only on the law itself and not on complications that have arisen with regard to interactions between income tax law and other U.S. laws and regulations.

The current income tax[12] was initially a straightforward and simple proportionate tax of one per cent on income with a surtax rate on higher incomes up to six per cent of both corporations and

[12] The following draws on material from Seidman (1938) and Paul (1947).

individual. Successive Acts built upon this simple structure to produce the income tax system that exists today. Graph 1 shows the number of pages of the major Revenue Acts (in later years given the title "Tax Reform Acts") from 1913 to 1986. These Acts repealed, altered or amended previous Acts, sometimes replacing a previous scheme and at other times merely revising the structure.

The number of pages of the individual Acts tends upwards over the period, so the size of the additions to the law were increasing over time. This trend to complexity continued on this path established in the early stages of the laws.

By today's standards, however, the income tax structure even as late as 1938 was quite simple. The total number of pages of laws passed between 1913 and 1938 is less than a single publication explaining the changes to the income tax laws effected by the Tax Reform Act of 1986 (1352 pages[13]) and far less than the number of pages of the two major income tax acts of the 1980s (1590 pages[14]).

The tax laws which had started out at a mere 36 pages had developed into something far larger. Indeed, by 1992, the booklet containing a single copy of each

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[13] See Staff for the Joint Committee on Taxation (1987).

[14] The Tax Reform Act of 1984 required 715 pages, and the Tax Reform Act of 1986 required 875 pages.

tax form had been transformed into a three volume set, comprising more than 800 pages!

Graph 2 provides a chart of the number of pages of the instructions accompanying the 1040 forms.[15] Initially, instructions consisted of a one-half page sheet. Currently, instructions cover 81 pages. The size of these instructions gives only a partial idea of the increasing amount of time and exercise of thought required to understand the income tax laws. The complexity of the instructions led the staff responsible for preparing the data for graph 2 to write: "it has been suggested that an individual must read at the level of a college graduate in order to cope, unassisted, with the instructions for the individual income tax forms for dividend and interest income and itemized deductions."[16] In 1977 the Internal Revenue Service Commissioner, Jerome Kurtz, reported that the IRS had received statistics from the Department of Health, Education, and Welfare that the "basic tax filing requirements have become so complex

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[15] These figures were taken from Staff for the Joint Committee on Taxation (1977) and the 1992 number from 1040 instructions 1992.

[16] Ibid, p. 10.

... that they are simply beyond the comprehension of a large portion of our adult population".[17]

It was stated in the previous section that three reasons for the growth of complexity in regulation were: (1) a concern for equity by the regulators; (2) self-interest of the administrators of the scheme; and (3) attempts to control market responses to the regulations. We shall primarily examine the first two of these reasons in the case of the US income tax laws, while in the following section concerning the US sugar imports controls, we shall concentrate on the third reason.

As an example of the first reason for the growth in complexity, Jerome Kurtz noted that "our income tax attempts to achieve a considerably more refined and equitable definition of the ability to pay [than the Social Security tax]. And each step towards this elusive goal adds complexity."[18] This desire for equity produces complexity as each attempt to allow for the special circumstances of a particular group of taxpayers adds exceptions to the general rules under the tax laws. With each such attempt, however, other equally compelling special circumstances present

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[17] This was taken from the Address of IRS Commissioner Jerome Kurtz to the Eleventh General Assembly of the Inter-American Center of Tax Administrators reprinted in the 123 Congressional Record 16123-16126: May 23, 1977.

[18] Ibid.

themselves. Kurtz illustrated this principle with the example of the ever-changing rules governing the employment-related moving expense deduction under the US tax laws and ended with the pessimistic statement: "Even now, only 6 months after the passage of the 1976 Tax Reform Act, we can look at the present moving expense provision and easily contemplate several additional refinements which might be made in the name of increased equity."[19] The history of the changes to the tax laws in part represents an attempt to reach a more equitable scheme, yet as was mentioned above, the regulators are not selfless creatures driven by altruism to find a fairer system. One aspect of the second reason for the growth of complexity is that a level of complexity greater than the social optimum will be in the interests of the regulators. In the case of the tax laws this problem is exacerbated by the fact that there are several bodies with differing interests with legislative-regulatory power: the US Congress, the US Treasury, and the IRS.

A model of the motives of these actors could include the US Congress acting to maximize political donations and support, the US Treasury acting to maximize tax base, and the IRS acting to minimize tax avoidance and lower the costs of tax collection. The

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[19] Ibid.

incompatibility of these motives would be seen to lead to increasing complexity.

In addition to the motives of the various branches of government, the incentives of individual agents of the government would not lead to reducing complexity. A few years in the IRS has always been regarded as a good stepping-stone to a profitable career in the private sector due to the valuable human capital gained during the time of government service. Even as far back as 1919, the IRS was finding it difficult to retain its employees given the higher wages available outside the government for individuals trained in the intricacies of the tax laws. In 1947 Randolph Paul would write concerning the situation in 1919-20, "[t]hen, as now, a steady stream of employees with valuable training and experience flowed out to more lucrative jobs in private businesses."[20] A substantive reduction in the complexity of tax regulation would reduce the value of the human capital accumulated not only by the tax intermediaries outside of government,[21] but also those members of the public

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[20] Paul (1947), p.30.

[21] There is no doubt that tax intermediaries are well aware of the possible loss they may suffer under a simplified tax scheme. In hearings before the Subcommittee on Oversight, see USHR (1978), fully one-sixth of the witnesses before the hearing were representatives of legal associations or other third parties.

service who may envisage a future in the private sector.

This coincidence of incentives, or even of personnel, of bureaucrats and intermediaries as was noted in the second section of this paper would cast doubt on any stated purpose of reform for the simplification of regulation. In 1989 Chairman Pickle of the Subcommittee on Oversight, could state: "[t]he big winners in tax reform may have been return preparers who, as taxpayers cried out for help, have filled out forms in unprecedented numbers."[22] Graph 3 shows the increase in the percentage of 1040 form returns filed by third parties over the period 1954-1974, before Chairman Pickle's "record numbers." Undoubtably much of this increase is due to the tax deductibility of tax preparer fees, but far more would have to be due to the enormous difficulty that the average taxpayer faces in attempting to fill out his or her own taxes, as was related above, due to the complexity of the tax laws.

This increase in complexity appears to be very hard to reverse in the case of US income tax laws. Despite two recent drives for a simplification of the income tax laws, one in 1976-77 and one in 1985-86, the US Tax Code has grown even more complex over that time. There had been 368 different IRS forms in 1977, while in 1989 this number had increased to 392, 88 of

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[22] USHR (1989), p. 5.

which were newly created due to the Tax Reform Act of 1986. In the words of Chairman Pickle: "So much for simplification."[23]

4. U.S. Sugar Imports Controls in the 1980s.[24]

Whereas considerations of equity, administrative issues, and the growth of intermediaries played large roles in increasing complexity of the U.S. income tax, market responses have played an important part in increasing complexity of sugar policy, although administrative issues and intermediaries have also contributed.

The U.S. sugar program started in the 1800s when the U.S. Department of Agriculture was attempting to introduce sugar beet production into parts of the United States. At that time, a fairly high tariff and "bounty" were set to encourage production. While there were complications,[25] the program remained relatively straightforward in its international aspects until the 1930s, when import quotas and production controls were imposed, largely intended to "help Cuba." Production

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[23]USHR (1989), p. 1.

[24]This paper draws heavily on Krueger (1990).

[25]The history of Hawaii's annexation and eventual status as the 50th state is intricately bound up with the story of sugar and represents one of the ways in which complexity emerged. The U.S. relationship with the Philippines is also closely tied to sugar policy.

controls and import quotas were abandoned during the Second World War, but import quotas were reinstated afterwards, with Cuba receiving more than 90 percent of all quota entitlements. These quota rights were valuable to Cuba because they permitted Cuban exporters to receive the U.S. domestic price of sugar, which was generally higher than the international price.

Despite the initial motivation, country-specific quotas on sugar imports were not abandoned when Fidel Castro came to power; rather, quotas were redistributed to other countries. In 1974, import quotas were abandoned, as the world price rose to U.S. levels.

In 1981, however, the world price of sugar was very low relative to the U.S. support price. Sugar price supports had been established under agricultural legislation, and a proviso had been inserted that the sugar program should not cost the U.S. government money. A first attempt to conform with this proviso was to raise the tariff on sugar. However, imports continued and the only way to insure that result was to reimpose quotas, which were, once again and inexplicably, country-specific (and did not include Cuba).[26]

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[26]There was a widespread belief that sugar importers had purposely started importing and selling sugar in large quantities in order to force reimposition of the quota - another market response to

The ratio of the domestic to the Caribbean price for sugar rose to 2.36 in 1982, to 4.19 in 1984 and reached as high as 5.02 in 1985. The domestic price was received by foreign producers insofar as they held quotas. For the rest of their production, they received the much lower world price.

Consequently, market responses in the early 1980's were overwhelming. The price hike angered the US food exporters who complained that they were being rendered internationally uncompetitive by the high price of sugar. In answer to pressure from food exporters a presidential decree of November 30, 1982, exempted food exporters from paying duty on imported sugar. Sugar imports took place early in the quota period so that quotas had to be made quarterly rather than yearly.[27]

One loophole that was quickly exploited was that "sugar" had been defined as any product with more than 94 percent cane or beet sugar content. Canadian exporters seized on this wording and exported a commodity containing 7 percent high fructose corn

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price supports.

[27]Imported sugar at that time had to be refined in domestic refineries; since sugar needs to be refined fairly quickly, refineries could not cope with the uneven deliveries. Even this complication was complicated because the U.S. customs service was initially unable to track sugar imports sufficiently quickly to enforce quotas when sugar reached U.S. ports.

syrup (which was not "sugar") and 93 percent sugar. When that was banned, imports of "cake mix" and other items containing disproportionately large amounts of sugar mushroomed.

The next Presidential decrees permitted the Secretary of Agriculture to adjust the sugar tariff quarterly and placed relatively stringent import quotas on all imported syrup products. The response was a huge increase in dry product imports such as cocoa mix; finally, in 1985, a Presidential decree set strict quotas on imports of many food products. By early 1985, that decree resulted in a total prohibition of imports of such items as imported Korean noodles, and a number of kosher food. The import categories limited under this decree were obviously far too general. In response to this situation, on May 17, 1985, a decree raised the quota limits under the decree of March 5 and exempted products of less than 10 per cent sugar.

There were other ways in which the program became increasingly complicated. American sugar refiners objected that the high price of raw sugar prevented them from being internationally competitive. A special program was therefore undertaken permitting refiners to import sugar at world prices for reexport.

Meanwhile, there were also complications on the international side. In part, these originated from GATT obligations, and the necessity to impose quotas in a nondiscriminatory way. Even more important,

however, was the fact that high sugar prices had led to the increasing adoption of high fructose corn syrup as a substitute in many liquid uses.[28] By 1985, more than 90 percent of all non-diet soft drinks in the U.S.were produced with HFCS, thus reducing total U.S. sugar consumption despite rising total consumption of calorie sweeteners.

In consequence, the permitted level of imports into the U.S. fell sharply. From imports of 5 million tons in 1979 and 1981, imports fell to a low of 1.3 million tons in 1988.[29] The 41 individual countries with import quotas thus became worse off as a consequence of the program: the amount they could sell under quota had greatly decreased and thus the world price - at which the remainder of their exports were sold - was depressed. In some instances, this result conflicted directly with other legislation, as with the Caribbean Basin Initiative (CBI) countries. For many of them, the decline in the value of import

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[28]High fructose corn syrup (HFCS) is estimated to become an economically viable substitute for liquid sugar uses when its price is no more than twice that of sugar. The U.S. price was set at 20 cents per pound and it is estimated that a price of 16 cents would have sharply deterred the development of HFCS. The world price did not reach a level above ten cents per pound during the 1980s.

[29]Data from U.S. Department of Agriculture, ERS, Sugar and Sweetener Situation and Outlook Yearbook, June 1991, p. 65.

quotas into the American market exceeded the value of U.S. aid under the CBI.

The regulatory structure has now reached such a complex state that when the legislation governing sugar was introduced into the House of Representatives, the then-chairman of the House Agriculture Committee presented it with the statement that Congressmen should "take it on faith", explaining that it was too complicated to be understood!

The experience with sugar illustrates a number of aspects of complexity. The sugar program itself is quintessentially complicated; it is certainly in the interests of those who have worked on the program to keep it that way.[30] Complexity has increased both because of market responses which have needed to be controlled and because the budgetary costs of achieving the same ends through direct payment are regarded as being "too high."[31] In addition, the obscurity of the program may be desirable to guard it

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[30]Almost all heads of the Sugar and Sweetener Section of USDA later become lobbyists. The "sugar lobby" has been recognized for years as one of the most potent in Washington. See Krueger (1990) for details.

[31]It is interesting that U.S. sugar interests opposed direct production support payments (deficiency payments) until HFCS was developed. Thereafter, politicians from states producing corn (maize) opposed deficiency payments because they argued it would be unfair to corn! In fact, only about 5 percent of corn production is used in HFCS production.

against public scrutiny. There are only 12,600 "sugar farms" in the United States, and total employment is estimated at about 36,000 - far less than the number of persons arguably having lost employment because of costs associated with the program.[32] It is doubtful that a public and visible costly program of this size benefitting so few would withstand political scrutiny: obscurity, for which complexity may be an essential part, may be a prerequisite for its continuation.

5. Conclusions.

The implications of increasing complexity of regulation over time are many and cannot be fully explored here. Nonetheless, the phenomenon appears to be sufficiently pervasive to warrant closer attention than it has been given in the past. Economists' tendencies to model policies inherently remove much of the complexity from the issues under study. As such, they may obscure an important component of the policy process.

If complexity is, as we suspect, both pervasive and costly, a number of questions for further research

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[32] See U.S. Department of Commerce, International Trade Administration, United States Sugar Policy: An Analysis, April 1988, p. 20. To make the matter still more incomprehensible, the 36,000 employed on sugar "farms" are often persons who are permitted to immigrate to the U.S. for the express purpose of enabling sugar farmers to hire enough labor to grow sugar.

arise. One question relates simply to the ways in which complexity might be systematically characterized so that the descriptive evidence provided here might be supplemented with broader tests of the hypothesis.

A second and very important question would then relate to the determinants of societal decisions to simplify regulations. Certainly, the 1980s witnessed "deregulation" efforts throughout the world. These may result in a once-and-for-all reduction in complexity only to be followed by a reversion to the tendency for its increase over time, or they may be followed by a new, permanently lower, equilibrium level of complexity. Understanding which of these possibilities will eventuate will certainly be important for policy analysis. In addition, research on the reasons why the deregulation wave occurred in the 1980s, and other reform efforts have been undertaken with respect to particular policies, could shed a good deal of light on appropriate policy formulation and implementation. That question awaits further research.

If, despite reform efforts, complexity and the social costs associated with it increase indefinitely over time, there are some obvious implications. One concerns Wagner's Law, which states that government expenditures increase more rapidly than income. This law has always been interpreted to mean that people have an income elasticity of demand for governmentally-provided goods and services greater than one. An alternative interpretation would be that

the cost of regulation rises more rapidly than income because of increasing complexity of regulation as the structure of production differentiates increasingly with economic growth. If growing complexity increases government costs, it may be that part or all of the increased government share reflects a supply and not a demand phenomenon.

A second concerns Mancur Olson's (1982) hypothesis that vested interests increasingly encumber economies during periods of stability, and therefore result in a deceleration of economic growth. Increasingly complexity is a hypothesis, or phenomenon, consistent with Olson's hypothesis. Neither, however, needs imply the other. One could have vested interests increasingly strangling economic efficiency for reasons entirely unrelated to complexity of regulation, and one could have increasing complexity of regulation, offset by endogenous growth phenomena in such a way that growth is, in fact, accelerated despite it.

Yet a third implication pertains to the international trade economist's notion of "transparency." It has long been held that such restrictions as there are on international trade should be as "transparent" as possible, meaning that tariffs are preferable to quotas, and that hidden protection such as entailed in American sugar is greatly to be deplored. It has therefore been something of a puzzle that protection has tended to be

opaque, with the chosen protective instruments normally being as hidden as possible from public scrutiny. Considerations regarding complexity explain this absence of transparency: the interests of intermediary groups and of bureaucrats clearly work in the opposite direction. That is, if there were a uniform tariff, or if the income tax schedule was simple, there would be little reason for either a large number of bureaucrats or for professional intermediaries to prepare income taxes.

In conclusion, while it is certainly the case that a minimum level of complexity in any regulatory structure is desirable, as, for example, most people would regard a lump-sum head tax as inequitable, the marginal costs of increasing complexity will at some level be greater than the marginal benefits of such complexity. The pressures towards increasing complexity detailed in this paper suggest that regulatory structures will generally be in the level of complexity in which marginal costs exceed marginal benefits and that this will tend to become more pronounced with time. The role of the economist in such situations is to lobby for reform and simplification, reminding the decision-makers and the public of the costs of complexity, and keeping in mind the fact that once the pressure for reform is off, "business as usual" will proceed.

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