Market Failure and Government Failure

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Abstract

We distinguish two settings for market processes: The first is the "invisible hand" world of private goods, decreasing returns, and full information where general equilibrium and the fundamental theorems of welfare economics are well defined. The second is the "pin factory" world of increasing returns and creative destruction arising from innovation, technological change, and entrepreneurship. Then we note the differences in the application of "market failure" in these two settings. Building on the well-known "anatomy" of market failure in welfare economics, we develop an anatomy of government failure, confronting government with the more realistic and dynamic world of pin-factory type market processes. This anatomy distinguishes passive and active government failure, and it links market and government failure with the core functions of aggregation, incentives, and information, and with problems of agency, rent-seeking and time consistency.

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For some, market failures serve as a rationale for public intervention. However, the fact that self-interested market behavior does not always produce felicitous social consequences is not sufficient reason to draw this conclusion. It is necessary to assess public performance under comparable conditions, and hence to analyze self-interested political behavior in the institutional structures of the public sector. Our approach emphasizes this institutional structure--warts and all--and thereby provides specific cautionary warnings about optimistic reliance on political institutions to improve upon market performance.

We may tell the society to jump out of the market frying pan, but we have no basis for predicting whether it will land in the fire or a luxurious bed. (George Stigler, 1975, p. 103)

Market failure is the standard justification for government action in neoclassical welfare economics. The simple version of the theory has two parts. The first is the presumption that market processes are the default for allocating scarce resources. This amounts to an assumption of perfect competition, where price information will direct self-interested market participants to correct "mistakes," or Pareto-dominated allocations, in resource use.

The second part of the theory asserts that when competition is imperfect, the consequent "market failures" can and should be corrected by government. This second claim amounts to an assumption that political actors have both appropriate incentives and accurate information, so that Pareto optimal allocations of resources can be achieved.

The difficulty with this simplified approach is that there are two contradictory assumptions about human motivation and capacity. Consumers are assumed to lack relevant information, but when those same citizens enter the voting booth they are fully informed. Economic elites, such as corporate CEOs, are assumed to be selfish utility maximizers, but political elites are assumed to be altruistic servants of the public trust.

Public choice and modern political economy have corrected a number of these inconsistencies in treatment of the level and quality of information, and about actors' motivations, but the corrections have taken place in piecemeal fashion. The result has been a growing recognition of the possibility that government failure at least mitigates, and might completely thwart, the achievement of Pareto optimal outcomes in the face of violations of the assumptions of perfect market competition. The problem is that our theories of government failure are pale shadows of the venerable and analytically precise theory of market failure. This paper is addresses that problem in two steps. First, we elaborate a generalized anatomy of organizational failure. Second, we fit both market failure and government failure into this

framework, on the same footing and judged by the same criteria. This allows us also to evaluate articulated or mixed market-state mechanisms. Thus, while we are in some ways crediting the question posed by Shepsle and Weingast (1984), our answer is a bit different. Shepsle and Weingast proposed that it is possible to judge political solutions and market problems on the same metrics. We will argue that some market problems, such as housing shortages due to rent control, are really just mistaken political actions. But market solutions such as enormous disparities in income and influence create significant political problems, particularly in a society with private campaign finance. Neither markets nor government can be analyzed in isolation.

Our conclusion, illustrated by two examples, is that failures that are likely to occur in real political economies cannot be neatly classified as either market or government failures. Instead, it is more appropriate to consider such problems to be system or mechanism failures, where the particular set of property rights, aggregation mechanisms, and incentives to use information fail to capture the available gains from cooperation and exchange.

I. The classical theory of market failure

Archimedes claimed that, given an immovably fixed point of reference and a lever, he could move the world. Ever since, an "Archimedean point" has meant a god-like perspective, an objective benchmark from which all other points can be evaluated. Market failure has been defined with respect to a very particular Archimedean Point: the equilibrium that would exist if somehow the assumptions of perfect competition were met. For convenience, we will refer to this as the "Competitive Equilibrium Theory" (CET). CET concludes that if certain assumptions (including at a minimum pure private goods, no externalities, every agent a price taker, full information, diminishing returns in both production and consumption) are satisfied, then the outcomes of market processes are Pareto Optimal.

The importance of the "CET implies Pareto Optimality" as a benchmark becomes obvious when one considers the implications of the violation of the each of the core assumptions of CET. Specifically, if we relax the assumptions one by one we get the classic "market failures."[1] These market failures are precisely the failure to achieve Pareto Optimality, and these failures to achieve Pareto Optimality follow directly and logically from the violation of the assumptions of the CET. Government cannot correct the violations of the assumptions, but it is

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[1] For a variety of treatments, see Bator, 1958; Ledyard, 2008; or Besley, 2006.

assumed to be able to improve the allocation of resources. Such improvement must be possible in principle because the violation of the assumptions of the CET establishes that actual market allocations must be inefficient, falling short of the level of utility possible in the benchmark equilibrium under perfect competition.

This is Adam Smith's world of the invisible hand and constant or decreasing returns. It is intellectually satisfying, and has been used for generations as the basis for scholarly and even practical understanding of market processes and competition. Models of public goods, Pigouvian taxes and subsidies, antitrust policy, and regulation of information provision are all based on this core model of the economy.

This world of the invisible hand is also the world of brutally impersonal market efficiency and discipline. Profits are dissipated in competition, and firms that produce negative returns simply do not survive. This means that if firms are caught in a Prisoner's Dilemma--such as a production process that produces pollution—they have no means of acting unilaterally to internalize the externalities even if they wanted to. If only one polluting firm uses scrubbers on its smokestacks, while all other firms continue to pollute, the public-spirited firm will suffer a cost disadvantage that will soon put it out of business. Thus the reason that greed is assumed in such a system is that individual public-spirited action is inconsistent with firm survival, and is selected out by a process very similar to biological evolution.

The problem is that, by explicit assumptions, the CET is static, and allows for no growth, profits, or innovation. The CET allows no role for entrepreneurship or human agency, because all profits are fully dissipated by competition. But the larger problem is that very few (if any) real world markets resemble the predictions of CET, because there are profits, there is research, and production is commonly characterized by both externalities and increasing returns. A more verisimilous model of markets will make life more difficult for economic theorists, but we argue in the remainder of this paper that there are important compensating advantages to a more general approach in the real world of policy and production.

II. The possibility of government failure: From Pigou to Public Choice

Regardless of its empirical shortcomings, Competitive Equilibrium Theory does provide an Archimedean point for analysis of market perfection and market failures. But there is no analogous fixed "god's eye" basis of comparison for government actions to correct market

failures. Following Weimer and Vining (2005, 206) we might distinguish "passive government failure," where government *inaction* results in Pareto inferior outcomes, from "active government failure," where government *action* results in outcomes worse than if government had done nothing.

> [T]he presence of market failure is evidence that there must also be government failure: the failure to correct market failure. The failure of government to intervene is best described as *passive government failure*. It can include outcomes that are attributable to the government not diagnosing market failures correctly as well as situations in which the lack of intervention derives from more concrete causes, such as the active influence of organized interest groups that successfully block efforts to correct market failure. (P. 206, emphasis in original).

But in neither case is there a barometer for measuring success and failure. Passive government failure *seems* straightforward: it is the failure of government to respond by correcting market failure when a feasible correction can be shown to exist.[2] For example, as Pigou (1920; 1932) argued, the correction for an externality is a tax or subsidy that internalizes the externality by adjusting price so that social costs and private costs coincide for all actors. If one has read nothing but later critics one might think that Pigou was unaware of the problem of government failure.

R.H. Coase, perhaps Pigou's chief critic (Coase, 1988), offers an especially simplistic caricature. Coase's assessment of Pigou's contribution is as nothing more than a distraction, a result of confusion about the real problem. As he puts it in one paper (Coase, 1988, p. 179; emphasis added):

> Economists, following Pigou, spoke of uncompensated disservices and implied those responsible for those harmful effects ought to be liable to compensate those they harmed…Most economists have thought that the problems arising from the producers' actions which had harmful effects on others were best handled by instituting an appropriate system of taxes and subsidies, with emphasis being placed on the use of taxes…*Whatever its merits as a means of regulating the generation of harmful effects, the use of taxes had the added attraction that it could be analyzed by existing price theory,*

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[2] Examples may be controversial, but it is safe to say that many economists who have studied the problem of pollution and global warming have concluded that a comprehensive carbon tax is the "cleanest" and most logical solution. Failing that, a substantial tax on gasoline, bringing into line the effects of driving and more fuel with the costs of using that fuels, would still be an improvement over the current practice. However, in spite of a near consensus among experts, democratic governments have failed to implement either policy because of voter and interest group opposition.

that the schemes devised looked impressive on a blackboard or in articles, and that it required no knowledge of the subject.

Of course, Coase may have been picking a quarrel with Pigouvians, rather than Pigou himself. Coase notes the summary of Pigouvian policy offered by Sandmo (1980, p. 799; emphasis added):

> It is an established result of economic theory that the achievement of efficiency in a competitive economy *requires* taxes (subsidies) on commodities generating negative (positive) economic effects.

That is, the imposition of a tax and subsidy scheme is not only sufficient to achieve Pareto optimality, but is also strictly necessary, under the Pigouvian program. Later authors (e.g., Simpson 1996) have questioned whether it is fair to blame Pigou the original scholar for the subsequent sins of the Pigouvians. Pigou himself seems to have had a far more nuanced and realistic conception of the possibilities for state action. It is true enough that Pigou's position can be caricatured this way, but a careful reading of Pigou himself shows that this is not so. In the most important passage for our purposes, Pigou (1920, p. 296) said:

> It is not sufficient to contrast the imperfect adjustments of unfettered enterprise with the best adjustment that economists in their studies can imagine. For we cannot expect that any State authority will attain, or even wholeheartedly seek, that ideal. Such authorities are liable alike to ignorance, to sectional pressure, and to personal corruption by private interest. A loud-voiced part of their constituents, if organized for votes, may easily outweigh the whole.

It is interesting that Pigou was careful to distinguish so clearly two of the core problems any organization, market or government, must face: incentives and information. In fairness to Pigou's quite sensible and foresighted modesty, in what follows we will hew closer to Pigou himself rather than to the caricature of Pigouvian policy.

III. The Core Problems: Incentives, Information, and Incoherence

As Pigou recognized, it is oddly idealistic simply to expect that government actions will be obvious improvements on market failures. In fact, such idealism is every bit as naive as the "free market fundamentalism" that simply assumes markets will somehow perform optimally

with *zero* government intervention. It is more accurate to say that few processes, market or political, turn out the way we expected or desired.

Our goal in this paper is to propose a balanced, and empirically informed, pessimism about both market failure and government failure. Using realistic empirical performance as the criterion for judging the appropriate mix between market and government organization, on a case-by-case basis, will place market failures and government failures on an equal footing. Markets left to play out their logic of action and distribution will exhibit deep and pervasive failures. But, as Pigou said, "it is not *sufficient*" to identify market failures, and assume that government will correct them. There are problems that span all varieties of attempts to organize a society to capture the gains from exchange and cooperation. We have identified three core problems that prevent Pareto optimal results in all organizations or social mechanisms, and we'll discuss each of them briefly. These together constitute our "anatomy of organizational failure," and we will use them in the following sections to illuminate some fundamental problems that admit of no solution so obvious as "more markets" or "more government." The three fundamental problems are incentives, information, and incoherence.

Incentives—When we say "government" we generally are referring to the combined activities of a disparate and not always unified collection of individuals who face political incentives and have political goals. Some of these individuals are elected, and choose their actions to increase their chances of reelection, or increase their power, or to enact what they perceive as good public policy. Some are appointed, and respond to the particular principal/agent context in which they find themselves. Bureaucracies may create incentives that select for employees who prefer calm and safety over risk and innovation. On the other hand, government agencies may also attract activists who share a desire to expand the size and scope of their agency's activities. This desire could well arise from a deep and genuine belief that their work is important to the public welfare, but this view may not coincide with the goals of the public at large. The problem with this complex system of goals and motivations is that there are generally no units to measure output, the cost incentives for productive efficiency nearly nonexistent, and there is no feedback mechanism akin to the profit motive, where economic firms must capture a value greater than or equal to their costs.

Of course, nearly all of these problems apply also to large corporations, with the separation of ownership of control, incentive problems in giving agents reasons to act on the

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goals of principals, and information impactedness in agencies (accounting department, marketing department) that face no direct feedback test such as profits. Production decisions, monitoring and enforcement, and direction of employees all create severe (though different) incentive problems for large organizations, be those organizations market-based or government-created.

Information—The problem of externalities is partly a problem of information. Prices do not reflect the full opportunity cost of the resources being used in the activity where the externality is produced. Consequently, "too much" of the activity is undertaken in a private, unfettered market setting. Once the state acts to correct the incorrect price, all will be well, one hopes. But the very lack of information that made private action inefficient will dog state attempts at correction. How much damage is being done, and what is the cost of that damage? Without market data on how to value the damage, the state lacks accurate information.[3]

Aggregation Incoherence and Arbitrariness—The welfare theorems of general equilibrium theory rest on a series of claims. First, equilibrium must exist, in the sense that price vectors adjust in ways that damp down, rather than explode, changes in other economic factors such as incomes, tastes, technologies, and the prices of substitutes and complements. It all has to "add up," in the sense that there exists a vector of prices that solves the system of n equations in n unknowns that Walras used to characterize the problem of general equilibrium. In equilibrium, then, we can evaluate whether the result of market processes reaches, or falls short of, Pareto Optimality. If no equilibrium exists, the problem is much more complex, and the welfare theorems of CET may not apply.[4]

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[3] See, for example, Pasour (1996). The problem of "neighborhood effects" for noise or other nuisances rests partly on the difficulty of measuring the costs imposed on property owners in the area. The damages are unpriced, because the externality is not internalized without clear property rights. However, the state faces exactly the same problems in measuring costs, and faces pervasive political problems in arriving at an accurate measure using administrative procedures or political voting processes. The "calculation problem" cuts across both market externalities and government estimates, so that each is likely to arrive at biased estimates.
[4] One might reply that one or more equilibria generally *do* exist, unless increasing returns are pervasive. However, as Saari and Simon (1978) showed, the information conditions for market clearing price dynamics may prevent the equilibrium from being reached on any practically useful time scale.

But government action likewise faces the problem of aggregation incoherence, though for different reasons. Lindahl (1919) came up with a decentralized solution for a single public good, based on some very optimistic assumptions about the honesty of preference revelation on valuing public goods. If multiple public goods are at stake, there is no general solution (Slutsky, 1977; Denzau and Parks, 1979), especially if (as seems likely) preferences are non-separable.

Worse, the results of Condorcet (1785, 1788), Arrow (1951/ 1963), Black (1958), Plott (1967) and others demonstrate that the conditions under which we can expect a government-induced equilibrium are, if anything, even more restrictive than those required to assure equilibrium in market processes. The set of preference configurations that generate equilibria are a set of measure zero in the set of all possible preference configurations. (McKelvey and Schofield, 1986). And preferences over public goods would have to be additively separable with respect to preferences over private goods (Coughlin and Hinich, 1984).

IV. Classic market failures in the world of increasing returns

The assumptions required to generate equilibria in CET are unrealistic, bordering in fact on outlandish. The notion that all production processes are subject to diminishing returns seems unlikely. Partly for this reason, but also because of attempts at price-fixing contracts by firms supposed to be competing, we would expect that at least some firms face downward-sloping demand curves. Both production and consumption decisions have external effects. A wide variety of the commodities and services desired by consumers have the features of Samuelsonian public goods (Samuelson, 1954). Many complex or durable commodities exhibit stark asymmetries of information, in some cases life and death differences between what is desired by consumers and what is produced by firms.

The theory of market failure theory begins with the assumptions of the CET, and then uses those assumptions to establish a benchmark for performance. If actual market performance is different from this benchmark, then government policies are to be implemented, focusing on reducing the difference between the idealized Archimedean point of CET and the world of realized outcomes in imperfect markets.

But it is unrealistic to compare actual market performance with the idealized predictions of CET. And it is dangerously naive to expect that an actual government, under realistic

assumptions of government failure, can close the gap. In brief, it seems odd that unrealistically perfect government action is proposed to solve problems of realistically imperfect markets. Is it possible to begin with a more realistic picture of market processes than the idealized "invisible hand" world of Adam Smith?

The answer is yes. Interestingly, Adam Smith himself also proposed this more realistic and descriptive alternative description of actual markets, in the same *Wealth of Nations* that gave us the "Invisible Hand."[5] Smith's central thesis, and in fact the title of the book itself, *An Inquiry Into the Nature and Causes of the Wealth of Nations*, focuses on increasing returns in production! The entire attribution of the "invisible hand" results to Smith are misunderstanding of Smith's object and method. Smith begins the book as follows:

> The greatest improvement in the productive powers of labour, and the greater part of the skill, dexterity, and judgment with which it is anywhere directed, or applied, seem to have been the effects of the division of labour.

In other words, increases in productivity, and the consequent causes of growth, lower output prices and higher wages for labor, originate in specialization and economies of scale. More bluntly, the fundamental cause of "opulence," or increases in prosperity, is increasing returns. In the "pin factory" example, Smith argues that the wealth of nations arises from the increasing returns to scale that occur because of division of labor. These increasing returns might be due to combination of improved dexterity, tool design and use, or increased mechanization of stages of the production process.

The important thing, as Smith pointed out, is that "The division of labor is limited [only] by the extent of the market." Thus, division of labor is a motor of the dynamic expansion of markets. Later scholars, most notably Joseph Schumpeter, pointed out the equally important role of the entrepreneur, the vigilant and constantly aware trader and producer constantly looking for new profit opportunities (what Schumpeter called "new combinations") to exploit with the division of labor. And Schumpeter recognized that the consequence of the uncertainty and economies of scale resulting from entrepreneurial activity made the notion of neo-classical equilibrium nearly irrelevant to real world of markets.

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[5] This point is made in detail by Warsh (2006, chapter 4).

There is no such thing as a dynamic equilibrium. Development, in its deepest character, constitutes a disturbance of the existing static equilibrium and shows no tendency at all to strive again for that or any other form of equilibrium…If the economy does reach a new state of equilibrium then this is achieved not by the motive forces of development, but rather by a reaction against it. Other forces bring development to an end, and by so doing create the first precondition regaining a new equilibrium. (Schumpeter [1911] 2003:76

This is an important insight: not only is the neoclassical conception of decreasing returns unrealistic--*it's actually normatively bad, in terms of growth and prosperity*. Policy attempts to approximate the "idealized" world of price takers and diminishing returns would be catastrophic.

The dynamic world of innovation implies constant, unpredictable change, with profits sometimes used to create new investments and new products. This world, with winners who may not deserve their gains, and losers who do not deserve their losses, is the world of modern capitalism, a world with increases in productivity, rising overall national incomes and in some cases highly concentrated wealth.

Schumpeter actually called this process "creative destruction," with entrepreneurial activities constantly creating and destroying existing relations of production and exchange. Interestingly, though he appreciated the productive and growth implications of such a system, he predicted that capitalism would eventually be replaced by a form of socialism, because he thought that people were unwilling to accept the unpredictability and morally arbitrary income distributions in which a capitalist system results.

The problem we face in this far more realistic and productive model of capitalism is to attempt to characterize "market failures," in the absence of the fixed normative benchmark afforded by CET. Without an idealized equilibrium for comparison, what basis is there for saying that markets fail, or for that matter that markets succeed? When would government action be beneficial, or necessary, and when instead would markets left to their own destructive and creative devices better serve society?   What do market failure and government failure look like in this more realistic world?

It is easy to see that using the wrong benchmark for comparison could result in catastrophic failures in policy. Suppose, for the sake of argument, that entrepreneurship and innovation result in a new production process characterized by significant economies of scale and network economies in user convenience. The company that created this new product (call it

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GoogleSoft) would dominate the market, and would have enormous profits that could be used to invest in research and development of new software and other products.

A government policy based on the presumption that the ideal market structure is many small firms would break up GoogleSoft into a number of separate competitors. If successful, this policy would result in dozens of small firms selling identical products, earning zero profits, and with negligible research and development budgets.

Alternatively, government policy might take the form of establishing GoogleSoft as a regulated monopoly, effectively foreclosing all possible competition and ensuring that GoogleSoft need not invest any of its budget in research or development, enabling it to pay out all of its profits in dividends, or extra private jet flights for its executives, who would arrange to meet with regulators in posh resorts like Aruba or Ann Arbor, Michigan.

The point is that the cause of growth and prosperity in the realistic world of increasing returns would be treated as a pathology, a market failure requiring government action, if the frame of reference is the static CET. On the other hand, genuine market failures surely exist also in the more complex world of increasing returns. If anything, the opportunities to exploit information asymmetries, to engage in price-fixing, or to impose catastrophic externalities on the broader environment are even more prevalent in a world with increasing returns.

Fortunately, a theory of market failure does not need competitive equilibrium theory to be valid. Public goods are still undersupplied by unregulated markets, but now the undersupply is by comparison is to the Pareto optimal result implied by a Lindahl-style preference revelation mechanism. Some kind of "voluntary coercion," where citizens agree to be punished if they fail to make tax payments to fund public goods, are still implied by the Lindahl logic, and Pareto improvements can be captured by government action. Negative externalities such as pollution still exist in a world of increasing returns, but instead of comparing the result to the CET benchmark we can use property rights and consent, adjudicated by the courts for small numbers of citizens, and regulated by government agencies in settings where transactions costs and collective action make private solutions impossible. Information asymmetries still need to be accounted for, and fraudulent transactions punished.

The only classical market failure that cannot pass through into the world of increasing returns unscathed is the presumed desirability of a market structure where all economic agents are price-takers. Price-fixing agreements and attempts to monopolize would still be illegal, but

successful capturing of network economies have such enormous implications for lower cost and higher output that the ideal of competitive market structure, with no profits and no research or innovation, must be laid aside.

Competition is desirable, and government policy should be examined to ensure that it does not restrict competition through artificial entry barriers. But there may be compensating benefits to large firms that can choose their prices. One is product differentiation. Another is research and development, which leads to more innovation.

To summarize: market failures can still be defined in the world of increasing returns. But the problem of addressing market failure is more empirical than theoretical. Given the actual incentives that face political actors, and the actual level of information and expertise that can be achieved in regulatory agencies, is government action likely to result in a net improvement in performance? If markets fail, government action can only be justified by realistic empirical claims that such action will make things better, both in the short term and in terms of allowing innovation and destruction of inefficient forms of production. We must be careful to avoid the mistake of awarding the prize in a singing contest to the remaining singer after hearing only the first.

V. Firms and governments are subject to the same problems: Government has incentive and information problems that are not disciplined as in CET. So do large firms.

Competitive markets that fulfill the assumptions of CET automatically discipline selfish behavior, rendering profit maximization by firms consistent with maximal welfare for consumers. But this legerdemain is accomplished by assuming away all the potential problems (externalities, public goods, incompletely specified property rights, high transactions costs, and market power on the part of producers) that might make individual incentives and public goals conflict. Still, in principle at least, it is possible to specify conditions under which private actors, guided by an invisible hand, act to increase the public welfare. (Smith, 1776, Book IV, Chapter 2, p. 485).

Is there any analogous set of circumstances, no matter how idealized, under which we can expect elected officials to act together to maximize the public welfare? The survival mechanism in politics is the reelection test. Representatives who are reelected, survive. Entry into political campaigns is sharply restricted by barriers to entry in organization particularly political parties,

which exhibit enormous economies of scale. The services provided by government are never subjected to any kind of efficiency or "profit" test, because governments specialize in the production of those goods and services that by definition are prohibitively expensive to produce under any kind of pay-for-consumption arrangement.[6] Further, bureaucratic agencies possess profound, perhaps insurmountable, advantages in terms of information asymmetries about the cost of the agencies activities and services. It is difficult to think of any corporations that survive more than 50 years, because it is difficult to pass the profit test continuously over such a long period. But bureaucratic agencies need never pass any kind of test, or be exposed to any feedback mechanism that could result in their disappearance. To the contrary, an entrenched and "successful" agency measures its success by the amount of money that it is able to give away.

Far from being "costs," these transfers create incentives for the organization of powerful lobbying organizations will defend the agency against any attempt to eliminate it or even cut its budget.   The survival of clearly wasteful programs, ranging from tobacco price supports to sugar subsidies and the geographic dispersion of contracts for defense projects, suggest that there is a clear "government failure," in the sense that it would be much cheaper to pay off the recipients of these transfers rather than continue the program. But of the programs mentioned, to date only the tobacco quota program has been ended by a buy-out.

The point is that there is no theory of government, not even one with assumptions as fanciful as the assumptions that CET posits for idealized markets, that is able to describe an incentive compatible mechanism for government action that yields Pareto optimality in equilibrium. Officials, whether elected or appointed, are not led by some organizational "invisible hand" to serve the public interest rather than reelection incentives and organized private interests.

It is important to note that this conclusion does not depend on any assumption that government officials are lazy or greedy. Officials *might* be lazy or greedy, of course, because

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6   In <u>Bureaucracy</u> (1944), von Mises notes: "Bureaus specialize in the supply of those services the value of which cannot be exchanged for money at a per unit rate… As a consequence of the above, bureaus cannot be managed by profit goals and 'the economic calculus.' In the absence of profit goals, bureaus must be centrally managed by the pervasive regulation and monitoring of the activities of subordinates." (pp. 47-49).

they are just as human as corporate CEOs or used car salesmen. But it is equally plausible to expect that many government officials might genuinely be motivated by their perception of the public interest, and that they might work very hard to achieve that conception of the public interest. Such officials might also work for lower pay than they might expect in the private sector, because they see themselves as serving the greater good.

The problem is that conceptions of the public interest are likely to differ, perhaps profoundly. Private markets solve this problem, albeit imperfectly, by allowing differences in choices. If I like chocolate and you like vanilla, each of us can order off the menu. But if government policy is formulated according to a particular perception of the public interest, then all citizens are forced to accept that policy regardless of whether they share that perception.

The problem scales up. Public sector pay is less than private sector jobs with similar training and experience requirements. Consequently, each agency is peopled by employees whose strong belief in the value of their unique mission. If each agency has information advantages, and authority in discretion in enforcement, then the result will almost certainly be a government whose every activity exceeds the optimal level.[7] Bluntly, then, markets systematically underproduce public goods, but public agencies can be expected to overpay input factors and overproduce goods and services (see, e.g., Barro, 1973; Ferejohn, 1986; Persson, Roland, and Tabellini, 1997).

The problem of aggregating different and (at least in terms of budget opportunity cost) conflicting preferences for the levels and mix of public activities is fundamental. It is interesting, and important for our attempt at reintegrating organizational problems for an overall anatomy of failure to achieve Pareto optimality, that such an integrated understanding was the original goal of Kenneth Arrow (1951, 1963). Arrow[8] is justifiably seen as one of the key figures in the development of CET is a key figure in proving that a political analogue to CET is

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[7] This claim is more plausible for agencies with regulatory authority. It is plausible to believe that the preference for additional regulation is higher in the hallways of the Environmental Protection Agency than on Main Street. For the claim to work for spending, the complicity of Congressional oversight authorities would be required. But to the extent that Congressional oversight committees are self-selected "high demanders" of the agency's services, it is not implausible to think that the preference for crop subsidies is higher at the Agriculture Department, and the Senate Ag Committee, than the average of the population at large.

[8] See, for example, Arrow and Hahn, 1971, for a review.

impossible (Arrow 1951, 1963). More specifically, Arrow proved that there is no method that simultaneously satisfies five innocuous conditions of good collective decision-making.[9]

We introduce a framework for analysis below. In our table (page 22), this function of "aggregation" is the leftmost column. Now there may be nothing pernicious about this function of organizations. If collective preferences are cyclical, such that *a* defeats *b, b* defeats *c*, and *c* defeats *a*, the outcome of a voting procedure depends on which pair of alternatives are voted on first, and whether citizens vote strategically. No option is necessarily better than another, objectively, on the basis of voters' preferences. However, as McKelvey has shown (1976), there is a possibility that a monopoly agenda setter can get a majority to support any alternative she chooses.

Unless the agenda is manipulated in this way, this problem merely means that the outcomes of voting are often arbitrary, and without meaning as expressing the will of the voters (Riker 1982). Elections, distinct institutions, (whether with checks and balances among the separated powers or not), and rules are the main ways of disciplining government activity. But none of these mechanisms overcomes the incentive problems and the information problems that we have identified as endemic for non-market institutions.

But the same goes for firms that violate the price-taker assumption of CET. Microsoft, Toyota, Exxon and Apple have the capacity to diminish the consumer surplus that exists at competitive equilibrium, and as profit-maximizing organizations they have clear incentives to do so. They are likewise subject to rent-seeking activity on the part of their leaders, who may give themselves bonuses, stock options, luxurious offices and private airplanes that are taken from the residual producer surplus of a firm with market power.

What this means is that firms in an increasing returns world, and government agencies operating as legal monopolies, are on very nearly the same footing as far as discipline is concerned. Consumers have little power to discipline corporations enjoying increasing returns, and citizens have little power to discipline politicians or appointed officials protected by insuperable barriers to entry. We need to rebalance the scales; the question of "which is better,

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[9] The conditions are (a) universal admissibility of preference orderings, (b) Pareto preferable options prevail, (c) independence of irrelevant alternatives, (d) transitivity, and (e) non-dictatorship. Arrow's original conception was to raise questions about the Bergson-Samuelson welfare theorems in general equilibrium theory in the study of *markets*, not politics. See Arrow (1951), chapters I-III.

markets or government" compares two nonexistent extreme alternatives that no one actually advocates. The real question is empirical: what *mix* of markets and government is simultaneously most efficient, and most responsive, and most consistent with social justice?

VI. **The Matrix, Rebalanced**

The "markets or government" dichotomy in much of current policy debate ignores the fact that any organizational arrangement, ranging from a pure market system to a system of pure state ownership of all factors of production, must solve three core problems. Further, a balanced approach would compare the differences and drawbacks of each of the problems, because no single system or institutional arrangement is clearly dominant in all circumstances.

These *problems*, which we denote with "R"s for row numbers, are:

R1: Principal-Agent Problem

R2: Corruption and Rent-Seeking

R3: Time Consistency

Organizations must also carry out certain core *functions*. The functions are the basic tasks or utilities of any social system that is focused on capturing gains from exchange or cooperation. Again, there are three central functions for any organizational system, denoted "Cj" for "column j":

C1: Aggregation of Individual Choices or Goals

C2: Provide Incentives or take existing incentives into account

C3: Transmit Information Accurately and Quickly

In the following three subsections, we will first discuss each of the problems organizations must solve, and then describe each of the functions successful organizations must carry out, in turn. In the third sub-section we will form a matrix, with the problems being rows and the columns being functions. Each cell in this matrix presents particular challenges and opportunities for organizational design. We review the literature regarding each of the nine problem/function pairs, and distinguish the suitability of government bureaus or private firms to address these challenges or take advantage of these opportunities.

VI.A. Problems:

R1--Principal-Agent Problem

The problem of the superior ("principal") in any hierarchy is to motivate others ("agents") at an equal or lower level in the hierarchy to act in ways that either (a) serve the interests of the principal or (b) serve the interests of the collective organization of which all are a part. In general, these actions are benefits to the principal but costs to the agent(s). The means available to the principal include moral suasion, compensation in money or in-kind, or threats of punishment. A key problem in the principal-agent agreement is transactions cost, which includes specifying contingencies, assigning who will bear risk, determining what constitutes compliance and how compliance is measured, and finally specifying how monitoring and enforcement will be carried out. Transactions cost are a deadweight loss in the contracting relationship, reducing the surplus created by agreeing on the contract in the first place. In extreme cases, where transactions costs are larger than the expected gain to the principal in the absence of transactions costs, mutually beneficial contracts may not even be agreed to in the first place.

R2--Corruption and Rent-Seeking

Corruption is the use of power conferred for one purpose to obtain advantages in other spheres of one's life. If a public official requires a bribe to process an application for a license, and then uses the extra money to buy a nice house, that's corrupt. The power conferred to judge the license application is delegated by the public to ensure the applicant is qualified, not as a means to enrich the official who happens to be charged with processing the paperwork. Rent-seeking is the wasteful competition for acquiring the rights to gain from corrupt systems. In highly corrupt countries, the "salary" of the official may *de facto* be negative, as prospective officials bribe current officials for the chance to collect part of the boodle.

Corruption takes the form of transfers, based on unjust use of power. Rent-seeking is worse than simple transfers, however, and may be a pure waste of resources. If the competition takes the form of excessive studying for exams, or the accumulation of qualifications that have little to do with the performance of the office, it is in effect an all-pay auction, where all the losing bids (study, attempts at flattery, learning arcane material) are nonrefundable deadweight loss. Corruption, then, causes two problems. First, the taking of bribes to determine the

outcome of hiring processes or awarding of grants is damaging because it results in the selection of inferior workers or projects. Second, the recognition that an office confers an ability to collect bribes attracts people whose primary interest is collecting bribes, not carrying out the core functions of the job. And competition for access to the right to collect bribes can distort incentives, attracting the talents of people who would be better suited for employment the society values more highly.

R3--Time Consistency

The time consistency problem occurs when the best thing to do at a given time is not the best thing to do for all times. Although it is as old as parenthood, its modern analytical formulation is due to Finn Kydland and Edward Prescott (1977). While the most familiar examples regard government, we argue that the problem is relevant to the private sector as well.

It is often important to make commitments, or to promise to carry out certain actions. But time intervenes. If the incentives the promiser faces at the time the promise is made are identical to the incentives at the time when the promise is to be carried out, then the promise is time *consistent*. But if the incentives change, either because the promise changes conditions or because of the passage of time, then the promise is time *inconsistent* and there is good reason to believe that the promise will be broken.

The idea is well conveyed by the principle that a government should never negotiate with terrorists who have taken hostages. As a credible general principle, this idea is self-enforcing. If terrorists believe that a government will never negotiate, there will be no point in taking hostages. The best thing to do in general and for all times is never to negotiate for hostages. But the promise not to negotiate for hostages may not be credible. If captives are taken and held alive the political pressure to resolve the situation may become irresistible. Once hostages are taken, the best thing to do may be considered to change. The best thing to do for the situation once hostages are taken may be considered to negotiate. But such a decision to negotiate will undermine the credibility of the best policy for all times.

There are private sector applications as well. A business firm might publicly announce that it will undercut prices of any entrant. But if a strong new entrant with deep pockets enters the market this promise is incredible, because the losses required to bankrupt the competitor will also bankrupt the incumbent firm.

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VI.B. Functions of Organizations:

C1--Aggregation of Individual Choices or Goals

The aggregation problem has to do with the combined consequences of many individual choices, where the motivations of each chooser may be different. In social or political contexts this requires the registering of individual preferences or statements of goals, often in the form of purchases or of votes, and using some procedure to select some alternative for the entire group.

Kreps (1990) gives this example: "...total demand will shift about as a function of how individual incomes are distributed even holding total (societal) income fixed. So it makes no sense to speak of aggregate demand as a function of price and societal income." The aggregation problem can be seen in both *ex ante* and *ex post* applications. It may be very difficult to make predictions about the aggregate consequences of many individual choices in the market, even if in principle each separate choice could be known. It was in this context that the results proven by Arrow, Debreu, MacKenzie, Hahn, and others are significant, because they show that there exists a coherent aggregate price vector that could in principle, and under some conditions, cause every market to clear simultaneously.

Arrow is also a significant figure in the scholarship on the aggregation problem in politics, demonstrating through his "Impossibility Theorem" (Arrow 1951 / 1963) that any aggregation mechanism that gives some positive weight to the preferences of all citizens will have some undesirable properties. Gibbard and Satterthwaite provided an elegant context for this insight, pointing out that it implies that any collective decision problem, ranging from market process to democracy, will under some circumstances arrive at outcomes that are either arbitrary or have been subject to manipulation. In fact, the general problem of aggregation can be understood in these terms, either in markets or politics: any set of institutional processes that begin with individuals and result in some outcome will be subject, to varying degrees and for varying reasons, to problems of arbitrariness or manipulability.

C2--Provide and Respond to Incentives

All institutional arrangements create incentives, formally or informally, intentionally or by accident. Incentives are defined as inducements that change the choices or actions of people in social settings where there are alternatives. North (1990) points out that institutions create incentives but are generally not themselves subject to amendment through feedback about

incentives. The optimizing agent or "moving part" in North's system is the organization, which always acts rationally given the incentives and property rights structures created by the relevant institutions.   Incentives can involve payment, a moral sense of guilt or pleasure from praise, threats or coercion, but for our purposes they originate outside the person responding to the incentives. That is, hunger may be a powerful inducement, but it is not an incentive in our sense.

C3--Transmit Information Accurately and Quickly

Information is a broad category of knowledge about possibility, value, and constraints. Organizations of all kinds must process information, because information about resources, their value, their opportunity cost, and the technology by which resources can be transformed all form the building blocks of the menu from which the organization must choose. Some information processing systems are conscious and directed, such as military intelligence or urban planning. Other information processing systems, such as markets, have widely distributed and decentralized information collection and decision nodes. There may be no central planning or directive function, yet information about scarcity and value is provided by prices. Resources move without buyers or sellers knowing anything other than their own preferences and costs. Prices thus provide information about scarcity in other markets current owners know nothing about, and also an incentive to direct resources toward those scarce markets, without the current owner caring in any way about the welfare of the distant buyers.

VI.C. The Function-Problem Matrix

In the following section, we will combine the three problems as rows with the three core functions as columns in a matrix with nine cells. For each cell we will discuss the difficulties posed by this matching of problem and function for both market and government organizations.

Table 1: Matrix of Problems and Functions

	Aggregation	Optimize Incentives	Transmit Information
Agency	1. Governance Institutions, separation of ownership and control	2. Costs of negotiating, monitoring, and enforcing contracts, as well as imposing sanctions	3. Bureaucracy and oversight problems in large organizations
Corruption and Rent-seeking	4. Agenda control confers power in aggregation, so runs the danger of corrupting decision process. Competition to obtain position of agenda controller can dissipate some of gains of collective action in forming large organization in the first place	5. and 6. (Problems are linked) Corruption distorts incentives toward creating rents that can be sold to the highest bidder, rather than creating benefits for the owner (for firms) or the citizen (for governments). Institutions must solve the collective action problem to allow large group of owners / citizens to be able to capture the contracted benefits. Passive government failure: government is distracted from correcting market failures, and falls short of Pareto optimal policies.	
Time consistency	7. Active government failure: incentives to serve short run electoral goals drive policy. "Best" policy for the next two years might be to stimulate economy until election, even though ensuing recession is much worse than if an "optimal" policy were pursued.	8. Incentives right now diverge from the incentives for all time, by more than a "rational" discount rate would imply. Cannot bind present actors to act ex ante as they themselves would have preferred to have acted, ex post.	9. Common pool resource (CPR) problems, sustainability. Easter Island example (Jared Diamond). Actors may not know that their own self-interested actions will damage sustainability. But even if they did know, can't escape logic of CPR unilaterally. Oil wells and the federal budget are both CPRs.

Cell 1: Agency and Aggregation

When a group of stake-holders seek to control an agent, they face two fundamental problems. First, they have to make collective choices about what their goals are, since they may disagree. Disagreement could result from differences in information sets, differences in preferences over outcomes, or different mental models about cause and effect relationships between courses of action and outcomes.

Second, the members of the group must write a contract or create an institutional arrangement that creates incentives for the agent to act in accordance with the goal chosen in the first step.

Some form of voting procedure is frequently used, both in private firms and in government policy problems, as a means of solving the first problem. In political contexts, elections or some kind of voting process also is the only available mechanism to solve the second problem, so that electoral incentives must both choose the policy and at the same time discipline the representatives charged with carrying out the policy.

For private firms, stockholders vote with their power weighted by the proportion of shares that they own. But stockholder governance is notoriously weak, and is subject to enormous problems of collective action. In many firms, a plurality or even a majority of voting shares are concentrated in just a few hands. This problem of weighted voting means that private firm governance institutions can be subject to abuse, meaning that the solutions to the first problem, discovering collective choices for the group, may not work well.

On the other hand, private firms need not rely so heavily on elections and voting procedures to discipline managers at the level of incentives, because the ability of private firms to write flexible contracts is substantially greater. Private firms can discipline the agents (managers and CEO) through three mechanisms

1. The market for managers (hiring, and firing, leaders)

2. The profit test (a firm that loses money goes bankrupt, a clear if complicated and perhaps arbitrary feedback mechanism, as suggested by Alchian, 1950)

3. mergers and acquisitions (unfriendly takeovers, if the equity value of the firm is more than its market capitalization, or the total value of all shares of stock)

Berle and Means (1933) pointed out long ago that the separation of ownership and control gives scope for shirking. This has been taken as a criticism of the "corporate" form of

organization, but in fact this separation of "ownership" and control is at least as severe for government agencies. In such a setting, "shirking" can take at least two forms:

a. Act in ways that require effort, but serve personal rather than collective goals or interests

b. Simply fail to act at all, exerting no effort

The "active" form of agency failure is to use the power of agenda control to manipulate outcomes of collective choice processes to suit the goals and preferences of leadership, rather than of stake-holders with standing in the decision process. For firms this might take the form of complicity with a minority of the stockholders, or the board of directors, who nonetheless are able to block initiatives to change corporate policy in the direction desired by a majority of stockholders. The activities of the firm may be quite significant, but in a direction different from that implied by a more representative form of aggregation.

In a similar vein, but with strikingly different implications, incumbent politicians or senior appointed officials may possess significant advantages by virtue of holding office. They may be able to fend off challenges and maintain their active control over agency or government policy, even if those policies are not consistent with the desires of the median voter.

The other side of failure, the "passive" failure to act, or to implement, policy desired by the median voter, is pervasive. All that is necessary is that oversight committees, or regulatory agencies, block or delay policy. The use of complex procedures, parliamentary rules, and "public comment" requirements on new rule promulgation nearly assure that actual government action will fall well short of the level of change desired by voters. If the existing level of policy and spending is too high, this surplus level of policy can simply be preserved by inaction, delay, and dragging out implementation of changes. These procedures are notorious in defense contracting procedures, but passive government failure is also likely in other settings as well.

Passive failure is much less likely for private firms, though active failure is probably more common for firms even than for federal agencies. A firm in even a mildly competitive market, or for that matter a regulated monopoly such as a utility, still faces the discipline of unfriendly acquisition or takeover threats. Only government regulation, paradoxically, can protect firms that exhibit passive failure.

It is important to emphasize the difference. For firms, the collective choice problem only extends to the initial choice of goals. Incentives can be created in market-oriented contracts. For elected officials, the use of collective choice to choose goals is also the only way to discipline

shirking, because neither the profit test nor unfriendly acquisition is viable in politics. That is, for government, collective choice and incentive contracts are combined. Voters decide direction for the future, and discipline incumbents, through periodic elections characterized by substantial collective action problems on behalf of voters, and significant incumbent advantage working to the advantage of current office holders. Thus, the "market" for political managers is restricted by party entry barriers and protected by information asymmetries about the availability of alternatives. And the only kind of unfriendly takeovers are those involving tanks and columns of mechanized infantry.

Cell 2. Agency and Incentives

The "agency" problem is to write a contract that induces an agent to act in accordance with the desires of the principal(s). Features of the contract include the cost of specifying, monitoring, and enforcing just what constitutes "compliance."

In the classic PA problem, there are two types of "shirking" by the agent. The first is actions different from those desired by the principal. The agent may act quite energetically, but in ways that benefit the agent exclusively, or that are less preferred by the principal. This problem is when the agent takes extra compensation in non-monetary perquisites or benefits.

The second is the absence of action or effort, so that the agent is simply consuming leisure on the job rather than acting in accordance with the agreement with the principal. This problem is particularly acute in the case of team production, where the failure to exert energy may be hard to measure. (Agents may also "shirk" by misrepresenting competence, but that is a problem of asymmetric information, taken up in the next section.)

There are two key incentive problems with PA contracts: Moral hazard and conflict of interest. These problems are not mutually exclusive, and may in fact be mutually enforcing. Moral hazard is a situation where the benefits of risk taking and costs of risk taking are distributed differently. In contracting, this may take the form of a principal taking gains from exposing workers to excessive risks (as in avoidable mining accidents), or workers exposing principals to excessive risks (as when a truck driver gets drunk and destroys a load of cargo).

Conflict of interest occurs when the goals of the principal are imperfectly translated into incentives for the agent. The medium through which incentives are created and transmitted is the contract. An ideal contract is one that makes the goals of the principal coincide perfectly with

the incentives of the agent, at a monitoring and enforcement cost of zero. This perfect coincidence of interests can never be accomplished in practice, and the principal is faced with the problem of identifying the optimal trade-off between additional contract provisions ex ante compared with the costs of monitoring and enforcement provisions ex post.

Business and government face very different problems of aligning agents and incentives, but the problem is universal. Businesses, with some exceptions, tend to rely on the carrot of increased pay and bonuses, combined with the threat of being fired for poor performance or even for performance that falls short of measurable profit goals. Government "agencies," lacking the feedback information provided by profits, are much more likely to use metrics based on obedience to rules and procedures. They have neither the carrot of substantial pay increases nor the stick of firing for reasons other than failure to follow the rules. Government agencies offer job security, with pay and promotion based on seniority and conformity with rules, while business firms may employ both short-term and long-term incentives schemes based on pay for performance.

Cell 3. Agency and Information

In the classic agency literature, the problem is assessing the "type" of the agent. There are several descriptions of this problem, ranging from a labor market version of the "lemons" problem (Akerlof, 1970) to the "assurance game" of Kreps (1990) and others. There are three problems to be dealt with: disutility of effort, competence, and preferences for non-pecuniary rewards. From the perspective of the principal, the ideal agent enjoys working hard, is highly competent, and eschews non-pecuniary rewards (long lunch breaks, luxurious offices, private jets for transport to meetings in exotic locales of questionable business purpose). All agents will portray themselves this way, but the agent's true nature is only revealed after the contract is signed, and even then only through costly monitoring by the principal.

The asymmetric information problem has two components: the principal may or may not know the type of the agent, and the agent may have incentives to conceal her "nature" (particularly the disutility of effort). But the agent may also have limited information about the principal, particularly the willingness of the principal to follow through on long-term commitments. This problem is especially acute if the agent is required to undergo training, or buy equipment, that is not useful in other contexts.

For government the agency / information problem was given its most explicit treatment by Niskanen (1971). Niskanen claimed that the reliance of bureaucracies on rules and procedures was likely to attract particular types of people to government "agencies." Bureaucrats were likely to be people who had less preference for intense, extended work, who defined competence as obedience to rules and norms of professionalism, and who valued non-pecuniary rewards very highly.

These non-pecuniary rewards generally took the form, for Niskanen, of an over-emphasis on increasing the budget and scope of the agency far beyond what was desired by the principal (in this case, voters). Niskanen's view is made more plausible by his recognition that this desire for non-pecuniary, preference-based rewards might not (just) take the form of private jets and plush offices, but also a level of service provision higher than that desired by the Congress or the general public. For example, at least some of the employees of a non-profit organization dedicated to helping the homeless are likely to care deeply about their cause, more deeply in fact than the general public. Such employees may be willing to sacrifice some part of the competition they could earn in the private sector for a lower-paying job in government. But then they will take additional "compensation" (utility) from trying to increase the budget of their agency beyond the level desired by the general public as a means of serving their "real" constituents, the homeless.

In Niskanen's model, the way this is accomplished is through control of information. The agency employees, who want increased budget either for personal consumption or to serve their desire to overprovide the service the agency produces, control information about production costs and budget. The legislature could demand better information, or hire a manager to monitor the agency, but the oversight duties in legislatures are likely to be performed by members who actually share the goals of the agency. If the agency attracts high demanders of the service, and if oversight is performed by legislators who are likewise high demanders, then the idea of agency control is a "stylized farce," in Niskanen's terms.[10]

Both business and government face severe problems solving the problem of asymmetric information in the agency context. Formal solutions such as licensing and certification can mitigate the problem, but it is expensive to identify rules and examinations that capture the core

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[10] Niskanen's model probably overstates the information asymmetry. Hammond and Miller (1985) and McNollGast (1987, 1989) have pointed out that Congress can design the process of rule promulgation and agency "production" to elicit much more information than Niskanen considers likely.

competencies that employers are looking for. From the employee perspective, it is necessary to commit to being able to deliver on promises of future benefits (pensions, a viable stock, health benefits) to induce workers to seek the employment-specific assets that constitute the competency desired.

Kreps (1990) identifies "corporate culture" as the commitment device most likely to solve the problem. This could take the form of professional norms and devotion to rules and procedures for government agencies, though of course this may be the origin of the caricature of bureaucracies as caring more about rules than people. Private companies need to create a "culture," organized around some costly but orthogonal principle, according to Kreps. Consequently, IBM employees had to have short hair, white short-sleeved shirts, and pocket protectors, while Apple employees (at one time at least) wore Hawaiian shirts and rode bikes to work.

Cell 4: Corruption/Rent-Seeking and Aggregation

Since for the most part, there is consumer choice, aggregation problems are less of an issue for firms than for governments. The private part of Gross Domestic Product is the aggregation of uncounted market transactions that are for the most part driven by individual choices. Governments, however make policies that are for everyone or for whole classes of people who may or may not support the policy.

The capacity to control the governmental agenda may be the result of an election that has arbitrary features, and might reasonably have turned out otherwise under different rules and procedures. This has been true, for example, in U.S. presidential elections with more than two candidates where no candidate wins an absolute majority of the votes, or in two candidate elections in which the winner-take-all feature of the Electoral College distorts the count of popular votes. In legislative elections in single member districts, the arbitrariness can come from the drawing of the district lines. In proportional elections the arbitrariness can come from the vote counting formula and from the size and definition of the districts.

In sum, in conditions where aggregation is either arbitrary or subject to agenda control, the position of "setter" confers enormous value on whoever occupies that position. Consequently, the competition for access to the power to set the agenda quickly becomes a rent-seeking contest, with all the usual features of such contests.

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Cell 5: Corruption/ Rent-Seeking and Incentives

In firms with market power, the producer surplus may be used to reward stockholders with the profits that do not exist under competitive equilibrium. The producer surplus may be used to pay very generous executive salaries. Capital gains and dividends are appropriate ways to attract investment. High executive salaries are appropriate ways to provide incentives and rewards for good management. However, when executive salaries, bonuses, and retirement packages are awarded in spite of failure or losses of income, they approach corruption.

In government, the capacity to make rules that affect the incomes of citizens can provide incentives to give campaign contributions that raise questions about the legitimacy or objectivity of the policymaking process. The desire to fund increasingly expensive electoral campaigns makes members of legislatures especially greedy for campaign contributions. The difficulty is that in equilibrium incumbents can raise as much money as they need to fend off challengers. As a number of scholars have pointed out (e.g., Lessig, 2011), this practice creates an irresistible conflict of interest: incumbent members of Congress cannot possibly be expected to regulate themselves, because regardless of their ideological differences 100% of the members of Congress are incumbents.

Cell 6: Corruption / Rent-Seeking and Information

In both the private and the public sector there are problems of asymmetric information. Many of these involve the effectiveness and safety of products sold on the market. Since the original Food and Drug Act was passed in 1906, we naturally think of these things as government responsibilities.   But there are private means to overcome faulty or dangerous products.

Underwriters Laboratories is one non-governmental institution that is designed to assure quality products. Producers who want the UL seal of approval would submit their products and submit to testing. The success of this arrangement depends on UL's desire to maintain their reputation. Warranties are another private way to address asymmetric information problems.

Several government agencies are involved in the regulation of products: the Food and Drug Administration has regulated the safety of food and drugs since 1906, and the effectiveness of such products since 1962. The Consumer Product Safety Commission was created by

Congress in the 1972 Consumer Product Safety Act, which directed it to "to protect the public against unreasonable risks of injuries associated with consumer products."

The result is that the problem of asymmetric information is assumed to have two quite different aspects. For a variety of products, it is assumed that asymmetric information about health and safety are worth regulating directly. These range from food to restaurants to drugs to used cars and representations made in consumer ads. The other dimension of asymmetric information is focused on efficacy: does the product do what it claims?

Under some circumstances (movies, literature, newspapers) there is little regulation of either type, because the presumption is that word of mouth and the failure to achieve repeat business is sufficient to discipline producers. There is no federal agency charged with making sure movies are enjoyable, entertaining, or informative. The result is that organizations such as Rotten Tomatoes and other reviews of consumer products are provided privately, and widely used, without government direction or subsidy. For other products (food, restaurants, supplements of various kinds, automobiles) the regulation ensures only that the product is not dangerous. There is no "federal bureau of burritos" to ensure that the food tastes good in a Mexican restaurant, but there is a health department inspection to ensure that the food will not cause deadly diseases. Cars are subjected to regulations affecting safety and mileage, but there are no requirements for style, comfort, or smoothness of ride.

But for some products there are both health regulations and efficacy regulations. The most obvious example is drugs: before a product can legally be sold as a prescription drug it must be proved (a) not to cause dangerous side effects, and (b) to offer actual curative or ameliorative benefits, compared to a placebo. These regulations delay new drugs and make their prices much higher, both because of the expense of conducting drug trials and the implied barriers to entry for competing products. But thalidomide, which chemically maimed tens of thousands in Europe, was kept out of US drug markets until after the dangerous side effects were recognized. Implicitly, the decision in the US appears to be to allow more Type II error (convict innocent drugs) for the benefit of preventing all Type I error (allowing guilty, or dangerous, drugs to go free.)

Cell 7: Time Consistency and Aggregation

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The decision to take a time inconsistent action may be an arbitrary result of a preference aggregation institutions or a preference cycle. A decision to negotiate for hostages, or to bail out a failing bank might be contingent on distributions of preferences or on procedures that just as legitimately could have been something else. That is, if one were to choose among the set of "fair" political choice mechanisms, it would be possible to get different outcomes from identical preferences. This raises an interesting question, an extension of the Riker objection to "equilibrium institutions" (Riker, 1980; Shepsle, 1986): How can a polity make a credible commitment to maintain a set of institutions?

The problem of time consistency is usually thought of as an incentive problem, where the incentive to negotiate for hostages in one instance cuts against the incentive to make a commitment never to deal with hostage-takers in any future period. But adding aggregation problems makes things more complex, and more difficult. How can a Congress bind future Congresses? How can a government bind future governments to pay back debt, given the possibility that not just cycles, but institutions themselves, may be subject to cycling problems? This is the problem raised by North and Weingast (1989), but the general severity of the problem may not be recognized. North and Weingast select (appropriately, given their subject) on a successful use of institutional commitment. But this is usually seen as a time consistency problem, where it may equally be an aggregation problem.

Cell 8: Time Consistency and Incentives

There is always an incentive to do the time-inconsistent thing that has advantages at the time, but is at odds with the best policy for all times. That is the very nature of time consistency. The problem is that the incentives for short-run satisfaction of goals may be overwhelming. Consider the following account from Winder's (2010) Germania:

> The crisis of the fourteenth century began with an immense famine. It seems to have rained and rained and rained. Crops completely failed over huge areas. It was so wet that salt could not be dried to preserve meat...*People were driven to eat the seed corn needed for the following year's crop*. It has been suggested that the story of Hansel and Gretel stemmed from this awful time. (91-92)

The metaphor "eat the seed corn" was a real choice for the starving families of 14th century Germany. And it is in some sad way rational for starving people to eat their seed corn, since the dead cannot plant next year's crop anyway. The solvable problem of time inconsistency is when incentives are so misaligned that a society "eats its seed corn" when it is *not* starving.

Consider the following quote from the Republican (Minority) report of the Financial Crisis Inquiry Commission:

> For a policymaker, the calculus is simple: if you bail out AIG and you're wrong, you will have wasted taxpayer money and provoked public outrage. If you don't bail out AIG and you're wrong, the global financial system collapses. It should be easy to see why policymakers favored action – there was a chance of being wrong either way, and the costs of being wrong without action were far greater than the costs of being wrong with action. (FCIC Minority Report, p. 433).

This was an expected value cost-benefit analysis, given things as they were in 2008. But one reason that things were as they were at that time was that time consistent practices had not been followed in previous years. Ever since the government bailout of Continental Illinois in 1984, banks had had reason to believe that they were "too big to fail" and that if they got into trouble, they could count on government bailouts. Put differently, government behavior had made big banks take bigger risks than they might have taken if they had not expected government to rescue them.

In market-based enterprises, there are substantial incentives to make profits now at the expense of future profits, especially in the cases of externalities such as common pool resources. Managers may also face incentives to inflate stock prices and then leave the company, after selling their stock holdings at artificially high prices. But without government bailouts, the ability of market enterprises to succeed in these activities is punished by Alchian's (1950) positive profits test, and also by the mergers and acquisition threat of other owners with a longer view. No analogous long-term incentives exist for political actors who face the short-run horizon of an election. The time horizon for a member of the US House of Representatives is at most two years, and that is on the day after an election; the horizon is usually much shorter. Unless voters practice some sophisticated form of Ricardian equivalence (and the evidence is strong that they do not), politics will be dominated by extremely short-sighted, near term incentives at the expense of the long term. It may be literally impossible for political actors to

solve the time-consistency problem if the survival test is periodic elections (for a formal result, see Jackson and Yariv, 2011).

Cell 9: Time Consistency and Information

Information is central, both to the statement of time consistency problems and to solving the problem. The future, in addition to being discounted by the rate of time preference, is also less certain. The curtain of uncertainty may actually separate the decision taken now from its consequences for the choice set in the future in ways that make the two decisions appear to be entirely separate.

This problem is likely to be more acute for complex systems where the nature of feedback and nonlinearities in the effects of current policies are hard to gauge. The most important examples may be common pool resources (in situations where individual actors have no reason to understand that the pool is limited or finite) or environmental problems where the external consequences may be long-term and physically distant. The extinction of carrier pigeons, and the near extinction of the American bison, seem palpably idiotic in retrospect. The current problems fishery collapse off Nova Scotia likewise seem in retrospect to cast hunters and fishermen in the roles of self-consciously selfish and even evil actors. But contemporary accounts in each of these instances are full of descriptions of "infinite" resources, covering the prairie to the horizon, filling the skies, or overflowing the seas. Everyone thinks he is taking the first fish, not the last fish.

Jared Diamond has a chapter on Easter Island in his book *Collapse: How Societies Choose to Fail or Succeed* (2005, chapter 2). In it he reviews the history and alternative explanations for deforestation of Easter Island, and concludes that "it is the clearest example of a society that destroyed itself by overexploiting its own resources (2005, 118). Diamond conducts a rather poignant thought experiment, wondering what the person who cut down the last tree was thinking. There were no more trees. This was the last one. How can this possibly be the right thing to do, even from an individual, selfish perspective?

At that point, of course, it hardly mattered. If the person in Diamond's thought experiment had not cut down the tree, someone else would have. The problem is that individual, self-interested action will conflict with collective welfare in any common-pool resource setting. The problem is that the society has to recognize the common-pool nature of the problem, and act

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to change incentives, before it is too late. In a democracy this relies on individuals being fully informed and acting to achieve the collective good, not their individual good, in the voting booth.

VII. Case studies

The discussion so far has been abstract, and conducted at a very granular level. Let us consider two examples. We will not develop these examples very deeply, but each is a useful illustration of two key tenets of our argument. First, the failures of complex organizations are not "market failures" or "government failures," but a systems failure of the particular arrangement of incentives, information possessed by decision makers, and aggregation systems that happened to be in place. Second, the benefits of hindsight often make it seem surprising that such failures could take place, because the crises seem inevitable in retrospect. But this is far from true; most systems manage to stumble along without crisis, most of the time, because of the path dependent, and marginal adjustment, aspects of their creation.[11]

Our examples are the US financial crisis of 2007-9 and the Deepwater Horizon oil spill in the Gulf of Mexico in 2010. Both would seem on first glance to be market failures, since they both involved the private sector. And to be fair each of these examples was in fact characterized by massive market failures. But the private sector in the US does not operate in a policy vacuum. Market enterprises are regulated by government, in a matrix of rules and incentives, some conscious and intentional and others the product of history and accident.

VII. A. Financial Crisis

The recent financial crisis caused the worst economic downturn since the Great Depression of the 1930s. It has been called the Great Recession because it is not an ordinary downturn of the business cycle, and because of the great economic damage it has caused. This financial crisis was precipitated by the collapse of housing prices in 2007. This collapse caused many mortgages to be "underwater," in that the house was worth less than the money owed on it. Problems were exacerbated by the fact that many of the mortgages were "subprime," or for borrowers that did not meet high credit standards, and were more likely to default than "prime" borrowers. These mortgages had been sold, packaged and resold into securities that were bought

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[11] This idea of "muddling through" is lauded by Lindblom (1959), and is consistent with Hayek's (1988) notion of spontaneous orders being, if not efficient, at least workable.

by many banks, and when owners were unable to pay their mortgages, many financial institutions were adversely affected.

So far, this episode seems to be a private sector story. Markets did not appropriately value houses. Prices rose beyond sustainable levels in a "bubble," which burst and left a lot of people with very large losses. But aggregating information about supply and demand to set prices is something markets do well, and do better than any other known institution. It is not obvious that an alternative institution such as government could do better. So let us acknowledge that the housing bubble was a market failure in an intuitive sense that does not arise from CET.

This crisis was also a government failure in several ways. Government policy had encouraged, if not demanded, relaxing or weakening of the standards used by banks in dealing with mortgage applications. Leaders of both political parties were in favor of "affordable housing" and of broadening the income and racial diversity of people who secured mortgages. This stance encouraged, and in some cases very nearly required, practices that in retrospect looked a lot like "predatory lending" on the part of banks. Since some banks were reluctant to suspend their rules for risk assessment, the pressures to make these high-risk loans engendered an astonishing proliferation of specialized non-bank lending institutions as new loan originators. These new originators expected to be able to make loans, and then immediately sell the loans to be repackaged and sold again. The accountability that normally goes with a local bank and local mortgage borrowers was lost by the selling, reselling and packaging of these loans into "structured investment vehicles" such as collateralized debt obligations that totally severed the connection between borrower and lender.

Fannie Mae and Freddie Mac were government sponsored enterprises (GSEs) whose shares were publicly traded in the stock market, but which had the implicit backing of the U.S. government. They guaranteed mortgages at lower than market rates. This backing made their mortgages less risky than companies that were more vulnerable to market forces. There were some half-hearted attempts at reform in the Bush administration, but the GSEs were protected from reform by members of both parties in Congress on the grounds that they were successful. And, of course, they were. For nearly two years (2006 IV – 2008 III) this system of private originators and government repackaging of loans pumped out more than 100 billion of new mortgage-backed securities every quarter.

Government was also implicated in encouraging excessive risk taking in the financial sector. Both with bank bailouts that went back as far as the rescue of Continental Illinois in 1984, and with the "Greenspan Put," government led financial institutions to think that they could enjoy profits in good times, but that government would step in and protect them in bad times. This thinking was fulfilled with the Troubled Asset Relief Program, or TARP. TARP may be the clearest example in modern US policy history of the time consistency problem.

Was the financial crisis a failure of markets? Of course. Self-interest led thousands of modern day pirates to plunder the American financial system. But the conditions that made this plunder possible, and that increased the size of resulting catastrophe, were a product of regulatory system that completely failed to use information accurately and to create the right incentives. If anything, the incentives that were created by the financial regulations were complicit in the disaster.

VII.B. Deepwater Horizon

In the Oil Pollution Act of 1990 the U.S. Congress passed regulation designed to encourage the exploration and exploitation of the enormous oil reserves off the shore of Texas, Louisiana, Alabama, and Florida in the Gulf of Mexico. To ensure the safety of the public, the law established regulations to guide the procedures and equipment that oil platforms had to use to be allowed to drill in the 5000 foot depths of the Gulf. To encourage companies to undertake the expense, and financial risks, inherent in oil exploration and building drill platforms, the law also established liability caps of $75 million dollars per incident.

It is importance to recognize the set of incentives created by this arrangement, as a kind of principal-agent mechanism. First, the federal agency, the Minerals Management Service (MMS) that has regulatory oversight of drilling receives an annual budget based on the costs of monitoring drilling operations. More drilling, more budget.

But the MMS is not in any way at risk if the regulations are not carried out. In fact, federal employees are explicitly protected against any kind of lawsuit for carrying out their official duties. The protection afforded to the drilling companies of a paltry $75 million liability cap is nowhere else offset by an increase in liability to anyone else.[12] In effect, no one is

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[12] This limit was imposed on liability for damages from the spill. The 1990 law also created a clean-up fund, or "Oil Spill Liability Trust Fund," administered by the US Coast Guard through

answerable or accountable in the event of a spill, because companies are shielded from lawsuits, and the federal government is exempt.

In fact, the revenue of the MMS is determined by the level of activity of the drilling industry, not by its safety or efficiency. There is no bar to people from the industry working in MMS, and (importantly) vice versa. An MMS employee, in fact, might expect a substantial pay increase for being hired away to an industry position as government liaison.

When the leak started with the blowout on Deepwater Horizon on April 20, 2010, many people began to ask questions about the procedures and regulatory inspections that had been used. It quickly turned out that the MMS had in fact failed to inspect the drill rig for at least the past year, and that the drilling process itself had used only parts of the safety "blow out" equipment that is recommended (but not formally required) for drill rigs of this type.

The arrangements that led to this outcome are so implausible that they bear repeating. To secure near immunity from liability, and protection from law suits in the event of environmental damage, the Congress had created a maximum total liability, for all private actors, of $75 million per incident (the actual costs of the Deepwater Horizon spill have been estimated at at least $30 billion, and perhaps as high as $100 billion, including damage to habitat, the fishing industry, and tourism). In exchange, the industry had given to the US government the right to oversee and regulate drilling and safety procedures.

But the MMS had failed to carry out significant parts of its regulatory charter. To be fair, the budget of the agency, because it is based on annual activity of the regulated industry being *regulated*, rather than the value of the resources being *protected* by the agency, had been stagnant for years. The MMS has too few inspectors, and too few resources, to be able to carry out its part of the bargain.

After the blowout, many people looked for someone to blame. Not surprisingly, many people blamed BP, because the company had in fact cut some corners on both procedures and equipment. But the real culprit may well be the regulatory scheme itself, because BP had

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the National Pollution Funds Center. The OPA does allow for the federal government to seek reimbursement for actual expenses incurred as a result of clean-up efforts after a spill, and the BP contributed more than $10 billion to this fund. But the shield from damages caused by the spill, over and above actual clean-up costs, substantially protects drilling firms from having to pay for the full consequences of spills.

insufficient incentives, and MMS had insufficient manpower and effectively zero incentives, to ensure that BP chose the desired level of safety equipment and procedures.

Imagine a rather extreme alternative, one that requires little direct government oversight. Instead of a $75 million liability cap, suppose that any company applying for a license to drill offshore had to post a $100 billion bond. The company would place this bond in escrow, and could receive the income from the bond for the life of the well. But if the well blew out, causing harm to the environment and the economy of the Gulf, the company would forfeit the amount of the damages, up to the total amount of $100 billion.

Under this scheme, it would be unnecessary for any government agency to perform more than minimal oversight, because the entity performing the drilling stands to lose a very substantial amount of money if it is done badly. Obviously, one could still imagine a wealthy but inept management botching the well, and losing the bond, causing catastrophic damage to the environment and economy of the Gulf.

The point is that it is not clear which regime is more effective: (1) suspend liability, and charge government with all oversight, effectively insulating the private company from responsibility, or (2) impose full liability, and require the posting of a large bond which the company would forfeit in the event of an accident.

One could plausibly object that the second scheme is too costly, but the cost of the liability / bond scheme is actually much less, in terms of the need to employ an army of bureaucrats. The costs would be attached to the act of drilling and pumping oil, and would be passed on to consumers of that oil.

One might also argue that the role of government is just as large in the liability / bond scheme as in the regulatory scheme. After all, the government would have to license the company, to take and control the bond, and to establish procedures under which the bond would be forfeited for cause. And that is quite true. But the direct oversight of the procedures of the company, ex ante, are much smaller in the liability / bond scheme. The company would only be subject to sanction ex post, and those ex post sanctions might well be a better and more incentive compatible spur to ex ante compliance than regulation provided.

VIII. A guideline for deciding when market failure would be improved by public intervention in a world of increasing returns: Uncertainty and political decision.

In the absence of a theoretical god's eye view, such as the benchmark provided by CET, there is more of a presumption in favor of the decisions of private firms than of government. The reason is that (short of crony capitalism and "too-big-to-fail") firms do not survive unless there is some demand for their products. And under most conditions, nobody has to purchase their products. In a genuine capitalist system, firms go out of business when they fail to make the market test.

Government, on the other hand, is not subject to the same kind of market discipline and does not go out of business. Moreover, its decisions are collective decisions that affect everyone, and individuals and groups cannot avoid government policies that are relevant to them. (Tiebout 1956 identifies an exception.) Since aggregation issues make government decisions potentially arbitrary, this is an even more serious problem for government. When government considers firms like banks or automobile companies too big to fail, and bails them out to save them from bankruptcy, as happened in the recent financial crisis, government failure and market failure become intertwined.

We hope that it has become clear by now, that both government and markets populated by firms face very similar kinds of problems, because both are large organizations. There may not be a benchmark for an economy with large firms or for government, but some outcomes of both kinds of processes are clearly inferior. Without clearer specification of the nature of the problem, the concepts of market failure and government failure are much too vague and general.

Firms operate in markets and face competitive pressures that provide a kind of discipline on them. But firms have market power that insulates them from the pure competition of competitive markets. Government regulation to solve market failure problems may well be subject to the same kinds of problems. Governments are disciplined in elections, which are a blunt instrument of control. And democratic governments can be induced to protect firms from competition as well as to assure the competitive discipline of markets.

References

Akerlof, George A. 1970. "The Market for 'Lemons': Quality Uncertainty and the Market Mechanism." Quarterly Journal of Economics 84 (3): 488–500.

Alchian, Armen A. 1950. "Uncertainty, Evolution, and Economic Theory." Journal of Political Economy, 58(3): 211-221.

Arrow, Kenneth J. 1951, 1963. Social Choice and Individual Values. New York: John Wiley and Sons.

Arrow, Kenneth, and Frank Hahn. 1971. General Competitive Analysis. San Francisco: Holden-Day.

Barro, Robert. 1973. The Control of Politicians. Public Choice. 14(1): 19-42.

Bator, Francis M. 1958. The Simple Analytics of Market Failure. The Quarterly Journal of Economics. 72(3): 351-37.

Berle, Adolf A., and Gardiner C. Means. 1933. The Modern Corporation and Private Property. New York: MacMillan.

Besley, Timothy. 2006. Principled Agents? The Political Economy of Good Government. Oxford: Oxford University Press.

Black, Duncan. 1958. The Theory of Committees and Elections. New York, Cambridge University Press (reprinted 1987, Kluwer Academic, Netherlands).

Coase, Ronald H. 1988. The Firm, the Market, and the Law. Chicago: University of Chicago Press.

Condorcet (M.J.A.N. de Caritat, Marquis de). 1785. "An Essay on the Applications of Analysis to the Probability of Decisions Rendered by a Plurality of Votes." Reprinted in Iain McLean and Arnold Urken (1995; eds and translators), Classics of Social Choice, Ann Arbor: University of Michigan Press, pp. 81-90.

Condorcet (M.J.A.N. de Caritat, Marquis de). 1788. "On the Constitution and Functions of Provincial Assemblies." Reprinted in Iain McLean and Arnold Urken (1995; eds and translators), Classics of Social Choice, Ann Arbor: University of Michigan Press, pp. 113-143.

Congleton, Roger. 2004. "Rent-Seeking and Political Institutions." Encyclopedia of Public Choice.

Coughlin, Peter, and Melvin Hinich. 1984. "Necessary and Sufficient Conditions for Single Peakedness in Public Economic Models." Journal of Public Economics, 25: 323-41.

Cowen, Tyler, Amihai Glazer, and Henry McMillan. 1994. Rent Seeking Can Promote the Provision of Public Goods. Economics and Politics. 6:131-145.

Denzau, Arthur T. and Robert P. Parks. 1979. Deriving Public Sector Preferences. Journal of Public Economics 11(3): 335-352.

Ferejohn, John. "Incumbent Performance and Electoral Control." Public Choice. 50 (1-3): 5-25.

Financial Crisis Inquiry Commission: Final Report of the National Commission on the Causes of the
        Financial and Economic Crisis in the United States. Pursuant to Public Law 111-21. January
        2011. Washington, DC: USGPO.

Hammond, Thomas H., and Gary J. Miller (1985). "A Social Choice Perspective on Authority and
        Expertise in Bureaucracy." American Journal of Political Science 29:1 (February): 611-638

Hayek, Friedrich. 1988. The Fatal Conceit. University of Chicago Press.

Jackson, Matthew O., and Leeat Yariv. 2011. "Collective Dynamic Choice: The Necessity of
        Time Inconsistency." Working Paper. Stanford University, Department of Economics.

Kreps, David. 1990. A Course in Microeconomic Theory Princeton: Princeton University Press.

Kreps, David M. 1990. "Corporate Culture and Economic Theory. in J. E. Alt and K. A. Shepsle, eds.,
        Perspectives on Positive Political Economy, Cambridge, England: Cambridge University Press.

Kydland, Finn and Edward C. Prescott. 1977. Rules Rather than Discretion: The Inconsistency of
        Optimal Plans. Journal of Political Economy.   473–492.

Ledyard, John O., 2008. Market Failure. The New Palgrave Dictionary of Economics, Eds. Steven N.
        Durlauf and Lawrence E. Blume, Palgrave Macmillan.

Lessig, Lawrence. 2011. Republic, Lost: How Money Corrupts Congress. New York: Twelve
        Publishers, Inc.

Lindahl, Erik. 1958. Just Taxation—A Positive Solution. (original in Swedish(?), 1919. Translated in R.
        Musgrave and A. Peacock, eds., Classics in the Theory of Public Finance. London: Macmillan.
        168-176.

Lindblom, Charles. The Science Of 'Muddling Through', in Public Administration Review, Vol. 19,
        pp. 79–88, 1959.

McKelvey, Richard, and Norman Schofield. 1986. "Structural Instability of the Core." Journal of
        Mathematical Economics, 15: 179-98.

McCubbins, M. D., R. G. Noll, and B. R. Weingast (McNollgast). 1987. Administrative Procedures as
        Instruments of Political Control. Journal of Law, Economics, and Organization. 3: 243–77.

McCubbins, M. D., R. G. Noll, and B. R. Weingast (McNollgast). 1989. Structure and Process, Politics
        and Policy: Administrative Arrangements and the Political Control of Agencies. Virginia Law
        Review 75: 431–82

Mises, Ludwig von. 1944 [1983]. Bureaucracy. Libertarian Press, Inc.: Grove City, PA.

Niskanen, William. Bureaucracy and Representative Government. Chicago: Aldine-Atherton. 1971.

North, Douglass C. and Barry R. Weingast (1989) "Constitutions and Commitment: The Evolution of Institutions Governing Public Choice in Seventeenth-Century England," Journal of Economic History, 49, 803-832.

Olson, Mancur, Jr. 1982. The Rise and Decline of Nations. New Haven: Yale University Press.

Pasour, E.C. 1996. "Pigou, Coase, Common Law, and Environmental Policy: Implications of the Calculation Debate." Public Choice. 87(3/4): 243-258.

Persson, Torsten, Gerard Roland, and Tabellini. (1997). "Separation of Powers and Political Accountability." The Quarterly Journal of Economics (1997) 112 (4): 1163-1202.

Pigou, Arthur C. 1920. The Economics of Welfare. London: MacMillan and Company.

Plekhanov, Alexander (2007) "Endogenous Corruption in a Federation," The B.E. Journal of Economic Analysis & Policy, 7(1): #20.

Plott, Charles. 1967. A Notion of Equilibrium and Its Possibility under Majority Rule. American Economic Review, 57: 787-806.

Riker, William. "Implications from the Disequilibrium of Majority Rule for the Study of Institutions," American Political Science Review, Vol. 774, No. 2 (June 1980), pp. 432-446

Riker, William. 1982. Liberalism against Populism: A Confrontation between the Theory of Democracy and the Theory of Social Choice. San Francisco: Freeman.

Samuelson, Paul. (1954). "The Pure Theory of Public Expenditure". Review of Economics and Statistics 36 (4): 387–389

Sandmo, Agnar. 1980. "Anomaly and Stability in the Theory of Externalities." Quarterly Journal of Economics. 94(4): 799-807.

Schumpeter, Joseph A. Capitalism, Socialism, and Democracy. New York: Harper.

Shepsle, K. A. (1986). "Institutional equilibrium and equilibrium institutions." Political science: the science of politics. H. Weisenberg. New York, Agathon Press.

Shepsle, Kenneth, and Barry Weingast. 1984. "Political Solutions to Market Problems." American Political Science Review, 78: 417-434.

Slutsky, Steven. 1977. A Voting Model for the Allocation of Public Goods: Existence of an Equilibrium. Journal of Economic Theory. 14(2): 299-325.

Smith, Adam. 1776. An Inquiry Into the Nature and Causes of the Wealth of Nations. London: Methuen and Co., Ltd., ed. Edwin Cannan, 1904. Fifth edition.

Simpson, A. W. Brian. 1996. "'Coase v. Pigou' Reexamined." The Journal of Legal Studies, Vol. 25, No. 1 (Jan., 1996), pp. 53-97.

Slutsky, Steven. 1977. "A Voting Model for the Allocation of Public Goods: Existence of an Equilibrium." Journal of Economic Theory. 14(2): 299-325.

Sobel, Joel. "Information Control in the Principal-Agent Problem," International Economic Review, Vol. 34, No. 2 (May, 1993), pp. 259-269.

Stigler, George J. 1975. "The Economists' Traditional Theory of the Economic Functions of the State," The Citizen and the State: Essays on Regulation. University of Chicago Press.

Tiebout, C. (1956), "A Pure Theory of Local Expenditures", Journal of Political Economy 64 (5): 416– 424

Warsh, David. 2006. Knowledge and the Wealth of Nations: A Story of Economic Discovery. New York: W.W. Norton.

Weimer, David L. and Aidan R. Vining. 2004. Policy Analysis: Concepts and Practice. Fourth edition. Upper Saddle River, NJ : Pearson Prentice Hall.

Winder, Simon. 2010. Germania: In Wayward Pursuit of the Germans and Their History.   New York: Farrar, Straus and Giroux.