PART II

Consequences of State Interference and Non-interference

Chaper IV

Microsoft vs Netscape—Policy for Dynamic Models

Anti-trust and Intellectual Property Rights Revisited

The current version has benefited from comments by participants in a seminar at the Ecole Polytechnique, Paris, May 21, 1997, organized by Petros Kavassalis; also a session at Global Networking '97, Calgary, June 15-18, 1997. I particularly appreciate insights from three discussants, Dieter Elixmann, WIK; Laurent Caby, CNET; and Christian Licoppe, CNET. More generally, this paper is a successor to a work presented at the Schumpeter Society meeting a year earlier, Stockholm, June 2–5, 1996. I especially thank Don Lamberton and Gunnar Eliasson for exhaustive reviews, including comments from two anonymous reviewers which Don arranged.

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"And so we have people here, engineers here [at the World Wide Web Consortium/W3C], who have been forming the Web for a long time, and they keep in the back of their minds the **long-term vision**, the long-term **goals of a clean architecture**, of making decisions now which won't hamper us tomorrow for the things that we haven't even dreamed of yet, but still making sure that the Web will be able to encompass them."

"There is this enormous market, which follows from the interoperability and common standards firstly, and secondly—sort of ironically but appropriately—by the tremendous **competition** there is to try **to put extensions on top**, to produce the smartest way of **leveraging the common standards**."

Tim Berners-Lee [2]

"This is unprecedented, but we realized we need to work together [with Netscape] for the **common good**. We decided we should not propose separate standards for privacy software."

David Fester, Microsoft, June '97 [1]

Netscape goes back to the trenches as it revives the browser war: Remember the browser war? Well, it's back with a vengeance. ...[B]y officially reviving **hostilities with Microsoft** last week, Netscape ... [has begun] a new assault on the ... market.

Steve Lohr, reporter, New York Times, August '97 [3]

1 New York Times, June 12, 1997, p D1.
2 As quoted in Web Week, Vol 2 (1996), No 11 (August 5), p 45. For the purposes here, it is useful to have a record of recent industry history; Web Week [the name has subsequently changed to Internet World] serves as one excellent chronology.
3 New York Times, August 25, 1997, p D7.

Abstract

Traditional static approaches to competition policy are coming under increasing scrutiny in dynamic technology markets. Beginning with the face-off between Microsoft and Netscape, the torrent of innovation which is the 'Net and the Web yields a model to capture the essential dynamics. Simple at its core, the novel model unfolds to the natural richness of the evolving Web (with, among others, flexible industry structure, an information 'product' distinct from the industry behavior which creates it, variety and commonality as part and whole, shared protocols to guide process, and a working definition for "openness"). Inference derives from industry and technology cases, throughout. Now with a template in hand to describe the evolutionary scenario, anti-trust and intellectual property rights can begin to be retooled, to suit the dynamics of change. At stake are productivity and a society's standard of living.

The Internet and Web, in the last few years, have been party to one of the more surprising runs in the annals of innovation. Sustained innovation—and with that the prospect for long-term productivity increase—lie at the root of a society's capacity to improve its standard of living. Development of the 'Net and Web carries encapsulated within its story a model for industry organization. In this story, the borders that define industry actors shift dynamically, contrary to convention. I suggest this model is pivotal in the remarkable capacity to sustain innovation.

This paper, beginning from the intense commercial conflict particularly between Netscape and Microsoft, goes to some pains to elucidate the embedded industry model. With the model in hand, the question becomes, and the paper turns to, comparisons against prevailing theories and policy prescriptions.

The agenda

Since Microsoft swung its guns onto the Internet in late '95 / beginning '96, there ensued an intense and ferociously fought commercial battle, in the first instance between the upstart wunderkind Netscape and Microsoft the new Goliath. In their public profiles, the two seem to epitomize fundamentally opposed and contending styles of industry organization. Netscape, on its side, seems to carry into the private sector the novel model for industry organization which has propelled the 'Net so far. Microsoft, for its part, has seemed to embody the very extreme for the currently prevailing policy mandate: competitive behavior—to the point finally of crossing irretrievably into anti-competitive territory.

With the first and major part of this paper devoted to elucidate the novel 'Net model for industry organization, the first half of the first part delineates the two opposed approaches Netscape and Microsoft seem to offer. Others, such as Sun, also play a key role. We find this is useful introduction, but a full description of the novel model requires we turn back in time to the story of 'Net development itself. This is the second half of the first part. Here positive description begets normative prescription as well. Sub-sections focus on industry conduct and structure in the model, also on the information "product."

With the novel model in hand, the paper can turn to its briefer second part, to prepare the ground for comparing the new model against prevailing theories and policy. Anti-trust and intellectual property rights policy are both reconsidered.

Part one
A novel model for industry organization

1 Microsoft and Netscape

The Internet and now the Web have been the occasion for a remarkably rapid and sustained run of innovation, even accelerating in recent years. The pace of change is such that 'Web years' has become a common term, where a single calendar year is thought somehow to shoehorn perhaps seven Web years inside. Customers have been noted to lament, "I can't take this much innovation this quickly."[4] The ability to innovate so nimbly lies at the heart of a society's capacity to improve its lot markedly, its standard of living.

Coming upon this scene about two years ago, in late 1995, Bill Gates found that his Microsoft was caught flat-footed. The company's cash flows were tied to desktop computing, but there was a fundamental shift underway, toward networked computing. Remarkably, among many such performances by the man, he turned his leviathan virtually "on a dime" and steamed it off in relentless and vigorous pursuit of the Internet. There quickly arose a most intense opposition.

On the one side, an informal group emerged for whom "anyone but Microsoft" was the rallying cry. This could on occasion include Netscape, Sun, Oracle, Apple, or IBM, along with an entire contingent of the developer community who felt palpable antipathy to the threat of Microsoft hegemony. Microsoft has, by appearances, often seemed alone in its struggle against this opposition. Often, in a given fight, it is the bogey arrayed against one or the other of the informal sometimes-allies. In its efforts to make and keep dominance, Microsoft's behavior has regularly reinforced its isolation, confirming that Microsoft is the company everyone loves-to-hate.

4 Eric Schmidt, now the head of Novell, when he was chief technology officer at Sun, as reported in *Web Week*, Vol 2 (1996), No 4 (April), p 10.

In this opposition, Netscape first carried the standard against Microsoft, with the "browser wars" setting off the tumult—Netscape's Navigator versus Microsoft's Internet Explorer. The antipathy has renewed and continued, across repeated conflicts, including standards for style sheets and later push technology, to name a couple. Over the time, the browser has metamorphosed into a vastly multi-functional groupware client; the conflict which began with clients spread far and wide, to servers and beyond.

In a finish to setting this scene, Sun has lately started to carry the standard against Microsoft. Sun's Java computing—both the Java programming language and the from-the-ground-up operating system / OS based on new Java chips, along with Sun's championing of a Network Computer / NC—squares off directly against Microsoft's prime preserve in the desktop OS. Microsoft, for its part, has demonstrated that it can find partners, certainly among major hardware vendors, beyond those industry actors who simply take comfort behind a Microsoft shield.

1.1 The two provisional models compared

With this as setting, our interest for this paper is the way in which Netscape and Microsoft came, at least initially, to typify two alternatives to industry organization. In the crispest comparison, Netscape promotes inclusiveness for people and ideas, across the industry; Microsoft by contrast maneuvers at all costs to keep control to itself. Related to this, Netscape promotes "open" standards; Microsoft instead aims for what here will be called "vertical integration." These are the ideal characterizations, unmuddied by the reality of actual behavior.

We will see how the first of the contrasts—inclusiveness vs control—regards industry organization, its conduct and structure finally. The second of the contrasts regards the information "product" of industry behavior—the shared (or not-so-shared) conceptual / logical structure that emerges. To introduce this notion, consider an example of contrasting 'information products:' The cross-platform Java language serves as an intermediary layer between server and any of several client platforms, such as PC, Mac or UNIX. The information product

is, in this case, layered. By contrast, ActiveX worked only vertically to connect client and server, that is just within the Microsoft Wintel world, at the outset anyway. (Graphics to depict the contrast are developed from page 116 on.)

Netscape

Netscape actively espoused participation, by individuals across the industry, in the development of innovations. This was particularly in contrast to a Microsoft, characterized as trying to set all the standards by itself. Netscape's public advocacy was in addition to the concrete steps which it took. For instance, Netscape early-on published some of its code, as an invitation to outside input. Now it has made the source code for Navigator available explicitly to encourage input from the whole developer community.

Open standards were certainly a talisman. 'Open' was meant in practice to be the ability to substitute different companies' products for each other. In fact the main symbol for openness became operability across OS platforms, particularly against Microsoft's devotion to Windows by itself.

Microsoft

Microsoft's prowess as competitor—the epitome of the policy ideal—proved almost legendary. Surely, by prevailing standards Microsoft pushed so far that it fell over into being markedly anti-competitive. The story of Microsoft's zeal in pursuit is fascinating. Microsoft seemed to have written the book on cornering a market (for which in this case read 'predation'), then added new wrinkles for good measure. Microsoft seemed massively to deserve its reputation for being devoted entirely to control, against inclusion.

Gates is quoted as saying in December 1995 that he intended to make browsers a "zero-revenue business."[5] By zero-pricing both Microsoft's browser and Microsoft's server, he moved to deny his main competitor, Netscape, revenues in its principal markets. This, when Microsoft had at the time a $2 billion cash hoard, and its upstart competitor depended entirely on its capital financing and the ability to prosecute a few limited markets. And the story certainly did not stop there. Microsoft

5 *Web Week*, Vol 2 (1996), No 15 (October 7), p 19.

made tying deals with sites which provide content. Access to the site would be free, but only to those who used the Microsoft browser, Explorer.

Microsoft also made real an innovation on monopolistic behavior, a theory originally presented in a Silicon Valley white paper.[6] Microsoft levered its high-dominant position in the desktop OS, to overpower competitors in adjacent nascent markets. The company had no more position than did others in the new market, of course. But because of the technical interconnection among markets, Microsoft could use its overwhelming dominance in the mature market to extend its power, above other entrants, into the new market.

Specifically, Microsoft made online services a deal they could not refuse. In return for a place on the dominant Windows desktop, the online services gave Microsoft's Explorer a favored position over Netscape's Navigator. Netscape announced a deal to *be* that favored browser, and one day later was reversed by Microsoft. One by one, each of the online services fell to Microsoft's Explorer—America Online, CompuServe, and so on. With online service interconnected to the desktop, Microsoft dominance in the desktop was irresistible to the online companies, who would control the new use of browsers in their services.

In just the same vein, Microsoft has moved to convert the desktop to a Webtop. The browser interface becomes the desktop, as well. Netscape is doing the same, but its software is a layer on top of the Windows system. Because Microsoft's new Webtop integrates directly into Windows, it will always enjoy some better functionality for Windows users. In this case, interconnection itself, specifically the closer integration, conveys advantage over Netscape, the other entrant to the Webtop. Dominance in the original market, the OS, is not only extended, but reinforced.

Other moves have been subtler. Though Microsoft later concluded that its reputation against public standards bore too great a cost, Microsoft pointedly omitted Netscape from some key, early deliberations over standards-setting, such as regarding push technology. Once again Microsoft proved exclu-

6 Though not formally attributed, said to have been authored by two Stanford economists.

sive, rather than inclusive, even though the new standard would purportedly be open. Or again: When Microsoft finally committed ActiveX to a standards body, the Open Group, it closely controlled the process, seeming to arrange a 'friendly' caretaker, even excluding an alternate body, the Open Management Group.

In perhaps the grandest statement of Microsoft in control, Gates convened a "summit." Held at his palatial new home, still under construction, numerous CEO's of major companies gathered from around the world. To underline the exclusiveness, apparently some companies in a given industry sector were favored, when others were not invited. To bring home that the influence extends beyond just industry, to the highest political realm, the Vice-President of the United States was also in attendance.

Microsoft richly earned its reputation as favoring control over inclusion. Vertical integration, the counterpoint to open standards, is the other element in the comparison with Netscape. What is vertical integration (in information product, *not* traditional vertical integration in industry organization—so, hereafter "*idea*-vertical integration"[7])?

Microsoft *idea*-vertically integrates, as an example, by tying to its existing—"legacy"—desktop Windows OS. The move to a Webtop, described above, is a case. The new Webtop interface, because it is more tightly integrated, helps to preserve Microsoft's position in its legacy desktop software and so reinforces it. Another example is preservation of Microsoft's legacy object model, Object Linking and Embedding / OLE, which it developed for Windows. Other industry members moved toward the Common Object Request Broker Architec-

7 The reader naturally associates vertical integration with industry organization, not with the present topic of information product (and industry organization is also a key topic in this paper, which increases the potential for confusion—indeed, later in the paper a similarity emerges to *connect* idea- and organization- integration). But the notion of vertical integration suits the information product phenomenon too aptly to be substituted with something else less descriptive, even if a substitute would not so directly conflict. To help distinguish the two uses of the notion, between information product and industry organization, the balance of this paper uses '*idea*-vertical integration.' More rigorous attention to the particulars of information (and communication) in the economy, as Don Lamberton encourages, will likely lead to other similar distinctions. [See for instance Lamberton's "Information : pieces, batches or flows?" Stirling: Loasby Conference, 1997.]

ture / CORBA and its Internet InterORB Protocol / IIOP. But Microsoft fought fiercely to sustain its old OLE technology by extending it to network play, cloaked there as the Distributed Common Object Model / DCOM.

Before leaving the direct comparison of Microsoft and Netscape, we should note a point that will presage later discussion. While Microsoft has used zero-pricing in classic predatory fashion, Netscape made a point early-on also to give away some of its software, mainly to students (and now has been forced by Microsoft's zero-pricing to make the Netscape browser free, too).

Not revealed by either case, however, is a more basic phenomenon. The server software, Apache, which continues to dominate the Web—its share is on the order of three times that for either Netscape's or Microsoft's servers—is freeware. The motivation behind *this* zero price is, however, essentially opposite to Microsoft's. The freeware tradition (a tradition strong in the university world of Netscape's origins) makes code available to build a better system, and with it a better community. The emphasis is on the community of reference and its better future (not on a positive price for one or the other of the community members).

1.2 Summarizing ... with conflicting straws in the wind

The comparisons and contrasts, so far, are clear. Netscape champions inclusion, which is paired with open standards / cross-platform interoperability. Microsoft epitomizes the opposite with its lust for control and exclusion, which is paired with a penchant for vertical integration.

But Sun, demonstrably on the Netscape side, has pursued exactly the same course as Microsoft—vertical integration—for its Java language. To keep Java "100% pure," Sun has tried tightly to control the standardization process, among others submitting Java to the unaccustomed International Standards Organization / ISO. Vertical integration, and control, apparently have their place on the opposite, 'Netscape' side of the contrast, too.

Beyond that, not just Microsoft but also Netscape has broken the mold of a standard, previously committed, to extend capabilities in a proprietary way. Both, as an early for instance, wrote proprietary tags to extend Hypertext Markup Language / HTML.

How do we understand the conclusions to be drawn? Netscape we characterized as bringing the style (without specifying what that was) which earlier had served the 'Net so well. The contrast between Netscape and Microsoft might, it seems we could hope, illuminate what makes for the remarkable success with innovation. But the comparison, though it will prove useful, encounters the two inconsistencies just above.

We can resolve these contradictions, and also build on the contrasts, if we move beyond the essentially static characterizations in the comparison so far—if for instance we incorporate the dynamics behind both the Netscape and Microsoft proprietary extensions to HTML. The process by which the 'Net originally developed seems to offer such a dynamic model. We now (re)turn to it.

In preparation, what in summary can we conclude so far about the results of the opposition that set Microsoft and the Netscape / Sun / allies coalition against each other?

In fact, Microsoft is now seen as innovative, when previously it was taken more to be a copycat. The competition seems to have been effective in that regard. (Microsoft has also embraced the standards process, for instance with the fourth largest contingent pre-registered for a recent Internet Engineering Task Force / IETF meeting. It has even grown more cross-platform, with for instance one of the largest Mac developer teams outside of Apple. But many doubt the motivations behind both the standards and the cross-platform work. And the cross-platform implementations often do not perform nearly as well as on Windows. Nor is it uncommon to find Netscape lambasted for contravening its own public rhetoric to be open.)

The competition may have worked; the consensus, however, failed. Despite fleeting occasions for agreement (as captured for instance in one of the opening quotations), long-

running feuds continue to separate Microsoft particularly from Netscape and Sun, some of the cases being those above.

2 The IETF—a dynamic model

The history of the 'Net now covers several decades. We focus on the recent period of accelerating innovations.

The ongoing flow of innovations in the 'Net is constructed from a simple building block. For each innovation, the 'Net community first generates, then incorporates the new idea. This simple, though dynamic, building block—a cycle between first innovation, then standardization[8]—is repeated for each new step.

In the first half of the cycle, a new idea generates, which may spur other new ideas on the same topic. These new possibilities must be tried out, in a competition with each other—they must be tested for their usefulness.[9] After a period of trial, the mode switches to the second half of the cycle. Now the new possibilities must be winnowed, perhaps melded with each other, to find a 'best' composite.

In the first—innovation—phase of the cycle, the community devolves to its individual elements. Each competes with the other to produce the best innovation. In the second—standardization—phase, the group re-assembles to sort the trial results and reach consensus on a new, perhaps melded, stan-

8 Petros Kavassalis has developed a set of ideas focused on just the same phenomena. A recent paper with Richard Solomon, for instance, discusses an iteration between fragmentation and convergence (which specific phenomena we will see in industry structure), "Mr Schumpeter on the telephone : patterns of technical change in the telecommunications industry before and after the Internet," in *Communications & Strategies*, 1997, No 26 (2nd quarter), p 371. There are earlier papers on the subject from Kavassalis. See also my "Telecommunications policy between innovation and standardization : the evolving network." Sophia-Antipolis, France: Ninth Biennial ITS Conference, 1992.

9 Gunnar Eliasson has particularly emphasized the 'experimental economy.' His policy conclusions differ a bit from those here, but the work is parallel in some other key respects. Among his several contributions on the subject, for a discussion of experimentation that parallels the innovation phase here, see his "Commentary" on "Gateway technologies and the evolutionary dynamics of network industries : lessons from electricity supply history," by David, P A & Bunn, J A, in *Evolving technology and market structure : studies in Schumpeterian economics*, by Heertje, A & Perlman, M (eds). Ann Arbor: University of Michigan Press, 1990, pp 157–163.

dard for the best future system. With its committees and chair structure, the Internet Engineering Task Force / IETF forms a loose hierarchy to reach consensus (however the idea of hierarchy may contravene 'Net ideology).

Thus Netscape's inclusiveness is appropriate, indeed fundamental, to consensus for the standardization phase. But the hierarchy does take control over the outcome. Though Microsoft failed to situate control in appropriate hands, control is necessary, as we saw also with Sun and its Java. And Microsoft's fierce competitiveness is essential to the innovation phase.

Thus is innovation both generated and incorporated. In fact the cycle is a necessity—here we come to the normative. Network technology must interconnect[10], and this drives the result. An innovation by its nature breaks the connection; for interconnection to be re-established, the innovation *must* eventually be resolved into a new, interconnecting standard.

We can test this, with results from the opposition between Microsoft and Netscape, Sun et al. As noted in the summary above, competition produced more innovation from Microsoft; but consensus failed. The test of our normative proposition is whether failed consensus retarded the uptake of innovation [implicitly, but nonetheless from the opening lines of the paper, the objective function in this dynamic model is successful adoption of innovation[11]]—did the failure to agree around successive new standards prevent new uses which might otherwise emerge? Decidedly.

For instance, developers regularly report that they avoid new technology which they would otherwise choose, because Microsoft and Netscape have failed to agree on a standard approach. Instead a developer will use an existing lower common denominator, avoiding investment in more interesting technology because it is of uncertain future.

10 Computing, in contrast to networked computing, is an intermediate case, one where there is some interconnection—externalities—but where strict interconnection is not a necessity. Though not dealt with in this discussion, the case is included elsewhere.

11 This relatively straightforward objective function creates a basis to introduce the model, which is the purpose of this paper. In other discussion, the real complexity of (technical) change in human affairs—certainly, limits on the rate of desirable change—takes due place.

One news report even attributes multi-millions of dollars of loss to the failure of consensus, in this case the choice between the two distributed object models, DCOM and CORBA. Lacking a clear industry choice, the Union Bank of Switzerland, or UBS, was unable to deploy an intranet application related to its role as a clearing-house. Without the application, the bank loses $10 million *a day*—and a delay of even a calendar quarter is about a hundred days, or the vicinity of a billion dollars.[12] [13]

With this dynamic cycle there are two points of inflection. *First*, in the shift to the innovation phase, the cloak of hierarchy falls away and the industry actors assert their individual positions; thought turns from consensus standards to new possibilities; consensus shifts to competition.

Thus we see, through this dynamic lens, how both Microsoft and Netscape served the cycle when they extended the HTML standard with proprietary tags.

Second, in the shift *back* to the standardization phase,[14] focus moves from individual ideas and individual betterment to concern for the best technology that will suit the group; the roles and rules for conduct in the loose IETF hierarchy once again become the harness; competition shifts to consensus.

These essential dynamics distinguish this model; they convey its power both to explain and to guide. The two points of inflection are of course captured by the two opening quotes from Tim Berners-Lee, one of the originators of the Web. Likewise, the two parallel quotes from the Microsoft-Netscape saga chronicle the two points of turn—perhaps largely unbeknownst but nonetheless, Netscape and Microsoft vivify the dynamic 'Net model, despite an imbalance with too little consensus between them. (Both pairs of quotes are presented in the reverse order: shift to standardization, *then* to innovation.)

We should also notice that a zero price philosophy profoundly undergirds the proceedings. A torrent of innovation has been necessary to fuel the development of the 'Net and

12 Inter@ctive Week, Vol 4 (1997), No 11 (April 14), p 47.

13 Almost a year later as the stand-off between DCOM and CORBA continues to fester, the effect is sufficiently debilitating across the entire industry that Intel has undertaken to negotiate a 'middleware' middle ground between the warring sides. See *InfoWorld*, Vol 20 (1998), No 9 (March 2), pp 1, 3.

14 Petros Kavassalis has spoken of "creative accumulation," ibid.

Web. Hackers make their code freely available for the purpose. Their interest is a better 'Net. As an example, we have already seen the case of Apache freeware for servers. This underlines the shift at the second inflection point: the community and its larger interests become the object of the consensus decision, instead of individual gain from (positive) prices.

Finally, we turn to the conflict over generic top level domain / gTLD names, to illustrate a last feature of the model. The IETF undertook to expand the number of gTLD's, such as .com, also to change the regime for assigning names. To assemble the necessary consensus, it consulted and brought into the process a large number of actors. This included several parties not ordinarily thought of as participants. Despite this, both the United States Government and the European Commission expressed public dissatisfaction with the process and outcome.

The purpose of this case is to illustrate the expansion of the community. Though the IETF is vastly inclusive, it is finally, of course, only a sub-community within a larger group. It is a (loose) hierarchy nested within a larger (loose) hierarchy—in fact I will use 'nest' rather than 'hierarchy,' to signify the loose / tight flexibility of the bonds. In the gTLD case, the boundary would expand to bring inside those who had previously been outside (or two groups may merge to form a new encompassing entity). Then the group's implicit groundrules—such as for handling disagreement, and for assembling consensus—are no longer shared among all parties.

The routine shifts between individual and group, which are characteristic of the cycle, also amount to an expansion and contraction. But they take place within a given group, and so with an implicitly shared set of behavioral protocols across the cycle. In the expansion of the group itself, however, the groundrules become indeterminate. Groundrules from the original group collide with different groundrules held by those outside the group. A new set of shared groundrules may eventually emerge, for the merged sub-groups, but there is a "law of the jungle" in the interregnum. Dissatisfactions, such as with the new gTLD's and with the process surrounding them, are a symptom.

To summarize the model: At its core is a simple repeated iteration, between innovation and standardization. The behavioral and social implications may seem less simple. Individuals or individual firms, promoting new ideas, repeatedly alternate temporally with loose hierarchies of these same individuals, now harnessed to the work of the larger community with pursuit of individual gain momentarily submerged. In this dynamic characterization of industry, borders repeatedly shift in response to the on-going cycle between fragmentation and (re-)coalescence. Expansion of the community engaged in the cycle unsettles the shared social protocols, which are the glue holding together the process in the first place.

The foregoing is the model I see embedded within the development of the 'Net, now Web. This dynamic model has been pivotal, I suggest, in the extraordinary flow of innovations, successfully implemented. Besides the evidence of success, the model is self-confirming, through its internal normative logic.

Now we can turn to the implications for industry structure and conduct; also to the raison d'être for the cycle, its output, namely, the 'information product.'

2.1 Industry organization: model structure and conduct

What are the implications for industry organization, both model structure and model conduct?

Conduct (individual and group)

Industry participants are expected to interleave two opposite behaviors temporally—competition, then consensus, and repeatedly. First, in the *innovation phase* of the cycle, classic competition is essential to bring out and test the best new ideas. As noted, Microsoft's competitive fervor, at least, is some sort of ideal.

Second, in the *standardization phase*, the opposite behavior is required. A constellation of behaviors make up a consensus. In a shift away from the individual and self-aggrandizement—just for this phase of the cycle, of course—the focus turns to a better 'Net and improving the lot of the group as a

whole. This means an openness to new ideas from others—access for them—to enable the best result. So Netscape's advocacy for inclusiveness is fundamental. To sift and meld contesting innovations into the best standard requires that each participant take an allotted part in the standards-making loose hierarchy. An implicit set of group groundrules guides the behavior in the hierarchy.[15] As evident from the standards process, there is a conscious choosing of the best outcome.

With shared protocols across the group, at some level each member also engages in evolving forward the shared visions of the 'good' 'Net, the shared groundrules, and the shared objectives overall.

Structure

Mimicking an accordion, the oscillating musical instrument, the dynamic industry structure alternately fragments to its atoms, for the competition among new ideas; then re-gels into the loose hierarchy—the nest—for consensus around a new standard. This virtual industry organization is, at one point, disparate individual and corporate actors; then at a later point, it becomes a loose group, transcending the individual and corporate borders and linking them inside a larger common, if loose, border—borders are dynamic in the model.

Perhaps the single constant is the sharing of behavioral protocols, the groundrules, across the whole group.

What of the notion of 'openness'? Does everyday usage of the word denote and intend the intricacies of the foregoing dynamics? Is this what industry participants mean when they say 'open'? A recent example offers some evidence. Objections heard during Apple's forced end to Macintosh cloning seem clearly to plead for the importance of a community of protagonists, if the Macintosh platform is to have any hope. More than the ability to substitute one company's machine for another (certainly more than cross-platform operability), the sentiments expressed seem to recognize the primacy of an 'inclusive community.' There was no reference to the detail gyrations used here to analyze the basic cycle, but there seems to

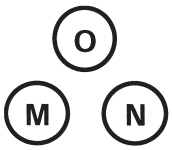
15 Sometimes the groundrules are even explicit, such as in FAQ´s about acceptable behavior for IETF newcomers.

be deep recognition of the competitive/cooperative tension essential to a vibrant, ongoing enterprise of improvement.

The dynamic structure—graphically

To represent the dynamic model graphically, imagine a three-company industry, say, Microsoft, Netscape and one other. In the innovation phase, the three actors are disparate.

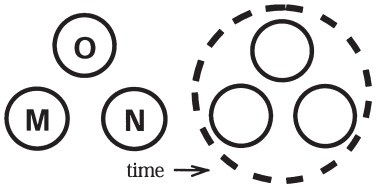
Figure 1



The innovation phase [industry structure]

For the shift to the standardization phase, the three assemble into a loose hierarchy.

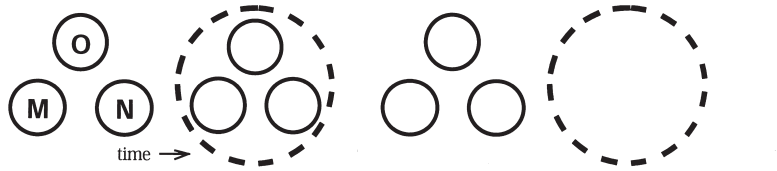
Figure 2



The cycle, innovation *to* standardization

For the *next* cycle of innovation and standardization, the two phases repeat, and so on with each cycle.

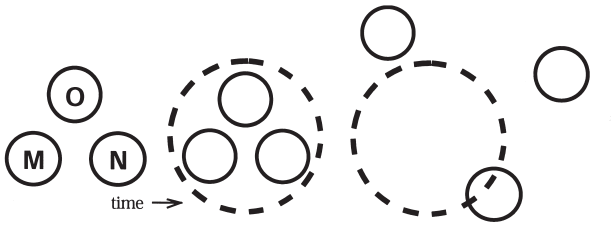
Figure 3



The cycle, repeating

To visualize the expansion of community, the case of gTLD's for instance, we start from the two steps in the basic innovation and standardization cycle, in other words we build from Figure 2. For expansion of community, there is effectively a third step, to bring in those who do not ordinarily participate.

Figure 4



The expansion of community: Three levels

2.2 Information product

A shared view—the information product—is a key result from a group's interaction. Each person has a different experience of the world, and so sees phenomena of concern with an eye that has some privileged access. Information is a confection that arises as the experiences of separate individuals are mingled together. Nor can the mingling be avoided; even the frameworks for thought—the categories into which raw perceptions are fitted—are a legacy of those who have come be-

fore. The raw input is individual, but the resultant—information—is conjoint. Done right, the joint result is stronger, taking advantage of each person's different access to the real world.

Of course a 'strong' information end product is the whole point of the dynamic alternations in the model, specifically the model conduct and structure just reviewed—it is the whole reason to foment and support this complex ritual across time.

Open standards versus *idea*-vertical integration were the two extremes in Netscape against Microsoft. These two templates for an information product implicitly argued, one for looser integration among the logical parts, the other for tighter integration. Choosing where to fall between the two determines the number of points at which new variety may be introduced—*idea*-vertical integration offers fewer points, and open layering more points. (See the graphics immediately below.)

In fact neither open standards nor *idea*-vertical integration proved to be a naturally correct choice. This is despite the rhetoric for openness (not to be confused with inclusion).[16] A fundamental thrust of this paper, of course, is to deconstruct the architecture of the information product from the industry behaviors which produce it.

For an example that 'open or vertical' (in information product) is a choice and not normative, we saw how the-usually-castigated integration was in fact important for Sun with Java. Beyond that, both penalties and benefits have accrued to *both* ends of the loose / tight scale in logical structure; for example:

- Tighter integration—*idea*-vertical integration—could serve badly. We have seen already that Microsoft fought to keep

16 There is a pivotal case for the view that 'open or vertical' (again, in logical structure, not in organization) is a choice, and not dictated normatively: that is the case in which vertical integration in logical structure is *not* incompatible with inclusion for industry organization. The original Apple model for 'cloning' its Macintosh was such a case. That Apple model carefully balanced inputs from multiple industry participants with protection for the Mac's hardware / software integration, a key to the Mac's appeal. Though Apple's cloning model has now failed, in fact was not ever fully implemented, it appears clear that the reasons for failure were other than the practicability of the model. This test case will have to be a discussion for another occasion, however.

its old Windows-based component architecture, OLE, though OLE is pretty widely seen not to rival even closely a "modern" alternative, such as OpenDoc. In fact, the Microsoft juggernaut helped to kill OpenDoc. Outdated but vertically protected technology stopped a (much) better new alternative.

- Or, vertical integration could serve well. Sun's Java was a case. The Microsoft Webtop we also saw to be such a case, where closer integration meant better performance. The same holds for ActiveX performance, because it is integrated with Windows. The hardware/software integrated Mac is one of the most obvious cases.
- Open standards may offer benefits. The PC/Wintel open hardware platform, with many more points at which variety may be introduced, has allowed the rapid introduction of some innovations.
- Or, open standards may perform less well. Microsoft struggles to keep a *vertically*-integrated software OS (Windows), in part as a response to the great difficulty presented by so many variations in the *open* hardware PC platform! Slow performance by cross-platform Java is another case.

As these (implicitly 2x2) cells suggest, one of the trade-offs is between the performance which *idea*-vertical integration may bring as against opportunity for more innovation at more entry points with the opposite. In turn, the degree to which the performance of a given technology benefits from *idea*-vertical integration—the "system-ness" of the technology, we might say—becomes a parameter. This just sketches the complexity of the choice.

Where to land on the choices between open and vertical logical structure, including when and how to shift the mix, is one of the most important decisions. It is high on the agenda of the consensus decision-taking in the second phase of the cycle.

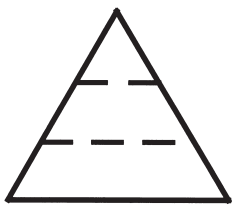
Both industry organization and its information product become looser or tighter hierarchies, with variety nested at lower levels. For the industry organization, that is in the con-

catenated communities and sub-communities into which the group fragments and alternately rejoins. For the information product, that is the looser or tighter logical structures, and the greater or lesser variety enabled. It is this which brings the model, and its analysis, real complexity.

Since industry organization and its information product are both looser / tighter hierarchies, both can be described by the same analytic graphics. The above graphic which portrays the *dynamics* (see Figure 4 on page 117, the fullest, three-stage diagram) effectively illustrates the concatenation of variety at levels in the *organizational* 'nests.' Earlier, or disaggregated, stages display variety which subsequently is subsumed at later, or higher, stages (for a given cycle). (And now we can also notice that only the relevant variety is subsumed into a new standard; other variety continues to persist at the disaggregated layer.)

If we switch to a more typical *static* view, the layering of variety in *an information product* will be more obviously on display. Here I use the convention that a pyramid may represent a [static] hierarchy. To convert from the dynamic stages in the graphic above to a static pyramid, each of the three stages above becomes a layer in a pyramided stack. Each stage is a successively higher aggregation, across time. To convert to the static view, and so omit a time dimension, the first stage above becomes the foundation layer, the second stage / aggregation the second layer, and so on (with the largest aggregation converting, perhaps unintuitively, to the narrowest layer).

Figure 5



Looser/tighter hierarchy: Static view

For the information product, looser coupling among the layers—'open layering'—allows more points at which new variety may be introduced. Tighter coupling—*idea*-vertical integration—offers fewer points.

Figure 6a
Open layering

Figure 6b
Idea-vertical integration

Open vs vertical and access for innovation

In fact, both the dynamic and the static graphics characterize *both* loose / tight hierarchies (notwithstanding that one or the other graphic fits more closely our predilections for organization or for its information product)—this because dynamic or static, both describe the same thing analytically, only from different views. A single analytic device characterizes industry organization and its information product.

To summarize overall: A key function of the industry organizational dynamics is to choose an information product. Analytically, both the organizational dynamics and the information product entail the same interplay between whole and part, as a central feature. When viewed dynamically [for organization], across time the interplay between whole and part juxtaposes variety, the trace left by innovation, against commonalties necessary for a standard (other variety continues to persist at 'lower' levels in the nest). When viewed as a static slice across the time stream [for information product], we can choose the relative number of points at which the variety from innovation may enter, as against performance of the technology system.

Part two
Theory and policy

3 The model and prevailing theory

How does this new model comport with prevailing views? The bluntest comparison is with neoclassical views. There is also one observation about evolutionary economics. The notes below intend just to prepare the ground for a comparison.

3.1 Comparisons with the neoclassical viewpoint

The neoclassical position is founded on the individual, and individual action. This new model treats the individual in a community. The neoclassical position is wary at best of social ties, particularly the threat that group power may overwhelm individual choice. The new model celebrates social ties—for the 'better' shared information;[17] but underlying that, for the power of social ties[18] to lift joint performance.[19]

But to say, as I do above, that "the community and its larger interests become the object of the consensus decision" invites neoclassical exasperation at defining the 'community interest.'[20] Thoughtful neoclassicists have created the lively litera-

17 Though, stalwart neoclassicists also appreciate shared information. I am indebted to Don Lamberton for bringing to my attention Kenneth Arrow on the subject ("Some ordinalist-utilitarian notes on Rawls's Theory of justice," in *The Journal of Philosophy*, Vol 70 (1973), No 9 (May), pp 245–263). A phrase from Don's note to me captures it most succinctly: Arrow especially applauds Rawls's Theory of Justice for arguing the "importance of the 'natural complementarity' amongst people because no one has all information." The Austrian school also takes the assembly of shared information as a major departure. Perhaps ironically, the view is commonly considered staunchly conservative, with laissez faire producing an "autonomous, decentralized, non-bureaucratic information system." The seminal work is Friedrich A Hayek, *The road to serfdom*, Chicago: University of Chicago Press, 1944. (My appreciation to Marcellus Snow for his guidance about the Austrian school.)

18 Hierarchy is of course one element in the Coase / Williamson school of work.

19 For instance in the case above, re objections to the forced end of Macintosh cloning.

ture on [not] comparing preferences; but the shared notion of community seeks an analytic approach which will be fashioned anew, expressly for the purpose.

The prospect for group dominance is more than a threat—the news headlines daily remind us of human nature. But humans operate in groups—exclusively in groups. Virtually all our proudest achievements have depended in *some* way on group ties. Certainly, today's complex innovations depend intimately on close human interaction, and always a mix of the push and the pull. Economics is a science of aggregates—it seems appropriate to try and incorporate that most fateful of aggregates, the human group. To deal explicitly with the *power* of the group is essential. That is why the shared ethic of group behavior—here, the mandates around industry conduct and structure—plays a central role in this thinking. The embedded power-sharing is carefully balanced. Other power outcomes are possible, even prevalent; but if we are to grasp the essence, we had better start with the productive form.

An adequate characterization in this model becomes a little complex, to represent experience with some fidelity—but it is no more complex than the daily reality of all economic activity. And the IETF process for developing the 'Net indulges this complexity with stunning results—and seeming effortlessly!

What are the "primitive" assumptions, the bedrock? The objective function is speed and quality of innovations incorporated.[21] Does the model falter, if this is suspended? A more sophisticated treatment, for another occasion, would make more explicit the group evolution of objective function.

Will the model extend to non-networked industries? Though hardly a question for this paper, I believe we can look to another question and its answer: Will the quintessential network industry, telecommunications, become a 'normal' industry? Yes—in that the 'normal' industries will prove to have the characteristics essential to *network* industries when group dynamics are incorporated into the analysis.[22]

20 My balance between individual and community is of course not collectivism. Though not for this paper, I have in other places scrupulously worked out nominal group phenomena in terms of individual action.

3.2 Evolutionary economics and the selection environment

This paper is of course implicitly in the tradition of evolutionary economics. Though a bit self-reflective, there is one observation.

Defining the selection environment is an interesting question. The new model makes it even more interesting. Once group choice is recognized, what may previously have been seen *as* a selection environment can shape itself proactively, both the human and tool-based environments.

4 Policy

Network—for which currently read telecommunications—policy is headed massively in the direction of competition. This model is clear about an alternation between competition and consensus (with no diminution of the importance of competition, [though competition in the model focuses among ideas, not commodities]).

In the model, a group "picks winners," to which those who eschew industrial policy would object strenuously. The key point, however, is that the correct layer of 'private government' is identified to do the 'picking'—in the 'Net case, that is the IETF 'layer.' The conceptualization as concatenated hierarchy, or nest, provides new tools for identifying who / what layer appropriately chooses. Rather than a blunt divide between government and private sector, there is a gradation of levels each of which has a distinctive sphere of competence.

Anti-trust and intellectual property rights are two policy areas where the impact of the new model is particularly plain.

21 However, see footnote 11.

22 Further to be noted: It is not uncommon to equate standards with neoclassical scale economies. The notion of scale is often taken in a narrow sense, distilled essentially to a continuing decline in costs. Because the standards phenomenon is multi-faceted, certainly involving organization among others (as described), I have not chosen to invoke neoclassical scale as a descriptor.

4.1 Anti-trust

The root proposition for anti-trust holds that corporate size must not be allowed to become dominant. Otherwise in this view, size will be used to disadvantage other actors (with deleterious effect economically). This proceeds, of course, from neoclassical protection for the individual and freedom of movement. In contrast the model here, which has produced such successful innovation, holds that it is crucial to use the power of the group—not just of some large company, but of the entire group. But the point is to use that power productively.

Lying behind these contrasting models seem to be two divergent conceptions of human nature. One extols self-interest, even avarice; the other sees self-interest set in the social context. In fact, the protocols into which we are socialized may emphasize one outcome or the other—what we get is to some extent what we preach and ask for. Evidence in the cases above makes clear that both outcomes are possible, interestingly even within the same US culture.

How does the model modify traditional anti-trust? Two basic differences are worth inspection, alongside the many details.

First, the concern in the model is not size, but behavior. The model relies on relatively sophisticated social protocols, which allow for fluid transversal of the cycle, between self-interest and shared objectives, repeatedly. How is a "spoiler" handled, the actor who transgresses the protocol?[23] The Amish in the US for instance use 'shunning'—the exclusion of the offender from usual social perquisites—and so do all social groups, in one way or another. (Recent treatment of Saddam Hussein in Iraq is just another example.) That illustrates the role of informal social processes, over the relative formality of judicial systems.

Does size matter? Yes, both in that the power of the whole group is needed for successful outcomes *and* in that the atomized individual actor is also cherished for the creativity of un-

23 For a more detailed treatment of this and other previous topics here, see my "Beyond competition : where are we in the dialog about policy for telecommunications?" in Lamberton, D (ed), *Beyond competition*. Amsterdam: Elsevier, 1995.

fettered impulse. Perhaps most to the point, the joining of ideas, not the joining of people into relatively inflexible 'merged' organizations, is the objective. The creativity of the smaller group, with equal ability temporarily to join others when indicated, is the model of course.

Second, the focal scenario is dynamic, not the static conception of a relatively frozen 'market.' The furor between Microsoft and the US Department of Justice, over whether the browser Internet Explorer is part of Windows 95, amply illustrates. Object-oriented software design only recapitulates the juxtaposition between part and whole, which we have seen underlies useful understanding of organization and of *idea*-vertical integration.[24] Explorer, as an accumulation of objects 'in' Windows, is a part which is to be understood relative to a whole. Only when we take a dynamic view do we see that it may be *both* a separate part and part of the whole, depending on where we are in the basic organizational cycle.

Rather than caught in a conundrum which serves really no useful purpose, trying to parse Explorer re Windows in a static world,[25] we might take a dynamic view, which instead gives a framework to take sensible steps. Then we can bend ourselves to the real, hard work of sorting out choices for the Explorer / Windows information product (among others), between vertical and open.

Practice

What are the practical implications for policy? A quite significant change is indicated, obviously. An 'ideal,' up-and-working new regime is one topic; requirements for transition is another.

A new regime requires (quite) different institutions. Rather than an approach in which compliance is forced from outside, by some policing agency such as the US Department of Justice or other competition authority, the outcomes depend on internalized protocols of conduct. The pivotal institutions are the loose hierarchies, such as the IETF. In fact, a given hierarchy

24 I am grateful to John Markoff for reminding me of the object-oriented design. See for instance his *New York Times* article, March 2, 1998, p D5.

25 Or the equally hollow conundrum: Microsoft is a predating monopolist, but sets [bad] standards that are necessary.

or group must be able to find common ground with other such groups; that means that even looser aggregations, at 'higher' levels, finally extend up to what we ordinarily think of as government (so the 'expansion of community,' earlier, is actually necessary for coherence across a society—a topic touched again below). Early socialization is the real source of the behavioral outcomes which are the focus of a dynamic approach.

Are there difficulties deciding whether a given behavior is a 'good' consensus or an abuse of the group's power? Of course. (Schisms internationally over how to treat Saddam Hussein are also a useful illustration of such problems in more informal systems.) Do our present anti-trust regimes also fail to stop predation? The answer seems decidedly to be yes. The question is which process can work effectively.

From the cases above, it is clear that the new model can work remarkably well. All social groups come equipped with internal policing mechanisms, in some form. Gunnar Eliasson has suggested an encapsulation: that in this policy we do not allow "predation of the family." That is the succinct summary, I think (with thanks to Gunnar). Then we ask about our ability to mobilize those devices, when the participants may start from (very) different cultures, in a globalizing world.

Transition is another large topic. Ultimately, the emphasis has to be on early socialization. Immediately, there would be acute problems with the 'spoilers' who already have huge positions and have no intention of abandoning their style. 'Shunning' in this case could take very large proportions, such as not buying from internal company units which were not allowed the freedoms endemic to the innovation phase of the cycle,[26] even removing offending magnates.

The implications are too blasphemous, generally, to be considered—except that we are addicted to the success of just such a policy model for the dynamics of innovation. Are the policy dictates too fanciful to be taken seriously?

26 An extreme case would be an (unacceptably unfreed) internal unit which sells a popular OS. Then the 'shun' would entail shifting to purchase an alternate OS, rather than buying from that unit—with all the profound economic ramifications.

Constantly shifting organizational borders are hard to square with notions about firm identity, for instance. Consider the 'social architecture' which underlies the experience each of us has every day (and also underlies the analysis of the model, above). We are each members of several different 'groups'—family, work, play, perhaps religion and so forth. For any group we have membership in a widening set of concentric circles, with the bonds looser as the circle widens—at work, for instance, the most intent links are typically with the work group, but there may also be affiliation with a division, the company, even the industry. (The axes through the centers of *each set* of concentric circles—family, work and so forth—may overlap to some extent, but they will also be significantly orthogonal.)

Many times during the day, for any of the several groups, each person first exercises judgment based on membership in a circle of given scope (the work group, say), then may immediately shift to consider a question for a wider or narrower circle (the industry, for instance). Daily experience reproduces constantly shifting borders, our preconceptions notwithstanding.

Actually to sanction the power of the group, then to manage that informally rather than through strict rule-based procedures, seems to ignore, even threatens to trample cherished icons in our (Western) ideology. In the Asian financial crisis the regime in Indonesia has been held up as illustrating the excesses of 'crony capitalism,' when the Indonesian constitution enshrines the family as a model for economic policy-making.[27] With the net wealth of Suharto's ruling family thought to be in the same league as Bill Gates' ($30 billion and beyond), concern about informal mechanisms and about trusting a group's use of power does have to be taken seriously.

The discussion here can only frame a dialog on these two fundamentals, to be taken up later. The arguments favoring the novel model—dramatic productivity enhancements—are clear; it is the concomitants which may give pause. Let's be

27 The 1945 Indonesian Constitution holds that, "The economy shall be organized as a common endeavor based upon the principle of the family system."

plain about the main elements; then we can ask how different they are from actual practice today:

> Some coherence is maintained between 'higher' and 'lower' layers, ultimately throughout a society. Equally, there is opportunity for entry by new—dissenting—ideas. This is the essential, careful tension—coherence and, at the same time, entry for the novel idea—carried forward by agreed social protocols. The protocols are maintained by active 'jawboning,' including shunning for spoilers (those who would spoil the *process*; 'spoiling' a soon-to-be-outmoded idea is indicated of course). Care is taken to distinguish the inclusion of voices with new ideas from the choices to be made about the degree of integration for a given system—including individuals and choosing technology are not to be confused with each other.

Then a Microsoft is expected—not to wrest the control of standards to itself—but to join with the community, bringing its contribution alongside others and taking its part in the choices. For an example (again), the IETF has been remarkably good at keeping the use of power exercised by the group trustworthy. The difficulties arise at the 'higher' layers, where more tenuous ties (with implicitly greater differences at the [submerged] 'lower' layers) make consensus a greater challenge. Despite the intrusion of some hierarchy, this regime seems hard to distinguish from cherished notions of democracy. How different, in the end, is the maintenance of (these procedural) 'informal social protocols' from the evolution of law in formal judicial systems? Which is the more robust? (Steps for an Indonesia which has got off-track will open, hopefully, to the dialog which should be framed here for later.)

4.2 Intellectual property rights

There have recently in the US been two interesting lawsuits about Web content. Both concerned information—Web

pages—that one service had "linked" from another service. In one suit, a group of newspapers objected to their site content being linked by another news service. In the other, Ticketmaster sued Microsoft for linking in a fashion that bypassed Ticketmaster's home page.

We have already seen how the hackers who largely created the 'Net and Web operate with freeware and typically disregard their intellectual property rents. The Web's fundamental, distinguishing quality—its hypertext links, which tie one set of information to another—is orthogonal to the usual tenets of intellectual property rights / IPR.[28] Elements of information, rather than being strictly compartmentalized as to one source or another, are linked, much in the way that individual ideas also connect in human cognition.

That is the parallel with individual thought; if we analogize with the social production of information: The architecture of hyperlinking recapitulates the creation of the information product, where each person's separate ideas may also contribute to a larger, joint whole. In hypertext linking, the loose dependence between whole and part, each upon the other, is perhaps nowhere clearer. The two lawsuits only begin to bring to the surface the inherent conflict between IPR and real world complexities of information which the Web can finally spin.

How does the model impinge on the regime of intellectual property rights? In basic terms, IPR is inflexible relative to the dynamics endemic to the model. Also, the control in IPR is situated with the individual, rather than socially. Finally, the social context essential to innovation is underplayed or missing entirely. IPR does protect the individual's pivotal role in creativity.[29] Can we operate without IPR? John Perry Barlow[30] argues that authors' incomes will actually rise, absent rent-accumulating intermediaries in the distribution chain.

28 For a classic treatment of IPR, see Kenneth Arrow, "Economic welfare and the allocation of resources for inventions," in Nelson, R (ed), *The rate and direction of inventive activity: economic and social factors.* Princeton: Princeton University Press, 1962, pp 602–627.

29 A full treatment of the question is in my "Intellectual property rights : an evolutionary reappraisal," in Lamberton, D (ed), *Communication & trade : essays in honor of Meheroo Jussawalla.* Creskill NJ: Hampton Press, forthcoming.

30 See for instance http: / / www.eff.org / ~barlow.

But more profound are the implications for social and economic organization which arise, once the shortcomings of IPR are confronted. Rather than reward an individual with overflowing rents, for a big 'hit,' benefits would be spread among the entire social group. By raising the basic questions about property itself,[31] the implications for economic organization, for 'making a living,' become fundamental. To pursue a dialog about a future intellectual property rights regime, I believe the focus needs to be on actual practice among those who would espouse the new model: namely, there is *both* attribution (to individual authors) for 'good' ideas *and* a sense of shared ownership of the resultant information product.

> For both theory and policy, a single thread underlies the new model. That is a back-and-forth, a tension, an alternation between order and its opposite, whether we want to call that opposite by the name disorder, chaos, non-structure or use another label. We find this tension throughout. In industry structure: hierarchical form and inchoate atomization alternate to provide both for the stable agreements which are necessary and for the flights of creative fancy which are equally necessary. In industry conduct: fidelity to agreed norms alternates with self-propelled choices for innovative directions. In the underlying, basic cycle—and in its information 'product': the order of standards alternates with a free-form for innovation—the ideas themselves are alternately congealed with the consensus and made fluid for independent, creative thinking.

We might speculate that some order is essential to gain the advantages of its opposite: that innovation flowers when those who would create also have some stable footing from which to launch. That parallels a 'market place' set within a more ordered context or 'level playing field.' However we do speculate, which later we then need test, the implications across both theory and policy are unmistakable.[32]

31 Wherein important classes of real property are, alongside intangibles such as information, also 'both-shared-and-individual.'

One of the most remarkable runs in the annals of innovation has apparently been the product of a novel model for industry organization. With dynamic borders and alternating behaviors, the model stands at some variance from the prevailing views. But it builds, or tries to anyway, faithfully upon the underlying human experience. At stake in our choice of such models are the productivity and standards of living for our societies.

32 A conversation with Bertil Thorngren, during a respite between ITS deliberations and the Calgary conference, brought out how pervasive is the alternation between order and its opposite, particularly as he traced through his prior analysis of the phenomenon in the practicalities of managing an organization.

The Limits of Government

On Policy Competence and Economic Growth

Papers from the Sixth Conference of the International Joseph A Schumpeter Society in Stockholm

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Contents

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The Sixth Biennial Conference of the International Schumpeter Society was held in Stockholm, June 2–5, 1996. The Conference drew a record number of submissions and participants. In all more than 100 papers were presented. This volume, entitled *The limits of government*, is a set of nine essays drawn from some 30 papers presented at the Conference related to the role of government in economic growth. A set of 22 essays have been published seperately in another volume entitled *The microfoundations of economic growth : a Shumpeterian perspective*, by the University of Michigan Press.

The Conference was made possible by a generous grant from the Marcus Wallenberg Foundation for International Scientific Cooperation and from several Swedish corporations. Because of the generosity of the Swedish State Railways (Statens Järnvägar), some sessions were conducted on a conference train between Falun and Stora. Stora, the world's oldest corporation, a mining and forestry firm founded in 1288, hosted the society's General Assembly. We are grateful to the City of Stockholm for the magnificent reception in the City Hall on the opening day. To the members of the Scientific Committee and to the persons who handled local organizing, notably Monica Hamrén, Christina Carlsson, Staffan Laestadius, and Per Storm, we wish to say thanks for a job well done. Finally, we wish to thank Erik Kristow and Wera Nyren for editorial and secretarial services in the preparation of this volume on the role of government.

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Foreword

There is no way to understand how an economy at large behaves without taking a close look at the actors who make it behave. There is no way to understand the agents operating in markets without placing them in the context of the institutions that determine the incentives that pull, and the competition that pushes them in different directions and together co-ordinate all actors into a fairly consistent macro-economic whole. This also means that successful policy-making, whether directed at the macro or micro levels of the economy, demands insights on the part of the policy-maker that go far beyond what mainstream economic theory is capable of providing.

The Sixth Conference of the International Joseph A Schumpeter Society, June 2–5, 1996, in Stockholm was arranged by the Royal Institute of Technology, in collaboration with the City University of Stockholm. The theme of the Conference was "The Microfoundations of Economic Growth." The number of papers submitted and accepted for presentation was larger than ever before. Two volumes from the Conference are therefore being published.[1]

Many interesting and excellent papers presented at the Conference focused on the role of institutions, notably government, in economic growth. The most interesting of these papers are collected in this volume.

Stockholm in February 1998

Gunnar Eliasson
Royal Institute of Technology
President of the Joseph A Schumpeter Society 1995 / 1996

Nils Karlson
President of the City University of Stockholm

1 One volume with the title *The microfoundations of economic growth,* edited by Gunnar Eliasson and Christopher Green with the assistance of Charles McCann, is published by the University of Michigan Press 1998.

Introduction

The State as a Supporter or Disorganizer of the Market Economy

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The limits of government and the consequences of government interference in markets for economic growth are the central themes in this collection of papers from the Sixth Conference of the International Joseph A Schumpeter Society in Stockholm, June 2–5, 1996. Theoretical as well as case-oriented empirical studies are included. When and why does government interference in the market process succeed and when and why does it fail?

For obvious reasons the selected papers do not cover all of this field, but the authors have been asked to revise their papers to fit the overall theme. And with this introduction we are also trying to fill in missing links to the extent possible.

Actors in markets need various forms of support: legal, social and moral. Institutions or infrastructures such as these are part of all functioning market economies and are necessary for economic progress. Even though neglected for years by the economics profession and the growth theorists, their study is a must for anyone with the ambition to understand economic growth. Such institutions can be public or private, including the externalities emanating from the joint actions of all actors in the economy.

Collective infrastructures and other institutions facilitate exchange outside equilibrium (Day 1986) and as such contribute significally to the wealth of nations. But the same infrastructures can also operate as negative externalities and constrain and inhibit important market activities. In a sense all such infrastructures have emerged in response to a demand, government being only one among many market actors initiating the establishment of infrastructures or externalities in the economy. The volume includes several papers suggesting that a reduction of government would benefit the economy, notably in areas where market arbitrage exhibits clear advantages over policy control or regulation in allocating resources, and where policy-makers lack the necessary competence to contribute positively to economic development. The process of the establishment of infrastructures, their composition and the outcome of their influence on the economy, therefore, are an important area of scientific inquiry.

In particular, this volume focuses on the supporting collective institutions of the market processes, including the role of

big government. The selection of papers can be seen as complementary to a first volume from the Stockholm Conference, *The microfoundations of economic growth* (Gunnar Eliasson & Christopher Green (eds), University of Michigan Press, 1998).

One question addressed in this volume is the lack of necessary institutions, and why market incentives and / or government action fail to establish them. This is typically the situation in the formerly planned East European economies. Another question concerns the overestablishment of infrastructures and institutions, notably by government origin, that hinders or even blocks economic progress, i e when the state turns into a disorganizer of the market economy. This is often the case in pronounced welfare economies (Karlson 1993, Karlson 1995, Eliasson 1998).

In the tradition of Joseph Schumpeter, notably his *Capitalism, socialism and democracy* (1942), society is composed of actors and institutions which partly reinforce and partly conflict with each other and the economy at large. This line of reasoning from a theoretical point of view dominates the chapters in Part I of the book: "Theories of state interference."

Democracy, as argued by Richard Day in Chapter I, can be a necessary and efficient institution to resolve and soften social instabilities caused by efficient market behavior. The same institutions, if not properly organized, argues Erik Moberg in Chapter II, may also lead to an excessive expansion of the public sector and long-term economic inefficiency. To make it worse, it may also cause an *institutional* (or political) *lock-in* that is almost impossible to get out of through a democratic process (also see Chapter VI by Reed, Karlson 1993, Eliasson 1986). While the first volume from the 1996 Schumpeter Conference (Eliasson & Green 1998) looked at technological lock-ins, we are here concerned with the incidence of possible parallel institutional lock-ins.

Is there a way out of such an unfortunate situation? How can institutional trimming or creative institutional destruction be organized in the welfare economies of the West? Clas Wihlborg, in Chapter III, discusses the introduction of *enabling law* as one possible institutional innovation that may help distressed welfare economies and East European economies out of their institutional lock-ins. However, it is far from

clear that the necessary incentives and the relevant political competence for such a change are at hand.

While the individual actors in the market can pursue individual gains with a fair probability of success, his or her efforts in the political system (in the political market), as noted by Schumpeter (1942, p 261), are far less likely to contribute to his or her personal well-being. As "a member of an unworkable committee, the committee of the whole nation, and this is why he expends less disciplined effort on mastering a political problem than he expends on a game of bridge … the typical citizen drops down to a lower level of mental performance as soon as he enters the political field."

In fact, it may be far more profitable for the individual to act rationally in the political market by pursuing personal rents offered by vote-seeking politicians, while at the same time optimally allocating his or her income in the real markets for goods and services. If the political system is so organized as to make these two rational individual decisions inconsistent the political process may create strong internal tensions in the economy (Eliasson 1986a,b), which are inflationary and may eventually be socially disruptive. This is in fact very likely to be the case, looking at Moberg's analysis in Chapter II.

While economic theory has conventionally conferred a supervising role of the markets to the government to minimize market failure, the theory has consistently failed to recognize that unique and scarce competence is required for that monitoring. Hence, mistaken identification of market failure and/or inconsequent policy action to correct for politically perceived market failure and/or inconsequent policy action to correct for actual market failure, may result in government failure, most likely on a grander scale than the market failure supposed to have been corrected.

Part II of the book focuses on empirical issues: "Consequences of state interference and non-interference."

Governments can act on the economy in two capacities; (1) *modestly*, by reforming the institutions and circumstances conditioning the behavior of the market actors and (2) *ambitiously* and dangerously, by attempting to influence the actual outcomes of the market processes. Most chapters address "type (1)" policy, as was the design of the Conference. Most evi-

dence, however, is on the outcomes of "type (2)" policies, notably Gørtz (in Chapter VII) who observes the disastrous outcome of "type (2)" policies on a very small economy, and notes that little harm and much good could have been achieved, easily, with more modest "type (1)" policies directed at the micro-economic circumstances.

Both David Allen (Chapter IV) and Jean-Philipe Bonardi and Bertrand Quélin (Chapter V) address the design of market institutions directly. Looking at the fast computer and communications markets Allen shifts policy emphasis away from formal property rights towards anti-trust policy, but he asks for a much more sophisticated policy than current US practice. Bonardi & Quélin are concerned with the design of deregulation. How do you eliminate inefficient rent-seeking behavior in favor of productive, Adam Smith-type competition?

The rent-seeking and monopolizing behavior discussed by Allen and Bonardi & Quélin opens up a vast range of unproductive political activities, not in the least the destructive redistributive policies of democratic parties discussed by Moberg and—in a similar vein—vote-seeking through egalitarian policies.

In Chapter VI Andrew Reed discusses the institutional failures of government in the agricultural sector of Russia. Old, centralist and inefficient ways of doing things persist. In part this is, perhaps paradoxically, caused by Western organizations involved in technical assistance who naturally team up with the old bureaucracy. The result is that proper market institutions do not evolve, at least not at the pace required. The political as well as the market demand for change is too weak.

An example of a more, perhaps extreme, activist approach of state interference is provided, as noted, by Erik Gørtz in Chapter VII in his study of government subsidies to the fishing industry of the Faeroe Islands. The results were, to put it mildly, frightening. On a smaller scale, the same kind of negative consequences of state subsidies occurs in Fredrik Bergström's paper in Chapter IX on government support to corporations in order to increase employment. No positive effects can be identified.

A more optimistic view on this account, however, is provided by Karl Heinrich Oppenländer in Chapter VIII. In his study of equity support to new business start-ups in Germany he concludes that, yes, subsidies may in fact under certain conditions be helpful. Market failure caused by asymmetrical information in investment markets may indeed be a reason for government interference. If modesty pursued as "type (1)" policy aimed at improving micro-market conditions, the risks for significant government failure at the macro level are fairly small.

To summarize, three themes run through the papers of this book: (1) lack of policy-making competence to correct market failure turns into government failure; (2) the critical choice of institutions for good economic performance; and (3) the risk of institutional lock-in. A finger of warning is raised for ambitious "type (2)" policies attempting to control the actual outcomes of the market processes. It seems fair to say that there are strong limits to government interference in markets to successfully promote growth—and other targets as well.

It might be objected, however, that our choice of articles and examples are biased. Selections of articles in social sciences always, to some extent, become political and it may seem as if the selection to be presented here is biased by negative evidence on the role played by government.

First we can say that this is a fairly representative selection of the papers presented at three sessions on Government and institutions at the 1996 Schumpeter Conference. *Second*, there is one good reason for this seemingly negative bias. Schumpeterian-type analytical approaches of course dominated the papers. We, therefore, indirectly avoided having the traditional policy analysis based on intellectually controlled equilibrium models dominate. In such a traditional model analysis the central policy-maker is always in intellectual policy control conveying the idea that he may also be in practical policy control of the economy. In a realistic policy setting he rarely is, so in this sense our selection is both good contrast to traditional analyses and fair. In fact, it highlights the need to formulate better theory of policy analysis that explains the reasons for both policy failure and success, and removes the

impression of a supremely competent and fully informed policy actor in central control.

Democracy as a softener of markets

Richard Day (in Chapter I, "An evolutionary theory of democratic capitalism") provides a useful format for discussing the collection of papers presented in this volume. His analysis begins by arguing that institutions are needed to support dynamic market behavior and the efficient functioning of Adam Smith's coordinating invisible hand. Realistically, institutions evolve in response to a demand for such collective services.

Even though institutions evolve to intermediate activities out of equilibrium, the currently fashionable repertoire of economic theory provides practically no intellectual help in dealing with this important socio-economic problem.

Above all, Day argues, when out of equilibrium adjustments become too rough and/or when the existing institutions are not up to their task of softening the consequences of change for people, "the imbalances spill over into the political system." Government institutions have evolved to deal with those instabilities to preserve a politically orderly economic process. Democracy, Day emphasizes, is a cost-efficient institution to deal with social conflicts caused by economic imbalances.

Even though democracy undoubtedly is an important softener of markets, if inappropriately designed it can cause serious functional problems within the economy.

When and why democracy may run out of control

Erik Moberg (in Chapter II, "The expanding public sector—a threat to democracy?") takes a, from Day, different public-choice-oriented, approach to democracy. He develops a political decision theory of *delegation and instruction*. Constitutional environments, he argues, which favor delegation tend to be presidential ones, with a strong executive power sepa-

rately elected, but also with very independent legislators, as in the US. The instruction-based, parliamentary political system, on the other hand, features strong parties canvassing the market for votes, offering to sell, through formulated programs, favors to special interest groups and minorities, at the expense of the powerless majority.

Moberg's theoretical argument is that the parliamentary-based political agenda of instructions is inherently spendthrift and oriented towards politically engineered redistribution of favors, using the tax system and the public sector as a vehicle. Therein lies an inevitable expansion of the public sector (in percent of total output) in such political regimes. When manipulated extensively parlamentarism easily turns into party dictatorship, but also, Moberg argues, winds up in an over-dimensioned public sector and economic crisis, with no democratically determined exit. The people have democratically imprisoned themselves. The inevitable economic crisis, if sufficiently deep, may resolve the situation, or people will vote with their feet physically and / or economically leaving the country, thereby undermining the tax base of the public sector and forcing economic collapse.

The Moberg view constitutes a serious catch that would make economists and political scientists alike very pessimistic. Is there no nice way out?

Enabling law may break institutional lock-in

Clas Wihlborg (in Chapter III, "The role of enabling and mandatory company law for financial systems efficiency") introduces *enabling law* as an institution that gives parties to an agreement: (1) *freedom* to design contracts to suit their local needs; and (2) *predictability* in the sense that enabling law may be made to dominate other law (old and new) in case of conflict and to guide precedent formation. The first attribute is obtained by allowing the parties to deviate from a standard contract by mutual consent. The second attribute is obtained if the constitution specifies that enabling law dominates mandatory law in case of conflict. This applies also in countries with developed legal systems where mandatory law is used to

achieve other objectives than economic efficiency, for instance pursuing extreme egalitarian objectives.

At a first glance, the two dimensions of enabling law may seem to contradict one another, when they really complement each other. The second attribute was first established in Eliasson, Rybczynski & Wihlborg (1994) as a "means" to overcome the contradictory institutions in formerly planned economies when trying to introduce market regimes. Rather than taking on the impossible task of attempting to specify an entirely new institutional code for the desired market regime, a few dominant principles of enabling law could be introduced as a "constitutionally based" principle to override all earlier and new mandatory legislation that contradicted the new principles and thus enforce new precedent. Legal and institutional predictability would be established. Enabling law in this second sense, hence, offers a way out (Eliasson 1998), not only for socially and politically distressed formerly planned economies, but also for overdimensioned parliamentary welfare regimes bogged down in the marshes of rent-seeking, rational voters. (See Karlson 1993 for an alternative way to escape the lock-in.)

The recent decision (April 1998) passed down by the EU Court imposing the free trade principle in services as well on government provided health insurance and health care provision is an excellent example of enabling law as a "constitutional principle." The Court judgment overrides local (national) mandatory law that restricts the freedom of nationals to shop for health care services across the EU. It (1) raises economic efficiency through removing public monopolies in health care, and (2) introduces consumer sovereignty in a previously government controlled market and, hence, is in every respect a positive measure consistent with the EU principles of economic freedom.

The EU Court decision, Wihlborg observes, runs counter to previous precedent formation. At least in Sweden, it appears, the more detailed and prespecified mandatory law, the more it seems to take precedent over principles of enabling law in higher court decisions.

Enabling law as defined here, hence, can substitute as a constitutional principle that carries certain efficiency characteris-

tics associated with flexibility and predictability. Wihlborg then goes on to illustrate the two laws with examples from finance. His general conclusion is that mandatory law specifying one compulsory "standard-form contract" can never be efficient since the circumstances always vary to the extent that customized contracts are more efficient. Excessive use of detailed mandatory contracts, therefore, typically signal that other objectives than efficiency are pursued by the lawmakers.

The significance of the design of market supporting institutions

David Allen (in Chapter IV, "Microsoft vs Netscape—policy for dynamic models : anti-trust and intellectual property rights revisited") hits the core of the Schumpeter, or rather Austrian, problem when attempting to resolve the balance between innovative activity and the economies of scale emanating from standardization, on the one hand, and to clarify the nature of intellectual property rights in the world of rapidly merging computing and communications industries, on the other.

The neoclassical, and perhaps outdated, standard view is that legal protection should be available to guarantee an incentive rent to the innovator, a standard argument rephrased by Arrow (1962) to mean that efficiency and welfare will perhaps be maximized if R&D is socialized and the results made available free of charge. This view, derived from the standard Walrasian model, disregards the influence on research productivity of the organization and incentives of R&D production. It also sets the stage for R&D, the winner takes all, races.

Allen's view is different. *First*, he observes that in the rapidly changing and complex network of merging computing and communications technology legal property rights may get in the way of innovative change. *Second*, he says, look at the Microsoft-Netscape fracas and Microsoft's predatory behavior as a temporary monopolist. Perhaps the best protection for the innovator Netscape, after all, is protection from the competitor and predator monopolist imposing a standard

that kills the innovator, and locks the industry into an obsolete technology, let us say Esperanto instead of English. But (and *third*), Allen argues, antitrust legislators have little understanding of the dynamics of this industry. They use overly blunt instruments to curb monopolist behavior, and, after all, the industry needs a standard, at least temporarily during a consolidation period, after a solution has been sorted out during an earlier innovation phase. Perhaps even an inferior standard will be better than no standard at all, *provided* it is not allowed to impede innovative progress, to the extent of soon breaking itself up. What can be done? Well, let us look at Allen's argument by looking at the members of a functioning family. To make the family business work the individual members have to behave. You cannot have one family member predate on the other members. They will stop contributing and leave the family. Big is good only as long as big behaves as a member of the family. The complex and rapidly moving computing and communications innovation game requires that the players work together in order not to break up development. They have to follow the norms of well behaved team participation. The delicate team cohesion cannot take a spoiler like Microsoft, aiming for family (market) control, Allen argues. Hence, if the spoiler does not voluntarily behave, antitrust authorities have to use their very blunt second best instruments to contain him.

Can deregulation succeed?

Jean-Philippe Bonardi and **Bertrand Quélin** (in Chapter V, "Regulatory body, rent-seeking and market activities : the case of telecommunications in Europe") study what happens when a formerly regulated market, often a state monopoly, is deregulated, when the government moves out. What conditions are necessary to end the rent-seeking activities and to promote a competitive market?

Focusing on Public Telecommunications Operators in Europe, Bonardi & Quélin observe that deregulation is a slow and complex process. More than ten years after its beginning it has not been completed and rent-seeking activities are still

frequent. The operators possess strong political resources which they devote to various activities aimed at influencing government policies, to get subsidies, to restrict competition etc. Moreover, they are extremely competent when it comes to achieve their ends, due to their direct access to public decisions, lengthy relations with government agencies and informational asymmetries that work to their advantage. The same phenomena can of course be observed in a number of other European industries, i e in rail and air transport, in education, television, health care, etc.

Bonardi & Quélin argue, from a comparative study of German, French and British examples, that deregulation will only be successful, at least among Public Telecommunications Operators, if a specific regulatory body is created that has the power to change the regulatory governance of the sector. Such power, in turn, must be based on (1) freedom of action, i e independence from political authorities, and (2) a clear incentive to favor the entry of competitors into the industry. If not, i e if such a body lacks the required incentives and autonomy, rent-seeking and quasi-monopolies will persist.

There is always a risk, however, they observe, that such an agency may itself turn into a rent-seeker. The way out of the institutional lock-in, hence, creates its own problem.

Institutional failure

Andrew Reed (in Chapter VI, "Russia´s agrarian dilemma : the legacy of an economy *without* innovation, entrepreneurs or market competition") provides an interesting illustration from Russian agriculture of how regulation that restricts the ways to organize production, that reduces economic incentives and that lowers competition, cripples the ability of the formerly planned economy to allocate resources efficiently for sustained long-term economic growth. Understanding this situation has been a perplexing experience for the West, notably its advisors, approaching post-Soviet Russia with the a priori textbook "understanding" that economic infrastructure is lacking. Since it appears not to be lacking in the conven-

tional sense, the problem must lie in lacking institutions, a problem formulation unfamiliar to western advisors.

The main culprit, Reed argues, is the lingering hierarchical (Soviet) tradition of discriminating against alternative, innovative ways of doing things. Since organizations in the West involved in technical assistance typically approach their problem with a centralist, interventionist mind set, they tend to team up with the bureaucracy of the past, rather than to attempt to break it up. The traditional Soviet policy of mobilizing resources for planned growth rather than using resources in an economically efficient way has made the Russian agricultural industry deficient in acquiring new technology and utterly helpless in coping with privatization, new competition and change.

With a system that favored high-cost production of low quality products in large volumes, deregulation produced two expected outcomes; some producers were able to adjust, others not. Those who could adjust increased their profits and could afford to pay high wages. People with relatively high and rising incomes are demanding a high quality and a more varied food that Russian agricultural industry cannot supply. This demand, hence, can only be satisfied through imports. The outcome has been catastrophic for Russian agriculture. Most problematic of all, Reed notes, is the inability of the Russian mind to grasp the concept of an economy with a self-organizing structure.

The evolution of a market economy can be described as a chaotic development with feedback mechanisms that allow agents to make qualitative assessments of alternatives. The "Perestroika" jump started the feedback mechanisms, but the Soviet system had a seriously impaired ability to respond.

Reed also notes the similarities with the European, Brussels-regulated and subsidized agriculture and the Russian dilemma. While Russian agriculture underproduces with no quality variation and little appeal to customers, the West overproduces. In both cases Government has contributed to the inefficient outcome. When Government intervenes in markets with lacking insight and competence, problems are created rather than solved.

Policy failure on a grand scale in a small place

The consequences of policy action are best highlighted when policies are extreme, and the economy is small and simple (two sectors). Such an economy is not robust, and ill-conceived policies typically hit hard and fast. **Erik Gørtz'** story (in Chapter VII, "Private and public expenditures and the Faeroese business cycle") of the policy disaster of the Faeroese islands provides a perfect and very pedagogical setting for the analysis of grand-scale government failure.

During the 1980s the small Faeroese economy was excessively primed by investment subsidies. For some years the investments amounted to 40–50 percent of GDP, practically none of it being filtered by market criteria. Rates of return to investments were driven down far below market interest rates. Since most investments went into one production sector, fishing, or associated public infrastructure, the resulting expansion depleted the stock of fish. This in turn resulted, after some years, in a sudden collapse of both output and the (only) exports of the islands. 25 percent unemployment, an explosion of public debt and the emigration of ten percent of the population followed, the last consequence being already predicted in Moberg's analysis (in Chapter II).

How could such a destructive policy be politically allowed and sustained?

Well, Erik Gørtz concludes, with a fragmented political system, with self-centered rational local politicians, with the absence of political responsibility and without direct economic feed-backs a touch of public-choice analysis would predict the political system's failure.

But the Faeroese problem was not really created by policy, Gørtz continues. It would have happened anyway. It was only made worse by misdirected attempts at macro stabilization, he argues. The real problem was micro-economic and one of institutional design. And understanding that would have suggested much easier solutions.

An example of a fairly successful intervention

Markets fail for several reasons, and the government has a role to play in attempting to remedy such situations. Correcting market failure, however, requires unique competence on the part of the policy-maker, notably a thorough understanding of the dynamics of an experimentally organized market economy (Eliasson 1992). This understanding is not typically present outside the business community, and economic theory guiding policy advisors is grossly inadequate in this context. Hence, government attempts to correct market failure easily lead to significant government failure, if not cautiously and competently administered. We have one fairly successful attempt, and one failure to report on.

Karl Heinrich Oppenländer (in Chapter VIII, "Problems in assisting new business start-ups in Germany") studies the German equity assistance program for new business start-ups. He observes that market failure appears to be characteristic of the venture end of the capital markets, caused primarily by informational asymmetries. He wants to know whether this can be remedied by an equity capital assistance program implemented by the German government.

His conclusion is that, indeed, the program has been valuable in financing new firms and innovations at the micro level in a way that had positive consequences for economic growth. Because the participants had to fulfill certain requirements and provide information about themselves, the informational asymmetries were reduced and thereby also the risk to the lender / investor.

We also have to observe that the German intervention in the markets was very cautious and concerned with remedying a particular situation in the market, not with achieving certain outcomes or social policy ends. The risks for creating macroeconomic disturbances were minimal. While the German policy results appear promising, the Swedish employment-oriented support programs do not fare well in a similar analysis.

Policy failure on a small scale

Fredrik Bergström (in Chapter IX, "Do public capital subsidies to firms increase employment?") is very explicit in his empirical analysis of the two kinds of failures, market and government. Incompetent government action to correct market failure, in fact often seems to result in a much bigger government failure.

Employment support of failing firms, for instance, often results in industrial technological lock-ins. As shown already in Eliasson & Lindberg (1981), it is all right for firms to make significant investment or business mistakes. The economy at large can sustain such mistakes, which are in fact a normal cost for economic learning in a dynamic market economy (Eliasson 1992). The really large, negative macro-economic effects occur when production is allowed to go on in the failed investments. Such sustained failure could not occur in the market, only under a protective government subsidy umbrella. And a democratic political institution will, by its very political charter, be bad at correcting or terminating mistakes (Eliasson 1990, p 285). Carlsson, Bergholm & Lindberg (1981), Carlsson (1983), furthermore, show that it is normally far better for long-term employment to subsidize the most profitable firms, if you have to subsidize at all, and disregard possible direct negative employment effects. The same study also demonstrates that when subsidy support of defunct firms is pushed to the extreme, as in the case of Swedish shipyards during the 1970s, severe negative macro-economic effects can be observed. Bergström observes that the symptoms are very similar in his sample of firms, but that they only constitute a mini-example of the shipyard debacle of the 1970s.

Bergström's case is, however, clear. The Swedish Government, when subsidizing industrial firms, has in fact engaged in a significant government failure under the cover of attempting to correct market mistakes. Subsidies have tended to go to inferior, low productivity firms, reinforcing the negative effects through both creating additional negative productivity effects in the firms receiving subsidies, and holding back investment and growth in other, non supported firms.

In addition, Bergström observes, by engaging in life-supporting measures on obsolete firms, the Government may not only slow growth but also create lock-in effects in obsolete industries and technologies.

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