

Chapter 1

Is Telecommunications Liberalization an Expansionary Process?

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A look across countries and across different economic sectors shows a spreading in the liberalization of previously strictly controlled economic activities. In the U.S., deregulation has expanded *functionally* from one line of business to adjoining ones, such as in transportation from airlines to railroads and then to trucks, or in telecommunications from equipment to long distance service, local transmission, and central office functions. Liberalization has also spread *geographically*. In telecommunications it has moved from the U.S. to the U.K., Japan, and to some extent to continental Europe. In air transportation, too, it proceeded from the U.S. to Britain and Europe. One should note that, in other historical periods, the opposite trends have occurred, and regulation has expanded. In the United States, for example, state railroad regulation led to federal railroad regulation in the 1880s, which in turn spread in the 1920s and 1930s to trucking, buses, and airlines. In financial services, regulation of savings and loan banks expanded to commercial and investment banks and brokerage services. In telecommunications, national telegraph regulation of European countries was extended in the 1850s to international arrangements, and later to telephone service.

This leads to the question why these long-term trends are taking place. Is it a change in *ideology*, in which the Chicago School of Economics follows, e.g., the Fabian Society? Or is it the political *dominance* of one country, which is then reflected in international

8 NOAM

trends of policy? Or is it a dialectic cycle, in which the inevitable shortcomings of any policy lead in time to the adoption of another?

More likely, these factors are the symptoms or catalysts of change rather than its causes. While they all play a role, there is a more structural cause for regulatory change. This force is the instability of interaction. That is, the more interrelated countries and economic activities are, the less likely are there stable solutions to separate policies. And where instabilities exist, they ripple throughout the entire system. It becomes increasingly difficult to control all of the elements in such a complex matrix of interrelations. Ultimately, overarching control over many countries and many economic activities is necessary. And since this power does not exist, or is usually not deemed desirable, regulatory strictness unravels.

The following will provide a simple framework to analyze a regulation in its intersectoral and international dimensions. We start by narrowly defining regulation as the setting, by a regulatory body, of a price vector R for a set of economic activities. A total prohibition is an infinite price; total laissez-faire approach by the state means a vector of market prices; most regulation, however, is somewhere in between and can be viewed as a way of making an economic activity costlier (as in pollution control) or cheaper (as in residential telephone usage). Various interest groups are affected by the setting of these prices, and they seek favorable P s by exercising pressure through the political process.

Where will R be set? This depends on the optimizing function of the regulator. For purposes of the model, it is not necessary to specify this function, except to assume that regulatory behavior is affected by the groups according to their power and stake in the outcome. Let us assume two interest groups A and B , each with with a "political weight" of W_A and W_B . Each group is affected by the regulation R , with the effect E described by $E_i = g_i(R)$. We assume for simplicity that the two groups are impacted differently by regulation, in that one gains from a higher R , while the other loses from it.

$$E'_A \geq 0 \quad E'_B < 0$$

Each group asserts pressure P_i according to that impact E_i , weighted by the group's political weight W_i .

$$P_i = E_i W_i = g_i(R) W_i$$

The various pressures are in equilibrium when

$$P_A + P_B = g_A(R) W_A + g_B(R) W_B = 0$$

which is where the ratio of the benefit functions is equal to the inverse of the political weights of the respective groups.

$$\frac{g_A(R)}{g_B(R)} = - \frac{W_B}{W_A}$$

Since the W_i and g_i are given, we can determine the expected regulation R in such a system as

$$R = h \begin{bmatrix} g_A & w_A \\ g_B & w_B \end{bmatrix}^{-1}$$

We now introduce a second and related economic activity and denote it by 2. This activity affects both A and B in their activity 1. For example, activity 2 could be telephony, which affects telegraphy (activity 1) and two interests affected by it, carriers and users. Similarly, activity 2 could be functionally the same as 1, but exercised in a different political jurisdiction. The demand and supply for one activity tends to be related to the other, either as substitutes or as complements. Hence, in an interrelated world, the politically optimal regulations may be different than for a single activity in an isolated jurisdiction.

$$R_1 = \delta_1 \begin{bmatrix} g_A & w_A & R_2 \\ & & \\ & & \\ g_B & w_B & \end{bmatrix}$$

In most instances, we will encounter a cross elasticity C that is positive,

$$\frac{dR_1 R_2}{dR_2 R_1} = C_1 > 0$$

But in some instances, cross-elasticity of regulation C would be negative. For example, if banking laws are tightened in Italy, they may be lowered in Switzerland, since its banking industry, which benefits from inflows from Italy, would be worse off than before without counterrelaxation. Similarly, if Switzerland lowers the strictness of its banking regulations, Italy may have to tighten up its own to reduce outflow.

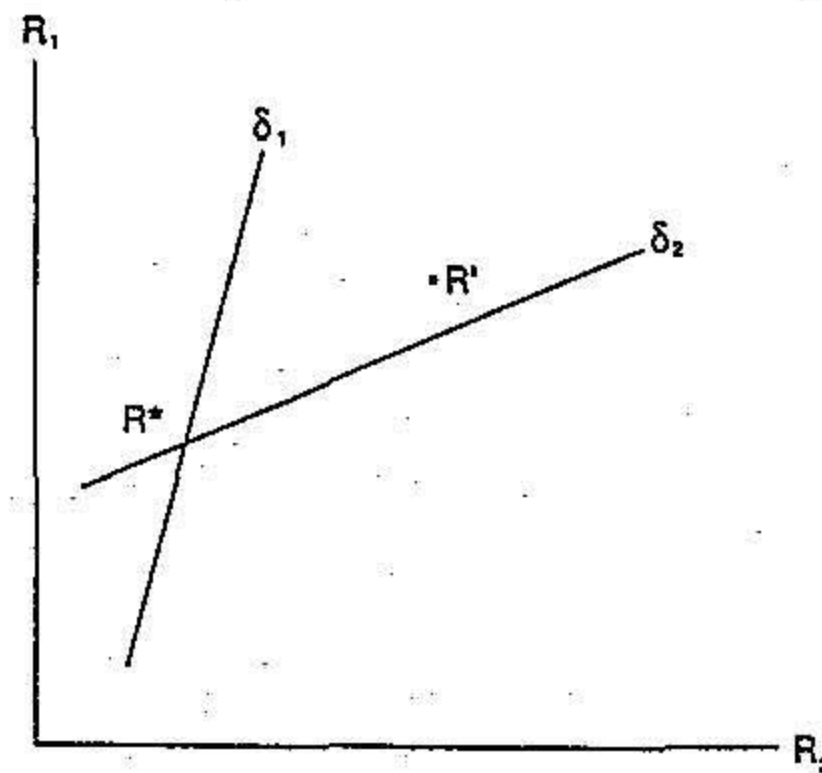
This can lead to instability. As Italy successively tightens up, Switzerland keeps liberalizing.

10 NOAM

An example in telecommunications are transborder data flow protection laws. The less protected data are in one country, the tighter the other may become in response.

Now for activity 2 the same holds true. Here, too, are two interest groups, denoted by C and D, and an effect of R_1 with a cross elasticity of C_2 .

Therefore, we can think of two "reaction functions" f_1 and f_2 which track the response of one regulation to the other's given level.



A point such as R' would denote the two independently set regulatory policies. But once we postulate reactions to each other, there would be a shift to R^* .

$$R^*_1 = (R'_1 \cdot R_2^{C_1}) \exp(1/(1 - C_1 C_2)).$$

Under moderately sized and positive cross-elasticities, there will be an equilibrium point such that regulation will be lower for desirable activities, and higher for undesirable ones.

Examples include: (a) lower telephone rates, if one wants to attract business from the other jurisdiction; (b) stricter local zoning laws, to prevent undesirable activities from spilling in.

There is no need for *coordination* between 1 and 2; and equilibrium can be reached by unilateral actions and reactions.

However, for an equilibrium to exist requires that the reaction functions 1 and 2 are such that 2 is steeper than the inverse of 1 at the point of intersection, i.e., that δ_2 cuts δ_1 from below.

If the reverse is true, then there is no equilibrium, and the regulatory strictness either moves successively higher or lower to corner solutions. Examples include "race to the bottom" in state corporation law in the United States. The reverse is the zoning out of chemical waste dump sites. These are instances of corner solutions. For other configurations of the reaction functions, cyclical change is possible.

Instability raises questions of how to prevent it, and therefore leads to the issue of *policy coordination*. But even in stable situations, R^* may not be the optimal result for either 1 or 2, or for both, and policies may be sought to affect moving from R^* back to R' .

There are several possibilities for such policy coordination:

1. **"Supra"regulation.** This is an encompassing regulation, either across jurisdictions, e.g., a supranational policy, or across functions, i.e., "supramodal." This expands regulation to a *higher* level of institutions, for example to the European Commission, or to a *wider* institution, such as the Interstate Commerce Commission in the U.S., which regulates all modes of surface transportation.

How is supraregulation set? By analogy to the single jurisdiction case, the two sets of interest groups are assumed to affect the joint jurisdiction in an aggregated fashion, if the suprajurisdiction is answerable to the body politic.

$$R_s = f_3 [(P_{1A} + P_{2A}), (P_{1B} + 2_B)]$$

This can be higher or lower than uncoordinated outcomes. Supraregulation is not invariably stricter than particularist regulation, for the reasons discussed above. In telecommunications, for example, the regulatory principles of the European Commission are less strict than those of most of the member states. In the United States, the same holds true for the FCC vis-à-vis the state Public Utility Commissions. But the reverse is also often the case, as for example in the regulation of securities.

One question is why interest groups (or a whole country) would consent to supraregulation. Would this not dilute the power of dominant groups? This is indeed true. Therefore, a dominant group will normally consent to a shift to supraregulation only where its favored policy would be enhanced, e.g., if the balance of power of interest groups in the other sector is even more favorable to its concerns. However, for symmetrical reasons, the dominant group in the other sector would then oppose supraregulation lest it dilute its own influence. Lag rolling aside, this then leaves as the primary reasons for mutual joining of supraregulation two cases: (a) when the balance of power is essentially equal in the two sectors, so that supraregulation does not make much difference. This is why policy coordination is easier among Western European countries than, for example, East Asian ones. And, more importantly, (b) when supraregulation establishes a *policy cartel* to avoid separate regulation to affect each other and to lead to results that are considered suboptimal by the dominant groups. This is more likely to be important where the cross-

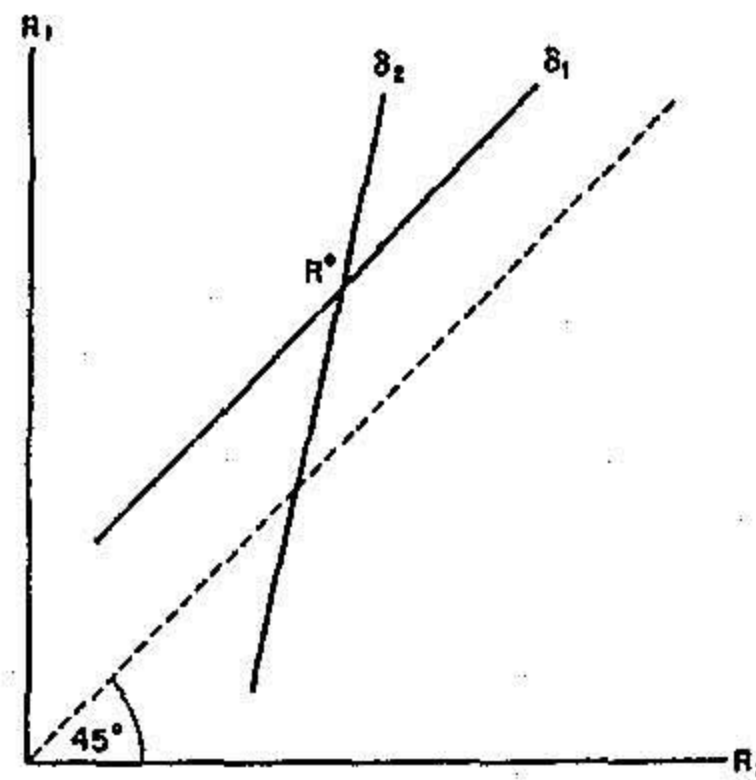
12 NOAM

elasticity of regulation is high, which is likely to be the case with sectors or countries that interact strongly with each other.

In other words, the advantage of the elimination of uncontrolled interaction must be greater than the value attributed to control and independence. Of course, *de facto* independence already had been lost through the mechanism of interaction, and supraregulation reflects this.

A related issue is that of uniformity in regulation. Here, the issue is not the strictness per se, but the importance of being identical. There are situations where efficiencies exist in uniformity or connectivity. The width of railroad gauge or protocols in telecommunications are examples.

Technologists tend to favor standardization. Economists have more mixed views, because uniformity has its costs. To have cars with identical pollution controls in both Australia and Japan may not necessarily be optimal for either or for both jointly.



In terms of the model, uniformity is given by the 45° line, which is likely to be off the equilibrium point R^* . Uniformity is the dominant policy throughout if at least one reaction functions is sloped at 45°, i.e., where at least one jurisdiction reacts to the other's change by an identical change so as to preserve uniformity. But that is an exceptional situation.

There may be great incentives for one state to be nonuniform. Examples include large countries for whom international interaction may be small in relative terms, such as the United States, which, e.g., affords a nonmetric system of measurements. At the same time, many other examples are small countries, or states: Switzerland in banking; Delaware in corporation law; Hong-Kong in tariff duties; Liechtenstein in taxes; Monaco in gambling; Luxembourg in broadcasting. These examples suggest that small countries have incentives to being

nonconforming, probably since the loss in revenue, control, etc. from their own relatively small domestic economies is more than offset by the inflow from the larger countries due to nonconformity. To prevent such nonuniformity, the other states have to impose substantial pressure on the maverick jurisdictions or pay significant compensation.

2. Regulatory Treaties. Another possibility of coordination is to establish interjurisdictional or intersectoral treaties. Here, there is no supraregulation by a suprabody, only an agreement, and, each side must be better off than before to enter into it. Agreement will stop at the point where marginal benefits of marginal regulation will begin to be negative for at least one jurisdiction. Thus, such a system is a convoy travelling at the speed of its slowest ship. It can be extended further where compensation to some participants is possible, which is one of the ways the European Community operates in the agricultural field.

3. Regulatory Colonialism. An extreme example for regulatory coordination could be called *regulatory colonialism*, when one jurisdiction can set regulations for another jurisdiction solely to benefit itself. Britain's imposition of regulations on cotton spinning in India or on opium trade in China are examples. Other illustrations include American railroads imposing regulations on trucking using the Interstate Commerce Commission, or America broadcasters successfully pressuring the FCC to restrict cable television for a number of years. The model can describe the regulatory outcome for such a situation.

Instability

The problem of any coordinated regulatory structure is its instability. First, there may be no equilibrium possible, because the reaction functions do not meet the stability criterion described above. Second, one jurisdiction's adherence to an agreement provides the other with an opportunity of gain by seeking a noncooperative policy. In each jurisdiction there are pressures to seek one's own ideal regulatory level, which is likely to be different from the agreed upon level or from the interactive equilibrium. Going it alone can be due to shortsightedness or lack of understanding of the interaction involved. But it can be based on the rational desire to gain advantages over others by breaking joint policy, at least in the short run.

In telecommunications, for example, communications "havens" are possible and likely to emerge. The example of telex service is instruc-

14 NOAM

tive. In the 1980s, London-based telex bureaus started to retransmit traffic between North America and continental Europe in defiance of CCITT cartel "recommendations" against such retransmission. It was profitable for U.K. firms to break these rules, since this generated more traffic and made the U.K. more attractive as a business location. In time, the cartel rules were held to be illegal.

It is important to recognize that domestic intersectoral instability is linked to international instability in regulation. A matrix describes the set of intersectoral (vertical) and international (horizontal) regulatory cross-elasticities.

$$\begin{array}{c} c_{11}, c_{12}, \dots, c_{1n} \\ c_{21}, c_{22}, \dots, c_{2n} \\ \cdot \\ \cdot \\ \cdot \\ c_{m1}, c_{m2}, \dots, c_{mn} \end{array}$$

Generally, a stable solution is less likely:

1. as the number of jurisdictions (columns) increases.
2. as the number of sectors (rows) increases.
3. when the sectors increasingly overlap (higher vertical cross-elasticities), for example, due to "merging" technology. (Examples: telecommunications, mass media, computers.)
4. when jurisdictions increasingly interrelate (higher horizontal cross-elasticities), for example, due to lower transportation costs.
5. when the relative weight of interest groups in different jurisdictions varies as their economies develop on different trajectories. This can be a self-feeding mechanism, as some countries become specialized in certain sectors.
6. the more the regulatory price set diverges from cost, generating incentives for breaching the set.

These changes lead to unstable situations that affect the entire system. A single inconsistency has multiple secondary effects, which in turn lead to further inconsistencies. At the same time, collaborative regulatory adjustments becomes more difficult, because they cannot be confined to subsectors.

Outlook

Is there anything to stop the process? At some point, the cost of instability and diversity become high enough for a coordinated regime to be reestablished. But this is not likely to be stable over time, especially since no real international enforcement or compensation mechanisms exist, and their absence has domestic reverberations. For example, if international airline cartels break down, domestic ones are threatened. One can fly from Toronto to Vancouver through the United States, if Canadian prices are too high.

Applied to telecommunications, one should therefore expect an overall trend towards liberalization, though accompanied by efforts to stabilize its collaborative aspects. As the matrix of interrelations becomes steadily more cross-elastic, one hence has some oscillations. The overall tendency, in the long term, should lead to reduced regulatory strictness internationally. In that sense, liberalization is an expansionary process. If it is not so much an ideological choice, but as a response to an internal inability to structure a stable equilibrium that serves multiple domestic interests and goals, then one has to predict that similar inconsistencies will spread throughout the system.

Traditional telecommunications operated through national monopolies protected internationally by a cartel arrangement. Now, a challenge to domestic monopolies threatens the international cartel. Conversely, the breakdown in international arrangements threatens domestic stability. It is difficult to see how the simplicity of the traditional system can be maintained or restored. Most likely we are merely at the beginning of a lengthy, dynamic, and untidy process, of which the presently asymmetric liberalization across the two sides of the Atlantic is a manifestation.