Throughout the world, the rail industry has been one of the most heavily regulated sectors. The public utility paradigm of government regulation has failed to handle the central regulatory problem—the mixture of competitive and monopoly elements in supply—and is now being blamed for the poor financial condition of the railroads, for the deterioration of rail plant, for the lack of innovation, and for the mediocre quality of rail services. This Note outlines a set of principles, called constrained market pricing, for regulatory reform in the public interest and considers their implications for railroad restructuring.

Catalyst for new thinking

Contestability theory offers a new, improved set of guidelines for appropriate government intervention in the structure and conduct of firms and industries—including sound criteria for distinguishing between cases in which intervention is warranted and those in which it is not. It focuses increased attention on entry barriers and their defining characteristics. Contestability analysis shows, for example, that high fixed costs and the consequent economies of scale, traditionally considered impediments to entry, need not permit excessive prices or profits or any of the other symptoms usually associated with market power. It is the presence of sunk costs, rather than economies of scale alone, that matters for market performance.

In the rail industry, fixed costs are large because of the infrastructure—track, stations, and the like—that must be provided before any trains can run on a route. Duplicating this infrastructure is generally inefficient, so provision of the physical network is characterized by natural monopoly cost conditions. Because rail infrastructure is of minimal value for other purposes, the fixed costs are largely sunk. These sunk costs of infrastructure create significant entry barriers, especially where there are natural monopoly conditions.

The cost conditions relating to the operation of services on this physical network, on the other hand, may be more consistent with active and potential competition. To operate a service, it is necessary to have trains, staff, support, and rights of way. Although hiring staff and buying or leasing rolling stock inevitably involve some sunk costs, they are small relative to the massive sunk costs of establishing network infrastructure. And most of the cost of locomotives and freight cars might be easily and quickly recovered by rolling them to other markets.

Thus, contestability suggests a modulated approach to regulation. In activities subject to effective competitive pressure from the actual (or potential) supply of substitute services, and in markets in which efficient technology does not require significant sunk costs, traditional regulatory constraints should be avoided and open entry and more flexible pricing permitted. And in markets in which the railroad has significant market power, regulation should constrain the prices and terms of services no more (and no less) than the forces of active or potential competition would in competitive or contestable markets. This theory of contestability, together with other advances in regulatory theory and practice, is the basis for the following three principles for railroad regulation:

- Permit a private sector railroad freedom in pricing and operations in services facing effective competition in the relevant market, whether from other railroads, other transport...
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modes, other origins, other destinations, or other commodities.

- Permit a railroad to set prices that are responsive to differences in demand and in marginal costs and to enter into voluntary contracts with shippers that have individualized terms, conditions, commitments, and compensation mechanisms.
- Permit a railroad to charge “captive shippers,” those over which the railroad has monopoly power, prices that are no higher than the stand-alone costs of the shipper’s service and that do not generate earnings that consistently exceed the railroad’s replacement costs, including a competitive return on capital.

The regulatory challenges

The substantial economies of scale and scope in the railroad industry create several challenges for this regulatory framework. Perhaps the most troubling is the cost allocation problem—the impossibility of allocating, in a nonarbitrary way, a share of fixed and common costs to any one of a railroad’s many activities. There is no way to subdivide those costs in a mechanical fashion that is unique and is founded in economic logic. Historically, regulatory authorities have determined tariffs on the basis of so-called fully distributed costs. Under this method, regulators allocate shared production costs to individual services in terms of some common basis of utilization, such as gross ton-miles.

Fully distributed cost (FDC) pricing suffers from several defects. The most serious one is that it does not necessarily use a causal approach in measuring marginal cost responsibility—taking into account how much costs would increase if more of a particular service were used, or how much they would fall if less of that service were used. Instead, costs are averaged arbitrarily. A further defect of FDC pricing is its neglect of demand data.

Ramsey pricing

FDC pricing frequently “overassigns” or “underassigns” a carrier’s unattributable costs to particular services. If a carrier applied FDC pricing to all its traffic, it would lose the traffic for which demand could not support the price assigned. The remaining shippers would then be saddled with a larger portion of the carrier’s unattributable costs since they would no longer share those costs with the lost traffic.

Ramsey pricing overcomes this problem by apportioning all unattributable fixed and common costs of the railroad among its services on the basis of their demand characteristics. Each service is priced at a markup over marginal cost that is inversely related to the elasticity of demand for that service. Under Ramsey pricing, it is the shortfall between total costs and the revenues that would accrue from pricing each service at its marginal cost that is apportioned on the basis of demand. Ramsey prices therefore deviate from marginal costs only to the extent necessary to provide adequate revenues—they permit the railroad to achieve revenue adequacy with the least sacrifice of economic welfare compared with marginal cost pricing.

Price ceilings—stand-alone cost

A critical issue for efficiency is the criterion used to set the ceiling on rates where there is market dominance. While rate ceilings derived from fully distributed costs are inimical to the public interest, economically rational ceilings can be obtained from the stand-alone costs. This is the cost of serving any captive shipper or group of shippers that benefit from sharing joint and common costs as if the shipper or group were isolated from the railroad’s other customers. The stand-alone cost method finds the theoretically maximum rate that a railroad could levy on shippers without losing its traffic to a hypothetical competing service offered by a hypothetical entrant facing no entry barriers or by a shipper providing service for itself. Thus, the stand-alone cost criterion serves as a surrogate for competition and leads to a simulated competitive price.

The stand-alone cost test does not apply—and cannot be made to apply without disastrous consequences—if railroads are not allowed to abandon unremerenerative facilities or services. Where that freedom is denied, a railroad can-
not earn adequate revenues if its rates on potentially remunerative activities are constrained by stand-alone cost ceilings. For this reason, it is unwise for public policy to limit the freedom of railroads to curtail unremunerative services without providing public funds to help defray the costs of those services.

Options for railway restructuring

The historical model of railway operations is the monolithic organization, where a single entity controls all facilities and operating and administrative functions and determines what services to provide to generally captive markets. The conditions that gave rise to this model no longer exist in most countries, and governments have had to consider a fundamental restructuring of the railway entity and of its relationship with the state. The two main options are vertical separation and competitive access.

Vertical separation

Vertical restructuring options that separate the ownership of facilities from other rail functions, such as train operations and marketing, have recently attracted much favorable attention because they seem to segregate the difficult regulatory problems associated with the largely sunk roadbed costs. If ownership of track and trains is separate—with the track assets held by the government, by a consortium of operators, or by a regulated private entity—there can be vigorous active and potential competition over railway services provided by operators with equal access to the roadbed. This competition would eliminate the need to regulate the operators and give them powerful incentives to provide efficient services that are responsive to the needs of shippers and a growing entrepreneurial economy.

Competitive access

Unlike vertical separation, competitive access permits integrated operations by the rail entity. It implies a requirement that the integrated carrier make its facilities available to other entities on a “fair and equal basis.” If the integrated carrier has strong incentives to keep other entities out, however, it is unclear how effective an equal access mandate is likely to be.

If the integrated carrier is regulated in a way that permits it to charge higher prices to captive shippers the more of their business it has, it would have an incentive to exclude other participants. Similarly, if regulation limits the amount the integrated carrier can earn from the share of service it provides when it does cooperate with other entities, the carrier would have an incentive to undermine or avoid efficient cooperation in order to enlarge its share of the service. The integrated carrier would also have an incentive to exclude an efficient participant if by doing so, the carrier, acting in a predatory manner, could weaken the potential entrant’s ability to compete in another market. Under classic rate-of-return regulation or under a system of regulated “divisions” that specifies what an integrated carrier can earn from an activity in which there is cooperation, an integrated carrier does have incentives to undermine efficient cooperation.

In sharp contrast, under constrained market pricing, an integrated carrier would generally have a real profit motive to cooperate with an efficient participant in its business. Under this system, “divisions” are not specified by regulation—even on service provided to a captive shipper. Instead, the stand-alone cost ceiling applies to the price charged to the shipper, and cooperation with an efficient entity enlarges the pot of returns available from the service, allowing the integrated carrier to earn more money rather than less. Consequently, except for the rare possibility of predation, an integrated carrier would have ordinary business incentives to find and to cooperate with efficient participants in its business and to negotiate mutually beneficial terms with them. This is just a railroad version of “make-or-buy” decisions in other industries.

Despite the incentives for efficient behavior by integrated carriers provided by constrained market pricing, it is useful and wise to augment the system of regulation with a fallback set of standards to apply if disputes about predation through competitive access should arise. These
Separating track assets from operations is likely to be a particularly attractive option where a dense and extensive rail network permits many operators to function, ensuring both active and potential competition. It is also likely to work well where fixed facilities are mature and well developed, limiting the domain of new infrastructure investments, where incentive problems are more likely to arise. Where fixed facilities are not well developed, regulation of the infrastructure entity should permit it to enter into medium- or long-term contracts with shippers or with operators that themselves have contracts with shippers, so that the risks and rewards from investments can be efficiently shared by shippers, operators, and the infrastructure entity. If the infrastructure entity is expected to seek recovery of its replacement costs, it should be permitted and even encouraged to use price discrimination to help bring shippers’ prices into line with principles of Ramsey efficiency.

The competitive access option could also be fraught with problems if the incentives of bottleneck holders are adverse to efficiency and competition. But under rail regulation that focuses on the rates charged to shippers rather than on other prices, such as those charged for access to bottleneck services, incentives generally promote efficient vertical relationships. As a result, if integration is permitted under this system of price regulation, the outcomes are predictably consistent with efficient participation by the integrated carrier and by other, nonintegrated carriers, on terms that permit compensatory support for the efficient participants. Further, prices to shippers can be selected in accordance with Ramsey efficiency, even as they are constrained by regulation where the carrier has monopoly power.

Efficient component pricing and parity pricing are both names that have been given to the principle that an integrated carrier that possesses a “bottleneck”—a facility without which the competitor cannot offer its services—should not refuse an agreement that provides for full compensation of all its costs, including opportunity costs.

Separation versus competitive access

The primary virtue of separation as a policy option is that it may ensure active or potential competition among rail operators or retailers—and efficient selection among them for provision of their services. However, prices are unlikely to be fully Ramsey-efficient for the coverage of replacement costs, because of the difficulties of reflecting the differences in shippers’ demands in the prices charged for infrastructure services. At the same time, separation may create serious coordination problems, loss of economies of scope, and otherwise unnecessary transactions costs. In addition, in thin markets rail operators may not face effective active and potential competition, undermining the potential for realizing the primary benefit of this option.