

Regulation in times of digitalization

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Let's imagine a near-future bus service

- Integrated bus exchanges for state-owned and private buses
- A network of articulated routes, rather than a collection of routes
- Integrated and articulated timetables that are actually followed
- Efficient revenue collection system that reduces incentives to overload, race and deviate from timetables
- Adequate provision of peak and off-peak services
- Thin routes adequately served
- Assured first-bus and last-bus services
- Incentives for quality service

Agenda

- How can regulation contribute?
- What can digitalization contribute?

To gain optimal results (in many cases, any results) from digitalization initiatives, it is necessary to implement them along with “analogue complements” – improvements in institutional arrangements that align with the digitalization actions

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Baldwin, R.: Cave, M. (1999). *Understanding regulation: Theory, strategy and practice*. Oxford: Oxford University Press, p. 2.

Why are scheduled bus services regulated?

- Buses
 - From perspective of potential passenger at bus stop, each bus operator is monopolist
 - Schedules require coordination and enforcement
 - Have network characteristics (not just point-to-point)
 - Involve some choke points (bus exchanges with limited loading platforms)
 - Feast & famine characteristics (too many at peak; too few at off-peak)
 - Thin routes under supplied; thick routes over supplied

Behavioral and structural regulation

- Behavioral regulation seeks to
 - Specify behavior (that is usually against the interests of the actor, but desirable); and
 - Impose sanctions for non-compliance
- Since behavior occurs 24/7/365, continuous monitoring required
 - As this is impractical, random checks, complaint-based enforcement
- Structural regulation seeks to align incentives to desired behavior, reducing, if not eliminating need to monitor
 - Also seeks to generate information for regulation

Balance between behavioral & structural regulation

- Best if we can align the interests of the state and the bus operators through structural regulation
 - More likely to succeed
 - Requires less resources
 - Creates fewer opportunities for corruption and allegations of corruption
- But not possible to eliminate behavioral regulation altogether

A simple illustration: Thin-route problem

- Regulator wishes to ensure that rural areas are served
- Passenger volumes are low, so routes tend to lose money
- Normal remedy (behavioral)
 - Mandate the service; specify penalties for non-compliance; fund through cross subsidies
- What if higher prices are allowed?
 - Cause of non-compliance removed
 - But problem can shift. Operator will run at peak times, but may not run off-peak when revenues are low
 - Also, higher prices for passengers in remote areas likely to attract political opposition as it offends sense of what is fair
- What if least-cost subsidies are offered, either for thin routes and/or for off-peak runs?
 - How to monitor? Behavioral regulation is required

Least-cost subsidy auction

- How do we know what the right subsidy is
 - If we ask the potential recipient of the subsidy, he/she is likely to give too high an answer
- Solution is a least-cost subsidy auction (competition for the market)
 - Specify the task that is required to be performed in as great detail as possible (similar to specifications provided when bidding out civil works)
 - Conduct a fair and transparent auction
 - Award the subsidy to he/she who asks the lowest amount
- Difference from award of a tender for civil works, is that the government does not own the resulting facility or service

Remedy, with substantial structural elements

- Ring fence the subsidized market (thin route)
 - Do not allow operators in non-subsidized markets to participate in auctions
 - Incentive to move buses from thin routes lower, but at cost of having to pay higher subsidies
 - Does not eliminate the likelihood of buses being idled by the roadside to reduce opex
- Disbursements to be triggered by records of operation of first- and last-buses
 - Still the risk exists that these records will be falsified
 - Additional penalty clauses if records false
 - Back to behavioral regulation

Digitalization to improve behavioral regulation

- All buses operating on subsidized thin routes must be equipped with GPS trackers
- A secure and reliable data processing facility that can identify deviations from the mandated timetable & communicate in realtime to the regulator
- License and/or subsidy contract will specify procedure for imposing penalties
 - Following principles of natural justice, decision will be made by
 - An impartial entity (the designated regulator)
 - After giving an opportunity for the operator to explain his behavior
 - Based on the evidence stipulated in the subsidy contract & license (GPS data)

Bus exchange: Possible applications of regulatory & digitalization tools

An efficient bus exchange

- Allows orderly boarding and deboarding of passengers
- Allows for efficient interconnection of services provided on different routes, by same operator or different operators
- Provides ancillary services to passengers and drivers & revenues to exchange operator
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Structural aspects

- Ownership & management of the exchange must be separate from the bus operators
- All bus operators to be treated without discrimination (both with regard to prices and services)
 - Classes of users (operators) to be treated the same, though justified differences may be permitted
- Separate the functions of the regulator and exchange operator, because that would enable regulator to mediate/settle disputes between exchange operator and bus operators
 - Because timetable enforcement is partly regulatory and partly required for efficient operation of exchange, specific coordination mechanisms to be set in place

Behavioral aspects

- Depending on the applicable law (central/provincial), exchange operator may have to be licensed. License conditions may include
 - Non-discrimination within classes and differentiation of classes
 - Specification of services provided to bus operators & passengers and, where applicable, prices
- If adherence to timetable is a license condition, it must be monitored; it is also necessary for efficient operation of the exchange
 - Data on adherence to timetables needed by both entities, by the exchange in realtime

Digitalization aspects

- Scenario 1

- All buses using exchange must be equipped with GPS trackers
- Data received in realtime by exchange, and transmitted as required to regulator
 - Arrival and departure information directly connected to display boards and apps maintained by exchange

- Scenario 2

- Drivers of buses using the exchange can register mobile phones and use apps installed on phones to serve as equivalents of GPS trackers

More applications?

- Do not collect data for the sake of collecting
- Work backward from what problem you are trying to solve
- Always think of analogue complements
- Also think of what could go wrong & devise robust solutions
 - You do not want the exchange paralyzed because of compute glitch