Operating Subsidies in Urban Public Transport … the good, the bad and the ugly

Beijing Jiaotong University – School of Economics and Management, December 8, 2007
Shomik Mehndiratta, World Bank

What is a subsidy?

Theory (based on economic efficiency criterion – Pareto and Hotelling)
- In the absence of externalities, subsidy is defined as long run marginal cost minus price.
- In the presence of negative externalities, subsidy is defined as long run marginal social cost minus price.

Practice (e.g. OECD/WTO)
- Subsidy is a financial contribution by a government, or government-directed organisation, that confers a benefit.
- The definition used by the World Trade Organization (WTO) includes government revenue that is otherwise due is foregone or not collected (e.g. a fiscal incentive such as a tax credits) and also income or price supports.

Motivations – there are different valid motivations, that need differently designed schemes

<table>
<thead>
<tr>
<th>Equity</th>
<th>Providing mobility to all population groups; serving the poor at an affordable price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congestion</td>
<td>Relieving road congestion, particularly that caused by private cars</td>
</tr>
<tr>
<td>Land-use</td>
<td>Encouraging a particular pattern of land-use and urban development</td>
</tr>
<tr>
<td>Environment</td>
<td>Improving the urban environment and (more recently) reducing greenhouse gas emissions</td>
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What makes for a ‘good’ subsidy scheme?

Efficiency
- Productive - cost per unit of output (Rmb/km)
- Administrative - cost of implementation

Effectiveness
- Meeting policy goals - How much of the target group is getting served?
- How much of the subsidy is ‘wasted’ outside target group

Sustainability
- Impact on service - Quality, quantity of service
- Subsequent system impacts
- Impact on government - Overall fiscal impact
- Control over impact

Can not isolate one from others. Well designed scheme reflects appropriate balance.
User subsidies – can be effective but not always efficient or sustainable

- Target specific groups
  - Students
  - Elderly and retired
  - Disabled
  - Military and police
- Harder to target the poor directly

- Too often government imposes responsibility on operator but does not fully pay for them
  - Kunming, other Chinese cities
  - Ulaan Baatar, Mongolia: 70% riders don’t pay
  - Delhi, India: Only SOE honors the passes
  - East Europe e.g. Warsaw

- Service can be impacted
  - Can lead to restricted and poor service
  - Often ‘informal’ or private sector not forced to honor uncompensated concessionary fares
  - Taiyuan, Delhi, Ulaan Baatar

- How pays for the subsidy?
  - Transparent: can be easy to track
  - Government should pay

- Too often government imposes responsibility on operator but does not fully pay for them
  - Kunming, other Chinese cities

- Harder to target the poor directly

- Who pays for the subsidy?
  - Government should pay

- Light rail service

- Lack of coordination between government and operator

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  - Kunming, other Chinese cities

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User subsidies – serving targeted groups

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<tr>
<th>Efficiency</th>
<th>Vale Transporte Brazil: user subsidies for the ‘working poor’</th>
</tr>
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<tbody>
<tr>
<td><strong>Productive efficiency</strong></td>
<td>No significant impact</td>
</tr>
<tr>
<td><strong>Administrative cost</strong></td>
<td>Not very high – IC Cards lowers administrative burden</td>
</tr>
<tr>
<td><strong>Effectiveness</strong></td>
<td>– Targeting valid target groups, but not serving the poor. – When government non-payment results in privates – effectiveness goes down</td>
</tr>
<tr>
<td><strong>Sustainability</strong></td>
<td>– Depends on government – operator relationship and scope of subsidy schemes. Experience suggests that formal contract between government and operator to pay for revenue loss.</td>
</tr>
</tbody>
</table>

Vale Transporte Brazil: user subsidies for the ‘working poor’

- Employer based system started in 1985
  - Employees can choose to join program
  - Receive free work commute tickets every month from employer in exchange for 6% of their earnings
  - Employers expenses on this program are tax-deductible; i.e.
  - Government pays about 35% of the cost in foregone tax revenue

- Participation
  - Un-employed, informal sector workers excluded: 50% of workers are in informal sector
  - Workers with wage rates more than 3 times the minimum wage find it cheaper to buy fares than participate in program

- Impact
  - Substantial black market for reselling ‘free’ tickets
  - Workers walk, carpool, cycle

Vale Transporte – user subsidies for the ‘working poor’

- Efficiency
  - Productive efficiency: No impact
  - Administrative cost: High management cost imposed on employer

- Effectiveness
  - Excludes over 50% of working poor
  - Designed to persuade ‘richer’ households from not benefiting
  - Some poor cash out by reselling tickets

- Sustainability
  - As long as public transport fares remain within means, employers treat this as a labor tax on low cost employees
TransitChek USA: user subsidies for all workers

- Employer based system started in 1985
  - Employers can give employees up to $100/month in tax-free transit
    - $100 transit tickets equivalent to a salary increase of $140
  - Employers expenses on this program are tax-deductible; i.e.
    - Government pays about 30% of the cost in foregone tax revenue

- Participation
  - Unemployed, informal sector workers excluded
  - All workers benefit regardless of income
  - Provides an incentive to potential auto users to stick with public transport

- Impact
  - Black market for reselling ‘free’ tickets
  - Workers walk, carpool, cycle

- Sustainability
  - Employer chooses to participate
  - Government tax loss is capped

TransitChek USA: user subsidies for all workers

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<th>Productive efficiency</th>
<th>No Impact</th>
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<tr>
<td>Administrative cost</td>
<td>Cost imposed on employers – but employer chooses to participate</td>
<td></td>
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</table>
| Effectiveness               | Excludes informal sector and unemployed
  - Includes high income workers
  - Incentive for public transport use |
| Sustainability              | Employer chooses to participate
  - Government tax loss is capped |

Pereira, COLOMBIA. City of ~1M Population

- New BRT system, Megabus
  - Implemented with World Bank loan
  - Open for one year, >100,000 daily riders in ‘demonstration’ corridor
  - Integrated system including feeders

- Operators chosen by competitive tender
- Fares set to cover operator costs
- Cost of buses and operating costs
- Subsidy program (planned)
  - Focused on ‘poor’ eligible for other social assistance
  - Registered IC cards where user pays 33% and city pays rest

- From general revenue, targeted but no control on fiscal impact

Pereira – targeted user subsidy scheme

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<th>Efficiency</th>
<th>Productive efficiency</th>
<th>Competitive franchising</th>
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<tr>
<td>Administrative cost</td>
<td>Linked to existing social security system</td>
<td></td>
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<tr>
<td>Effectiveness</td>
<td>Targeting only the pre-targeted poor</td>
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<td>Sustainability</td>
<td>From general revenue, targeted but no control on fiscal impact</td>
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Fuel subsidy for poor, Chile

- Subsidy to offset fuel price increase nationally
  - Started in 2005
  - Means based eligibility: based on eligibility in other social security programs
  - 2.2 million eligible households; 40% of Chilean households
  - Annual transfer: compensates for higher fuel prices and a 9 months of higher public transport fares
  - Public transport fares allowed to rise with increase in fuel prices
  - 31% increase in fares in 2005/2006

- Aggregate subsidy
  - 2005: US$63 million
  - 2006: US$42 million
  - Some households no longer eligible because of increases in other complementary social programs
  - From general national budget

Fuel subsidy Chile – targeted user subsidy for the poor

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<td></td>
<td>No Impact</td>
<td>Non-trivial cost, though linked to assisting systems</td>
<td>Precise targeting of the poor</td>
<td>Transparent and incremental to other subsidy schemes</td>
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Operator subsidies – easy to administer, politically attractive but efficiency, effectiveness and sustainability are all difficult

- Subsidize operators the difference between fare revenue and cost
  - When ‘cost-recovery’ fares are considered ‘too high’
  - When ‘cost-recovery’ fares rise quickly due to external reasons
  - Low fares to create public transport culture and increase ridership
- Benefits the poor?
  - Poor a small fraction of riders who benefit
  - Many poor don’t use public transport
- Reduces congestion?
  - For riders with a choice of mode, role of price in mode choice consistently rated much less important than quality of service

- Incentives for operator efficiency?
  - Operators can have perverse incentive not to minimize costs
  - Problem particularly severe when union is strong, or entrenched SOE
- Auditing costs very difficult
  - Operators have more information and incentive to cheat
  - Competitive procurement of service is an alternative
- Sustainability
  - Difficult to reverse: low fares easy to introduce, not-so-easy to take away
  - Impact of incentives on productivity
  - Experience suggests there is often impact on quality of service

Operator subsidies – politically easiest but...

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|              | Potentially very serious concern unless competitive mechanisms are introduced | Low – unless there is a focus on ‘auditing costs’ | - Not an effective tool to target the needy
- Often vast share of beneficiaries are middle-class outside targeted groups
- Any negative impact on service quality will deter potential riders | - Difficult (not impossible) to maintain and expand service, and to raise fares when needed |

- Bus and subway system
  - Per capita subsidy
    - 2004 ~ US$0.06/trip
    - 2006 ~ US$0.12/trip
  - Aggregate subsidy
    - 2003: US$173m
    - 2006: US$400m
    - 2–3% of national government fiscal resources
    - Funds managed outside normal budget and financial management system

- Evidence suggests that as time passes, middle-income residents benefit disproportionately

Efficiency

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<td></td>
<td>Competitively procured service – but this program introduced midway through franchises</td>
<td>Low – but increasing concern on financial management issues</td>
<td>-Was effective in keeping public transport afloat at time of crisis -Now middle-income passengers biggest beneficiaries</td>
<td>-High and rising fiscal cost difficult to sustain -Limited funds for service improvement – impact on service</td>
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US Public Transport Programs

- Long history: Federal national highway programs date from early 1800’s
  - Current highway “partnership” between Federal and state governments began in 1916
  - Federal transit program, modeled on Federal highway program, began as a small “loan” and demonstration program in 1965

- Federal Public Transport Subsidies: Began as 66% share, “discretionary” program
  - Main recipient metropolitan public transport authorities
  - Initially focused on public buy-out of failing private enterprises
  - Later financed restoration of systems to good state of repair and expansion

- In early 70’s, big boost in funding (to over $1 billion/yr.), Federal share changed to 80% and formula-allocated program added
  - National allocation to cities on basis of population, population density, Km of fixed guideway transit (rail and bus) and ridership
  - Intent: Improve public transport quality, performance and coverage
  - All costs, capital + operating and maintenance originally eligible

- Impact
  - By 1980, virtually all formula funds were being used to subsidize operators, mostly to offset rising labor costs and reduced fares, not to increase quality and expanded coverage
  - By 1990, operations no longer eligible for subsidies in large cities though major maintenance activities are
  - Total Federal PT assistance currently over $10B/yr

Lessons of US Experience

- Operations subsidies provided to PT operators inevitably create perverse incentives toward labor inefficiency and universal low fares
  - Policies that make the difference (fare policies, labor relations) rightly in local domain regardless of who pays
- Capital subsidies much easier to target to more cost-effective activities that actually promote, not hinder efficiency
US – Federal Transit Program discretionary grants program

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<td>Productive efficiency</td>
<td>SOE monopolies with strong unions. Evidence suggested that most of the subsidy went to labor</td>
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<td>Administrative cost</td>
<td>Low – but no incentives for performance</td>
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<td>Effectiveness</td>
<td>High-income passengers biggest beneficiaries</td>
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<td>Sustainability</td>
<td>High and rising fiscal cost difficult to sustain. Limited funds for service improvement – impact on service</td>
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US – Federal Transit Program discretionary grants program

London – a success story of reform and subsidy

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<tr>
<td>Productive efficiency</td>
<td>Competitively procured service – reduced costs and has provided confidence that city is getting value for money</td>
</tr>
<tr>
<td>Administrative cost</td>
<td>Medium – city needs to build capacity to manage competitive tendering process and monitor operator performance</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>Subsidy post-reform targeted at service improvements leading to increased ridership</td>
</tr>
<tr>
<td>Sustainability</td>
<td>Fares are linked to costs, increase regularly. Competition pricing provides reliable, theoretically appealing source of funds</td>
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London - a success story of reform and subsidy

London – Complex multi-modal PT system

- Phase I: From 1930s until mid-1980’s, run as huge, monolithic monopoly
  - By 1980s, deficits had become unsustainable while service quality was perceived as poor
  - Institutional approach to providing PT reformed in 1986
- Phase II: Institutional reform
  - SOE broken up into a series of private, independent for profit companies on an “area” basis
  - After transition period, service rights in areas opened to competition, with appropriate labor guarantees for former SOE staff
  - Cross subsidies from services in wealthier areas to poorer areas
  - Small subsidies provided on net cost basis
- Phase III: Service quality improvements and funding sources
  - Starting about 2000, Government provided modest amount of capital subsidy to implement “Quality Bus Corridors Program” throughout City
  - Service expanded and fleet renewed
  - Fares among highest in the world
  - Ridership up over 50% since mid-1990s
  - Congestion pricing scheme provides reliable, dedicated revenue stream

London – a success story of reform and subsidy

China – Issues to ponder

- Shanghai – user subsidy experience
  - Workers provided with vouchers
  - Many sold vouchers in grey market
  - Money often used to buy motor scooters
  - Serving the poor?
  - Over 50% of all trips are walking and cycling
- Beijing
  - Bus fares 20 to 40% of Chinese norm for cost recovery
  - Metro fares lowered by a third
  - Operating subsidy ~ CNY600m/year
  - Serving the poor?
  - Impact of lower fare in choice decision for people currently using taxis, cars?
- Relieving congestion?
- Impact of lower fare in choice decision for people currently using taxis, cars?
- Incentives for efficiency?
- Long-term impact on service quality?
Summary

- The question with subsidies often is not whether, but how and what?
- Several design choices exist – is the subsidy having the desired impact?
  - Operator subsidies to keep fare low are not the only option
  - There is a rich experience with successful user side subsidies to target vulnerable groups
  - Subsidies designed to improve service quality can be very effective in attracting riders
- Mechanisms matter
  - Impact of a user subsidy will depend on quality and coverage of existing social security infrastructure
  - Unless there is a mechanism in place to protect efficiency – risk of subsidy going to operator – not to users
  - Competitive procurement can provide discipline for efficiency
  - Easy to administer usually does not equate with efficiency, effectiveness or sustainability