



BALANCING FINANCIAL
SUSTAINABILITY AND AFFORDABILITY
IN PUBLIC TRANSPORT
THE CASE OF BOGOTA, COLOMBIA



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Agenda

I. Subsidies in Public Transit

II. Bogota's Tariff Policy

III. Bogota's Pro-Poor Subsidy Scheme

Subsidies in Public Transit— The Case for Supply and Demand Side Subsidies

- Traditionally, the arguments for public transit subsidies have included the following:
 - reducing the costs of environmental externalities
 - making efficient use of modes with different cost structures
 - taking advantage of user economies of scale (“Mohring effect”)
- But, if transport subsidies are inadequately used and are not accompanied by efficiency incentives, they can lead to “padding of costs”, system inefficiencies, and risks associated with supply-side subsidies (i.e. unsustainable fiscal commitments, difficult exit strategies)
- In a developing country context, the arguments against supply-side subsidies can further be extended by the need to limit fiscal burden and focus subsidies where they are most needed socially
 - Cities should set fares for cost recovery but offer targeted subsidies for specific segments of the population.
 - “First Generation” demand-side subsidy programs (socio-demographic targeting, *vale transporte* and *billete unico in Brazil*, feeder lines/cable cars) do not always reach the target audience and may even have unintended outcomes.

Cost recovery vs sustainability

US FTA experience with operating subsidies

- Impact on productive efficiency – unsustainable
- Neither poor nor service quality benefited

Buenos Aires fares frozen in 2002

- Impact on service quality – unsustainable
- Impact on productive efficiency – unsustainable (1% GDP)
- Most of the subsidy benefits the middle class

Bogota, Brazilian cities

- Cost recovery
- Fare integration— Bogota
- Yet, unaffordable for the poor – particularly the informal sector

London experience

- Competitive concessions to pick operators
- Financing from congestion pricing
- Improvements in service quality – mode choice

Early Experience with Demand-Side Subsidies

	Productive Efficiency	Effectiveness at targeting poor	Sustainability
User groups; elderly, students	No impact	Convenient more than accurate	Does government pay?
Brazil <i>vale transporte</i> for employees	Reduces cost discipline for operators – users don't have stake in costs	Self-selects poor employees with 6% threshold BUT informal workers left out	Some reselling. Labor tax on poor employees
USA TransitChek	No impact	All employees – not poor but mode shift	Government forgoes tax revenue
Pereira “free morning”	No impact	Self-selected	Low fiscal impact
Chile fuel subsidy	No impact	Appropriate but not public transport	No impact
<i>Bilete Unico</i> (SP, Rio, Curitiba) & Integrated Fares Santiago, Bogota	Starting point—organized/rationalized network	Effectively subsidizes transfer for multi-modal trips– low-income groups overwhelmingly benefit, but reinforces sprawl?	Usually high fiscal, if not accompanied by some network rationalization (Curitiba)

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Tariff Policy: Competitive Bidding to Identify Cost Recovery

“Cost Recovery” Principle Formula...



Where, each of these elements (except the public sector administrator costs) are bid out separately:



Trunk & Feeder



Fare Collection



Trust Agent



Local BRT Agency

- Provides public transit services
- Competitive bidding process for trunk and feeder services.

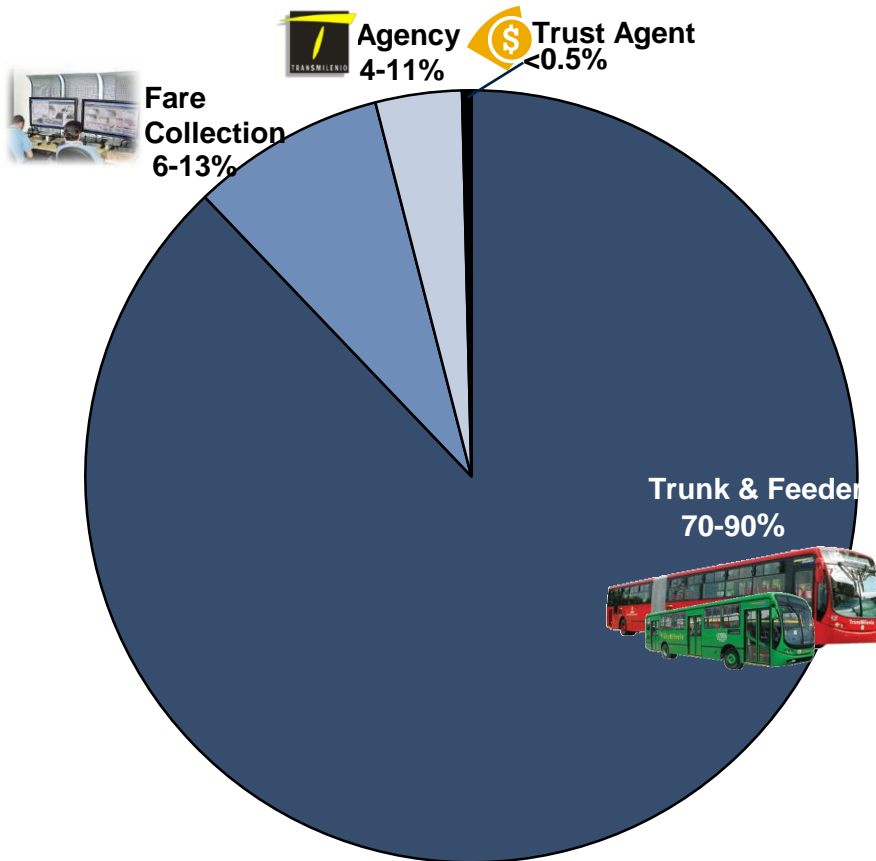
- Automatic fare collection, centralized fleet control/programming
- Competitive bidding process.

- Manages system's resources and pays different agents
- Receives a percentage over total tariff (fare) sales

- System planning and control
- Fixed payment

Tariff Policy: Technical Tariff & User Tariff

“Indicative” Technical Tariff

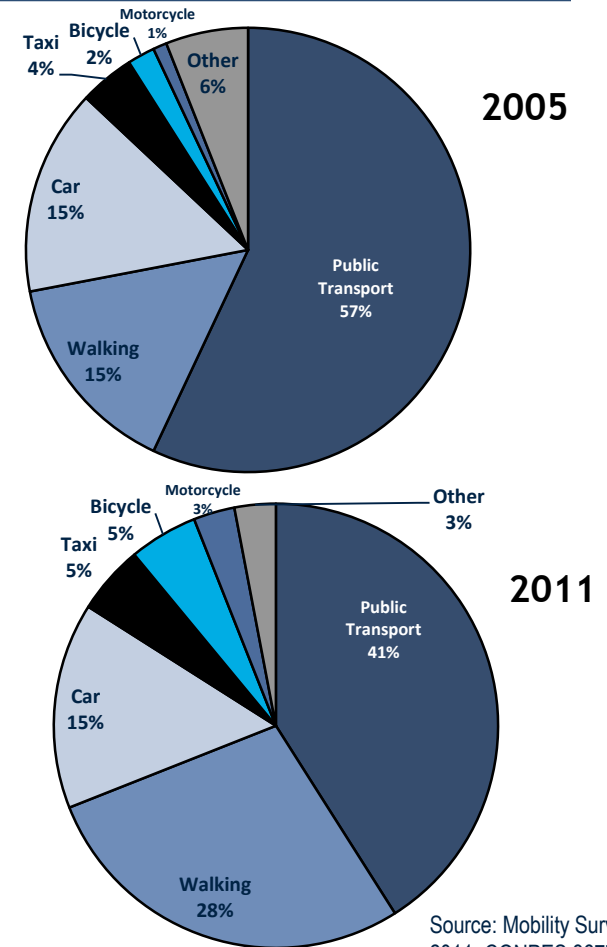


- From “Cost Recovery” Principle, a notional Technical Tariff is calculated to estimate the required average revenue per ticket sold that is needed to guarantee remuneration of all of the system’s service providers
- User Tariff set close to Technical Tariff and determined by decree (Mayor of Bogotá).

“User Experience” worsened by changes in city’s mobility patterns and policies

- Changes in Bogota’s mobility patterns have challenged the assumptions incorporated in the operational design of the SITP
- The city has changed (increased motorization, congestion) and the District has modified key policies that change the assumptions incorporated in the operational design (license plate restriction, infrastructure, bus typology, tariff rates)

Modal Split Bogota, 2005 vs. 2011



Source: Mobility Survey 2011; CONPES 3677

High Quality Ridership Estimates

Benchmarking subsidies in selected Colombian Cities (2014)

Indicador	Barranquilla	Bogota	Bucaramanga	Cali	Medellin	Pereira
BRT Network Length (km)	13.3	112.0	20.1	39.0	18.0	16.15
Projected Daily Demand (pax, from model)	305,000	1,500,000	220,000	441,600	249,200	140,000
Daily Demand (pas)	92,000	2,087,229	133,156	265,000	127,370	92,000
Daily Passengers per KM	6,917.3	18,636.0	6,624.7	6,794.9	7,076.1	5,696.6
A. Daily system income - tickets (USD)	\$ 48,875.00	\$ 1,066,443.57	\$ 68,658.56	\$132,500.00	\$78,298.88	\$48,875.00
B. Technical Tariff (USD)	\$ 0.85	\$ 0.58	\$ 0.54	\$ 0.51	\$0.45	\$0.65
C. User Tariff (USD)	\$ 0.53	\$ 0.51	\$ 0.52	\$ 0.50	\$0.44	\$0.53
D. Annual Subsidy (USD)	\$11,286,795.83	\$51,014,240.83	\$1,428,797.62	\$663,487.33	\$634,154.54	\$4,146,169.90
Annual Subsidy as % of City GDP (%)	0.079%	0.055%	0.005%	0.002%	0.001%	0.077%

Lessons Learnt: Length of Contract

Selected Bus Concession Contract

	Length Contract	Cost/Km
Bogota SITP	24	USD2,85/km
Bogota Transmilenio (Phase1 & 2)	10 (+add 3)	USD 3,42/km
Santiago (Trunk Operators)	12	USD 2,5/km
Santiago (Feeder)	5	--
London	8	--

Source: World Bank SITP Study (2013)

- Key driver in determining length of contract, is the time it will take the operator to recoup investment (i.e. fleet)
- Critical contract feature that determines the public sector's ability to adjust, and move towards truly 'competitive bidding' process

Lessons Learnt: Be “aware” of the promise of financial sustainability

Composition of the Technical Tariff – Selected Colombian Cities

	Bogotá	Barranquilla	Bucaramanga	Cali	Pereira
Bus Operators ⁽¹⁾	87.96%	68.6%	67.6%	68.0%	87.2%
Fare Collection	8%	6.0%	13.5%	13.0%	9.1%
BRT Agency	4%	7.0%	6.85%	7.0%	3.5%
Bus Scrapping ⁽²⁾	--	9.4%	--	3.0%	--
Infrastructure	--	9.0%	11.75%	3.0%	--
Trust Agent ⁽³⁾	0.04%	N/A	0.03%	N/A	0.2%
Transport Authority	--	--	0.27%	--	--
Contingency Fund	--	--	--	6.0%	--
Total	100%	100.0%	100.0%	100%	100.0%

Source: World Bank (2014)

1. Tariff “scope creep” non-opex costs
2. Competitiveness of the bidding process
3. Contract duration

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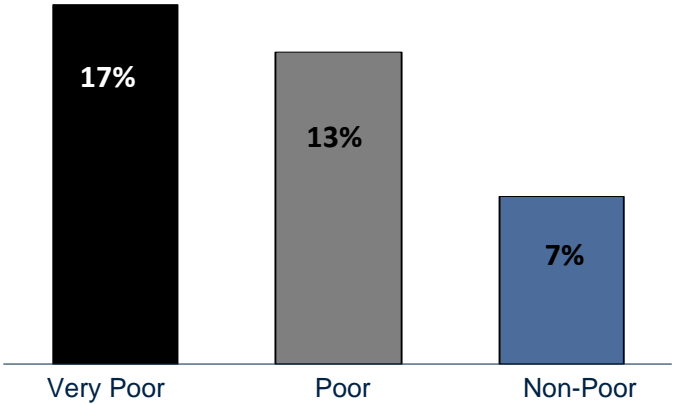
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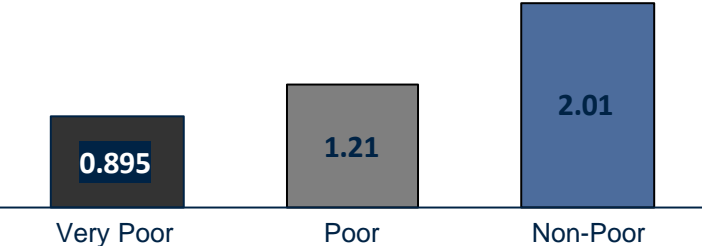
III. Bogota's Pro-Poor Subsidy Scheme

Bogota's poor face an affordability constraint—they devote more income to transport, make lower number of trips per day

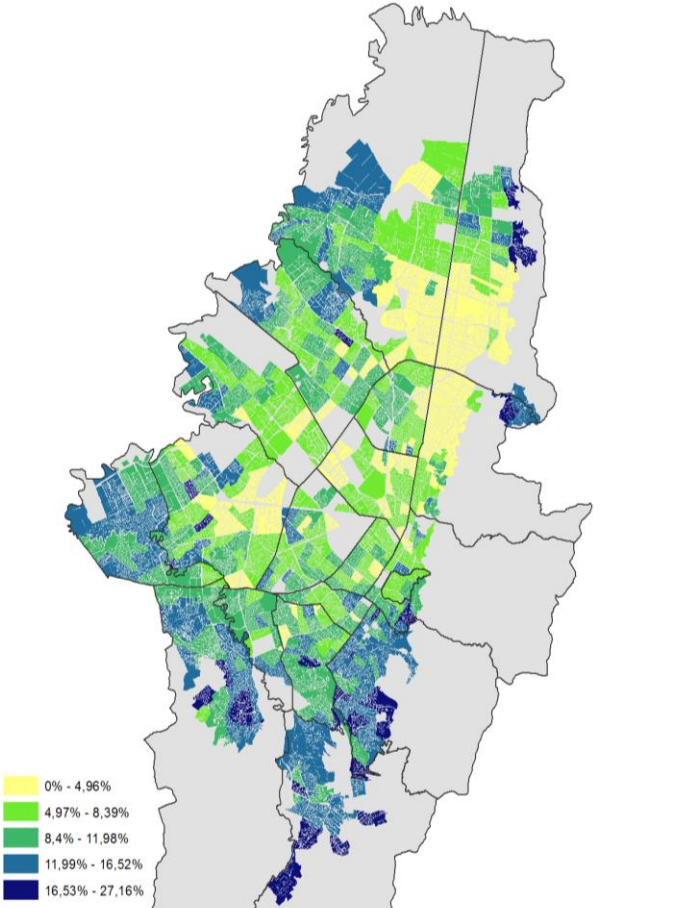
% Individual Income devoted to Transport



Number of Motorized Trips per Day



Public transportation spending in Bogota as a Proportion of Income

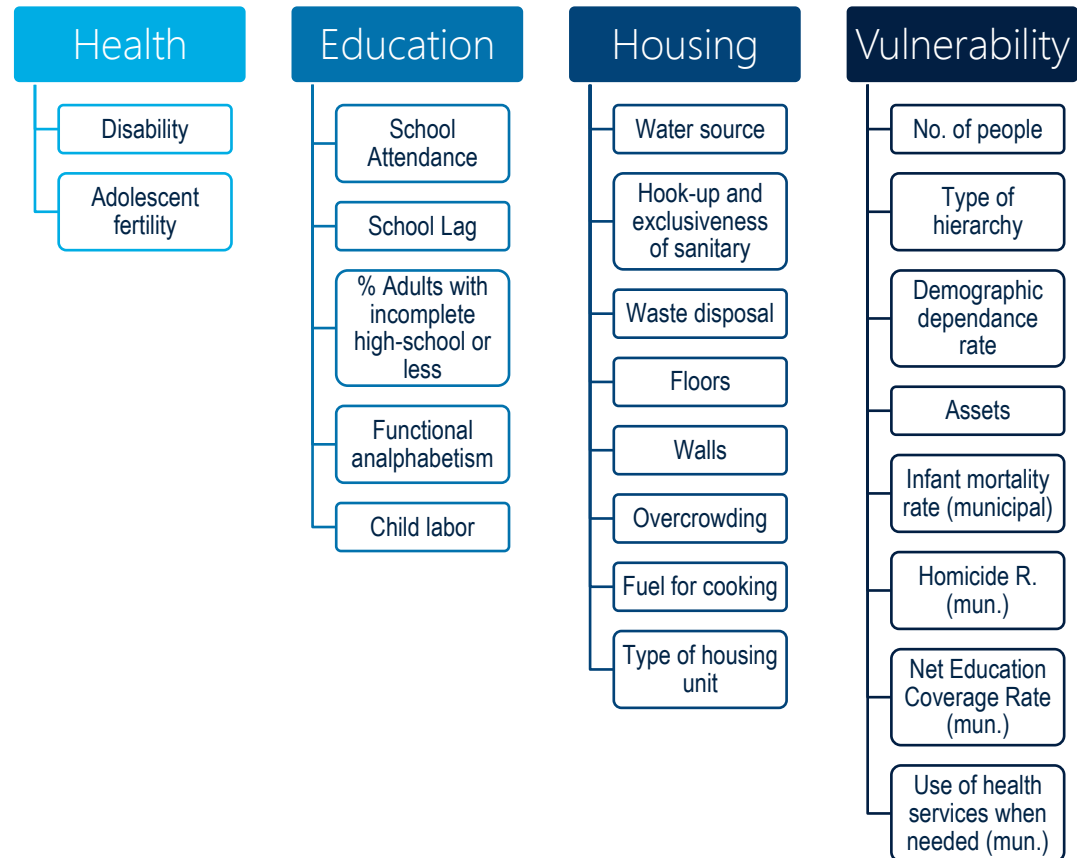


Source: 2011 Bogota Mobility Survey. Definition of Very Poor, Poor and Non-Poor is based on % of residents with a SISBEN score of <35 in every transport zone. Figure is based on Bogotá Multi-Purpose Survey, 2014.




Proxy Means Testing for Targeting: SISBEN

- Proxy means tested System for Selecting Beneficiaries of Social Spending
- General objective: establish a technical, objective, equitable and uniform mechanism for selecting beneficiaries of social programs to be used by all government levels.
- Methodology updated every three years
- SISBEN III: allows each subsidy program to define its own cutting points based on the objectives of the program, and the characteristics of the population

Variables SISBEN III



To targeted subsidies, Bogota leveraged increase use of Smartcards and improved methodologies for defining who is poor

Who?	What?	How?
<ul style="list-style-type: none"> • Proxy-Means tested using SISBÉN Database (Score 40 or less) • Self Selection 	<ul style="list-style-type: none"> • All journeys in Bogota's system – "Zonal" services and Phase 3* Trunk Services <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>Trunk</p>  </div> <div style="text-align: center;"> <p>Zonal</p>  </div> </div> <p>*(due to non-existing coverage of TuLlave Smartcard in Phases 1 and 2 of Trunk System)</p>	<ul style="list-style-type: none"> • # of subsidized segments: Fixed monthly number (40 trips) • % of subsidy: <ul style="list-style-type: none"> – Fixed COP\$ 900 (USD0.3) discount: – 50% for Trunk (full cost: COP\$1,800) – 60% for Zonal (full cost: COP\$1,500) – No transfer cost <p>Technology</p> <ul style="list-style-type: none"> • Personalized Smartcard (<i>Tu Llave</i>)  <p>Distribution Network</p> <ul style="list-style-type: none"> • Local Gov't service centers • Mobile Points of Sale (minivans) • Partner w/ other social programs • Mail Home delivery



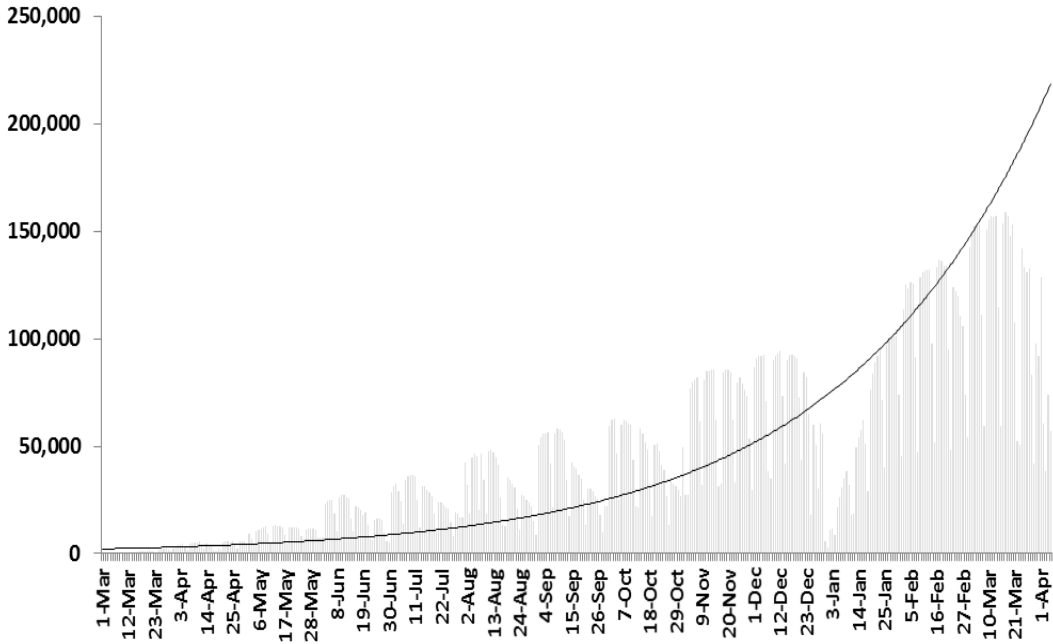
Funding: Annual City Budget



Almost 160,000 new users of the public transport system due to the subsidy scheme

- Nearly 285,000 smartcards delivered with subsidy; almost 160,000 cards have been validated (134,000 new users, 26,000 existing users)
- Nearly US\$2.5 million worth of discounts

Subsidy Use (trips)— March 2014 to May 2015



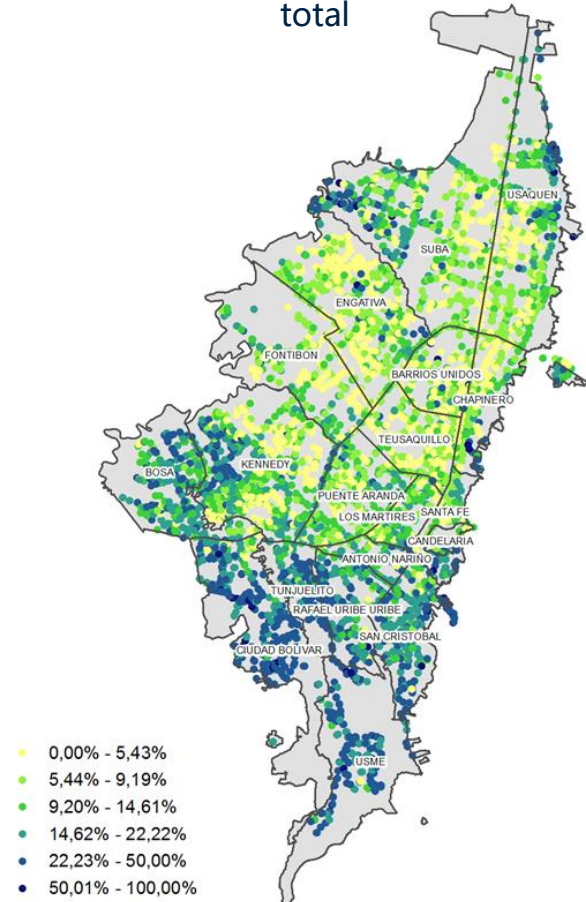
What determines whether you obtain the public transport subsidy?

- At the individual level:
 - Women are more likely to obtain the subsidized card (10% greater probability)
 - The higher the level of education, the greater the likelihood of obtaining the subsidized card
- As family income increases, the probability of obtaining the subsidy decreases
- Workers have a higher probability of obtaining the card than students or individuals who stay at home.
- Word of mouth is important—likelihood of obtaining subsidy increases if someone in your neighborhood obtained it.
- Point of sales (card personalization spots) and proximity to bus stop do not appear to have an effect on obtaining the card.

Effect of the subsidy on the use of the Transit System

- The SISBEN subsidy recipients have an **increase in monthly trips of nearly 56%** when compared to normal fare card use.
- Subsidy helps overcome the lower frequency of daily-motorized travel among the poor
- Increase in transfers might indicate that the users are **learning how to take advantage of a multimodal system**
- **No significant effects on the total transport expenses** incurred by users being subsidize.

Subsidized cards in use and subsidized trips as a proportion of total



Labor Outcomes

- Significant effects were found only for in the case of hourly income of informal workers' hourly income—an increase between 19% and 22% in their hourly compensation is estimated.
- No significant effects on employment status, access to education.
- **Robustness**: Sensitivity Analysis and Dif-in-Dif using continuous treatment variable confirmed previous results
- **Heterogeneous effects**: The hourly income of informal workers is higher and significant for the case of employees (not independent)—these workers are more likely to have less flexible working hrs