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**A NEW LOOK AT THE INCIDENCE OF
PUBLIC TRANSPORT SUBSIDIES: A
CASE STUDY OF SANTIAGO, CHILE**

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Abstract

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Resumen

En general, los subsidios al transporte público en países en desarrollo se justifican por motivos sociales y distributivos. Sin embargo, no está claro si estas políticas logran los objetivos planteados. En este trabajo se evalúan varios subsidios al transporte público en el caso de Santiago, Chile. Este es un caso interesante de analizar debido a que en años recientes se introdujo una transferencia directa y focalizada para distribuir los subsidios de transporte en lugar de utilizar mecanismos tradicionales de subsidio a la oferta. Los resultados muestran que el uso del sistema general de bienestar para distribuir subsidios al transporte es mucho más efectivo que los subsidios a la oferta tradicionales. Estos últimos no tienen buenas propiedades de focalización y en algunos casos son considerablemente regresivos. Junto con evidencia reciente de otras ciudades de países en desarrollo, los resultados de este trabajo implican que se deben hacer mayores esfuerzos para analizar, diseñar e implementar subsidios sociales en el sector de transporte.

A new look at the incidence of public transport subsidies: a case study of Santiago, Chile

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Resumen: En general, los subsidios al transporte público en países en desarrollo se justifican por motivos sociales y distributivos. Sin embargo, no está claro si estas políticas logran los objetivos planteados. En este trabajo se evalúan varios subsidios al transporte público en el caso de Santiago, Chile. Este es un caso interesante de analizar debido a que en años recientes se introdujo una transferencia directa y focalizada para distribuir los subsidios de transporte en lugar de utilizar mecanismos tradicionales de subsidio a la oferta. Los resultados muestran que el uso del sistema general de bienestar para distribuir subsidios al transporte es mucho más efectivo que los subsidios a la oferta tradicionales. Estos últimos no tienen buenas propiedades de focalización y en algunos casos son considerablemente regresivos. Junto con evidencia reciente de otras ciudades de países en desarrollo, los resultados de este trabajo implica que se deben hacer mayores esfuerzos para analizar, diseñar e implementar subsidios sociales en el sector de transporte.

1. Introduction

There is a long literature in the transport field justifying public transport subsidies on economic efficiency arguments. Most, but not all, of these arguments are “second best” in nature, in the sense that subsidies compensate for externalities in other parts of the economic system, namely private transport use, that cannot be addressed directly. In this context, public transport subsidies may reduce these externalities improving resource allocation in society.

Unlike the efficiency argument for subsidies, this paper emphasizes the social and distributive dimension of transport subsidies. It follows papers such as Frankena (1973) and Guriai and Gollin (1986) in the academic literature although we focus on a developing country experience.

Among the multilateral agencies, the relationship between poverty and transport has received considerable attention of late. Incorporating poverty issues and pro-poor project design in transport projects has become an important priority for lending by multilateral banks.¹

Furthermore, transport subsidies based on equity or social grounds are ubiquitous around the world. Discounts for students, the elderly or other specific groups in society are very common. So are capital and operating subsidies aimed at keeping fares low for the transport modes used by the poor.

What is less clear is how effective existing subsidies are in meeting their social objectives. Recent research seems to suggest that in most cases public transport subsidies are not very progressive. For example, Flynn (2007) shows that transport subsidies in Mexico City are not as pro-poor as commonly believed. The majority of the poor do not benefit from the metro, public bus and trolley and light railway subsidies, which form the bulk of transport subsidies in that city. Cropper (2007) finds similar results for bus and rail subsidies in Mumbai, India.

Since most subsidies in the developing world are justified on income distribution and poverty alleviation arguments, the above evidence is troubling. It indicates that more effort needs to be directed towards the design and implementation of better targeted transport subsidies justified on social or distributive grounds.

In this paper we present the evidence for Santiago, Chile. This is an interesting case study because recently some transport subsidies have been distributed as a lump-sum transfer

¹ See for example Asian Development Bank (2001), The World Bank (2005), chapter 3 of The World Bank (2002), Gannon and Liu (1997) and a number of case studies on the subject commissioned by the World Bank in recent years, including SITRASS (2004a; 2004b), Shuiying, Han, Weili and Dening (2003), Howe and Bryceson (2000), Godard and Diaz Olivera (2000), and ECORYS and NEA (2004) among others.

through the general welfare system rather than by subsidizing fares or using other traditional subsidy policies in the transport sector. This is an important and relevant innovation for distributing subsidies, at least in a developing country context. We evaluate the performance of this new mechanism relative to the traditional alternatives used in the transport sector.

The results show that in Santiago socially motivated subsidies applied directly in the transport sector are badly targeted and in many cases worsen the income distribution. Using the general welfare system to distribute transport subsidies seems to work much better.

The main policy lesson to be obtained from these results is that more effort needs to be placed on the analysis, design and implementation of social subsidies in the transport sector. Moreover, as the case of Santiago shows, programs and instruments beyond the transport sector must be considered as possible targeting instruments for these policies. Therefore, transport specialist and policy makers in developing countries should work together with other specialist, particularly experts in the welfare system of each country, when designing, reforming or introducing subsidy schemes.

Another lesson derived from the results of this paper is that fuel subsidies will generally be very regressive in developing countries like Chile, where private car ownership is still somewhat of a luxury. This calls for special measures to counter the political pressure created by middle to higher income groups during periods of rising international fuel prices, such as that witnessed during the present decade.

2. The case of Santiago, Chile

Santiago is the capital of Chile. The Greater Santiago area has an estimated population of 5 million. Santiago's public transport network is composed of a subway (metro), buses operating routes under a franchising system, taxis, 'colectivos' (a taxis carrying a number of passengers on a pre-established route) and until 2005 there was also Metro-Bus system whereby some modal and tariff integration was achieved through special buses operating at the end points of the metro network.

Characterizing Santiago's public transport system is difficult due to significant and rapid changes that have occurred during the last few years and which are still in progress today. Among these is the significant extension of the metro network from 40.3 kilometers in 2003 to 67.3 kilometers in 2005 (see Table 1). Ongoing investments will increase the network extension to 104.5 kilometers by 2009.

Table 1: Santiago's Metro System

	2000	2001	2002	2003	2004	2005
Length (km)	40.3	40.3	40.3	40.3	46.1	67.3
Nº of stations	52	52	52	52	58	77
Nº trains	68	68	69	83	83	133
Stock of cars	394	394	402	486	486	636
Passengers (millions per year)	207,8	202,5	198,9	203,3	231,8	267,1
Average patronage (thousand passengers per working day)	742.0	725.3	707.7	721.7	819.7	936.5
Maximum patronage (thousand per working day)	902.4	867.3	851.0	877.8	1,010.4	1,200
Number of employees	1.362	1.356	1.429	1.424	1.502	1.636
Employees / thousand daily passengers	1.8	1.9	2.0	1.9	1.8	1.7

Source: Metro, Annual Report, 2005.

Another important event is the on-going reform called Transantiago. This is a very ambitious and all encompassing reform of the public transport system, especially for the bus industry. In the main, this reform changed the route configuration of the bus system, introduced modal and tariff integration (between different bus routes and between these and the metro system), modernized the rolling stock and transferred the operation of buses to formal companies.

With all these changes taking place any characterization of the travel patterns and modal choice of Santiago's population using past data may be soon outdated. However, for the purpose of this paper—that studies the incidence of different affordability policies undertaken in the last few years—recent changes in travel patterns would probably not modify the main conclusion regarding the benefits of using general welfare instruments to distribute transport subsidies.

According to the 2001 travel survey (EOD 2001 from now on) 16.3 million trips were undertaken on a normal working day that year in Santiago, of which 10.0 million were motorized trips.² Current estimates put this last figure at 10.8 million trips per working day by the end of 2006.³

Table 2 presents the modal split for motorized trips. The table shows that 42.2% of motorized trips are made in buses. In comparison, only 6.7% of trips are made in metro. This implies that for every metro rider there were at least 6 bus riders in 2001. With the expansion of the metro system in recent years, the number of trips undertaken in metro probably rose. Gómez-Lobo (2007) estimates that at the end of 2006 the percentage of motorized trips undertaken in metro was between 10% and 12% of the total. This implies a fall in the ration of metro riders to bus riders from 1:6 in 2001 to close to 1:4 at present. However, in spite of the huge investments undertaken in recent years (close to US\$2,000 million) in extending the metro network, it is still

² EOD is the acronym for 'Encuesta Origen Destino' (Origin Destiny Survey).

³ This estimate is calculated assuming a 1.6% annual growth rate of trips between 2001 and 2006.

the case that the majority of public transport trips are made in buses. This has important distributive implications and will be discussed below.

Table 2: Modal split of motorized trips on a normal weekday, 2001

Mode used	Trips (thousands)	% of total
Automobile	3,860.0	38.6%
Metro	674.6	6.7%
Bus	4,220.9	42.2%
Other	1,246.2	12.5%
Total	10,001.7	100.0%

Source: PUC-Sectra, Encuesta Origen Destino de Viajes 2001, Santiago, *Informe de Difusión*, Secretaría Interministerial de Planificación de Transportes, Santiago, Chile.

Note: trips made in bus and metro are considered as trips in metro.

3. Subsidy policies

There are many policies that have an indirect impact on transport needs and costs. Practically all urban policies, including housing subsidies, will have an effect. We have identified five policies that are relevant to the discussion of public transport subsidies in Santiago. Not all of these were introduced with the explicit or exclusive purpose of reducing households' public transport costs, but they all had this effect either directly or indirectly.

It is important to note that due to lack of information we will not consider the subsidy related to social housing. Housing is provided to low-income households usually in areas that are isolated and in the outskirts of the city, forcing those living in these neighborhoods to travel longer distances. In some ways this effect will be captured by the different intensity in the use of buses across social groups, something that does affect the distributive impacts of some of the subsidies analyzed below. The absence of distance related fares in Santiago probably contributes to reduce the possible negative impact of social housing location on transport expenditure.⁴

3.1 Preferential rates for students and the elderly

Students with a 'Student Pass' pay a preferential rate in the bus and metro system.⁵ As of this date, students showing this ID card pay only Ch\$120 (US\$ 0.23) for a trip (\$130 (US\$ 0.25) for a metro ride) compared to the full fare of Ch\$380 (US\$0.72) for buses, Ch\$370 (US\$0.70) for

⁴ The 2001 EOD shows that the average distance travelled by households in different income groups is very similar, except for the highest income quintile.

⁵ The 'Student Pass' is an ID card given by the Ministry of Education to eligible students. It serves to control some of the restrictions on the preferential fares described below.

the Metro in off-peak hours and Ch\$460 (US\$0.87) for metro during peak hours.⁶ The benefit is not universal and there are some restrictions that serve to improve the distributional impact of this subsidy.

First, it only applies to students from 5th grade in primary education to the end of secondary education enrolled in a public (municipal) or a state subsidized private school. Therefore, it does not apply to students attending private schools.⁷

Second, for students attending university, technical schools and other upper education establishments, the Ministry of Education sets a limit on the number of passes for each institution. Each institution then has to select through socioeconomic merits the students qualified to obtain the pass. For example, in 2007 the University of Chile, the largest in Santiago, established that only student whose per capita family income is at or below Ch\$450,000 per month (around US\$833 per capita per month) is eligible for the benefit.⁸

Compliance with the above rules is verified yearly by the Ministry of Education when students apply for the ID card.

The preferential fare only applies during the academic year and, until recently, only on weekdays and Saturdays during a pre-specified schedule. A few months ago, however, the preferential fare was extended to 24 hours and seven days a week (still during the academic year only) after a spate of student protests forced the government to accept some of their demands.

The elderly also have some benefits. If they meet certain criteria (retiree or pensioner, 60 years or older for women, 65 or older for men) they can apply for a special credential that will give them the right to the same fares as students in the Metro. This benefit is restricted to two trips per day with the further restriction that during weekdays these trips have to be taken during off-peak hours. There are no special benefits for the elderly in the bus system.

These preferential fares are all funded by cross subsidies since the government does not make transfers to operators to compensate for the lower fares. Therefore, they are being paid for by other users of the public transport system in the form of higher tariffs.

⁶ The cost of a metro ride can be reduced if a prepaid electronic card is used. This reduces the fare during peak and off-peak hours by Ch\$20.

⁷ Children up to 4^o travel free.

⁸ This is a very generous limit since it a monthly per capital figure.

3.2 Differential fuel taxes between gasoline and diesel

As in most other countries, fuels in Chile are burdened by a specific tax. In the case of gasoline and diesel this tax amounts to 6.0 UTM and 1.5 UTM per cubic meter of each fuel, respectively. A UTM (acronym for 'Unidad Tributaria Mensual') is an indexed monetary unit that varies according to previous month's inflation rate. In November 2006 a UTM stood at Ch\$32,303 (around US\$61).⁹ Thus, for gasoline the tax added Ch\$193 per liter to the final price that month (US\$0.37 per liter) and for diesel around Ch\$48 per liter (US\$0.092 per liter). That same month the pump price of a liter of 93 octane gasoline in Santiago was \$557.9, while for Diesel it was \$427.9.¹⁰ This implies that the tax represented around 35% of the final price of gasoline and 11% of the final price of diesel.¹¹

Naturally, a tax on fuels is not a transport subsidy; in fact, it makes transport, including public transport, more expensive. However, for the purpose of the current study these taxes are relevant because of the different level of the tax set for gasoline as compared to diesel. This difference is due, in part, to affordability considerations since diesel is the fuel used by the buses of the public transport sector.

As an affordability measure for public transport, however, the low specific tax on diesel is questionable. It benefits many other sectors and agents besides users of the public transport sector. For example, the trucking industry, industrial users of diesel, and many non commercial owners of diesel run cars, vans and other light vehicles benefit from these lower taxes. In fact, the political economy behind a low diesel tax has as much to do with placating the powerful trucking lobby as with keeping public transport fares down.

According to the 2005 Energy Balance (CNE, 2005), in that year 5,938 thousand cubic meters of diesel were consumed in Chile, of which 3,456 were consumed by the road transport sector. Thus, only 58.2% of the benefits of the lower diesel tax accrue to the road transport sector. In addition, the consumption of the trucking industry is accounted for in the road transport sector, which implies that the consumption of public transport buses represents a minor share of the national consumption of diesel. Therefore, lowering the overall tax on diesel is a very indirect and expensive way to lower the price of public transport.

⁹ UTM and exchange rate data was taken from the statistical base of the Central Bank of Chile. We use the November figures because this is the last month for which fuel pump prices for Santiago are available.

¹⁰ These figures come from the SERNAC (Consumer's Defense Body) monthly fuel survey. See www.cne.cl.

¹¹ Fuel prices are also affected by the Value Added Tax. In November 2006, this tax represented 12.4% and 16.8% of the final price of gasoline and diesel, respectively. Thus 47% of the pump price of gasoline in Santiago can be attributed to the VAT and specific tax. For diesel this figure is only 28%. However, it must be noted that public transport fares are exempt from VAT, one of the only exemptions from this tax in Chile.

Nonetheless, there is a recurrent clamor in the press and pressure from certain congressmen, to lower the specific tax on fuels. Invariably, these calls cite the benefit to the “middle classes” and the “poor” of such a reform. We will test this proposition by evaluating the distributive impact of lowering fuel taxes further below.

3.3 Fuel price stabilization fund¹²

Another policy that has had an impact on transport prices is the Fuel Price Stabilization Fund (FEPP). This fund was created in the wake of the 1990 invasion of Kuwait by Iraq, when the international price of crude oil surged. The intention of the fund was to shield internal fuel prices from transitory variations in international prices.

The fund was initially created through a US\$200 million transfer from the government. This system operated successfully while fuel prices were declining or stable. That is, until mid 1999. The fund had close to US\$200 million in August of that year. The rising price of fuels in international markets starting in 1999 and the presidential elections that year conspired to deplete the fund within a short period of time. In February 2000, there were only US\$37 million left in the fund when the government decided to boost it with an additional transfer of US\$200 million. The increased fund was also rapidly depleted and in July of 2000 another US\$63 million were transferred to the fund. Also, at that date some changes in the operation of the fund were introduced in order to reduce the discretion in the setting of some of the parameters of the band, the asymmetry between the subsidy and the tax when international prices were outside the band was eliminated, and a formula was introduced to proportionally reduce the tax and the subsidy when the fund became very large or depleted. In spite of these changes, the steady rise in fuel prices during the next three to four years had again depleted the fund.

Although the FEPP was designed to be a price stabilization mechanism and not a subsidy mechanism, ex-post it operated as a subsidy mechanism. Piedrabuena (2006) estimates that between January 1991 and September 2004 the net balance of the fund was US\$-341.1 million, of which US\$-133.8 were net subsidies for diesel prices and US\$-88.4 were net subsidies to gasoline prices.

Therefore, on balance the FEPP has worked as a price subsidy mechanism that in practice has kept public transport fares somewhat lower than they would otherwise have been.

Recently there has been recurrent political pressure to inject more resources to the fund which makes this policy relevant for the analysis of this study. At the end of 2005 another fuel

¹² This section is based on Piedrabuena (2006). Interested readers can find specific details on the operation of the fund in that reference.

stabilization plan was launched for diesel, gasoline and domestic kerosene, with US\$10 million provided by the government. Another US\$11.9 million has subsequently been injected to the new fund. The balance of the fund at the end of 2006 was US\$12.3 million, which implies that close to US\$10 million had been spent in subsidizing fuel prices during that year.¹³

3.4 Government grants to expand the metro system

Metro's investment plan during the last six years has been very ambitious and has required large amounts of funding. The extension of Line 2 and Line 5 to the south cost US\$436 million. The recent completion of the new Line 4 (33 kilometers) cost US\$1.070 million. This year the 5.2 kilometer extension to the north of Line 2 was completed at a cost of US\$200.6 million. Work has now started on the extension of Line 1 (4 kilometers) and an extension of Line 5 to Maipú (13.5 kilometers). The estimated cost of these two projects is US\$900 million and they are expected to be completed by 2009.

These investments are funded from a variety of sources. Metro does contract commercial debt (and emits bonds) in order to raise capital. For example, in 2005 Metro contracted a credit from national and international banks for US\$120 million without the need of a government guarantee. Since 2001 Metro has emitted over US\$700 million in bonds in the national and international financial markets. The financial commitments from these credits are partly served by operational revenues.¹⁴ In some cases, as the extension of Line 1, part of funding comes from the local municipal government where the network is being extended. However, a substantial amount of the investment in the network expansion is funded by government transfers, which implies that metro fares do not cover the full economic cost of the service.

A crude estimate of the implicit subsidy involved is provided in Table 3, which uses data from Metro's 2005 audited financial statements. In 2005 the operational results of Metro reached US\$ 18 million.¹⁵ However, total gross assets were US\$3,603.6 million.¹⁶ If depreciation is added to the operational results the total cash flow that year was US\$69.3 or about 1.9% of gross assets. If we assume a weighted average cost of capital of 10% for investments in this industry, then annual cash flows would have to be US\$360.4; US\$291.1 million higher than they were in 2005. This income shortfall represents 193% of current income from fares, which was US\$151 million in 2005. Therefore, in order to generate the required cash flow and assuming

¹³ All these numbers were provided by the Ministry of Finance.

¹⁴ According to the 2005 Annual Report, in December 2005 the government approved a US103 million capitalization transfer to Metro which was used to pre-pay bank debt. Therefore, not all financial commitments are necessarily paid by its revenues.

¹⁵ These are net earning before interest payments, financial earning or other payments and accounting corrections for inflation and exchange rate variations.

¹⁶ Gross Assets are valued at historical cost but corrected for inflation.

demand is constant, average fares would have to increase by this percentage.¹⁷ This implies an off-peak fare of about Ch\$1.083 compared to the Ch\$370 charged today.

Table 3: Equilibrium fare calculation for Metro

	US\$ million
(1) Gross Assets in 2005	3,603.6
(2) Net earning before interest	18
(3) Accumulated depreciation and amortizations	51.3
(4) Net cash flow ((2)+ (3))	69.3
(5) Cash flow/Assets ((4) / (1))	1.9%
(6) Required Cash flow /assets	10%
(7) Cash flow shortfall ((6)*(1) – (4))	291.1
(8) Fare revenue in 2005	151.0
(9) Required increase in fares ((7) / (8))	193%

Source: own calculations based in Financial Statements contained in the 2005 Annual Report of the Santiago Metro.

Note: all figures in Ch\$ were converted using an exchange rate of Ch\$540 per US\$.

It is possible to criticize the above calculations on many grounds, but it is the best that can be done with the available information. However, they do give an order of magnitude to the possible subsidy that metro riders currently receive.¹⁸ According to the above calculations it is in the order of US\$290 million per year.

Further bellow we will evaluate the distributive impact of this subsidy compared to other affordability policies. First, however, we need to discuss whether car and bus traffic is not being equally subsidized. This subsidy could be due to the free provision of surface infrastructure for these vehicles. Unfortunately, to assess this issue requires information that is unavailable; for example, the value of the current road stock. However, there are several elements which make the subsidy in this case unlikely.

¹⁷ If demand falls, fares would have to increase even further since this is a declining average cost industry.

¹⁸ In addition, our estimate is quite consistent with Metro's own estimate. According to Metro (personal communication with the Planning Director), 35% of investment is funded by Metro's income and 65% by government grants.

First, the specific tax on fuels represented 7.7% of all tax income of the central government in 2005.¹⁹ This amounted to 5.5% of all central government income. The largest proportion of this revenue comes from the specific tax on gasoline used by the transport sector, representing 62% of the total and 3.4% of total central government income. The tax on diesel used by the transport sector represents 18% of the total fuel tax revenues, representing 1% of all central government revenues in 2005.²⁰ It is unlikely that the annual expenditure on road maintenance and construction by the central government represents such a high percentage of total public sector expenditure.²¹

In many cases, road maintenance and construction is funded from local governments (Municipalities). However, all vehicles must pay an annual permit to their Municipality ('Permiso de Circulación') which is one of the most important sources of income for Municipalities. It is unlikely that all this income is spent exclusively on road maintenance and construction.

Second, since the mid nineties, the major inter-urban and urban road projects have been concessioned to the private sector. In all of these projects, users must pay tolls. Among these are four major road projects in Santiago representing close to US\$1.500 in investment. Although some of these projects do receive a subsidy from the State, they are nonetheless funded principally from tolls. Therefore, road users in Santiago are paying directly for the use of the major road infrastructure or, at least, in a higher proportion than they would have been paying if these projects did not consider tolls.

Although more research is required to give a definite conclusion, the available data indicates that car users are not being subsidized in the form of free road and surface infrastructure from the State. Whether there is a cross subsidy from car (gasoline) users to public transport users (or other diesel users) requires further research.

3.5 Direct transfers to poorer households to counteract rising fuel prices

With the rise in the international price of crude oil during the last five years there was mounting political pressure in Chile —as in many other countries— to shield domestic consumers from the impact of this rise on domestic fuel prices. The proposals most favored by politicians was a new

¹⁹ Dirección de Presupuesto (2006).

²⁰ CNE (2005). These figures were calculated using the total consumption of each fuel by the transport sector in 2005 according to the Energy Balance of 2005.

²¹ Calculations by the author indicate that fuel tax revenues are seven times larger than all of the expenditure and investment by the roads and highway division of the Ministry of Public Works in 2005. On the other hand, expenditure may not represent the full economic cost of road use if these are not being maintained to standard. However, if road expenditure includes the maintenance and reposition of past investments, then this figure would be a good approximation to the true economic depreciation of the infrastructure.

injection of funds into the now depleted FEPP or a reduction of the specific indirect fuel taxes, especially the one levied on gasoline.

These proposals were clearly regressive, as will be demonstrated below. Both would reduce the domestic price of fuel, especially gasoline and would thus favor richer households. According to the 1997 Family Expenditure Survey for Santiago, 59% of gasoline is purchased by the highest income quintile. In the first case, fresh resources would be used to fund the subsidy, while in the second case a reduction in tax revenues would finance the policy.

The evolution of the consumer price index (IPC) showed that the impact of rising fuel prices was not affecting overall household welfare. The yearly inflation rate during this period was 1,05% in 2004, 3.05% in 2005 and 3.24% in 2006 (until October) while nominal wages rose 2.90% in 2004, 4.97% in 2005 and 4.94% in 2006 (until October). In spite of this, the government was under pressure to do something. Starting in 2004 it chose to give a direct monetary transfer to poorer households to compensate for rising fuel prices. It was argued that this policy was much more progressive and better targeted than policies aimed at reducing retail fuel prices.²² These transfers were again granted in 2005 and 2006 for the same reason.

The government had used direct transfers as a social policy instrument in previous years. For example, in the year 2000 it chose to give a direct monetary transfer to vulnerable households. In 2003 a \$10,000 bonus (around US\$ 32 at the 2004 PPP exchange rate) was given in order to compensate poorer households for the rise in the value added tax from 18% to 19% which occurred that year. However, the 2004 bonus was the first where the increase in fuel prices and its impact on public transport fares was one of the motivations. On that occasion a \$10,000 transfer (US\$ 32 at PPP) was given once to all persons receiving a state backed minimum or guaranteed pension (“pension asistencial” or “pension minima”) or households participating in the “Chile Solidario” program. This last program is an all encompassing social plan aimed at the 5% of hard core poor (“indigentes”) and gives beneficiary households a package that includes all public subsidy benefits (housing, family and water subsidies, among others), incentives to send children to school and social and psychological attention. In all, it was expected that around 1 million people, among the poorest in Chile, would benefit.

It is interesting to note that in the Presidential address for the budget law that conceded the 2004 transfer, the Executive declares that the transfer is sufficient for a poor beneficiary to fund higher domestic kerosene prices and *nine months of higher public transport fares*.²³

²² In addition, it was also more efficient since it did not promote higher fuel consumption at a time when the resource allocation arguments would indicate that the country should save on expensive imported fuels.

²³ See Ricardo Lagos Escobar (2004). Emphasis added.

With the continuing rise in fuel prices, another transfer was granted in 2005 (Law N° 20.012 of 2005). Rising fuel prices was also explicitly mentioned as the motivation for this policy.²⁴ This time the benefit was divided into two transfers, one in May for \$10,000 (US\$ 32 at PPP) and another in July for \$6,000 (US\$ 19 at PPP). Eligible households were significantly expanded to include not only pensioners with government guarantees or support, and households in the “Chile Solidario” program, but also all families receiving the Family Subsidy, and workers who were receiving a family supplement subsidy and who earned less than Ch\$180,000 per month. This expanded the number of eligible households to 2.2 million, close to 40% of Chilean households, and the fiscal cost was \$35,457 million (US\$ 63 million at the contemporaneous exchange rate).²⁵

In 2006 the new government decided to continue with the policy of direct transfers to offset rising fuel prices. Once again, the rise in fuel and public transport costs were explicitly cited as the motivation for the benefits.²⁶ This time a \$18,000 (US\$ 57 at PPP) was granted in July of that year for all households in the “Chile Solidario” program, families receiving the Family Subsidy, and workers who were receiving a family supplement subsidy and who earned less than \$180,000 per month (Law N° 20.111 of 2006). Fiscal expenditure in the 2006 transfers was \$22,065 million (US\$ 42 million at the contemporaneous exchange rate).²⁷ It is important to note that earlier that year, pensions were increased for poorer people and they were thus excluded from this special transfer. Because of this the number of eligible persons was around 1.2 million households.

3.6 VAT exemption for transport services

Transport services are one of the few exemptions to the 19% VAT tax. This affects not only public transport services, such as buses, but also airline tickets, interurban bus fares, maritime travel and all other transport modes. This exemption directly reduces bus and Metro fares by around 19%. The distributive impact of this reduction will be analyzed below.

4. An evaluation of affordability policies in the case of Santiago

We will analyze the distributive impact of five policies: the student preferential pass, the metro infrastructure subsidy, the direct compensatory transfers, the reduction in the price of gasoline

²⁴ See Ricardo Lagos Escobar (2005).

²⁵ The expenditure information was provided by the Ministry of Finance.

²⁶ See Michelle Bachelet Jeria (2006), the Presidential address that preceded the bill sent to congress.

²⁷ Data provided by the Ministry of Finance.

and a reduction in bus fares.²⁸ This last policy aims to cover the case of a reduction on the price of diesel that indirectly affects bus fares and also the exemption of these fares from VAT tax.

Except for the student preferential pass, all the other policies are funded through general taxation. Therefore, in order to get a complete picture of the distributional effects of all these policies the incidence of the general tax system must be determined. Engel, Galetovic and Raddatz (1999), using individual data—including the tax returns filed from the tax authority's database—, conclude that the overall tax system was basically neutral in Chile in 1996. Since then, the tax system has not changed radically and it is fairly safe to assume that it still has a neutral impact on the income distribution. Therefore, we assume in what follows that the funding of policies using the general tax system have Gini coefficients of zero. For these policies, the only distributive effects that need to be analyzed are those generated by the distribution of benefits, not the way they are funded.

5. Data

Most of the empirical analysis is undertaken using the 2001 Origin and Destiny study for Santiago (EOD 2001). In this survey more than 12,000 households were interviewed. It contains information on trip segments, mode of transport, distance, fare, origin and destiny and many other variables for the trips made by each member of the household. Socioeconomic data of each household, including income, was also recorded.

The survey was undertaken during two seasons of the year, the summer and 'normal' periods and for two types of days, a normal working and a day in the weekend. The bulk of the data is for a normal working day in the non-summer season, which is the data we will use. Thus, our results indicate the distributive impacts of the different policies conditional on the travel patterns of individuals in a normal non-summer working day.

We use the EOD 2001 data but we use current levels of fares and subsidies to analyze each policy. Since most of the analysis is couched in relative terms (proportion of total subsidy going to each household) the level of fares used is not that crucial.

However, there are other assumptions and methodological choices that we have to make. These include:

- Due to data limitations, we have to assume that travel patterns have not changed radically since 2001. This is unfortunate since we know that the extension of the metro

²⁸ We will not analyze the impact of the elderly preferential fare in the Metro since it is a very small program representing only 1.11% of metro riders in a normal working day (EOD 2001).

network has altered transport mode choices, increasing the use of metro and reducing the importance of buses. However, we do not know the socioeconomic status of the individuals that have changed. We can make some rough guesses which will be discussed further below.

- We consider that all trips are paid for by the individual making the trip. Thus we ignore that some trips may be paid by the employer or someone outside the individual's household.
- In the case of gasoline subsidies, we assume that only the driver of the vehicle pays for the fuel, not any other occupants. Thus, individuals making automobile trips as an occupant do not benefit from the subsidy.
- Some policies —namely those that affect fuel prices and VAT exemption—, affect households indirectly through lower taxi fares, taxi-colectivos fares, train fares, school transport prices, and others. All these effects are ignored for the purpose of this paper.

In order to analyze the distributive impact of the direct monetary transfer policies, we need to use the 2003 CASEN socioeconomic survey since the eligibility criteria for these subsidies includes being recipient of some other subsidy programs, information not included in the EOD 2001. The CASEN survey is a national household survey (along the lines of the Living Standards Measurement Surveys) undertaken every two or three years, with regional representation. It contains information on the various income sources of the household and registers the receipt of all government subsidies.

Although the year of the household survey does not coincide with EOD 2001, this will not affect the comparisons which for the most part are couched in relative terms, such as the relative benefit curves or Gini coefficients. Unless the income distribution changed radically between 2001 and 2003, which is unlikely, the results from these two data sets should be comparable.

6. Results

6.1 Student preferential fare in the bus system

In order to examine the distributive impact of this policy we need to first estimate the monetary value of the subsidy for the case of bus trips. Table 4 presents the breakdown of tariffs paid by bus users in a normal working day in 2001.

Table 4: Fares paid by users of the bus system in a normal working day, 2001

Fare	Number of trips	Percentage
Normal	3,169,386	72.6%
Student pass	788,050	18.1%
None	407,636	9.3%
Total	4,365,072	100%

Source: EOD 2001.

Note: Frequency weights for each individual were used to expand survey results.

The proportion of passengers paying the student preferential fare to those paying normal fares was about 1 to 4 in a normal working day in 2001. Small children and policemen do not pay, and these users represented 9.3% of all users. Assuming these proportions remain constant, and using the current bus fare of Ch\$380 for a normal ticket and Ch\$120 for a student ticket, the average fare that would generate the same income as these fares is around \$330. Therefore, there is currently a Ch\$200 subsidy on student fares and a \$50 surcharge on normal fares. These estimates are used to calculate the subsidy and surcharge paid by each household as a consequence of the cross subsidy policy.

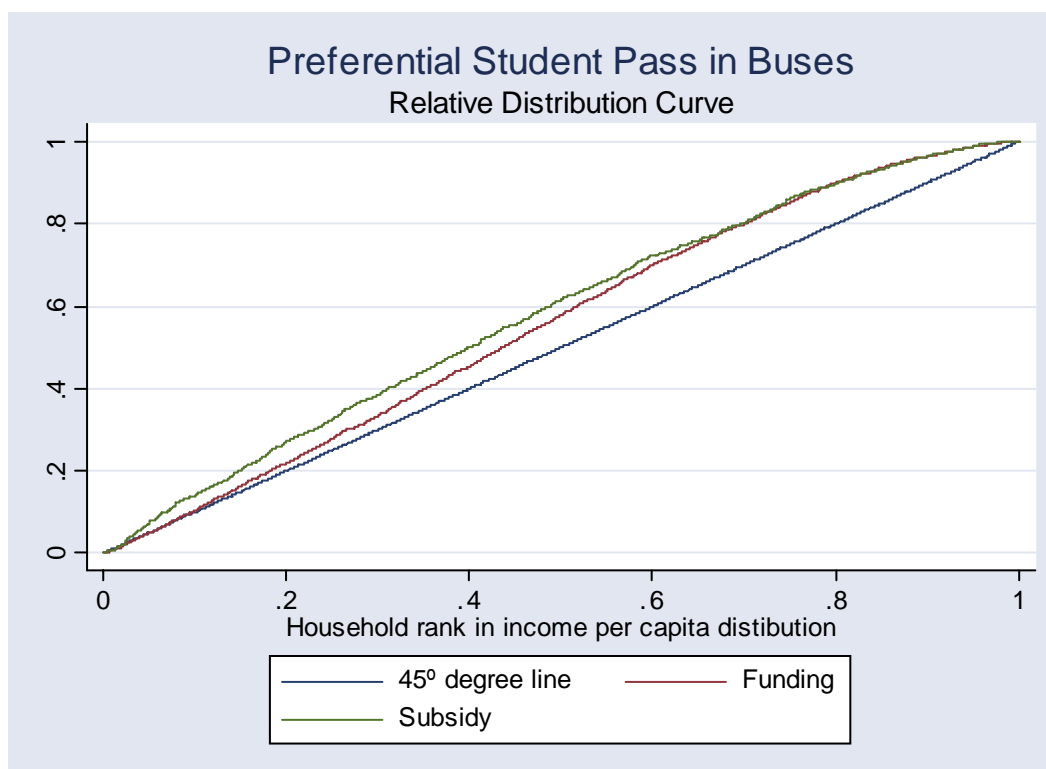
Graph 1 presents the relative transfer distribution curve for subsidy benefits and surcharge in the bus system. Households were ordered according to their per capita income in ascending order. The relative benefit curve represents the percentage of the cumulative benefits of the subsidy accruing to the poorest percentage of households. The 45° line represents a neutral subsidy, whereby the X% poorest households receive X% of the total benefits distributed by the program. If the distribution curve is above the 45° line, then the subsidy distribution is progressive, while if the opposite occurs the subsidy distribution is regressive, with higher income household receiving a higher proportion of the subsidy. The funding curve represents the same information but for the distribution of the surcharge used to fund the cross subsidy. In this case, a curve above the 45° line indicates that the poorest X% of households pay more than X% of the funding for the program, indicating a regressive financing of the subsidy.

From Graph 1 we can see that the student preferential fare for buses is somewhat progressive. The associated Gini coefficient is -0.16, which is a bit more progressive than a Gini coefficient of 0 for a neutral distributional impact. However, it can also be seen from the graph that the funding of this subsidy is also regressive in the sense that poorer households pay a higher proportion of this tax. The associated Gini coefficient for the funding of the cross subsidy is -0.11, very close to the coefficient for benefits.

Another way to evaluate the impact of the subsidy is presented in Table 5. This table presents the average subsidy, surcharge, net benefit for each decile of the per capital income distribution. From the table it is evident that on average households in the first two income

deciles receive a positive transfer, while household in the middle of the income distribution pay on average a surcharge. It is interesting to note that the 20% richest households also receive a net benefit on average. Members of these households are less intensive users of buses. However, students from these households do use buses and benefit from the subsidy, while the corresponding adults of these households are relatively less intensive users of buses and so do not pay the surcharge.

Graph 1: Relative distribution curve for student pass in the bus system



Source: own calculations based on EOD 2001.

Table 5: Average subsidy, surcharge, net benefit of student preferential fares in buses by per capita income deciles, Ch\$ per normal working day

Decile	Average subsidy	Average surcharge	Net benefit	Proportion paying a net surcharge
1	207.1	151.4	55.8	57.8%
2	178.4	161.1	17.3	61.3%
3	166.5	172.4	-5.9	61.6%
4	167.5	173.0	-5.4	62.6%
5	160.2	178.9	-18.7	64.4%
6	146.7	169.5	-22.8	61.3%
7	118.5	136.6	-18.0	56.1%
8	132.3	135.9	-3.6	55.4%
9	98.0	85.7	12.3	44.6%
10	48.6	45.1	3.5	31.4%

Source: own calculations based on EOD 2001.

The last column of Table 5 is very revealing. It indicates the percentage of households in each decile that pay a net surcharge due to the cross subsidy scheme used to fund the preferential student fares. What is striking is that the majority of households in the lowest two income deciles pay a net surcharge to fund the system.

These results imply that the student preferential fare is distributing resources from households without students to households with students. This distribution of resources occurs across all deciles of the income distribution. Although on average this subsidy is marginally progressive, the majority of poor households are hurt by this policy, basically due to the way it is funded.²⁹

One way to make the scheme more progressive would be to fund preferential fares through direct government transfers rather than the current approach of using cross subsidies.³⁰ For example, the normal fare could be lowered to Ch\$330 while the government transfers resources to operators equivalent to \$200 for every student passenger. Since this is exactly equivalent to a policy of subsidizing bus fares, we defer further discussion of this proposal until the section where this policy is discussed in more detail.

6.2 Student preferential fare in the metro system

Students also receive a preferential fare in the Metro system. Estimating the monetary subsidy in this case is somewhat more difficult since there are more tariffs than in the bus system. Table 6 presents the breakdown of tariffs paid in a normal working day in the metro in 2001. Of the more than 624 thousand passengers in a working day in 2001, 121 thousand were students. Using the same approach as used for buses we arrive at the following subsidy for each tariff class.³¹ Students receive a subsidy of \$260 in the peak hours and \$184 in the off-peak hours. Normal tickets pay a surcharge of \$70 in peak hours and \$56 in off-peak hours. For the pre-paid multiple tickets and value tickets, the corresponding surcharge are \$67 and \$53 in peak and off-peak hours, respectively. With these numbers the subsidy or surcharge accruing to each household was calculated based on the number, time period and type of fares they pay in the Metro.

²⁹ Another negative consequence of this cross-subsidy is that bus drivers do not have an incentive to carry students, since they earned higher revenues by taking adults only. Thus, students are discriminated against and have difficulties taking a bus.

³⁰ This assumes that the incidence of the general tax system in Chile is neutral. See the discussion in section 4 of the article.

³¹ The few riders who were not students or elderly and had a missing value for the time period of the trip were assumed to pay the peak tariff. The peak normal tariff used was Ch\$460 and Ch\$370 in the off-peak period. The value ticket and multipletrip ticket is Ch\$20 lower than the corresponding normal ticket in each period.

Table 6: Fares paid by users of the metro system in a normal working day, 2001

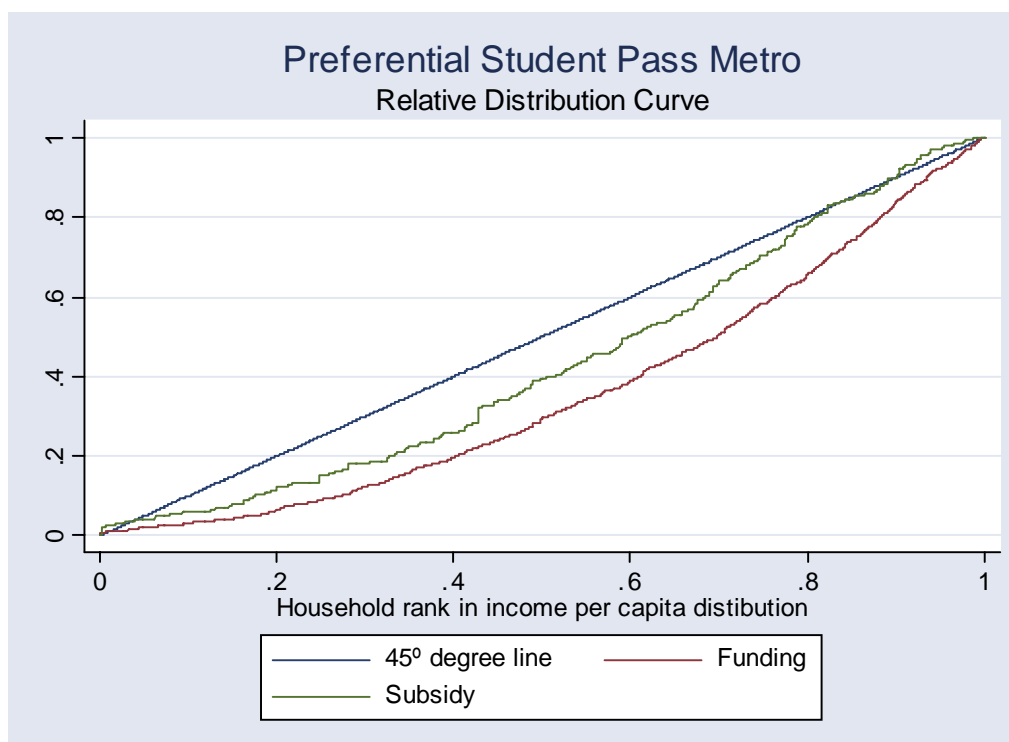
	Time Period			Total
	Missing	Peak	Off-Peak	
Normal	672	149.253	217.806	367.732
Value	158	45.277	35.955	81390
Student pass	40,187	50.669	30.351	121.207
Elderly pass	4.778	951	1.209	6.938
Multitrip ticket	434	16.745	8.812	25.991
Free	10.613	4.516	5.726	20.856
Total	56.843	267.412	299.859	624.114

Source: EOD 2001.

Note: Frequency weights for each individual were used to expand survey results.

Graph 2 presents the relative transfer curve for benefits and surcharges of the student preferential fare in the metro system. It can be seen that the distribution of benefits is regressive. That is, a higher proportion of benefits accrue to higher income households. The Gini coefficient for benefits is 0.13. This is due to the fact that metro users tend to be from higher income households. However, those paying the surcharge also tend to be from higher income households. The Gini coefficient for surcharges is 0.28. Thus, this scheme tends to transfer resources from higher income households with a low proportion of students using metro, to households with a higher proportion of students using metro.

Graph 2: Relative distribution curve for student pass in the metro system



Source: own calculations based on EOD 2001.

Table 7 presents the average benefit, surcharge and net benefit per income decile. It shows that for the first two deciles of the income distribution the average benefit and surcharge are small, owing to the low use of metro by this income group. The net effect however is positive for this group. What is more important is that only a small minority of these households pay an overall negative surcharge. For higher income deciles, more households receive a benefit and also pay a surcharge. The net effect is small for households in the middle of the income distribution, although mostly negative on average. More importantly, the number of households that pay a net surcharge for this subsidy grows for higher income households. The highest three deciles in the income distribution are the ones most negatively affected by this subsidy. A significant number of these households pay a positive surcharge and on average this group receives a negative transfer from the scheme.

Table 7: Average subsidy, surcharge, net benefit of student preferential fares in the metro system by per capita income deciles, Ch\$ per normal working day

Decile	Average subsidy	Average surcharge	Net benefit	Proportion paying a net surcharge
1	12.1	8.0	4.1	6.3%
2	12.2	9.0	3.2	7.2%
3	10.7	14.4	-3.7	11.1%
4	16.0	19.0	-3.1	13.6%
5	28.3	23.0	5.3	15.3%
6	22.1	23.0	-1.0	15.8%
7	29.1	29.5	-0.4	18.0%
8	31.3	36.9	-5.6	23.5%
9	28.1	42.9	-14.8	29.1%
10	18.6	36.7	-18.1	25.2%

Source: own calculations based on EOD 2001.

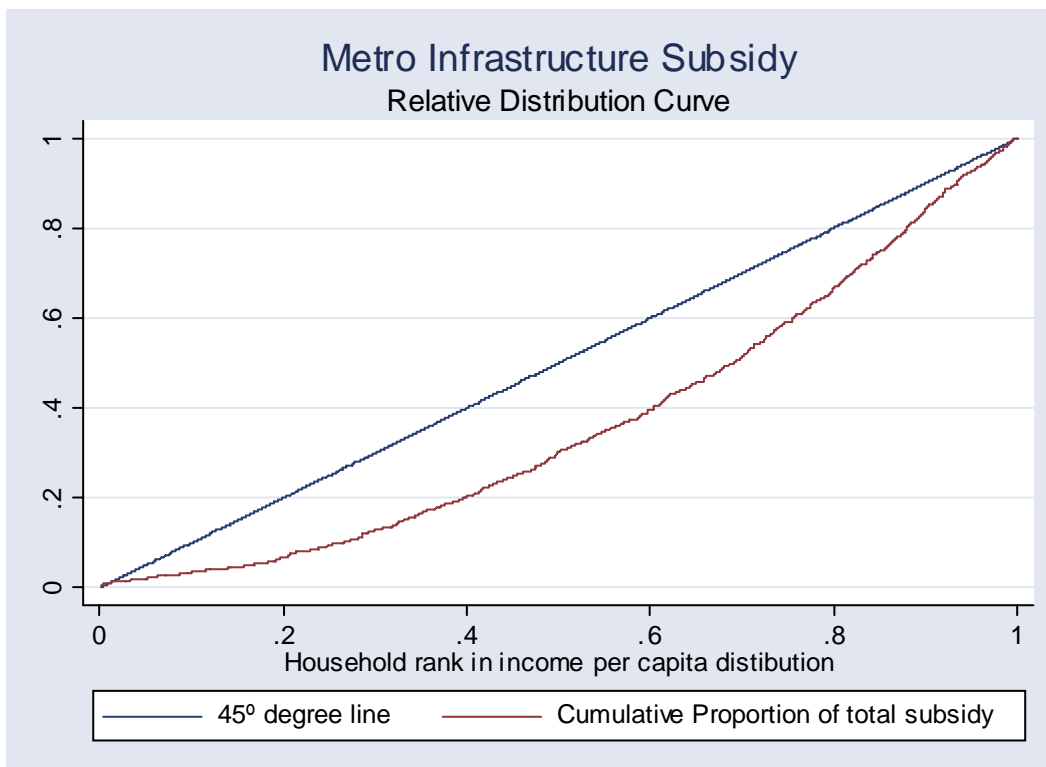
6.3 Metro infrastructure subsidy

In order to study the metro infrastructure subsidy we use the estimates of the impact of this implicit subsidy on tariffs. This was presented earlier in Table 4, where it was estimated that full economic cost recovery tariffs were 193% higher than current tariffs. We use this figure together with current metro fares to estimate the subsidy benefit accruing to each household, which depends on the number of metro trips taken. We assume that the fare structure remains constant (i.e. student preferential fares, elderly preferential fares, peak and off-peak fares maintain their current relative values) and the subsidy is the difference between the fares paid and what would have been paid had these fares been 193% higher.

Graph 3 presents the relative distribution curve for this subsidy. It is evidently regressive, with an associated Gini coefficient of 0.27.

From the above graph we can conclude that most of the benefits go to non-poor households. Therefore this subsidy, which is funded from general tax revenues that have a neutral distributive incidence, deteriorates the income distribution of households in Santiago.

Graph 3: Metro infrastructure subsidy relative distribution curve



Source: own calculations based on EOD 2001.

An important question that needs to be raised is how relevant are the above results using the 2001 EOD data? Especially when we know that metro use has increased during the last few years as a result of network extension investments. The answer will depend on the socioeconomic status of the new users of the system. Unfortunately, there is no data available to rigorously analyze this issue, but given the average socioeconomic conditions of the municipalities where the network was extended, a reasonable hypothesis would be that beneficiaries have mostly been middle income households.³²

³² The extensions were mainly to the south east of the city (Line 4) which is predominantly a middle income sector, to the north a couple of stations (Line 2 to the north) which is more of a lower middle class neighbourhood and to the south (Line 2 and 5). The poorest areas of Santiago are to the South and South west of the city. Only these last two extensions have the potential to reach the very poor of Santiago.

6.4 Gasoline subsidy

With the rise in the international price of oil, there was political pressure to reduce domestic fuel prices either by lowering the specific tax levied on them or by putting more resources into the FEPP. In this section we examine the distributive impact of reducing the price of gasoline, the fuel used mostly by private car owners.

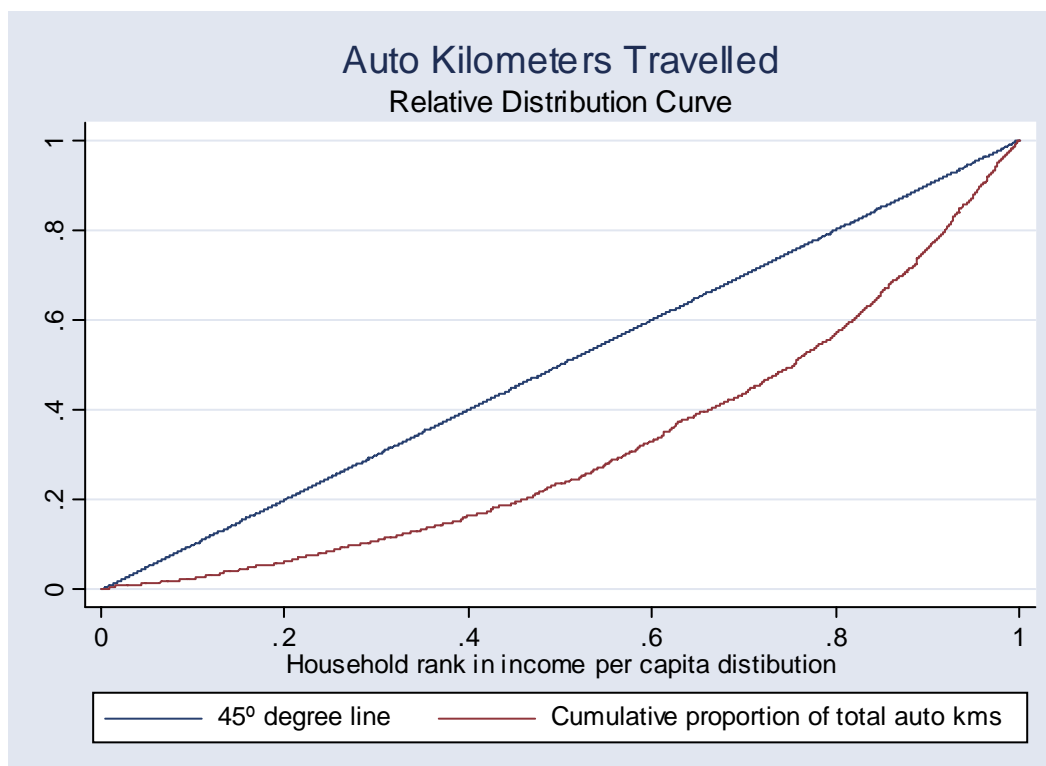
Since the tax and FEPP work to reduce the price per liter consumed of gasoline, the benefits of this policy will be roughly proportional to the number of kilometers traveled by car. This is an approximation since the fuel consumption per kilometer traveled will vary according to the type, age and condition of each car. Richer households probably have bigger cars that consume more fuel per kilometer, but they probably own newer more efficient cars also. Since we do not have information in order to do a more detailed analysis we assume that fuel consumption per kilometer is equal for all users. We also assume that only the driver pays for the fuel, thus the kilometers traveled by household members as passengers in a car do not enter our calculations.

One possible problem with our data is that the distance per trip in the EOD 2001 is not calculated for each segment of a trip, only for the complete journey. Thus, if a person uses the car to drive to a metro station and then changes to this last mode of transport, we only have the distance traveled in the complete trip, including the distance traveled in Metro. However, in practice this problem is irrelevant as only 0.44% of all trips in automobile (with the person driving) involve the use of another mode of transport.

Graph 4 presents the relative distribution curve for this policy. It is clearly very regressive with a Gini coefficient of 0.36.

Once again we need to ask whether the rising automobile ownership rate in Chile during the last five years may not have changed the above results which are based on 2001 data. Unfortunately we do not have data to analyze this issue but a reasonable conjecture is that car ownership has probably risen in the middle class households more than in poorer households. While this would probably make the relative distribution curve somewhat less regressive, it is unlikely to change the overall conclusion that gasoline subsidies are regressive. The main reason is that even if the poor have an increasing access to personal cars, the rich are still intensive users of this mode of transport. Therefore, any policy to subsidize gasoline prices will benefit the rich and will be poorly targeted.

Graph 4: Kilometers traveled in automobile relative distribution curve



Source: own calculations based on EOD 2001.

6.5 Bus fare subsidy

Another possible policy is to reduce the bus fares, either through a subsidy on diesel fuel or by directly subsidizing this price. The first alternative will clearly be badly targeted. According to the figures presented earlier (section 3.2) for every dollar spent on this subsidy, only around 58% will benefit the road transport sector. Of this, a significant part will benefit the trucking industry. Therefore, as an affordability policy for public transport, subsidizing diesel prices is not recommendable.

The second alternative would be to subsidize bus fares directly, as currently occurs with the VAT exemption on transport services. This benefit would be proportional to the number of bus trips made by the household. In fact, if we assume that this policy only affects normal fares — that is, students who already receive a subsidy through the preferential fare are not subsidized again— then the distributive consequences of this policy are exactly the same (although with the opposite sign) as those calculated above for the bus surcharge to fund the student preferential fare (section 6.1). In that section it was estimated that the \$50 per trip surcharge on normal bus fares was regressive. Therefore, a reduction, say of \$50 per fare, in the current bus price would be a progressive policy. The Gini coefficient of this policy would be -0.11, showing some degree of progressiveness.

Of all the policies reviewed so far, subsidizing bus fares directly seems to be the best option to help the poor, although the progressiveness of this policy is not impressive.

6.6 Direct monetary transfers

As mentioned earlier, in order to study the distributional consequences of the monetary transfer policy we need to use the CASEN 2003 data. From this data set we only use observations from the Metropolitan Region, which is larger than the Greater Santiago area since it includes some rural municipalities close to the capital.

There were monetary transfers granted in 2004, 2005 and 2006. We take the 2005 transfer as representative of this type of policy. In that year, eligible individuals were those that met one of the following criteria:³³

- Pensioners whose value was less than Ch\$100,000 per month
- Individuals receiving any of the following government subsidies: family subsidy (SUF or SUF duplo), pension assistance (PASIS), or a subsidy within the framework of the “Chile Solidario” program.
- Workers receiving family allowance and earning less than Ch\$180,000 a month.

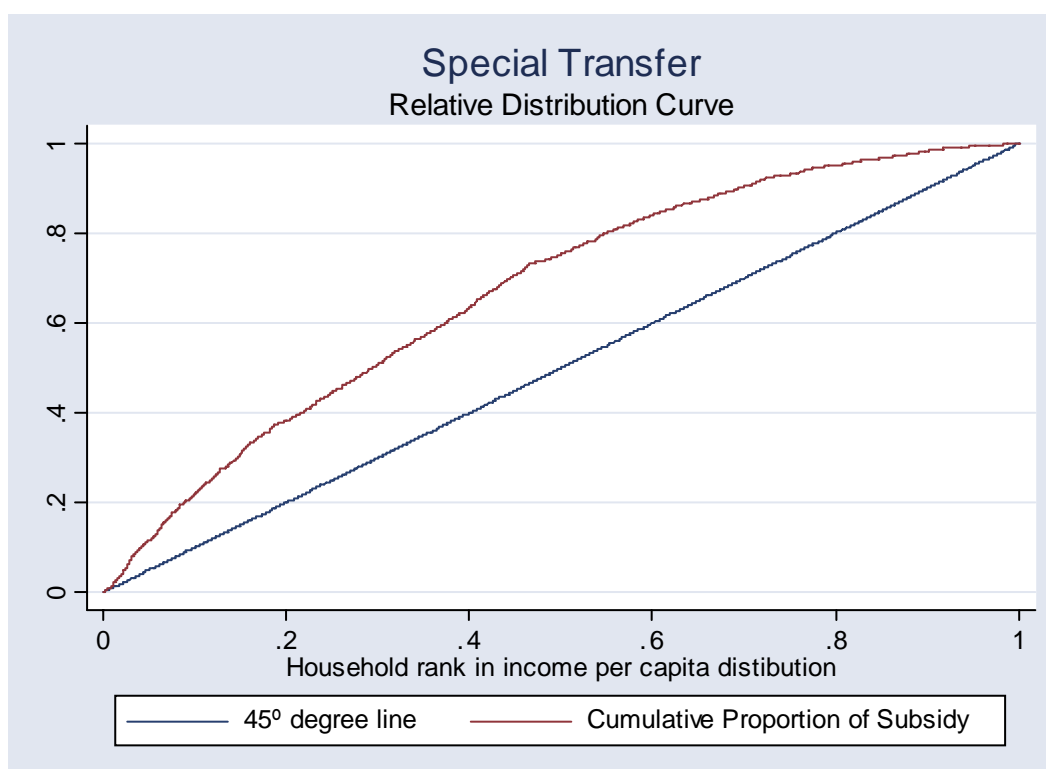
It is also important to mention that the “Chile Solidario” program was just starting in 2003, so the program was still not in its steady state level of participation when the data was taken. For this reason, our calculations are probably a bit conservative in the sense that they sub-estimate the progressiveness of the transfer policy.

The relative transfer curve for the monetary transfers is shown in Graph 5. It can be seen that it is significantly more progressive than the other policies reviewed, with a Gini coefficient of -0.34.

Finally, the results also indicate what is already known in the literature. Namely, that targeting subsidies to the truly poor is a difficult affair. In spite of this, the targeting properties of the monetary transfers in the case of Santiago are very good by comparison to alternative policies options.

³³ These monetary values were deflated using the evolution of the consumer price index between 2003 and March 2005 in order to define the eligibility criteria in the 2003 CASEN survey.

Graph 5: Monetary transfer relative distribution curve



Source: own calculations based on EOD 2001.

7. Conclusions and policy recommendations

The results are clear. The direct monetary transfer policy based on individual's socioeconomic characteristics is the most progressive and best targeted policy. The second best policy would be to subsidize bus fares, although its progressiveness is not very impressive. However, it must be stressed that to exploit the targeting properties of a bus fare subsidy, this policy should be done directly, not indirectly by subsidizing the price of diesel fuel as is done to date.

The student preferential fare policy in the bus system seems at firsthand to be progressive. However, the way it is currently funded—from cross subsidies from normal fares—substantially reduces the convenience of this policy. The distributional consequence of the surcharge on normal fares is regressive and most poor households are negatively affected by this policy. Over 60% of poor households pay a net surcharge under the current cross subsidy scheme. The distributional impact of the student bus fare would be greatly enhanced if these subsidies were funded from general taxation rather than from cross subsidies within the bus system.

Finally, it must be mentioned that there are some other infrastructure subsidies in Santiago which are very regressive. The 'Costanera Norte' urban highway which was completed a few years ago is an expressway corridor running from the rich eastern neighborhoods of the city to the airport and to northern and western entrances of the city. Although data on the

socioeconomic background of current users of this highway is not available, it is highly likely that they are predominantly from the highest income groups. Although this infrastructure is funded through user tolls, it nonetheless received a US\$120 million subsidy from the State. This is clearly a regressive policy.

What general lessons can be extracted from the case of Santiago?

First, this case clearly shows that affordability policies that work at the sectoral level, and that operate by subsidizing certain prices (such as fuels or bus fares), do not help the poor much and, as shown by the case of the student preferential fare's cross subsidy, can be harmful to the majority of poor households. This is not exclusive of Santiago as the evidence for Mexico and Mumbai discussed in the introduction shows. Nor is it exclusive to the transport sector; the international evaluation of sectoral subsidies in the water and electricity sector undertaken by Komives, Foster, Halpern and Wodon (2005) shows that in general this is the case with sectoral subsidies.

Second, subsidizing investments in modern transport systems, such as a metro, may be very regressive. This will depend on the use of this system by poor households and, thus, is an empirical matter. However, in the case of Santiago these investments turned out to be quite regressive. Having invested the same amount of funds in the bus system instead of expanding the metro system would have had a much greater impact on poor households.³⁴ However, it must be noted that these results are prior to the Transantiago reform. This reform will increase significantly the use of the Metro system, especially among the middle to low income households. Therefore, the distributive impact of investments in this infrastructure may well become more progressive. This is an empirical matter that will need to be studied in time.

Third, in order to tackle social and equity issues in the transport sector it may be more promising to use mean tested direct monetary transfers using the instruments available from the general welfare system. This has been the general approach taken in Chile and it seems to have been the most effective way to help poor households in the face of rising transport costs.

In the end, poverty is an all encompassing problem for a household. They are not 'fuel poor', or 'transport poor', rather they are just poor and have a general low level of income that manifests itself through affordability problems at the sectoral level. Therefore, it makes sense to tackle poverty problems at a general level rather than at the sectoral level.

³⁴ Similar apprehensions are noted by Godard and Diaz Olvera (2000) for the metro investments in Cairo, Egypt.

However, there are at least two important qualifications to the general recommendation of using transfers and the general welfare system to address affordability issues.³⁵ First, it may be that society has a special interest in the actual consumption of certain goods and services. This may be due to externalities in the consumption of these goods or because they are deemed to be merit goods. Potable water is a good example in this respect since public health concerns indicate that people should consume a minimum amount of this good irrespective of their personal preferences. In this case, a monetary transfer may not be a good substitute to a direct price subsidy since part of the transfer will often be used to purchase other goods and services.

Related to the above, it may also be that the intra-household allocation of resources differs according to the way benefits are distributed. A specific subsidy on the consumption of a good may increase the resources available to certain members of the household (women, children, elderly) that would not be available had the head of household received a monetary transfer.

For transport subsidies there may be an argument along these lines in the case of children's education, children and women's access to health services and perhaps other goods and services requiring mobility. Society may value these goods more than the implicit valuation by the head of household or the parents' interest may not coincide perfectly with children's interest. In this case the direct provision of subsidized transport may be a better mechanism to achieve society's goals relative to a monetary transfer to the head of household.³⁶

However, if the actual consumption of transport services is the justification for sectoral transport subsidies, then more emphasis needs to be placed on measuring the number of trips undertaken by individuals and how certain policy interventions affect this magnitude.

The second qualification is when the country does not have a well functioning welfare system. There may be no welfare instrument in place to channel financial resources to the poor, existing mechanisms may be very badly targeted or they may generate distortions worse than those created through sectoral subsidies. Setting up mean testing mechanism to screen beneficiaries and the bureaucratic institutions to make monetary transfers on a regular basis may be very costly.

Even in this case, however, some consideration should be given to improving or redesigning the welfare system to benefit the poor instead of relying on sectoral subsidies. Moreover, in the absence of formal targeting mechanisms subsidizing other goods and services besides transport, such as staple foods, may still be a more effective way to channel resources to the poor. This

³⁵ For an excellent discussion of these and related issues see Alderman (2002).

³⁶ However, there are other ways to achieve the same goal of aligning household adult members' interest to those of their children; for example, by conditioning monetary transfers on children's school attendance as in the *Oportunidades* program in Mexico.

will depend on the consumption patterns of the poor and non-poor households, which is an empirical issue that should be evaluated when designing subsidies.

In general then, the need and justification for subsidies will depend on the country context. The more institutionally developed a country, the less transport subsidies are justified on social grounds. Also, it is important to analyzing all the available options to channel benefits to the poor and avoid narrow sectoral views on this subject.

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