The Cost of Fare-Free Public Transit in the COVID Economy: Looking into the Case of the EDSA Carousel Bus System in the Philippines

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Abstract

Transportation costs in public transit are usually fixed to provide mobility to the largest segment of the public. Subsidies are also provided in the form of discounts to students, the elderly, and persons with disabilities. Operators are subjected to follow a fare matrix based on the travel distance between two points. Subsidizing the full transportation costs would require the government to allot funding to cover the operation costs. Businesses may also provide free transit, though most of their operation is funded through corporate sponsorships. Only a few cities in the world currently operate on this scheme, most likely due to the resistance against fare-free public transit policies (FFPT). In the Philippines, this was introduced in a newly-built bus rapid transit (BRT) throughout the Epifanio de los Santos Avenue (EDSA), one of the major thoroughfares in Metro Manila during the onslaught of the coronavirus pandemic. This paper analyzes the contributory effect of an FFPT in the country's economy through a cost-benefit analysis. As most of the stations throughout the bus line are found in central business districts across the region, it has incentivized workers who heavily depend on public transit. It has also increased the level of mobility throughout the area, thus increasing the household consumption made. However, it has affected other public transit in the area, such as the Metro Rail Transit (MRT-3), whose operation also relies on government expenditures. Other factors weigh in towards the effectiveness of implementing an FFPT in Metro Manila, such as the state of infrastructure, the modal choice of passengers, and the gasoline prices in the region. This paper argues that an FFPT is only a short-term solution to increasing the economic activity in the region amidst the coronavirus pandemic, as the BRT system is heavily controlled per the health protocols that are being implemented throughout the country. More passengers would mean more buses in the BRT, and more people waiting in each station would require lesser travel time if possible. This is not to mention the hazard it may bring as physical distancing measures are not being met due to the limited space of each station throughout the BRT system. This paper contends that if the government wishes to continue this scheme after the pandemic, it would require additional infrastructure to support the increasing demand in the system while addressing the mobility needs of vulnerable sectors in the community.

Keywords

Free-Fare Public Transit Policy, Coronavirus Pandemic, Mobility, Bus Rapid Transit, Philippines

Introduction

One of the significant challenges metropolitan areas face is the increasing demand for mobility, partly due to the economic opportunities coming in through these areas. Apart from this reality comes the existing infrastructure network. Greater demand for mobility requires more efficient and effective transport hubs, allowing commuters to reach greater distances with the shortest possible travel time. However, this comes with a price. Governments have to deal with a two-fold task of balancing their budget while providing better transport services to the public as much as possible. However, to avoid any deficit from its budget, they usually bear the costs of its operation by imposing fees, which are usually fixed to cover the largest possible population. Moreover, they have also relied on official development assistance (ODA) to cover the costs of building and managing the transport system.

Transportation costs are associated with numerous factors, such as distance and time. However, it may also be linked to the mode of transportation used, the array of fees that the provider may encounter (i.e., surcharges, taxes, toll fees) in the course of its operation, and the existing competition in the market. These factors create an impact in setting up the fees that will be imposed on the system. In some instances, such as in the Philippines, which is the focus of this research, discounts are placed on students, the elderly, and persons with disabilities to shoulder the transport costs.

Therefore, it is unthinkable for some scholars to see such actions that would provide free transportation to the public. As utopian as it might sound, fare-free public transit policy (FFPT) has garnering much attention recently due to the benefits it brings to the community. It eliminates some of the operational costs despite eliminating all the potential revenues that may be collected for the time being (Scheiner, 1976). It also encourages the public to use public transit as their means of commuting. One example of this is best displayed in Corvallis, Oregon, where an FFPT was implemented in 2011. The city noticed that the daily passenger ride has increased by more than 43% (Volinski, 2012).

However, critics of the policy argue that it poses a free-rider problem, where passengers who can pay could sit in and leave without opening their wallets. However, Hodge et al. (1994) argue that this is an exaggerated response towards the policy. According to their study, the success of FFPT lies in the perception of the management over a fare-free policy. Moreover, free-riders have not been a problem insofar as the narrative of the policy is concerned. The debacle over the FFPT can be dated back as early as the 1960s, whereas an implementation of such could send a seismic shift to a wide range of transport policies, from fuel prices to the public's sudden modal shift to public transit (Štraub, 2020).

Regardless of the academic disputes that have been encapsulating the discourse of FFPT, many still believe that this is not a catch-all solution to the ever-increasing demand for mobility around the world. Its implication to both the economy and the society affects non-riders as well, as I will discuss shortly in this paper. Following the onslaught of the coronavirus pandemic, transport operators have to work out their strategies to mitigate the spread of the virus throughout the transit. Passengers are required to wear a face mask upon their entry into the transit. In some other countries, physical distancing is also encouraged.

I shall divide this paper into three parts. First, I shall briefly discuss the state of transportation in the Philippines. Numerous projects have been taken into consideration by the government to address the increasing demand for mobility in major cities around the country, including Metropolitan Manila. Part of the solutions that are being implemented as of the writing of this paper is the EDSA Carousel Bus System (more commonly referred to as EDSA Busway), a bus rapid transit system (BRT) introduced in June 2020. The BRT will be the focus of the second part of the paper. The final part identifies how the government's service contracting program paved the way for a fare-free scheme in the EDSA Busway. The program aims to support drivers of public utility vehicles (PUV) amidst the coronavirus pandemic.

However, the program drew criticism from some transport groups in the country as bus conductors are forced not to work, as a fare-free transit service throughout the EDSA Busway would mean lower operational costs. Although the government has made it cleared that the program covers both drivers and conductors of public utility buses (PUB), it is yet to be seen how things would go out along the way. As the country imposed one of the stringent lockdown measures at the start of the pandemic, workers in the transport sector have been severely affected due to the limited mobility in most areas around Metropolitan Manila. Although the government later relaxed these measures, it did not cope with the gradual increase of demand for mobility as soon as workers get back and report for work. Implementing an FFPT in a global health crisis should consider a wide range of policy issues, from economic to socio-political. To use the rhetoric of development economists, the benefit of the policy must outweigh the costs incurred.

Current State of Public Transportation in the Philippines

Several works of literature exist on the nature of public transportation around the Philippines. Scholars associate the development of the country's transport with urban planning, primarily due to the land-use development patterns built after the Second World War, especially in major cities. For example, a group of researchers identified two major trends in describing the urban growth of Metropolitan Manila. First, the increase in distances covered by passengers as they travel in the area, and second, the construction of large commercial centers along EDSA and other major thoroughfares, which in the long-run has contributed to traffic congestion (Mijares et al., 2014). However, another group of researchers contends that it is not always the case, as people living near railway stations (i.e., MRT-3) facilitate access to critical services and facilities such as hospitals and schools. Moreover, it discourages households from using their private vehicles as much as possible (Rith et al., 2020). In addition, a local news report suggests that more than 31 shopping malls were plying across EDSA (Barrientos-Vallarta, 2011), contributing to heavy traffic congestion (Boquet, 2013). As a result, more than 2.4 billion pesos are lost due to the severe traffic congestion across major thoroughfares in Manila, such as EDSA and Commonwealth Avenue (JICA, 2014).

To address the increasing traffic congestion in EDSA, the government, through various channels, has implemented a series of sweeping reforms. During the Ramos Administration (1992-1998), its Medium-Term Philippine Development Plan of 1992-1998 was envisioned to construct new highways within and beyond Metro Manila. The Metropolitan Manila Development Authority (MMDA) was also established during his term in 1995 to handle the traffic crisis across the region. In 1997, the Presidential Task Force on Traffic Improvement was created to exert additional powers to address the crisis. Major thoroughfares were later constructed, such as the Skyway and the Manila-Cavite Tollway (Llanto, 2002).

Various rail lines were also introduced during this time. Under the Estrada Administration, the Metro Rail Transit Line 3 (MRT-3) was already on its way, including the Light Rail Transit Line 2 (LRT-2). During his term, two additional railway projects were proposed: the LRT-1 extension from Baclaran to the City of Bacoor in Cavite Province and the LRT-4 along Quezon Avenue. These were not implemented, however, following his impeachment in February 2001. It was during the Macapagal-Arroyo Administration when the LRT-2 was completed (ibid.). The MRT-LRT connection project was also launched to close the loop between the LRT-1 and the MRT-3. Despite these new transport infrastructures, it failed, however, to keep up with the demand for mobility across Metro Manila due to the excessive concentration of economic activity within the area (Boquet, 2013). Only 77 kilometers of railway length were built in the last two decades, covering 61 stations from various lines with 234 train sets plying every day. Plans of extending these existing lines are already underway as of the writing of this paper, with new additional lines are being constructed, including the North-South Commuter Railway (NSCR), the Metro Manila Subway, and the Mindanao Railway. Other proposals are yet to be implemented by the Duterte Administration before his term ends in 2022 in the hopes of improving the railway infrastructure around the Philippines.

Apart from the urbanization in the area also comes the increasing motorization of households beginning in the late 1990s (Barter, 1999). The number of private vehicles has significantly accelerated in the last decade (Table 1), while PUVs did not (Table 2). In a 2014 JICA report, PUVs only use a measly 28% of the road space but covers more than 67% of the public's mobility demand. More than 90% of public utility jeepneys plying across Metro Manila are more than 15 years old (Delgra III, 2018).

These circumstances in the country's public transportation all go down to the lack of government-led planning to improve their service. The Land Transportation Franchise and Regulatory Board (LTFRB) previously issues franchises based on existing routes available only, constraining the road capacity, especially in major thoroughfares. Moreover, as more PUVs are plying on the same route, it becomes a leeway for intense competition. This is not to mention their co-existence with other modes of transport (i.e., tricycles), thereby resulting in the lack of hierarchy in the country's road transport.

Table 1. Number of Private Vehicles Registered in the Philippines, 2007-2014

Private	**4,558,727**	**4,908,332**	**5,216,646**	**5,631,377**	**6,096,423**	**6,417,809**	**6,673,815**	**7,093,059**
Cars	700,384	713,175	732,659	759,683	788,372	808,968	830,131	…
Trucks	255,522	269,367	281,282	288,427	298,789	308,644	325,412	…
Motorcycles/ Tricycles	2,039,850	2,360,304	2,559,997	2,841,646	3,206,255	3,440,777	3,584,848	…
Trailers	21,641	24,299	25,965	26,163	29,373	32,240	33,915	…

Table 2. Number of Public Utility Vehicles Registered in the Philippines, 2007-2014

For hire	**887,023**	**899,211**	**931,048**	**934,176**	**970,946**	**969,784**	**940,073**	**912,584**
Cars	37,648	35,342	39,812	41,787	33,131	36,426	31,625	…
Utility vehicles	215,585	215,929	217,967	217,338	229,330	220,114	209,359	…
Buses	23,142	23,032	25,519	26,566	25,262	27,298	23,743	…
Motorcycles/ Tricycles	591,254	604,238	623,663	624,078	658,466	658,675	647,554	…

Source: Philippine Statistics Authority, 2019

The government launched several initiatives to address these concerns in the country's road transport. One of these is the controversial PUV Modernization Program, where it aims to replace old PUVs such as buses and jeepneys with modern ones, subject to the guidelines settled by the LTFRB. Some of the required features of the modern jeepneys include a dashboard camera, speed limiter, automatic fare collection system, and a broader seating capacity for passengers. However, drivers and operators contend for the program's anti-poor narrative, as buying modern jeepneys would cost them around ₱ 2 million.

Transport network vehicle service (TNVS) later emerge in the streets of Manila and Cebu in 2014, as companies like Grab and Uber set down its operation in the Philippines. The government later regulated them in the following year to ensure that the service does not abuse the commuting public. New franchises

were later handed out to several start-up companies such as Angkas and Tok Tok. In 2018, the LTFRB issued a memorandum order limiting the number of TNVS drivers throughout Metropolitan Manila. Providers of such service question the move of the agency, where Grab Philippines' chief Brian Cu called the decision "not good for [their company] and the industry." (Laurel, 22 January 2018). Protests were later held in major thoroughfares around the metro, including EDSA and Quezon Avenue, where drivers called out the government to stop imposing such limits throughout the TNVS in the country.

The EDSA Carousel Bus System

Buses play an essential role in public transit across Metropolitan Manila, especially those plying across EDSA, one of the most important thoroughfares in the region. The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) remarked in its TRANSfer Project Report that the daily bus ridership across EDSA stands at around 1 million, with more than 47 bus routes available in the area (Table 3).

Table 3. City Bus Services Operating in EDSA[1]

Route	Mode	Length* (1-way)	Vehicle Units	Daily Passengers
Alabang-Malanday	PUB	43.7	62	27,996
Angat-Leveriza	PUB	58.5	0	5,738
Baclaran-Malanday	PUB	35.2	79	27,308
Bagong Silang-Baclaran	PUB	39.0	77	11,922
Bagong Silang-NAIA	PUB	42.8	105	8,564
Balibago-SM Fairview	PUB	60.5	65	7,611
Dasmarinas-Navotas	PUB	58.6	237	16,193
FTI-SM Fairview	PUB	34.7	116	9,821
Grotto-Baclaran	PUB	42.2	698	83,074
Grotto-NAIA	PUB	45.1	465	60,773
Heritage Homes-Baclaran	PUB	38.5	94	9,096
Malanday-Baclaran	PUB	33.0	165	20,665
Malanday-Muntinlupa	PUB	44.2	56	6,685
Malanday-NAIA	PUB	39.0	564	74,945
Marilao-Muntinlupa	PUB	55.1	100	11,335
Montalban-Baclaran	PUB	36.6	70	6,396
NAIA-Malanday	PUB	36.8	477	44,623
Navotas-Alabang	PUB	41.5	253	28.035
Navotas-Baclaran	PUB	30.8	217	32,270
Navotas-FTI	PUB	32.4	458	78,844
Navotas-Pacita	PUB	49.7	290	28,632
Norzagaray (Sapang Palay)-Baclaran	PUB	54.4	322	33,246
Norzagaray (Sapang Palay)-NAIA	PUB	58.2	281	32,359
Novaliches-Alabang	PUB	41.2	447	57,446
Novaliches-Baclaran	PUB	30.5	198	17,428
Pacita-Letre	PUB	48.0	22	2,149
Pacita-Novaliches	PUB	46.7	135	14,226

[1] Before the coronavirus pandemic begun in March 2020. Most of the routes were either altered or discarded by the LTFRB eventually, replacing them instead with a network-based transport scheme throughout the area. The scheme allows for a point-to-point transport service instead of the usual route-based scheming, which allows passengers to avail of public transit services in most areas around the Metropolitan Manila.

SM Fairview-Alabang	PUB	43.8	505	54,973
SM Fairview-Baclaran	PUB	33.1	646	54,019
SM Fairview-Buendia/Cartimar	PUB	32.0	153	19,168
SM Fairview-NAIA	PUB	36.9	55	4,908
SM Fairview-Pacita	PUB	54.1	357	27,948
Sta. Maria-Baclaran	PUB	47.5	102	12,747
Sta. Maria-Santolan	PUB	43.9	367	26,419

* in kilometers

Source: Integrated Transport Planning (ITP), Metro Manila Road Transit Rationalization Study (RTRS).

Despite the steady increase in the number of routes plying through EDSA, Vergel de Dios (n.d.) argued that it failed, however, to cover a wider extent of Metro Manila as most of the routes are concentrated. Competition is also prevalent as there are a handful of bus operators in EDSA. As a result, bus services are inadequate and, at times, unsafe for passengers. Road accidents are common not only in EDSA but in other major thoroughfares across the region as well. In 2020, EDSA was still the most accident-prone highway in Metro Manila, accounting for more than 14% of the total number of traffic-related incidents recorded in the area. Of this number, around 10,842 of which involves public utility buses, resulting in 28 fatalities.

To address the series of concerns, the MMDA set up several bus schemes in the past. In 2003, the Organized Bus Route System (OBR) was implemented during the leadership of then-Chairman Bayani Fernando. In this scheme, buses were given color-coded dispatch numbers based on the terminal or control station location where it was issued (Table 4). Buses are only allowed to load and unload passengers in designated terminals for 30 seconds. An additional 15 seconds may be permitted depending on the extent of the demand. In 2006, it was later revised, dividing the city bus lanes on EDSA into two. Buses marked as A is only allowed to load and unload passengers at terminals for Bus A. The same fashion goes on with Bus B. However, in his privilege speech given to Congress in 2019, Fernando mentioned that "after three months, the system broke down as drivers learned to outwit the controls [of the system] and bribery corrupted the system. The system in place relying on personal supervision of MMDA ground personnel proved to be so vulnerable to corruption and the bad work ethics and greed of drivers and government workers the system collapsed."[2] In the end, terminals under the OBR became meaningless as buses kept on loading and unloading passengers wherever they wanted to along the EDSA stretch.

In 2012, the MMDA again tried to revive the system through the EDSA Bus Segregation System. This time, however, it only covers Kamuning in Quezon City to Magallanes in Makati City. The agency deemed the necessity to implement it only to the areas mentioned above as these are considered chokepoints, causing traffic congestion along EDSA. Buses were again designated into three lines (A, B, and C). New, color-coded terminals were built along the avenue to guide the passengers. Stickers were also placed in the upper-right corner of city buses to inform the riding public about their respective designations. Like the OBR, the EDSA Bus Segregation System failed to address the traffic crisis across the area. Bus drivers were reportedly using fake stickers to circumvent the system. Two years after the system was first introduced, a new set of bus codes were implemented to address these problems. Instead of using red and blue colors, the revised EDSA Bus Segregation System adopted green, yellow, and orange colors.

[2] Fernando, B.F. (2019, August 13). Organized Bus Route (The OBR): A Solution to Metro Manila Transport Needs and Traffic Problem. Speech delivered before the House of Representatives of the Philippines.

Table 4. Color-Coded Queue Numbers for the Organized Bus Route System

TSB1	Letre, Navotas	White
TSB2	Malanday, Valenzuela	Black
CSB1	Monumento at Honda (for buses from Valenzuela, Malanday, etc)	Red
TSB3	Novaliches via Quirino	White
CSB2	After Balintawak Market at Royal (for buses from CSB1, NLEX, Novaliches via Quirino, etc)	Yellow
TSB3	Novaliches via C-5	Black
CSB3	Roosevelt at PLDT (for buses from CSB2 and Novaliches via C-5)	Orange
TSB4	Fairview (for buses from Fairview and Lagro)	Black
TSB5	San Mateo/Marikina	White
COMN	Commonwealth at Don Antonio	Red
CSB4	New York (for buses from CSB3 and Marikina	Pink

Source: Metro Manila Development Authority, 2003.

Apart from the EDSA Bus Segregation System, authorities from the MRT-3 management introduced the MRT-3 Bus Augmentation Program to channel its passengers to city buses due to the limited riding capacity of its rail service. The program covers all stations of the MRT-3 line, with drop-off and pick-up stations designated in key locations within the area. It was also used whenever the line experiences technical errors and difficulties, which affects the ridership not just in the line but also across EDSA. In 2019, following the onslaught of the coronavirus pandemic in the Philippines, the Department of Transportation (DoTR) considered the program as a solution to minimize the transmission of the COVID-19 virus in major public transits across Metro Manila, including the MRT-3. The EDSA Busway Project later absorbed the program in 2020, one of the first Bus Rapid Transit Systems (BRT) introduced across the metro.

Plans for creating a BRT in Metro Manila began as early as 2018 when the Philippine Government requested a loan to program the project. The World Bank subsequently approved the request, and a feasibility study was launched to determine the project's specifics. Two BRT lines were initially planned to introduce in the area, one is in EDSA, and the other is in Quezon Avenue. The EDSA Carousel Bus System has 21 stations, stretching from Monumento in Caloocan City to the Paranaque Interchange Terminal Express (PITX). Most of the bus stops along the system are directly connected to LRT-1 and MRT-3. In 2020, the DoTR, together with SM Prime Holdings, signed an agreement allowing for the construction of three additional terminals in SM Mall of Asia, SM North EDSA, and SM Megamall. The proposed terminals will use an automated fare collection system for a much convenient transaction. At the same time, facilities such as ramps and elevators will also be added to better assists the elderly and PWDs.

Fare-Free Transport Scheme in Metro Manila

On April 2021, the LTFRB released a memorandum circular on the guidelines for implementing a fare-free transport scheme across the Philippines for authorized persons outside of residence (APOR) and medical workers. The memo was released following the enactment of the Bayanihan to Recover as One Act (Bayanihan 2), where key stipulations on the transport sector are introduced to assist affected transit operators and drivers. According to the memo, the pay-out will be done every week, using the actual daily kilometer run made multiplied by the kilometer fee set by the LTFRB. In addition, drivers will get 30% of the total weekly pay-out, while operators will get 70% to cover all operational and maintenance costs.

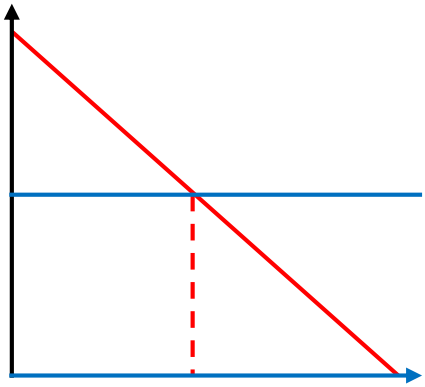
The Costs and Benefits of a Fare-Free Public Transit

Analyzing the costs and benefits of implementing free public transportation requires a brief introduction to its theoretical background. For one, it involves the externalities produced in the market economy. Any one of the factors of production affected by these externalities posits for either a risk or a benefit to the economy. Externalities can be identified either as a consumption externality or as a production externality. The former shows how an agent's action may affect the utility of another agent in the market, while the latter focuses on how an agent's action may significantly affect the production function of a given firm (Varian, 1978).

Further, externalities may be positive or negative. Each good produced in the market economy has its own cost, which indirectly affects the consumption and production opportunities of the public. An example of this is best displayed by factories releasing toxic chemicals in bodies of water, which in return killing various marine species. Negative externalities like that of the previous scenario illustrate the social costs of harmful activities made in the community. In the case of transport policy, this is best illustrated in the pollution made as more cars are plying through the streets, emitting harmful gases in the air. Positive externalities, on the other hand, are activities that provide benefits to the people. Implementing research and development (R&D) activities on transportation and communication is one example of this.

In a typical setting, transportation costs are usually fixed, oftentimes determined by the government to provide public transit service to a certain extent of the population. As a result, operators are left to cover the financial costs of managing their daily operations. These costs will significantly decline as soon as a fare-free public transit policy is introduced. Vliet (2009) identified four observable effects of the decline in financial costs, affecting the ridership of cars, bicycles, and public transit. Using simple economic theory, he argued that the introduction of a fare-free public transit would increase the ridership in public transit. Figure 1 shows that the supply curve reaches the axis as soon as ticket prices fall from P' to P", while the number of passengers increases from Q' to Q" along the demand line. This, however, varies as the elasticity of the demand in every city where free public transportation exists is different from one another.

Figure 1. Direct Effect of Fare-Free Public Transportation on Ridership Demand

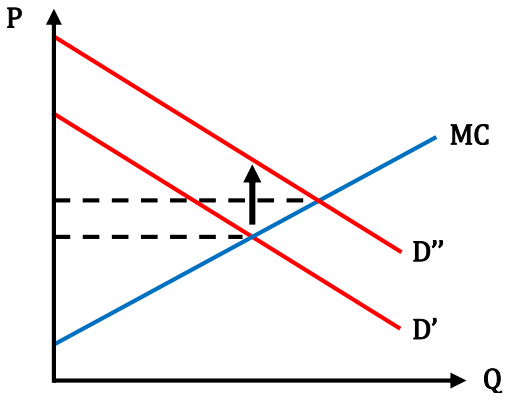


Source: Rosen, 2005.

Using Greene and Jones (1997) to illustrate the indirect effect of free transportation on the market economy, the demand curve shifts from D' to D" due to lower travel costs (Figure 2). As a result, consumers have an additional peso available to spend on other goods and services. Furthermore, since more people will travel to shopping centers as a result of free public transit, it is likely that shop owners also benefit due to higher

profits. However, they have also reinstated that transportation involves a wide range of markets in the economy, making it hard for students of transport policy to fully identify the costs and benefits of adopting a fare-free public transit policy in the community. This is not to mention the various externalities that may also affect the implementation of an FFPT, such as technological upgrades as well as the changing behavior.

Figure 2. Indirect Effect of Fare-Free Public Transportation on the Market Economy



Source: Greene and Jones, 1997.

Since the utility of every individual increases due to the adoption of a free public transportation, the consumer surplus also increases. Using Vliet (2009), the change in consumer surplus can be defined by:

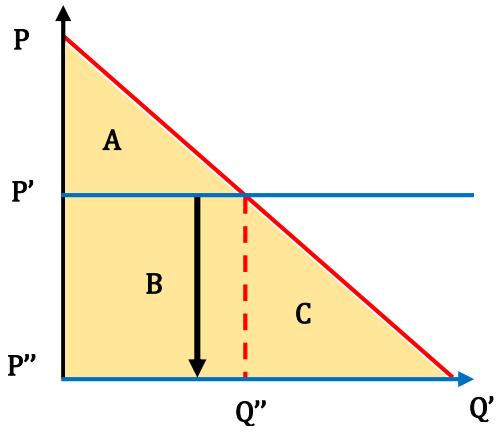
$$\Delta CS = Q'(P' - P") + \frac{(Q - Q')(P" - P')}{2} \qquad (1.1)$$

where:

ΔCS = change in consumer surplus
P' = price of a ticket before an FFPT
$P"$ = price of a ticket after an FFPT
Q' = number of passengers before an FFPT
Q'' = number of passengers after an FFPT

This equation can be visualized using the demand-supply curve in Figure 1. As transportation is considered a derived demand (Blauwens et al., 2006), any significant change in ticket prices may affect the demand of both the transit, intermediate service, and other goods individuals will consume in the short run. Moreover, since the price has reached the axis, individuals' willingness to pay for the service is now larger than in a scenario before an FFPT is introduced. Combining this willingness would provide the total consumer surplus under the demand curve (Rosen, 2005). In the end, transportation firms that engage in an FFPT scheme gain a turnover of Rectangle B, including Triangles A and C. This scenario will only work for as long as two criteria are met: (1) the total demand for public transportation is smaller than the available supply, and (2) the government compensates all participating public transportation firms to cover the implementation costs of the FFPT. This is to ensure that negative externalities are minimized.

Figure 3. Direct Effect of Fare-Free Public Transportation on the Consumer Surplus



Source: Rosen, 2005.

Adopting an FFPT has its negative side, however. For one, more people will utilize public transit more than cars due to the substitution effect. As a result, FFPT provides a net positive effect on public transit use, while car use will have a net negative effect. According to Vliet (2009), car usage would only be substituted entirely once public transport finally covers the extent of journey cars have. The same case applies to other public transportation, which is not covered in the free-fare policy. As displayed in the case of Metro Manila, only selected routes determined by the LTFRB are implementing an FFTP. Not all bus and jeepney routes are covered by the government's service contracting program. Further, public rail transport such as the LRT-1, LRT-2, and MRT-3 is not covered. As I will discuss shortly, since most of the stations under the EDSA Carousel Bus System lie along the MRT-3, implementing an FFTP would significantly reduce the ridership in MRT-3 and other means of public transit as more people will avail of the free public transportation.

Methodology

To identify whether the government's service contracting program benefits the economy, the benefit-cost ratio (BCR) is determined between the pay-outs made through the program and the revenues made by each bus driver in a normal setting. These two are both determined by the distance traveled in a day, expressed in kilometers. The BCR identifies whether a program is viable enough, such that it will bring cash inflows, either in the form of additional revenues or investments made through the program. Three generic ranges constitute the BCR (BCR < 1; BCR = 1; and BCR > 1), each having its own respective interpretation. If the BCR's value is lower than 1, it means that the program generates losses as cash inflows are smaller than that of the corresponding costs associated with the program's implementation. An investment option only becomes profitable if the BCR is higher than one as the discounted benefits exceed the costs incurred. The November 2018 version of the fare matrix is used as a basis in determining the BCR of the program.

The second part of the analysis looks into the effect of implementing a fare-free transit policy, brought about by the government's service contracting program, in the household consumption in Metro Manila. Two factors are used to determine the relationship between the two variables. This includes the inflation rate and the consumer price index (CPI) of various goods and services in Metro Manila. To achieve this part of the research, binary logistic regression is used to identify the relationship between the predictor and the predicted variables in the study. It is also used to see the likeliness for one event to happen again in the future, which can be identified through its odds ratio. Its equation can be expressed as follows:

$$P = \frac{1}{1 + e^{-(\beta_0 + \beta_1 x_1)}} \quad (1.2)$$

where:

β_0 = Population Intercept
β_1 = Population Slope Coefficient
x_1 = Independent Variable
P = Probability for the Dependent Variable to Occur at 1s

Two important points are needed to remember when using Equation 1.2. First, the p-value determines whether the relationship between the two variables used is statistically significant or not. If the value of α is less than the p-value, the association between the predictor and the predicted variable is insignificant. Likewise, if the value of α is greater than or equal to the p-value, its relationship is statistically significant. Second, the odds ratio, which, as mentioned, identifies the likeliness for one event to happen in the future. Odd ratios greater than one pose a greater occurrence of the event as the predictor variable increases. The opposite is true when the odd ratios below 1 pose for lower occurrence.

Results and Discussion

Benefit-Cost Ratio of Fare-Free Public Transit in Metro Manila

The BCR for a fare-free public transit program along the EDSA Carousel Bus System is smaller for shorter distances traveled along the route, meaning that the cost has outweighed the benefits. Therefore, bus operators and drivers would rather return to their regular operations than enroll in the government's service contracting program as it would cover both the operational and corresponding costs. This is only true for a full-seating capacity in all public transit across the Philippines. However, since the seating capacity is reduced to half due to the health protocols imposed as a result of the coronavirus pandemic, the BCR for the program becomes financially profitable on the part of the bus firm as the government shoulders both the operational costs and the extra revenue gained (expressed as Triangle C in Figure 3) in its operation. Table 5 shows the distance of each station along the EDSA Carousel Bus System. Ticket pricing is measured in terms of distance traveled expressed in kilometers. For the first five kilometers, the ticket price is ₱ 13.00. For every additional kilometer traveled, an additional ₱ 2.25 is added. Discount is given to students, the elderly, and persons with disabilities (PWDs) provided that they should present an identification card.

Further, the results shown in Table 5 suggest that the current pay-out given to bus operators and drivers weekly is not enough to sustain the actual costs of its operation if operating in full-scale. Implementing a "true" free-fare transit program in the community would involve massive amounts of capital on the part of the government. This is apart from the infrastructure it needed to maintain to carry out its operation in the long run. However, it encourages the public to support more public transit rather than relying on cars despite introducing free public transportation. In return, the amount of carbon monoxide emitted by cars and other forms of transportation is significantly reduced due to a catch-all approach in mobilizing people around the community. Another social cost of the program is the accidents involving public buses around Metro Manila. As the buses are plying across a specially designated area in EDSA, the movement of buses is guided by the barricades installed along the route. As of the writing of this paper, most of the accidents reported along the EDSA Carousel Bus System are bus crashes in barricades. Therefore, the MMDA has decided to reduce the speed of buses along the said line to 40 km/h from its previous speed of 50 km/h. Finally, as discussed in the previous section, a fare-free public transit program allows people to spend their money on other goods and services since the travel costs of getting to shopping centers is zero.

Table 5. Benefit-Cost Ratio (BCR) of a Fare-Free Public Transit Program in EDSA Carousel Bus System

(Southbound)

Travelling from MCU	Regular	Student/Elderly Disabled	Distance (km)	Future Benefits	Future Costs (Full Seating)	Future Costs (Half Seating)	BCR (Full Seating)	BCR (Half Seating)
Bagong Barrio	13.00	10.50	1	82.50	793.00	390.00	0.104035309	0.2115385
Kaingin Road/LRT Balintawak Station	13.00	10.50	2	165.00	793.00	390.00	0.208070618	0.4230769
LRT Munoz Station	13.00	10.50	4	330.00	793.00	390.00	0.416141236	0.8461538
MRT North Avenue Station	13.00	10.50	5	412.50	793.00	390.00	0.520176545	1.0576923
MRT Quezon Avenue Station	17.50	14.00	7	577.50	1067.50	525.00	0.540983607	1.1
Nepa Q-Mart	21.75	17.50	9	742.50	1326.75	652.50	0.559638214	1.1379310
Main Avenue	24.00	19.25	10	825.00	1464.00	720.00	0.563524590	1.1458333
MRT Santolan Station	26.25	21.00	11	907.50	1601.25	787.50	0.566744731	1.1523810
MRT Ortigas Station	32.75	26.25	14	1155.00	1997.75	982.50	0.578150419	1.1755725
MRT Guadalupe Station	37.25	29.75	16	1320.00	2272.25	1117.50	0.580921994	1.1812081
Buendia	41.50	33.25	18	1485.00	2531.50	1245.00	0.586608730	1.1927711
Ayala	43.75	35.00	19	1567.50	2668.75	1312.50	0.587353630	1.1942857
Taft Avenue	50.50	40.25	22	1815.00	3080.50	1515.00	0.589190067	1.1980198
Roxas Boulevard	52.50	42.00	23	1897.50	3202.50	1575.00	0.592505855	1.2047619
SM Mall of Asia	54.75	43.75	24	1980.00	3339.75	1642.50	0.592858747	1.2054795
PITX Terminal	61.50	49.00	27	2227.50	3751.50	1845.00	0.593762495	1.2073171

(Northbound)

PITX Terminal	Regular	Student/Elderly Disabled	Distance (km)	Future Benefits	Future Costs (Full Seating)	Future Costs (Half Seating)	BCR (Full Seating)	BCR (Half Seating)
SM Mall of Asia	13.00	10.50	4	330.00	793.00	390.00	0.416141236	0.846153846
Roxas Boulevard /Taft Avenue	13.00	10.50	5	412.50	793.00	390.00	0.520176545	1.057692308
Ayala	21.75	17.50	9	742.50	1326.75	652.50	0.559638214	1.137931034
Buendia	24.00	19.25	10	825.00	1464.00	720.00	0.563524590	1.145833333
MRT Guadalupe Station	26.25	21.00	11	907.50	1601.25	787.50	0.566744731	1.152380952
MRT Ortigas Station	32.75	26.25	14	1155.00	1997.75	982.50	0.578150419	1.175572519
MRT Santolan Station	37.25	29.75	16	1320.00	2272.25	1117.50	0.580921994	1.181208054
Main Avenue	39.50	31.50	17	1402.50	2409.50	1185.00	0.582070969	1.183544304
Nepa Q-Mart	43.75	35.00	19	1567.50	2668.75	1312.50	0.587353630	1.194285714
MRT Quezon Avenue Station	48.25	38.50	21	1732.50	2943.25	1447.50	0.588635012	1.196891192
MRT North Avenue Station	50.50	40.25	22	1815.00	3080.50	1515.00	0.589190067	1.198019802
LRT Munoz Station	54.75	43.75	24	1980.00	3339.75	1642.50	0.592858747	1.205479452
Kaingin Road/LRT Balintawak Station	57.00	45.50	25	2062.50	3477.00	1710.00	0.593183779	1.206140351
Bagong Barrio	59.25	47.25	26	2145.00	3614.25	1777.50	0.593484125	1.206751055
MCU	61.50	49.00	27	2227.50	3751.50	1845.00	0.593762495	1.207317073

Further, the labor market is also incentivized in the short run as workers do not have to worry about the travel costs of getting into their work. However, on the other hand, firms benefit too as their workers do not have to spend most of their time traveling for work, thereby market productivity increases in the short run.

In the long run, however, free public transportation poses a risk for other means of public transit in the area. In the EDSA Carousel Bus System case, commuters would opt to ride the bus instead of the MRT as both transits cover the same coverage along EDSA. As ridership in MRT and other forms of public transit decreases, operators would find themselves in a difficult situation to cover their operational costs. Further, this externality would significantly affect the benefits brought about by the FFPT, especially in those public transit controlled and managed by the government, such as MRT and LRT. The same is true for private bus firms whose operation relies solely on the revenues they collect from passengers. As it was mentioned, firms cannot increase their bus fleet as there is a threshold to the number of buses allowed to ply across the EDSA Carousel Bus System, and if ever they have the privilege to do so, the government shall cover the costs for every bus driver added to its service contracting program, thus increasing the expenses.

Since more passengers are riding the bus than other means of public transit, bus stations along the line may experience an overcapacity to their intended size. This is not to mention that most of these bus stations are small. Given a time when a coronavirus pandemic is plaguing the entire world, health protocols must be followed at all times, including in transportation. However, as there is an excess demand for public transit, oftentimes, these are not being met. As a result, potential transmission of the virus may take place in some, if not all, of the stations. The costs of covering passengers who contract the virus outweigh the benefits. Medical costs are shouldered by the victims, and if ever possible, by the government if they are enrolled through its health insurance. If more people are diagnosed with the virus, the economic activity will severely affect, and the government will be forced to limit the movement of people once again.

Economic Costs and Benefits of Fare-Free Public Transit in Metro Manila

For this section, Equation 1.2 is used to determine whether the free public transit program along the EDSA Carousel Bus System affects domestic household consumption and the consumer price index (CPI) in Metro Manila. Figure 4 shows that the FFPT significantly affects the CPI for food and non-alcoholic beverages. This means that the prices for food and non-alcoholic beverages have significantly changed since the FFPT has initiated as more people can travel to shopping centers to buy necessities, especially in a time of pandemic. Therefore, people would choose to spend their additional peso saved from transportation costs on food and non-alcoholic beverages rather than use it for non-essential durable goods. However, results have shown that there is also a statistical significance between the FFPT and the CPI for furniture and other household equipment and clothing and footwear. Among the 11 major goods and services surveyed in the study, the CPIs of alcoholic beverages and tobacco, as well as education services, public utilities, and communication, are not directly affected by the implementation of an FFPT in EDSA.

Meanwhile, the inflation rate throughout the region is not affected by the FFPT (see Figure 5). One possible reason for this is that not all people across Metro Manila are availing the free public transportation. Only those who are within the area have access to utilize the service, not unless potential riders would travel to one of the stations along the EDSA Carousel Bus System. Moreover, it exhibits the case of a free-rider problem, where passengers who can pay for ticket price are also covered in the FFPT, even if it poses a greater demand for public transit. As a result, all potential revenues are foregone and are covered by the government. While the CPI for transportation directly links to the FFPT, it does not necessarily mean it can also affect the travel costs for moving other goods and services within Metro Manila. For instance, some passengers who, after availing the free transit, would have to ride again to get to their destination. While the costs of traveling have reduced, it does not, however, fully cover the distance traveled from one point to another as the service contracting program covers not all routes throughout the region.

Figure 4. The Effect of Free Public Transportation to the CPI of Food and Non-Alcoholic Beverages in Metro Manila Using Binomial Logistic Regression (95% C.I.)

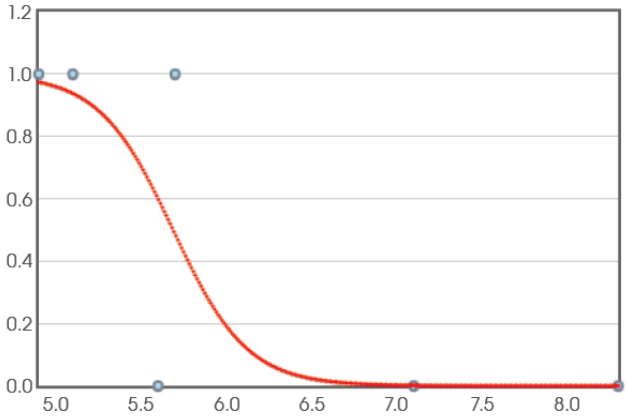
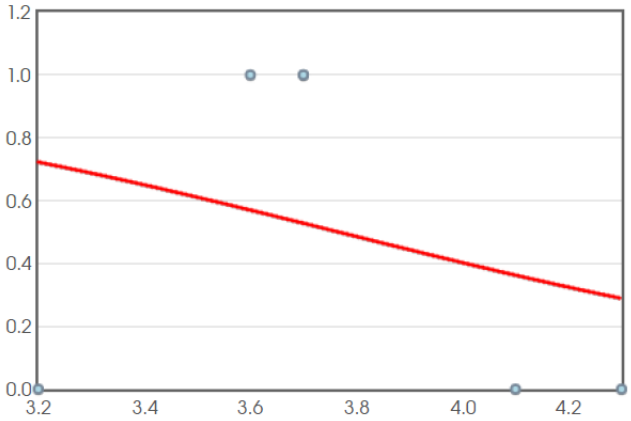


Figure 5. The Effect of Free Public Transportation to the Inflation Rate of Basic Goods and Services in Metro Manila Using Binomial Logistic Regression (95% C.I.)



Finally, despite the statistical association between FFPT and the CPI of several goods in Metro Manila, it does not affect the overall household consumption expenditure made throughout the country even if the entire region takes account for over a third (36.3%) of the country's gross domestic product (GDP) in 2014 (Porio, 2004). The same trend goes with its gross regional domestic product (GRDP) from 2011-2013, totaling 2.1% (Porio et al., 2019). While most of the economic activity is taking place in Manila, not everyone is availing of the services available in the region, such as the FFPT along EDSA. Again, the free-rider problem enters the picture. Do taxpayers in Cagayan Valley have to bear the costs of operating an FFPT in a 27 kilometer stretch of a thoroughfare in Metro Manila? Moreover, do they even have the capacity to avail themselves of the free ride, to begin with? The costs of implementing an FFPT by principle are shouldered by the revenues collected from taxpayers, regardless of their location. Assuming that the same will be applied in other major cities around the Philippines (e.g., Cebu, Iloilo, Davao), it is likely that there will be an effect on the household consumption expenditure. Another scenario would be the implementation of FFPT in all provinces around the country. As local governments have the power to exercise financial control in their areas of concern, local revenues collected can be allocated to fund local FFPT. In this way, local economic activity is encouraged, so is the domestic household consumption.

Conclusion

This paper identifies whether implementing an FFPT through the Service Contracting Program in the Philippines would benefit the economy in the long run amidst the coronavirus pandemic. Several routes were covered in the said program, including the EDSA Carousel Bus System. Bus drivers and operators who are part of the program receive a weekly pay-out determined by the amount of distance traveled in a week. It was identified that the FFPT only covers the operational costs of bus firms along the line but does not cover the additional potential revenue they can get in a regular operation. The benefit-cost ratio of implementing an FFPT along the line only becomes profitable as soon as it covers a longer travel distance, given a half seating capacity in public buses. In terms of economic activity, people are encouraged to travel more without bearing the costs of doing so, as the government shoulders it. As such, passengers would use their money intended for traveling to consume other goods and services such as food and non-alcoholic beverages, as well as medicines. While the FFPT does not affect the overall household consumption expenditure made throughout the country, it encourages a pro-active domestic economic activity in Metro Manila, especially in a global health crisis. Further, this program allows the government to overlook the current transport situation around the country. The Duterte administration, through its "Build, Build, Build" Program, aims to improve the transport infrastructure across the Philippines. By allowing the government to invest more in transportation would undoubtedly benefit the larger extent of the population.

But there are, of course, consequences in allowing this to happen. The government has to find additional sources of funding to make these projects come true. In the case of the FFPT, however, three things need to be considered. First, the existing infrastructure along the EDSA Carousel Bus System. Since the economic activity throughout Metro Manila is restrained due to the coronavirus pandemic, bus stations are not fully utilized, and if so, only during rush hours and in selected stations. To continue the economic viability of the FFPT, should the government wishes to institutionalize it for good, it must invest in the infrastructure along the said BRT line by increasing the size of every station and adding new services such as elevators and ramps for the elderly and PWDs. Second, the costs of funding the program. As not all people are availing the FFPT, the least good thing its users can do is to make the most out of it. To use this as an opportunity to contribute to the economy by consuming more if possible. However, this would not be possible if the people, to begin with, have no financial capacity to do so, which comes to the third and final point that the government must secure the country's economy despite the pandemic. FFPT will be meaningless if the people do not have the money to spend on their needs and wants. Thus, economic activity should be encouraged by the government by giving away cash grants or subsidies. These three points constitute a more extensive and perhaps, more complicated approach to address the mobility needs of the people. This is also the reason why Vliet (2009) has radically pointed out that "free public transportation does not exist and will never exist in the future," since there are costs for every factor of production used in the process. The future of the FFPT in the EDSA Carousel Bus System is yet to be determined.

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