Economic Preferences and Attitudes Towards Alternative Ways to Finance Public Transport

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Abstract:

The public transportation system in the region of Västra Götaland elicits quick and efficient travel, while, simultaneously, decreasing the negative effects of driving. However, the system suffers from various problems, mainly fare-evasion. The importance of behavioral economics has recently been recognized in policymaking, and could be very useful for understanding travel behavior, and thereby developing a beneficial and accessible public transport system.

This thesis investigates the relationship between economic preferences, and opinions on the financing of the system. We intend to put forward the possibilities of, and the reasons advocating for, Fare-Free Public Transport to be implemented in Västra Götaland, based on behavioral economic factors. Through a web survey, answered by residents of Västra Götaland, we measure degrees of altruism, cooperation, status-quo, and sunk-cost fallacy. We also elicit opinions on the functionality of public transportation, travel behavior, inclination to pay, and attitudes towards alternative ways of financing public transport. In order to answer our research questions, a literature review of examples of Fare-Free public transport implementations and regression analyses were conducted.

The results show that behavioral factors greatly affect travel habits and opinions on how public transport should be financed and that a majority of respondents prefer a change in public transport financing. People exhibiting pro-social behavior tend to lean more towards tax-funded alternatives, while people exhibiting status-quo or sunk-cost behaviors tend to be negative towards any form of change. The alternative with the highest approval rate turns out to be earmarking and transferring all parking fees and fines to finance public transport.

Keywords: economic preferences, travel behavior, public policy, fare-free public transport, Västra Götaland

Acknowledgements

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List of abbreviations and acronyms

PT- Public Transportation

FFTP- Fare-free public transportation

BE- Behavioral economics

SEK- Swedish crowns

VGR - The region of Västra Götaland

1 Introduction

In recent decades, the cost for travellers using public transport (henceforth PT) has steadily been increasing, without much of a change in how the system is financed. In the 1960s, when Swedish PT operators experienced great losses, due to the increase in private car ownership, the state intervened and started subsidizing PT (Ringqvist, 2016). The system that became of the intervention is the one currently still in use; a combination of state and regional subsidies, and ticket revenues. Virtually, the only changes that keep occurring in the way the system is financed are ticket prices and evasion fees keep increasing.

A hassle-free, well functioning and accessible PT system is beneficial for not only its users but also for the rest of the city or region. Being able to commute easily, quickly, and affordably is naturally beneficial for the traveller who can move freely. Additionally, it decreases the number of cars on the road which reduces congestion, lessens the risk of motor accidents, and improves the overall well-being of an inner-city environment (Gerber, 2017). Hence, a PT system is more beneficial the more people choose to and are able to use it. The current system has not yet fulfilled the function of being affordable, accessible, and beneficial for all and could be in need of a substantial change. Given these conditions, Västtrafik might fulfill this function better if it were to change its strategy and implement a Fare-Free Public Transport (henceforth FFPT) system.

Västtrafik currently operates 900 different PT lines and accommodates 1.1 million trips every day. Västtrafik currently finances its PT system by receiving subsidies that cover roughly 50% of their costs, while collecting the remaining 50% from ticket sales and other incomes (Västra Götalandsregionen, 2021a). Despite the system having a widespread coverage of the region and being subsidized by 50%, only 33% of all transport in the region is done by PT (Västra Götalandsregionen, 2020b). This means that a majority of travel is still made by car.

Cars are the main reason for negative effects in city environments, causing negative externalities such as pollution, congestion, noise, poor health, and increased traffic risks (Linda, 2003). It is recognized that private car ownership levels are high globally and that as cities continue to grow car traffic will continue to increase (Redman, 2013). During the

period from January 2014 until December 2019, the number of newly registered cars in Västra Götaland (henceforth VGR) was 233,341 (BilSweden, 2021). The population increase during this time was 94,000 (Västra Götalandsregionen, 2020a), meaning that the number of cars grew faster than the population.

Other than limiting the externalities of private car use, there are several arguments why the PT system in VGR would benefit from a change in financing. The city of Gothenburg, and its surrounding municipalities, experience a widespread problem with fare-evasion, i.e. people travelling without paying. Estimates show that 10% of travellers do not pay their tickets when using Västtrafik's services (George, 2019). Due to the loss in revenue stemming from fare evasion, and increased operating costs (Karlén, 2020), Västtrafik regularly raises their ticket prices. In November 2020, Västtrafik increased their monthly ticket prices from 775 SEK to 795 SEK (ibid). In 2009, the price for the same ticket was 435 SEK (Karlén, 2019), meaning that, in a little more than ten years, the price has almost doubled. High ticket prices are shown to increase the amount of fare evasion occurring; ticket prices increasing by 10% result in fare evasion increasing by 2% (Allen, 2019). Therefore, higher ticket prices might not be the optimal solution for decreasing the amount of fare evasion. FFPT, on the other hand, could be an effective way of tackling fare-evasion, as well as social injustices, financial inequalities, and municipality-oriented problems regarding congestion, air quality, and road safety (van Hulten, 2015).

In several locations, an FFPT system has been implemented to substantially change how the PT systems function, and to try to remedy some of the negative effects that the current systems suffer from. To investigate the possibility of implementing FFPT in VGR, a sample of regions with different characteristics was chosen.

Table 1 shows three regions, selected out of a number of examples where FFPT has been implemented, used as research in this study. The outcomes of the implementation in these regions could be attributed to a large number of factors, including people's opinion on the current system, how well the current PT system operates, as well as different behavioral tendencies displayed by the inhabitants of that region. The table shows that one year after the implementation of an FFPT system, there will be an increase in the amount traveled by

PT. Furthermore, it is also shown that before the implementation of an FFPT system, the financing of the PT system is generally already subsidized to a large degree, and according to this table, the most common way to reach an FFPT system is to fully finance it by tax increases. However, the three regions also suffer from different problems, which may depend on several reasons such as the number of inhabitants, opinions on the implementation, neighbouring regions, and deficiencies in the PT system overall.

Table 1: Differences in implementation of FFPT in Tallinn, Luxembourg, and Avesta.

	Increased amount of PT travel	Eliminated fare-evading	Period of implemen-tation	Financing	Previous ticket share of revenue	Potential problems
Tallinn	First-year increase of 14%.	Decreased amount of fare-evading substantially	2013-present	Fully financed by taxes.	20%	The cost of maintaining the system increased because of increased use.
Luxemburg	Data compro-mised by COVID-19 pandemic.	Yes	2020-present	Fully financed by taxes.	10%	Substantial deficiencies in the transport system.
Avesta	First-year increase of 80%.	Yes	2012-2021	Fully financed by taxes.	25%	Relatively large area and few inhabitants. The system was not implemented in the entire region

Notes: Further information and sources cited under each respective category, in section 2.4.

Opinions on the PT system, opinions on prices, frequency of travel, and the degree of fare evasion can be linked to personal economic preferences and behavioral tendencies. For example, people exhibiting prosocial behaviors, such as altruism, might be less likely to engage in fare-evading, while people exhibiting free-riding tendencies might do the opposite. Moreover, different economic preferences might also interfere with the implementation of an FFPT system. For example, people exhibiting status quo bias might be reluctant to change, even though they might perceive the change as beneficial.

In writing this thesis, we aim to investigate any possible links between individuals' economic preferences, behavioral tendencies, their preference for any change in the financing of PT, and what type of financing would be preferred.

As of 2021, the research on how behavioral economics and economic preferences influence PT choices remains slim. There is however a large amount of research reflecting the impact of behavioral economics and economic preferences on policy acceptance and how to implement successful policies using the tools that behavioral economics and economic preferences provide.

In order to design beneficial and acceptable policies, there is a need to be able to understand and account for people's opinions and behavior. "Incorporating more realistic assumptions of human behavior into economic models can lead to profound differences in predicted actions, many of which are of interest to practitioners and policymakers" (French, 2017). It is likely that economic preferences and attitudes have an effect on travel behavior and therefore would be required to be taken into account when developing public transport policy, or any tax policy.

To explore this subject, our main research questions are:
i) How are economic preferences and behavioral tendencies linked to individuals' choice of public transport financing?
ii) Would inhabitants in the region of Västra Götaland prefer a fare-free public transport system over the current system, and if so; what alternative method of financing would be preferable?

Beyond our main research questions, we also address additional questions on the subject. These include, but are not limited to: what are people's opinions on the current system, are economic preferences good determinants of PT preference? Would an FFPT system increase travel by PT in VGR and would an FFPT system be efficient in eliminating the issue of fare evasion? Are there any key differences between men and women regarding travel behavior, or regarding ways of financing PT?

Additionally, we attempt to provide a possible solution on how to implement FFPT in VGR, stemming from findings in relevant literature, data on the current PT system, an analysis of other countries or regions that have implemented similar systems, and the results of our survey.

In order to gain insight about people's preferences and to evaluate our hypotheses, a survey was conducted from May 4, 2021, to May 11, 2021, in which a total of 392 (380 Swedish, 12 English) people participated. The sample was later narrowed down to a total of 351 respondents. The survey was sent by email to students at the School of Business, Economics, and Law at the University of Gothenburg, and shared in a Facebook group consisting of people living in a suburb of Gothenburg.

The thesis is divided into six main parts, including this introduction to the study. The remaining five parts consist of section two which contains a review of relevant literature on the current PT system in VGR, alternative ways of financing, empirical evidence of implementations of FFPT systems, and the relevance of behavioral economics on the subject. The third section presents the methodology and the structure of our survey, and how the survey is intended to connect behavioral tendencies and economic preferences to our hypotheses. The fourth section depicts the results of our survey, processed through our econometric models of choice, and discusses the relevant variables at hand. In section five we discuss what the results entailed and if we, thereby, can prove our hypotheses. This section also includes a suggestion on a plan of implementation of FFPT in VGR. The sixth and final part concludes our thesis.

2 Literature review

The arguments for "free" PT have existed for decades. The first small-scale experiments of FFPT were conducted in the 1970s in the USA (Hess, 2017). Although the first experiments were conducted several decades ago, implementations of FFPT have been sparse.

This chapter presents the theoretical framework of the research, the current systems in Gothenburg, and examples of FFPT systems, as well as the theory on behavioral economics

applied in this thesis. In 2.1, an in-depth review of FFPT is presented. In Section 2.2, a description is given on the current PT system, how the system is funded, and ulterior problems with it. Thereafter, in 2.3 alternative ways of financing are presented, which could be applied to establish FFPT in VGR. In Section 2.4, a few examples of regions or countries where FFPT has been implemented are examined. Lastly, Section 2.5 presents the theoretical framework and related concepts from the literature of behavioral economics.

2.1 Fare-free public transport

As of 2020, the majority of PT systems worldwide are financed by a combination of subsidies and ticket sales (Ruiz-Montañez, M. 2017). The share of ticket revenues, tax, and other incomes financing the systems, differ. Also, the effectiveness of PT systems varies.

Alm (2020) categorizes forms of FFPT into seven categories. The first category is one in which PT is unlimited and accessible to all. All costs are covered by government subsidies, stemming mainly from an increase in municipal tax. The second form provides FFPT for all people registered as residents in the region and excludes tourists and those in the population not living in the region. The next four categories all limit FFPT in some way and only cover either certain groups of people (such as the elderly or students), specific times (specific days or hours of the day), certain areas of the region, or only by a few chosen routes/lines. The final category is implementations made with a promotional purpose, which change conditions short-term and hopefully behavior long-term.

The main benefits from increased use of PT stem from the decrease in car use since increased private car use in urban areas heightens environmental concerns and exacerbates social problems such as traffic congestion and poor health (Montanez, 2016). The positive effects of PT are therefore societal, economic, and environmental. Socially, because it allows people to travel to and from work, school, medical services, offices, and much more- all while not having to pay for (or own) a car, a driving license, or a place to park. It also reduces the risk of motor traffic accidents. Economically, because the cost of building and maintaining infrastructure increases the more cars are on the road. The benefits are also environmental since PT vehicles generate much less greenhouse gas per capita, which has

direct effects on the well-being of the city, as well as long-term positive environmental effects.

According to Redman (2013), a lower fare is the most important measure to improve customer perceptions and use of PT, with speed being the second most important factor. Out of inhabitants surveyed in a pan-European survey by the European Commission, 59% believe that lower prices and 56% believe a general improvement of PT are the two best measures to improve urban transport (Cats, 2017).

The idea of FFPT is that travellers would not be required to buy tickets for travelling with PT and that the system would be financed using other measures. When the very first FFPT systems were implemented in the 1970s, the main point was to reduce congestion and the number of cars driven (Alm, 2020). Following the first implementations, only a few instances of FFPT can be found.

Public passenger transport is, demonstrably, a public benefit and is one key element of the socio-economic environment of society as a whole. Free-of-charge public goods such as schools, libraries, health care, roads, and parks are free to everyone. An argument for implementing FFPT is therefore that, like any other public good or service, PT should be free of charge when needed (Cats, 2017). Poliak (2017) argues that the state has an obligation to provide public transport services to all its citizens, even if these services are not the most cost-effective.

Another argument for implementing FFPT is its effects on the development of the city. It is highly important that cities are equipped with PT networks, as they not only are a means of transport for many, they are one of the primary reasons for creating wealth in a country (Ruiz-Montanez, 2017). Cities are the engines of the economy; drawing in skilled workers, consumption, and investment (Arizona PIRG Education Fund, 2009). Functioning and affordable PT enables accessibility, especially at a time when cities are expanding rapidly and more and more people opt to live further and further away from the city center, where education and job opportunities are located. Market share for cars is increasing, at the same time as urbanization continues, resulting in an exponentially higher need for road capability

and parking spaces (Winston, 1991). PT also contributes to sustainable city-living, keeping the city mobile, and prevents overcrowding.

PT offers better mobility, both for those with and without a car, because of decreased congestion and therefore time efficiency and less parking hassles. The amount of cars in a household affects the amount and which means of transportation one uses. Preferences that increase car use include speed, comfort, convenience, and freedom (van Hulten, 2015). The car is also, by many, regarded as a status symbol. According to Linda (2003), cars are evaluated more positively than PT, in nearly every aspect. It is, however, regarded as a more costly, less safe, and more homogeneous form of travel.

2.2 Public transportation in Västra Götaland

In this section, the PT system in VGR is explained. Furthermore, the functionality of the system, how it currently is financed, and the causes of fare evasion are reviewed.

2.2.1 The current state of public transportation in Västra Götaland

The PT system in VGR is run by Västtrafik, who facilitate different means of transportation. According to 2020 statistics, Västtrafik has 900 different PT lines, operated by 1,857 busses, 263 trams, 101 trains, and 36 boats (Västtrafik, 2021b). Transport services are provided for 444,000 people per day, corresponding to 1.1 million daily trips (Västtrafik, 2020).

With a population of roughly 1.7 million (Västra Götalandsregionen, 2020a) Västtrafik currently offers every inhabitant in VGR the possibility to travel to one of the regions larger commuting hubs, e.g. Borås, Skövde, Trollhättan via PT. However, travel time differs widely depending on where one lives. 85.6% of people in VGR have less than 60 minutes to one of these commuting hubs (Västra Götalandsregionen, 2020b).

The percentage of trips made by PT has been holding steady at 33% for a couple of years, while trips made by bicycle have declined slightly over the same time period (Västra Götalandsregionen, 2020b). This implies that driving still is the dominant mode of transport. Since 2018, VGR has undertaken a large project by constructing Västlänken which, when finished, will give 100,000 residents and 130,000 workers in VGR walking or cycling distance to a commuter-train station (Göteborgs Stad, 2021).

2.2.2 Financing the public transport system

In November 2020, Västtrafik made some significant changes to the structure of their zonal layout. Before the change, VGR was divided into 70 different zones. In an attempt to simplify and make long-distance travel easier for their customers, Västtrafik decided to implement a three-zone system (Västtrafik, 2021a), zones A, B, and C. Along with the new zone system, ticket prices were increased.

In their annual report for 2019, Västtrafik states that 3,481 million SEK (35.8%) of their income stems from ticket sales, 4,810 million SEK (49.9%) from regional grants, and another 1,430 million SEK (13.6%) from other incomes (Västra Götalandsregionen, 2021a). In 2019, VGR had a regional income tax of 11.48% (Västra Götalandsregionen, 2019), this resulted in tax incomes of 44,612 million SEK for the entire region, with costs of 61,027 million SEK (Västra Götalandsregionen, 2021b). The grants given to Västtrafik amounted to roughly 7.9% of the total cost for VGR.

Table 2: Financial statistics from Västtrafik and VGR

Sources of Västtrafik's income 2019 (in million SEK)		
Source	**Amount**	**Percent of income**
Ticket Sales	3,481	35.8%
Grants	4,810	49.9%
Other incomes	1,430	13.6%
VGR's tax income, total costs, and expenses for Västtrafik (in million SEK)		
Tax income	44,612	
Total costs	61,027	
Cost of Västtrafik	4,810	
Percent of total cost	7.88%	

Revenue is collected by ticket sales, and, additionally, fines for failing to present a valid ticket. Tickets can be purchased through the Västtrafik To-go app or by machines on

vehicles. Västtrafik offers 90-minute single tickets, 24-hour tickets, monthly tickets, as well as a reusable card that can be loaded and draws the price of a ticket on each trip. Västtrafik also offers free-of-charge senior tickets, available for those above the age of 65, and school tickets for all students who have yet to graduate from upper secondary school (valid only on weekdays).

2.2.3 Fare-evasion

The PT of VGR operates under, what Barabino (2020) refers to as, a Proof Of Payment system (POP), with occasional fare verification. All Västtrafik's PT has an onboard payment system, as opposed to an off-board payment system, where tickets are continuously verified and inspected before one gets access to the service. Implementing a system where each commuter pays by themselves, by card or digital measure, and is inspected occasionally is highly beneficial, in the sense that it reduces labor costs, accelerates boarding and relieves stress for PT drivers. It does, however, facilitate fare evasion. Ticket inspectors employed by Västtrafik are therefore put in place to perform spot-checks of tickets. However, ticket inspections only occur occasionally and are therefore rare. The low inspection rate, combined with the fact that Gothenburg has no under-ground system and the fact that inspectors wear a noticeable uniform (black attire and a white cap or hat) makes fare evading fairly easy. According to Allen (2019), ticket evasion increases as (i) more people are boarding, (ii) passengers can board by rear doors, (iii) vehicles have higher occupancy levels, (iv) vehicles have more doors, and (v) passengers travel for longer- all of which are possible in the VGR system.

A 10% increase in the fare price increases fare evasion by 2 percentage points, and a 10% increase in inspections lowered evasion by 0.8 percentage points (Allen, 2019). To counteract these losses, prices are increased further, and paying passengers sustain higher costs.

Barabino (2020) finds the primary solution to decreasing fare evasion to be improving PT, and increasing satisfaction. Allen (2019) also finds that there is a direct correlation between users' PT satisfaction and their degree of fare evading, but argues that this is not the sole reason and that transport satisfaction, as well as evasion, may be directly impacted by other users' evading behavior.

With the pervasive inefficiencies in the inspection process and the rising prices due to fare-evading, a substantial change would be needed to lower the burden for regular commuters. A substantial change that has been implemented in other parts of the world is a change in the way that PT is financed. One way of financing that redistributes the burden of payment and eliminates the need for inspections is FFPT.

2.3 Financial ways to reach FFPT

PT has to get its financing from somewhere. Almost every PT system in the world today relies on subsidies, to different extents. Most commonly, PT is funded through a combination of subsidies and income from ticket sales. There are instances where PT is privately owned as will be discussed later, but this is very rare.

Around the world, several other solutions have surfaced on how to fund PT. As early as 1971, Paris started to tax companies to help out with the funding of PT. The system functions in such a way that if the company has over 9 employees and does not provide their employees with their own form of transportation or the employees live on company property, the company has to pay a tax to help fund the PT system (Poliak et al., 2017). This system has also seen use in some states in the USA and countries in Europe.

In parts of Asia, we find a few of the only systems operating without subsidies from the municipality or government. In Tokyo, the rail companies are privately owned but have diversified their operations to include a lot of other businesses (e.g. shopping center and real estate development) to be able to fund new expansions of their PT system and still keep ticket prices on a reasonable level (Kiggundu, 2009). Stockholm has had some success in swaying people from using their cars and, instead, using the PT by using road tolls. With some of the income that the city made, they decided to invest in PT and new direct bus lines, which made it even easier for people to use PT (Kottenhoff, 2009).

In the following five sections, some of the alternative ways of financing PT that could be applicable in VGR are explored, with the end goal of finding a solution for making the system an FFPT system.

2.3.1 Increasing the regional tax rate

As the current system already is funded by a combination of tax-funded grants and ticket sales, one of the first suggestions people naturally think of is to increase the regional tax rate. As of 2021, VGR has a regional tax rate of 11.48%, which is slightly below the Swedish average of 11.56% (Regionfakta, 2020). As discussed when looking into how Västtrafik is financed, roughly 7.9% of VGR's total costs in 2019 were spent in the form of grants given to Västtrafik. In the scenario of an FFPT, the regional tax rate increase must cover the lost income of ticket sales. To make sure that this money is spent on PT improvements, VGR has to approve a policy that earmarks this extra tax income for the sole purpose of financing PT.

2.3.2 Parking charges dedicated to public transport

Most people who have traveled in any city by car have come into contact with parking fees. In today's world, parking fees are a common means for cities and municipalities to fund part of their operation such as paying for parking inspectors and upkeep of parking spots. However, they are rarely dedicated to funding PT specifically, only in a few instances. There are some instances where parking fees have been used to fund PT. For example, Amsterdam, which for many years has suffered from problems regarding parking and congestion, due to its limited amount of space in the city. In an attempt to increase the use of PT, the municipality took over the administrative and penalizing duties of the government in 1991 (de Lange, 2014). As part of this new administrative work, the municipality decided to start what is called the Amsterdam Mobility Fund. Roughly 62% of all income from parking fees and parking tickets gets deposited into this fund. The fund is then distributed between the central city and the city districts, which then decide separately on how to allocate the funds they have received. A large amount of this money is used for projects aimed to improve the ease of use and rideability of PT (de Lange, 2014).

However, Amsterdam still does not operate under an FFPT scheme, even though their system meets several of the requirements for implementing one, such as good PT coverage, regular stops, and no recurring significant delays. One could speculate that the layout of the city and the policies set by the municipality are aimed more towards increasing the use of bicycles.

2.3.3 Petrol tax

Cars and trucks have been driven on petrol and other fossil fuels for almost 100 years. As previously discussed, cars are the biggest contributors to congestion on roads and in cities. Sweden has a rather high price on petrol and other fuels, this is because petrol is subject to a few different taxes. As of January 2021, the average price of petrol in Sweden was 14.56 SEK per liter, out of which 9.65 SEK were taxes (Holmström, 2021). Much like the consumption tax, which will be discussed later on, a tax on petrol is a really effective way for the government to collect capital. During 2019, the total sales of petrol and diesel in Sweden amounted to roughly 8,8 million cubic meters, or 8,8 billion liters (Energimyndigheten, 2020).

The tax collected from petrol and other fuel is currently not earmarked for any specific use and therefore goes into the government's treasury together with all other general taxes collected. Since the amount of fuels sold every year is substantial, a small tax increase would result in relatively large additional incomes for the government. An increase in the petrol tax would possibly also have other effects. As the tax goes up it should have a negative correlation to the number of cars driven and congestion. The amount of new cars registered in Sweden has been on the rise since 2016, with the exception of the year 2020, when it fell by roughly 16% (Bilsweden, 2021). One could assume that this decline could be attributed to the Covid-19 pandemic and the fact that a lot of people during this time were uncertain about their future.

Just like with some of the other taxes discussed in this paper, one of the central key points is the fact that an increase in the tax has to be accompanied by a policy of earmarking. The funds raised by the tax have to go to the improvement of the PT system and to cover the lost income from ticket sales.

2.3.4 Increasing consumption tax (VAT tax)

Consumption tax is generally a tax levied on the consumer in Sweden, as businesses in Sweden have a possibility to get back all of the consumption tax, or VAT tax, for purchases made on products intended for the operation of the business. In Sweden, the general VAT level is 25% of the value of the purchased goods or services. However, there are exceptions to this consumption tax for specific goods and services. Groceries and meals from

restaurants are subject to 12% VAT and newspapers, books, and PT travel are subject to 6% VAT. (Verksamt, 2021)

Since VAT is applied to almost all purchases made in the entire country, it is an exceptionally effective way for the government to collect capital. With a budgeted income from all the different consumption taxes in Sweden of 611 billion SEK for 2021 (Ekonomistyrningsverket, 2021), one could easily assume that a very small increase in the consumption tax would result in large incomes for the government, and this increase could have the possibility to finance the PT system, as long as this income is earmarked towards that specific purpose. The only instance in recent time where a consumption tax has been earmarked for a specific purpose was terminated in 1981. Until then, the consumption tax on gas was earmarked for the improvement of the road network (Holmström, 2021).

Higher taxes are generally something that is regarded quite negatively, although there are discernable differences in opinion based on which tax is proposed. An increase in consumption taxes usually is received far better than an increase in income tax. If an increase in the consumption tax was earmarked for the financing of FFPT, it would also act as an economic equalizer. Those who consume more would pay more for the PT system, and generally, those who have higher incomes have a higher likelihood of owning and operating cars. Those with a lower income, who tend to be the ones using the PT system more often, would be of great benefit from this.

There are instances where a similar system, to what has been described in this section, has been implemented. After getting the necessary voter approval some counties and states in the USA have earmarked some part of their consumption tax to help fund their PT system (Ubbels and Nijkamp, 2002).

2.3.5 Reintroducing the property tax

Between 1991 and 2008, all Swedish property owners were obliged to pay 1% of the assessed value of their property in property tax to the government. In 2008, this tax underwent a considerable change. The tax was entirely removed and in its place, a fee, paid to each municipality, was implemented. The switch from a tax to a fee dramatically decreased the amount paid by each property owner. After the change in 2008, the fee paid

decreased to 0.75% of the assessed value of the property, and a cap for the fee was set to 8,049 SEK for the year 2020 (Ekonomifakta, 2020).

Using property tax to help fund the PT system can act as a form of value capture, as properties formerly not serviced by PT would benefit greatly from being connected to the PT system. Both privately and commercially owned properties would benefit from the improved accessibility, which could result in an increase in the financial value of the properties (Ubbels et al., 2001). The increased property values resulting from the improvement in the PT system are what should be subject to this taxation. The improvement in the PT system, and the mobility of the citizens, would possibly also have a positive effect on businesses where the number of potential customers who could reach their location would increase. Similar types of systems have been implemented primarily in the USA (Ubbels et al., 2001).

As previously discussed, in Asia we find some of the few PT systems in the world operating without subsidies from the government. In the very densely populated region of Hong Kong, almost all of the PT system is privately owned and operating with success, mainly thanks to a successful implementation of this value capture system (Kiggundu, 2009).

2.4 Examples of FFPT implementations

There are several PT systems that have implemented some form of FFPT system. A few of the implementations of FFPT have been selected for discussion, to depict different scenarios. The reasons behind these implementations and the outcomes of the altered funding will be discussed below.

2.4.1 Tallinn

In 2013, Tallinn, the capital of Estonia, implemented a free-fare system for all its residents. The aim behind the implementation was to reduce the amount of driving and congestion. Travels by PT had decreased by 30% between 1991 and 2012, likely due to the effects of Estonia regaining independence after its 50-year long Sovjet occupation (Hess, 2017). Due to Estonia entering the world market economy, salaries rose and lifestyles improved. More people could afford to own cars and car ownership doubled in the country.

All Tallinn residents can use the system free of charge, the only condition being that travellers had to purchase and carry a so-called Personalised Smartcard, or "green card", along with personal identification documents. The Personalised Smartcard can be purchased for a one-time charge of €2, only if permanent residency can be proven (Tallinn.ee, 2020). All visitors from outside the city, regardless if they are Estonian or not, still have to pay for using the transport system in Tallinn.

Due to the implementation of the system, the allure of free commuting made the city's population increase by several tens of thousands. The additional tax income per resident led to the city of Tallinn turning a profit of €20 million a year (Shearlaw, 2016). The policy was therefore not only beneficial for both commuters and the rest of the city, the system basically paid for itself. Due to the success of the implementation, all counties in Estonia were eligible to implement the system as of July 1, 2018, which 11 out of 15 have (Modijefsky, 2018).

2.4.2 Luxembourg

In March of 2020, Luxembourg became the first country to offer FFPT for all, with no requirements of regional or national residency. Luxembourg, having one of the fastest-growing populations in Europe, as well as a high level of incoming workforce commuting from neighboring countries, experienced immense congestion, high levels of pollution, and heavy deterioration of its infrastructure (Walther, 2010). For over a decade, nearly half of the total Luxembourg workforce has lived outside the country's borders, and, when entering, crowded the city past its capacity in regards to traffic. Out of commuters from outside the country's borders, 86% travelled by car, compared to 75% of Luxembourg residents (Gerber, 2017).

All in all, making PT free appears to be the perfect solution for decreasing driving and its destructive effects in Luxembourg, but several flaws in the system need to be taken into account. Firstly, the PT system is inefficient and outdated. Busses and trains are few and far between and are late too often to be reliable. The infrastructure also is not built to account for all commuters amassed, making commuting time too long to be advantageous (Agence France-Presse in Luxembourg, 2020). Many people resort to driving in order to ensure that they are on time. Secondly, diesel and petrol costs are very low in Luxembourg compared to

neighboring countries, making the cost of driving relatively low (Schneider, 2019). Additionally, Luxembourg already had a system in place where PT was financed almost completely by taxes. Only about 10% of the costs were covered by ticket fees pre-implementation, leaving 90% of the system funded by taxes (Auxenfants, 2019). No longer having to pay €2 for a one-way ticket, or double for a day-pass, probably was not incentive enough to give up the comfort of driving. As of 2018, Luxembourg had the highest number of cars per person, 676 cars out of 1000 people (Eurostat, 2018).

Due to the COVID-19 pandemic, the amount of passengers utilizing the system most probably does not reflect the possible improvement in PT commuting that would have taken place without the outbreak, since many people have been quarantined and working from home. However, it is reasonable to assume that the removal of ticket fees might not have made that big of a difference, since the intrinsic problem of the PT system is its inefficiency and not the cost of using it.

2.4.3 Avesta

Avesta is a smaller municipality in the county of Dalarna, with roughly 23,000 residents. Since 2012 they have offered all residents the possibility to ride with PT for free, becoming one of the first municipalities to do so in Sweden. According to Ramböll (2013), this experimental implementation of FFPT could only be viewed as a success.

In a report from Ramböll (2013) examining the effects of the implemented system, it was found that 80% more trips were made by PT one year after implementation. The amount of increased travel by PT amounted to a decrease in carbon dioxide emissions by 40 tonnes during this period. The implementation of an FFPT system attracted new travellers to start using PT, both those who previously travelled by car, but also those who used to walk or travel by bicycle (Ramböll, 2013).

Avesta wanted to implement this system to decrease carbon dioxide emissions and increase the amount of travel made by PT (Ramböll, 2013). Travellers who used to travel by carbon-neutral modes of transport (eg. bicycle or by foot) switching over to PT might be seen as one of the drawbacks of an FFPT system. However, Avesta succeeded in both of

their goals. Perhaps they could have reached even greater success with a combination of FFPT with subsidies of carbon-neutral modes of transport.

2.4.4 Gothenburg: Promotional implementations of FFPT

Västtrafik has had an ongoing effort to attract car users to start or to more frequently use PT. Ever since 2011, they have implemented promotional strategies that involve giving car users the possibility to try out PT for free for two weeks. In 2020, Västtrafik ran the successful campaign "Hjälp oss ställa 30 000 bilar" [Help us set aside 30,000 cars], put in place to decrease gas emissions and pollution. Through an illustrative video visualizing 30,000 cars and how much space these could free up on the roads, the campaign was noticed both in the national and international press. The campaign gave 41,000 car users the opportunity to try out the PT system, free of charge, for two weeks. Västtrafik (2020) claims that 8,000 car users continued to use PT, even after the campaign was concluded and they had to pay for their own PT ticket.

Since 2011, when Västtrafik began using campaigns giving car users the possibility to ride PT for free, the cumulative effect, according to Västtrafik (2020), is that 100,000 car users have switched over to using PT. This shows that one of the key factors to get people to start using PT might be to break their habitual behavior, which can result in lasting effects.

2.5 Behavioral economics

This section reviews the relevant concepts from behavioral economics literature, such as altruism, conditional cooperation, status quo bias, and sunk cost bias, and presents the possible relationships of them with the public transport-related behaviors and attitudes. By relationships we mean for example what would be an altruistic individual's attitudes and preferences for public transport and the way it is financed.

BE expands on traditional economics with insights from other behavioral elements such as psychology, emotional factors, and social factors (French, 2017). BE highlights the human difficulty in making logical decisions, and furthermore, it provides an understanding of these decisions (James, 2012). Empirical findings from BE often show surprising and counterintuitive results and may suggest some novel ways for policy design today (French, 2017).

In order to design efficient policies, we need to understand how people behave. It has been found that people are not always rational, and not only consider their own self-interest when making decisions (Tomer, 2005). Due to the increasing relevance of behavioral economics (BE) on policy making, especially related to PT, this has resulted in extensive research and literature connecting travel behavior to behavioral factors over the past 15 years (see Hampton, 2018, and James 2011). Literature suggests that behavioral factors such as inattention, habits, and loss aversion, play a large role in the field of PT.

For this thesis, a few relevant concepts of behavioral economics were chosen, in order to narrow down the scope of behavioral and economic factors. To test if people are cooperative and caring or not, altruism and conditional cooperation have been discussed and tested. Altruism measures selfless cooperation and conditional cooperation measures the degree of cooperation under the condition that others also provide equally as much. These prosocial behaviors are relevant in a discussion of financing PT, since they may determine one's tendency to fare-evade or not, as well as one's tendency to always opt for driving, regardless of its negative effects. Additionally, tendencies to be status quo biased and to fall for the sunk cost fallacy are explored. Since behavioral economics emphasises that people's behavior is greatly affected by habits and by an overwhelming aversion to loss, these factors were determined to be of importance for our study.

2.5.1 Economic preferences

Prosocial behaviors. To which extent these prosocial traits are exhibited depends on individual preferences, collective behavior in one's surroundings, and the frequency of cooperative settings available (Bosworth, 2015). *Altruism* can be defined as the degree to which one is concerned for other people, and the selfless willingness to help others. *Conditional cooperation* means one's level of contribution to a shared objective tends to match the level, or perceived level, of others' level of contribution.

As Francxk (2021) mentions, in traditional economic research, people have been examined in isolation, and travel behavior and preferences have been considered individual choices, with no consideration of other people's influence. But increasingly, social interaction is taken into account when evaluating preferences (Metcalfe, 2012). Not only do individuals

consider what outcome their own decisions cause themselves, but also how these decisions relate to the actions of others in a group they belong to.

A study on the impact of self-interest on car use found that the amount of car use for commuting was explained by variables reflecting degrees of self-interest, such as altruism and contribution (Abrahamse, 2009). Behavior depended greatly on one's perception of the extent of others' approval or disapproval of their car use. It also finds that possible personal inconveniences, such as having to walk to and from the bus stop, are regarded as less important by those exhibiting altruistic behavior. This might suggest that prosocial behavior elicits people taking active measures to contribute to others' benefit, even if it compromises their own convenience. It has also been found that a lack of prosocial tendencies is one of the main contributing factors to free-riding behavior (Volk, 2011).

Status quo bias. Adhering to the status quo means following the praxises that are already in place and an inclination of keeping things as they are and "always have been" (Avenari, 2011). When faced with new options, many tend to stick to the status quo alternative (Samuelson, 1988). Exhibiting a *status quo bias* means one tends to resolve all situations in favor of the status quo. Preferring to, or automatically, following habits is a common behavioral response, especially for decision-making in high-pressure situations.
A study by Eriksson et al. (2008) found that strong travel habits can be changed once people are informed of the effects of their actions, as well as given some incentive to do so. By interrupting habitual patterns of driving, they found a significant reduction of car use, especially for those with a habit of driving and a strong moral motivation to reduce the negative effects of car use. The framing of a stated option is highly relevant in directing people to choose other alternatives (Garcia-Sierra, 2015).

Sunk cost fallacy. People tend to regard losses as highly negative, and since losses are valued very highly, they are difficult to disregard, even if a loss has already occurred. A sunk cost is a cost, either time, money, or creativity, that has been spent on something that generates no pay-off and is non-retrievable. The *sunk cost fallacy* means taking past losses into account when making future decisions, which is a faulty strategy (Covey, 2010). A consequence of the sunk-cost phenomenon is the willingness to risk even larger losses by

continuing investing, in order to gain back the original loss (Dijkstra, 2019). Since people generally are loss averse, they have a strong inclination to choose a free option over any other. Something costing exactly zero is more attractive than any other option, regardless of how low the cost of other options is. This is referred to as the zero-price effect. Often, failure to treat sunk costs is caused by a strong subjective or emotional component.

Dijk et al. (2020) find that those who have purchased a car, and commuters who have already purchased monthly tickets or other travel passes, tend to stick to these modes of transport. Travellers do take costs into account, but Dijk et al. find that travellers generally are not influenced to a great extent by a sunk cost fallacy.

2.5.2 Predictions

We predict that people displaying prosocial behavioral tendencies (altruism and cooperation) will be more likely to be the ones to currently pay for tickets, and not evade fares. This being because they experience a higher degree of social responsibility and willingness to contribute to others' well-being. We also predict that prosocial people will be open to changes in the financing of the system since this would entail that costs are spread out more than they are by ticket fares. More specifically, prosocial people are hypothesized to be more positive about the idea of increasing taxes to finance PT. There is also a possibility of a kind of peer pressure situation occurring for those displaying high degrees of conditional cooperation. Since those displaying conditional cooperation tend to be influenced by others' decisions, a situation might occur where the larger population is in favor of a specific alternative and several individuals agree to this, simply because the larger population is doing so.

We hypothesize that people exhibiting status quo behavior are less likely to be in favor of a change in the financing of the PT system since they tend to dislike changes. However, this could greatly depend on their opinion on the current system and might also depend on factors such as if they own a car/cars or what their current family situation looks like. A family with kids where the parents exhibit status quo behavior might be even harder to persuade to give up the comfort that a car gives them. Applied to PT, a status quo inclined view deems a system in which people pay for the use of PT by tickets to be the only imaginable option since this is what has always been in place. One who exhibits status quo

behavior and frequently drives, because they at one point concluded that driving was more preferable than using PT, might be less likely to give up driving- even if they perceive the implementation of FFPT to possibly be more beneficial than private car use.

We predict that previous investment into cars will have an effect on one's desire for change in the financing of PT, especially for those who exhibit tendencies of falling for the sunk cost fallacy. For those that do, the greater the investment- either in money, time, or comfort- the harder it will be to accept a new system and adhere to it, instead of their current one. There might also be a correlation between how old a person is and their tendency to fall for the sunk cost fallacy. Besides age, education might also influence one's tendency to fall for the sunk cost fallacy, since higher educated people might be more aware of tendencies such as falling for the sunk cost fallacy and might be able to correct for it.

Based on the knowledge and predictions above, Table 3 has been developed to display our predicted outcomes of approval on forms of different alternatives of FFPT, based on economic preferences and behavior. Overall we predict that people displaying higher levels of altruism will be positive towards a change in PT financing, as well as the different alternatives. People displaying higher levels of conditional cooperation might swing from yes to no depending on how the majority votes. Exhibiting status quo behavior will most likely be accompanied by a negative attitude towards changing PT financing as well as the different alternative ways. Decisions on PT financing while displaying tendencies of falling for the sunk cost fallacy will have a lot of different factors of influence, factors such as current opinion on prices, how well the PT system functions, distance to work or school, amount of cars in the household could all play important roles in how this group votes.

Table 3: Predictions on economic preferences and behavioral tendencies influence on PT financing

	Any change	Increase reg. tax	Parking	Petrol	VAT	Property
Altruism	yes	yes	yes	yes	yes	yes
Conditional cooperation	yes*	yes*	yes*	no*	yes*	no*
Status quo	no	no	no	no	no	no
Sunk cost	yes**	yes**	yes**	yes**	yes**	yes**

Under the condition that the majority supports the option (see Section 2.5.1 for public goods game)
** Depending on opinions on how well the current system works, how much the system costs, use of PT and car comparatively, and investment into cars or other transport alternatives

3 Methodology

In this section, we clarify the design of our survey, what descriptive statistics have been used, which variables have been taken into account, and why. We follow this up by explaining which econometric models have been used to process our data and if we have found any methodological critique applicable to our study.

3.1 Survey design and descriptive statistics

It was concluded that this survey would benefit from as many respondents as possible, with a wide variety in age. With the ongoing pandemic and its proximity restrictions, a web survey was considered the best alternative to gather data. In an effort to reach as many respondents as possible the survey was sent by email to students at the School of Business, Economics and Law, as well as shared on Facebook with friends and acquaintances. The anonymous web survey was sent out Tuesday, Apr. 4, at 10 pm, at the same time as an invitation was shared on Facebook, and stayed online until Monday, Apr. 10, at 10 pm.

By using two different channels to gather survey responses, we widened the variety of respondents and gathered information on more than just students. However, the sample of respondents is not randomized, since a specific group of students, and a group of Facebook users in a specific area, was chosen. In order to perform a more representative and unbiased

study, random sampling would be preferable. Due to the limited time and resources, a survey was sent to a sample of respondents in our close vicinity.

Table 4: Descriptive statistics divided by gender

	Mean age	Percentage students	Percentage full-time employees
Women	30.851	37.32%	16.24%
Men	30.845	25.07%	14.53%
Total	30.849	62.39%	30.77%

For eliciting both financial behavior and other behavioral tendencies, the survey was constructed using both quantitative and qualitative questions. According to Falk et al. (2018), quantitative measures that involve monetary stakes, which closely resemble choice-based experiment measures, since they keep probabilities and information relevant to the study constant, might be better predictors of financial behavior. Qualitative, on the other hand, are more abstractly framed and hold less actuality and, therefore, might be better predictors of other behavior, specifically self-assessed behavior. By including both qualitative and quantitative measures, our study allows for the respondent to be put in a situation more similar to a multiple-choice experiment. Respondents of a financially incentivized experiment are likely to be truthful, which respondents of a survey gain nothing from. But as Falk et al. (2018) point out/makes clear, a survey replicating a financially incentivized choice experiment offers very similar results and is therefore credible.

Studies show that students' preferences differ from results gathered through a more representative sample (Cats, 2017). Additionally, relevant to our study, students are more likely to not own a car, to have a low income, and to live closer to the city center. A survey of only students would therefore be too limited to provide accurate data to be researched. To attempt to resolve this, the survey was shared through two Facebook posts available to our friends and acquaintances, as well as in a Facebook group consisting of residents in a suburb to Gothenburg, containing a more diverse range of demographics. Since our study concerns VGR specifically and the survey was shared on Facebook, a control question was included to ensure that respondents were currently living in the region.

In hopes of increased participation, the survey was incentivized with the possibility of winning a gift card worth 200 SEK. Respondents were informed that their answers would be kept anonymous and that they had the opportunity to be included in the draw for the gift card or not. They could enter the draw by sending an email to one of the creators of the survey, ensuring there was no way to connect a specific set of answers to its respondent.

Since it is almost impossible to know exactly how many people saw the invitation link, this might not necessarily be an accurate representation of the participation rate. To be able to present some measure of the participation rate, an approximative participation rate has been formulated with the available numbers. The Facebook group at the time of posting had 5,795 members. The email list acquired from the School of Business, Economics and Law contained 4,540 email addresses. With 392 respondents, the survey had a participation rate of roughly 3.8%. The raw data shows us that 58.1% of the respondents were women, 41.3% men, and 0.51% chose to not identify themselves by gender.

A few answers were discarded, including all answers from respondents outside of VGR in order to keep our sample as true to the population of VGR as possible. To keep the gender variable as a control variable and easily definable, it was decided that the answers from the individuals wishing not to identify themselves were discarded. The survey was provided in both English and Swedish. A lower number of people chose to answer the survey in English, only twelve out of 392 respondents. To ensure that the survey suffered no language bias, as well as the difficulties of drawing significant conclusions from such a small sample, all of the English answers were discarded. All of the answers were examined to make sure that the questions were answered correctly and within the stated limits. Any answers not following these instructions were discarded to not skew the data.

After the process of ridding the raw data of errors, a total of 351 responses remained. Out of these 351 respondents, 202 respondents (57.55%) were women and 149 (42.45%) were men. Of the 351 remaining respondents, the mean age was 30.84 and the most common occupation was being a student. Roughly 32% of the respondents currently lived with a partner, without kids. The most common income of the respondents was 10,000-15,000 SEK

per month, closely followed by above 30,000 SEK per month. For full distribution of age, see Appendix (A).

The structure of the survey was set up as follows. In the first part, respondents were asked socio-demographic questions, followed by questions eliciting measures of economic preference and potential biases. The third part of the survey contains questions regarding preferences for travel mode and opinions on PT, and lastly, the fourth part asked the respondents to state their preference regarding alternative ways of funding PT. To see the full survey, see Appendix (C).

3.2 Variables

In this section, the relevant variables to our research questions, and how they were elicited, are presented.

3.2.1 Measures of economic preferences and behavioral tendencies

According to Bauer et al. (2020), the golden standard when eliciting economic and social preferences is using incentivized tasks in a controlled environment, this is because under these conditions the respondents have an incentive to tell the truth. However, the feasibility of constructing an experiment as such could only be considered low when factoring in the amount of time, money, and sample size that would be needed to complete it. To get as good a result as possible, good question and survey design had to be of great importance.

Falk et al., (2016) constructed a survey where they, interestingly enough, also recreated the survey's content during an incentivized experiment. By doing this they validated the question design used in this survey. They validated their questions by examining how the answers and results differed between the survey and the incentivized experiment and found that this type of survey was a good replacement for incentivized tasks. Regarding economic preferences, from Falk et al.'s (2016) paper, two different questions regarding altruism were decided appropriate for this survey. A quantitative and qualitative question eliciting preferences regarding altruism were included in the survey.

Some of the other preferences of interest have been researched for a long time. To make sure that questions eliciting the correct measures and receiving useful answers were used, it was

decided to use questions from studies that have been vetted and cited extensively. When the appropriate economic preferences were chosen, adequate research papers were searched for on Google scholar.

One of the research papers chosen to be adequate was Samuelson and Zeckhauser's (1988) paper discussing the phenomenon of status quo bias. To test for status quo bias, two of the questions from this paper were used. According to the Samuelson and Zeckhauser survey, the respondents exhibited a larger relative status quo bias if the alternatives on each question in the survey increased. Even though Samuelson and Zeckhauser did find evidence that status quo bias is present when using an experimental study, they also claim that in a real-world situation, when people have a better understanding of their environment, they would exhibit status quo bias to a greater extent.

Falchetta's (2015) paper on sunk cost fallacy was decided to be used. Falchetta states, like many before him, that a sunk cost is an investment in either time, money, or creativity that is impossible to get back no matter how one decides to act going forward. The fallacy part to be tested in this survey examined if the respondents acted according to the fallacy that a former purchase affected their behavior going forward. To test for this, two questions eliciting tendencies of sunk cost behavior were used from Falchettas's (2015) paper.

Fischbacher et al. (2001) constructed a research paper eliciting conditional cooperation tendencies. According to Fischbacher et al., conditional cooperation could be viewed as a contributor to the phenomenon, observed in economic research, that people are much less selfish and less rational than economic theory suggests them to be. This could be because people contributed themselves with attributes such as altruism to make themselves feel good. To test the survey participants for any tendencies of conditional cooperation, or lack thereof, a slightly summarized version of the Fischbachers et al. (2001) test was used in the survey.

The questions eliciting preferences on alternative ways to fund PT and on current travel behavior (i.e. distance to nearest PT stop, how they pay for their travels, how frequently they travel by PT, and distance to their work/school) were constructed by the authors of the study

with the main goal of the paper in mind. Following is an in-depth explanation of the questions used to elicit social and economic preferences from the respondents.

Altruism: Two questions measure altruism in this study; one qualitative and one quantitative. The qualitative question
asked respondents to self-assess their willingness to give to a charitable cause, without expecting anything in return, in the form of a 7 point Likert scale. The quantitative question asked respondents to state the amount of money they would give to a charitable cause, between 0 and 18,000 SEK. How much they stated is a measure of altruism.

Conditional cooperation: In this survey, conditional cooperation was elicited from the respondents through a version of a linear public goods game, adapted by Fischbacher et al. (2001), with slight modification to fit the survey. As previously addressed, people tend to cooperate to a higher degree when people around them are doing the same. To see if this effect had an impact on decisions regarding PT funding, twelve questions regarding cooperation were included. The respondents were asked to imagine themselves in a scenario where they were living with three roommates, all four with a budget of 200 SEK. The first question asked how much the respondents were willing to contribute to a common fund, used for goods the roommates shared, without knowing how much the other roommates contributed. The following eleven questions asked the respondents how much they would contribute to the fund if they knew the average contribution of the other three roommates, increasing by 20 SEK per question, from 0 to 200 SEK.

Status quo: Status quo bias was measured by two questions in the survey, painting a hypothetical scenario for the respondent. The two questions had the respondent thinking about how to invest money that they inherited. The first question, the neutral question, had 4 alternative ways of investing the funds. To actually test for the status quo bias the second question's scenario was different. Alternative A from the first question was now in what is called "the status quo position", meaning that the respondents were asked a second question on the same investment scenario, but instead of inheriting a large sum of money, they now inherited a large sum of stocks in the company from alternative A from the first question.

The respondents were now asked if they wanted to keep the stocks they inherited in company A or sell the stocks and invest in any of the other three alternatives.

Sunk cost: To test for sunk cost fallacy, the survey included two questions asking the respondents to imagine a scenario where they had bought a ticket to a concert they really wanted to attend, worth a (to them) significant amount of money. The respondents were told that they woke up on the day of the concert with a fever, cough, and a terrible weather forecast. They were then asked if they would make the trip to the concert anyway. The second question asked the respondents to imagine the same scenario, with the ticket to the concert now having been given to them. They were then asked again if they would make the trip to the concert.

3.2.2 Dependent variables
The study elicited answers to questions regarding preferences on alternative ways of funding the PT system, and how their travel behavior would change if FFPT were implemented.

Alternative ways of funding PT: A larger portion of the survey was dedicated to this topic, seven questions in total since this is the main question of interest in our study. Five of the questions asked the respondents about their preferences on different alternatives to the current funding system. A small introductory text, briefly explaining the current structure of financing for Västtrafik services, was presented to the respondents, after which they were asked in separate questions whether or not they thought that the alternative way of funding presented was a good idea.

The five alternative ways of PT financing presented to the respondents, which could all be answered by either yes or no, were:
- Increasing the income tax and earmarking it for use to support PT.
- Diverting all income from parking fees and parking fines to financing PT.
- An increase in the tax on petrol and other fuels with the income made earmarked for the financing of PT.
- An increase in the sales tax moms and earmarking the income for the financing of PT.

- A reintroduction/increase in the property tax and earmarking the income for the financing of PT.

The sixth question asked the respondents which of the five different systems they would choose if they could only choose one alternative to change the way PT was financed. The respondents also had the option to choose the answer "I don't want any change in the way PT is financed". The seventh and final question in this section of the survey asked the respondents to estimate how their travel behavior would change if any of these systems were implemented. A 7 point Likert scale was used, where 4 indicated an unchanged travel behavior.

3.2.3 Other variables of interest

Besides the variables mentioned above, the survey elicited some other variables. The participants of the survey were asked to state sociodemographic facts about themselves, such as their gender, age, the highest level of education acquired, and their living conditions. Since significant correlations were found between several of these variables and our dependent variables, they were kept in the thesis.

3.3 Econometric models

To see if the data that was collected was of interest to the thesis, a series of contingency tables were constructed to visually display any possible patterns that could be identified, either between gender or other variables. After checking for any patterns or links, a larger Spearman correlation test was conducted to find any significant correlations between the variables. After completing this we continued on with regressions, in total seven regressions were conducted. Different methods of regression were used depending on what type of dependent variable was looked at. Logit regression and ordered probit regression were the types of regression used.

3.4 Methodological critiques and delimitations

For this study, the sample of respondents who are students at the School of Business, Economics and Law at the University of Gothenburg. By also eliciting answers from residents in a suburb to Gothenburg, with a wider range of age, occupation, education, income, and use of PT, we tried to aid this overrepresentation. However, as previously

discussed, our sample is not randomized and might not be representative of the larger population in VGR. The group of students being limited to students at the School of Business, Economics and Law, might skew answers since these students are likely to have a better understanding of economics than the average citizen. It might therefore be interesting to see if preferences would differ if other faculties of the university also could receive the survey by email. Since the topic of the thesis was specified, both in the email and in the Facebook post, there might be some degree of selection bias occurring, since people who are interested in the topic might be more likely to want to participate. While we cannot disprove selection bias occurring, we doubt it will significantly affect our results.

The questions on economic preferences have been validated in previous studies (for example Falk et al. 2018), but we do note that many of the variables used are self-assessments on a seven-point Likert scale. These types of qualitative measures have been frequently used in research, but may still be interpreted, and thereby answered, differently between individuals. We refrain from interpreting the magnitude of the coefficients, since answers to these questions may weigh differently.

In this study, we have chosen five alternative measures of implementing an FFPT system. These were selected on the basis of functionality and span of difference, but more do exist and have not been discussed or researched extensively. We recognize that some respondents may view other alternatives as more beneficial or of more importance, but we found that limiting the alternative forms of financing down to a set of five would cover the scope of our research questions. By focusing on economic preferences, other factors, such as environmental effects and effects on health, have only been discussed and recognized, but not been taken into account in the survey, results, or discussion.

In this thesis, we have investigated the entire Västtrafik system. Due to the majority of the population in VGR, and most likely the majority of the respondents in our survey, being residents of the city of Gothenburg, a focus may however have been on the PT of inner-city Gothenburg, and less so on suburbs or surrounding areas. If changes in financing PT would occur, and changes would be made to any form of municipal tax, then all residents in the region would be affected- not only those living in Gothenburg city.

Perhaps most importantly, we have not taken the Covid-19 outbreak into account. Both in the survey and in the thesis, it is made clear that the point of this thesis is to investigate opinions on changes to the PT system, regardless of the fact that it currently is not used to its full extent. Current travel behavior may differ for many, compared to what it may have looked like or what it has looked like previously. At the beginning of our survey, we therefore clearly noted that this survey aimed to investigate the travel behavior in a fully mobile city, not one limited by COVID-19 regulations.

4 Results

4.1 Descriptive statistics

In this section, all variables, tables, and regressions are presented. Firstly, we summarize the variables that have been used during the processing of our data. Secondly, contingency tables are presented to investigate the relationship between different groups of people and specific behavior and to investigate any associations between the variables of interest to our research questions. Lastly, when the relationships have been investigated, a series of regressions will be performed.

Table 4 presents the descriptive statistics of some of the variables collected in the survey. When looking at these variables it is possible to start to get some inclination about what the respondents' thoughts are regarding the PT system and what changes would be possible. To investigate this further, some of the variables are described below. The general opinion is that the PT system in VGR functions relatively well. Prices are regarded as too high, with a mode of 7 (highest option) and a mean of 5,89. Opinions on respondents' own travel behavior if FFPT was to be implemented indicate that a majority would not increase their PT travel (mode of 4), but, overall, an increase would occur (mean 5.15). Table 4 shows that the mean contribution during our public goods game follows the average contribution of the group pretty closely. However, there are respondents who contribute 0 SEK on all eleven questions. Table 4 also shows that the general opinion regarding taxes in VGR is skewed a bit to the right, with a mode of 4 and a mean of 4.64. (For all Spearman correlations mentioned but not explicitly written out, see the Spearman Table in Appendix (C)

Table 5: Summary Table over descriptive statistics

Variables	Mean	Median	Max	Min	Mode	SD
Opinion on PT prices (too low - too high)	5.89	6	7	1	7	1.25
Opinion on current Taxes (too low - too high)	4.64	4	7	1	4	1.5
Opinion on PT functionality (bad - good)	4.22	4	7	1	5	1.51
Most used form of transport	3.35	2	8	1	1	2.34
Municipal tax funding PT (yes/no)	.40	0	1	0	0	.49
Parking fees funding PT (yes/no)	.83	1	1	0	1	.37
Petrol tax funding PT (yes/no)	.44	0	1	0	0	.5
VAT tax funding PT (yes/no)	.15	0	1	0	0	.36
Property tax funding PT (yes/no)	.1	0	1	0	0	.3
What FFPT did you prefer?	2.56	3	6	1	3	1.10
Being positive to a change in PT financing	.75	1	1	0	1	.43
Travel increase if FFPT implemented (1 - 7)	5.15	5	7	1	4	1.31
Qualitative altruism question (1 - 7)	5.06	5	7	1	7	1.63
Quantitative altruism question (0 - 18000)	1403.3	500	18000	0	0	2481.3
People showing sunk cost behavior	.09	0	1	0	0	.28
People showing status quo behavior	.39	0	1	0	0	.49
Contribution not knowing	92.49	100	200	0	100	58.28
Average contribution = 0 (0 - 200)	19.87	0	200	0	0	46.19
Average contribution = 40 (0 - 200)	51.91	40	200	0	40	33.62
Average contribution = 80 (0 - 200)	86.17	80	200	0	80	30.68
Average contribution = 120 (0 - 200)	118.09	120	200	0	120	32.49
Average contribution = 160 (0 - 200)	147.13	160	200	0	160	40.20
Average contribution = 200 (0 - 200)	175.04	200	200	0	200	49.11

Notes: All variables answered by text in the survey have been categorized for ease of use. To see the full categories, answers, and full summary table please refer to Appendix (C)

4.2 Investigation of correlations between variables

Below, a series of contingency tables combined with correlation tables will be presented and explained, the main reason of which is to investigate if there are any relationships between different variables that have been collected in the survey. This will later on in the survey play a larger role when trying to explain different travel behaviors and opinions. Since all of our variables will not be present in the regressions, it is important that we establish and investigate how they are related beforehand to be able to properly explain them.

The data shows that, in our sample, there is a negative correlation between being female and income, with a rho of -0.105 and a p-value of 0.049. Education has a positive correlation to income, with a rho of 0.333 and a p-value of 0.000. Amount of cars in the household also correlates to income, with a rho of 0.19 and a p-value of 0.0003. All of these correlations seem reasonable when considering that, in Sweden, men tend to earn more than women, a higher income increases the possibility to buy multiple cars, and salary normally increases with higher levels of education.

Table 6: What form of transportation is used the most, divided by gender

	Car	Bus	Bicycle	Motorcycle	Train	Tram	Walking	Scooter	Total
Women	56	50	15	1	3	47	30	0	202
Men	51	31	23	1	2	20	20	1	149
Total	107	81	38	2	5	67	50	1	351

The single most commonly used form of transportation by our respondents is private cars, for men and women respectively. Although, when combining all forms of PT, this is used to a higher extent than cars are. Women are more likely than men to use PT, both in actual numbers and in the percentage of the number of respondents. However, the amount of cars in a household does not differ significantly between gender, as shown in Table 6.

Table 7: The effect of amount of cars (in a household) on the most used mode of transport

	Car	Bus	Bicycle	Motorcycle	Train	Tram	Walking	Scooter	Total
0 cars	2	23	20	1	0	46	34	1	127
1 car	47	36	11	0	3	17	13	0	127
2 or more cars	58	22	7	1	2	4	3	0	97
Total	107	81	38	2	5	67	50	1	351

There is a visible skewness in Table 7, where the amount of cars in the household affects what mode of transport is most regularly used. This can also be seen when performing a Spearman test on these three data points. The data pair of the number of cars in the household and what transport mode is most regularly used shows a significant correlation, with a rho of -0.58 and a p-value of 0.000. This observation is in line with what has been predicted earlier in this thesis.

As shown by figures 1 and 2 below, opinions on how well the PT system works today follow a normal standard distribution very closely, even when looking at the entire sample. This is to be expected when the sample is of a large enough size. There are also no discernable differences between the genders' opinions on how well the system functions today. Regarding prices, there is, however, a skewness to the graphs both for men and women. Almost 50% of women responded that prices were way too high (7 on a 7 point Likert scale, where 4 is neutral).

Figure 1: Left; Distribution of opinions on PT, Right; Distribution of PT prices by gender.
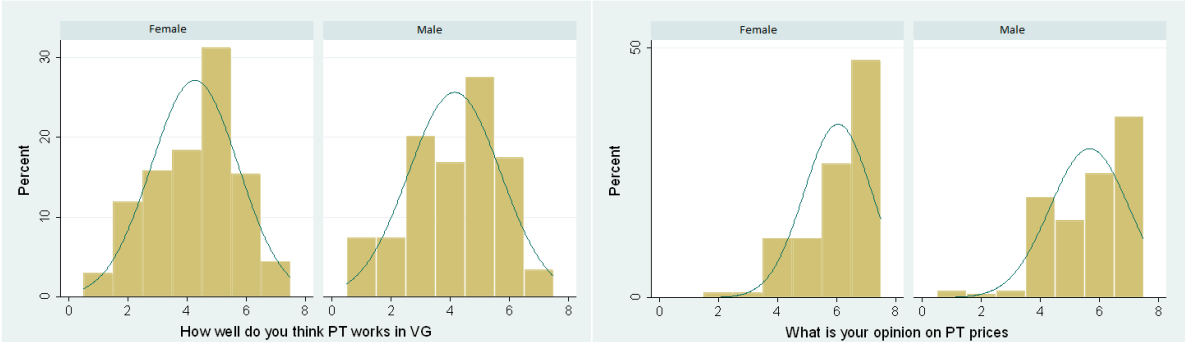
In total, almost 82% of the respondents think that prices are too high (answers between 5 and 7). Opinions on the current price level also negatively correlate, rho-value of -0.115 and p-value of 0.032, with how the respondents chose to pay for their tickets when using PT.

A large proportion of the respondents, roughly 50%, purchase a single 90-minute ticket, each time they travel by PT (Table 2 in Appendix B). Depending on how much one uses PT, this might come at a higher price than if they would pay for a monthly ticket. Opinion on prices has a negative correlation with opinions on how well the system functions, rho -0.26 and p-value of 0.000, which would be expected according to the economic theory of supply

and demand. In this case, even if prices continue to go up, there might not be another option for those who travel exclusively by PT which can affect their opinion on how well the system functions. This could, for some people, be a deciding factor to start engaging in fare-evading. As previously stated, an increase in price by 10% increases the amount of fare-evading by 2%.

Our survey shows that there already is a rather large proportion, roughly 14% of respondents, who choose to engage in fare-evading (Table 2 in Appendix B). This is 40% higher than Västtrafik's own estimation, which estimates that one in ten people engage in fare-evading (SVT, 2019). With low inspection rates, ticket prices regarded as too high and continuously increasing and fare-evasion being an established phenomenon in VGR, this outcome is to be expected. There are, however, some key differences in who decides not to pay when using PT. The data suggests that the shorter the distance to one's destination, the higher the likelihood is that they will fare-evade. Students are more likely to evade fares, making up four out of five who do, since they generally live closer to their destination and tend to have a lower income. When looking at the Spearman correlation Table in Appendix C, fare-evading negatively correlates with both income and occupation. As described earlier in the thesis, opinions on the functionality of the PT system also affect fare-evading behavior. This result also shows up in our data, with fare-evading negatively correlating with opinions on PT functionality.

A majority of students do, however, think that the PT system functions well (5-7 on a 7-point Likert scale). Of all fare-evaders, 51% state that the current system does not function well (1-3 on a 7-point Likert scale). This is in line with theories of fare evading, specified in the literature review section; when opinion on the current system declines, the likelihood of engaging in fare-evading increases.

Out of all fare evaders, 36% think that the system functions well, some of these display free-riding tendencies, while others display high levels of altruism. This fact becomes more complicated when the respondents' opinion on how the system functions negatively correlates with their opinion on prices, i.e when the opinion on how the system functions go up, the respondents think that the price is fair or too low. This could possibly mean that there

is some factor excluded in our survey which has an effect on people's travel decision making.

Table 8: Influence of opinion about PT on the way of paying for PT

	1 (Poorly)	2	3	4	5	6	7 (Great)	Total
I don't travel by PT	5	1	2	3	7	1	0	19
I don't pay for using PT	3	7	15	6	11	5	2	49
Employer/school pays	0	2	5	3	2	6	0	18
I pay for a ticket for each ride	7	18	35	32	50	26	8	176
I pay by a monthly ticket	2	7	5	18	34	19	4	89
Total	17	35	62	62	104	57	14	351

4.2.1 Results connected to altruistic tendencies

Our two questions on altruism show somewhat divisive results. A majority, 66%, are willing to give to a charitable cause when asked a more hypothetical question (the qualitative altruism question). However, when asked how much they would donate, when receiving an unexpected sum of 18,000 SEK (the quantitative altruism question), only 55% answered any sum above 0 SEK, and 71% answered an amount of 1,000 SEK or below (Table 9 and 10 in Appendix B). This may be due to several reasons. For one, the first question does not specify if the donation is monetary or not. One may, for example, consider time a contribution, while others do not. Second, when given an actual amount of hypothetical money (18,000 SEK), the respondent perceives their contribution as more real and are therefore less willing to give it away. Thirdly, only in the second question is the contribution amount specified. The two questions do however correlate with each other, rho 0.37 and p-value 0.000, which is to be expected since they relate to the same subject.

According to the survey, gender also correlates with altruism. Women are more likely to give to a charitable cause, and on average, give more than men do, but men have a larger standard deviation and are therefore more likely to contribute a larger sum individually. Our study also shows that respondents who assess themselves as highly altruistic on the Likert scale for altruism chose to contribute higher amounts in our question eliciting preferences to contribute to a group without knowing how much the group would contribute. This link also shows up when performing a spearman test, these data points are correlated with a rho value

of 0.26 and a p-value of 0.000. This would be in line with what has been discussed in this thesis; altruistic people have a higher tendency to contribute to help others. People self-assessing as altruistic are more likely to approve of a change in the way PT is financed. 51% of all respondents consider themselves more altruistic than average (5 or above, on a 7 point Likert scale) and want a change in the way PT is financed.

However, a large portion of the respondents who choose not to contribute any money in the quantitative altruism question, also want a change in how PT should be financed. This group specifically prefers that parking tickets and fines would be used to finance PT, a total of 69% of those who chose not to contribute any of their money in the altruism question and wants a change in the way PT is financed would pick this option. These two observations are somewhat contradictory. Our prediction stated that altruistic people would choose a system where the burden of the cost would be spread out on as many individuals as possible, while the non-altruistic would do the opposite. There is however a significant correlation between self-assessing as altruistic and thinking that paying for PT with increased income tax or property tax is a good idea. This correlation might change the result between altruistic and non-altruistic people if our sample was larger or more diverse, with a lower number of students.

Both the qualitative and quantitative questions regarding altruism show significant correlations with the questions in our version of the public goods game, testing for conditional cooperation.

4.2.2 Results connected to conditional cooperation

The survey elicited conditional cooperating preferences from the respondents regarding their degree of contribution to a group, in a linear version of a public goods game. This experiment revealed a wide variety of behavior. The respondents were categorized into eight different groups, based on what contributing tendencies they displayed. Each group consisted of respondents who answered similarly, using correlation as an indicator of similar behavior.

The first group, the *perfect conditional cooperators*, consisted of respondents who always contributed the exact amount as the group average, on all eleven questions, displayed in

Table 1 in the Appendix with a correlation of 1 and including 122 respondents. A 123rd respondent followed the same contributional pattern, also with the correlation of 1, but always contributed exactly half of what the group did, and is therefore included in "others". The second distinct group identified in the survey was *free-riders*. A free-rider was identified by the fact that they contributed 0 SEK on all eleven questions. This group included six respondents, and they all share a value on the correlation chart of 0 with a perfect conditional cooperator.

As shown in the correlation chart in the Appendix, there are twenty respondents with a correlation of 0, eleven of which are included in the third group. This is the group consisting of *perfect altruists*. The identifying preference of this group was the fact that they contributed 200 SEK (the maximum amount), on all eleven questions in the survey. Although they in this question give perfectly altruistic answers, they have no significant correlation with the qualitative nor the quantitative altruism question. This may be the result of respondents viewing the question as more hypothetical and with a lower personal impact, than in the quantitative altruism question, where they were asked to contribute out of 18,000 SEK. The size of the group categorized as perfect altruists might also influence the lack of correlation. There were also three respondents, with a correlation value of 0, who belong to the "other" group. These three respondents have contributed the same value on all eleven questions but the contributed value is neither 0 or 200.

The fourth group that can be identified is the group determined to be *above average cooperators* and contains twelve respondents. On all eleven questions, these respondents contributed more than the group average. This group is categorized by a correlation with a perfect conditional cooperator of between 0.6 and 0.99.

The respondents who were categorized into the fifth, sixth and seventh groups displayed specific contribution behaviors in two different ways; they either contributed a minimum amount on all eleven questions, or their contributions reached an upper limit level, after which they no longer increased their contribution. 42 respondents displayed behavior of contributing below or equal to 100 SEK on all eleven questions, and are categorized as the group *100 max cooperators*. This group is correlated with self assessing as altruistic, which is quite strange since those self-assessing as altruistic should contribute a large sum in a

public goods game. The sixth group consists of respondents who contributed above 100 SEK on all of eleven questions, but not enough to qualify for the perfect altruist group. This group consists of five people and is categorized as *100 min cooperators*. The seventh group, *the 150 max contributors*, consists of people who display a similar behavior to group five, the difference between the groups being that this group contributed above 150 SEK on all of eleven questions, also not on a level high enough to belong to the group above cooperators, nor to the group perfect altruists.

The eighth and final group was identified as *others*. The group contains 120 respondents and can be categorized by not exhibiting any specific behavior, with responses varying a lot across the eleven questions. However, 86% of the respondents in this group have a correlation to the perfect conditional cooperator above 0.95. This result could be caused by individual preferences regarding money. It might be easier to contribute more when the sum is small. However, when the sum grows larger they might feel more comfortable with contributing slightly less than the group. Some of the distinct pattern individuals in this group display are a straight line on the sum they contribute on all eleven questions, a stair-like approach where they contribute the same amount over a couple of questions before increasing it, displaying reversed perfect conditional cooperation (i.e starting at 200 SEK and decreasing by 20 SEK each contribution level), contributing along the diagonal line up until their preferred level of contribution and staying there for the remainder of the questions.

Figure 2 displays the differences in contribution levels between the five most distinctive groups discussed above. Perfect conditional cooperators are displayed in red. All respondents in this group increase their contribution in accordance with the average group contribution. Free riders are displayed in blue, where all respondents contribute zero. Perfect altruists are displayed in grey. In this group, all respondents give 200 SEK consistently. Above average cooperators are displayed in dark blue, and show the contribution of one randomly chosen respondent. Others are displayed by yellow, and, also, shows the contribution of one randomly chosen respondent.

Figure 2: Visual representation of the 5 most distinct cooperation groups
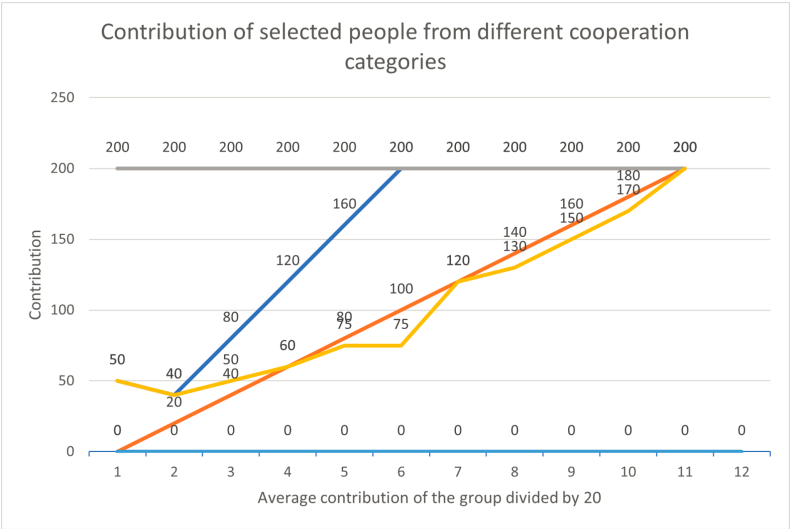
Regarding gender, as shown in Table 1 in Appendix B, women have a higher correlation to a perfect conditional contributor. 77% of women have a correlation of 0.95 or higher while 70% of men have a 0.95 correlation or higher. This can be explained by the fact that women tend to display prosocial behaviors to a higher extent.

4.2.3 Results connected to status quo and sunk cost fallacy

The survey elicited preferences from the respondents regarding how they would act under circumstances where the questions were loaded either with status quo bias or set up as a sunk cost fallacy. The results from these questions will be presented below. 39% of respondents exhibited tendencies of status quo bias, a slight difference detected between men and women, roughly 4%. The responses of those falling under the status quo category also negatively correlate with their opinion on taxes. Although the correlation is only significant on a 0.1 level, with a p-value of 0.0569, there might be a reasonable explanation for this correlation. Respondents who exhibit status quo bias prefer to keep things the way they are, hence, if their opinion on taxes is that it is too low or on an adequate level, there would be no reason for them to want a change. Answers in the status quo question also correlate with the answers from the sunk cost questions.

Roughly 8.5% of respondents could be classified as showing sunk cost tendencies. However, there is a larger discrepancy between the genders in these questions. 5.9% of women and 12.1% of men fall into the category of showing sunk cost tendencies. This can also be seen when looking into the Spearman Table. Being categorized in the sunk cost category correlates with the respondent's gender, age, responses to both of the altruism questions in the survey, how much they would contribute in the group experiment (without knowing the group contribution), as well as what payment method they use when travelling by PT and being categorized as a free-rider.

In Appendix B, six correlation charts are displayed. These charts show, among other things, how the different groups described above position themselves when questioned about the alternative ways of financing PT.

4.3 Opinions on alternatives of FFPT

It is clear that 75% of respondents want a change in the way PT is financed when questioned. However, opinions on how to fund PT differ widely. The alternative with the highest approval rating is transferring all parking fees and fines, and earmarking them to finance PT. This alternative received an approval rating of 83%. 88% of women and 77% of men thought that this was a good idea, which is also shown in the Spearman test; being female correlates with approval of this alternative with a rho-value of 0.15 and p-value 0.006. What mode of transportation, how far away from work or school respondents live, as well as what the respondent's current occupation is, all have an impact on their opinion on parking fees financing PT. Moreover, displaying sunk cost tendencies negatively correlate with approving of changing PT financing to this alternative. In our survey, this might be explained by the fact that 36% of respondents displaying sunk cost tendencies also own two or more cars. The group with the highest amount of dislike for this alternative was the perfectly conditional cooperators, with 25% of respondents considering this option a bad idea. This is also shown with a negative correlation of -0.16 and a p-value of 0.0029.

The alternative with the second-highest approval rating was an increase in petrol and other fuels tax, with an approval rate of 43% of respondents. Answers to this question correlate negatively with the number of cars in the household, with a rho-value of -0.174 and a

p-value of 0.001, as well as several other data points, such as income, distance to work or school, and those exhibiting free-riding tendencies. One could assume that a household that already owns several cars would be against an alternative to finance PT by increasing petrol taxes because it would potentially have a direct effect on them.

Answers to the questions on increasing petrol tax have a significant correlation with how altruistic the respondents assess themselves to be. The explanation for this might be that there are several respondents who own two or more cars, but since they consider themselves to be altruistic at the same time they are willing to accept a larger cost for their own household to benefit the greater population. Another interesting correlation that can be found when looking into this question is that the respondents exhibiting freeriding tendencies correlate negatively with opinions on increasing petrol tax to fund PT. The explanation for this could be that in our sample, three out of six respondents who exhibit freeriding tendencies also have two or more cars. Not wanting to pay for others and owning several cars might be the reasons that these respondents disapprove of this idea.

The third most popular alternative way of financing PT according to this study is an increase in the income tax, with an approval rate of 40% and only a small difference between men and women. These answers also correlate with what opinion respondents have on taxes, whether or not they display sunk cost behavior, how many cars are in the household, the distance to their workplace, and what their preferred mode of transportation is.

The fourth most popular alternative is an increase in VAT, by earmarking and transferring all those funds to finance PT, with an overall approval rate of 14.8% and a very small difference in opinion between genders. Opinions on this topic also correlate to opinions on taxes, how many cars are in the household, and how far away from school or work they live.

The fifth and final alternative that was brought up in this thesis and included in the survey was increasing property tax. This alternative received an approval rate of 9.7%, with men favoring this alternative slightly more than female respondents did. The survey shows that this alternative correlates to how altruistic respondents self-assess to be, their opinion on taxes, and the number of cars in their household.

When faced with the question of implementation, the respondents had to decide on only one system that they would like to be implemented, or if they wanted the system to stay unchanged. This result is presented in the pie chart below:

Graph 3: Distribution of most preferred alternative way of funding PT

■ Unchanged financing	■ Increase income tax	
■ Parking ticket and fees	■ Fuels tax	
□ VAT	Property tax	
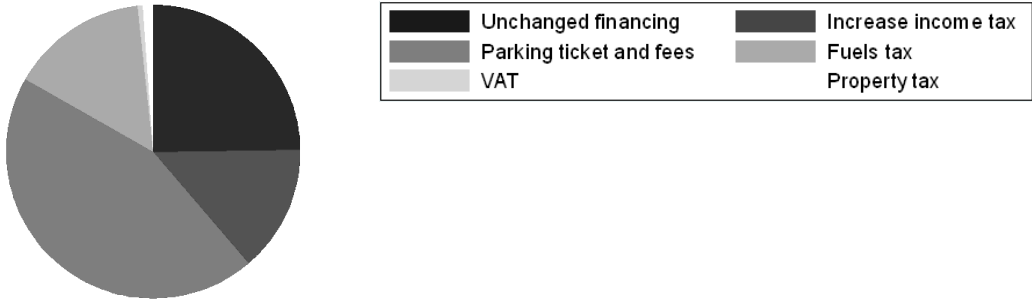
Notes: Answers in percentage. Unchanged financing: 24.79%; Parking tickets and fees: 44.44%, VAT: 0.57%; Increased income tax: 13.96%; Fuels tax: 15.1%; Property tax: 1.14%

4.4 Regressions

This section presents the results of the regressions conducted for the 351 observations in this thesis. The dependent variables for models 1 to 6 are binary variables taking the value of 1 if the respondent answered yes and 0 if no for the alternative financing methods to achieve FFPT such as (i) increasing the income tax and earmarking, (ii) parking fees and parking fines, (iii) increasing the tax on petrol and other fuels, (iv) increasing the sales tax, (v) increase in the property tax and earmarking, respectively (See Section 3.2.2 for details). Since we have dichotomous dependent variables, we used logistic regression for those six models with robust standard errors clustered at the individual level. Regression Table 1 below presents the odd ratios for each independent variable; significant ones are accompanied by stars corresponding to the relevant significance level: An odds ratio (OR) above one implies a positive association between the dependent and independent variable whereas a ratio of below one implies a negative association.

Starting with Model (1), we see that the OR of the variables PT as most used, qualitative altruism, sunk cost behavior, and status quo behavior are significant. This suggests that for respondents who use public transport as their main form of transportation, the odds of stating yes for an increase in income tax used to finance PT increases by 1.76. For one unit increase in self-assessed altruism level OR is lower but still positive and significant; 1.21.

On the other hand, the odds ratios for sunk cost behavior and status quo behavior are below 1 suggesting a negative association. In other words, for respondents exhibiting status quo bias and sunk cost fallacy, the likelihood of stating "yes" for an income tax increase decreases. We observe that all results match the predictions made in Table 3, for example that people displaying higher degrees of altruism are more likely to prefer a change in the financing of the PT system and that those displaying sunk cost and status quo behavior are less likely to. These facts correspond very well to the literature section discussed in this thesis.

For Model (2), the dependent variable is respondents' preferences for financing public transport through parking fees and fines. The likelihood of stating yes for the option increases for the people who use public transport as the main mode of transportation. Moreover, we see that there is also a significant effect of gender, particularly for women who's odds of answering "yes" to this option increases by a factor of 1.75. It is difficult to detect a pattern and significant conclusion, and this might be due to the limitations of the data used in this thesis (See Section 3.4).

For Model (3), we investigate the factors behind saying "yes" to the option in which the funding comes from increasing the fuel related taxes. The OR for age is slightly below 1 but significant suggesting a negative relationship. For other significant variables, those using PT as the most used mode of transport again exhibit a significant and positive relationship to this alternative, in terms of OR. More importantly, we have a new significant factor for this model, we see that for a one unit increase in self-assessed level of qualitative altruism the odds of stating "yes" for this option increases by a factor of 1.15. Finally, the highest OR belongs to above cooperators with a factor of 4.87, suggesting that for people who belong to this group the likelihood of stating "yes" for this option increases by 4.87.

For Model (4), the dependent variable was respondents' preference for increasing the VAT tax, yet we failed to observe a significant predictor for it. The dependent variable in model (5) is about financing PT by increasing property taxes. Consistent with results for the other models, we again see the positive effect of being a frequent user of public transport. In addition to this, similar to Model (3) we have a significant positive effect of above cooperators for this option as well (OR=10.43). 100 min cooperators are also significant.

This might be interpreted as those that have answered to contribute more than 100 SEK, and are willing to contribute more than average, and also own a property are willing to pay more for FFPT being implemented. This would however require that we can check for if one owns a property or not.

Finally, in Model (6) the dependent variable is answering "yes" to at least one of the alternative means of financing. Here, we see the dummy variables for being a frequent user of PT and being female are significant and positive; 2.11 and 2.43, respectively. For example, using PT as the main mode of transportation results in an increase of odds saying "yes" for at least one of the alternative modes of financing by a factor of 2.11.

Overall, we see the positive effect of being a frequent user of PT on the likelihood of saying "yes" to alternative means of financing. For the quantitative measure of altruism, we observe insignificant OR for all models which are close to 1. Yet, the self-assessed altruism variable seems to be a significant predictor, since it has OR of above 1 for all models except Model (6) and is significant on three out of six models. Exhibiting sunk cost fallacy has an OR of below 1 for all models except model 3 and 5 and it is a significant predictor for only one model. For status quo bias it has an OR of below 1 for four out of six models. For the variables related to the public goods task in the survey, unfortunately we fail to observe significant ORs except for in Model (3) and (5) where above cooperators and 100 min cooperators were the significant ones. Furthermore, we can also see that in several of our models, being identified as a free-rider has a negative impact towards several alternatives regarding a change in how to finance PT, as well as an overall negative disposition towards change in PT use if PT should have a change in its financing.

Regression Table 1: Logistic-regressions on independent key variables of alternative ways to finance PT

VARIABLES	(1) Tax increase financing PT	(2) Parking fees/fines finance PT	(3) Fuels tax finance PT	(4) VAT finance PT	(5) Property tax finance PT	(6) Positive to a change in PT Financing
Age	1.013179	.9897214	.963625***	.9794637	1.003671	.9846309
	(0.188)	(0.375)	(0.00112)	(0.105)	(0.817)	(0.156)
Gender	.8647404	1.746451*	.895433	1.10928	.6828632	2.438216***
	(0.544)	(0.0873)	(0.650)	(0.746)	(0.317)	(0.000953)
PT as most used	1.7566**	2.284403**	1.522279*	.6146028	1.08693	2.112878***
	(0.0204)	(0.0190)	(0.0853)	(0.161)	(0.839)	(0.00919)
Qualitative Altruism	1.2107**	1.040274	1.152252*	1.120062	1.452791**	.9270158
	(0.0141)	(0.700)	(0.0695)	(0.307)	(0.0209)	(0.418)
Quantitative Altruism	.9999605	1.000113	.9999944	.9999979	.9999591	1.000137
	(0.419)	(0.402)	(0.923)	(0.974)	(0.567)	(0.129)
Sunk cost behavior	.390589*	.7232453	1.289084	.2598333	1.144595	.5878113
	(0.0657)	(0.528)	(0.527)	(0.225)	(0.862)	(0.242)
Status quo behavior	.667045*	1.341841	.9622692	.6439356	1.127925	.7984877
	(0.0881)	(0.353)	(0.870)	(0.202)	(0.765)	(0.390)
Perfect cooperation	.9104063	.4184085	1.459933	.4840157	1.860571	.8165842
	(0.826)	(0.150)	(0.386)	(0.222)	(0.570)	(0.685)
Freeriders	.8927308	.110584**	Omitted	Omitted	Omitted	.1467102**
	(0.922)	(0.0179)				(0.0217)
Perfect Altruists	1.003798	1.519	2.223385	.2965434	6.552219	1.316566
	(0.996)	(0.747)	(0.296)	(0.321)	(0.171)	(0.754)
Above cooperation	2.144062	1.734339	4.87088**	2.090598	10.43439*	2.77
	(0.269)	(0.649)	(0.0290)	(0.354)	(0.0673)	(0.249)
"Other" cooperation	1.216868	1.018946	1.863707	.8877611	3.144462	.9569828
	(0.640)	(0.976)	(0.157)	(0.837)	(0.282)	(0.932)
100 max cooperation	1.127057	1.280109	.7875097	.5356472	2.934242	1.192537
	(0.813)	(0.742)	(0.658)	(0.393)	(0.350)	(0.764)
100 min cooperation	1.543237	.2005197	1.183764	3.255067	14.23755*	.2869355
	(0.712)	(0.233)	(0.887)	(0.274)	(0.0603)	(0.226)
150 max cooperation	Omitted	Omitted	Omitted	Omitted	Omitted	Omitted
Id	.9996604	.9982868	.9990322	.9980342	1.002165	1.000903
	(0.788)	(0.333)	(0.459)	(0.220)	(0.309)	(0.538)
Constant	.1824***	5.295879*	.8244527	.4904823	.003746***	3.127085
	(0.00720)	(0.0660)	(0.772)	(0.408)	(0.00247)	(0.135)
P-value	0.0145	0.0001	0.0116	0.2315	0.2631	0.0016
Observations	351	351	345	345	345	351

Notes: Robust p-values in parentheses: *** p<0.01, ** p<0.05, * p<0.1

In Regression Table 2 we see that being older, displaying sunk cost aversion, and tending to follow the status quo, all have negative effects on changed PT use if FFPT was to be implemented. Women, perfect cooperators, above cooperators, and other cooperators would all increase their use of PT if FFPT would be implemented.

Regression Table 2: Ordered probit regression on increasing travel behavior

VARIABLES	How much PT travel would change, if FFPT was to be implemented
Age	-0.0154***
	(0.00467)
Gender	0.244**
	(0.119)
PT most used	-0.182
	(0.121)
Qualitative Altruism	0.0496
	(0.0429)
Quantitative Altruism	-7.31e-06
	(2.83e-05)
Sunk cost behavior	-0.539***
	(0.201)
Status quo behavior	-0.202*
	(0.116)
Freeriders	-1.174*
	(0.602)
Perfect cooperation	0.226
	(0.200)
Perfect Altruists	-0.0953
	(0.376)
Above cooperation	0.300
	(0.377)
"Other" cooperation	0.227
	(0.208)
Max 100 contribution	0.410*
	(0.246)
Min 100 contribution	0.173
	(0.395)
Max 150 contribution	Omitted
id	0.000441
	(0.000632)
P-value	0.0003
Observations	351

Notes: Robust p-values in parentheses: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

The reader should note that all of our regression models were significant except regression Models (4) and (5), therefore we can state that economic preferences and behavioral tendencies are a good predictor of travel behavior and preference in PT financing.

Lastly, we will investigate any relationship between our dependent variables that has not been investigated before.

Table 9: Pairwise Spearman's rank correlation coefficient between the form of implementation and desire for, as well as effects of, the implementation

	Tax financing PT	Parking fees/tickets financing PT	Fuels tax financing PT	VAT financing PT	Property tax financing PT
Wanting a change in PT financing	0.3493***	0.5085***	0.3449***	0.1651***	0.0542
Increased travel if FFPT were implemented	0.2006***	0.2165***	0.1538***	0.1171**	0.0707

Notes: Robust p-values *** $p<0.01$, ** $p<0.05$, * $p<0.1$

In Table 9 above, it is shown that being in favor of a change in how the system is financed is correlated with each alternative for implementation, except for property taxes. All of these correlations are significant on the 0.01 level, except for increase in travel if VAT was increased to finance PT. Furthermore, it is shown that for all alternative ways, except property tax, there is a significant correlation with the amount of which one's PT travel would increase if FFPT was implemented.

5 Discussion

This study was conducted with the purpose of answering the following questions: i) How are economic preferences and behavioral tendencies linked to individuals' choice of PT financing? ii) Would inhabitants in VGR prefer an FFPT system over the current system, and if so; what alternative financing would be preferable?

Our study comes up with clear answers to both of these questions. Since all of our regressions show significant results we can say that economic preferences and behavioral

tendencies are important predictors regarding the choice of PT financing. The results also show that there is a general consensus that there should be some form of change in the financing of the system, and that ticket prices are regarded as too high. Our results show a correlation between these two opinions (Spearman's rho=0.25, p=0.000). This correlation is expected since, as discussed in the literature review section, price is one of the deciding factors for people regarding PT opinions. Both in our results and in the literature we can see that price is a determining factor for engaging in fare-evading.

Our survey holds up to some degree of inference. However, our sample is not perfectly diverse because of partly being overrepresented by students, and not being a fully randomized survey. It would therefore be interesting to investigate if a more diverse sample would replicate or change the results found. We do believe that the study would show similar results, regarding economic preferences and behavior between different groups. Although, by eliciting a more diverse sample and decreasing the share of students in the sample, results would probably change in regard to, for example, the number of fare-evaders and car users.

What we can infer from the results is that, in general, self-assessing as altruistic does not, in any significant way, influence whether or not one wants the financing of the system to change or remain the same as the current one. However, when choosing between different alternative implementations, people who consider themselves more altruistic are more likely to accept some form of FFPT system financed by taxes, as shown in models 1, 3, and 5 of regression Table 1. This result is expected when considering what has been predicted in the literature review of this thesis. However, self-assessing as an altruist does not imply that one would increase their travels by PT if an FFPT system was to be implemented.

The results also show that being a perfect conditional cooperator, or having a correlation value that very closely correlates to one, is a significant indicator that one wants a change in how the PT system is currently financed. Displaying tendencies of conditional cooperation seems to influence the choice of what alternative way of financing PT is most attractive, particularly alternatives that levy the cost of PT on the non-consumers. Besides that, people

who display these tendencies are more likely to increase their PT travels by a lot if an FFPT system were to be implemented.

Furthermore, the results show that exhibiting tendencies of falling for the sunk cost fallacy or exhibiting status quo behavior, negatively influences PT travel behavior if FFPT was to be implemented- as expected. This also shows the importance of using the tools provided by behavioral economic theory when proposing an implementation of FFPT. One of the main tools for preventing suboptimal results due to these behaviors is to frame the implementation of an FFPT system in a way that speaks to these people. By providing an easy transition from car use to using PT and much information on the benefits of an FFPT system, the status quo option (combination of ticket prices and subsidies) will not be seen as the only option.

According to our research it should be possible to implement an FFPT system. The current level financed by ticket sales is 35.8%, leaving less than half being required from additional/tax funding. This is higher than the other examples of FFPT implementations in this thesis. However, it has been shown that in other regions of interest, high ticket prices were not the main concern. Compared to other regions where FFPT has been implemented, there are not any major deficiencies in the VGR system; it is reliable and widely implemented with routes covering the entire region and with several forms of travel options. The PT modes in VGR all have a comprehensive timetable and scheduled stops every 10-15 minutes at each station. The system covers the region intricately, where trams, which make up the body of the system, are complemented by bus, train, and boat routes. In case of delays, information is given by speakers and screen displays on the affected stations, as well as on websites and apps for travel planning and the ticket purchase. During reconstruction or lasting traffic disruptions in tram or bus traffic, temporary or additional bus lines are put in place to facilitate mobility to destinations.

Based on the findings in our study, we conclude that an FFPT system would be possible and beneficial to implement in VGR. Our suggestion is to combine the measures of redirecting all parking tickets and fees revenue, as well as increasing the income tax, to go towards financing PT. Our results show that these two alternatives have the highest approval rate. We believe that this combination will produce a successful strategy for VGR. The parking ticket

and fees being transferred to PT could have a deterring effect on car use, which in turn will provide a lot of beneficial effects for VGR, such as decreased congestion, better air quality, and lower environmental impact. Since the tax will be levied on the residents of VGR, we suggest, much like the case of Tallinn's FFPT system, that all residents of VGR are required to carry a green card to be able to access PT. This serves the purpose of ensuring that the person is a registered resident of VGR and contributes to the system in the form of paying taxes and parking fees in the region. We also suggest that VGR has to be mindful of the possibility that travelers who either walk or travel by bicycle as their main form of transportation today would have an increased incentive to start using PT when FFPT is implemented. The respondents in our study as well as data from the FFPT experiment in Avesta show signs that an FFPT system would attract new users from these carbon-neutral travel modes, which can be seen as a negative effect on the system. In order to prevent this when implementing an FFPT, VGR could possibly benefit from using some of the extra income generated from the system to subsidize carbon-neutral travel modes and improve the infrastructure already in place so that carbon-neutral modes of travel remain attractive to users. VGR could for example include a "green card" valid for public transport for a year when one buys a new bicycle, as long as all the other criteria are met.

6 Conclusion

To conclude, findings in this study suggest that economic preferences and behavioral tendencies act as determinants when making choices regarding PT systems. Standardized measurements of economic preferences and behavioral tendencies were used on several different PT alternatives for drawing our conclusions. This study provides insight into how behavioral determinants affect these choices. For the policymakers of VGR, it is shown that a firm understanding of how these concepts are linked to PT choices will be of great importance when deciding on how the PT system of VGR is going to look in the future.

This study aimed to answer two important questions for the future of PT in VGR and managed to produce answers that are in line with what previous theories regarding behavioral economics and economic preferences predicted. We are also somewhat certain that our study has some value when inferring these results on the bigger population in VGR.

With this study, we have aimed to provide a possible solution for financing the public good that is PT. Relevant literature has covered alternative forms of implementation, economic preferences, and some on the connection between the two. What we intend is to add to the research, and to apply what is relevant to VGR. However, this study does also raise several questions that could be interesting for future research. We would recommend that this study was reproduced with a larger and more representative sample of the population in VGR. We would also recommend that a study was made where the willingness to pay for an FFPT was investigated.

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8 Appendix

Appendix A:

Visual representation over some of our variables.
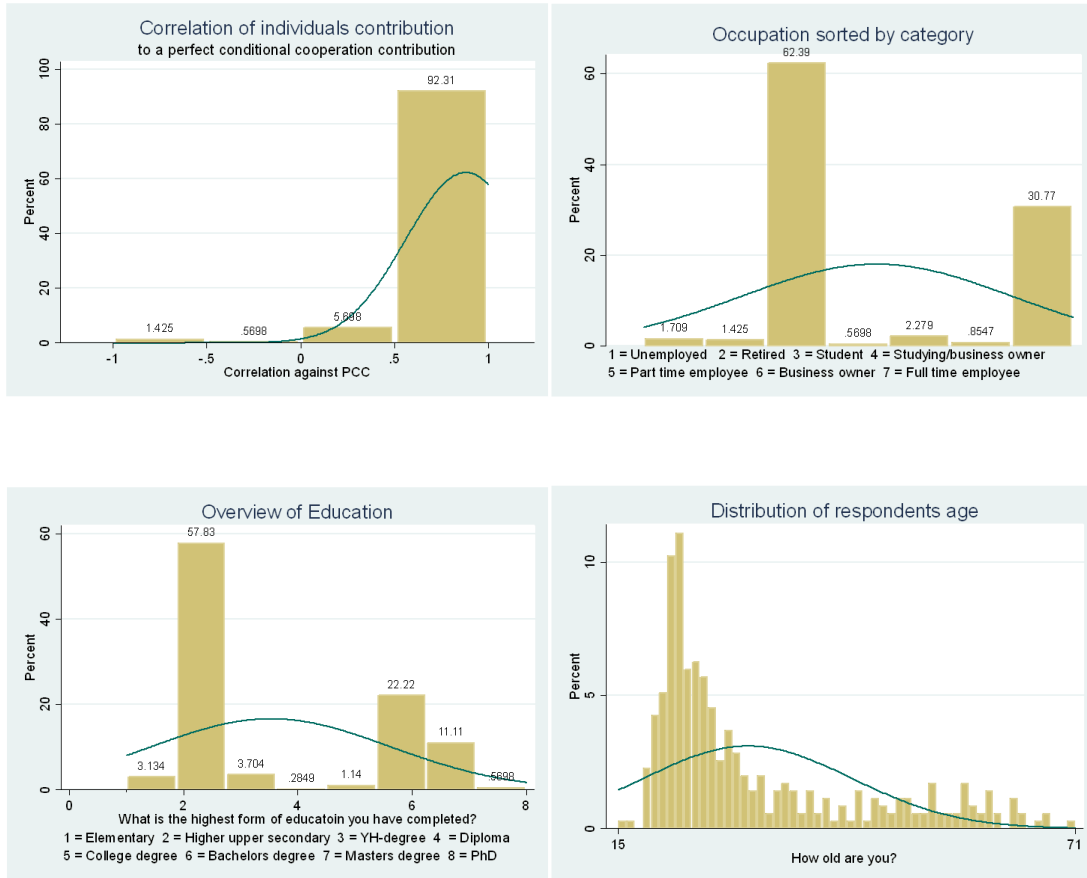
Appendix B:
Contingency tables

Table 1: Relationship between different correlation groups and gender.

	Female	Male	Total
Corr < 0	3	4	7
Corr = 0	10	10	20
Corr >0 & Corr <=0.6	3	0	3
Corr>0.6 & Corr<=0.7	4	1	5
Corr>0.7 & Corr<=0.8	1	3	4
Corr>0.8 & Corr<=0.9	15	18	33
Corr>0.9 & Corr<=0.95	10	7	17
Corr>0.95 & Corr<=0.99	88	51	139
Corr = 1	68	55	123
Total	202	149	351

Table 2: Correlation between what payment method is used for PT and Occupation

	Unemployed	Retired	Student	Student + business owner	Part time employee	Business owner	Full time employee	Total
I don't travel by PT	0	0	12	0	0	0	7	19
I don't pay when travelling by PT	2	1	39	0	1	0	6	49
Employer/School pays	0	0	17	0	0	0	1	18
Single payment / per ride	3	4	91	2	5	3	68	176
Monthly ticket	1	0	60	0	2	0	26	89
Total	6	5	219	2	8	3	108	351

Table 3: Relationship between correlation groups and wanting a change in PT

	No	Yes	Total
Corr < 0	3	4	7
Corr = 0	7	13	20
Corr>0 & Corr<=0.6	1	2	3
Corr>0.6 & Corr<=0.7	2	3	5
Corr>0.7 & Corr<=0.8	2	2	4
Corr>0.8 & Corr<=0.9	6	27	33
Corr>0.9 & Corr<=0.95	3	14	17
Corr>0.95 & Corr<=0.99	28	111	139
Corr = 1	35	88	123
Total	87	264	351

Table 4: Correlation group and opinion on increasing tax to finance PT.

	No	Yes	Total
Corr < 0	6	1	7
Corr = 0	12	8	20
Corr>0 & Corr<=0.6	0	3	3
Corr>0.6 & Corr<=0.7	2	3	5
Corr>0.7 & Corr<=0.8	4	0	4
Corr>0.8 & Corr<=0.9	18	15	33
Corr>0.9 & Corr<=0.95	9	8	17

	No	Yes	Total
Corr>0.95 & Corr<=0.99	80	59	139
Corr = 1	79	44	123
Total	210	141	351

Table 5: Correlation group and opinion on parking fines and fees financing PT

	No	Yes	Total
Corr < 0	1	6	7
Corr = 0	5	15	20
Corr>0 & Corr<=0.6	0	3	3
Corr>0.6 & Corr<=0.7	0	5	5
Corr>0.7 & Corr<=0.8	2	2	4
Corr>0.8 & Corr<=0.9	4	29	33
Corr>0.9 & Corr<=0.95	1	16	17
Corr>0.95 & Corr<=0.99	14	125	139
Corr = 1	31	92	123
Total	58	293	351

Table 6: Correlation groups and opinions on increasing Fuels tax to finance PT

	No	Yes	Total
Corr < 0	6	1	7
Corr = 0	15	5	20
Corr>0 & Corr<=0.6	2	1	3
Corr>0.6 & Corr<=0.7	3	2	5
Corr>0.7 & Corr<=0.8	3	1	4
Corr>0.8 & Corr<=0.9	20	13	33
Corr>0.9 & Corr<=0.95	10	7	17
Corr>0.95 & Corr<=0.99	70	69	139
Corr = 1	69	54	123
Total	198	153	351

Table 7: Correlation groups and opinions on VAT financing PT

	No	Yes	Total
Corr < 0	6	1	7
Corr = 1	18	2	20
Corr>0 & Corr<=0.6	3	0	3
Corr>0.6 & Corr<=0.7	2	3	5
Corr>0.7 & Corr<=0.8	4	0	4
Corr>0.8 & Corr<=0.9	27	6	33
Corr>0.9 & Corr<=0.95	14	3	17
Corr>0.95 & Corr<=0.99	114	25	139
Corr = 1	111	12	123
Total	299	52	351

Table 8: Correlation groups and opinions on Property tax increase to finance PT

	No	Yes	Total
Corr < 0	6	1	7
Corr = 0	18	2	20
Corr>0 & Corr<=0.6	3	0	3
Corr>0.6 & Corr<=0.7	4	1	5
Corr>0.7 & Corr<=0.8	3	1	4
Corr>0.8 & Corr<=0.9	28	5	33
Corr>0.9 & Corr<=0.95	17	0	17
Corr>0.95 & Corr<=0.99	124	15	139
Corr = 1	114	9	123
Total	317	34	351

Table 9: Relationship between gender and self assessed altruism

	1 (Not willing)	2	3	4	5	6	7 (Very willing)	Total
Women	2	6	16	29	47	39	63	202
Men	7	11	24	24	35	21	27	149
Total	9	17	40	53	82	60	90	351

Table 10: Relationship between quantitative altruism and gender.

	Women	Men	Total
0	71	87	158
100	4	1	5
150	1	0	1
200	4	1	5
300	2	0	2
360	0	2	2
500	25	8	33
600	0	1	1
800	1	0	1
900	2	0	2
1000	26	16	42
1500	1	0	1
1800	3	2	5
2000	20	7	27
2500	1	1	2
3000	15	7	22
3500	1	1	2
4000	2	2	4
5000	13	1	14
5400	0	1	1
6000	1	2	3

8000	5	1	6
9000	4	4	8
10000	0	2	2
18000	0	2	2
Total	202	149	351

Table 11: Descriptive statistics of variables.

Variable	Mean	p50	Max	Min	Mode	SD
Opinion on PT prices	5.89	6	7	1	7	1.25
Opinion on current Taxes	4.64	4	7	1	4	1.5
Opinion on PT functionality	4.22	4	7	1	5	1.51
Most used form of transport	3.35	2	8	1	1	2.34
Municipal tax funding PT yes/no	.40	0	1	0	0	.49
Parking fees funding PT yes/no	.83	1	1	0	1	.37
Petrol tax funding PT yes/no	.44	0	1	0	0	.5
VAT tax funding PT yes/no	.15	0	1	0	0	.36
Property tax funding PT yes/no	.1	0	1	0	0	.3
What new system would you pick	2.56	3	6	1	3	1.10
Being positive to a change in PT financing	.75	1	1	0	1	.43
If FFPT implemented how much more would you travel?	5.15	5	7	1	4	1.31
Give to altruistic cause 1-7	5.06	5	7	1	7	1.63
Amount donated out of 18 000 SEK	1403.33	500	18000	0	0	2481.33
Self-assessed mathematical ability	4.8	5	7	1	5	1.47
Displaying free-riding tendencies	.02	0	1	0	0	.13
Perfect conditional cooperation	.35	0	1	0	0	.48
Perfectly altruistic cooperation	.03	0	1	0	0	.18

Above average cooperation	.03	0	1	0	0	.18
Some form of deviation from perfect cooperation	.57	1	1	0	1	.5
People showing sunk cost behavior	.09	0	1	0	0	.28
Not showing sunk cost behavior	.91	1	1	0	1	.28
People showing status quo behavior	.39	0	1	0	0	.49
Not showing status quo behavior	.61	1	1	0	1	.49
PT as most used mode of travel	1.05	1	2	0	1	.75
Groups divided by how close they are to perfect conditional cooperation	6.5	7	8	0	7	2.03
Gender dummy variable	.58	1	1	0	1	.50
Respondents age	30.85	25	71	15	22	12.87
Occupation	4.26	3	7	1	3	1.90
Education	3.52	2	8	1	2	2.10
Income	3.26	2	6	1	2	1.94
Contribution not knowing	92.49	100	200	0	100	58.28
Average contribution = 0	19.87	0	200	0	0	46.19
Average contribution = 20	36.89	20	200	0	20	37.65
Average contribution = 40	51.91	40	200	0	40	33.62
Average contribution = 60	68.69	60	200	0	60	32.01
Average contribution = 80	86.17	80	200	0	80	30.68
Average contribution = 100	101.34	100	200	0	100	30.55
Average contribution = 120	118.09	120	200	0	120	32.49
Average contribution = 140	132.25	140	200	0	140	35.30
Average contribution = 160	147.13	160	200	0	160	40.20

Average contribution = 180	162.12	180	200	0	180	45.67
Average contribution = 200	175.04	200	200	0	200	49.11
Preferred mode of transport	2.90	2	11	1	1	2.46
Amount of cars in household	1.91	2	3	1	1-2	.80
Distance to work/school	2.35	2	5	1	1	1.24

Appendix C

Spearman Correlation Table

Do file for stata

CSV file

Full survey answers

Full Survey questions

(All of the files above are available at this link: https://drive.google.com/drive/folders/1RmqwUH-96e6dk0B-DjGiHYncVRqR80FB?usp=sharing)