



Voting Behavior and Economics

An Analysis of Individual and Municipal Voting Behavior in Sweden

Joseph Haghghi & Alexander Myrberg

Abstract:

This study aims to determine if there is a relationship between a few chosen socio-economic and economic factors and the results of the 2006 and 2010 Swedish elections. The thesis relates to both individual- and municipal levels. By using logistic and OLS regressions, for our individual and municipal data, respectively, we found links between some of our chosen factors and the election results. We see clear differences between our four regressions, which shows clear distinctions between the Moderate and the Social Democratic Party. The thesis found a positive effect of a higher degree of financial assistance in a municipality on the vote for the Social Democratic Party. Similarly, the same variable was negative for the Moderate Party. The same contrary relationship occurs for higher education level, where the variable is positive for the Moderate Party and negative for the Social Democratic Party.

Concluding our thesis, we discuss how individual socio-economic factors may not be as important, and contemplate whether individual data are less relevant than collecting broader municipal data, with the aim of finding the effects of socio-economic and economic factors on a vote.

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Supervisor: Elina Lampi

Department of Economics

School of Business, Economics and Law

University of Gothenburg

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1 Introduction

1.1 Background

In “An Economic Theory of Democracy,” Downs (1957) intended to show why a rational person votes in a particular way. This fundamental question, which many prominent researchers have asked, is challenging to answer. There seems to be a consensus that economic factors tend to affect voters, but which factors and how much are not definite.

Previous research suggests that individual factors may provide significant impacts on voting behavior. Kramer (1971) examines the U.S. voting behavior between the years 1896 - 1964 and finds personal income as one of the main factors affecting voters. Likewise, Nannestad and Paldam (1997) find, while examining Danish voters, that personal income was one of the most significant factors. Furthermore, Holmberg and Oscarsson (2004) specify several essential factors, whereas education is one of the main factors.

The period before 2006, Sweden experienced a thriving economy; GDP grew, and inflation remained at a reasonable level. In 2006, Sweden had its election, and the results were very different compared to the preceding elections. 2006 was a turn in Swedish politics and the first election in 12 years that produced a favorable outcome for the right flank. While the Moderate Party increased the number of voters, the Social Democratic party lost 11 percentage points. The right power shift in Swedish politics continued in 2010 with another favorable outcome for the Moderate Party (Holmberg and Oscarsson, 2008).

We chose the years 2006 and 2010 due to the importance of these years. Between these years Sweden also experienced the financial crisis of 2008 which itself makes this time interesting to study.

This thesis aims to clarify what socio- and economic factors have contributed to these

results, and whether these effects have affected the vote.

By defining the significance of the factors, this thesis seeks to gain a better understanding of how these affect the incumbent party. How the selected factors affected the parties distribution of votes and what factors could have resulted in this significant change in Swedish politics. From this thesis, we hope to learn more about why some political parties may favor specific motions.

1.2 The objective of the study

This thesis aims to investigate the relationship between individual and municipal factors, and the Swedish election outcomes of 2006 and 2010, additionally, to determine any significant differences between the years. We observe socio-economic factors at an individual level and factors capturing economic and social standards, at the municipal level. This will be done by examining the results of both elections and data provided by Holmberg et al. (2006, 2010) and SCB (2005, 2009).

The factors to be investigated in our thesis are:

- Factors at the individual level: Gender, education level, employment status, individual taxed income, age, and where an individual grew up.
- Factors at municipal level: Reported crimes per 100 inhabitants, tax rate, percentage of highly educated, average net-income expressed in thousand SEK, relative municipality size, financial assistance expressed in thousand SEK, and percentage of the foreign-born population.

1.3 Problems and limitations

People are complex beings with complex thoughts, making it difficult for us to explain all possible factors that may influence public opinion. Therefore, we narrow it down to some selected variables and measure the impact these have on the likelihood of voting for each party, and the voter turnout that each party receives. This thesis will focus on the election results for the Moderate Party and the Social Democratic Party (see Appendix A1.1 - A1.2 for a brief history and description of the parties). To investigate this, we will observe variables at municipal and individual levels. With only the 2006 and 2010 election results and the lack of factors, there will be a limit to the interpretations of the analysis, making it difficult to determine a lasting trend.

2 A summary of the period from 2002 to 2010

2.1 A summary of the election years before 2006

Election of 2002 was a triumph for the left flank of Swedish politics. The ruling parties were the Social Democratic Party along with the Green and the Left Party. Table 1 shows that unemployment rate rose from 5.95 percent in 2002 to almost 7 percent in 2006. Annual inflation had fallen slightly, resulting in a change from 1.9 percent in 2002 to 1.5 percent in 2006. Inflation was relatively stable over the years, with a slight decrease during 2004 and 2005, but increased again in 2006, where the lowest and highest values were 0.8 and 2.3 percent. Finally, we see Sweden's GDP, which changed by a few percentages during the period, between 2.07 and 4.69 percent (IMF, 2002-2006).

Holmberg and Oscarsson (2008) did extensive research before and until the election year of 2006. They showed the diminishing effect of class, union membership, education, and several more factors on a vote. Although relevant, some of these factors appear to have a reduced impact on how an individual votes (Holmberg and Oscarsson, 2008).

Table 1: Values for years 2002 to 2006, definitions in appendix A1.4

Year	2002	2003	2004	2005	2006
GDP	2.07	2.39	4.32	2.82	4.69
Inflation	1.94	2.32	1.02	0.84	1.50
Unemployment	5.95	6.57	7.38	7.64	7.04

Source:(IMF, 2002-2006)

Table 2: Election results for the Swedish Parliament in 2006 and 2010

Parties	Percentage of votes 2006	Percentage of votes 2010
The Alliance	48.24%	49.28%
Moderate Party	26.23%	30.06%
Centre Party	7.88%	6.56%
Liberal People's Party	7.54%	7.06%
Christian Democrats	6.59%	5.60%
The Red-Greens	46.08%	43.60%
Swedish Social Democratic Party	34.99%	30.66%
Green Party	5.24%	7.34%
Left Party	5.85%	5.60%
Populist parties	5.67%	7.13%
Sweden Democrats	2.93%	5.70%
Other parties	2.74%	1.43%

Source:(SCB, 2006, 2010)

2.2 Election Results: 2006

In the Swedish election of 2006, the right parties prevailed after 12 years of left party rule. A coalition of The Moderate Party, the Center Party, the Christian Democrats, and the Liberal People's Party would now govern Sweden. Compared to previous elections, this was a great outcome in favor of the Moderate party. The election was particularly bad for the Social Democrats who had not had a worse result since 1914. Another important fact to state in this post-election summary is the strategy used by the Moderates, the Liberal People's Party, the Center Party and the Christian Democrats. They united as early as 2004 under the coalition name "Alliance for Sweden" (Holmberg and Oscarsson, 2008).

The election was also unique as a large number of people switched parties. About 37 percent of the people switched parties before this election, which is a higher amount than the

usual 30 percent. This change may be an effect of the increase in the number of political parties (Holmberg and Oscarsson, 2008).

Another point specified by Agius (2007) was the optimism of the figures. Although the figures for Sweden’s growth looked good until 2006, unemployment was still higher than preferred. Many sources, as discussed by Agius (2007), would even say that this figure was very optimistic and that the real unemployment in Sweden was much higher during this time. Especially for youths, unemployment was higher than what was said; this, in turn, was even more pronounced for the immigrants who were largely excluded from the labor market (Agius, 2007).

2.3 *Period between 2006 and 2010*

Table 3: *Values for years 2006 to 2010, definitions in appendix A1.4*

Year	2006	2007	2008	2009	2010
GDP	4.69	3.41	-0.56	-5.19	5.99
Inflation	1.50	1.68	3.35	1.94	1.90
Unemployment	7.04	6.12	6.18	8.30	8.58

Source:(IMF, 2006-2010)

Looking at the outcome, we see an increase in all of the above, both GDP, inflation, and unemployment. The considerable decline of 2008 and 2009 can be attributed to the economic crash. Although Sweden was struck hard by the crash, it retained its strength and, between 2009 and 2010, regained some economic growth. This resulted in increased support for the Prime Minister, as 76 percent of all Swedes rated Fredrik Reinfeldt as a good crisis manager (Jochem, 2010).

2.4 Election Results: 2010

From table 2, we observe the outcome of the 2006 and 2010 election. Much like the 2006 election, 2010 was a favorable year for the Moderate Party. They gained four percentage points in direct comparison to the previous election. We also observe a slight decrease for the other Alliance members; the Centre Party, the Liberal people's party, and the Christian Democratic Party, which experienced a decrease in the proportion of votes.

On the opposite side, we see a slightly stronger Green party with an increase of roughly two percentage points. Both the Left Party and the Swedish Social Democratic Party experienced a decrease, where The left party had a slight reduction of 0.2 percentage points, and The Swedish Social Democratic party experienced a higher decline of 4.33 percentage points.

2.5 Short separation between right and left

Agius (2007) discusses in her study the Moderate Parties attempt to brand themselves as the new labor party. Before the 2006 election, they tried to show a new Swedish Model, which would emphasize individualism more than before. After the election, they also came to make tax cuts along with changes in health insurance and unemployment benefits. The Social Democratic Party had long been the labor party, and had remained in office for almost the entire 20th century, with some exceptions. They emphasized the "people's home" or "folkhem" as it is known in Sweden. This thought of the nation as a family had stayed relevant in Sweden for a long time. Agius (2007) briefly discusses similarities between the parties and how, while the Moderate party has had to include more of the Swedish model, the Social Democratic Party has had to embrace more and more of the market economy.

3 Literature Review

One of the first researchers who investigated the relationship between voting and economic variables was Tibbitts (1931). His quantitative study was one of the early studies to show the connection between the business climate and the popularity of the majority party. The study was made by using a large amount of election data and then comparing this to times of depression or economic growth. The article stated that there was a connection depending on how the economy performed and the majority parties' popularity. The study showed that the party would have lower popularity during a recession (Tibbitts, 1931).

During the 1970s, several significant studies were conducted regarding economic effects on the vote (Mueller, 1970; Goodhart and Bhansali, 1970; Hibbs, 1973; Jonung and Wadensjö, 1979). Two of the first were Goodhart and Bhansali (1970), who studied the impact of unemployment and inflation on popularity. Their study was done utilizing monthly polls conducted in the U.K. These polls were collected since the beginning of the 1960s, which meant that they had a respectable amount of observations to measure the effects. The method they chose for this was multiple regression analysis. Goodhart and Bhansali (1970) also broadened their study and investigated if there was a relation between the party leader's popularity and the popularity of the party itself. Their result displays many intriguing finds and among others that the effect differed depending on the party. The study indicate the relationship between unemployment and inflation but also that the latter has a greater impact on the conservative party's popularity. They also suggested that the unemployment rate was critical but should be stated as a lagged variable, which in this case means that unemployment rate five to six months back was the rate that mattered for the parties' political reputation.

Mueller (1970) advocated a link between unemployment and popularity. However, his study associated the popularity with the president and not the party itself. Mueller (1970)

also stated that an unemployment increase would lead to a loss in popularity, while a decrease would provide no effect. He noted that this would only happen if unemployment were above a certain threshold. Mueller (1970) used the variable “slump” to show this. He stated that the current unemployment rate, when the president began his presidency, would prove the base value. Another interesting subject of his research was the inclusion of the variable “coalition of minorities”. This variable states that as time passes after electing a president, the number of people he or she will alienate with their decisions will grow. Thus causing the popularity to decline as time passes (Mueller, 1970). Other researchers have discussed similar effects of losing votes, such as Nannestad and Paldam (1997), although under the term “cost of ruling” and Downs (1957).

In his same article, regarding the previously mentioned “slump” variable, Nannestad and Paldam (1997) observed that there was an asymmetry, saying that negative effects would have a stronger influence than positive ones. Although their study differed from Mueller’s, both showed this asymmetry. Hibbs (1973) disagreed with Mueller’s results based on statistical methods applied. Hibbs argued that GLS would perform better in handling a considerable decline in popularity compared to OLS.

Another researcher who studied this relationship was Kramer (1971). Kramer’s study showed different results and stated that inflation and unemployment did not affect the result, but that it was the real personal income change that affected the vote. He estimated that a ten percent decrease in real income would roughly lead to a four to five percent loss in the congressional vote.

Kramer’s theory was questioned several times after this. Fiorina (1978) was one of those who differed from Kramer. In 1978 Fiorina published an article doubting macro variables’ effect on the election and asked if this effect might be caused more by the expectations rather

than the actual effects. In this way, the expectations could be a self-fulfilling prophecy. In addition to this, the Fiorina (1978) also reminds the reader of the inconsistency that not all elections display these relationships. A few years later, Kiewiet and Udell (1998) showed that it was not the change in real income, but as stated before, unemployment that was the most influential factor. However, Kiewiet and Udell (1998) also agrees with the findings of Kramer (1971) regarding the gain of the incumbent parties' favor if the country had experienced improvements in real income.

Kinder and Kiewiet (1981) continued Kramer's thoughts of personal income but aimed to investigate if a voter is driven purely by personal gain or by other factors. They studied the relationship in the U.S using cross-sectional data sets. The result of the study varied and gave no conclusive response regarding personal gains. Some results displayed the effect, while some did not. They tested this by observing several micro variables and the shift of the vote. Other cross-sectional surveys were done by Rattinger (1981), who continued the research into the effect of unemployment. In his study he also added party identification into his research as well as the Clientele hypothesis. This hypothesis states that not all parties are adversely affected by unemployment and that the party that favored this issue the most could gain votes because of an increase in unemployment.

The research on whether micro or macro variables influence a person's voting behavior was followed by Nannestad and Paldam (1997). They questioned this previous result and found that micro variables such as personal income had a distinct higher effect than the macro variables. However, they also state the difficulty in comparing different countries as this was a study reflecting Danish voters between 1986 and 1992.

Palmer and Whitten (1999) tried to clarify these effects but focused on observing unexpected differences. They specified the difference between unexpected and expected

changes in the economy and emphasized the volatility of the economic effect on voting. Firstly, that the volatility is higher over time; secondly, the less the voter knows about who enacts the policy, the less volatile the effect will be.

Bengtsson (2002) compared 266 elections between the years of 1950 to 1997. Bengtsson takes a less economic approach and states that the economic effect can be a factor but also that one needs to include the political context into consideration. Another Scandinavian researcher who examined the relationship between economic factors and voting is Jordahl (2006), who stated the similarity in macro- and microeconomic factors on the vote. In his study, he claimed that macro had a more substantial effect than micro; however, both were similar in their impact.

4 Theory

The economic voting theory has been studied since the beginning of the 20th century; however, significant advancements came in 1957 when Anthony Downs released his book “An economic theory of democracy”. In this book, he explains his theory of how economic variables affect the personal choice and introduces his rational voter theory. This theory describes how a voter considers individual factors before deciding how to vote.

4.1 *The rational Voter*

Downs (1957) starts by stating a simple utility formula

$$E(U^A) - E(U^B)$$

This formula, as expressed in his book as the basis of economic voting. If the utility given from A which in this case stands for the incumbent’s party is greater than the utility of B which is the opposition party, a rational voter will vote for the incumbent’s party, which is the party currently holding office (Downs, 1957). The difficulty comes as we try to define the utility. The utility of the incumbent’s party can be expressed as the economic gain the person achieved during the years of A ’s incumbency. Still, the utility of B can only be expressed as the hypothetical gain the person would have had if they had elected the opposing party. It is, however, important to specify that the utility cannot be derived from the future; instead, it refers to the past. This is crucial since the model assumes a rational choice, and a rational choice would not be based upon the future, but by analyzing the past. The same theory can also apply to a multi-party system but would then take into account the U of the highest performance party of the opposition (Downs, 1957).

Thus the model shows that a government should always take into account the personal

utility of the imagined reform. If this reform does not increase the voter's utility, it should not be implemented. However, if a government were always to take the majority's side, they would create an increasing opposition. This adds to the group of minorities. As each new political action creates opposition, so will this decrease the support of the incumbent's party (Downs, 1957). The same approach was later discussed by Mueller (1970), who also included the minority variable in his study.

According to Downs, the concept of utility leads to uncertainty. He sees uncertainty as something that restricts the person's ability to assess different political actions. To avert this problem, the voter researches the ideologies of each political party and determines which party would represent their well being the best (Downs, 1957).

4.2 Voting distributions and the Median voter

In his book, Downs (1957) explains the spatial market theory but transforms the spatial market scale of 0 to 100. This scale he uses as a tool where he designates the political preferences for each side. Following this, we can assume the 0 as the extreme left and 100 as the extreme right. We further assume that every voter prefers as close to his or her point as possible. For example, if a voter feels he prefers a point around 40, he or she will be less happy with 50 than with 45. Implying that the most extreme right voters would position themselves on the right tail, while the extreme left voters would position themselves on the left tail of the distribution. The likelihood is that most voters would place somewhere near the middle. This theory would also assume that every party would strive towards the middle as to engulf as many voters as possible (Downs, 1957).

This core theory, the majority voting theory, explains how attracting the Median voter results in a normal distribution due to the parties converging to the middle. Converging

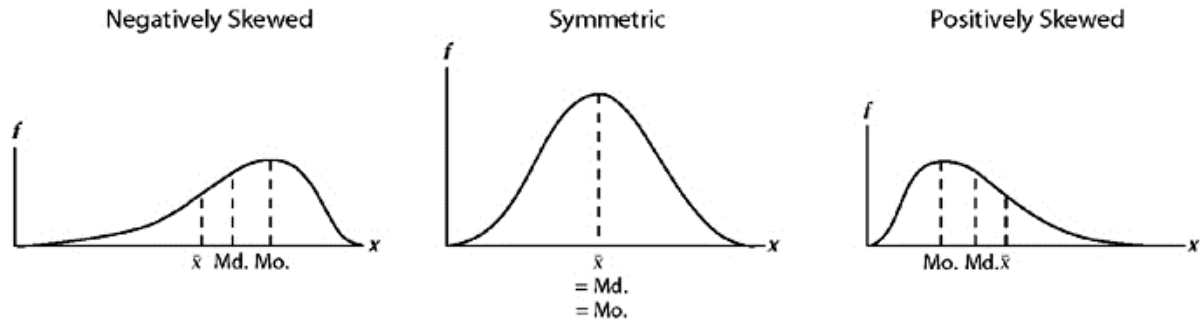


Figure 1: Normal Distribution, adopted from (Sirkin, 2006)

happens when parties try to broaden their strategy to incorporate as much of the voters as possible (Connolly and Munro, 1999).

However, the distribution might not be as precise, depending on the choice of the extremist voters the distribution might have a more bimodal appearance.

In an extreme case, when the number of parties is at least three, we could have a similar distribution of votes throughout the scale, we would then have something close to a polymodal distribution (Connolly and Munro, 1999).

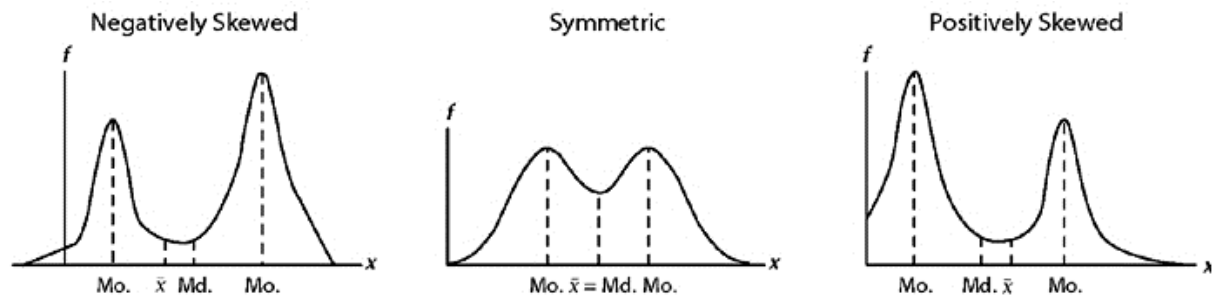


Figure 2: Bimodal Distribution, adopted from (Sirkin, 2006)

4.3 When abstaining is rational

The cost of voting can be expressed as the time or resources spent to inform oneself about the current election. To describe this model, we start by assuming no cost; then an indifferent

person will abstain from voting on account of not gaining any personal utility from the action. In comparison, if a person is not indifferent, they will vote. Assuming no cost is according to Downs irrational, the voter needs to invest time, either, to visit a voting booth or to research the current political climate. This cost, in reality, is often higher than the utility given from voting. In that case, abstention would be rational (Downs, 1957).

Building on this theory, according to Connolly and Munro (1999), we can change the rational voting equation, by including the cost and the probability.

$$E(U) = P(U(X)) - C$$

In this model, P describes the probability for the vote to matter. $U(X)$ is the utility gained from the election victory, and C is the cost of voting. An example of the cost could be; time spent. P depends on the number of people voting, and if the election is in favor of either side. If favored, there is a higher likelihood of P being lower because of the decreasing importance of one vote. The paradox in this model is that despite the utility often being lower than the cost of voting, many people still vote (Connolly and Munro, 1999). Downs (1957) recognizes the effects of C and P with similar conclusions.

4.4 Theories trying to explain the paradox

One theory expressed by Connolly and Munro (1999) mentions the Minimax theory. The Minimax theory emphasizes the utility lost if the opposing party win. For instance, if a new party which the voter disagrees with enters the election, this effect is higher, because of the risk of the opposing party (Connolly and Munro, 1999). Another theory that tries to explain the paradox is the ethical voter theory. This states the importance of the group's utility, not only the individual utility. This theory assumes people are altruistic in their voting, and seeks not only to enhance their utility but aims to help others (Connolly and Munro, 1999).

5 Discussing Theoretical Framework

What effects could have shifted public opinion ahead of the 2006 election? If we look at the opinion polls between the years 2002 and 2006 (see graph A9 in the Appendix), we see a steady decrease in support for the Social Democratic party. This follows the theory of “coalition of minorities”, i.e., the effect of a decreasing support for the incumbent party. This was an effect formerly stated by both Downs (1957) and Kramer (1971). As Sweden was experiencing a boom in the economy, the Social Democratic Party kept losing votes as time passed. This is not surprising, according to economic voting theory.

If we look at the years between 2002 and 2006, we see steady growth in GDP and an inflation level close to the Swedish goal of around two percent. The only factor having a less positive development was unemployment, which was increasing. Reading from previous studies, it is likely that unemployment influenced the outcome of the election. The effects of unemployment were discussed by, for example, Goodhart and Bhansali (1970); Kiewiet and Udell (1998), and Rattinger (1981). The negative impact would, however, be diminished by the Clientele hypothesis stated by Rattinger (1981), which states that the party who represents the most substantial policies regarding unemployment should gain votes if unemployment increases. However, the same point can be applied to the Moderate Party. If the Moderate Party is viewed to have a greater grasp of the problems in the economy, the Clientele hypothesis should favor them. The hypothesis emphasizes which factors were significant during the time up until 2006 and 2010. The Swedish right-wing came to create a coalition to unite the sum of the voters. The theory of the Median voter describes the reason behind this action, used by the political parties to attract a broader range of voters. This theory is explained by Connolly and Munro (1999) and might be reasonably valid in Swedish politics. Especially considering the Alliance attempt to incorporate more of the “folkhem” model

and, through this, create a new Swedish model. This point, as discussed by Agius (2007), corresponds to the median voter theory. This theory results in a stronger difference between the parties as both parties gather closer to the center.

Why an individual votes in a certain way was also addressed in our thesis. According to economic theory, the voter can either vote to minimize the damage of the other party or to vote ethically for the greater good (Connolly and Munro, 1999). The ethical voting theory describes why a person votes and can, therefore, be reasonably applied in our thesis. The ethical voter votes to increase utility for the entire group; and could correspond to key Social Democratic issues such as unemployment and welfare.

Summarizing this chapter, we deduce some effects that could have resulted in the Swedish election of 2006 — both the decreasing support caused by the growing minorities and the movement towards the middle. According to the Median voter theory, this may be part of the explanation for why the Social Democratic Party lost votes. Regarding the Median voter theory, the smaller distinction between the parties may cause lesser issues to disappear and the focus to instead be concentrated on the big emphasized points such as lower taxes or a greater amount of financial assistance. According to these theories, the only significant factors should be the emphasized points. In this discussion we include the point of the ethical voter, which should favor the left while the Clientele hypothesis should favor the right.

6 Econometric Framework

The choice of econometric models is based on two different questions. What affects the likelihood of a vote at an individual level and what impacts the share of votes at a municipal level. To answer this, we have to use two different regression models.

The logistic regression model is similar to the linear regression model, except the logistic regression model is designed to explain if something is true or false instead of predicting something continuous. Instead of fitting a line to a data set, the logistic regression fits a sigmoid logistic function, in which the dependent variable is binary. Thus it is dichotomous; the values of the variable are only coded zero or one, false or true.

The function of this technique is to model the probability of an event occurring, depending on the values of the independent variables, which themselves can either be categorical or continuous. In summary, logistic regression tries to estimate the likelihood of an event occurring for a randomly selected observation versus the likelihood of it not occurring. To combine our linear combination of variables, we need a function that links them together, maps the linear combination of variables that could result in any value onto the Bernoulli-distribution, which has a domain from zero to one.

The natural logarithm of the probability, logit, is this function.

$$\ln(odds) \Rightarrow \ln\left(\frac{p_i}{1-p_i}\right) = \text{logit}(p_i)$$

Where p is the probability of an action occurring, and the range of the Bernoulli-distribution determines the range of values the variable can hold.

$$0 < p_i < 1$$

$$\text{logit}(p_i) = y^* = \ln\left(\frac{p_i}{1-p_i}\right) = \beta_0 + \sum_{i=1}^n \beta_i x_i$$

The natural logarithm of probability is equivalent to a linear function of independent variables. The anti-log of the logit function makes it possible to find the estimated regression equation.

$$\text{anitlog} \Rightarrow \frac{p_i}{1 - p_i} = e^{\beta_0 + \sum_{i=1}^n \beta_i x_i} \Rightarrow \hat{p} = \frac{e^{\beta_0 + \sum_{i=1}^n \beta_i x_i}}{1 + e^{\beta_0 + \sum_{i=1}^n \beta_i x_i}} = \frac{e^{y^*}}{1 + e^{y^*}}$$

In our case, we have both dichotomous and continuous dependent variables, meaning we use both methods for our estimations. OLS regression is a technique where one or more quantitative variables predict another quantitative variable. The dichotomous variable is not continuous, suggesting OLS would not be a good fit. In addition, the dichotomous variable is not linear, i.e., curvilinear.

$$y = \mathbf{X}\beta + \varepsilon$$

X_{ij} : Is an $n \times m$ matrix called the design matrix where the j th column and the i th row represent the values of the j th variable associated with the i th observation.

y : Represents the n -vector of observations on the dependent variable.

β : Represents the n -vector of unknown parameters.

ε : Represents the vector of errors term.

Some issues may arise if we were to run the regular OLS regression model for our dichotomous dataset. The first problem would be that our dichotomous variable, in this case, vote or not to vote, does not have a normal distribution, which is a prerequisite condition needed for most types of regressions. The predicted values of a continuous dependent variable can be beyond zero and one. This creates a problem, due to the rule of probability always being between zero and one, together with the fact that probability functions often are non-linear.

7 Data

The data used in our analyzes comes from two different sources, one of which comes from an earlier survey conducted by Holmberg et al. (2006, 2010), and the other from data provided by SCB (2005, 2009). While we investigate at the individual level with variables from our survey material, we analyze broader municipality variables using our data from SCB. With this approach, we hope to get a better insight into what affects voting behavior.

The election surveys (Holmberg et al., 2006, 2010) are questionnaires at the national level, which has investigated party choice, voter participation, and opinion formation within the Swedish electorate in connection with a parliamentary election. These surveys first started in 1956, where the most recent occurred during the 2018 elections. The material in our data set is based on a panel that participated during the 2006 and 2010 elections. Looking at our subset, we see that some of our variables are not representative at the national level. These variables are discussed and displayed in section 7.1 and table 4.

Our municipal data is gathered from SCB (2005, 2009). In table 5, we display mean, standard deviations and number of observations of our municipal variables. We chose variables with a one-year lag due to previous research emphasizing the period before an election (Goodhart and Bhansali, 1970), and economic theories suggesting utility is derived from the past and not from expectations of the future (Downs, 1957).

7.1 Description individual level

The dependent variables Moderate Party and Swedish Social Democratic Party come from the question "*Which party did you vote for?*". Where the respondents have answered which party they voted for in the 2006 and 2010 elections. We have created dummy-variables; they represent the value of 1 only if they have voted for the party in question and 0 if they have

not voted for the party. Comparing tables 2 and 4 on pages 5 and 23, respectively, we see that our dependent variables are not representative at the national level.

We have not changed the variable *Gender*. It represents the genders of the respondent and holds the value of 1 for females and 0 for males.

Education is a variable created from the survey Holmberg et al. (2006, 2010). They constructed this variable in six categories where it starts with middle school education, which is shorter than nine years and ends with associate professor/professor level of education. For our thesis, we reworked the variable by remaking it into two levels as we were interested in seeing the differences in having education of at least three years after high school or less. Reference category being, having education less than three years post-highschool. This variable in our subset is not representative of the national statistics. Our data has a higher percentage of educated individuals. According to SCB (2006, 2010), the national education percentage was 17.7 in 2006 and 19.6 in 2010.

Employment status is a variable we have created from the questionnaire called labor group. They formed the question in 8 parts. The first two categories, "Employed" and "Work in labor market policy measures", were given the value of 1, and the others as reference category the value of 0. These are "Unemployed", "Retired", "Early retirement/Disability pension/Sickness benefit", "Homeworkers", and "Students". The variable is representative for the national levels in 2006 and 2010.

In the survey, there is a variable with five categories that describes the *Income level* of our participants. These categories were arranged into percentiles, the 15 lowest percentiles, the 16-35 percentiles, the 36 - 65 percentiles, the 66 - 85 percentiles, and the 15 highest percentiles. We have utilized these to generate our variables, Income level: High and Low. *Income level: High* takes the value 1 for the 66th percentile and up, and 0 for the remainder.

Income level: Low takes the value 1 for the 35th percentile and down, and 0 for the rest. The reference category is, the income level that is neither high nor low. We could not determine if the variable was representative.

The variable "age divisions in three categories" is a variable from the survey; these three categories represent the age groups, "18 - 30", "31 - 60", and "61 - 85". We use these to generate our variables, Age: 18 - 30 and 61 - 85. *Age: 18 - 30* takes the value 1 for the age group 18 to 30 and 0 for the rest. *Age: 61 - 85* takes the value 1 for the age group 61 to 85 and 0 for the rest. The reference group for our "Age" variable is 31 to 60. Our variable *Age: 18 - 30* is representative for the year 2006 but higher than the national level for 2010. The real value, in this case, is 22.5 percent for 2006 and 23.9 percent for 2010. The variable *Age: 61 - 85* is representative for 2010 but not for 2006. The real value, in this case, is 29.2 percent for 2006 and 30.2 for 2010.

The variables Country Side and Stockholm, Gothenburg or Malmö, is based on a survey variable with seven categories that describes where the respondent grew up during his or her childhood. These categories are the "Countryside in Sweden", "Smaller urban areas in Sweden", "City or larger urban areas in Sweden", "Stockholm, Gothenburg or Malmö", Other countries in the Nordic region, Other countries in Europe and Countries outside of Europe. We utilized these to generate our variables. For *Countryside*, the variable takes on the value of 1 if the respondent is raised in the area and 0 if the person was not. For *Stockholm, Gothenburg or Malmö*, the variable takes on the value of 1 if the respondent is raised in the area and 0 for the rest. The reference category for this is "Smaller urban areas in Sweden", "City or larger urban areas in Sweden" Other countries in the Nordic region", "Other countries in Europe", and "Countries outside of Europe". We could not determine if the variable was representative.

Table 4: Description of variables at individual level by year

Dependent Variables	Description	Mean 2006	Mean 2010
Moderate Party**	Holds the value 1 if the respondent voted for the party and 0 if not	.232 (.262)	.277 (.300)
Swedish Social Democratic Party**	Holds the value 1 if the respondent voted for the party and 0 if not	.299 (.349)	.261 (.307)
Independent Variables	Description	Mean 2006	Mean 2010
Female	Holds the value of 1 for Female respondents and 0 for Male	.501	.487
Education**	Holds the value of 1 for respondents with at least 3 years education after High School and 0 for less	.294 (.177)	.343 (.196)
Employment status	Holds the value of 1 if the respondents is working and 0 if the respondents is not	.672	.652
Income level: Low*	Holds the value of 1 for respondents with Low income levels and 0 for High and Average	.319	.254
Income level: High*	Holds the value of 1 for respondents with High income levels and 0 for Average and Low	.407	.436
Age: 18 - 30**	Holds the value of 1 for respondents which are between 18 to 30 years old and 0 for 31 to 85 years old	.227	.138 (0.239)
Age: 61 - 85**	Holds the value of 1 for respondents which are between 61 to 85 years old and 0 for 18 to 60 years old	.225 (0.292)	.324
Countryside*	Holds the value of 1 for respondents who grew up on the countryside and 0 for everywhere else	.262	.268
Stockholm, Göteborg or Malmö*	Holds the value of 1 for respondents who grew up in Stockholm, Göteborg or Malmö and 0 for everywhere else	.189	.167
Observations		1030	892

Source:(Holmberg et al., 2006, 2010). * indicates variable that we could not determine on the national level. ** indicates variable that is not representative, the national value in parentheses

7.2 *Description municipal level*

Brå (2005, 2009) provided the independent variable Reported crimes. The Swedish National Council for crime prevention defines reported crime as follows:

“The statistics of reported crimes include all incidents reported and registered as offenses with the Swedish Police Authority, the Prosecutor’s Office, the Customs, and the Swedish Economic Crime Authority. The reported crimes also include events that, after investigation, turn out to be other than crimes” (Brå, 2005, 2009).

Reported crimes was generated by dividing the number of reported crimes in the municipality by the population size, multiplied by 100. This then gives us a standardized value for each municipality, which better captures its effect on the party voting.

$$\text{Reported crimes} = \frac{\text{Crimes in the municipality}}{\text{Population size of the municipality}} \times 100$$

Percentage of highly educated is a variable created using data from SCB (2005, 2009). Here we look at the proportion of individuals in a municipality that has education longer than three years after high school. This also includes postgraduate education. The variable is created by the total educated in the municipality divided by population size in the municipality, multiplied by 100.

$$\text{Percentage of highly educated} = \frac{\text{Highly educated individuals}}{\text{Population size of the municipality}} \times 100$$

We have tried to capture the size of the municipalities by creating the variable *Relative municipality size*. This variable is created by dividing the population size of the municipality by the total population of the country, multiplied by 100.

$$\text{Relative municipality size} = \frac{\text{Population size of the municipality}}{\text{Total population size of the country}} \times 100$$

Financial assistance is the average assistance that individuals have in the municipality in thousands of SEK. The variable is created by dividing the total amount of assistance in the municipality by the municipality's population size to get the value per capita.

$$\text{Financial assistance} = \frac{\text{Average assistance}}{\text{Population size of the municipality}}$$

Percentage of the foreign-born population attempts to explain if voting behavior changes depending on the proportion of immigrants. This variable is generated by dividing the number of immigrants in the municipality by the population size of the municipality, multiplied by 100.

$$\text{Percentage of the foreign-born population} = \frac{\text{Immigrant size in municipality}}{\text{Total population size of the country}} \times 100$$

The variable *Tax rate* explains the total tax rate per municipality in percent units. *Average net income* is the average taxed income that individuals have in the municipality in thousands of SEK, and the dependent variables are the share of votes each party got in each municipality.

And finally, where the dependent variables *Moderate Party* and *Swedish Social Democratic Party* are the percentage of votes each party received at the municipal level during elections in 2006 and 2010.

Table 5: Descriptive statistics of variables at municipality level by year

Dependent Variables	Description	2006		2010	
		Mean	Sd	Mean	Sd
Moderate Party	The share of Moderate Party votes	22.59	8.51	27.06	8.24
Swedish Social Democratic Party	The share of Swedish Social Democratic Party votes	38.85	9.05	35.01	10.13
Independent Variables	Description	2005		2009	
		Mean	Sd	Mean	Sd
Reported crimes	The annual reported crimes, per 100 of the average population	9.69	3.03	9.90	2.99
Tax rate	The annual average tax rate	31.97	0.96	32.16	1.05
Percentage of highly educated	The annual percentage of population with at least three years of education after high school	8.56	3.98	9.71	4.21
Average net-income	The annual average net-income, in 1000 SEK	180.27	23.57	214.11	30.20
Relative municipality size	The annual relative municipality size, compared to the country	3.12	5.98	3.22	6.38
Financial assistance	The annual financial assistance per capita, in 1000 SEK	0.63	0.34	0.91	0.44
Percentage of Foreign-born Population	The annual percentage of foreign-born population	9.08	5.04	10.59	5.40
Observations		290		289	

Source:(SCB, 2005, 2009)

8 Choice of variables

8.1 *Individual level*

Education was chosen to include a background variable that would explain some variation not created by economic factors. Both Bengtsson (2002), Holmberg and Oscarsson (2008) discussed the noneconomic effects and, Holmberg and Oscarsson (2008) even included education as a variable. This leads us to include education as a variable.

Unemployment was discussed in previous research by Goodhart and Bhansali (1970); Mueller (1970); Kramer (1971). For this reason, we included a variable that would display employment status. This variable is interesting in the aspect of the Clientele hypothesis, which states that not all parties are negatively affected by, for instance, unemployment. Rattinger (1981) discussed how the party that held the highest favor on a specific issue could gain votes if this issue were to grow. For example, unemployment which experienced an increase during the years between 2002 and 2006.

Plenty of previous researchers have emphasized the effect of income gain (Kramer, 1971; Nannestad and Paldam, 1997). Income level is a variable often expressed through personal income gain or loss. On the individual level, we chose not to look at the personal gain but the current income level of the respondent as it represents the individuals purchasing power.

We were interested in the variable age to see if significant relationships could be drawn between age and voting. Even though little of the previous research we investigated discussed age as a variable. The same reason applies to our variable gender, and where the respondent grew up, while we do not consider these in our previous research, we thought these variables would prove beneficial in our thesis as they explain the characteristic traits of the individual.

8.2 *Municipal level*

The main reason to include the variable *Reported crimes* is due to the probable effect of an increasing crime rate on the vote. In order to broaden our investigation and not only examine economic effects, it is also vital to include other effects that may affect the outcome. For this reason, we chose *Reported crimes* as this will likely affect the population in a municipality.

Percentage of highly educated was chosen for the same reason we chose education at the individual level. Education is discussed in previous research and will probably affect the population. It is then interesting to investigate whether higher education can lead to a different distribution of votes in a municipality. Education may correspond to income levels and may also represent a similar effect.

Financial assistance is a vital variable to include, Lindblom (2010) discusses how a primary focus of the Moderate Party is to ensure that the income gained from employment should exceed the income gained from state subsidies. According to the mentioned Clientele hypothesis (Rattinger, 1981), this variable should prove positive for the Social Democratic Party, who has been a strong supporter of higher state benefits. This variable is vital due to the theory of the ethical voter stated by Connolly and Munro (1999). This theory explains that people are altruistic in their voting, implying that voters vote to create higher benefits for the rest of the population.

According to Lindblom (2010) and the history of the Moderate Party *tax rate* has long been a vital question. Since the founding of the Moderate Party in 1904, the party has opposed the raised tax burden (Moderaterna, 2019). While this focus had a different meaning during the beginning of the 20th century, the philosophy still flourishes in the Moderate Party. Another interesting fact about this variable is its connection to financial assistance. As taxes fund financial assistance, a lower tax often implies a lower level of financial assistance.

Average net-income we examine according to the same reasoning as our prior economic variable in order to gain an economic insight into the vote. We investigate whether income is significant in regards to voting, both at a broader municipal level but also at an individual level.

While the income was an economic variable in this section, we also wanted to include the *relative municipality size* and the *percentage of Foreign-born Population*. The *relative municipality size* is crucial for our study because of differences in population between the Swedish municipalities. *Percentage of Foreign-born Population* is decisive because of the Swedish Democratic Party that joined the Swedish Parliament after the 2010 election, which was a populist party that opposed immigration.

8.3 *Expectations of our regressions*

We expect the *financial assistance* variable to be favored towards the left while *tax rate* should favor the right. The most significant economic difference between these parties is their look at tax cuts and how they create new jobs. Reading from previous research, the Moderate Party focuses on a lower tax to stimulate employment. At the same time, the Social Democrats focus on a higher tax to protect the worker who may lose their job with a strong welfare state.

9 Research results

This section explores and analyzes the logistic and OLS regression models for The Moderate Party and The Swedish Social Democratic Party.

Each party has two regressions, where the first tries to explain the probability of voting depending on who you are, i.e., individual level. In contrast, the second tries to explain how the proportion of votes the party receives may be affected by different variables at the municipal level.

We have controlled our regressions for multicollinearity with VIF and other tests (table A5-A6 in the Appendix), but only the OLS regression for Test of Normality, QQ-plots and histograms with a normal-curve for the residuals (table A1-A4 and figure A1-A8 in the Appendix).

While our collinearity tests show low VIF values, we find possible problems with our residuals. The Test of Normality rejects the null hypothesis which means we cannot prove the normality of the residuals. Lumley et al. (2002) and Schmidt and Finan (2018) suggested that non-normality in the residuals often has a small effect on the result when the sample size is greater than 10.

9.1 Regression 1: Moderate Party at individual level

Table 6: Marginal effects for logistic regression analysis with White standard errors. The dependent variable is an answer to the question "Which party did you vote for?".

	Moderate Party: 2006		Moderate Party: 2010	
Female	-0.046	(0.027)	-0.028	(0.031)
Education	0.084**	(0.031)	0.071*	(0.034)
Employment status	-0.023	(0.036)	0.016	(0.046)
Income level: Low	-0.046	(0.038)	-0.028	(0.044)
Income level: High	0.089**	(0.034)	0.114***	(0.039)
Age: 18-30	0.019	(0.040)	-0.081	(0.045)
Age: 61-85	0.023	(0.038)	0.007	(0.045)
Countryside	-0.092***	(0.029)	-0.027	(0.036)
Stockholm, Göteborg or Malmö	0.019	(0.034)	0.076	(0.044)
Observations	1030		892	
Pseudo R^2	0.044		0.042	

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

In table 6, we observe the regressions for The Moderate Party at the individual level, where the dependent variable is *Which party did you vote for?* Note that the regressions only account for about four percent of the total variation. In 2006, we saw significant relationships between the dependent variable, *Which party did you vote for?* and the independent variables *Education*, *Income level: High*, and *Countryside*. Table 6 shows us that the likelihood to vote for The Moderate Party increases by 8.4 percentage points for a respondent with at least three years of educations after High School compared to a respondent with lower education.

We see that the likelihood to vote for The Moderate Party also increases by 8.9 percentage points if the respondent has a high income compared to those with a middle income level. The likelihood to vote for The Moderate Party decreases by 9.2 percentage points for a respondents who grew up in the Countryside compared to an individual who neither grew up in the countryside or in a metropolitan area in Sweden.

In 2010, we observed significant relationships between the dependent variable, *Which party did you vote for?* and the independent variables *Education and Income level: High*. Table 6 shows us that the likelihood to vote for The Moderate Party increases by 7.1 percentage points for a respondent with at least three years of educations after High School compared to a respondent with lower education. Lastly, we see that the likelihood to vote for The Moderate Party increases by 11.4 percentage points if the respondent has high income compared to those with middle level income.

Comparing the years, we see that the likelihood of the variable education decreased between the years by 1.3 percentage points and that the likelihood for variable Income level: High has increased by 2.5 percentage points.

By using a Z-test we tested for significant differences between the regressions (i.e. between the variables 2006 and 2010), the test shows no evidence of the differences being significant (see table A7 in the Appendix).

9.2 Regression 2: Moderate Party at municipal level

In table 7, we observe the regressions for The Moderate Party at the municipal level, where the dependent variable is the *Share of votes by the municipality*. Note that the regressions account for 76.5 and 72.9 percent of the total variation.

Table 7: OLS regression analysis with White standard errors, using percentage of votes by municipality as dependent variable.

	Moderate Party: 2006		Moderate Party: 2010	
Reported crimes	0.469***	(0.110)	0.244*	(0.123)
Tax rate	-0.579	(0.394)	-1.512***	(0.376)
Percentage of highly educated	0.680***	(0.158)	0.450**	(0.156)
Average net-income	0.125*	(0.050)	0.078*	(0.039)
Relative municipality size	-0.593	(0.405)	-0.842	(0.639)
Financial assistance per capita	-4.447***	(0.896)	-2.672***	(0.749)
Percentage of Foreign-born Population	0.006	(0.044)	-0.035	(0.050)
Constant	16.163	(17.256)	60.387***	(15.968)
Controlled for municipalities	YES		YES	
Observations	290		289	
<i>AdjR</i> ²	0.765		0.729	

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

In 2006, we see significant relationships between the dependent variable *Share of votes by the municipality*, and the independent variables *Reported Crimes*, *Percentage of highly educated*, *Average net-income*, and *Financial assistance per capita*.

In 2010 the significant dependent variables are *Reported Crimes*, *Education*, *Average net-income*, *Financial assistance per capita*, and the *Tax rate*.

Table 7 shows a one percentage point increase in *Reported crimes* increases the votes by 0.469 percentage points in 2006 and 0.244 percentage points in 2010, showing a decreasing effect of 0.225 percentage points. We see that a one percentage point increase of *Procentage of highly educated* increases the of votes by 0.68 percentage points on average in 2006 and 0.45 percentage points in 2010, implying a decreasing effect of 0.23 percentage points. A 1000

SEK increase of *Average net-income* increases the voter share by 0.125 percent on average in 2006 and 0.076 in 2010, suggesting a decrease of 0.049 percentage points. A 1000 SEK increase of *Financial assistance per capita* decreases the voter share by roughly 4.5 percent on average in 2006 and 2.7 percent in 2010, implying a decrease of 1.8 percentage points. Finally, a one percentage points increase of *Tax rate* decreases the voter share by 1.512 percentage points on average in 2010.

By using a Z-test we tested for significant differences between the regressions, the test shows no evidence of the differences being significant (see table A7 in the Appendix).

9.3 Regression 3: Swedish Social Democratic Party at individual level

Table 8: Marginal effects for logistic regression analysis with White standard errors. The dependent variable is an answer to the question "Which party did you vote for?".

	Swedish Social Democratic Party: 2006		Swedish Social Democratic Party: 2010	
Female	0.045	(0.030)	0.050	(0.031)
Education	-0.177***	(0.029)	-0.151***	(0.028)
Employment status	0.030	(0.038)	0.000	(0.044)
Income level: Low	-0.051	(0.039)	-0.023	(0.037)
Income level: High	-0.057*	(0.036)	-0.098**	(0.035)
Age: 18-30	-0.041	(0.041)	-0.039	(0.045)
Age: 61-85	0.085	(0.044)	0.049	(0.045)
Countryside	-0.016	(0.033)	-0.057	(0.032)
Stockholm, Göteborg or Malmö	-0.103**	(0.035)	-0.135***	(0.033)
Observations	1030		892	
Pseudo R^2	0.045		0.060	

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

In table 8, we observe the regressions for the Swedish Social Democratic Party at the individual level, where the dependent variable is *Which party did you vote for?* Note that the regressions only account for about five percent of the total variation.

In 2006, we find significant relationships between the dependent variable, *Which party did you vote for?* and the independent variables *Education, Income level: High and "Stockholm, Göteborg or Malmö"*. Table 8 shows us that the likelihood to vote for the Swedish Social Democratic Party decreases by 17.7 percentage points for a respondent with at least three years of educations after High School compared to a respondent with lower education. We see that the likelihood to vote for the Swedish Social Democratic decreases by 5.7 percentage points if the respondent has high income compared to those with a middle income level. The likelihood to vote for the Swedish Social Democratic Party decreases by 10.3 percentage points for a respondent grew up in a metropolitan area compared to an individual who grew up neither on the countryside or in a metropolitan area.

In 2010, we observe significant relationships between the dependent variable, *Which party did you vote for?* and the independent variables *Education, Income level: High and "Stockholm, Göteborg or Malmö"*. Table 8 shows us that the likelihood to vote for the Swedish Social Democratic Party decreases by 15.1 percentage points for a respondent with at least three years of educations after High School compared to a respondent with lower education. We see that the likelihood to vote for the Swedish Social Democratic Party also decreases by 9.8 percentage points if the respondent has high income compared to those with a middle income level. The likelihood to vote for the Swedish Social Democratic Party decreases by 13.5 percentage points for a respondent who grew up in a metropolitan area compared to an individual who grew up neither in a metropolitan area or on the countryside.

Comparing the years, we see that the likelihood to vote for the Swedish Social Democratic Party increases by 2.6 percentage points for a respondent with at least three years of educations after High School compared to a respondent with lower education. The likelihood to vote for the Swedish Social Democratic Party decreases by 4.1 percentage points for a respondent with a high income level compared to a respondent with a middle level income. Lastly, the likelihood to vote for the Swedish Social Democratic Party decreases by 3.2 percentage points for a respondent who grew up in a metropolitan area compared to an individual who did not grow up in a metropolitan area nor on the countryside.

By using a Z-test we tested for significant differences between the regressions, the test shows no evidence of the differences between years to be significant (see table A7 in the Appendix).

9.4 Regression 4: Swedish Social Democratic Party at municipal level

In table 9, we observe the regressions for the Swedish Social Democratic Party at the municipal level, where the dependent variable is the *Share of votes by the municipality*. Note that the regressions account for 55.9 and 65.9 percent of the total variation.

In 2006, we see significant relationships between the dependent variable *Share of votes by the municipality* and the independent variables *Percentage of highly educated* and *Financial assistance per capita*. In 2010 the significant dependent variables are *Tax rate*, *Percentage of highly educated*, and *Financial assistance per capita*.

Table 9 shows a one percentage point increase in *Percentage of highly educated* decreases the votes by 0.958 percentage points in 2006 and 0.801 percentage points in 2010, showing a decreasing effect of 0.157 percentage points. We see that a 1000 SEK increase of *Financial assistance per capita* increases the Percentage of votes by 5.096 percent on average in 2006

Table 9: OLS regression analysis with White standard errors, using percentage of votes by municipality as dependent variable

	Swedish Social Democratic Party: 2006		Swedish Social Democratic Party: 2010	
Reported crimes	0.036	(0.156)	0.094	(0.163)
Tax rate	0.095	(0.461)	1.712***	(0.433)
Percentage of highly educated	-0.958***	(0.138)	-0.801***	(0.133)
Average net-income	-0.059	(0.033)	-0.040	(0.027)
Relative municipality size	-0.763	(0.587)	0.015	(0.751)
Financial assistance per capita	5.096***	(1.365)	2.306*	(1.011)
Percentage of Foreign-born Population	0.122	(0.072)	0.185	(0.097)
Constant	44.530**	(16.526)	-15.928	(15.726)
Controlled for municipalities	YES		YES	
Observations	290		289	
<i>Adj R</i> ²	0.559		0.659	

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

and 2.306 percent in 2010, implying a decreasing effect of 2.79 percentage points. Finally, a one percentage points increase of *Tax rate* increases the voter share by 1.712 percentage points on average in 2010.

By using a Z-test we tested for significant differences between the regressions and the years, the test shows no evidence of the differences being significant (see table A7 in the Appendix).

10 Conclusion and Discussion

10.1 Conclusion

This study aimed to determine the effects of economic and socio-economic factors on voting. This study specifically focuses on the economic effect on voting and determining the relationships that might adhere to this. Concluding this, we see relationships both on individual and municipal level.

In our individual level regressions, we observe pseudo R-Squared values between 4.2 and 6 percent. This value is undeniably low, although this could be on account of us investigating this at such a personal level. The likelihood is that with individual socio-economic factors, there is an effect. However, the effect might not be as significant as perhaps ideological background or upbringing. Even though our individual regression shows small pseudo R-square values, we see some significant links. Our regression describes education, income level, and where the individual grew up as significant factors. Looking at education, we see that this variable affects individuals who vote for the Social Democratic Party much more than individuals who vote for the Moderate Party.

It is understandable to discuss if the effects are as significant as previous studies have implied. The discussion that Bengtsson (2002) highlights of how voters may have to disregard economic factors to support other personal values are interesting. These types of personal factors may stand for a much larger degree of personal choice regarding the vote.

Compared to our individual level regression, our municipal level regression shows much larger Adj R-Squared values. The thesis presents values between 55.9 and 76.5 percent of the total variation. Implying that on a municipal level, our regressions explain much more of the total variation. This could indicate that our result somewhat agrees with Jordahl (2006),

who stated that macro variables had a stronger influence.

In regression 2 we observe a positive relationship between the Moderate party's vote and increasing *reported crime*, *percentage of highly educated*, higher *average net-income* and lower *financial assistance*. This implies that for municipalities with a higher degree of *reported crime* and, *percentage of highly educated*, the probability is greater in favor of voting for the Moderate Party, equally, when the tax rate and the financial assistance is low.

Observing the regressions for the Social Democratic Party, we find less significant values. In regression 4 we find *percentage of highly educated*, *financial assistance per capita* and *tax rate* as significant variables, implying that these are truly opposite of the right-wing Moderate Party. It is not surprising that we observe the opposite effects, as these represent some core beliefs of both parties.

Looking back at previous research, it is not surprising that *average net-income*, *Education* and *Income level: High* are significant. Both Kramer (1971) and Nannestad and Paldam (1997) emphasized the gain in personal income. Although our study does not investigate the gain, it investigates which income bracket the respondent adheres to; it is not surprising that these show significance.

The *tax rate* is another factor that may contribute to personal income. The lower tax would imply a higher disposable income, which leads to greater personal gain. Perhaps this result can be understood using economic theory. Observing the utility theory, we can explain why people value factors like *tax rate*, if the individual experiences a greater utility in voting, either to increase disposable income or to decrease a factor like *Reported crimes*. The ethical voter theory, as mentioned by Connolly and Munro (1999), might explain the variable *Financial assistance*. Depending on who is voting, the voter may either want to increase their own or other's utility; The latter shows an ethical voter trying to improve the

well-being of others.

From our results, we see that it may indicate that the individuals' socio-economic characteristics do not explain all possible variations. That is, individuals' decisions about how they vote do not depend precisely on the factors we are looking at. Individuals are irrational beings, which tells us they make different decisions even when they are based on the same information, i.e., individuals differ considerably from one another. Many other factors come into play for the individual in decision making, such as perspective, emotions, et cetera.

If we compare this with the results at the municipal level, we see that similar factors explain a greater proportion of the total variation. When you look at a more substantial mass, for example, the municipality, all the noise, which separates the mass, disappears, and the municipalities' most essential factors are revealed.

10.2 Discussion

A complication with our sample at the individual level, is that it does not represent the country. Our sample represents a higher proportion of educated people relative to the country. Presumably, Holmberg et al. (2006, 2010) used some sampling methods such as stratified or cluster sampling. This problem causes our regressions at the individual level to lose their ability to represent a correct image of the election. Considering that the respondents did not answer all questions in the survey, the sample used in our regressions becomes a subset of the sample. At the same time, the regressions get distorted as those who responded are those who feel they are contributing.

The disadvantage of looking at the municipality level instead of asking specific individuals is that we do not take into account the act of moving and how voters perhaps will move to where their views are shared. Some opinions also tend to influence certain areas more heavily.

This might create stronger relationships between factors than what could be valid.

Another aim of this study was to establish if there were any differences between the years 2006 and 2010. While we see differences, we cannot present any significant ones, as stated by table A7 in the appendix.

The difference we perhaps can observe is the variables that were only significant for one election. An example of this is *tax rate* for the Moderate Party and the Social Democratic Party. *Tax rate* was only significant in the 2010 election. This was surprising, concerning this being one of the main questions for the Moderate Party. A reason to this can be the economic hardships that came during the 2009 crash. This might have influenced the voters, increasing the importance of *tax rate*.

This study will stand as an addition to the research into the economic effects on voting. We recommend further research to include additional elections in their analysis to capture possible trends while focusing on the core parties of a multi-party system. Another recommendation is to use shorter surveys for analyzes at the individual level, as longer surveys discourage possible respondents from responding to the whole survey.

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A1 Appendix

A1.1 Brief history of the Moderate Party

The Moderate Party was in 2006 and 2010, the second biggest party in the Swedish Parliament. They founded the party in 1904 as General Electoral League (Allmänna valmansbundet) and was a conservative and nationalistic party. Since then, the party has changed, while still conservative it values international cooperation much greater than previously. In the 1950s, the party emphasized “Ägandedemokrati,” which was a belief in transferring state ownership into private ownership. Another focus during this time was the protesting of the increasing tax burden. From the year 1969, the party renamed itself the Moderate Coalition Party (The Moderate Party). The first center-right government came to power in 1976. During the 1970s and the 1980s, the Moderate Party aimed to promote a more concise policy that focused more on choice and less reliance on the state. (Moderaterna, 2019)

In a study, Nilsson (2003) investigates the Moderate Party between the years of 1976 and 1991 and names deregulation as one of the critical issues of the party. This position regarding deregulation was not a new concept, however, it had its most significant advances after 1970. Despite the Social Democratic Party keeping power during almost the entire 1980s, the Moderate Party came to enhance their positions in many municipalities throughout the country during this time.

One of the most important questions for the Moderate Party according to Lindblom (2010) is the incentive to work. The potential income from employment should exceed the potential income from subsidies. Another ambition of the Moderate Party, according to Lindblom, is to lower taxes or to prevent further tax increases.

A1.2 Brief history of the Swedish Social Democratic Party

The Swedish Social Democratic Party was in 2006 and 2010, the biggest in the Swedish parliament. The party was founded in 1889, and like similar labor parties, was founded in close cooperation with the unions. Many representatives of the first congress were, in fact, union representatives. At the end of the 1800s, the right to vote was not established, and much of the current labor class were being withheld from voting. This, together with the focus on eight-hour workdays, attracted much of the labor force. As early as in the year of 1896, the Swedish Social Democratic Party had their first representative in the Swedish parliament, and already in 1920, Hjalmar Branting established the first Social Democratic government. The worker's rights were not only meant for men. Woman's right to vote and the equality between the genders was an early focus of the Swedish Social Democratic Party. In 1918 all men and women in Sweden would gain the right to vote, and as early as 1921, the party would have their first woman in parliament.

In 1917 a division took place. The members of the party that aimed to enhance the worker's rights in a revolutionary and non-parliamentary way left the party. In contrast, the members who only wanted to use parliamentary means remained. The members who left later found the new Swedish Communist Party, which was later renamed "Vänsterpartiet" ("The Left Party").

The first majority win by the Social Democratic Party came in 1932, although the parliament remained favored to the right. The 1930s came to be an influential decade for the Social Democrats, reforms like unemployment benefits, and increased pension reform was enacted. In the 1950s, Tage Erlander, who was the current prime minister, enacted a public vote on an addition to the public pension. The vote was favorable, and they would introduce the reform in 1960. During the 1970s, they would implement many new reforms.

Among them were developments in healthcare and dental care. In 1973 they implemented a law regarding job security (LAS). The focus of the 1970s and the 1980s was to combat unemployment and to increase state ownership (Socialdemokraterna, 2019).

A1.3 Tests

Table A1: Test of normality for OLS regression; Moderate Party: 2006

Shapiro-Wilk W test for normal data	Obs	W	V	z	Prob > z
	290	0.9731	5.555	4.018	0.0000
Shapiro-Francia W' test for normal data	Obs	W'	V'	z	Prob > z
	290	0.9694	6.849	4.075	0.0000
Jarque-Bera test for normal data	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob > chi2
	290	0.0077	0.0000	23.88	0.0000

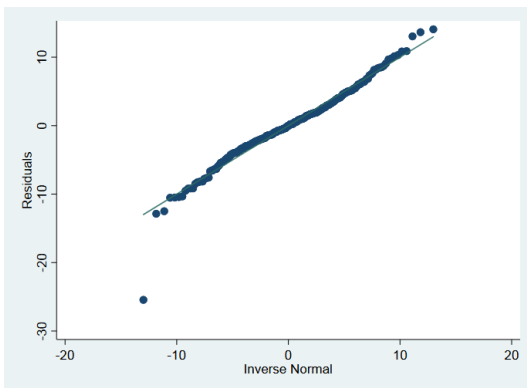


Figure A1: Q-Q Plot for Residuals; Moderate Party: 2006

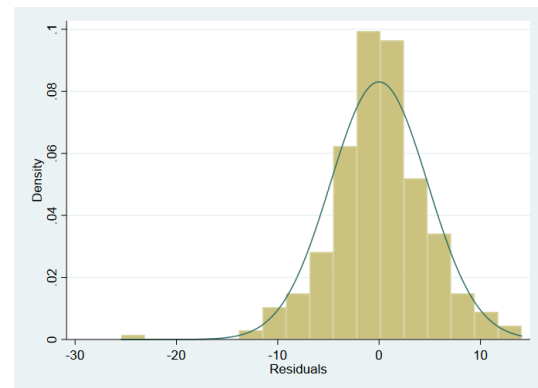


Figure A2: Histogram With Normal Curve for Residuals; Moderate Party: 2006

Table A2: Test of normality for OLS regression; Moderate Party: 2010

Shapiro-Wilk W test for normal data	Obs	W	V	z	Prob > z
	289	0.9761	4.921	3.734	0.0000
Shapiro-Francia W' test for normal data	Obs	W'	V'	z	Prob > z
	289	0.9737	5.883	3.753	0.0000
Jarque-Bera test for normal data	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob > chi2
	289	0.0001	0.0001	24.74	0.0000

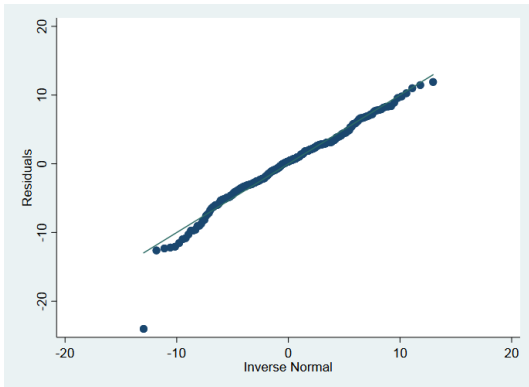


Figure A3: Q-Q Plot for Residuals; Moderate Party: 2010

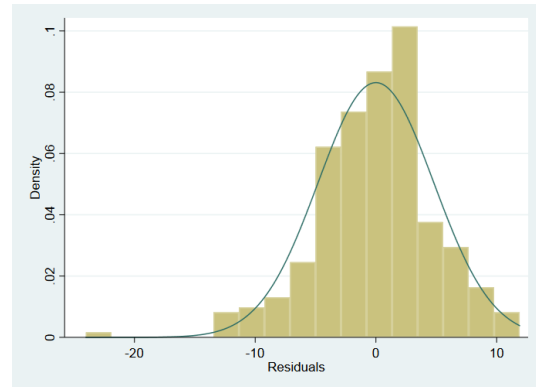


Figure A4: Histogram With Normal Curve for Residuals; Moderate Party: 2010

Table A3: Test of normality for OLS regression; Swedish Social Democratic Party: 2006

Shapiro-Wilk W test for normal data	Obs	W	V	z	Prob > z
	290	0.9836	3.386	2.859	0.0021
Shapiro-Francia W' test for normal data	Obs	W'	V'	z	Prob > z
	290	0.9846	3.443	2.619	0.0044
Jarque-Bera test for normal data	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob > chi2
	290	0.0018	0.6691	9.060	0.0108

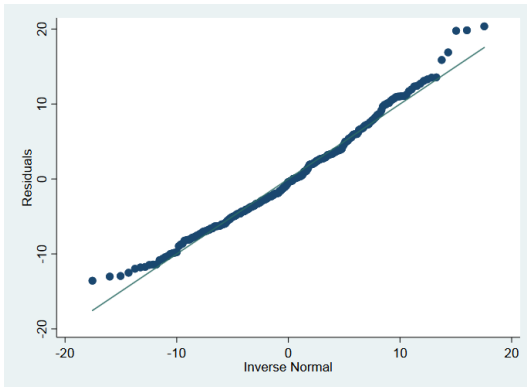


Figure A5: Q-Q Plot for Residuals; Swedish Social Democratic Party: 2006

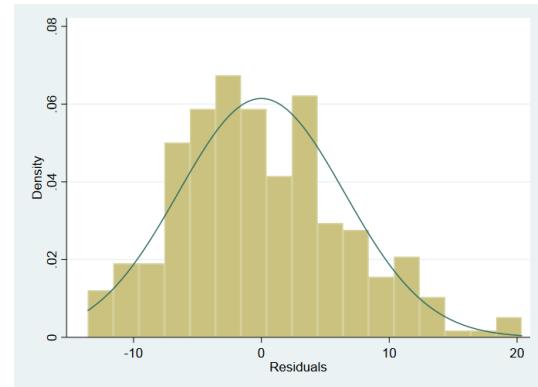


Figure A6: Histogram With Normal Curve for Residuals; Swedish Social Democratic Party: 2006

Table A4: Test of normality for OLS regression; Swedish Social Democratic Party: 2010

Shapiro-Wilk W test for normal data	Obs	W	V	z	Prob > z
	289	0.9769	4.756	3.654	0.0001
Shapiro-Francia W' test for normal data	Obs	W'	V'	z	Prob > z
	289	0.9767	5.203	3.493	0.0002
Jarque-Bera test for normal data	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	Prob > chi2
	289	0.0001	0.0688	15.750	0.0004

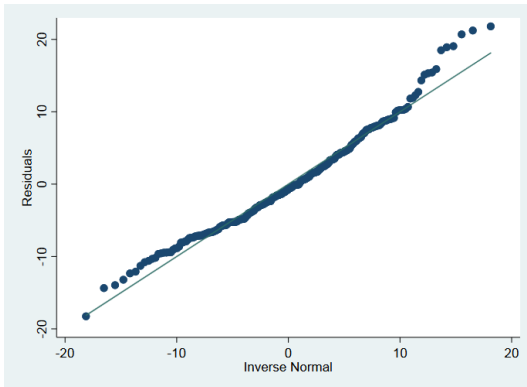


Figure A7: Q-Q Plot for Residuals; Swedish Social Democratic Party: 2010

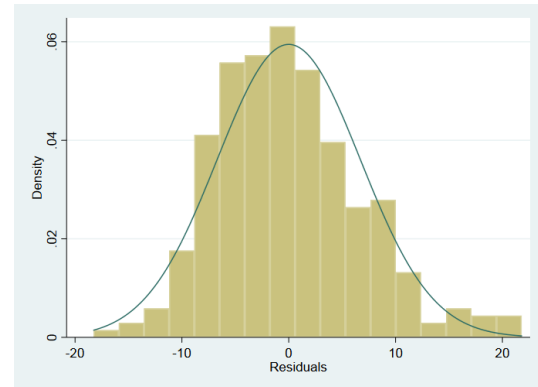


Figure A8: Histogram With Normal Curve for Residuals; Swedish Social Democratic Party: 2010

Table A5: Collinearity test for Logistic regressions

Variables	VIF	SQRT VIF	Tolerance	R-Squared
Female	1.10	1.05	0.9090	0.0910
Education	1.08	1.04	0.9260	0.0740
Employment status	1.58	1.26	0.6337	0.3663
Income level: High	1.63	1.28	0.6121	0.3879
Income level: Low	1.84	1.35	0.5448	0.4552
Age: 18-30	1.50	1.22	0.6681	0.3319
Age: 61-85	1.49	1.22	0.6715	0.3285
Countryside	1.13	1.06	0.8882	0.1118
Stockholm, Göteborg or Malmö	1.10	1.05	0.9130	0.0870

(a) Year 2006

Variables	VIF	SQRT VIF	Tolerance	R-Squared
Female	1.13	1.06	0.8888	0.1112
Education	1.08	1.04	0.9278	0.0722
Employment status	2.20	1.48	0.4537	0.5463
Income level: High	1.58	1.26	0.6324	0.3676
Income level: Low	1.46	1.21	0.6833	0.3167
Age: 18-30	1.23	1.11	0.8099	0.1901
Age: 61-85	2.12	1.46	0.4714	0.5286
Countryside	1.11	1.05	0.9016	0.0984
Stockholm, Göteborg or Malmö	1.10	1.05	0.9085	0.0915

(b) Year 2010

Table A6: Collinearity test for OLS regressions

Variables	VIF	SQRT VIF	Tolerance	R-Squared
Reported crimes	2.28	1.51	0.4382	0.5618
Tax rate	1.48	1.21	0.6779	0.3221
Percentage of highly educated	2.58	1.61	0.3870	0.6130
Average net-income	2.38	1.54	0.4207	0.5793
Percentage of total population	1.87	1.37	0.5351	0.4649
Financial assistance per capita	1.96	1.40	0.5115	0.4885
Percentage of Foreign-born Population	1.59	1.26	0.6270	0.3730
Municipalities	1.55	1.25	0.6445	0.3655

(a) Year 2006

Variables	VIF	SQRT VIF	Tolerance	R-Squared
Reported crimes	2.02	1.42	0.4960	0.5040
Tax rate	2.01	1.42	0.4966	0.5034
Percentage of highly educated	3.03	1.74	0.3300	0.6700
Average net-income	2.74	1.65	0.3653	0.6347
Percentage of total population	1.78	1.34	0.5607	0.4393
Financial assistance per capita	1.59	1.26	0.6284	0.3716
Percentage of Foreign-born Population	1.81	1.35	0.5511	0.4489
Municipalities	1.71	1.31	0.5838	0.4162

(b) Year 2010

Table A7: *Z-Test, Testing equality of coefficients from two different regressions*

Regression 1	β : 2006	β : 2010	SE :2006	SE : 2010	Z-value	P-value
Education	0.084	0.071	0.031	0.034	0.283	0.778
Income level: High	0.089	0.114	0.034	0.039	0.483	0.629
Regression 2	β : 2006	β : 2010	SE :2006	SE : 2010	Z-value	P-value
Reported Crimes	0.469	0.244	0.110	0.123	1.364	0.173
Percentage of highly educated	0.680	0.450	0.158	0.156	1.036	0.300
Average net-income	0.125	0.078	0.050	0.039	0.741	0.459
Financial assistance	-4.447	-2.672	0.896	0.749	1.520	0.129
Regression 3	β : 2006	β : 2010	SE :2006	SE : 2010	Z-value	P-value
Education	-0.177	-0.151	0.029	0.028	0.645	0.519
Income level: High	-0.057	-0.098	0.036	0.035	0.817	0.414
Stockholm, Göteborg or Malmö	-0.103	-0.135	0.035	0.033	0.665	0.506
Regression 4	β : 2006	β : 2010	SE :2006	SE : 2010	Z-value	P-value
Percentage of highly educated	-0.958	-0.801	0.138	0.133	0.819	0.413
Financial assistance	5.096	2.306	1.365	1.011	1.642	0.100

Adopted from (Clogg et al., 1995)

A1.4 Graphs and explanations

- **GPD:** In constant prices and showed as the percentage change over the years.
- **Inflation:** Average consumer prices, percentage changes over time.
- **Unemployment:** Percentage of total labor force.

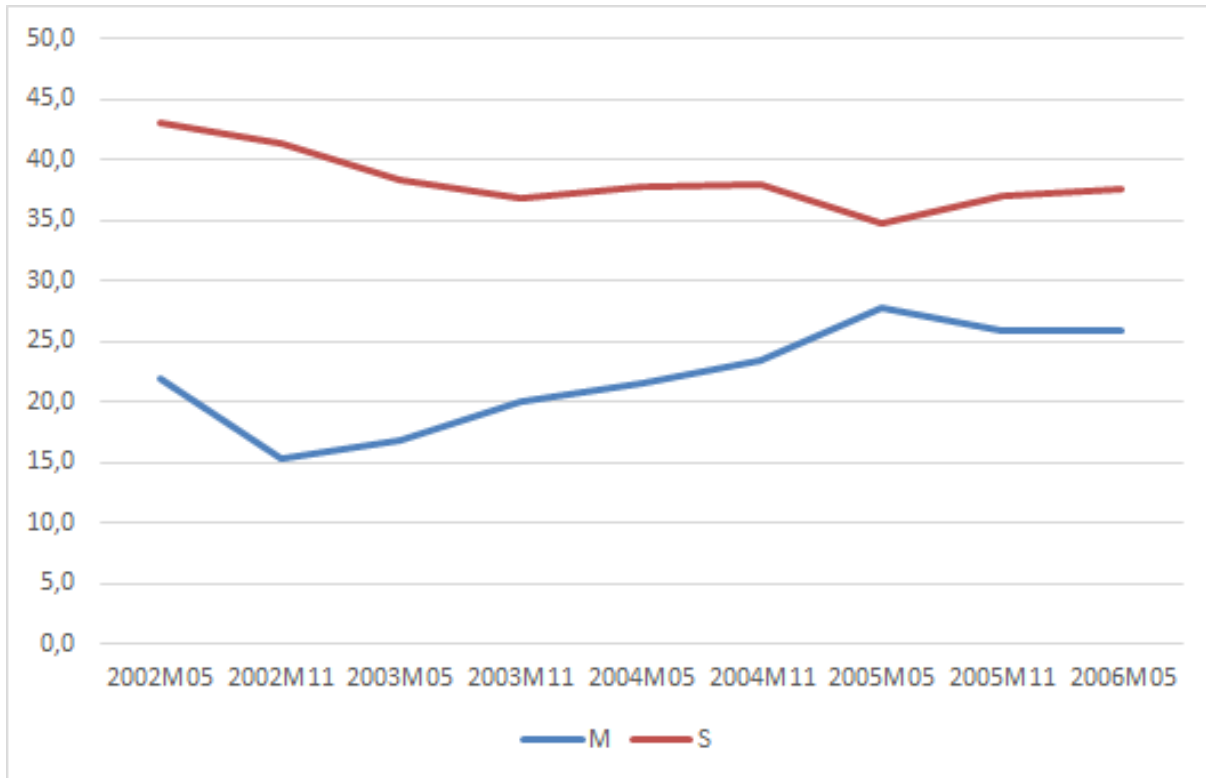


Figure A9: The Party Preference Survey: "If there were an election to the Riksdag today".