Information Acquirement in Committees

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Introduction

Information acquirement in committees is a very important topic. A lot of decision making is done by committees nowadays and a lot of committees with different sizes exist. In the table below some committees with their sizes are stated. As can be seen, the committees differ in their sizes.

Committee	Size
Dutch Parliament	150
Dutch Senate	75
Town Council Rotterdam	45
Town Council Amsterdam	45
Town Council Vlaardingen	35
Town Council Houten	27
Commissions Parliament	25
Governing Councel ECB	22
Security Council United Nations	15
Jury size England	12

Table 1 – Committees with their sizes

There are several reasons why committees are used. First of all, a lot of people find it important that important decisions are not made by just a single person. They think that better decisions are made when a committee is used. A second reason is that different people in one committee can have different biases, which means that a better outcome can be reached by using more people. The third advantage of using committees is that specialisation with regard to information acquirement can take place. Every committee member can search for one part of the available information and this will lead to better decisions.

There are also some disadvantages to the use of committees. First this can lead to the free rider effect, this means that everyone will think that someone else will search for information and will not search for information himself. This means less information is found and this thus leads to a less accurate decision.

In this thesis there will be a literature study to see if it is indeed better to have more people in a committee with regard to information acquirement. Other aspects also matter for the decision to let committees decide, but these will not be taken into account in this thesis.

Motivation

The reason why I want to write this thesis is that I would like to make a contribution to the research in the area of political economics. This specific topic, information acquirement in committees, is really important nowadays, because a lot of decision making is done by committees. Some examples of important decisions that are made by committees are decisions made by the European Central Bank and juries in court in the United States. My attention to this subject was immediately drawn, because of the interesting application on a broad level of subjects and decision making processes. This thesis is thus applicable at different levels.

Purpose and nature of the research

The purpose of this research is to explore the literature known on information acquirement in committees. It is important to find out what kind of literature already exists on this field, to be able to answer the research question, which will be stated in the next section.

1. Problem statement

A lot of decision making is done by committees nowadays. It is not always clear what the optimal size of a committee will be in a certain case. There are lot of committees with different sizes and it is important to know where the difference between these sizes comes from. For example, The Dutch House of Representatives (Tweede Kamer der Staten Generaal) consists of 150 members, while the Senate consists of 75 members (Eerste Kamer der Staten Generaal). For other examples of committee sizes, I refer to table 1 in the introduction of this thesis.
This thesis is written because of the incomplete research done on information acquisition in committees. There is little up to date knowledge about the information acquisition in committees, the variables that determine the optimal committee size and the problems which arise regarding to this acquisition. In this thesis the important issues will be pointed out regarding the information acquisition in committees, the advantages as well as the disadvantages of using committees.
In this thesis, knowledge about the information acquirement in committees will be found in the current literature by doing a literature study. A lot of problems arise with regard to the information acquirement. These problems will be pointed out in this research and possible solutions will be mentioned. Eventually the main question will be answered and an advice on the size of committees will be given, so the probability of acquiring information and the probability of making a correct decision will be maximized.
It is important to notice that this thesis will only contain an answer to the optimal size of a committee with regard to the information acquisition. Of course a lot of other variables, such as different preferences and specialisation, determine the size of committees. This thesis will only take the information acquirement into account.

Research questions

The main research question is as follows:

1. ***What is the optimal size of a committee to have the highest probability of members acquiring information?***

With this main research question I would like to give an advice about the optimal size of a committee, so that information acquirement and thus the probability of making a decision where social welfare is maximized. This research question is answered by answering the partial research questions mentioned below first.

I formulated partial research questions to help answer the main research question. These partial questions are the following:

2. ***What are the main reasons for using committees?***

Here I would like to make a start by analysing the reasons why committees are used for decision making. The current literature will be used to answer this question.

3. ***What variables determine the optimal size of a committee?***

The variables that determine the optimal size of a committee will be found in current literature. The DM-A model will be mentioned and the variables will be illustrated by using this model.

4. ***What kind of problems arise in the information acquisition in committees?***

The current literature and the problems that were found regarding information acquirement in committees in this literature will be analysed. The possible solutions found in the literature will also be mentioned.

2. Research Process

This thesis will mainly consist of a literature study, to explore the topic of information acquirement in committees. This will be a systematic literature study to find all of the available literature on this topic and this literature will be systematically analyzed.

3. What are the main reasons for using committees?

One of the oldest literature known on the theory of using committees for decision making is from Condorcet (1994). According to the Condorcet Jury Theorem a larger jury is better than a smaller jury and reaches a more accurate decision on average than a smaller jury. One of the implications of this theorem is that information acquirement is endogenous and thus that the committee members will always search for information. A lot of criticism exists on this theory, because of the non-realistic view of endogenous information acquirement.

One of the most important reasons for using committees is that information from the different committee members can be aggregated. Each member can have different information available or processes information differently, which means that the probability of making the correct decision should increase when the size of the committees increases. It is important to notice that this is not always the case. When the information is either common knowledge or the information is perfect and thus always leads to the correct decision, this advantage of committees may not be present. Visser and Swank (2007) also state that committee decision-making has the important benefit of exchanging information and discussion before the decision is made. This can possibly lead to a better decision on average, because of the aggregation of information before the decision is made.

Another important reason for using committees is that committee members may have different preferences (Blinder, 2006). This means that committee members may be concerned with different aspects of the decision and prefer different outcomes, given the information they found. In the case of monetary policy, this means that there are doves and hawks. The hawks are more concerned with inflation, while the doves are more concerned with employment. When either a hawk or a dove will do all of the decision making, so when there is no committee, this means that they are either concerned with inflation or employment and thus a very extreme outcome can be predicted. So very high inflation with a high employment level with a very dovish person and low inflation and a low employment level with a very hawkish person, this of course is not socially optimal. When the decision making on monetary policy is made by doves and hawks, this will

lead to a more social optimal outcome on average than when one person with extreme preferences will decide everything.

Blinder (2006) also mentions another very important reason for using committees, which is almost never mentioned by other authors. Committee members can have different heuristics. Different heuristics may matter when the information every committee member receives is the same. Committee members may process this information differently, due to different heuristics. This can also lead to a better decision on average, because of the aggregation of heuristics and thus information. This is also found by Hong and Page (2004); they found that diverse groups can outperform homogenous groups or individuals, because of their diversity of heuristics.

A reason why committees are used for decision making on monetary policy is that this came hand-in-glove with independence of central banks from the government. According to Blinder (2006) it is useless to use committees for monetary policy, when they are simply following orders from the government. It is only useful to use committees when they can make their own decisions, without interference of the government. Since the importance of independent central banks grew, the importance of using committees for monetary policy also grew.

Members of committees may also have different models of how the economy works, this is noticed by Blinder (2006). When decision making is done by different members with different models of the economy, this aggregates the models the committee members use and thus will lead to a better decision on average.

Another reason for using committees is that committee members may have different forecasts about the future. Since a lot of decisions are based on forecasts, this means that having members with different forecasts aggregates these forecasts and thus will lead to a better prediction of the future. This will in turn lead to a better decision, based on more accurate predictions of the future, than when the decision is made by one person.

4. What variables determine the optimal size of a committee?

There are a lot of different variables that determine the optimal size of a committee. With the knowledge about these variables, the optimal size of a committee can be found. In this partial question the variables that determine the optimal size of the committee will be found using current literature.

The DM-A Model

In this partial question the DM-A model (Letterie and Swank, 1997) will be used to illustrate some of the variables determining the optimal size of a committee. The DM-A model is a decision maker – adviser model where the decision maker can consult an adviser to help him decide which of the available alternatives he should choose. The adviser can observe the state of the world and can give an advice about the true state of the world.

The model is as follows:

There is a decision maker which will be denoted by P and an adviser which will be denoted by A. The decision maker has to decide whether he wants to maintain the status quo ($X = 0$) or wants to implement the project ($X = 1$). The consequences of the project are uncertain.

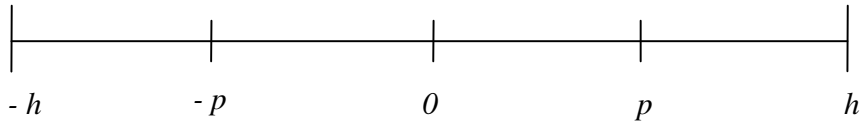
The pay-off the decision maker will get in case of one of the two projects is equal to:

$U_p(X = 1) = p + \mu$

$U_p(X = 0) = 0$

p = predisposition of P

μ = stochastic term, uniformly distributed on $[h,-h]$



Density function: $f(\mu) = \frac{1}{2h}$

The pay-off of the adviser in case of implementing or maintaining the status quo is equal to:

$U_a(X=1) = a + \mu$

$U_a(X=0) = 0$

$a =$ predisposition of A

When the decision maker consults an adviser, the adviser sends a message $m = \{m^g, m^b\}$

$m^g =$ implementation

$m^b =$ maintaining status quo

Assumptions:

- The decision maker does not observe μ
- $p + h > 0$
- $p - h < 0$

This implicates that the decision maker may make an incorrect decision. The decision maker should thus choose to implement the project ($X = 1$) if and only if $\mu > -p$. If $\mu < -p$ the decision maker should choose to maintain the status quo ($X = 0$) .

Variables

One of the variables that determines whether a committee is used or decision making is done by one person, is the importance of the decision that has to be made. This also determines the size of the committee, when decided that decision making should be done by a committee. When a decision is not that important, like buying bread and what kind of bread to buy, no one is consulted to help to decide which kind of bread will be bought. This is so with every kind of decision and in every field. When a decision that has to be made is not important, or not really important, decision making by one person can be optimal. One of the reasons is the cost of a committee, when only one person has to decide it is less costly than when many members have to decide. When the decision affects a lot of people and thus is perceived as important, a committee can be useful.

When the decision is perceived as important, the variables described later in this thesis can, in combination with the importance of the decision, result in the optimal size of the committee.

This can be illustrated by using the DM-A model described before. Whether the decision maker will decide on his own or consult an adviser, depends on the importance of the decision and thus the costs of making a mistake. When the decision is important the range where μ can lie is very big and vice versa. This means that *h* will take a large value when the decision is important and *h* will take a small value when the decision is not that important at all. This can be illustrated by using an example:

Important decision: $h = 100, p = 10$

Less important decision: $h = 10, p = 1$

Because $p > 0$, the decision maker will choose for implementing the project when he has no further information. His utility will be higher for implementing the project than when he maintains the status quo.

When the decision maker chooses $X = 1$, the costs of deciding $X = 1$, when with information about μ the decision maker would choose $X = 0$, and the costs of the average mistake can be calculated.

In case of the important decision this is: $\frac{100-10}{2} = 45$

In case of the less important decision this is: $\frac{10-1}{2} = 4{,}5$

The costs of making an error in case of the important decision are much higher than the costs of making an error in case of the less important decision. Because of the high costs of an error in case of the important decision, it can be optimal to consult an adviser in this case.

Of course the decision to use a committee or not, depends on the costs of this committee. When the costs of the committee are too high, it might not be optimal to use a committee. The benefits of using the committee may not outweigh the costs of the committee and thus decision making by one person is optimal.

This can also be illustrated by using the DM-A model. The decision maker can decide on his own or he can consult and adviser. Whether the decision maker will consult an adviser depends on the utility the decision maker can achieve by either making the decision on his own or consulting an adviser. When the costs of an adviser are too high, the decision maker may decide on his own, because his expected utility may be higher if he does not hire an adviser. This will be illustrated by the example of an adviser who can perfectly observe μ. The decision maker should choose an adviser with a equal to his own predisposition p, because this will maximize his expected utility. The decision maker will get the best information when the adviser has the same bias as he does, because he knows it is optimal to always follow the advice the adviser gives him.

$E_u(NA) = p$ (Expected Utility – No advice)

$E_u(A) = \frac{-p+h}{2h} * 0 + \frac{p+h}{2h} * \frac{1}{2} * (-p+h) - C$ (Expected Utility – Advice)

For advice to be useful and optimal, this inequality should be met:

$$\frac{-p+h}{2h} * 0 + \frac{p+h}{2h} * \frac{1}{2} * (-p+h) - C > p$$

The next numeric example will be used to illustrate this:

$h = 100$

$p = 10$

$C = 15$

The expected utility of no advice and advice of an adviser is:

$E_u(NA) = 10$

$$E_u(A) = \frac{-10+100}{2*100} * 0 + \frac{10+100}{2*100} * \frac{1}{2} * (-10+100) - 15 = 9{,}75$$

$9{,}75 < 10$ so $E_u(NA) > E_u(A)$

With the costs of 15 for consulting the adviser, consulting an adviser is not optimal since the expected utility for asking advice is less than it is for no advice. The maximum costs a decision maker is willing to pay in the above example can also be calculated:

$$\frac{-10+100}{2*100} * 0 + \frac{10+100}{2*100} * \frac{1}{2} * (-10+100) - C = 10$$

$$\frac{110}{200} * \frac{1}{2} * 90 - C = 10$$

$$24{,}75 - C = 10$$

$$C = 14{,}75$$

The decision maker is willing to pay up to 14,75 for a consult of the adviser.

The decision to consult and adviser also depends on the bias of the decision maker. When a decision maker is very biased for a project, so has a high *p*, consulting an adviser may not be optimal. This can be illustrated by using the next examples of the DM-A model.

$h = 100$

$p = 40$

$C = 0$

$E_u(NA) = 40$

$$E_u(A) = \frac{40 + 100}{200} * \frac{1}{2} * (-40 + 100) - 0 = 21$$

$21 < 40$.

The decision maker will not consult an adviser in this case, because his expected utility is higher without asking advice than it is with asking advice. With a high bias from the original decision maker, it is not optimal to hire an adviser, because the expected utility is then lower.

Several biases of the decision maker and the utility of asking advice are calculated; these results can be found in table 2 in the appendix. The graph in the appendix shows where the intersection of the utility of advice and no advice is. In this intersection the decision maker is indifferent between asking advice and deciding on his own, because the utility from asking advice and deciding on his own is the same.

It is important to notice that an important decision is not always made by a committee. When the decision only affects you, you will not always consult other people. This may be due to the fact that you are the only expert on your own field of decision making and you know more about what really matters. One of the most important decisions in your life, are made by a limited number of people. Some examples are your major during

college or a long-term relationship or even marriage. With a lot of these decisions, you decide by yourself or consult a limited number of people who are related to you (e.g., friends, family), asking advice from a committee may not be optimal, because they are no experts on this field.

Another variable that determines the size of the committee is the cost of information acquirement. It is important to have exogenous information acquirement, otherwise the costs of information acquirement can not be measured. When the information is endogenous, the already mentioned Condorcet Jury Theorem applies. This means that the size of the committee is unbounded and that a larger jury reaches a more accurate decision on average, than a smaller jury (Condorcet, 1994). The implication of endogenous information is not realistic and should thus be replaced with exogenous costly information acquirement. Information acquirement costs effort and people dislike putting effort in something, information acquirement is thus exogenous. One of the most important variables is thus the cost of information acquirement. When the costs of acquiring information are very high, the incentive to acquire information is very low. When the costs of information acquirement are very high, the committee should not be that large. This is because the change that a committee members' vote is pivotal is larger in a smaller committee and thus the incentive to acquire information will increase in a smaller committee. When the committee is quite large, the chance of a pivotal vote of a committee member is smaller and thus the incentive of a committee member to acquire information falls, because information acquirement is very costly (Mukhopadhaya, 2003). The precision of the signal of information is also important for the optimal size of the committee. When the signal of the information is perfect, so the information always leads to the correct decision and there is no room for interpretation or different perceptions of information, it is not useful to have a committee. The incentive of acquiring information falls when the size of the committee is enlarged, due to the free rider problem. It is sufficient to have a single person acquiring information to reach the correct decision, resulting in none of the committee members acquiring information, because they expect that someone else will acquire information. This problem becomes larger when the size of the committee grows, because it is not always clear which of the members will acquire information. When the signal is perfect, it is thus important to let a single person decide.

When the cost of paying attention is larger than the precision of the signal, so the signal is imperfect, there exists a symmetric pure-strategic Nash equilibrium where no juror pays attention and the probability of making a correct decision is thus 50% when there are two alternatives (Mukhopadhaya, 2003).

Another variable that matters is the pay-off of a correct decision. When the pay-off of making a correct decision is very high, the probability of committee members acquiring information rises. Committee members then care a lot about the decision and the outcome and are prepared to put effort in acquiring information. This can be linked to the importance of a decision that has to be made. When the decision is really important and the members really care about the decision and the outcome, the pay-off of making a correct decision will automatically be high. When the pay-off of making a correct decision is not high and the costs of information are higher than the pay-off, the committee members will not acquire information and thus the probability of making the socially optimal decision falls. It is thus important that either the pay-off of making a correct decision is high or the costs of paying attention are low, to give the committee members an incentive to acquire information.

The voting rule used for decision making in committees also determines whether committee members acquire information or not (Persico, 2002 and Gerardi and Yariv, 2008). A voting rule that requires a large plurality to upset the status quo can be optimal if the information available to each committee member is sufficiently accurate (Persico, 2002). When the signal is imperfect and the precision of the signal is not very high, the committee members may not acquire information when the voting rule requires a large plurality. When the signal is noisy, different committee members will have different perceptions about the correct decision, so the probability that the vote of one committee member is deciding is low. This means that a committee member will not acquire information. It is thus important that when the signal is imperfect and noisy, the voting rule does not require a large plurality. Another solution for this problem is to have a smaller committee; the size of a committee needs to decrease when the signal is imperfect and noisy. The probability that the vote of a member is then decisive is larger, because there are fewer members in the committee. Gerardi and Yariv (2008) mention that when the device of the decision making process in the committee is optimal given a certain cost

of acquiring information, this committee device is still optimal when the cost of acquiring information is lower than the costs were before and thus induces the committee members to acquire information. This is useful because it is not necessary to change the committee device and thus the voting rule when the costs of acquiring information unexpectedly are lower than before. The device and voting rule can still be useful and optimal for this committee.

Another determinant of the committee size is whether or not the committee members can communicate before the decision is made. This will be after the stage where the committee members will decide whether or not they are going to acquire information (Gerling et al., 2005). When the precision of the signal is very high and the committee members can communicate before they have to make their decision, this may result in lower information acquisition in the stage before the communication stage. Since the committee members can learn from each other in the communication stage, they may decide to not acquire information because someone else may. This means that when committee members can communicate, this can lead to a bigger free rider problem, which will be discussed in the next partial question.

The kind of members which are in the committee also matters. A distinction can be made between members with heterogeneous and homogeneous preferences and the size of the committee. A committee with a large difference in the preferences of the members will have the advantage of aggregating preferences. This may also induce members to acquire more information, if they know the preferences of the members are heterogeneous, because they prefer their state of the world and the decision in line with their preferences. Of course this advantage only matters when the decision is made by one person where they have to give their acquired information to. When the members have homogeneous preferences and thus all prefer one state of the world, they may not all acquire information, since they all have the same preference. One of the members can have proof for making the decision in line with their preferences. The free rider problem, discussed in the next partial question, may thus be larger in committees with homogeneous preferences.

Committees in the Dutch Parliament

In the Dutch Parliament (Tweede Kamer der Staten-Generaal) there are a lot of committees regarding several topics. One would expect these committees to be homogeneous in their size, the number of leaders of the parliament parties and the number of meetings for one committee. This is not the case as can be seen in table 3 in the appendix of this thesis. There is a large variety in the size of committees, the number of meetings and the number of leaders of the parliament parties in committees.
As mentioned in the first part of this thesis, important committees tend to have more committee members. This means that for example the committee of Justice is much more important than the Petitions committee, because of the number of committee members. Since the committee of Justice has 25 members and the Petitions committee has 8 members, this is an indication that the committee for Justice is much more important than the Petitions committee.
With only the members as a variable for importance of a committee, the committees with 25 members would be equally important. When the number of parliamentary party leaders are involved in the importance of the committees, this would mean that for the committee Intelligence and Security Services the ratio of members to parliamentary party leaders would be 1. This may have something to do with the fact that people in The Netherlands find this a very important topic and it is of course important for the parties in the parliament to obtain votes from the Dutch people for the next elections. By being in this committee they can show to the Dutch people how important this topic is for them and so obtain votes for the next elections. This means that this would be one of the most important committees from the Parliament. In the petitions committee there is not one of the party leaders, this shows that the government and the parties in the parliament find this committee less important.
Another indicator for importance of the committee is the number of meetings. For this analysis I took the number of meetings in June 2009 as an indicator. As one can see in table 3, the number of meetings has a high variance just as the other variables. The committee with the highest number of meetings is the committee for Health, Welfare and Sport, which has 16 meetings planned in the month of June. The Contact Group France has zero meetings planned in the month of June. This is also an indicator that this

committee is less important compared to other committees with a lot of planned meetings, such as the committee for Health, Welfare and Sport or the committee for Transport, Public works and Water Management.
It is hard to qualify one committee as the most important committee of all. One could say that when a committee has a lot of parliamentary party leaders and a lot of meetings, this would be an important committee. The committee would then cost a lot of effort and time from the parliamentary party leaders. The parliamentary party leaders still want to be in that committee, despite of the time and effort it may cost them. This of course is a sign for importance of a committee. One could say that the committee for Health, Welfare and Sport is an important committee. There are 4 parliamentary party leaders in this committee and there are 16 planned meetings in the month of June. Apparently the parties in the Dutch parliament find this topic and thus this committee very important. When one looks at the table, one can see that the committee for economic affairs only has 1 party leader and 12 meetings. This could mean that this committee asks too much time and effort from the party leaders compared to the importance of this committee. Party leaders may not find the committee important enough to invest a lot of time and effort in this committee and thus do not enter the committee.
A strange committee is the committee for Intelligence and Security Services. This committee has 10 members, whom all are parliamentary party leaders, which is an indicator for importance of a committee. However, this committee has no meetings planned in the month of June and this would thus mean that this committee is of less importance. This can however be misleading, this committee may only have meetings when there is a security issue in The Netherlands or these meetings are not open for public and thus are not mentioned on the website of the Dutch Parliament. The fact that all of the members are party leaders is still an indicator for the importance of this committee and thus this committee should still be indicated as an important committee.
A less important committee will be the Credentials committee, since this committee has only 4 members and none of these members are parliamentary party leaders. This committee also has only one meeting planned in the month of June. All of these variables in combination with each other are an indication for less importance of this committee. This is the same for several other committees, such as Dutch parliamentary delegation to

the OSCE, the committee on emoluments of the MPs and the Advisory Committee on housing and the buildings of the House of Representatives. These committees are, based on the variables taking into account in this analysis, of little importance for the Dutch people and thus for the Dutch House of Representatives.

5. What kind of problems arise in the information acquisition in committees?

Information acquisition costs effort and people dislike effort. This is the reason that different problems arise in the information acquisition in committees. In this partial question the problems that arise in the information acquisition will be found.

Strategic Voting

Austin-Smith and Banks (1996) proof that sincere voting is not always rational and thus may lead to the problem of strategic voting. This does not mean that none of the members will vote sincere, this only means that everyone voting sincere is not a Nash equilibrium and thus at least one of the committee members will vote insincerely. The Condorcet Jury Theorem (Condorcet, 1994) has the implication of sincere voting and that the members of the committee will vote as if they were voting alone and not voting in a committee. Austin-Smith and Banks (1996) have proven that this is not a realistic assumption and thus the Condorcet Jury Theorem does not always hold, because of the unrealistic assumptions it makes. When everyone has got a signal, the voting will take place by majority voting.

There are three sorts of voting behaviour relevant for the problem of strategic voting:

Sincere voting: Each individual selects the alternative yielding the highest pay-off, conditional on their signal;

Informative voting: Each individual selects the alternative according to their signal. So if the signal is 1, movie B is chosen and if the signal is 0, movie A is chosen;

Rational voting: Each individual votes rational and thus in the way he would vote is his vote is pivotal.

The problem of strategic voting arises because the vote of a committee member only matters when the vote is pivotal. The problem of strategic voting is thus the largest when the voting rule is unanimous and all other voters or jury members have to agree in order to convict the defendant. The problem of strategic voting can also be found by simple majority, as will be proved in the example. A vote is only pivotal when all other jury

members vote convict and this also reveals information about the defendant's guilt. Jury members may not vote according to their own information and may be overwhelmed by the other members and thus vote in accordance with their vote. (Feddersen and Pesendorfer, 1998). Strategic voting thus leads to a higher probability of wrongful convictions and wrongful acquittals in the case of jury trials, when the jury members all have to agree on the decisions to convict or to acquit, so the voting rule is unanimous. The jury members will not vote informatively and will choose the contrary of their own signal, which is strategic voting.

The probability of being pivotal is much higher when there is a non-unanimous voting rule. The chance of all members voting in the same direction, which is required for a unanimous voting rule, is much lower than the probability of a few members voting in the same direction. This leads to a higher probability of being pivotal and thus to a lower probability of the problem of strategic voting (Coughlan, 2000). Coughlan (2000) also mentions that when the basis model has the extension of declaring a mistrial, there exists a Nash Equilibrium where the jury members all vote sincerely and the votes are informative. The problem of strategic voting here is not as big as in the basic model, since there does exist an equilibrium in where the jury members all vote sincerely. This depends on the utility the jury members perceive when a mistrial is declared. When the utility of a mistrial is much lower than the utility of either convicting or acquitting the defendant, the problem of strategic voting still exists.

Coughlan (2000) also extends the basic model with the possibility of communication before the jury members will announce their votes. This can lead to an equilibrium where all the members vote sincere and thus informatively, when the utilities of the jury members are very similar. When the utilities of the jury members are similar, everyone can benefit from the honest sharing of information and thus the members will have more information and will still vote sincerely. Coughlan (2000) proofs that there can be an equilibrium in which the jury members all vote sincerely and thus the problem of strategic voting does not exist. This does not mean that the problem of strategic voting never exists, it depends on the above stated variables if and when an equilibrium exists where the members all vote sincere.

Example

The problem of strategic voting can be illustrated by using an everyday example, for which the model from Austin-Banks and Smith (1997) is used. Suppose you (D) and two of your friends (E and F), with all the same preferences, want to go to the movies. You each can read the review of movie A and movie B and based on this review you have to decide which movie is good. It is not possible that the movies are good and there is a common prior probability that movie A is good. This means that if D, E or F can choose after receiving all of the signals of them, he would only choose B if all of the signals are in favour of this movie so if:

$S_D = S_E = S_F = 1$

When movie A is good and all choose movie A, each of you and your friends will receive a pay-off of 1. When instead movie A is chosen, and movie B is good, the pay-off you will all receive is zero. In formula:

$E_u(A \mid A = good) = 1$ and $E_u(B \mid B = good) = 1$

$E_u(A \mid B = good) = 0$ and $E_u(B \mid A = good) = 0$

When movie A is good, then it is more likely that the signal you all receive is 0.
When movie B is good it is more likely that signal you all receive is 1.

$(B = good \mid S_i = 1) > 1/2$

$(A = good \mid S_i = 0) > 1/2$

You and your friends will get a signal, which will reveal the state of the world with a probability higher than 50 percent.
To show that every individual voting sincere is not an equilibrium in this case and thus strategic voting is a problem. Suppose that individual E and F vote sincere.

Situation 1

$S_E = 0$ and $S_F = 0$

This means that both E and F vote for movie A. Because of the majority voting rule, the vote of D does not matter.

Situation 2

$S_E = 1$ and $S_F = 1$

This means that both E and F vote for movie B. Because of the majority voting rule, the vote of D does not matter.

Situation 3

$S_E = 1$ and $S_F = 0$

In this case, the vote of D does matter, because it is pivotal. D would vote in favour of movie A, because of the common prior probability that movie A is the good movie.
D will always vote the way he would if his vote is pivotal, which is strategic voting. Because of the common prior probability that movie A is good, D would always vote in favour of movie A, regardless of his signal.
This means that everyone (so D, E and F) will choose for movie A (and this would be rational) and movie A will always be seen as the good movie, even when all of the signals are in favour of movie B. The problem of strategic voting has the consequence that movie B in this case would never be chosen as the good movie, regardless of the signals of everyone.

The problem of strategic voting can be solved by allowing communication before the voting stage, as Coughlan (2000) proposes. If you and your friends can communicate, the problem of strategic voting does not exist. Everyone will reveal their signal before they are voting, so communication is allowed. There are four possible situations, which will be revealed below:

Situation 1

$S_D = 0, S_E = 0$ and $S_F = 0$

Everyone will vote according to their signal and thus movie A is chosen.

Situation 2

$S_D = 1, S_E = 0$ and $S_F = 0$

Movie A will be chosen, because of the common prior probability that movie A is good and two out of three votes are in favour of movie A.

Situation 3

$S_D = 1$ $S_E = 1$ $S_F = 0$

Movie A will be chosen, because of the common prior probability that movie A is good. Every member will vote in favour of movie A.

Situation 4

$S_D = 1\ S_E = 1\ S_F = 1$

Movie B will be chosen and thus everyone will vote according to their signal.
As can be seen, by allowing communication it is possible that movie B is chosen, when all of the signals are equal to 1. This was not the case when communication was not possible and thus allowing for communication will solve the problem of strategic voting.

Free Rider Problem

Larger committees may make poorer decisions than smaller committees, due to the free rider problem (Mukhopadhaya, 2003). The free rider problem exists when committee members put less effort into acquiring information than is optimal. Committee members tend to put less effort into information acquirement, when there are other members who might search for information. They expect someone else to find the information required for making the socially optimal decision, but the question is who of the committee members will be the one searching for information and thus putting effort into information acquirement. Since people dislike effort and information acquirement is thus costly, they want to free ride on someone else's information. It is a common misunderstanding that the free rider problem exists when the committee members put less effort in information acquirement when they are in a committee than when they decide by their selves. It might be socially optimal to put less effort in acquiring information in a large committee than one would do when one is deciding alone. The free rider problem thus only exists when the information acquirement is below the social optimum and not just when committee members put less effort in information acquirement in larger committees. When the probability of making the correct decision falls, because committee members will put less effort in information acquirement, the free rider problem exists.
When the costs of paying attention are very high, the jury members may not want to put effort into paying attention in court. They may expect that other jury members will put effort into paying attention in court and thus put no effort in paying attention themselves.

Of course not paying attention at all is below the social optimum of information acquirement and thus will lead to a poorer decision on average.

Mukhopadhaya (2003) proofs that when the signal is perfect and thus one attentive juror is enough to always reach a correct verdict, a larger jury is less likely than a smaller jury to reach a correct verdict. This is because the probability of the jurors paying attention falls when the signal is perfect and thus leads to the free rider problem. One attentive juror is enough to always reach the correct verdict and thus the incentive to pay attention for the jurors falls. The problem however is that it is not clear which of the jurors shall pay attention and thus the probability of making a correct decision falls, because it is possible that none of the jurors will pay attention. It is rational to pay less attention in court, but one of the jurors should always pay attention for a high probability of making the socially optimal decision. Mukhopadhaya (2003) also proofs that the free rider problem becomes larger in larger juries than in smaller one, because in larger juries it is even less clear which of the jurors will pay attention in court than in smaller juries. As he shows the probability of making a correct decision and the probability of paying attention by one person is 1, which is higher than for any other jury size with a perfect signal. The probability of a 6-person jury paying attention is 37 percent and the probability of making the correct decision is 93.7 percent. The probability of a 12-person jury paying attention is 19 percent and the probability of making the correct decisions falls to 91.9 percent. This shows that the free rider problem is more present in larger juries or committees than in smaller juries or committees.

Mukhopadhaya (2003) also proofs that the free rider problem is present when the signal is imperfect. When the signal is imperfect, there is an uncertainty about the true state of the world. When the jury becomes larger, fewer jurors will be paying attention and the probability of making the correct decision falls. When the probability of making the correct decision falls when the jury becomes larger, the free rider problem exists. It is socially optimal for the jurors to pay more attention than what they do in equilibrium, because this will increase the probability of making the correct decision. The free rider problem is more present in larger juries than in smaller juries because the optimal number of jurors do not depend on the size of the jury. When the jury becomes larger, the gap between the optimal number of jurors and the real number of jurors becomes larger and

thus fewer jurors pay attention and the probability of making the correct decision falls. This proves that even with an imperfect signal, increasing the size of the jury can lead to poorer decisions on average. Mukhopadhaya (2003) proofs that a 12-person jury with an imperfect will on average make poorer decisions than a 6-person jury, when the signal has either 65 percent or 95 percent and the cost of paying attention are low. This proves that the free rider problem is also present in committees when the signal is imperfect and the costs of paying attention are low. The effect of aggregating more information by adding another juror to the jury will be less than the effect the free rider problem generates. This problem is more present for larger committees than for smaller committees and the free rider effect thus dominates the effect of aggregation more information.

Communication may even enhance the probability of the free rider problem. Committee members can learn from each others statements and thus the probability of committee members acquiring information will fall and the probability of making the socially optimal decision will fall (Gerling et al., 2005).

6. Conclusion

With help of the partial questions already answered, the main question of this thesis can be answered.

Main question: what is the optimal size of a committee to have the highest probability of members acquiring information?

In the partial questions discussed before it became clear that there is no straightforward answer to the question what the optimal size of a committee is. The size of a committee depends on a lot of variables.
Whether or not a committee decides depends first of all on the importance of the decision. When a decision is important, it can be optimal to use a committee for decision making. Second of all it depends on the costs of a committee, when the costs of a committee are very high, the benefits may not outweigh the costs of the committee and thus utility is not maximized by using a committee for decision making. Whether a committee is used also depends on the bias of the original decision maker, when this decision maker is very biased for or against a project, it is not optimal to use a committee. The size of a committee first of all depends on the costs of information acquirement. When these costs are very high, the probability of the members acquiring information is low, unless the benefits of making the correct decision are very high. When the costs are lower than the benefits of making the correct decision, the probability of members acquiring and searching for information rises. The precision of the signal of information acquirement also influences the size of the committee. When the signal is perfect, it is not useful to have a committee, because decision making by one person will always lead to the correct decision. When having a committee that has access to information with a perfect signal, this would enhance the free rider problem and will lead to a lower probability of the socially optimal decision. When the signal is imperfect, the precision of the signal should be larger than the costs of acquiring information. Another variable that influences the size of a committee is the pay-off of making the socially optimal decision.

When the pay-off of making a correct decision is very high, the probability of members acquiring information rises. Another important variable that influences the optimal size of the committee, or can enhance the probability of members acquiring information, is the voting rule used in committees for decision making. The voting rule can only require a large plurality when the precision of the signal is very high. When the signal is not very accurate and the voting rule requires a large plurality, this may enhance the problem of strategic voting, which can reduce the probability of making the socially optimal decision. This problem can be reduced by making it possible for the committee members to communicate before the decision is made. Communication can lead to a higher probability of the free rider problem though. Members may not acquire information in the first stage, because they can learn from each other in the communication stage. An assessment has to be made between the free rider problem and the strategic voting problem with regard to communication.

It is important to take all of the variables and the problems discussed in this thesis into account, when the original decision maker is deciding whether or not decision making will be done by a committee.

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Appendix

Table 2 – Utility (h=100)

p	*Utility Advice*	*Utility No Advice*	*Maximum Costs*	*Advice?*
-50	18,75	0	0	No
-40	21	0	0	No
-30	22,75	0	0	No
-24	23,56	0	0	No
-23	23,68	0	0,68	Yes
-20	24	0	4	Yes
-15	24,44	0	9,44	Yes
-10	24,75	0	14,75	Yes
-5	24,94	0	19,94	Yes
-2	24,99	0	22,99	Yes
-1	25	0	24	Yes
0	25	0	25	Yes
1	25	1	24	Yes
2	24,99	2	22,99	Yes
5	24,94	5	19,94	Yes
10	24,75	10	14,75	Yes
15	24,44	15	9,44	Yes
20	24	20	4	Yes
23	23,68	23	0,68	Yes
24	23,56	24	0	No
30	22,75	30	0	No
40	21	40	0	No
50	18,75	50	0	No

Graph 1 – Utility (h=100)

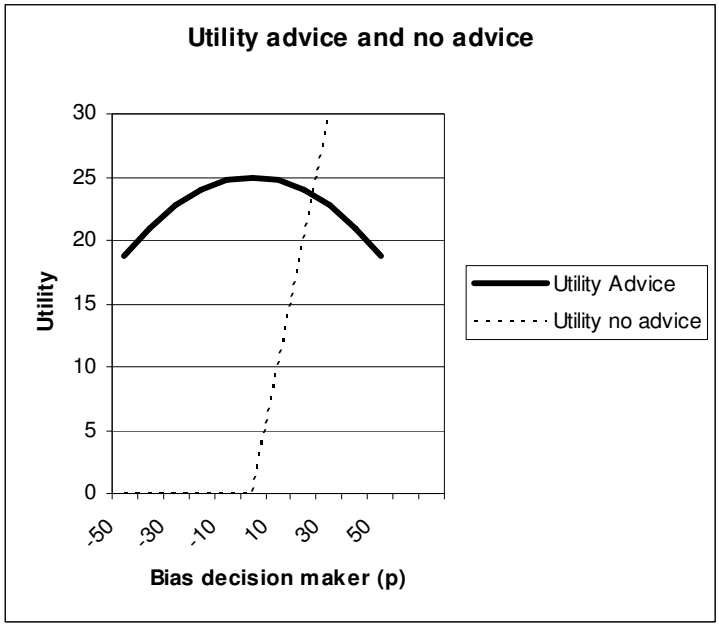

Table 3 – Committees Parliament

Committee	***Size***	***Numer of Parliamentary Party Leaders***	***Number of Meetings June 2009***
Health, Welfare and Sport	25	4	16
Transport, Public Works and Water Management	25	4	15
Foreign Affairs	25	4	15
Social Affairs and Employment	25	3	13
Education, Culture and Science	25	4	11
Justice	25	6	9
Agriculture, Nature and Food Quality	25	3	12
Spatial Planning, Housing and the Environment	25	3	12
Defence	25	4	9
Economic affairs	25	1	12
Finance	25	4	9
European Affairs	25	4	6
Netherlands Antilles and Aruban Affairs	25	4	1
Interior and Kingdom Relations	24	4	10
Public Expenditure Committee	24	3	9
Youth and Family	24	3	6
Housing, Communities and Integration	23	4	11
Contact group Germany	22	0	0
Contact group Belgium	14	1	1
Procedure Committee	11	1	1
Contact group Great-Britain	11	1	0
Intelligence and Security Services	10	10	0
Petitions committee	8	0	1
Contact group France	7	0	0
Interparliamentary committee on the Dutch Language Union	7	0	0
Art Committee	5	1	0
Dutch parliamentary delegation to the OSCE	5	0	0
Credentials committee	4	0	1
Dutch parliamentary delegation to the NATO Assembly	4	1	0
Committee on emoluments of the MPs	4	0	0
Dutch parliamentary delegation to the Council of the Western European Union	4	0	0
Committee on the review of the Act on Parliamentary Enquiries	3	0	0
Dutch parliamentary delegation to the Council of Europe	3	0	0
Dutch Group at the Interparliamentary Union	3	0	0
Advisory committee on housing and the buildings of the House of Representatives	2	0	0
Euro-Mediterranean Parliamentary Assembly	2	0	0