Collective Decisions with Spillovers

Many collective decision problems have in common that there is some agreement between the individuals who are supposed to take the decisions and that there is some disagreement. Other important features of such problems are that no monetary transfers are allowed and that participation in the decision is not voluntary. The questions I want to answer are then twofold: How does the optimal decision mechanism look like if there exist spillovers between individual preferences? Do some existing decision mechanisms replicate the optimal mechanism?

The mechanism design literature offers solutions to related problems, but none to my specific setting. If there are no spillovers and side-payments are allowed it is always possible to obtain (Bayesian) incentive-compatibility using an expected externality mechanism.[1] If informational and allocational externalities are considered but monetary transfers are allowed, the problem of efficient design has been analysed by Jehiel and Moldovanu [7] in an auction environment. However and to the best of my knowledge, if spillovers are present and monetary transfers are excluded a priori, it is not obvious if and how incentive-compatibility could be implemented.

Concerning spillover effects, the setting of the project builds an intermediate case between two frameworks widely used in the literature: On the one extreme, the literature deals with efficient aggregation of perfectly co-ordinated interests, i.e. 100% spillovers (see Piketty [9] and the references therein). On the other hand,

[1] See Mas-Collel, Whinston and Greene [8], D'Aspremont and Gèrard-Varet [3] or Arrow [1].

political outcomes under individual utility maximisation are analysed, i.e. the case of zero spillovers (see Vaubel [10] and the references therein). My research focuses on the intermediate case: what kind of political outcomes under different information aggregation mechanisms are to be expected if individual interests are correlated to a certain extend? Thus, I do not analyse political outcomes for a fixed degree of spillover effects, but instead vary the extent to which individual preferences influence each other.

Closely related to my work is a recent paper by Casella [2]. In a similar informational environment she proposes a simple voting scheme for deliberations taken by committees that meet regularly over time. At each meeting, committee members are allowed to store their vote for future use. Although the scheme cannot achieve the first best with more than two voters, making votes storable typically leads to ex ante welfare gains. This paper differs from my project in that I do not consider developments over time. Instead, I study a one-shot game excluding also any reputation effects a priori.

I propose to model the problem of collective decision taking in an environment of asymmetric information by including spillover effects[2] between individual preferences. Consider a specific class of collective decision problems where each of these has the following properties: In order to take a common decision, all agents obtain a piece of private information about their most desired policy.

[2] Spillovers are used in the sense that the own individually preferred decision of a group member does not only depend on his own private information but also on the other group members' private information.

However, no individual is perfectly informed about what the privately optimal policy would be. This imperfection is due to spillover effects between the desired policies. The information of all individuals could be used to calculate the private bliss points accounting for the fact that each individuals private information yields more information about the own bliss point then any other single individuals' information. Decision problems are characterised by one single parameter which measures the extent to which private information affects all individuals.

The final aim of this project is a description of the optimal decision mechanism dependent on the degree of spillover effects and an evaluation of existing decision mechanisms (f.e. majority decision, unanimity, etc.) if there exist spillovers. Since many collective decision problems are characterised by a correlation of individual interests, the results will be important for a wide range of decision problems. Any setting in which the individually preferred decision does not only depend on the agents' own private information but as well on the signals of the others fits well into this framework.

One important example may be the decision process in a common central bank like the ECB. Here national central banks may care about a policy that accommodates the macroeconomic shocks in the own country while taking a collective decision about the common monetary policy. However, due to demand spillover effects, shocks in one country may affect the desired policy in the other participating countries. It is then likely that national central bankers have some piece of private information about their national macroeconomic conditions. If spillovers are large,

then the other central bankers' information is very important for the own desired policy. These aspects are the more important the closer any EU-enlargement, because on this occasion a discussion about structure and organisation of the ESCB, the ECB and its council will become unavoidable to guarantee future functioning. The existing literature on decision making in this context focuses either on voting outcomes in the ECB council comparing alternative distributions of power over monetary policy decisions (f.e. Von Hagen and Süppel [11]), on the implications of different policy objectives of the common central bank (f.e. Gros and Hefeker [5] or Grüner [6]) or on equilibrium incentive contracts in a multi-principal agency framework (f.e. Dixit and Jensen [4]). Instead, I ask how the decision mechanism of the ECB (inflation as a function of announced shocks) should be designed in order to maximise the sum of (expected) utilities. Finally, my work could produce some kind of advice concerning the decision mechanism used in the ECB council. Is the current design appropriate for the degree of economic spillovers that affect the member states and will it remain appropriate after an enlargement of the Union?

Besides decision making in the ECB, the setting can for example be applied to decisions about Europe's Common Foreign and Security Policy. Basically, this policy dimension reveals similar features like the common central bank example. The nation states are interested only in their own well-being, but they have to take a common decision about a European wide policy. However, the situation in one member state is co-determined by the conditions obtaining in the neighbouring countries. It then may be the case that national governments posses private information about their national conditions. The closer the relations between countries inside the Union, the more

important becomes any piece of private information obtained in any single member state. To be more precise, take the example of a common asylum policy, i.e. a European wide decision about border security arrangements. Each national government is primarily interested in the number of asylum seekers in its own country and it may posses private information about how many additional seekers the country could tolerate before the right extreme would become too powerful. But the nationally preferred policy may as well depend on the situation in other countries of the Union due to spillovers in atmosphere and general political attitude.

Another application would be organisation design with respect to team work. Each member of the team wants to maximise his own utility (i.e. salary or reputation), but the performance of the team as a whole is evaluated. Each individual member knows his abilities, however the success of the team depends on the abilities of the other members as well. The more one individual is able to benefit from the other team members (i.e. learning effects), the more valuable become individual skills.

Thus, many collective decision problems comprise the main feature of my setting: there exist spillovers between the preferences of the individuals who are supposed to take a common decision. These individuals are privately informed about their individually preferred decision and therefore a mechanism design model seems most appropriate. Since the proposed approach is purely theoretical, no further statistical analysis is planned at the moment.

References

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