University of Toronto
Economics 336Y – Public Economics

Problem Set on Public Choice

1. (a) Summing demand curves vertically gives aggregate marginal willingness to pay (marginal rate of substitution) $W(G) = 130 - 3G$. Thus

$$130 - 3G^* = 100$$

or $G^* = 10$.

   (b) The tax price for each voter is 33.33 per hour, which exceeds the marginal willingness to pay for the first two consumers. Hence the majority voting equiibrium level of spending is zero. The problem with voting is that it does not allow voter 3 to express the intensity of his/her preference for the public good.

2. (a) The total benefit of the park is $3 \cdot 40 = 120 > 110$ so that the unique efficient choice is to build it. Building the park is a Pareto improvement if no one is worse off with building it than not, and at least one resident is better off. The government can, for example, assign a tax share of \$2.75 to each Nature-Lover (and no taxes to TV-Addicts) so that building it is a Pareto improvement. (Any tax system that raises \$110 where a Nature-lover pays no more than \$3 and TV-Addicts pay zero is a Pareto improvement.)

   (b) Since TV-addicts now get -1 is the park is built they vote against it and constitute a majority, defeating the proposal. Majority voting does not allow Nature-Lovers to express their intensity of preference (willingness to pay) for the park. Note however that the majority voting outcome is *not* Pareto inefficient: since we are now restricted to equal taxes on all residents, building it must make some residents worse off, while others are better off.

   (c) Your answer to this question depends on how you interpret the phrase "build the park if and only if it is efficient to do so". Suppose that there are n Nature-Lovers and $100 - n$ TV-Addicts. Suppose first that the planner wishes to make the decision to build the park or not to maximize social surplus, and does not care about how benefits and costs are divided among citizens. It is "efficient" to build the park in this sense if $3n \geq 110$ or $n \geq 37$ (restricting to integers). So the planner couldl announce that the costs are to be equally divided, and the park will be built if at least 37 people vote yes in a referendum. The problem with this approach is that TV-Addicts are strictly worse off (because they pay taxes) when $n \geq 37$ and the park is built. In other words, this decision rule does not make building the park a Pareto improvement.

   Suppose instead the planner wishes that building the park constitutes a Pareto improvement, but still seeks to design taxes so that voters vote honestly in the referendum. If TV-Addicts are not to be worse off when the park is built and are to vote honestly, then those voting no must pay zero taxes: and taxes on those voting yes must be at least high enough to cover the cost. But then, if a Nature-Lover believed that at least 37 other voters would vote yes, then he or she has a strict incentive to "lie" and vote no. So it is not possible to set taxes to induce truth-telling and guarantee that noone is worse off when the park is built than when it is not.

   Some students may choose to discuss Clarke–Groves taxes in more general terms, which can be designed to induce truth-telling even when there are more than two possible valuations citizens may place on the public good. The central intuition is that the decision to build should be based on the sum of reported valuations, and a citizen whose report makes the difference between building or not should have to pay a tax equal to the sum of others' reported willingness to pay for a move to the opposite social choice. (Part marks for explaining this intuitively.) Observe once again, however, that Clarke–Groves taxes cannot guarantee that no citizen is worse off when the projet is built than when it is not.

3. Mueller discusses the following factors that might have led government to grow. His arguments are divided according to views of government's primary role in the economy.
   (a) Government provides public goods:
      i. price changes: if the relative price of public goods has risen and demand is inelastic, or the price has fallen and demand is elastic, then total spending should have risen
      ii. rising incomes: public goods may be normal
      iii. changing tastes
   (b) Government redistributes income and wealth:
      i. Median voter models: as suffrage is extended to poorer people, the median voter becomes poorer. The model therefore predicts the extent of redistribution will rise.
      ii. Inequality: If inequality rises, the same model predicts a rise in redistribution.
   (c) Government is the tool of interest groups:
      i. Log-rolling: According to some, log-rolling leads to more proposals being passed than is efficient. If log-rolling has become more prevalent over time, then government would have grown.
      ii. Effectiveness of interest groups: The number of lobby groups has risen over time.
   (d) Bureaucracy controls government: If bureaucrats want larger government, they may have been more successful in controlling decision-making over time.

4. Let M be the preferred platform of the median voter, and suppose that parties L and R choose any positions $x, y \neq M$. If $x < M$, then the best response of party R is to deviate to a platform $x + \epsilon$ that is slightly closer to the median M. The argument is the same for L, and the same for platforms $x > M$. Therefore the unique fixed point is for both parties to choose M.

5. (a) Borda counts:

$$V_A = 2 + 10 + 8 = 20$$
$$V_B = 4 + 5 + 12 = 21$$
$$V_C = 6 + 15 + 4 = 25$$

   So A wins. If 2 reports $B > C > A$ then C wins which is worse. If 3 reports $C > B > A$ then B wins which is worse. No strategic voting.
   (b) Under AV, A is dropped from "first ballot" and B wins. But if 3 reports $A > C > B$ then A wins with 6 first choices over 5. Hence strategic voting is optimal.