

## 1 Question 1.

In the course we argued that a prime cause of underdevelopment is that poor countries have institutions that do not promote good economic incentives. The source of these institutions lie in politics, so in an important sense, poor countries are poor because they have governments which do not make socially desirable choices. This view is denied by Jeffrey Sachs. He has argued that African countries have surprisingly good governments, relative to what you might expect. He developed an empirical strategy for demonstrating this in his paper "Ending Africa's Poverty Trap" (download it from his web page: <http://www.earth.columbia.edu/about/director/documents/bpea0104.pdf>). The strategy is described on page 120. You take measures of governance from the World Bank and regress them on income per-capita to allow for the fact that poor countries cannot afford good governance. Then you take the residuals from this regression and say that a country has good governance if it does sufficiently better than the regressions line.

Provide a critique of this empirical strategy. Does this regression actually demonstrate that bad governance is not the cause of poverty in Africa? If not why not? If you wanted to test whether or not governance was a cause of the poverty of Africa how would you do it?

### 1.1 Answer

The strategy proposed by Sachs cannot estimate the impact of governance on development in Africa. Imagine bad governance was the cause of low income, then the regression that he runs suffers from reverse causality. African countries are poor because they have bad government, though of course the fit is not perfect. What would the residuals mean here? They would be that component of governance that does not predict income. So Sachs is emphasizing, in effect, that good governance is that component of governance that does not influence income!

Since governance is obviously endogenous, the correct way to demonstrate that governance does not have a causal effect on income is to develop an instrument for governance - a variable which determines governance which is not itself a determinant of income and to estimate a model along the lines of "Colonial Origins." Kaufman et al. at the World Bank governance project have proposed settler mortality as such an instrument but as the discussion in the lectures suggest, settler mortality is unlikely to be a good instrument to estimate the impact of governance, as opposed to many other institutions that may be correlated with governance.

## 2 Question 2.

In the class we discussed the version of the median voter model due to Downs where two political parties noncooperatively choose a policy to maximize the probability of winning. We showed that the equilibrium policy must be that preferred by the median voter. Now imagine that political parties care not just about winning but also about the policy that they choose if they win. There are two parties  $A$  and  $B$  with utility functions  $V_A(q)$  and  $V_B(q)$  and assume that the two political parties have ideal points  $q^A$  and  $q^B$ . Assume now that both parties choose policies  $q_A$  and  $q_B$  and wish to maximize expected utility. There is also a rent  $R$  from being in power. The model is otherwise the same as the one discussed in class. Parties first choose their policies, then people vote etc. We solve by backward induction as before. In particular let us emphasize initially that parties are completely committed to the policies that they choose in the first stage of the game in the sense that these cannot be deviated from once the election has taken place and the winning party takes power. The maximization problems of the parties can be written.

$$A \text{ maximizes } P(q_A, q_B) (V_A(q_A) + R) + (1 - P(q_A, q_B))V_A(q_B)$$

$$B \text{ maximizes } (1 - P(q_A, q_B)) (V_B(q_B) + R) + P(q_A, q_B)V_B(q_A)$$

1. Explain intuitively these two maximization problems.
2. Assume that  $q^A < q^M < q^B$  where  $q^M$  is the ideal point of the median voter. Here party  $A$  is to the left of the median voter while party  $B$  is to the right. Argue that even though the parties get utility from policy and prefer policies that are different from  $q^M$  the unique Nash equilibrium of the game between the parties involves both parties offering the policy  $q^M$ . To show this follow the steps in class. Work backwards and construct the function  $P(q_A, q_B)$  and then to show that both parties offer the policy  $q^M$  when they wish to maximize their utility consider if either of them could increase their utility by deviating from this policy.
3. Consider exactly the same situation as in the previous question and let us now drop the assumptions that the parties can commit to policy. If no commitment is possible what is the unique Nash equilibrium of the game?
4. Now assume that  $q^M < q^B < q^A$ . What is the unique Nash equilibrium of the political competition between party  $A$  and party  $B$ .

### 2.1 Answer

1. Let's look at A's problem. The first term  $P(q_A, q_B) (V_A(q_A) + R)$  is the probability of winning times the payoff that party A gets by winning. This is  $R$ , the rents from office, plus  $V_A(q_A)$  the utility that party A gets from adopting a policy of  $q_A$ . The second term is the probability of losing,  $1 - P(q_A, q_B)$  times the utility that A gets if it loses, which is  $V_A(q_B)$ . Note that this utility is the utility of party A from the policy chosen by party B,  $q_B$ , since this is the policy it will have to live with if B wins.

2. The construction of the function  $P(q_A, q_B)$  is the same as in the lecture notes. In essence, whichever party offers a policy which is closest to the ideal point of the median voter will win the election. If the median voter is indifferent between the parties then they each with probability=1/2, though we saw before that the precise value of this probability did not influence the nature of the equilibria.

Now moving back to the decision of the parties we can check whether or not either can make a profitable deviation from  $q^M$ . Consider first the situation in which  $q_A = q^M \neq q_B$ . Then, we have that  $P(q_A, q_B) = 1$ , and party  $A$  is winning for sure. The utility of party  $B$  is given by:  $V_B(q^M)$ . Now imagine a deviation by party  $B$  to  $q_B = q^M$ . We will have that  $P(q_A, q_B) = 1/2$ , so the utility of party  $B$  changes to  $R/2 + V_B(q^M) > V_B(q^M)$ , hence the deviation is profitable, and  $q_A = q^M \neq q_B$  cannot be an equilibrium.

Similarly, consider a situation where  $q_A \neq q^M \neq q_B$ , and suppose without loss of any generality that  $q^A > q^M > q^B$  and  $V^M(q_A) > V^M(q_B)$ , so that we again have  $P(q_A, q_B) = 1$ . It is clear that we must have  $q_A \geq q^M$ , otherwise, party  $A$  could find a policy  $q'_A$  such that  $V^M(q'_A) > V^M(q_B)$  and  $q'_A \geq q^M$  preferable to any  $q_A \in (q^M, q_B)$ . But then party  $B$  is obtaining utility  $V_B(q_A)$ , and by changing its policy to  $q_B = q^M$  it will obtain utility  $R + V_B(q^M)$  if  $q_A > q^M$  and  $R/2 + V_B(q^M)$  if  $q_A = q^M$ . By the fact that  $q_A \geq q^M$  both of these are greater than its initial utility,  $V_B(q_A)$ , hence, no policy announcements with  $q_A \neq q^M \neq q_B$  can be an equilibrium. Therefore, the equilibrium must have  $q_A = q_B = q^M$ , i.e., convergence to the median. Intuitively, the median voter's ideal point is preferable to each party relative to the other party's ideal point, and moreover increases their likelihood of coming to power. Therefore, no policy other than the median voter's ideal point can ever be implemented in equilibrium.

This result may appear strange because one might have thought that there would be a trade-off for the parties between offering a policy closer to their ideal point and reducing the probability that they win. Intuitively, this trade-off might break the convergence to the median. This does not happen however basically because the function  $P(q_A, q_B)$  is discontinuous. Because the utility function of the parties is differentiable, a small change in the policy always has a small effect on utility, but since  $P(q_A, q_B)$  is discontinuous a small change has a big effect on the probability of winning. Thus the change in probability always dominates and the parties convergence to the median.

3. The above explanation rested on the assumption that parties could commit to an arbitrary policy different from their ideal point. If they cannot the equilibrium is very simple. Voters understand that whatever the parties may promise before an election, they will choose whatever policy is optimal for them when they come to power. Thus either party will choose its ideal point and the party that wins will be the one which has an ideal point closest to the ideal point of the median voter and the policy will be the ideal point of the party. Hence when we drop the assumption of commitment we do not get convergence to the policy preferred by the median voter.

4. Next let us consider the case where  $q^B > q^A > q^M$  (other configurations

give analogous results) Now, suppose that we have  $q_A = q^A$ . What should party  $B$  do? Clearly, any policy  $q_B > q^A$  will lose the election. On the other hand,  $q_B = q^A$  will win the election with probability  $1/2$  and is preferable. But in fact party  $B$  can do better. It can set  $q_B = q^A - \varepsilon$  which is closer to the median voter's preferences, and by the fact that voters' preferences are single peaked, this is preferable to  $q^A$ , and therefore will win the election for party  $B$ . Although this policy is worse for party  $B$  than  $q^A$  (since  $q^B > q^A$ ), for  $\varepsilon$  small enough, the difference is minuscule, whereas the gain in terms of the rent from coming to power is first-order. This argument only breaks down when  $R = 0$ , and in this case, the best thing that party  $B$  can do is to offer  $q_B = q^A$  (or any other policy  $q_B > q^A$  for that matter, since it does not care about coming to power, and in either case,  $q^A$  will be the equilibrium policy).

So, interestingly in this case we do not get convergence to the median voter either. Of course you might think this situation is strange, why would you have two political parties which are both to one side of the ideal point of the median voter. Maybe we need some story about why parties have the preferences that they do. On the other hand there are many Latin American countries where the parties seem to be relatively unrepresentative of people's preferences and it seems that one could argue that the Liberals and Conservatives have both had ideal point to the right of the median voter. If this is the case this example shows that both parties may look the same, but they will both be located away from the ideal point of the median voter.