Unrecognized States: A Theory of Self-Determination and Foreign Influence
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1 3-player version, Status Quo better than Reunification

Let us consider a first case where the payoffs for the secessionists are higher in the unrecognized state ('Status Quo') than they are if they cede and rejoin the home state. This, for instance, may be the case very early after taking control of the territory before their economic situation has had a chance to deteriorate.

1.1 Players and Strategy Spaces

1. Home government (G) chooses $S_G \in \{SQ, C\}$ where SQ means 'Status Quo' of unrecognized statehood and C means 'Cede' the issue of status and recognize the secessionists as an independent state.

2. Secessionists (S) choose $S_S \in \{SQ, C\}$, same as for G except when they Cede, they rejoin the home state.

3. Patron state (P) chooses $p \in [0, \infty)$ to invest in the secessionists status quo payoffs

1.2 Timing and Information

The patron makes its investment. This investment is seen by all other players. Then the home government and secessions move simultaneously.

1.3 Payoffs

Let, for instance, (SQ, C) mean that G plays SQ and S plays C. Then

- The payoffs after (SQ, SQ) are $-p, 3, 2 + p$
- The payoffs after (SQ, C) are $-10 - p, 5, 1$
- The payoffs after (C, SQ) are $3 - p, 0, 5 + p$
- The payoffs after (C, C) are $-p, 3, 2$

1.4 Analysis

We proceed by backward induction.

- In the simultaneous game between G and S, C is dominated by SQ for player G.
  - Therefore the Nash Equilibrium (NE) of the subgame is determined by p:
    * If $2 + p \geq 1$ (i.e. $p \geq -1$), the NE is (SQ, SQ).
    * If $2 + p \leq 1$ (i.e. $p \leq -1$), the NE is (SQ, C).
    * Recall that the smallest value of p that the Patron can choose is $p = 0$.
    * Since $p \leq -1$ is not possible, (SQ, C) is not possible.
    * Therefore (SQ, SQ) will be the equilibrium.
- The Patron's decision: Since (SQ, SQ) will be the equilibrium no matter what, the Patron will get a payoff of $-p$.
  - Since the payoff is $-p$, the Patron maximizes its payoffs by choosing the smallest possible p, which is 0.

Therefore the Subgame Perfect Nash Equilibrium is $p = 0$, (SQ, SQ) regardless of the value of p.

2 3-player version, Reunification better than Status Quo

Let us now consider a case where the payoffs for the secessionists are lower in the unrecognized state ('Status Quo') than they are if they cede and rejoin the home state. We believe this will be the case a few months or years after they take control of the territory and unrecognized status has caused their economic situation to deteriorate.

2.1 Players and Strategy Spaces

Same as in Section 1.

2.2 Timing and Information

Same as in Section 1.

2.3 Payoffs

- The payoffs after (SQ, SQ) are $-p, 3, \mathbf{0} + p$
- The payoffs after (SQ, C) are $-10 - p, 5, 1$
- The payoffs after (C, SQ) are $3 - p, 0, 5 + p$
- The payoffs after (C, C) are $-p, 3, \mathbf{0}$

The only change(s) from Section 1 is that the secessionist's payoff from (SQ, SQ) has been reduced, and the payoffs from (C, C) along with it.

2.4 Analysis

We proceed by backward induction.

- In the simultaneous game between G and S, C is dominated by SQ for player G.
  - Therefore the Nash Equilibrium (NE) of the subgame is determined by p:
    * If $0 + p \geq 1$ (i.e. $p \geq 1$), the NE is (SQ, SQ).
    * If $0 + p \leq 1$ (i.e. $p \leq 1$), the NE is (SQ, C).
- The Patron's decision: if (SQ, SQ) is the equilibrium in the subgame, the Patron will get a payoff of $-p$. If (SQ, C) is the equilibrium in the subgame, the Patron will get a payoff of $-10 - p$.
  - Since (SQ, C) is the worse outcome for the Patron, the patron does not want to invest at all ($p = 0$) if (SQ, C) is going to be the outcome.
    * In this case, the Patron chooses $p = 0$ and the Patron's total payoff is -10.
  - The Patron prefers (SQ, SQ), but to make this happen the Patron must make an investment of $p \geq 1$. Because the Patron's payoff is $-p$, the Patron maximizes its payoffs in this case where it induces (SQ, SQ) by choosing the smallest p, which is $p = 1$.
    * In this case, the Patron chooses $p = 1$ and the Patron's total payoff is -1.
  - Since $-1 > -10$, the Patron will choose to invest $p = 1$.

Therefore the Subgame Perfect Nash Equilibrium is $p = 1$, and (SQ, SQ) as long as $p \geq 1$, (SQ, C) if $p \leq 1$.

- $p = 1$, (SQ, SQ) is an equilibrium outcome.
- $p = 1$, (SQ, C) is also an equilibrium outcome. You can rule this one out by specifying that the Secessionists choose SQ whenever they are indifferent.

3 4-player version, Reunification better than Status Quo

Now we look at the full version of the model including the international community, and continue to assume that the payoffs for the secessionists are lower in the unrecognized state ('Status Quo') than they are if they cede and rejoin the home state.

3.1 Players and Strategy Spaces

We add the international community:

1. Home government (G) chooses $S_G \in \{SQ, C\}$ where SQ means 'Status Quo' of unrecognized statehood and C means 'Cede' the issue of status and recognize the secessionists as an independent state.
2. Secessionists (S) choose $S_S \in \{SQ, C\}$, same as for G except when they Cede, they rejoin the home state.
3. Patron state (P) chooses $p \in [0, \infty)$ to invest in the secessionists status quo payoffs
4. **International community (C) chooses $c \in [0, \infty)$ to invest in the secessionists payoffs from rejoining the home state**

3.2 Timing and Information

The patron makes its investment. This investment is seen by all other players. **Then the international community makes its investment. This investment is seen by all other players.** Then the home government and secessions move simultaneously.

3.3 Payoffs

We add payoffs for the international community, and the international community's investment in the secessionists payoffs from ceding.

- The payoffs after (SQ, SQ) are $-p, \boldsymbol{-c}, 3, 0+p$
- The payoffs after (SQ, C) are $-10-p, \boldsymbol{5-c}, 5, 1+\boldsymbol{c}$
- The payoffs after (C, SQ) are $3-p, \boldsymbol{-7-c}, 0, 5+p$
- The payoffs after (C, C) are $-p, \boldsymbol{-c}, 3, 0+\boldsymbol{c}$

3.4 Analysis

We proceed by backward induction.

- In the simultaneous game between G and S, C is dominated by SQ for player G.
  - Therefore the Nash Equilibrium (NE) of the subgame is determined by p:
    * If $0+p \geq 1+c$ (i.e. $p \geq 1+c$), the NE is (SQ, SQ).
    * If $0+p \leq 1+c$ (i.e. $p \leq 1+c$), the NE is (SQ, C).
- Player C's decision: if (SQ, SQ) is the equilibrium in the subgame, Player C will get a payoff of $-c$. If (SQ, C) is the equilibrium in the subgame, Player C will get a payoff of $5-c$.
  - Since (SQ, SQ) is the worse outcome for Player C, Player C does not want to invest at all ($c=0$) if (SQ, SQ) is going to be the outcome.
    * In this case, the Player C chooses $c=0$ and Player C's total payoff is 0.
  - Player C prefers (SQ, C), but to make this happen Player C must make an investment of the $c \geq p-1$. Because Player C's payoff is $5-c$, Player C maximizes its payoffs in the case where (SQ, C) is the outcome by choosing the smallest c, which is $c = p-1$.
    * In this case, Player C's investment of $c = p-1$ makes its total payoff is $5-c = 5-(p-1) = 6-p$.
  - If $6-p \leq 0$ (where 0 is Player C's payoff from (SQ, SQ)), Player C will choose to invest $c = p-1$ and the outcome will be (SQ, C).
  - If $6-p > 0$ (i.e. $6 > p$), Player C will choose to invest $c=0$ and the outcome will be (SQ, SQ).
- The Patron's decision: if (SQ, SQ) is the equilibrium in the subgame, the Patron will get a payoff of $-p$. If (SQ, C) is the equilibrium in the subgame, the Patron will get a payoff of $-10-p$.

- Since (SQ, C) is the worse outcome for the Patron, the patron does not want to invest at all ($p = 0$) if (SQ, C) is going to be the outcome.
  * In this case, the Patron chooses $p = 0$ and the Patron's total payoff is -10.
- The Patron prefers (SQ, SQ), but to make this happen the Patron must make an investment of $p \geq 6$. Because the Patron's payoff is $-p$, the Patron maximizes its payoffs in this case where it induces (SQ, SQ) by choosing the smallest p that leads to (SQ, SQ), which is $p = 6$.
  * In this case, the Patron chooses $p = 6$ and the Patron's total payoff is -6.
- Since $-6 > -10$, the Patron will choose to invest $p = 6$.

Therefore the Subgame Perfect Nash Equilibrium is $p = 6$, $c = 0$ if $p \geq 6$, $c = p - 1$ if $p < 6$ and (SQ, SQ) as long as $p \geq c + 1$, (SQ, C) if $p \leq c + 1$.

- $p = 6$, $c = 0$, (SQ, SQ) is an equilibrium outcome.