Protests and Reputation

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Protests and Reputation[*]

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Abstract

Protests take place for a variety of reasons. In this paper we focus on protests that have a well defined objective, that is in conflict with the objectives of the government. Hence the success or failure of a protest movement depends crucially on how the government responds. We assume that government types are private information so that governments have an interest in building a reputation to deter protestors. We extend the standard reputation framework to one where potential protesters in the domestic jurisdiction are competing in a common market with protestors of a foreign jurisdiction, resulting in a situation where domestic governments care about the decisions of foreign governments. We derive conditions under which an equilibrium with "contagion" in protests might exist: protests that start in one jurisdiction spread to others. Finally we use our results to interpret the Fuel tax protests in France and England that took place in 2000 as well as the three successive pro-democracy revolutions in Georgia, Ukraine and Kyrgyzstan in 2003-05.

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1 Introduction

In a pluralist society, to the extent that protests are legally permitted, no government can avoid being their target. People participate in strikes, demonstrations or violent riots to express their disagreement with government policies and to try to influence policy–making. Examples of protest movements are anti-globalisation protests, animal rights protests, anti-war protests. This paper aspires to interest game theorists in the questions of protests.

Why do protests start? What triggers a protest, what causes their success or failure? Political scientists have studied such questions, addressing a number of theoretical and empirical questions, for instance: What are individuals' incentives to engage in costly political action? (Lohmann (1993) provides an insightful analysis of this issue) or why and how do political leaders respond to protest movements (DeNardo 1985)? Much of this literature distinguishes between protests that are made as a signal to the government and as a purely democratic expression from extreme examples of protests like revolutions or coups (e.g. Conley and Temimi, 2001). We focus however on the first type of protest movement.

One of the key factors influencing potential protesters' decision to take action is the probability of being successful. To assess this probability, individuals use information available to them, for example, the government's response in past movements or the level of organization among those who are dissatisfied with the status quo.[1] There is also some evidence suggesting that protesters have different thresholds of participation.[2] In this paper we focus on the key role of the government's reputation in the decision of whether to protest. To do so, although they may be of great importance, we abstract away from collective action problems between protestors as in Lohmann (1993).

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[1] See for example, Jasper (1997).

[2] See, for example, Oliver and Marwell (1985), Chong (1991) and Karklins and Petersen (1993).

We use a game–theoretic approach to analyze the state's response to protest movements and its impact on potential protesters. In particular, we use a reputation model (based on Kreps and Wilson (1982)) to explain different states' responses to protests. In this model, individuals with common preferences (hereafter protest groups) decide whether to protest to try to bias policy in their favour. The incumbent government is either 'tough' (it will never give in to protesters) or 'weak' (it is costly not to give in to protestors). Government's reputation is represented by the probability of being 'tough'. Protesters are not certain about the government's type but instead have beliefs based on common information. To capture some heterogeneity of protest groups we assume that groups are either 'moderate' or 'extremist' where a group of the latter type always protests and a group of the former type protests sometimes depending on payoffs. Protest groups' types are private information. In this context, with more than one potential protest group, a weak government may choose not to give in to protesters in order to build a reputation for being tough and thus deter other (moderate) groups from protesting.

We then extend this framework to one where protest groups also observe and use outcomes in other jurisdictions to assess their own chances of success. We formalize this idea first by using a simple reduced form model with two jurisdictions where the foreign government's actions will influence a domestic protest group's decision to protest, because the types are assumed to be positively correlated. With this model we can explain different responses to similar protest movements and the spread of protest movements across jurisdictions. Our main contribution however, is to endogenise the correlation between governments by modelling the competitive game between foreign and domestic protest groups. We show how this kind of interaction can cause protests to spread from one jurisdiction to another. We then use our theoretical results to interpret the British and French fuel tax protests in 2000 and the Orange, Rose and Tulip Revolutions that took place in 2003–2005.

The paper is organized as follows:

Section 2 discusses the related literature, Section 3 presents the basic reputation model and its results. Section 4 extends the model to analyze the case where protest groups use the outcome in other jurisdictions to assess the probability of facing a tough government in their own jurisdiction – a reduced form model with reputational externailities. We endogenise the correlation between types of governments in Section 5, and show that the conclusions are not subtantially different. In Section 6 we describe some facts of the 2000 British and French fuel tax protests and the Orange, Rose and Tulip Revolutions that motivate and can be explained by our model. Finally, Section 7 concludes.

2 Related Literature

There has been a recent surge of interest in protests. Acemoglu and Robinson have a series of papers on the extension of the franchise due to the threat of revolution (e.g. Acemoglu and Robinson (2000)and (2001)) – however the revolution itself is not modelled in these papers. Conley and Temimi (2001), on the other hand examine the incentives of unenfranchised groups to engage in political action to get the vote. However the focus is not on the micro-foundations of protest but rather the impact of the threat on the policies regarding extension of voting rights by the ruling class. The question is how the ruling class responds to threats of protest. In contrast, our paper focuses on the incentives of groups of citizens (who already have the vote) to engage in costly action in order to affect policy and the question we try to answer is how the decision to protest is affected by the reputation of governments who make policy decisions. Lohmann (1993) explains why people engage in costly political action when citizens are better informed than leaders about the state of the world. Moderate activists engage in protest to signal their information to the politicians. Her model therefore explains why people protest even in the presence of a free rider problem. Our paper abstracts

completely from the free rider problem, and instead focuses on protests by exogenously given groups and the interaction of the protestors actions and the responder's (government) actions. Baron and Diermeier (2006) consider activist NGO's and their targeting of industries or firms – their focus is on which firms get targeted by NGO's. To the best of our knowledge, there is no other paper that looks at the micro-foundations of protest movements.

3   The Model

There is incomplete information about each player's type. In our setting, the policy–maker faces potential protests by a finite series of organized groups (protest groups). Potential protesters decide to take political action based on the probability of being successful. Protest groups observe and use past actions to predict how the policy–maker will behave in the future. If a protest occurs, the policy–maker decides whether to shift policy (give in to the protesters) or maintain the status quo. That is, a policy-maker may have incentives to maintain the status quo in the short-run if doing so will make other protest groups believe that the government will never give in to protesters in the future.

Formally, there are N protests groups G_i, $i = 1, ..., N$, and one policy-maker. Each group is associated with a single policy issue (e.g. fuel–tax, education spending, hunting). In the rest of our analysis we will assume that the issues over which groups protest are the same – if they were different, then observing past actions of the policy maker would be a noisy signal of the type of policy maker – in reality the costs of giving in to protest groups vary greatly with the type of issue. But the general ideas will carry over even to the more general setting where types of protest groups are correlated.The policy–maker sequentially faces potential political action from one group at a time, starting with G_N and ending with G_1. Each group decides whether to protest (P) or not (NP) only once but observes all previous actions. If the

protest group decides not to protest, the policy–maker maintains the status quo policy; if there is a protest the policy–maker decides whether to keep the status quo (SQ) or to give in to the protesters and change the policy (CP).

We assume that the policy–maker type t may be either 'tough' (T) or 'weak' (W).[3] A tough policy–maker is always better off by maintaining the status quo. A weak policy–maker will prefer to maintain the status quo only if doing so will maintain or build a reputation for being tough. Both types of policy makers get the highest payoff when there are no protests at all. The policy–maker's type is private information.

We also assume that protest groups are of two types: moderate and extremist. A moderate group is better off by not protesting than protesting and not being successful (i.e. when the policy–maker maintains the status quo). Extremist groups are better off by protesting regardless of how they expect the policy–maker to respond (i.e. extremist groups always protest). Each group's type is private information, and each group is extremist with probability q, independent of the other protest groups.

$$
\begin{array}{c c c}
 & SQ & CP \\
P & b-c, a-\alpha_t & 1-c, 0 \\
NP & b, a & 1, 0
\end{array}
$$

Table 3 shows the game for a single stage of this game for a moderate group. That is, a moderate protest group gets a payoff of b from the status quo policy, incurs a cost of c if it protests and gets 1 if the policy–maker changes the policy. Note that if $b + c < 1$ the protest group is better off by protesting and being successful than by not protesting.[4]

At the time it decides whether to protest, a protest group is uncertain

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about the policy–maker's payoffs or, equivalently, his type. Policy–makers get a payoff of $a > 0$ from the status quo policy and 0 if they change the policy. If there is a protest and he maintains the status quo, a policy–maker of type $t \in \{W, T\}$ incurs a cost of α_t. The cost α_t is the type t policy–maker's cost of not giving in to the protesters. With this cost, we capture factors like losing votes from the members of that protest group or the fear of being shown as incompetent to other citizens, and hence losing votes. A "tough" policy maker is better at negotiating so that he can maintain the status quo without incurring a high cost in terms of votes.

Note that in the event of a protest, a weak policy–maker gets a higher payoff by changing the policy than by maintaining the status quo ($a - \alpha_W < 0$) and a tough policy–maker is better off by maintaining the status quo ($a - \alpha_T > 0$).

Below we present a perfect Bayesian equilibrium (PBE) of this game.

3.1 Reputational Equilibrium

Let p_n be the probability that group G_n, $n = 1, .., N$, assigns to the possibility that it faces a tough policy–maker. The game starts with $p_N = \gamma$. Later protest groups will update their beliefs about the policy–maker's type using their observations of previous actions. In the equilibrium, each protest group maximizes its payoff in its stage of the game, while the policy–maker maximizes the sum of his payoffs over all stages.

We now characterize an equilibrium of the game in which a reputation effect may arise.[5] In equilibrium, a tough policy–maker always maintains the status quo and a weak policy maker faced with only one protest group will always give in.

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[5]Reputation is measured by the protest groups' posterior beliefs that the policy–maker is tough.

Protest groups will always believe that a policy–maker who changes the policy is weak with probability 1. If G_n protests and the policy–maker maintains the status–quo then we assume that G_{n-1} will assign probability $p_{n-1} \geq p_n$ to the possibility that the policy–maker is tough.[6]

We solve for the two–protest–groups game to give the intuition for this equilibrium. The N–protest–groups game can be solved by induction.

Two Protest Groups

When there are two groups G_1 and G_2 that potentially protest over one policy issue there is scope for reputational effects. Let β be the conditional probability that, given it is weak, a policy–maker will maintain the status quo if G_2 protests. A solution for the two–period game is given by the following profile of actions and beliefs. The intuition for this result is presented in the Appendix.

Beliefs:

1. $p_2 = \gamma$

2. $p_1 = \gamma$ if G_2 did not protest.

3. $p_1 = 0$ if group G_2 protested and the policy maker changed the policy i.e. the policy–maker has revealed himself as weak.

4. $p_1 = \max(\left(\frac{1-b-c}{1-b}\right), p_2)$ if G_2 protested and the policy–maker did not change the policy.

Strategies of the Policy–maker:

1. A tough policy–maker always maintains the status quo.

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[6]i.e. not giving in to protesters allows to develop a reputation of being tough.

2. In the first stage a weak policy–maker's strategy is:

   (a) To maintain the status quo if $p_2 \geq \left(\frac{1-b-c}{1-b}\right)$

   (b) To maintain the status quo with probability $\frac{\left(1-\left(\frac{1-b-c}{1-b}\right)\right)\gamma}{(1-\gamma)\left(\frac{1-b-c}{1-b}\right)}$ if $p_2 < \left(\frac{1-b-c}{1-b}\right)$ and otherwise change the policy.

3. In the second stage a weak policy–maker's best strategy is to change policy if G_1 protests.

Strategies of the Protest Groups:

1. An extremist protest group always protests.

2. A moderate protest group:

   a) Do not protest if $p_n > \left(\frac{1-b-c}{1-b}\right)^n$ $n = 1, 2$

   b) Protest if $p_n < \left(\frac{1-b-c}{1-b}\right)^n$

   c) Do not protest with probability $\frac{\alpha_W - a}{a}$ if $p_n = \left(\frac{1-b-c}{1-b}\right)^n$

Proposition 1 *The above strategies and beliefs constitute a PBE equilibrium of the protest game.*

This result follows from Proposition 1 in Kreps and Wilson (1982).

3.1.1 Reputation effects

Note that the two–stage game policy–maker's strategies, as well as the protest groups' strategies, depend on the probability that each group assigns to the possibility of facing a tough policy–maker. Furthermore, if the probability of facing an extremist group is sufficiently high, a weak policy–maker will always give in when facing a protest.

If a group believes that with high probability the policy–maker is tough, the optimal strategy for the policy–maker may be to maintain the status quo (and lose out in the short-run), thus enhancing its reputation as potentially 'tough' and deterring other groups from protesting.

Below we describe the nature of the equilibrium for different possible values of γ (the initial probability that the policy–maker is tough) when there are only two protest groups ($N = 2$) and a weak policy–maker has an incentive to play tough (i.e. if $q < \frac{2a - \alpha_W}{a}$).

First, assume that $\gamma > \left(\frac{1-b-c}{1-b}\right)$. If the protest groups are moderate in both stages of the game, none of them will have an incentive to protest since the probability of facing a tough policy–maker is high (i.e. the likelihood of a successful protest is very low). Therefore, the policy–maker's expected payoff is $a(1-q) + q(a - \alpha_W) + a(1-q)$.

Second, when $\gamma < \left(\frac{1-b-c}{1-b}\right)^2$ because the policy–maker's reputation of being tough is sufficiently low both protest groups will protest. The best the policy–maker can do is randomize between his strategies to ensure his total expected payoff is 0.

Finally, if $\left(\frac{1-b-c}{1-b}\right)^2 < \gamma < \left(\frac{1-b-c}{1-b}\right)$, the policy–maker's initial reputation of being tough is high enough to deter the first group from protesting if it is moderate; it is not high enough, however, to avoid a protest from the second group. The policy–maker will maintain the status quo in the second period only if is tough.

The N-group game is solved by induction. All groups such that $\gamma \leq p_n$ $1, ..., n$ will protest in equilibrium. Hence, the number of protest groups that decide to protest depends on the initial reputation.

4   Reputational Externalities

In 2000, both the UK and French governments were faced with a series of protest movements against high fuel taxes. These protest movements started in France but quickly spread to the UK and other European countries. In the UK protesters and media declared that protests in France 'inspired' the protest movement. In another context, consider the "Rose" (Georgia, November 2003), "Orange" (Ukraine, November 2004) and "Tulip" (Kyrgyzstan, February - March, 2005) revolutions which followed each other in quick succession. Each of them was inspired by the rigging of presidential elections by corrupt regimes, and it is widely believed that they were at least in part inspired by the success of the preceding revolutions. Does our game theoretic model underpin these claims? Was the widely reported experience in France a catalyst for groups in other countries? Was the Orange Revolution (November 2004) inspired, in part, by the success of the Rose Revolution (November 2003–January 2004)? In this section, we attempt to model linkages between different policymakers to explain such phenomena, which we call *reputational externalities*.

In the previous section we assumed that protest groups only use the policy–maker's past behavior to estimate the likelihood of a successful protest. In this section we extend the basic model to a framework where there are different policy makers whose types are correlated and both of whose actions are observed by protest groups. In such a setting it is natural to expect reputational externalities between different policy makers. The model can be interpreted as one where different parties (policymakers) form governments after fixed terms and elections, governments "inherit" initial reputations and government types are correlated. We can then make predictions about when and how many protest groups decide to protest during each term. We focus on another interpretation: there are two neighbouring jurisdictions and their types are correlated. In this framework, policy makers realise that they are in a game: their actions will depend on what they anticipate will happen in

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the other jurisdiction. We show that under some conditions, "contagion", i.e. the spread of protests between different jurisdictions, can occur. Arguably, this is a very reduced form model that does not capture the reasons for the linkages between jurisdictions. Hence in the next section, we will endogenise the linkage or more appropriately, the transmission mechanism for protests. First we present the reduced form model with two jurisdictions to illustrate the linkage effect on a group's decision on whether to protest and on the policy–maker's actions when facing a protest.

4.1   The Model

Suppose that there are two jurisdictions: 'domestic' and 'foreign'[7]. Variables that apply to the foreign jurisdiction are denoted with a prime symbol. There are N' protest group in the foreign jurisdiction and N protest groups in the domestic jurisdiction.   Protest groups are assumed to be moderate. This simple setting is enough to capture reputational effects in the domestic jurisdiction of protest movements in the foreign jurisdiction.   As before, the policy–makers in both jurisdictions may be either tough or weak.   We denote the policy–makers' type by $t, t' \in \{T, W\}$. Protest groups will observe and use the outcomes in the other jurisdiction to draw an inference about the policy–maker's type in their own jurisdiction and then protest if their updated belief that the policy–maker is tough is sufficiently low.

Let G_1 and G_2 denote the domestic protest groups. From now on we will assume that there are only moderate protest groups as extremist groups do not add to the insights of the model. As before, we assume that the domestic policy–maker faces G_2 followed by G_1. Let G'_1 denote the protest group in the foreign jurisdiction.   Let us assume that G'_1 and the policy–maker in the foreign jurisdiction choose their strategies before the group G_2 makes its decision on whether to protest.   The payoffs for the policy–maker and the

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[7]See Besley and Case (1995) and Besley and Smart (2003) who model yardstick information in models of tax competition

protest group in each jurisdiction are those described for the one–stage game in Section 3. That is, the only possible difference between jurisdictions is the type of the policy–maker.

Thus, the timing of the game is as follows:

1. G_1' decides whether to protest or not. The policy–maker in the foreign jurisdiction chooses his strategy.

2. In the domestic jurisdiction, the policy–maker and protest groups observe the outcome in the foreign jurisdiction.

3. The policy–maker in the domestic jurisdiction faces sequentially G_2 and G_1.

We assume that the protesters believe that the policy–maker's types are correlated. This assumption captures linkages between the two countries – our example of the fuel tax protest is a case in point. It is plausible to assume that countries such as France and the UK are closely linked through a common market or through having similar economic environments leading to similar public finances.

Thus, assume that types are distributed according to a given joint probability distribution function (p.d.f.) of the policy–makers' type, $\Pr(t, t')$ where we assume that

$$\Pr(T, T) + \Pr(W, W) > \frac{1}{2}$$

That is, the policy–makers' types are positively correlated. We will also assume $\Pr(t, t') > 0$ for all pairs t, t'.

Example: Consider the following joint probability distribution of the policy–makers' type:

$$
\begin{aligned}
\Pr(T, T) &= \Pr(W, W) = \frac{3}{8} \\
\Pr(T, W) &= \frac{3}{16} \text{ and } \Pr(W, T) = \frac{1}{16}.
\end{aligned}
$$

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This implies that $\Pr(t = T) = \frac{9}{16}$ and $\Pr(t' = T) = \frac{7}{16}$. That is, the probability that the policy–maker in the 'domestic' jurisdiction is 'tough' is higher than the associated probability for the 'foreign' jurisdiction. Moreover, the probability that the policy–makers are of same type is bigger than the complementary probability.

We call this adapted game the protest game with linkages.

4.2   Equilibrium Strategies in the game with Linkages

The situation described above defines a game of incomplete information between the policy–maker and the protest group in each jurisdiction. The domestic protest groups observe the foreign policy–maker's response to a protest and hence, may base their decisions about protesting on their beliefs about the policy–maker's type in their jurisdiction and on the outcome in the foreign jurisdiction. Let p (p') be the probability that the policy–maker in the domestic (foreign) jurisdiction is tough. The game starts with $p = \gamma$ and $p' = \gamma'$. The groups in the domestic jurisdiction update their beliefs about the policy–maker's type from their observation of the foreign policy–maker's actions. In equilibrium, each protest group maximizes its payoff. The foreign policy–maker maximizes his payoffs in the one–stage game while his domestic counterpart maximizes the sum of his payoffs over the two stages.

Note that, in the foreign jurisdiction a tough policy–maker always maintains the status quo and when facing a protest a weak policy–maker will always change the policy. This is because there is only one protest group; hence, the reputation effect as described in Section 3.1.1 cannot occur.

We say that contagion occurs when a domestic protest group is more likely to take political action if the foreign policy–maker has given in to protesters and is less likely to protest if the foreign policy–maker has maintained the status quo policy when facing a protest movement, *ceteris paribus*.

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In the game described above, we have the following cases: (1) G_1' protests and the foreign policy–maker maintains the status quo (2) G_1' protests and the foreign policy–maker changes its policy and (3) G_1' does not protest. Note that in case 1 it is revealed that the foreign policy–maker is tough while in case 2 it is revealed that the foreign policy–maker is weak. In these cases, the domestic protest group G_1 will use the information about the foreign policy–maker to update its beliefs on its policy–maker's type. When G_1 does not have any additional information the probability of facing a tough policy–maker remains the same.

We now describe the equilibrium.

As in the previous section, let p_n be the probability that group G_n, $n = 1, 2$, assigns to the possibility that it faces a tough policy–maker. The game starts with $p_2 = \gamma$. A solution for the game is given by the following profile of actions and beliefs:

Beliefs:

1. $p' = \gamma'$

2. $p_2 = \gamma$ if G_1' did not protest.

3. $p_2 = \frac{\Pr(T,T)}{\Pr(W,T)+\Pr(T,T)}$ if G_1' protested and the foreign policy–maker maintained the status quo.

4. $p_2 = \frac{\Pr(T,W)}{\Pr(W,W)+\Pr(T,W)}$ if G_1' protested and the foreign policy–maker changed the policy.

5. $p_1 = 0$ if G_2 protested and the policy–maker changed the policy.

6. $p_1 = \max((\frac{1-b-c}{1-b}), p_2)$ if G_2 protested and the policy–maker maintained the status quo policy.

Strategies of the Policy–makers:

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1. A tough policy–maker always maintains the status quo.

2. A weak foreign policy–maker always changes the policy when facing a protest.

3. In the first stage a weak domestic policy–maker's strategy is:

    (a) To maintain the status quo if $p_2 \geq \left(\frac{1-b-c}{1-b}\right)$

    (b) If $p_2 < \left(\frac{1-b-c}{1-b}\right)$ to maintain the status quo with probability $\frac{\left(1-\left(\frac{1-b-c}{1-b}\right)\right)p_2}{(1-p_2)\left(\frac{1-b-c}{1-b}\right)}$ and otherwise change the policy.

4. In the second stage a weak domestic policy–maker's best strategy is to change the policy.

   Strategies of the Protest Groups:

1. Do not protest if $p_n \ (p') > \left(\frac{1-b-c}{1-b}\right)^n \ n = 1, 2.$

2. Protest if $p_n \ (p') < \left(\frac{1-b-c}{1-b}\right)^n .$

3. Do not protest with probability $\frac{\alpha_W - a}{a}$ if $p_n \ (p') = \left(\frac{1-b-c}{1-b}\right)^n .$

Proposition 2 *The above strategies and beliefs constitute a Perfect Bayesian Equilibrium of the protest game with linkages.*

The proof of this result is in the appendix.

To illustrate the impact of linkages or yardstick comparisons on the protest group equilibrium decisions we confine our attention to three possible scenarios for the probability distribution function of the beliefs.

First, a domestic policy–maker with a high reputation for being tough may nevertheless face a protest if the foreign policy–maker gives in to protesters. More precisely, let $\gamma' < \left(\frac{1-b-c}{1-b}\right) < \gamma$ and $\Pr(T, W) < \left(\frac{1-b-c}{1-b}\right)^2 (1 - \gamma')$. In this case, when the foreign policy–maker has a poor reputation for being

tough, the protest group's optimal strategy is to protest. While, in the absence of comparisons among jurisdictions, the domestic policy–maker has a reputation for being tough enough to deter potential protest groups from protesting, yardstick competition may change this situation. To see this, assume that the foreign policy–maker is weak: hence, in equilibrium, the foreign protest group protests and the policy–maker gives in to its demands (changes the policy). The domestic protest groups observe the outcome in the foreign jurisdiction and update their beliefs about their own policy–maker and lower their assessment of the probability of facing a tough policy–maker. Moreover, if the probability that the policy–makers are different types is sufficiently low, the equilibrium has the domestic policy–maker facing protests in the first stage with probability 1 and in the second stage with positive probability. That is, a foreign policy–maker that gives in to their protest groups may inflict an externality on the domestic policy–maker's reputation and increase the expected utility from protesting in the domestic jurisdiction.

Second, a domestic policy–maker with a low reputation of being tough may not face a protest if it is revealed that the foreign policy–maker is tough. Assume, that $\gamma, \gamma' < \left(\frac{1-b-c}{1-b}\right)^2$ and $\Pr(T,T) > (\frac{1-b-c}{1-b})^2 \gamma'$. Analogously to the case above, in the absence of yardstick comparisons, both policy–makers have a poor reputation of being tough and in equilibrium, both will face protests in the first stage. Now, assume that the foreign policy–maker is actually tough, so that in equilibrium, he will maintain the status quo when facing a protest. Then in the protest game with linkages, the domestic group updates their beliefs such that it assigns a higher probability to the possibility of facing a tough policy–maker. Thus, when the probability that the policy–makers are of the same type is sufficiently high, the domestic protest group does not protest. That is, a foreign policy–maker that does not give in to protesters' demands may affect the domestic protest groups' beliefs such that they will be better off by not protesting.

Third, a domestic protest group does not have an informational advantage from the prior belief that the policy–maker' types are correlated. In

circumstances when the foreign policy–maker has a sufficiently high reputation of being tough ($\gamma' > \frac{1-b-c}{1-b}$) the protest group's optimal strategy is not to protest. Therefore, the domestic protest group will not have any new information about the policy–maker in its jurisdiction, hence, its strategies would be the same as when it is not possible to observe the outcomes in other jurisdictions.

5 Endogenous Correlation

In this section we describe the transmission mechanism of protests. Suppose that the protest groups in the two jurisdictions are affected not just by the actions of the domestic policymaker, but also the foreign policymaker. For example, French and British farmers (who protested in both countries against higher fuel taxes) are competing in the same product market so that if the French government gives in, French farmers are better off in the competition and this imposes an extra pressure on the British government. The pressure comes e.g. from the different payoffs from protesting after the foreign government has already given in to protestors. There is also a higher pressure on the British government that comes from the higher implicit probability of losing the votes of protestors in the next election. We model this interdependence between jurisdictions in the simplest possible way: we modify the payoffs of the players so that they depend on the *profile* of actions: one for each player. The following table summarizes this modification when there is one protest group in each jurisdiction: the columns represent actions of the foreign jurisdiction while the rows represent the actions of the domestic jurisdiction: the first coordinate denotes the domestic protest group payoffs, the second co-ordinate represents the payoffs of the foreign protest group and the last two co-ordinates denote payoffs of the domestic and foreign governments respectively. Let $z > 1$, $y < b$ and $\alpha'_t > \alpha_t$.

Suppose both groups protest:

$$
\begin{array}{c|cc}
 & SQ & CP \\
\hline
SQ & b-c, b-c, a-\alpha_t, a-\alpha_t & y-c, z-c, a-\alpha'_t, 0 \\
CP & z-c, y-c, 0, a-\alpha'_t & 1, 1, 0, 0
\end{array}
$$

Suppose only one group protests, in the foreign jurisdiction, then the domestic jurisdiction maintains the status quo for sure:

$$
\begin{array}{c|cc}
 & SQ & CP \\
\hline
SQ & b, b-c, a, a-\alpha_t & y, z-c, a, 0
\end{array}
$$

In case the protest group in the domestic jurisdiction protests, then the payoffs should be permuted.

What we capture with these payoffs is the competitive game between the protest groups in the two jurisdictions – Suppose both groups protest: then if the foreign policymaker gives in while the domestic one does not, the foreign protest group is better off compared to the situation where there were no linkages between protest groups: $z-c > 1-c$. The domestic protest group is worse off since $y-c < b-c$. Moreover if the foreign policymaker gives in while the domestic one does not, then the pressure on the domestic policymaker to give in increases– this is captured by an increase in the cost of maintaining status quo $\alpha'_t > \alpha_t$.

The rest of the model is as before. Let us analyse the equilibrium with two groups in each jurisdiction, with the timing of the game being that first G'_2 decides to protest or not, then G_2, and then G'_1 followed by G_1. Denote the probability that the group G_1 protests by q. It is easy to see that the equilibrium is the same as the case with no linkages except for the values of the parameters: the strategies and beliefs that support the perfect bayesian equilibrium (Proposition 1) are the same but now the threshold for G_1 is $\frac{z-y-c}{z-y} > \frac{1-b-c}{1-b}$, and for G_2 it is $(\frac{z-y-c}{z-y})^2$. The probability of the weak

type maintaining the status quo if G_2 protests is now lower than before: $\beta = \frac{\left(1-\left(\frac{z-y-c}{z-y}\right)\right)p_2}{(1-p_2)\left(\frac{z-y-c}{z-y}\right)}$ and the probability that G_1 enters if the policymaker maintains status quo given that G_2 entered is now lower: $q = \frac{2a-\alpha'_W}{a}$. We say that an equilibrium is with "contagion", if in the absence of linkages, the probability of protest is lower and the probability that the weak policymaker caves in is lower than in the presence of linkages. This is also an equilibrium with reputational externalities.

Proposition 3 *Let* $(\frac{1-b-c}{b-c})^2 < \gamma < (\frac{z-y-c}{z-y})^2$. *Assume that the foreign juris-diction has been revealed to be weak. Then there exists an equilibrium with "contagion" : G_2 protests for sure in the domestic jurisdiction, G_1 protests with probability* $q = \frac{2a-\alpha'_W}{a}$ *and the domestic policymaker maintains status quo with probability* $\beta = \frac{\left(1-\left(\frac{z-y-c}{z-y}\right)\right)p_2}{(1-p_2)\left(\frac{z-y-c}{z-y}\right)}$.

The strategies and beliefs in the domestic jurisdiction that support this equilibrium are given in the Appendix (basically repeating Proposition 1 with different parameters).

In the absence of linkages between jurisdictions, the domestic jurisdiction has a high enough initial reputation $(\gamma > \frac{1-b-c}{b-c})^2)$ that it would not face any protest, but when there is a linkage, there is a contagion effect.

There may be a concern that the modelling approach with sequential protests in different jurisdictions leads to this result, but with this model even if protests are simultaneous, we conjecture that the results do not change.

What happens when there are many jurisdictions connected to each other through a common market (as in the EU for example)? Is there a domino effect of one country giving in, leading to others doing the same? Or does the existence of some tough policymakers break the spread?

To model this situation, let us assume for simplicity that given the actions of the m respective governments, protestors are playing a Cournot game (e.g.

farmers in the European common market, where the policy decision concerns the price of an input commodity like petrol). Let P denote the price of the final product. Let Q denote the total quantity of the product in the market, while Q_{-i} denotes the total quantity excluding group i's quantity. With linear demand functions: $P = \alpha - \mu Q$, and constant (heterogeneous) marginal costs C_i, the equilibrium quantity of group i, q_i^* is:

$$q_i^* = \frac{1}{m+1}\frac{1}{\mu}\left(\alpha + C_{-i} - mC_i\right) \tag{1}$$

where $C_{-i} = \sum_{j \neq i} C_j$.

and the value function for firm i is given by:

$$\pi_i^* = (\alpha - \mu Q^* - C_i)q_i^* \tag{2}$$

where

$$Q^* = \frac{1}{m+1}\frac{1}{\mu}\left[m\alpha - \sum_i C_i\right] \tag{3}$$

Thus the profits of group i are affected by the number of other groups in the market as well as the profile of costs. Now, consider the case when $m' < m$ policymakers have changed the policy in response to a previous protest and hence have been revealed to be weak. Let us assume there are only two possible cost levels, the high cost C_h and the low cost C_l. If a policymaker does change policy then the corresponding group faces a low cost, while if it maintains status quo it faces the high cost. Let m_i' denote the number of jurisdictions that have been revealed to be weak before the protest groups in jurisdiction i get to move. Consider the payoffs of the starting protest group in i: These are given by $\pi_i^*(m_i') - c$ where $\pi_i^*(m_i')$ denotes the profits given that m_i' policymakers have given in (c as before is the cost of protest). If the ith policy maker gives in as well then profits are higher at $\pi_i^*(m_i' + i) - c$, where $\pi_i^*(m_i' + i)$ denotes profits when, abusing notation, $m_i' + i$ countries have given in.

Consider, for simplicity, two protest groups in each country, denoted by G_{2j}, G_{1j} and assume that the time sequence is $G_{21}, G_{22}, ..., G_{2m}$ followed by

$G_{11}, G_{12}, ..., G_{1m}$. Obviously if there is a tough policymaker he will maintain the status quo, but suppose that $\tilde{m}$ policymakers are weak and suppose that m'_i policymakers have given in to protestors. In this case, if the ith government is also weak, it plays a mixed strategy where the probability of maintaining the status quo is $\beta = \frac{(1-x)\gamma}{(1-\gamma)x}$ where $x = \frac{(\pi_i^*(m'_i+i)-\pi_i^*(m'_i))-c}{\pi_i^*(m'_i+i)-\pi_i^*(m'_i)}$ and represents the updated probability that the policymaker is tough in the mixed equilibrium.

What happens therefore in equilibrium when $m' < m$ jurisdictions have (ex-post) changed policy and been revealed to be weak? Is there a domino effect of one jurisdiction giving in? We show that, contrary to intuition, the probability that a weak policymaker in jurisdiction i maintains the status quo in equilibrium (β) is an *increasing* function of m'. The more jurisdictions that are revealed to be weak the lower the incentives for protestors to protest, and the higher is the probability that the status quo would be maintained by a weak policy maker. We show this in the next proposition. Note that we always assume that the initial reputation is low enough for jurisdictions $1, ... m', i$ so that the second group always enters and the policymaker plays a mixed strategy. We need the following lemma first, to analyse this problem:

For the purposes of the lemma we will fix the jurisdiction i so that $m'_i = m'$. This is done to ease notation. Denote $D(m') = \pi_i^*(m'+i) - \pi_i^*(m')$.

Lemma 4 $D(m')$ *is decreasing as* m' *increases, i.e.* $\frac{\partial D(m')}{\partial m'} < 0$.

The proof of this lemma is in the Appendix.

Now we state the proposition, using the subscript i to refer to the jurisdiction that gets to move first after observing $\tilde{m}$ protest groups protesting and $m'_i < \tilde{m}$ of the policymakers giving in (as a realisation of their mixed strategies) to their domestic protest groups. Recall that $\beta = \frac{(1-x(m'_i))\gamma}{(1-\gamma)x(m'_i)}$ where $x(m'_i) = \frac{(\pi_i^*(m'_i+i)-\pi_i^*(m'_i))-c}{\pi_i^*(m'_i+i)-\pi_i^*(m'_i)}$.

Proposition 5 *Suppose that* $\tilde{m} > m'_j$ *jurisdictions have* $\gamma_i < (x(m'_j))^2$, *and*

at least m'_j of these are weak and change the policy (ex-post). There exists an equilibrium where protest groups G_{2j} enter for all $i = 1, ..., m'_j, ..., \tilde{m}$ and the probability of the weak policymaker maintaining the status quo in j is given by $\beta_j = \frac{(1-x(m'_j))\gamma}{(1-\gamma)x(m'_j)}$. Moreover as m'_j increases, β_j increases.

The proof is obvious, since β_j is decreasing in $x(m'_j)$ and $x(m'_j)$ is increasing in $D(m'_j)$ so that β_j is increasing in m'_j. The intuition behind this result is that in this model as the number of jurisdictions that give in increases, the gain from protesting goes to zero. This means that the threshold for the second group (G_{1j}) to protest is decreasing as m'_j increases. This makes it more worthwhile for the weak policymaker to build a reputation to deter protests!

Hence in this stylized model of competition we do *not* see the domino effect. The crucial factor is how $D(m'_j)$ changes in response to m'_j. If e.g. $D(m'_j)$ is increasing as m'_j increases, the results would support the domino theory.

6   Description of Events

6.1   The British and French Fuel Tax protests

In 2000 Europe faced a dramatic rise in fuel prices. In the UK, for example, between January 1999 and July 2000, due to a combination of high taxes[8] and rising oil prices, the price of a litre of unleaded petrol rose from 62.9 pence to 84.7 pence. In France, over the same period, fuel prices tripled. These price increases resulted in a series of protests calling for cuts in taxes. The wave of demonstrations started the last days of August 2000 in France and spread across other countries including the UK.

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[8]UK and France have the highest and the second highest fuel taxes in the European Union, respectively.

To protest against high fuel prices, French fishermen blockaded important ports for three days, demanding that the fuel price for fishermen be cut from 2.10 to 1.20 French francs per litre. Only when the government announced a compensation package equivalent to a fuel price for the fishermen (already untaxed) of no more than 1.30 French francs were the blockades lifted.[9]

On the 1st of September, one day after fishermen ended their blockades, French farmers, hauliers and taxi drivers called for a cut in taxes equivalent to a 20 percent cut in the tax on (diesel) fuel, blockaded roads. On the same day the French Prime Minister declared 'We have resolved the conflict with the fishermen.Now we will try....to provide answers to the industries affected like farmers and road hauliers'.[10]

French truck drivers, farmers and taxi drivers blockaded roads, oil refineries and depots around France for ten days. After a few attempts to persuade protesters to end the blockades[11] the conflict was resolved when the government agreed to a 15 per cent cut in fuel tax.

After the successful wave of demonstrations in France, UK farmers and hauliers decided to make their own calls for cuts in taxes.[12] On the 7th of

[9] "French ferry blockade lifted", *CNN.com, 31* August 2000. Available from http://www.cnn.com/2000/WORLD/europe/08/31/transport.france.03/index.html. Accessed 4 September 2002.

[10] "New French protests over fuel prices", *CNN.com, 1* September 2000. Available from http://www.cnn.com/2000/WORLD/europe/09/01/france.protest02.reut/. Accessed 4 September 2002.

[11] During this period the government made two offers, one of a 10 percent tax-cut on the fuel and another of a tax-cut between 10 and 15 percent. Both offers were rejected (see "French blockade hits fuel supplies" , *CNN.com,6* September 2000. Available from http://www.cnn.com/2000/WORLD/europe/09/05/france.blockade02.reut/. Accessed 4 September 2002. And, "French hauliers reject fuel deal" , *CNN.com, 6* September 2000. Available from http://www.cnn.com/2000/WORLD/europe/09/06/france.fuel02/index.html. Accessed 4 September 2002.

[12] "Fuel protests widen across Britain", *CNN.com, 10* September 2000. Available from http://www.cnn.com/2000/WORLD/europe/09/10/britain.petrol/index.html. Accessed

September a group of hauliers and farmers blockaded a refinery in Cheshire, demanding an immediate cut in the fuel tax.[13] In the following days the protests spread around the country. Blockades at refineries caused shortages at petrol stations, generating panic–buying among motorists, which exacerbated the shortages.[14] After six days of protests more that 90% of the stations were running dry.[15]

During the first week of the protests the government emphatically declared that the policy in petrol would not change immediately as a response of the protests. On the 11th of September the Prime Minister declared, 'We fully understand and share the concern of business and motorists about the high fuel prices, but first we cannot and we will not alter government policy on petrol through blockades and pickets'.[16]

After few days of blockades the crisis deepened; the few distributions tanks leaving the refineries were to supply petrol to emergency services. By then the British government had changed the tone of its declarations. The Prime Minister appealed to the campaigners to end with the blockades by declaring, 'Real damage is being done to real people. There is a real danger now for the National Health Service and other essential services'.[17]

Eight days after their first protests, most British protesters called off

4 September 2002.

[13]Parker, A and Wendland, A. "Downing Street rules out cut in fuel duty, oil prices reach 10-high" *Financial Times*, 8 September 2000. p3, London ed.

[14]"UK fuel shortages worsen" *BBC News Online, 11* September 200. Available from http://news.bbc.co.uk/1/hi/uk/919429.stm. Accessed 22 May 2002.

[15]"Countdown to crisis: Eight days that shook Britain" *BBC News Online, 14* September 200. Available from http://news.bbc.co.uk/1/hi/uk/924574.stm. Accessed 22 May 2002.

[16]Guthrie, J., Nicholson, M. and Solman, P. "Oil groups warn petrol stations set to run dry" *Financial Times*, 12 September 2000. p1, London ed.

[17]Atkins, R., et. al. "Blair admits crisis as Army tankers move in: NHS on "red alert" as supermarkets ration food supplies" *Financial Times*, 14 September 2000. p1, London ed.

their blockades with their demands unfulfilled but before public mood turned against them. At this point the protestors gave the government a deadline of 60 days to take action against the high fuel prices.[18] The government, however, insisted that it would not give in to the protesters. The Chancellor of the Exchequer declared in an interview, 'We are not going to make decisions on the basis of deadlines such as this'.[19]

In the following days the government started meeting with groups representing the protesters and at the same time started working on measures to secure future supplies of petrol. During the week after the blockades ended the main opposition party offered a cut in the price of petrol by 3p a litre if it won the next election.[20]

On the 8th of November, 5 days before the protesters' 60 day deadline, in his Pre–budget Statement the Chancellor of the Exchequer announced that duty rates on all fuels would be frozen until April 2002. It also announced a reduction for the ultra–low sulphur petrol (ULSP) of 3p a litre,[21] a corresponding cut in the duty rate for the ultra–low sulphur diesel (ULSD) and a 2p cut to unleaded petrol until the ULSP was available nationwide.[22] This reduction on the price of fuel matched the proposed change offered by the main opposition party.

In addition, the government also announced a series of measures to help both the farming sector and the haulage industry.[23] In his Budget speech

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[18] Adams, C. et.al. "Crisis eases for wounded Blair" *Financial Times*, 15 September 2000. p1, London ed.

[19] "Appeals for calm on fuel panic" *BBC News Online, 19* September 200. Available from http://news.bbc.co.uk/1/hi/uk/932829.stm. Accessed 22 May 2002.

[20] Adams, C. et.al. "Tory plan to cut petrol tax adds to government unease" *Financial Times*, 21 September 2000. p2, London ed1.

[21] Only two weeks after blockades were called off the government introduced a 1p cut in the ULSP, this cut was announced in the Budget report on March 2000. By the deadline it announced a further cut of 2p in the Pre-Budget report.

[22] House of Commons debates (2000, November 8 cc 321-322).

[23] The announcements were: road tax to be scrapped for tractors, cheaper driving li-

on 7 March 2001 the Chancellor confirmed the reductions in the fuel tax and the other measures as announced in his Pre–budget statement. Farmers, haulage and motorist organizations, however, criticized the measures as being insufficient.[24] Nevertheless, this was the end of the matter in the UK.

In the forthcoming analysis we provide a game–theoretic explanation of the series of events. We focus on the interaction between the policy–maker and the protesters with respect to the latter's decision about protesting and the policy–maker's response to a protest. We show that, under certain circumstances, policy–makers have the incentives to not give in to a protest group if doing so will deter other organized groups from protesting.

6.2 Pro-Democracy Revolutions in Georgia, Ukraine and Kyrgyzstan

6.2.1 Rose Revolution

In November 2003 mass demonstrations took place in Georgia against the results of a parliamentary election. Protesters demanded the resignation of Eduard Shevardnadze who had ruled the country for 11 years and whose government was associated with Georgia's pervasive corruption and poor economic performance.

When the election commission declared Shevardnadze's party as the winner, Georgia's elections on November 2, 2003 were widely seen by voters and international observers as fraudulent . The main opposition leader Mikheil Saakashvilli contested the result and urged supporters to engage in non-violent protests against the government. The government's answer to the

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cences for those with 1500cc vehicles and the introduction of a new tax for foreign lorry drivers for using British roads (House of Commons debates, 2000, November 8 cc 322-323).

[24]Taylor, A. "Mixed response to fuel duty cuts" *Financial Times*, 8 March 2000. p13, London ed.

protests was the deployment of hundreds of soldiers on Georgia's capital, Tbilisi.

After two weeks of widely spread protests against the new government, protesters led by Mikheil Saakashvilli seized the parliament where the president Shevardnadze was giving a speech. Next day, after a meeting with opposition leaders, Eduard Shevardnadze resigned.

In the aftermath of Shevardnadze's resignation the Supreme Court annulled the results of the November 2 elections and the interim government called for new elections. The main opposition parties named Mikheil Saakashvilli as their candidate who won the January 4, 2004 elections with an overwhelming majority[25].

6.2.2 Orange Revolution

One year after Georgia's rose revolution, a series of protests were held in Ukraine in response to official election results that declared the incumbent Viktor Yanukovych as the winner of the presidential vote. Opposition supporters took the streets of the capital Kiev to demand Viktor Yushchenko be recognized as the winner.

The official results of the run-off vote of November 21, 2004 between the Prime Minister Viktor Yushchenko and Viktor Yanukovych were seen by international and domestic observers as well as by voters as the result of a massive electoral fraud. Viktor Yushchenko called on his supporters to protest against the election's outcome. Massive peaceful protests started in the capital Kiev and spread across the country. On the 25th of November Yushchenko filed an appeal with the Supreme Court, which agreed to delay certification of results. After six days of non-stop protests parliament

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[25]Sources: http://www.cnn.com/2004/WORLD/europe/01/04/georgia.election/index.html
http://news.bbc.co.uk/go/pr/fr/-/2/hi/europe/4532539.stm
http://www.guardian.co.uk/georgia/story/0,,1093303,00.html

declared the election invalid and recommended a re-run.

At the same time, the government organized a series of events intended to show public support to the incumbent Viktor Yanukovych. However, the supporters of Yanukovych were outnumbered by the crowds supporting the opposition leader. On the 3rd of December the Supreme Court declared the run-off vote invalid and ordered a repeat of the election. On the 26th of December new elections were held and Viktor Yushchenko was declared the winner[26].

6.2.3 Tulip Revolution

As in the November 2003 election in Georgia and the one year later election in Ukraine, the March 2005 parliamentary election in Kyrgyzstan was followed by a series of protests that led to the overthrow of the newly re-elected president Askar Akayev who was associated with a corrupt and authoritarian government.

On the 13th of March elections were held in Kyrgyzstan and a few days later a series of protests started, that included the occupation of public offices, in Kyrgyzstan's second largest city, Osh. The protest in Kyrgyzstan prompted the international press to draw similarities with democratic revolutions in Georgia and Ukraine. On the 24th of March, protests spread to the capital, Bishkek where, after a violent clash between protesters and the police, protesters occupied the main government offices. The same day the president Askar Akayev fled the country to Moscow.

After several days of political unrest and violent incidents, on the 2nd of

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[26]Sources: "The Orange Revolution: Why Russia, the U.S. and Europe care so much about Ukraine's disputed presidential election", Time.com 28 November 2004. Available from http://www.time.com/time/europe/html/041206/story.html. Accessed 12 June 2006. "Victory in sight for the orange revolution", guardian.co.uk 4 December 2004. Available from http://www.guardian.co.uk/ukraine/story/0,,1366406,00.html. Accessed 12 June 2006.

April 2004, president Akayev agreed to resign and on the 25th of July new elections were held.[27]

6.3   Reputation and Protests

The salient facts that emerge from the description of events in Section (6) are: In 2000, in the face of protests from fishermen, farmers and road hauliers, the French government government offered a cut in the tax to both groups. The protests then spread to Britain. However, while the French government gave in very quickly, the British government was slower to respond and tried to signal that it would not give in to threats. In 2005, European governments tried to make a coalition of finance ministers against fuel tax protestors but this has already failed since both France and Poland announced that they would cut fuel taxes (Economist.com, 13/09/05, "Global Agenda"). Most governments have budget deficits, yet protests have been successful – the threat of a protest has already met with a response from most governments. In line with our model, if one or two countries give in to protestors (maybe because of asymmetries – protest groups are much more important as voters in some countries than others), then the pressure on others to give in increases.

Asymmetries between European countries might also explain why protests started first in France – the initial reputation that the French government started with may have been lower than that of other countries. However, concessions by the French government were followed by the spread of protests to the UK, Belgium, Germany, Spain and the Netherlands. In Germany, protests from lorry drivers and farmers led the government to pledge mea-

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[27]Sources:"Kyrgyz opposition seizes power", CNN.com, 25, March 2005. Available from http://edition.cnn.com/2005/WORLD/asiapcf/03/24/kyrgyzstan/index.html. Accessed 12 June 2006. "Akayev era over in Kyrgyzstan", CNN.com, 11, April 2005. Available from http://edition.cnn.com/2005/WORLD/asiapcf/04/11/kyrgyzstan/index.html. Accessed 12 June 2006.

sures to reduce the burden of fuel costs on pensioners, commuters and those on low incomes. In the Netherlands, hauliers blockaded major motorways until the government agreed to financial compensation to bus, taxi and trucking companies. In Belgium, taxi, lorry and bus drivers blockaded oil refineries, oil depots, ports and major roads. The protests ended when the government offered a compensation package to haulier's unions. In Spain, transport workers and farmers obstructed roads and border crossings and in response the government offered a compensation package to farmers and fishermen to reduce the burden of high fuel costs (CNN.com, "Europe's Fuel Crisis", Specials 2000). The fuel tax protests in Europe seem to suggest that there is a domino effect which our simple model with linear demand does not capture.

Our other illustration of reputational externalities shows the spread of largely peaceful protests from Georgia to Ukraine and Kyrgyzstan. There are reasons to believe that it was not a coincidence and that the success in one country was a salient signal of the type of government in the other countries: the protests were on the same issues in all three countries (rigging of elections), the overthrown leaders were identified with the former Soviet-era. They were also backed by Russia's government. The three countries are similar in levels of education among citizens, media attention, the "degree of democracy", use of army etc.

Obviously, as with any stylized model, we have left out many important factors in protest movements: the role of coordination between the members of a protest group has been ignored, as also the incentives to form protest groups in the first place. We did not explicitly model the costs to giving in vs the costs to maintaining the status quo. This is an important aspect: Indeed there may be links between protest groups within a country in the sense that if the budget is affected adversely by giving in to one group, the policymaker can credibly commit to *not* giving in to others.

Finally, given that all jurisdictions have a collective common interest in preventing protests, can they collude on maintaining the status quo? More-

over protestors could coordinate their protests as well. Coalition formation is an important aspect that we leave for future work.

7 Concluding Remarks

In spite of the fact that protest movements may have profound implications for political and economic outcomes, there are few, if any, game-theoretic models treating protest movements. This paper presented a model wherein potential protesters make decisions based on their beliefs about the probability of facing a policy–maker that never gives in to protesters. Protesters' beliefs depend on policy–maker's response in past movements. One solution of our model indicates that policy–maker has, under certain circumstances, an incentive to not give in to protesters in order to avoid facing protests in the future.

We extended the previous framework to one where protesters use the outcomes in other jurisdictions to assess the type of the policy–maker in their jurisdiction. We showed that foreign policy–maker's actions may inflict externalities on the domestic policy–maker's reputation and, hence, influence potential protesters' decisions. To some extent, this model explains why, after the success of the protests in France, protest groups in Britain started their movement. It may also explain why the Rose, Orange and Tulip Revolutions happened so quickly one after the other.

The model presented here is quite stylized. However, it addresses several key issues in a protest movement, for example, the protesters' assessment of their chances of success, the heterogeneity of governments and the strategic interaction between protesters and governments. Clearly, there are several issues that this model has not addressed. The model here considers two extreme types of policy–maker, tough and weak. A tough policy–maker does not have any incentive to change the policy when facing a protest. Future research could consider the policy–maker's type to be anything between these

two extremes.

Another important consideration is the role of other players in the political arena. For example, when the policy–makers' main motivation is to hold office, they will try to maximize their chances of being re–elected. Thus, it should be the case that policy–makers will take into account their competitors' policies when deciding their response to protest movements (electoral competition).

The important role of coalition formation is still open, as is the question of allowing different term limits for governments in different jurisdictions.

Finally, it is always a challenge for theoretical models in political economy to provide empirical evidence that supports their insights. Our case study here shows that it is not impossible to collect such evidence!

References

[1] Acemoglu, D. and James A. Robinson (2000), "Why Did the West Extend the Franchise? Democracy, Inequality, and Growth in Historical Perspective" November 2000, Quarterly Journal of Economics, volume 115, pp. 1167-1199.

[2] Acemoglu, D. and James A. Robinson (2001),"A Theory of Political Transitions", September 2001, American Economic Review, volume 91, pp 938-963.

[3] Baron, D. and D. Diermeier (2006), "Strategic Activism and Nonmarket strategy", Journal of Economic Management and Strategy, forthcoming.

[4] Besley, T. and A. Case (1995), 'Incumbent behavior: Vote seeking, tax setting and yardstick competition', *The American Economic Review* **85**(1), 25-45.

[5] Besley, T. and M. Smart (2003), 'Does Tax Competition raise Voter Welfare?', mimeo.

[6] Chong, D. (1991), *Collective Action and the Civil Rights Movement,* Chicago: University of Chicago Press.

[7] Conley, J.P and A. Temimi. (2001), 'Endogenous Enfranchisement when Groups' Preferences Conflict', *Journal of Political Economy* **109**(1), 79-102.

[8] DeNardo, J. (1985), *Power in Number,* Princeton: Princeton University Press.

[9] Jasper, J. (1997), *The Art of Moral Protests,* Chicago: University of Chicago Press.

[10] Karklins, R. and R. Petersen (1993), 'Decision Calculus of Protesters and Regimes: Eastern Europe 1989', *Journal of Politics* **55,** 588-614.

[11] Kreps, D. and R. Wilson (1982), 'Reputation and Imperfect Information' *Journal of Economic Theory* **27,** 253-79.

[12] Lohmann, S. (1993), 'A Signaling Model of Informative and Manipulative Political Action', *American Political Science Review* **87**(2), 502-34

[13] Milgrom, P. and J. Roberts (1982), 'Predation, Rreputation and Entry Deterrence' *Journal of Economic Theory* **27,** 280-312.

[14] Oliver, P and G. Marwell (1985), 'A theory of the critical mass I: independence, group heterogeneity, and the production of collective action', *American Journal of Sociology* **91**, 522-56.

Appendix

Intuition for Proposition 1: The policy–maker will face first G_2. Group G_1 observes the actions on the first stage before choosing its own strategy. Clearly, by our assumptions on payoffs, a tough policy–maker always choose the status quo. Recall that the probability of the protest group being extremist is q. Clearly if $q > \frac{2a - \alpha_W}{a}$, a weak policy–maker will change the policy if G_2 protests.[28]

Thus, if $q > \frac{2a - \alpha_W}{a}$ and if $\gamma < \frac{1-b-c}{1-b}$ then G_2 protests. Group G_1 protests if G_2 protested and, in addition, the policy–maker changed policy[29] otherwise G_1 does not protest.

If $q < \frac{2a - \alpha_W}{a}$ the weak policy maker is willing to maintain the status quo when G_2 protests if doing so deters G_1 from protesting. This will occur if p_1 (the probability that G_1 assigns to the possibility that the policy–maker is tough) is greater than $\frac{1-b-c}{1-b}$. Thus if $q < \frac{2a - \alpha_W}{a}$ there are two possibilities:

(i) If $\gamma > \frac{1-b-c}{1-b}$ and the policy–maker maintains the status–quo in the first stage then p_1 will be at least equal to γ. In this case the equilibrium is such that neither G_2 nor G_1 protest.

(ii) If $\gamma < \frac{1-b-c}{1-b}$ it is not an equilibrium for the weak policy–maker to maintain the status–quo in the first stage with probability 1, as this might not stop G_1 from protesting and the policy–maker would prefer to deviate from such strategy. Nor can it be an equilibrium for the weak policy–maker to change the policy with probability 1 since maintaining the status quo in the first stage might stop G_1 from protesting and the policy–maker would be better off by choosing this strategy. Thus, in equilibrium the weak policy–maker must randomize. This randomization requires that, when the policy–maker maintains the status quo in the first stage, G_1 randomizes in a way that

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[28]This is since the maximum gain from maintaining the status quo in the first period is $q(a - \alpha_W) + (1 - q)a$ (i.e. when G_1 is deterred from protesting if it is moderate).

[29]thus revealing that the policy–maker is weak.

makes the policy–maker indifferent between its two strategies in the first stage of the game.

Recall that β is the conditional probability that, given it is weak, a policy–maker will maintain the status quo if G_2 protests. Therefore, the total probability that the policy–maker will maintain the status quo if G_2 protests is

$$\Pr(SQ/protests) = \gamma + (1 - \gamma)\beta$$

and the probability that the policy–maker is tough, given that it has not changed policy, is

$$\Pr(t = T/SQ) = \frac{\gamma}{\gamma + (1 - \gamma)\beta}. \qquad (4)$$

G_1 is indifferent between its strategies if $\Pr(t = T/SQ) = \frac{1-b-c}{1-b}$ i.e. if

$$\beta = \frac{\left(1 - \left(\frac{1-b-c}{1-b}\right)\right)\gamma}{(1 - \gamma)\left(\frac{1-b-c}{1-b}\right)} \qquad (5)$$

Therefore, when it faces a protest in the first stage with probability β, a weak policy–maker will maintain the status quo and G_2 will protest if and only if $\gamma < \left(\frac{1-b-c}{1-b}\right)^2$.[30]

Proof of Proposition 2: For the protest–policy maker and the protest group in the foreign jurisdiction it is easy to prove this. G_1' will protest if and only if the expected utility from protesting exceeds the benefits from the status quo policy and the policy–maker will change the policy if and only if it is weak.

Now we turn to the strategies of the policy–maker and the protest groups in the domestic jurisdiction. First, we show that G_2's beliefs are consistent with the strategies of the policy–makers, in the sense that those are determined by Bayes' rule where possible. If G_1' did not protest G_2 does

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[30]In the first stage the policy maker will choose SQ with probability $\gamma + (1 - \gamma)\beta$. Therefore, the expected utility from protesting is $[\gamma + (1 - \gamma)\beta](b - c) + [1 - \gamma - (1 - \gamma)\beta](1 - c)$ which is greater that the utility from not protestis (b) if and only if $\gamma < \left(\frac{1-b-c}{1-b}\right)^2$.

not have any additional information about the policy–maker and we have that $p_2 = \gamma$ in such case. If G_1' protests the policy–maker in the foreign jurisdiction is supposed to change the policy if it is weak and maintain the status quo if it is tough. In those cases, beliefs should be updated according to Bayes' rule; then $p_2 = \Pr(t = T/t' = W) = \frac{\Pr(T,W)}{\Pr(W,W)+\Pr(T,W)}$ and $p_2 = \Pr(t = T/t' = T) = \frac{\Pr(T,T)}{\Pr(T,T)+\Pr(W,T)}$ as we have stated. Note that the yardsticking affects the protest groups and policy maker's strategies in the domestic jurisdiction to the extent that it affects the initial probability that G_2 assigns to the possibility that the policy–maker is of the tough type. Once the first potential group has updated its beliefs using the outcome on the other jurisdiction the game reduces to the game describe in Section 3, the difference is that the initial reputation (γ) was obtained from the observations about the outcome in the other jurisdiction. Therefore the rest of the proof easily follows from Proposition 1. $\square$

Strategies and Beliefs for Proposition 3:

Beliefs:

1. $p_2 = \gamma$

2. $p_1 = \gamma$ if G_2 did not protest.

3. $p_1 = 0$ if group G_2 protested and the policy maker changed the policy i.e. the policy–maker has revealed himself as weak.

4. $p_1 = \max(\left(\frac{z-y-c}{z-y}\right), p_2)$ if G_2 protested and the policy–maker did not change the policy.

Strategies of the Policy–maker:

1. A tough policy–maker always maintains the status quo.

2. In the first stage a weak policy–maker's strategy is:

(a) To maintain the status quo if $p_2 \geq \left(\frac{z-y-c}{z-y}\right)$

(b) To maintain the status quo with probability $\frac{\left(1-\left(\frac{z-y-c}{z-y}\right)\right)\gamma}{(1-\gamma)\left(\frac{z-y-c}{z-y}\right)}$ if $p_2 < \left(\frac{z-y-c}{z-y}\right)$ and otherwise change the policy.

3. In the second stage a weak policy–maker's best strategy is to change policy if G_1 protests.

Strategies of the Protest Groups:

1. Do not protest if $p_n > \left(\frac{z-y-c}{z-y}\right)^n$ $n = 1, 2$

2. Protest if $p_n < \left(\frac{z-y-c}{z-y}\right)^n$

3. Do not protest with probability $\frac{\alpha'_W - a}{a}$ if $p_n = \left(\frac{z-y-c}{z-y}\right)^n$

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Proof of Lemma 4:

Observe that:

$$
\begin{aligned}
\frac{\partial D(m')}{\partial m'} &= (\alpha - \mu Q^*(m'+i) - C_l)\frac{\partial q_i^*(m'+i)}{\partial m'} \\
&\quad - (\alpha - \mu Q^*(m') - C_h)\frac{\partial q_i^*(m')}{\partial m'} \\
&\quad + \mu\left[q_i^*(m')\frac{\partial Q^*(m')}{\partial m'} - q_i^*(m'+i)\frac{\partial Q^*(m'+i)}{\partial m'}\right] \quad (6)
\end{aligned}
$$

Let $A_1 = (\alpha - \mu Q^*(m'+i) - C_l)$, $A_2 = \frac{\partial q_i^*(m'+i)}{\partial m'}$ $A_3 = (\alpha - \mu Q^*(m') - C_h)$ and $A_4 = \frac{\partial q_i^*(m')}{\partial m'}$. Let $A = A_1 A_2 - A_3 A_4$. Let $B_1 = \frac{\partial Q^*(m')}{\partial m'}$ and $B_2 = \frac{\partial Q^*(m'+i)}{\partial m'}$. Let $B = \mu\left[q_i^*(m')B_1 - q_i^*(m'+i)B_2\right]$

We will show that $A < 0, B < 0$.

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First notice that

$$\begin{aligned}
\frac{\partial q_i^*(m'+i)}{\partial m'} &= \frac{\partial q_i^*(m')}{\partial m'} \\
&= -\frac{1}{m+1}\frac{1}{\mu}\left(C_h - C_l\right) < 0
\end{aligned} \tag{7}$$

Second, $A_1 > A_3$, since $\mu Q^*(m'+i) + C_l < \mu Q^*(m') + C_h$. Hence, $A < 0$.

Third, we have:

$$\begin{aligned}
\frac{\partial Q^*(m'+i)}{\partial m'} &= \frac{\partial Q^*(m')}{\partial m'} \\
&= \frac{1}{m+1}\frac{1}{\mu}\left(C_h - C_l\right) > 0
\end{aligned} \tag{8}$$

So the sign of B depends on whether $q_i^*(m')$ is bigger or smaller than $q_i^*(m'+i)$. It is easy to see that $q_i^*(m'+i) > q_i^*(m')$. Hence $B < 0$ as well and we are done. $\square$