

THE EMERGENCE OF LOCAL COUNCIL UNIONS

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pubblicazione internet realizzata con contributo della



COMPAGNIA
di San Paolo

società italiana di economia pubblica

dipartimento di economia pubblica e territoriale – università di pavia

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(preliminary draft)

ABSTRACT. We address the issue of how Local Council Unions – e.g. *Unioni* in Italy – actually form. We propose a model in which majors are rent seeking and decide whether to form Unions in order to increase the likelihood of being re-elected. The electoral competition is modeled as yardstick competition, so that what each major cares about is to perform better than the average performance of the other councils. We characterize the equilibrium of this two stage game showing which is the impact of some parameters – such as the presence transaction costs – on the creation, and size, of Local Council Unions.

JEL Classification:

Keywords: political yardstick competition, agglomeration, local governments

1. INTRODUCTION

In recent years a lot of attention has been devoted to the analysis of decentralization and local governance; many works investigate the relationship between different levels of government, assuming either benevolent or non-benevolent administrators. In the latter case, administrators and politicians are assumed to be rent-seeking, i.e. their actions pursue their own interests, which may not coincide with their citizens' interest. In any case the institutional structure is taken as given, and vertical and horizontal competition is accounted for. In the present work we want to consider the possibility that the institutional structure may change, i.e. we introduce the possibility that lower levels of government may create intermediate levels. We are referring to a phenomenon called “amalgamation”, see Dollery and Johnson [2005]. It consists of the possibility of local councils to form coalition agreements in order to cooperatively provide public services. There are several types of agreements that can be reached, according to the degree of

Date: August 20, 2007.

I would like to thank Barbara Ermini, Fabio Fiorillo, and Raffaella Santolini for discussing some of the topics, and helping me to reach a better understanding of the whole matter. Usual disclaimer applies.

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integration among local councils and the flexibility of the agreement. For instance local councils can reach an agreement in order to jointly provide a particular service – i.e. water and sewage –, or they can create a separate administrative body for the management and administration of a set of services and functions. The latter is characterised by a higher degree of integration and flexibility, because the new administrative body can make decisions independently. The focus of this paper is on the latter forms of partnerships among local councils. This form of agreement is referred to as “*Unioni*” in the Italian legal system. The law d.lgs 267/2000 (TUEL) has introduced the possibility for local councils to form “*Unioni*”. This is a relatively new phenomenon¹ mainly occurring among small size councils, which do not have enough resources to face a growing demand for public services and restrictions on budget transfers from the central government. Consequently, not much work has been done on this topic, with very few exceptions².

We believe there is a need for theoretical and empirical investigation to shed some light on a phenomenon that might substantially modify the structure of the local governance. As noted by Ermini and Salvucci [2006], this phenomenon presents some contrasting evidence. Firstly, it is not homogeneous among Italian regions, there are 55 *Unioni* in Lombardia while only 1 in Umbria; secondly, it seems to exist a negative correlation among average size of councils in the Union and quantity of services produced; and, finally, Unions are characterised by a small number of council members (recent data show an average of 4.53 councils each Union). The usual motivation for Unions is the possibility to exploit economies of scale: small councils can benefit if the service is jointly provided to a large number of people. If this was the whole story we would expect a more homogeneous pattern of Unions across the country, if local councils in Lombardia take advantage of economies of scale, also local councils in Umbria should do the same; moreover the higher the number of councils in the Union the higher the possibility to exploits the economies of scale. This is not what the empirical evidence show. For instance, the heterogeneous distributions of Unions seems to suggest that there could be

¹The possibility to form *Unioni* is not new, however in the past this was regarded as a first step which would necessarily lead toward merging.

²See for a reference Fiorillo and Robotti [2006].

a component of imitation in the formation of Unions, where some Unions form the other councils have a strong incentive to form one, while in area where there are no (or few) Unions councils are happy as they are.

In the present work we deal with the formation of Unions from the perspective of local administrators, analysing the formation of Unions in a context of electoral yardstick competition. We consider rent-seeking mayors which have the possibility to cooperate with other councils in order to provide public services. They are rent-seekers in a peculiar way: they receive a hedonistic utility from directly managing their resources. Usually, in the literature on rent-seeking behavior as developed by Tullock³, agents divert public funds in their pockets. In our model mayors use all funds to produce public goods, but they prefer to do it on their own even if it is less efficient from the citizens' point of view. This assumption is not far from reality, in many cases mayors fear to lose administrative power by delegating functions to the Union. In any case there is at least a sharing of administrative power, each mayor cannot autonomously decide on services delegated to the Union. Sometimes they also fear to lose visibility, so that in many Unions only "obscure" functions are delegated, such as the administration of the registry, financial offices, etc.

The idea is that, although mayors do not like to delegate administrative powers, they might be forced to do so in order to increase the probability of being re-elected. We model the election as a yardstick political competition: the incumbent mayor increases his/her probability of being re-elected performing better than the average. In other words, we assume that citizens do not know the "quality" of their politicians, they can only infer something from their performance, when in power. Hence, as long as forming a Union makes it possible to provide more (or better) services, it may increase the incumbent mayor's probability of election. Since citizens have no information on the challenger, they assume that his/her quality is the same as the average performance of all incumbent mayors. Therefore, we assume that citizens use a yardstick approach in order to judge the incumbent mayor's performance, the higher his/her performance, relative to the average, the higher the probability of being re-elected.

³See Rowley et al. [1988] for a good reference.

Our objective is to investigate whether a Union forms and, in that case, how many resources are delegated by each council. The trade-off we want to exploit relates to the fact that while some services can be delegated to the Union, each council remains accountable for the whole set of services provided to their citizens. Hence, in our model, the motivation to form a Union stems from the electoral constraint imposed on incumbent mayors – with no election there would be no Union.

We are able to characterize an optimal size of a Union in terms of both number of members and resources. This result depends on the efficiency of the Union as provider of public services. It exists an efficiency threshold level below which no Union forms. Unions whose efficiency level below the threshold are not necessarily inefficient in terms of social welfare, however. In other words, the Union could still be the optimal way of providing public services but it is not optimal from the rent-seeking mayor’s point of view. The implication is that even a “light” form of rent-seeking – mayors do not divert public funds in their pockets – is enough to create an inefficient outcome, which is linked to the choice of the organisational structure of the local governance.

Moreover, in case of benevolent mayors, we show that not only Unions are “easier” to form, but also that they would consist of all councils which delegate all their resources – this is because the only reason to form a Union would be to exploit economies of scale. Our model, shows that with rent-seeking mayors, the size of a Union is usually less than half of the number of *neighboring*⁴ councils. This is supported by the evidence that in a given geographical area not all councils, of the same size, are in a Union. We provide a possible explanation of the reason why councils do not agglomerate in big Unions⁵ even if they could exploit economies of scale. In our model a specific transfer to form a Union may be effective, however, this is not always optimal, it could lead to formation of Unions whose transaction costs are too high in terms of social welfare, so that, as likely outcome, the Union would dissolve once the transfer stops⁶.

⁴In the sense of councils that are “close” enough in terms of characteristics, so that yardstick competition is possible among them.

⁵See Ermini and Salvucci [2006] for a detailed description of Unions in Italy.

⁶This was actually experienced by some Unions, which decided to break up once the transfer from the central government ended.

The paper is organized as follows: in the next section the basic model is set up and the equilibrium condition is derived; then we consider a model with benevolent mayors and we compare results with the rent-seeking model; in section 3 we provide a simulation of our model to show how it should work; finally we propose an extension of the model in which we allow the possibility of more than one Union to form.

2. SET-UP OF THE MODEL

Let us consider $i = 1, \dots, I$ identical local councils, characterised by the same number of citizens and the same amount of transfers from the central government, T . We can think of I as the number of similar councils that are in a geographical/political limited area, such as a valley or a province. Mayors use resources to provide local public goods to their citizens according to a linear production function $g^c = T$. This is not the only way of providing public goods, however. Mayors can agree to form a Union, which centrally produces the public good for its members. Each council need to devote an amount of resources R to the Union, i.e. the Union is directly financed by each council. We assume that there are some administrative costs in setting up and managing a Union, which directly decrease the amount of public good that the Union can produce. These transaction costs, F , increase monotonically with the number of members, K , so that the per-capita cost is actually independent of the size of the Union. This means that there is no reason, in principle, to avoid large size Unions.

A Union with K members will produce the following amount of public good,

$$(2.1) \quad g^u = \sum_{k=1}^K R_k - KF$$

It is a linear production function which depends on the number of councils in the Union, K , the amount of resources that each of them provides R_k , and the administrative costs F . The good produced by the Union is non rival and excludible to councils outside the Union⁷, so that the amount g^u is actually what each member council receives.

⁷The basic features of the model would not change if we consider rival services, in this case each council would get $\frac{g^u}{K}$ and we would need to introduce some type of economies of scale in the Union production function.

The amount of public goods that a citizen in council i receives depends on whether the council is part of a Union,

$$g_i = \begin{cases} g^c + g^u = (T - R_i) + \sum_{k=1}^K R_k - KF, & \text{Union member;} \\ g^c = T, & \text{not in a Union.} \end{cases}$$

We consider a two-stage model. The timing is as follows: at date 0, the incumbent mayor decides on whether to form a Union, of size K , and the amount of resources to provide, R_i ; at date 1 an election takes place in all councils, the incumbent mayor runs against a new entrant – randomly draw from the council’s population. The electoral competition is modeled as yardstick political competition. In particular, we do not explicitly derive the election probability, rather we adopt a *contest success function*⁸. This is a function, introduced by Tullock [1980], which relates mayors’ performance to the probability of winning the election. The idea is that the performance of the incumbent mayor is represented by the amount of public good provided in the first period, g_i , while the performance of the challenger is the average of public good provided by all incumbent mayors, \bar{g} . The reason being that the incumbent who performs better than the average shows that he/she has acquired the necessary management skills, while voters are not sure that the new entrant would acquire these skills.

We consider a particular form of rent-seeking agents: mayors receive hedonistic utility from directly managing their resources, T . In other words, they do not like to delegate a Union the provision of public services. Their rent-seeking behavior, however, is limited by the electoral competition: they need to be re-elected in order to enjoy the second period payoff. Their objective function looks like,

$$(2.2) \quad m_i = (T - R_i) + \delta(T - R_i) * \pi(K, R)$$

where the second period payoff is discounted by $\delta \in [0, 1]$, and weighted by the probability of re-election π . The incumbent mayor’s probability of re-election is modeled as

⁸This approach is followed, among others, by Gordon and Wilson [2003], Sollé Ollé [2003], and Bodenstein and Ursprung [2005].

$$(2.3) \quad \pi_i(K, R) = \frac{g_i(K, R)}{g_i(K, R) + \bar{g}(K, R)}$$

The probability of the incumbent mayor to win the election increases with the amount of public good provided relative to the average amount; when $g_i = \hat{g}$ then $\pi = \frac{1}{2}$. This formulation implies perfect yardstick competition⁹.

The novelty of our model with respect to other cases of yardstick competition is that each mayor have the possibility to influence both his/her performance and the average performance, which ultimately depends on whether a Union forms.

We consider the possibility of forming only one Union¹⁰, our objective is to investigate whether a Union forms, and in the affirmative case the number of members and the amount of resources allocated. The idea is that councils have to reach an agreement in order to form a Union, the possibility of a council to join a Union depends on the acceptance of the other Union members – it is an exclusive-membership game. The negotiation process is modelled as follows: a mayor is selected with probability β to make a proposal to the other councils; the proposal ρ consists of the identity of councils with whom to form a Union and the amount of resources each member should provide, $\rho : (K, R) \rightarrow \mathbb{R}^2$; if all councils to whom the proposal is directed accept it, the Union forms and the game ends; if one or more of the councils reject the offer the Union does not form and the process starts again with another random draw to select a proposer. There is no discounting of time from one proposal to the other, we assume, however, that if the game goes on indefinitely a negative payoff is assigned to each mayor¹¹. Given the assumption of identical players we can show that,

Lemma 2.1. *In the stationary subgame equilibrium of the sequential union formation game, each proposer will make the same proposal, $\rho^*(K, R)$, where the amount of resources is the same for all councils, $R_i = R \quad \forall i$.*

⁹We could introduce a parameter θ in front of the function g_i , such that with $\theta = 1$ there is full yardstick competition, as θ becomes larger voters refer less to the average performance in order to evaluate their mayor – at the limit, for $\theta \rightarrow \infty$ the re-election probability tends to one.

¹⁰We acknowledge the importance of this restriction, and we leave the extension to a full coalition formation game for future research.

¹¹The game described is similar to the sequential game of coalition formation studied by Bloch [1996].

Proof. The proof relies on the fact that councils are identical, this implies that a proposal $\rho(K^*, R^*)$ which maximises the payoff of mayor i , maximises the payoff of the mayors to whom the offer is directed, hence they would accept. Any other proposal would be rejected, i.e. a proposal with either a different number of Union member or resources. \square

This result is in line with Ray and Vohra [1999] which show that a sequential coalition formation game with identical players with endogenous sharing rule produces and equilibrium in which the sharing rule adopted is the *equal* sharing rule. Notice that if it is not convenient to form a Union the proposal would be $(0, 0)$, i.e no Union forms. Moreover, if it is not convenient for a mayor to form a Union it would be not convenient for all other mayors as well, hence the Union does not form. Any mayor if chosen to make a proposal, will propose $\{K, R\}$ which maximises his/her inter-temporal payoff,

$$m = \begin{cases} (T - R) + \delta(T - R) * \pi(K, R), & \text{if in a Union;} \\ (1 + 0.5\delta)T, & \text{if no Union forms.} \end{cases}$$

2.1. Equilibrium. The equilibrium of the game is the stationary subgame perfect equilibrium¹² of the sequential game of coalition formation, which, given the assumption of homogeneous councils and unique Union, reduces to the maximization of each mayor's payoff function. In other words, each mayor if chosen to make a proposal will propose K and R which maximise his/her payoff. Since they are identical we take mayor i as the representative agent (we consider mayor i as the proposer in the negotiation process).

In order to assess the behavior of the mayor we need to maximise his/her payoff function in case the council is in a Union and compare this value with the payoff of not forming a Union.

In case no Union forms each mayor enjoys the following payoff,

$$(2.4) \quad \bar{m} = (1 + 0.5\delta)T$$

where 0.5 represents the probability of being re-elected given than all councils would produce that same level of public service $g_i = g^c(T)$.

¹²A stationary equilibrium consists in strategies which depends only on the parameters of the model and not on how players played in the past. In other words, the strategy of the chosen proposer depends only on the features of the economic parameter in that moment and not on how previous players may have played.

The payoff of the proposer in case a Union forms is $m^u(K, R)$. We need to find the Union size and resources which maximise that payoff.

$$\begin{aligned} \max_{\{K, R\}} m^u(K, R) &= (T - R) + \delta(T - R) \left(\frac{I[K(R - F) + (T - R)]}{(I + K)[K(R - F) + T - R] + (I - K)T} \right) \\ \text{s.t.} \quad K &\geq 2 \\ R &\geq R_0 \end{aligned}$$

between big brackets is the probability of being re-elected (the numerator is the amount of public good provided by council i). We constraint the value of R to cover the transaction costs to form a Union, i.e. $R_0 = F$.

We obtain the following first order conditions, where $g = K(R - F) + T - K$,

$$\begin{aligned} \frac{\partial m^u}{\partial K} &: (R - F)[(I + K)[g] + (I - K)T] - [g][(R - F)(2K + I) - R] = 0 \\ \frac{\partial m^u}{\partial R} &: -1 - \delta \left(\frac{I[g]}{(I + K)[g] + (I - K)T} \right) + \frac{\delta(T - R)[IT(K - 1)(I - K)]}{[(I + K)[g] + (I - K)T]^2} = 0 \end{aligned}$$

The solution of this system of implicit equations give the value of K and R which maximises m^u . The solution we get is a function of F the transaction costs, $K^*(F)$ and $R^*(F)$.

The mayor will make a proposal $\{K^*, R^*\}$ or $\{K = 0, R = 0\}$ according to

$$\max\{\bar{m}, m^u(K^*, R^*)\}$$

in other words the mayor will choose to form a Union of size K^* and resources R^* only if $m^u(K^*, R^*) > \bar{m}$.

2.2. Comparative Statics. We want now to investigate how the decision of the mayor changes as transaction costs change.

Firstly note that for a value of $F = T$, i.e. the transaction cost each council sustains is equal to the resources received by the council, the maximum value of the objective function is $m^u(K^*, R^*) = 0$. In this case the Union does not form because each mayor would prefer not to form a Union. As F decreases the value of $m^u(K^*, R^*)$ increases so that for low values of F it is convenient to form a Union.

Proposition 2.2. *It exists a threshold level \bar{F} such that for $F \leq \bar{F}$ a Union of members K^* and resources R^* forms, while for $F > \bar{F}$ no Union forms.*

Proof. The proof is simply that \bar{m} does not depend on F while $m^u(K^*, R^*)$ is decreasing in F , hence there must be a value of F such that $\bar{m} = m^u$. In the appendix we show that the maximum value of m^u decreases with F . \square

This result stems clearly from the fact that the Union forms as long as the advantage in terms of higher probability of re-election compensate the loss in resources directly managed. If there are large transaction costs the Union requires a lot of resources, and it could be more convenient for a mayor to keep the whole resources, T .

In this scenario a specific transfer to councils that form Unions can be the right incentive for Unions to spring. Actually, this is what happened in Italy, with the central (and regional) level of government paying transfers for the formation of Unions. The evidence shows that once this transfer stopped some Unions dissolved¹³.

3. BENEVOLENT MAYORS SOLUTION

The solution described in the previous section considers the incentive to form a Union from the point of view of rent-seeking mayors. That would not be the solution which maximises citizens' payoff.

If all mayors were fully benevolent, they would not mind losing the election. They would only care about the amount of services provided to citizens. Hence the choice to form a Union would exclusively depend on whether it allows to increase the amount of services provided. Each mayor would maximise,

$$(3.1) \quad \max \left\{ g^c(T), \max_{K,R} g_i = g^c(T - R) + g^u(KR - KF) \right\}$$

that is the maximum payoff between not forming the Union and forming a Union with K councils and resources R .

¹³See Ermini and Salvucci [2006].

Considering the linear production function we have assumed throughout the paper the maximisation of g_i in case of Union formation entails the solution of the following problem,

$$\begin{aligned} \max_{K,R} g_i &= (T - R) + (KR - FK) + \delta(T - R + (KR - KF)) \\ \frac{\partial g_i}{\partial K} &: (R - F) = 0 \\ \frac{\partial g_i}{\partial R} &: -1 + K = 0 \end{aligned}$$

from which we get that the best Union size, in case of $R > F$, is to set $K^* = I$ and $R^* = T$. In other words, as long as $F < T$ if a Union forms it should consist of all councils and all resources. However, the choice of whether to form a Union depends on the comparison between $\max g_i$ and g^c . It turns out that the Union forms when

$$(3.2) \quad T > F \frac{I}{I-1},$$

the total resources of the local council must be greater than transaction costs to form a Union weighted for the relative size of the set of councils (this weight reflects the fact that the productivity of the Union depends also on the number of members in the Union, which ultimately depends on the total number of councils, I).

Also in this case we get a threshold for the formation of a Union,

$$\tilde{F} < \frac{I-1}{I} T$$

This means that transaction costs must be quite high to prevent the formation of a Union, almost equal to the resources available to each local council T . Note that as the number of councils increases the threshold increases as well – at the limit for $I \rightarrow \infty$, $\tilde{F} = T$.

The first thing to notice is that in case of benevolent mayors if a Union forms it would consist of all councils, and all resources. This is in contrast with the solution in case of rent-seeking mayors, where the number of members is less than I , and the amount of

resources devoted is less than T . It is also in contrast with the empirical evidence on Union formation, where Unions are quite small in size.

The second thing to observe is that, in case of benevolent mayors, there is a higher “probability” to form a Union, i.e. the transaction costs threshold is very high. Our objective is now to show that $\bar{F} < \tilde{F}$, i.e. the threshold in case of rent-seeking mayors is lower than in case of benevolent mayors. At the moment we are not able to prove this result analytically, however the simulation of the model we conduct in the next section, shows that in a situation with $I = 100$ local councils, each one endowed with resources $T = 100$ the threshold is about $\bar{F} = 2.8$ – hence substantially lower than T – while the threshold in case of benevolent mayors would be $\tilde{F} = 99$.

4. A SIMULATION OF THE MODEL

In this section we provide an explanation of how our model actually works using some specific values. In particular, we want to check how the decision to form a Union changes with transaction costs F .

Let us consider the following situation: $T = 100$, $I = 100$ and $\delta = 1$. There are 100 local councils, each one endowed with 100 units of resources. Mayors do not discount the future, i.e. $\delta = 1$.

Let us start considering a low level of transaction costs $F = 1$, as shown in figure 1, where the straight line at a level of 150 represents the payoff of each council if no Union forms. The optimal choice in case of Union formation is $K \simeq 30$ and $R \simeq 5$. In this situation the mayor who has the possibility to start the negotiation process would propose to form a Union to 30 councils and devote resources equal to 5. This evidently gives a payoff higher than not forming a Union.

As the value of transaction costs increases forming a Union becomes less and less profitable. In figure 2 we see that the representative mayor is almost indifferent between forming a Union or not.

Finally, for large values of F the Union is never optimal for the rent-seeking mayors, as shown in figure 3. In our simulation the threshold level is $\bar{F} = 2.8$. This value depends on the specific values we take for transfers and number of councils.

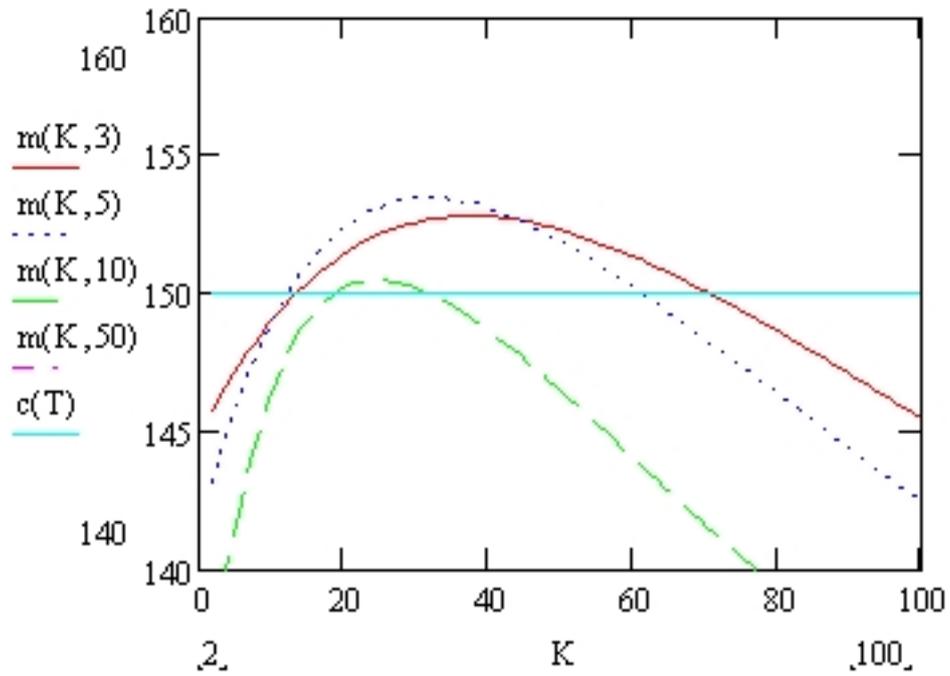


FIGURE 1. Values of $m(K, R)$ as K and R change, for $F = 1$.

Notice that the amount of resources devoted to the Union is quite small compared with the resources available by the council. This is in line with some evidence from Unions in Italy.

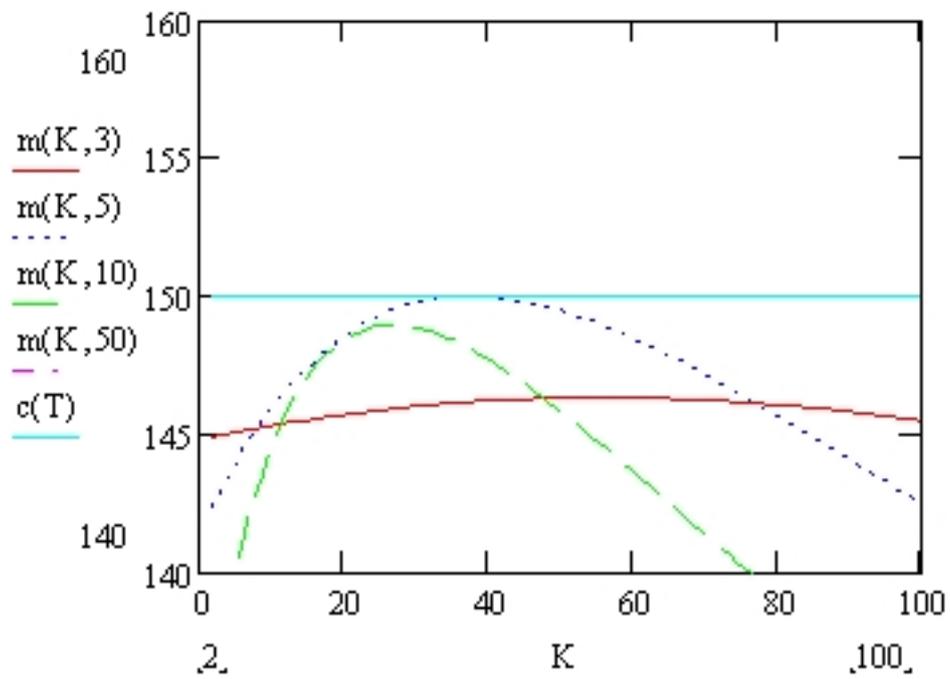


FIGURE 2. Values of $m(K, R)$ as K and R change, for $F = 2.8$

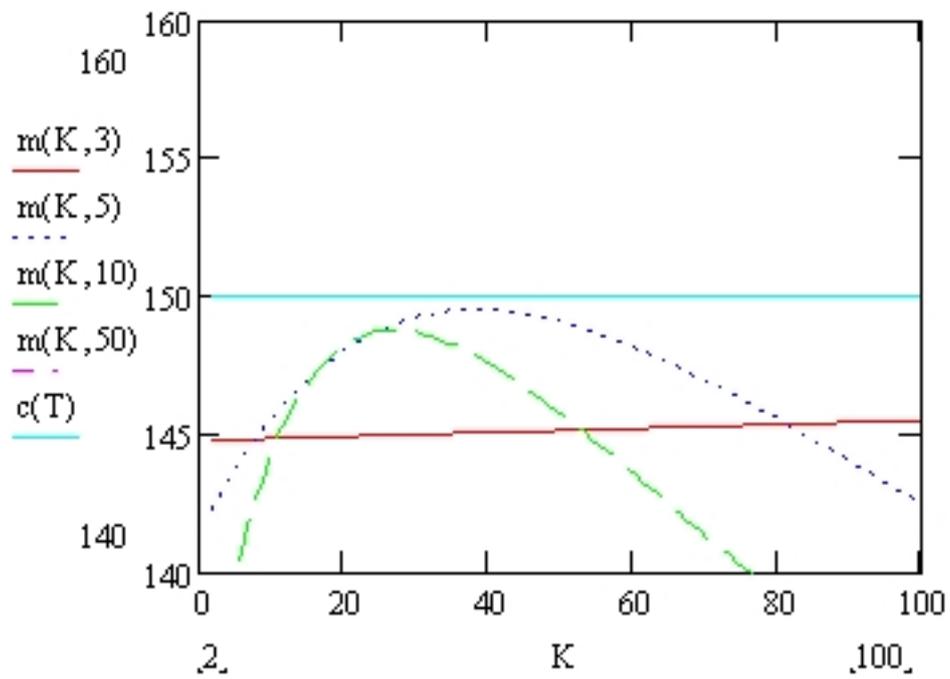


FIGURE 3. Values of $m(K, R)$ as K and R change, for $F = 3$

5. EXTENSION: POSSIBILITY TO FORM MORE THAN ONE UNION

The possibility to form only one Union limits the applicability of our model to real situations, hence our objective is to extend it in order to introduce the possibility for councils outside a Union to form competing Unions. In this section we propose the same model of coalition formation, with the difference that once a Union of K players forms, the remaining $I - K$ councils play again the game, with the possibility to form more Unions. This process goes on until no players are left¹⁴.

We make a different assumption on the probability of being re-elected, however.

- (1) citizens believe entrant performance is equal to the average performance of all majors, \bar{p} ;
- (2) citizens have information on the performance of the incumbent, p_i , with respect to the other councils:
 - $p_i = \bar{p} \Rightarrow$ probability of being re-elected $\pi_i = 0.5$;
 - $p_i < \bar{p} \Rightarrow$ probability of being re-elected $\pi_i = 0$
 - $p_i > \bar{p} \Rightarrow$ probability of being re-elected $\pi_i = 1$

This implies that it would be sufficient to perform slightly better than the average to win the electoral competition.

5.1. The equilibrium of the game. We need to compute a sequential equilibrium in which mayors forecast the outcome to the electoral competition when deciding whether to form a Union. What matters for the electoral competition is the policy

$$p_i = \{g_i\}$$

where $g_i = \{g_i^c, g_i^u\} = g_i^c + g_i^u$. The policy is completely characterised by the amount of public services provided.

$$p_i = g_i^c + g_i^u$$

Remember that $g_i^u = K(R - F)$ and $g_i^c = T - R$. The same threshold level \bar{F} applies, because if it is not convenient for a mayor to form a Union, it is not convenient for anybody.

¹⁴This is exactly the model considered by Bloch [1996].

Lemma 5.1. *If a Union of size $I - 1$ is created the aggregate level of resources devoted would be $R = F + \varepsilon$, where $\varepsilon > 0$.*

The intuition is that to have a performance larger than the average it is enough to form a Union of all players but one. Moreover, an amount of resources that covers the transaction costs, plus a small ε is enough to assure victory in the electoral competition. Hence, if $F < \bar{F}$ any mayor would propose to $I - 2$ local councils to form a Union, so that a Union of $K = I - 1$ players forms.

Proposition 5.2. *In case of $F < \bar{F}$, the equilibrium of the sequential game of coalition formation is given by the proposer offering to form a Union with $(I - 2)$ local councils, and each council contributes for $R = F + \varepsilon$ to the Union.*

Proof. We provide the intuition of the proof. All mayors would prefer not to form a Union. However, each mayor fears that the rest of the councils may form a Union. Hence, whoever have the change to make a proposal will propose to form a Union to all the other players less one, and devote to the Union less resources as possible. There is no incentive to form a Union with all players, because the yardstick competition would be null and it would be better to stay alone. However, the sequential nature of the bargaining and the assumption of commitment makes it too risky to stay alone. Offering to form a Union of size $K < I - 1$ does not increase the expected payoff of the proposer, it may decrease it. In fact, the remaining players could form a competing Union, so that the former Union should devote a quantity of resources higher than R_0 in order to prevent the other coalition to produces a higher level of public good. \square

Notice that they could try to collude and not form a Union, but there would always be the incentive for some of them to form a Union and exclude the rest – which is possible because to join a Union the approval of the other members is required (close membership).

The main reason of this extreme result is the discontinuous nature of the probability of being re-elected. In particular, forming a Union which leads to a policy level above

the average always leads to a probability $\pi = 1$ of being re-elected. Notice that this equilibrium solution is closer to the benevolent solution, at least in terms of coalition size.

6. CONCLUSIONS AND FURTHER DEVELOPMENTS

We proposed a positive model to investigate coalition formation from the point of view of policy makers. We showed that when mayors are reluctant to share their administrative power it is less likely that a Union forms and most importantly the amount of resources devoted to the Union is much less than in case of benevolent mayors. This can account for the evidence that Unions are formed by a small number of participants and few services are delegated, at least in the Italian case.

The model is quite preliminary, an extension to account for the possibility of creating more than one Union is needed. In that case Unions could compete in terms of services provided if citizens apply some kind of yardstick political competition when voting.

APPENDIX A. EFFECT OF F ON THE MAXIMUM VALUE OF m^u

In order to check the effect of cost parameter F on the maximum payoff of mayors, we just need to check the sign of $\frac{dm^u}{dF} = \frac{\partial m^u}{\partial F}$,

$$\frac{\partial m^u}{\partial F} = \delta(T-R) \left(\frac{-\left(\frac{K(I+K)}{I}\right) [K(R-F) + T - R] - \frac{I-K}{I}TK - \left([-K(R-F) - T + R]\left[-\frac{K(I+1)}{I}\right])}{[(I+K)[K(R-F) + T - R] + (I-K)T]^2} \right)$$

the numerator is negative while the denominator is always positive, hence the negative impact of an increase in transaction costs on mayors' payoff.

REFERENCES

- Francis Bloch. Sequential formation of coalitions in games with externalities and fixed payoff division. *Games and Economic Behavior*, 14:90–123, 1996.
- Martin Bodenstein and Heinrich W Ursprung. Political yardstick competition, economic integration, and constitutional choice in a federation. *Public Choice*, 124:329–352, 2005.
- Brian Dollery and Andrew Johnson. Enhancing efficiency in australian local government: an evaluation of alternative models of municipal governance. *Urban Policy and Research*, 23(1):73–86, 2005.
- Barbara Ermini and Samuele Salvucci. L'associazionismo intercomunale. l'esperienza delle unioni di comuni in italia e nelle marche. In Fabio Fiorillo and Lorenzo Robotti, editors, *L'Unione dei Comuni*. Franco Angeli, 2006.
- Fabio Fiorillo and Lorenzo Robotti, editors. *L'Unione dei Comuni*. Franco Angeli, 2006.
- Roger H Gordon and John D Wilson. Expenditure competition. *Journal of Public Economic Theory*, 5:399–417, 2003.
- Debraj Ray and Rajiv Vohra. A theory of endogenous coalition structures. *Games and Economic Behavior*, 26:286–336, 1999.
- Charles K Rowley, Robert D Tollison, and Gordon Tullock, editors. *The Political Economy of Rent-Seeking*. Kluwer Academic, 1988.

Albert Sollé Ollé. Electoral accountability and tax mimicking: the effects of electoral margins, coalition government and ideology. *European Journal of Political Economy*, 19:685–713, 2003.

Gordon Tullock. Efficient rent seeking. In J Buchanan, R Tollison, and G Tullock, editors, *Toward a Theory of the Rentseeking society*. Texas A&M University Press, 1980.

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