Asymmetric yardstick competition and municipal cooperation

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Abstract

This paper addresses the issue of inter-jurisdictional cooperation when incumbents are pure rent seekers. Asymmetric fiscal needs bias yardstick competition as in Allers (2012). While incumbents gain control over the political yardstick competition by cooperating, this bias leads to asymmetric rent share. Cooperation is also intrinsically unstable. Furthermore, incentives, such as matching grants or economies of scale, may enhance cooperation, but will not increase political accountability.

Keywords: Decentralization; expenditure needs disparities; municipal cooperation.

JEL Classification: D72; H77.

1. Introduction

This paper studies the interplay among voluntary centralisation, yardstick competition and rent seeking.

A question, which has not received systematic analysis in the study of local public finance, is why rent-seeking incumbents should cooperate. In order to address this question, we develop a yardstick competition model where voters cannot observe both the rent extracted by incumbents and the inter-municipal cost (or fiscal) disparities. What voters can observe and compare is the quality of services provided in their municipality with the quality observed in the neighbouring municipalities. Thus, they can infer the behaviour of local administrators. Incumbents, who are concerned about their probability of being re-elected, can influence voting behaviour by cooperating, as the joint provision of public goods and services mitigates the yardstick competition effects. We focus on the conditions under which cooperation may or may not become an advantage for the incumbents, in terms of rent extraction.

There are few papers (Kotsogiannis and Schwager, 2008; Allers, 2012) that investigate the effect that horizontal fiscal imbalances\textsuperscript{1} may have on the political yardstick competition and, to our knowledge, there is no research on the effect

\textsuperscript{1}A horizontal fiscal imbalance emerges when sub-national governments have different fiscal capacities or expenditure needs.
of the horizontal fiscal imbalances on the incentives for cooperation among sub-national governments.

2. The model

Consider two identical municipalities, A and B, with identical voters and municipal population normalised to one.

Jurisdictions provide a certain quality of a local public service, $S$, under constant return to scale.

The only difference between jurisdictions is in their expenditure needs or cost of provision of public service. Administrators know the entity of the cost (fiscal) disparity, voters do not.

Incumbents may decide whether they want to provide the service by themselves or jointly with the other municipality by constituting a consortium.

We suppose that, as in many local electoral systems (Italian municipalities, UK districts, etc.), incumbents can be in office for a maximum of two mandates. Therefore, we can model the choice problem in two periods. During the mandate $t \in \{I, II\}$, the incumbent administrator of the jurisdiction $i$ extracts a rent $R^t_i$, which is equal to:

$$ R^t_i = \theta y_i - e_i S^t_i, $$

where, $i \in \{A, B\}$, $\theta \in [0,1]$ is the tax rate, $y_i$ is the tax base and $e_i$ is a parameter that captures the spending needs of jurisdictions. In order to model the spending needs disparity, we assume that $e_A = 1 - d$ and $e_B = 1 + d$, with $d \in [0,1]$. Furthermore, we also assume that the common tax rate is set exogenously by the central government.

Since the jurisdictions have the same tax base and tax rate, we can normalize the revenues to one and express $R^t_A$ and $R^t_B$ as, respectively:

$$ R^t_A = 1 - (1 - d)S^t_A, $$

and

$$ R^t_B = 1 - (1 + d)S^t_B. $$

Voters cannot observe the amount of rent, $R^t_i$, extracted by the incumbent. What they can observe is the quality of the service, $S^t_i$.

In order to model the re-election probability of incumbent $i \in \{A, B\}$, we use the usual “contest success function” \[2\]

$$ P_i (S^t_i, S^t_j) = \frac{S^t_i}{S^t_i + S^t_j}, $$

where, $S^t_i$ and $S^t_j$ are the observed service qualities in jurisdictions $i$ and $j$ in the first period. In the case of perfect service-mimicking behaviour, $S^t_i = S^t_j$, then $P_i = P_j = 1/2$; instead, when $S^t_i > S^t_j$, then $P_i > P_j$. Furthermore, $\frac{\partial P_i}{\partial S^t_i} \geq 0$, $\frac{\partial^2 P_i}{\partial S^t_i^2} \leq 0$ and $\frac{\partial P_i}{\partial S^t_j} \leq 0$.

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Both incumbents care enough about re-election and have the same discount factor $\delta$, with $0 \leq \delta \leq 1$. Furthermore, in the first period of the game, both incumbents are in their first mandate.

In the next sections, we will look at rents in the non-cooperative equilibrium and compare this to rents in the cooperative solution. The extent of cooperation then depends on which situation is better for rent seekers.

3. Non-cooperative equilibrium

The decentralised non-cooperative Nash equilibrium is given by the service levels that maximise the total rent over the two mandates for the incumbents.

During the second mandate, both incumbents set the minimum service quality $S_{II}^* = S/e_i$ and extract a rent equal to $1 - S$, where $S$ is a minimum required standard.

In the first period, the service quality set by incumbent $i$ is then chosen in order to maximize the expected total rent over the two mandates as follows,

$$\max_{S_I^i} (1 - e_iS_I^i + P_i (S_I^i, S_I^j) \delta (1 - S))$$

with $i, j \in \{A, B\}$ and $i \neq j$.

The Nash equilibrium of the game is given by

$$(S_{II}^A; S_{II}^B) = \left( \frac{\delta(1 + d)(1 - S)}{4}; \frac{\delta(1 - d)(1 - S)}{4} \right).$$

Accordingly, the quality of the local services is lower in the municipality with the highest expenditure needs; i.e., $S_{II}^A \geq S_{II}^B$. Only in the absence of horizontal disparities, do jurisdictions set the same service level.

The yardstick bias caused by the unobserved disparities gives an electoral advantage to incumbent $A$, who is re-elected with a greater probability; that is,

$$P_A = \frac{1 + d}{2} \geq \frac{1 - d}{2} = P_B.$$  

In equilibrium, the total rents of incumbent $A$ and $B$ are, respectively,

$$R_{II}^A = 1 + \delta \left( \frac{1 + d}{2} \right)^2 (1 - S)$$

and

$$R_{II}^B = 1 + \delta \left( \frac{1 - d}{2} \right)^2 (1 - S).$$

The biased yardstick competition leads to a higher expected rent for the fiscal advantaged incumbent; that is, $R_{II}^A \geq R_{II}^B$ for any value of $d \geq 0$.

Furthermore, since

$$\frac{\partial R_{II}^A}{\partial d} = \delta \frac{d + 1}{2} (1 - S) > 0$$

3A lower quality of provision will trigger immediate investigation by the judicial authorities, which will lead to no rent to the incumbent. We assume that the judicial authority knows $e_i$ and can weight the minimum standard.
and
\[
\frac{\partial R_B^*}{\partial d} = \delta \frac{d - 1}{2} (1 - \bar{S}) < 0, \tag{11}
\]
higher unobserved expenditure needs disparity increases (decreases) the expected rent of incumbent \(A\) (\(B\)).

The role played by the discount factor \(\delta\) is also interesting. A greater concern about future payoff decreases the first period rent, but increases the total expected rent either individually and jointly.

4. Rent seeking under cooperation

In this section, we study the determinants of rent when incumbents can voluntary cooperate and constitute an inter-municipal consortium. The latter determines both a uniform quality of the local service \(S\) and the distribution of the joint rent between incumbents. The common quality and the rent share \(q\) will be the result of a Nash bargaining between the two incumbents. Note that \(q \in [0, 1]\) and \((1 - q)\) denote the shares of the rent assigned to incumbent \(A\) and \(B\) respectively.

Incumbents cannot commit on future provision, as they cannot know whether they will be reappointed. Therefore, in each period, there will be a different bargaining round between the administrators in office in the two jurisdictions in that period.

During the second and last mandate, in order to maximize the extracted rent, the re-elected incumbents will certainly set the lowest quality of service either with or without cooperation. As a result, both incumbents will extract a second period rent equal to one. This is true whether both incumbents, or only one of them, will be reappointed.

As a consequence, cooperation during the second period is intrinsically unstable, as incumbents will be indifferent between cooperating or not cooperating in their second mandates.

Given the second period outcome, during the first mandate, the expected total rent jointly extracted by the consortium over the two periods is:
\[
R = 2 - 2S^I + 2 \frac{S^I}{S^I + S^II}\delta (1 - \bar{S}) = 2(1 - S^I) + \delta (1 - \bar{S}). \tag{12}
\]

The agreement payoffs \(\omega_A\) and \(\omega_B\), with \(R = \omega_A + \omega_B\), of incumbents \(A\) and \(B\) will be
\[
\omega_A(S^I, q^I) = q^I(2(1 - S^I) + \delta (1 - \bar{S})) \tag{13}
\]
and
\[
\omega_B(S^I, q^I) = (1 - q^I)(2(1 - S^I) + \delta (1 - \bar{S})). \tag{14}
\]

The disagreement payoffs are given by equations (8) and (9).

4In the second period, three possible scenarios are possible. In the first scenario, no one is re-elected. In the second scenario, both incumbents are re-elected. Here, an agreement on an \(S^{II} > \bar{S}\) will lead to negative net gains for both incumbents, as rent creation declines. In the third case, only one incumbent is re-elected. Again, an agreement on an \(S^{II} > \bar{S}\) will reduce rent creation in both jurisdictions, as the probability of being re-appointed for the first mandate incumbent cannot increase with respect to the non-cooperative outcome. As a result, the incumbent in his or her second mandate will always set the minimum standard \(\bar{S}\).
The values of $S^I$ and $q^I$ that constitute the Nash bargaining solution are:

$$(S^I^*, q^I^*) = \arg \max((\omega_A(S^I, q^I) - R_A^*) (\omega_B(S^I, q^I) - R_B^*)), \quad (15)$$

with $((\omega_A(S^I, q^I) - R_A^*) \geq 0$ and $(\omega_B(S^I, q^I) - R_B^*)) \geq 0$.

After, substituting equations (13-14) and (8-9) into equation (15), we obtain:

$$(S^I^*, q^I^*) = \arg \max \left( q^I \left( 2(1 - S^I) + \delta(1 - S) \right) - 1 - \delta \left( \frac{1 + d}{2} \right)^2 (1 - S) \right)$$

$$\left( (1 - q^I) \left( 2(1 - S^I) + \delta(1 - S) \right) - 1 - \delta \left( \frac{1 - d}{2} \right)^2 (1 - S) \right).$$

Interestingly, the service quality that maximizes the consortium rent, independently from the rent quota $q^I$, is $S^I^* = S^S$. In fact, there is no conflict of interest on the service quality as both incumbents are interested in maximizing the total consortium rent.

It follows that the unique Nash bargaining solution is:

$$S^I^* = S^S \quad (17)$$

and

$$q^I^* = \frac{1}{2} \left( \frac{2 + \delta + \delta d}{2 + \delta} \right). \quad (18)$$

Accordingly, the joint provision of the local service is equal to the minimum quality allowed in both mandates, $S^I^* = S^I^S = S^S$, and is independent of the ex-ante disparities in expenditure needs.

Furthermore, according to the bargaining solution (18), incumbents equally split the total rent produced by the consortium either when there is no cost disparity, or the discount factor is zero. When both $\delta$ and $d$ are not zero, then $q^I^* > \frac{1}{2}$. Besides, an increase in $d$ will increase the rent share of the fiscally advantaged administrator.

It is also easy to verify that the consortium sets $q^I^*$ in order to equalise incumbents’ net rent; that is,

$$\omega_A(S^I^*, q^*) - R_A^* = \omega_B(S^I^*, q^*) - R_B^* = \frac{1}{4} (1 - d^2) \delta (1 - S) > 0. \quad (19)$$

In equilibrium, the net gains from cooperating (19) are certainly positive. As a result, incumbents will cooperate during the first mandate, as they extract more expected rent. Furthermore, total expected rent is higher for incumbent A.

It is also easy to verify that under compulsory cooperation $q^I^* = 1/2$, as the disagreement payoffs will be zero.

\(^5\)The proof is straightforward after considering that the Nash bargaining objective function is the product of incumbents’ net gains, which are both decreasing in $S^I^*$. 

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5. Final remarks

The joint provision of local public goods and services is a central issue in the agenda of many local and central governments.

Local administrators find cooperation appealing as they can gain control over the yardstick competition mechanism, which is used to manipulate voters’ choice. They may use this control to increase rent extraction by lowering the quality of the provision of local public goods and services. As a result, inter-municipal cooperation decreases political accountability.

On the other hand, fiscal disparities do not affect policy outcome under cooperation. Rather, they affect the rent share among incumbents. Under voluntary cooperation, the fiscally advantaged administrator gains more bargaining leverage, which leads to a larger rent the higher the fiscal disparities. Instead, this cannot happen under compulsory cooperation, where the joint rent will be equally split.

Cooperation is also intrinsically unstable as administrators lose interest in gaining control over the yardstick competition mechanism in their last mandate.

Furthermore, our results suggest that either matching grants from upper levels of government or economies of scale may be incentives to cooperation since they reduce the cost of local public goods supply. However, even if these incentives may enhance cooperation, as they increase rent extraction, they fail to increase both the quality of local policies and the political accountability of local governments.

This paper explains how incumbents may use cooperation in order to increase rent creation and extraction, as Hillman (2015) calls it. Local administrators may use the extracted rent for a number of purposes, which may be either legal or illegal. Congleton (2015) conceives rent as a non-productive use of public resources, which is welfare decreasing for voters. According to Hillman (2015), rent may also be associated to efficiency-improving activities, even if it may not be convenient to acknowledge the rent-seeking context.

A future development of this model may develop de Viti de Marco’s (1937) suggestions to explore the reasons that pushes politicians to adopt rent-seeking behaviours, such as the need to find resources for electoral campaign or obtain political and judicial protection. In order to explain a different behaviour of elected politicians, it may also be interesting to apply Niskanen’s (1971) theory of appointed bureaucrats by assuming that elected incumbents extract rents from the size of public spending.

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