



# Working Papers

POLITICAL YARDSTICK COMPETITION,  
ECONOMIC INTEGRATION, AND  
CONSTITUTIONAL CHOICE IN A  
FEDERATION

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Abstract

This paper investigates the behavior of rent-seeking politicians in an environment of increasing economic integration. The focus of the paper is on the implications of globalization-induced political yardstick competition for constitutional design with a view to the current discussion in the European Union. In contrast to the established literature, we carefully portray the double-tiered government structure in federal systems. The number of lower-tier governments and the allocation of policy responsibilities to the two levels of government are subject to constitutional choice.

Keywords: Economic Integration, Federalism, Political Economy, Yardstick Competition.

JEL Classification: D72, H73.

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# Political Yardstick Competition, Economic Integration, and Constitutional Choice in a Federation

## 1. Introduction

### *Federal constitutions*

Constitutions establish the governance structures of nation states, provinces, and supra-national organizations such as the European Union. In designing constitutions, arguably the most important issue is to determine the extent to which collective decision-making should be centralized. Three different types of government structures with respect to centralization are usually distinguished: confederations, federations, and centralized (unitary) states. Whereas confederations set up narrowly defined cooperation schemes among the participating members which otherwise retain all the decision rights of sovereign states, in unitary states cooperation is all-encompassing, i.e. all collective decisions are made at the center and the constituent parts either disappear or are reduced to administrative districts. Between these two extreme rules of collective decision-making, federal constitutions allocate policy responsibilities to multiple tiers of governments; some collective decisions are made by the constituent parts, the provinces (states, cantons, Länder, etc.), which can, in turn, assume a federal structure of their own, and some collective decisions are made by the central authority, the federal government.

Federal constitutions basically need to address three issues [cf. Inman and Rubinfeld (1997), p. 53]. First, they need to specify the *federal structure*, i.e. the way in which the federation is partitioned into provinces. In many incidences of state-building this issue was for all practical purposes preordained by historical factors. The number and delineation of provinces may, however, become an issue if the historic constraints vanish as time passes or if heterogeneous

nation states are merged in a supranational federal system.<sup>1</sup> Second, the question arises which *policy responsibilities* should be assigned to the provinces and which to the federal state. In this context confederations and centralized systems can be interpreted as extreme versions of a federation: a federation which assigns no policy responsibilities to the federal government is a confederation and one which assigns no policy responsibilities to the provinces is a unitary state. The third issue a federal constitution needs to resolve concerns the *collective decision rules* which are to be applied at the federal level.

### *The objective of our investigation*

This paper discusses federal constitutional design in an adverse political environment in which the political principals, the voters, have only a very limited influence on their agents, the incumbent governments. We portray the (post-election) political process with the help of Leviathan governments which face a reelection constraint.<sup>2</sup> The third issue on the agenda of federal constitutional design, the design of *federal decision rules*, therefore does not emerge; our investigation rather focuses on the first two issues, i.e. the design of the *federal structure* and the allocation of *policy responsibilities*. Moreover, we focus our investigation on a very specific determinant of optimal constitutional choice, namely the effect of *political yardstick competition*. Political yardstick competition emerges when the performance of the governments in various jurisdictions becomes sufficiently comparable so that the voters can alleviate the agency problem by making meaningful comparisons between jurisdictions. Under these circumstances governments are forced to interact strategically with each other in formulating their respective policies and thereby face a new constraint. Some recent evidence documents that yardstick competition significantly affects the behavior of incumbent

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<sup>1</sup> For a proposal to redraw the federal structure of the European Union, see, for example, Drèze (1993).

<sup>2</sup> This rather pessimistic view of government represents an appropriate background for constitutional choice since constitutional rules should provide a safeguard even in a worst-case scenario [cf. Brennan and Buchanan (1980)].

politicians, the empirical evidence relating to the United States [cf. Besley and Case (1995)] and Europe [Ashworth and Heyndels (1997)]. Our investigation acknowledges this insight and asks the question as to how the intensity of yardstick competition - which we relate to economic integration - affects the optimal design of a federation's constitution.

We are thus concerned with positive and normative questions. The positive part of our study analyzes how the federal structure and the assignment of policy responsibilities influences the outcome of the ongoing political process. The normative part then builds upon the positive analysis and derives recommendations with respect to the optimal design of a federation's constitution. The analysis is set up as a multi-stage game; the initial constitutional stage is followed by an infinitely repeated stage which portrays the strategic interaction of the incumbent governments in the post-election political process.

Two features of our model are quite novel and deserve some elaboration. The first one concerns the *role of the federal government*. The policy recommendations of the traditional literature on fiscal federalism notwithstanding, we observe that the qualitative difference between the policy responsibilities of federal and province governments has become increasingly blurred. We therefore conjecture that the voters are in a position to compare the performance of the federal government (the president) with the performance of the province governments (the governors) on the occasion of the presidential election. Moreover, since politics at the federal and province level requires similar if not identical skills and ethical prerequisites, governors with a good track record are the prime challengers of the incumbent president. In our model we therefore assume that all incumbent governors aspire to the presidency and that the incumbent governors are the only contenders. This set-up results in a hierarchical rent-seeking contest in which restraint at the lower (province) level is rewarded by a lottery ticket for a big prize – the presidency. The restraint which is generated by the federal structure cuts, of course, both ways, i.e. the incumbent president is also constrained in

his rent-seeking behavior because he knows that in the next election his performance is compared with the performance of the governors. The federation's two-tiered structure thus contains a idiosyncratic set of incentives which are liable to constrain the governments at both levels in their rent-seeking activities.

The second novel feature of our model is that we relate the intensity of political yardstick competition to *economic integration*. We envisage a number of provinces or countries (for example the member states of the European Union) whose governments provide a given set of goods. The cost of the publicly provided goods is subject to a province-specific shock which is not observable by the voters. The politician thus have an incentive to extract some rents by overstating the cost. In the absence of a reelection constraint the politicians would present a budget which equals total utility derived by the voters from the provision of the publicly provided goods [cf. Niskanen (1971)]; in this extreme case in which the governments are only constrained by a non-negative utility requirement (implemented, for example, by a budget authorization process) the agency problem strongly favors the agents. The principals, i.e. the voters, obtain a stronger position vis-a-vis their respective agents if the province-specific shocks are correlated. Government performance then can be compared across provinces and sanctioned in elections. We identify economic integration with an increase in the (positive) correlation of the province-specific shocks. Economic integration thus increases the intensity of political yardstick competition among the lower tier governments; our parameter measuring the intensity of yardstick competition in lower tier elections (gubernatorial elections) thus varies positively with economic integration.<sup>3</sup> The same reasoning applies to the presidential election: if economic integration increases the correlation of the local cost shocks and the federal government diversifies production of the provided goods across

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<sup>3</sup> We do not provide a micro-foundation for our contest success functions because we do not treat the voters as players who interact strategically with the politicians. Our modeling approach is more in line with the rent-seeking literature [cf. the survey by Nitzan (1994) and, in particular, Appelbaum and Katz (1986)] than with the literature on mechanism design [cf. Seabright (1996) and, for a model which closely resembles our conception of economic integration, Zantman (2000)].

provinces (federal highways, academic research, etc.), then economic integration will also give rise to an increase in yardstick competition in presidential elections.

### *The related literature*

Our paper relates to a substantial body of literature. By far the largest part of the economic literature on federalism adopts a *normative* viewpoint by assuming that governments act as loyal agents in the interest of their respective constituencies. This *fiscal federalism* literature (cf. Oates 1998 and 1999), by definition, turns a blind eye to the arguably strongest argument for the separation of powers via decentralized collective decision-making which can be traced back at least to the *Federalist Papers* (1788), namely the appreciation that political fragmentation contributes to the protection of mobile citizens' *civil rights and liberties* against public authorities who may be tempted to abuse their coercive powers for egoistic purposes.<sup>4</sup> *Political Yardstick competition* is closely related to this line of reasoning because yardstick competition imposes a constraint on elected governments even if the individual citizens are immobile across jurisdictions.

More relevant for our investigation is the modern *political-economic* literature on federalism which is based on a more realistic portrait of political motivation. The factors which have been identified to influence the behavior of political-support motivated governments range from local preference diversity (cf. Bolton and Roland, 1997), to budgetary externalities (cf. Persson and Tabellini, 1994), spillovers (cf. Besley and Coate, 1999), scale economies (cf. Alesina and Spolaore, 1997), and risk-sharing (cf. Persson and Tabellini, 1996, and Lee, 1998). These factors, incidentally, also play an important role in the traditional normative literature. In any case, most investigations, whether they adopt a normative or a positive

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<sup>4</sup> Political fragmentation may also protect minorities against exploitation undertaken by majorities [cf. Ellingsen (1998)].

viewpoint, compare completely decentralized with completely centralized collective decision-making, i.e. they compare confederations with unitary states.<sup>5</sup>

The political-economic literature on multi-tiered governance structures (federations) is still very small but growing. Nechyba (1997) investigates a general equilibrium model of a hierarchical government structure and derives conditions for the existence of a voting equilibrium and for the stratification of mobile citizens into communities providing different public good menus. The paper by Cremer and Palfrey (1999a) also employs the median voter approach and offers an explanation for the observation that central governments tend to intervene in lower-tier politics even when inter-jurisdictional externalities are minimal. The median voter approach, whatever its merits may be, is certainly not suitable to endogenize redistribution policies. Wärneryd (1998), therefore, employs the standard rent-seeking approach to investigate the efficiency losses resulting from political contestability of rents under different governance structures. He concludes that rent dissipation in a unitary state exceeds rent dissipation under federalism. Dixit and Londregan (1998) portray income redistribution with a model of electoral competition and show that the policy outcome in a federation can be very different from that in a unitary state because federations, on the one hand, allow for divided governments resulting in less stark policy outcomes, but, on the other hand, can admit multiple equilibria with the attendant risk of unpleasant welfare consequences for a large part of the voters.

Our study is most closely related to Cremer and Palfrey (1999b), Wrede (2000) and Zantman (2000). Just as we do, the paper by Cremer and Palfrey focuses on the optimal design of federal structures but it does not consider the effects of political yardstick competition. The papers by Wrede and Zantman, on the other hand, deal with political yardstick competition,

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<sup>5</sup> The neglect of federal systems in the literature appears to be a legacy from the influential work by Tiebout (1956) who not only juxtaposed unitary states and confederations, but also completely ignores the prevailing political institutions. Investigating the role of political institutions in a Tiebout world is a relatively recent line of research (cf. Kollman et al., 1997, and Caplan, 2001).



but they analyze non-hierarchical government structures and focus their investigation on the optimal voter response. The paper by Zantman, however, bears a close resemblance to our analysis by squarely addressing the issue of economic integration and its repercussions for governments drawn into yardstick competition.

## 2. The Model

Consider a federation with two layers of government: the federal government headed by the president and  $n$  province governments headed by governors. The public sector provides a given set of goods normalized to unity. The publicly provided goods may be private goods or local public goods which do not generate any spillovers across provinces. The fraction of the goods provided by the federal government is denoted by  $1-q$ . All provinces are assumed to be identical with respect to the allocation of goods provided by the federal government; i.e. each of the  $n$  provinces receives from the federal government the fraction  $(1-q)/n$  of the publicly provided goods and the individual province governments supplement the federal allocation by the fraction  $q/n$ .

The federal and the province governments are portrayed as Leviathans whose objective is to maximize the rent  $R_k$  ( $k=f,1,\dots,n$ ) which they extract from their respective jurisdictions. The extracted rent  $R_k$  is the difference between the tax revenue  $T_k$  and the cost  $C_k$  of the publicly provided goods:  $R_k=T_k-C_k$ , where  $C_f=(1-q)c_f$  and  $C_i=(q/n)c_i$  for  $i=1,\dots,n$ .<sup>6</sup> We assume that the voters do not know the per unit cost (input price)  $c_k$  of the publicly provided goods, they only observe the tax revenue  $T_k$  in each jurisdiction. Despite this lack of information, rent extraction is nevertheless bounded via the budget-authorization and the reelection constraint faced by the president and the governors. The reelection constraints become more restrictive

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<sup>6</sup> Linearity of the cost function implies that constitutional choice is not influenced by scale effects. This feature is in line with our focus on the yardstick effects.

the more correlated the input prices are known to be since the voters are then better able to compare the performance of the incumbent officials across jurisdictions. Price correlation forces the incumbent officials to compete against each other in a political yardstick competition.

We portray political yardstick competition via the probability of an incumbent to be reelected to office. We do not derive the election probabilities from the microeconomic fundamentals - such a micro-foundation can be found in Zantman (2000) – but rather adopt a macroeconomic view and base our analysis directly on the employed contest success functions. In our model of a two-tiered government structure we have to take into account that the governors may aspire to the presidency. In fact, in order to emphasize the nexus between the federal and the province-level governments which is established by the yardstick competition effect, we assume that only governors challenge the incumbent president. The reelection probability  $P_f$  of the incumbent president therefore depends, apart from the constitutional variables  $n$  and  $q$ , on the past performance of the incumbent president and the past performance of the governors as measured by  $b_k$ ,

$$(1) \quad b_k = U_k - T_k, \quad (k=f, 1, \dots, n),$$

where  $U_f/n = ((1-q)/n)u$  and  $U_i = (q/n)u$  ( $i=1, \dots, n$ ) denote the gross utilities derived from the respective government services. The assumed linearity of the utility functions guarantees that the voters' total gross utility  $U_f + U_i$  is not affected by the constitutional assignment of policy responsibilities.<sup>7</sup> Moreover, we assume that the voters' net utility  $b_k$  is non-negative,  $b_k \geq 0$ , because all governments are restricted by a budget authorization constraint.

For analytical convenience we will use the standard parametric specification of the contest success function  $P_f(b_f, b_1, \dots, b_n)$  due to Tullock (1980):

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<sup>7</sup> Linearity, moreover, implies risk neutrality on the part of the voters. This specification, therefore, does not allow to portray the social insurance feature of multi-layered government systems. Our modeling strategy is to focus the analysis completely on the yardstick competition effects of federal systems.

$$(2a) \quad P_f(t) = \frac{\varphi b_f(t-1)}{\varphi b_f(t-1) + n \frac{1-q}{q} \sum_{i=1}^n b_i(t-1)}$$

Notice, that the governors' performance levels  $b_i$  are made comparable to the president's performance  $b_f$  by the adjustment weight  $n(1-q)/q$ . Government performance is, of course, an instrument variable of the governments' maximization calculus since performance depends on rent extraction via  $b_f=(1-q)v-R_f$  and  $b_i=(q/n)v-R_i$ .<sup>8</sup> The parameter  $\varphi \geq 1$  measures the extent to which the president is exposed to yardstick competition. For very large values of  $\varphi$ , reelection of the president is for all practical purposes guaranteed, i.e.  $P_f$  assumes a value very close to unity which signifies the absence of yardstick competition and thus portrays a president in the position of an unchallenged Leviathan. If  $\varphi$  equals unity, the president's performance is perfectly comparable to the performance of the governors; under these circumstances yardstick competition is perfect.<sup>9</sup>

The probability  $P_i$  of a province governor to gain the presidency mirrors the probability  $P_f$  and is defined as

$$(2b) \quad P_i(t) = \frac{b_i(t-1)}{\sum_{s=1}^n b_s(t-1) + \frac{\varphi}{n} \frac{q}{1-q} b_f(t-1)} \quad \text{for } i=1, \dots, n.$$

To provide a feeling for the contest success functions 2a and 2b which portray the yardstick contest taking place at the federal level, assume that the federal government produces 50% of all publicly provided goods ( $q=1/2$ ). The remaining 50% is produced by two province governments ( $n=2$ ). Let the performance levels in period  $t=1$  be  $b_f=5$ ,  $b_1=3$  and  $b_2=1$ ; total voter satisfaction thus equals  $\Sigma b=9$ . What then is the probability of the three contestants to

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<sup>8</sup> As mentioned above, we adopt the rent-seeking approach and base our investigation directly on the postulated contest-success functions, i.e. on equation (2a) and on the equations (2b) and (3) below. We thereby relegate the underlying input price variation into the background of the analysis and work with a given level  $v$  of per unit voter satisfaction (gross of rent extraction) which in a truly micro-based model would recur to the price variation and the respective asymmetric distribution of information via  $v=U-C_k$ .

<sup>9</sup> Notice, that the parameter  $\varphi$  may also contain an incumbency advantage.

gain the presidency in period  $t=2$ ? If all three politicians were as efficient (or, negatively formulated, as greedy) as the incumbent president, total voter satisfaction would amount to  $b_t/(1-q)=10$ . If all three politicians were as efficient as the incumbent governor of province  $i$  ( $i=1,2$ ), total voter satisfaction would amount to  $b_1/(q/n)=12$  and  $b_2/(q/n)=4$ , respectively. The sum over the three counterfactual satisfaction levels is thus  $10+12+4=26$  and, for  $\varphi=1$ , the election probabilities can be seen to correspond to the respective ratios:  $P_f=10/26=39\%$ ,  $P_1=12/26=46\%$ , and  $P_2=4/26=15\%$ .

Yardstick competition, of course, also takes place at the province level. We assume that the gubernatorial elections are contests between two candidates, one candidate being, as a rule, the incumbent governor. The challenger has no record as a public official. The voters therefore assume that the challenger, if elected, would be of average quality, i.e. the  $b$ -value of the challenger is set equal to the average  $b$ -value of all other incumbent governors.<sup>10</sup> Under these circumstances the province-level contest success functions which correspond to the contest success functions (2a and b) at the federal level have the following appearance:

$$(3) \quad Q_i(t) = \frac{\theta b_i(t-1)}{\theta b_i(t-1) + \frac{1}{n-1} \sum_{s \neq i} b_s(t-1)} \quad i=1, \dots, n,$$

where  $Q_i$  denotes the probability that the incumbent governor  $i$  is reelected. The parameter  $\theta \geq 1$  which measures the intensity of yardstick competition at the province level has the same interpretation as the yardstick  $\varphi$  at the federal level: the smaller  $\theta$  the more competitive are the contests for the gubernatorial offices.<sup>11</sup>

In our game we envisage the following sequence of moves: at a first, constitutional, stage the parameters  $n$  and  $q$  are chosen by a constituent assembly. At the following stage of the game the elected officials simultaneously determine the level of rent extraction in their respective

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<sup>10</sup> We do not include the competing incumbent in the average in order not to provide this candidate with an opportunity to influence the yardstick. In this assumption we follow Shleifer (1985).

jurisdictions. The voters are not modeled as fully fledged players, their behavior is rather summarized in the contest success functions (2a and b) and (3), i.e. by a move of nature which takes place at the end of each period.<sup>12</sup> The second stage of the game which portrays the ongoing political process is infinitely repeated, whereby we assume that the elected officials have an infinite time horizon. Moreover, we assume that an office holder who is not reelected will never come back.

We analyze our dynamic game by backward induction. In the following section we derive for a given constitution the equilibrium rent extraction levels. Section 4 then derives the optimal constitution and shows how optimal constitutional design changes in an environment of increasing economic integration.

### 3. The political process

#### *The calculus of the governments*

The objective of the elected officials is to maximize the expected value of rent extraction over time, whereby future payoffs are discounted with the discount rate  $\beta$ .<sup>13</sup> Since the decision environment does not change as time passes, we can represent the objective functions of the politicians with the help of value functions. The incumbent president maximizes the value function<sup>14</sup>

$$(4) \quad V(R_f(t)) = \max_{R_f(t+1)} R_f(t) + \beta P_f(R_f(t), R_1(t), \dots, R_n(t)) V(R_f(t+1))$$

yielding the first-order necessary condition

$$(4a) \quad \beta P_f(R_f(t), R_1(t), \dots, R_n(t)) V'(R_f(t+1)) = 0$$

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<sup>11</sup> Again, this parameter may also contain an incumbency advantage.

<sup>12</sup> This modeling strategy is similar to, for example, Appelbaum and Katz (1986).

<sup>13</sup> The assumption that the politicians are risk does not unduly restrict the generality of our analysis. For the role of risk aversion in rent seeking games, see Hillman and Katz (1987) and Konrad and Schlesinger (1999).

<sup>14</sup> Arguments other than the own rent extraction are suppressed in the presentation of the value function.

which implies that  $V'(R_f(t+1))=0$ . Using this information and the envelope condition, we arrive at

$$(4b) \quad V'(R_f(t)) = 1 + \beta \frac{\partial P_f}{\partial R_f} V(R_f(t+1)) = 0.$$

We focus in our analysis on stationary equilibria. Using the fact that in a stationary equilibrium  $R_f(t) = R_f$  for all  $t$ , the value function then reduces to

$$(4c) \quad V(R_f) = \frac{R_f}{1 - \beta P_f(\cdot)}$$

and the envelope-cum-first-order condition (4b) becomes

$$(4d) \quad 1 + \beta \frac{\partial P_f}{\partial R_f} \frac{R_f}{1 - \beta P_f(\cdot)} = 0.$$

The maximization calculus of the incumbent governors is analogous. Denoting with  $X_i$  the probability that governor  $i$  does *not* win the presidential election but *does* win the subsequent gubernatorial election, i.e. the probability of being reelected ( $X_i=(1-P_i)W_i$ ), the governors' value functions can be written as

$$(5) \quad V(R_i(t)) = \max_{R_f(t+1)} R_i(t) + \beta P_i(R_f(t), R_1(t), \dots, R_n(t)) V(R_f(t+1)) \\ + \beta X_i(R_f(t), R_1(t), \dots, R_n(t)) V(R_i(t+1))$$

with the attendant first-order necessary conditions and envelope conditions

$$(5a) \quad \beta X_i V'(R_i(t+1)) = 0 \quad [\Rightarrow V'(R_i(t+1)) = 0] \quad \text{and}$$

$$(5b) \quad V'(R_i(t)) = 1 + \beta \frac{\partial P_i}{\partial R_i} V(R_f(t+1)) + \beta \frac{\partial X_i}{\partial R_i} V(R_i(t+1)).$$

Again using the stationarity condition  $R_i(t) = R_i$  for all  $t$ , we arrive at

$$(5c) \quad V(R_i) = \frac{R_i + \beta P_i(\cdot) V(R_f)}{1 - \beta X_i(\cdot)} \quad \text{and}$$

$$(5d) \quad 1 + \beta \frac{\partial P_i}{\partial R_i} V(R_f) + \beta \frac{\partial X_i}{\partial R_i} \frac{R_i + \beta P_i(\cdot) V(R_f)}{1 - \beta X_i(\cdot)} = 0.$$

The two equations (4d) and (5d) describe the equilibrium of the political process, i.e. the rent extraction  $R_f$  and  $R_i$ , as a function of the model's parameters  $n$ ,  $q$ ,  $\theta$  and  $\varphi$ .<sup>15</sup> The two core equations (4d) and (5d) comprise the value  $V(R_f)$  given in equation (4c), the probabilities  $P_f$ ,  $P_i$  and  $W_i$  (which is a factor of  $X_i=(1-P_i)W_i$ ) given in (2a), (2b) and (3), and the three partial derivatives which have the following appearance:

$$(6a) \quad \frac{\partial P_f}{\partial R_f} = \frac{-\varphi \frac{1-q}{q} n^2 b_s}{\left\{ \frac{1-q}{q} n^2 b_s + \varphi b_f \right\}^2},$$

$$(6b) \quad \frac{\partial P_i(t)}{\partial R_i} = \frac{-\left\{ (n-1)b_s + \frac{\varphi}{n} \frac{q}{1-q} b_f \right\}}{\left\{ n b_s + \frac{\varphi}{n} \frac{q}{1-q} b_f \right\}^2}, \quad \text{and}$$

$$(6c) \quad \frac{\partial X_i(\cdot)}{\partial R_i} = \frac{\partial P_i(t)}{\partial R_i} \frac{\theta}{1+\theta} - \frac{(n-1)b_s + \frac{\varphi}{n} \frac{q}{1-q} b_f}{n b_s + \frac{\varphi}{n} \frac{q}{1-q} b_f} \frac{\theta}{(1+\theta)^2 b_s}.$$

### *Comparative institutional analysis*

We are now in a position to analyze the relationship between the design of the federation's constitution given by the tuple  $(q,n)$  and total rent dissipation  $\Sigma R_k$  occurring in the political process. Formally we thus seek the comparative static properties of the maximization calculus presented above. Since the core equations of our model - the first-order conditions or reaction functions which are essentially given in (4d) and (5d) - do not admit an analytical derivation

of the signs of the partial derivatives  $dR_k/dn$  and  $dR_k/dq$  ( $k=f,1,\dots,n$ ), we computed the numerical equilibrium values of  $R_k$  for different values of the constitutional assembly's instrument variables  $n$  and  $q$  with the help of a simulation program (based on MATLAB).

The results of the numerical simulation for the representative parameter constellation  $\phi=30$ ,  $\theta=10$  and  $\beta=0.9$  are summarized in Figure 1. This figure shows that, depending on the values of the constitutional variables  $n$  and  $q$ , four qualitatively different equilibrium regimes can emerge.

#### Regime 1 (honest governors and a moderately corrupt president):

For small values of  $n$  and  $q$  the governors turn out to implement an efficient policy, i.e. they do not extract any rents for their own benefit ( $R_i=0$  for  $i=1,\dots,n$ ). The president, on the other hand, takes advantage of his high office and extracts a positive rent.<sup>16</sup> The president, however, does not go to the limit, i.e. he leaves the citizens a positive net utility from federal policy. In other words,  $R_f$  falls short of the maximum rent which the president can, in principle, extract ( $R_f < 1-q$ ).<sup>17</sup> This type of equilibrium emerges because an "honest" governor's probability of being elected president is relatively large as long as the incumbent president has a bad track record and the number of governors (fellow challengers) is small. Moreover, the contested prize is high since the federal government's policy responsibilities are extensive which implies a large potential for rent extraction at the federal level. The incumbent president's prospects of being reelected varies negatively with  $n$  and  $R_f$ . If  $n$  is small, the trade-off between present rent extraction and reelection prospects (future rent extraction) allows the president to grab a substantial sum without unduly compromising his reelection prospects.

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<sup>15</sup> A further condition which needs to hold in equilibrium is the participation constraint which guarantees that the governors have an incentive to run for president. In all of the numerical simulations presented below, the participation constraint turned out to be satisfied.

<sup>16</sup> Since the presidency does not have any intrinsic value and the president's inefficiency can only be sanctioned by throwing him out of office (which results in a zero pay-off), he will always extract a positive rent.

<sup>17</sup> Since we normalize per unit voter satisfaction  $v$  to unity, the maximum rent the president can possibly extract per period amounts to  $1-q$



Regime 2 (honest governors and a completely corrupt president):

A second type of equilibria emerges if the number  $n$  of provinces is sufficiently large while  $q$  remains at a low value. Under these circumstances the incumbent president is still in a position to substantially enrich himself in one electoral period but he now faces many challengers and his reelection prospects are dim. He therefore grabs all he can get ( $R_f=1-q$ ) and retires. The governors' best choice remains to be honest ( $R_i=0$ ) in order to qualify for the presidential contest.

Regime 3 (moderately corrupt politicians):

If the policy responsibility of the federal government becomes sufficiently small, i.e. if the policy responsibilities of the province governments become sufficiently large, the president can extract less and less in a given election period if he wants to keep his probability of reelection unchanged. This is so because his reelection probability depends on the ratio of the size of policy responsibilities and the budget. The president, therefore, converts (in absolute terms) into a more honest agent as  $q$  increases. Correspondingly, the governors can extract larger rents as their policy responsibilities grow without compromising their prospects of electoral success. We therefore observe a third type of equilibria in which all contestants extract rents but do not go to the limit ( $0 < R_i < q/n$ ,  $R_f < 1-q$ ).

Regime 4 (moderately corrupt governors and a completely corrupt president):

For a sufficiently large number of provinces, a fourth equilibrium regime emerges between the regimes 2 and 3: the province governors begin to extract rents ( $R_i > 0$ ) in the course of an increase in their policy responsibilities before the president begins to back down from his hit-and-run strategy ( $R_f = 1-q$ ).

#### 4. The Constitutional Stage

##### *Optimal Constitutional Design*

In the previous section we have identified four equilibrium regimes: the federal government (the president) can either be moderately or completely corrupt, the province governments (the governors) can either be honest or moderately corrupt. Which regime is the best? Since a no-corruption regime is not feasible, we need to look for a constitutional design which minimizes total rent extraction  $\Sigma R_k = R_f + nR_i$  and thereby maximizes the citizens' welfare. The choice variables of the constituent assembly are the number  $n$  of provinces and the distribution of political responsibilities to the federal and provincial governments as measured by  $q$ . The citizens' welfare  $W$  (which in our numerical simulations is normalized to values in the unit interval:  $W = 1 - \Sigma R_k$ ) thus depends on in the instrument variables  $n$  and  $q$  and on the exogenous variables  $\varphi$  and  $\theta$  measuring the intensity of yardstick competition. Taking the parameter constellation used in the previous section ( $\varphi=30$ ,  $\theta=10$ ,  $\beta=0.9$ ), the simulated values of  $W(n,q)$  indicate that the maximum welfare  $W$  occurs at  $n^*=7$  and  $q^*=36.15\%$ . This implies that the best constitution for  $\varphi=30$  and  $\theta=10$  is to divide the federation into 7 provinces, to assign  $1-q^*=63.85\%$  of the policy responsibilities to the federal government and to leave the individual provinces with  $q^*/n^*=5.16\%$  of the policy responsibilities.

As can be seen in Figure 1, the optimal constitution ( $q^*=36.15\%$ ,  $n^*=7$ ) lies on the border-line between regime 1 (honest governors, moderately corrupt president) and regime 3 (moderately corrupt governors and moderately corrupt president). This is so because the constituent assembly wants to keep the governors honest. In order to minimize rent extraction at the federal level, the federal government's policy responsibilities need to be minimized, i.e. the constituent assembly maximizes  $q$  under the constraint that the governors remain honest.

### *Yardstick Competition and Constitutional Choice*

Having shown how, in principle, the optimal constitution  $(n^*, q^*)$  can be derived for given values of the exogenous variables  $\theta$  and  $\varphi$ , the next step in our investigation is to analyze the influence of yardstick competition at the provincial and federal level on optimal constitutional design, i.e. we want to discuss the qualitative features of the functional relationships  $n^*(\theta, \varphi)$  and  $q^*(\theta, \varphi)$ . Since  $\theta$  and  $\varphi$  vary negatively with economic integration, these insights contain some indications as to how a constituent assembly should behave if faced with a situation of deepening economic integration.

Above we have derived  $n^*$  and  $q^*$  for one specific parameter constellation ( $\theta=10$ ,  $\varphi=30$ ). In order to provide a feeling for what is going on, it appears advisable to elaborate a little on the shape of the welfare function  $W(n, q)$  for given values of  $\theta$  and  $\varphi$  before we show our numerical results for  $n^*$  and  $q^*$  for some more parameter constellations  $(\theta, \varphi)$ . Since it is cumbersome to visualize three-dimensional representations of the welfare function  $W(n, q)$ , we show in Figure 2 a projection of  $W(n, q)$  on the  $W/n$  plane, i.e. we show the graph of the  $W(n, q^+(n)) = \tilde{W}(n)$  function for our reference environment  $\theta=10$  and  $\varphi=30$ , where  $q^+(n)$  denotes the welfare maximizing  $q$  for a given  $n$ . It can be seen that the graph of  $\tilde{W}(n)$  is bimodal. As noted above, the absolute maximum ( $W=0.5610$ ) is located at the point  $n=7$ ; the relative maximum is located at the upper limit of  $n$ .<sup>18</sup>

Figure 3 depicts the graphs of the  $\tilde{W}(n)$  functions for  $\varphi=10, 20, 30, 40$  and  $50$  (the parameter measuring the intensity of yardstick competition at the province level remains at  $\theta=10$ ). Setting the upper limit of  $n$  ad hoc at  $\bar{n} = 100$ , we see that for  $\varphi < 20$  the welfare maximizing  $n$  jumps to the upper bound  $n=100$ . Moreover, it transpires that for  $\varphi > 20$  the welfare maximizing  $n$  varies positively with the parameter  $\varphi$  measuring the intensity of yardstick competition to which the incumbent president is exposed. A more complete picture of the

relationship between optimal constitutional design ( $n^*$ ,  $q^*$ ) and the intensity of political yardstick competition is provided in Table 1. The numerical simulation-results reported in Table 1 document the following results.

**Result 1:** *If the intensity of yardstick competition for the president's office becomes sufficiently large ( $\varphi$  sufficiently small), it is optimal to partition the federation in as many provinces as is technically possible. The optimal fraction of policy responsibilities assigned to the provincial governments is in this case at a maximum.*

The province-proliferation result is, to some extent, an artifact of our neglect of scale economies and spillovers in the provision of public goods. On a deeper level, however, the result reflects the fact that a president who does not have a realistic chance of being reelected will face only the non-negative utility constraint. He will, therefore, extract as much as he can during his one-period incumbency. Since this is well understood, the constituent assembly grants the federal government only limited policy responsibilities in order to restrict rent extraction at the federal level. This leaves the provinces with extensive policy responsibilities which, in turn, sets the stage for corruption at the province level. In order to curb the corruption incentives of the governors, the number of provinces is increased; the policy responsibility of an *individual* province is thus extremely reduced with the consequence that rent extraction would severely compromise a corrupt governor's election prospects.

We now turn to values of  $\varphi$  for which the optimal number  $n$  of provinces is unconstrained.

**Result 2:** *For  $\varphi$  sufficiently large, an increase in the intensity of yardstick competition between the province governments (i.e. a decrease in  $\theta$ ) calls for a constitutional change which assigns the province governments more policy responsibilities and increases the number of provinces (or leaves it unchanged).*

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<sup>18</sup> For  $n=1000$ , we obtain  $W=0.5364$ .

Also this result can readily be understood. An increase in the intensity of yardstick competition between lower-tier governments reduces the provincial governments' proclivity to corruption which immediately gives rise to a redistribution of policy responsibilities towards these governments. Moreover, since the federal government's reelection prospects, *ceteris paribus*, decrease as the president's policy responsibilities shrink, the federal government can be expected to become less corrupt. Under these circumstances it may be possible to increase the number of provinces (which reduces the province governments' proclivity to corruption even further) without unduly jeopardizing – via increased competition for the presidency – government efficiency at the federal level.

**Result 3:** *For  $\varphi$  sufficiently large, an increase in the intensity of yardstick competition for the president's office (i.e. a decrease in  $\varphi$ ) calls for a constitutional change which assigns the province governments less policy responsibilities and decreases the number of provinces.*

This mirrors Result 2. If  $\varphi$  decreases, the president's probability of being reelected, *ceteris paribus*, also decreases. As a consequence he is tempted to increase rent extraction because his reelection prospects are bleak anyway. To counter this invitation to corruption, two measures will be taken: first, the president's policy responsibilities are increased in order to tempt him with a second term if he does not grab too much in the present term, and, second, the number of provinces is decreased since this reduces the number of contestants in the presidential election and thus provides a compensating factor for the exogenous decrease in the president's reelection prospects. If, however, these measures are not strong enough to counter the increase in yardstick competition the constitutional policy is reversed, i.e. the president's policy responsibilities are severely curtailed and we end up in the domain of Result 1.

### *Economic Integration and Federal Constitutional Design*

What are now the consequences of our analysis for federal constitutional design in an environment of increasing economic integration? Since economic integration, first of all, makes government performance of equivalent jurisdictions more comparable, yardstick competition between the provinces will increase; in terms of our model, this increase in yardstick competition between provinces is portrayed by a decrease in the value of the parameter  $\theta$ . As economic integration deepens, an optimal federal constitution should, therefore, little by little increase the number of provinces and, at the same time, increase the policy responsibilities of the lower-tier governments at the expense of the center. In this respect globalization and federalization should thus go hand in hand.

Of course, increasing economic integration may also render the performance of the federal government more comparable to the performance of the province governments, especially if the federal government has many policy responsibilities to begin with. If this is the case, yardstick competition for the president's office also increases, i.e. the value of the yardstick parameter  $\varphi$  may well decrease in the course of economic integration. This would, in contrast to the first effect, call for a *reduction* in the number of lower-tier governments and also a *reduction* of policy responsibilities allocated to the provinces.

Notice, however, that the  $\varphi$ -induced centralization-effect holds only if the intensity of yardstick competition at the upper level still remains at relatively low values, i.e. for  $\varphi$  sufficiently large. If economic integration drives  $\varphi$  down to a sufficiently low value, the recommendation with respect to constitutional design reverses: highly integrated federal systems should be extremely fragmented and should entrust the federal state with a minimum of policy responsibilities. Since decisions with respect to a federation's stratification are largely irreversible, this leads us to conclude that in the age of globalization a reduction in the number of lower-tier governments may turn out to be a rather short-sighted and costly

strategy. If one acknowledges that constitutions are hard to change, economic integration continuing for an unforeseeable future calls for a decidedly decentralized federal constitution.

## **5. Conclusions**

Increasing economic integration has a momentous effect on government. Whereas some commentators deplore the decline in government power which results from increasingly footloose tax bases and argue for a countervailing centralization of public decision making, others welcome the fact that governments begin to feel the need to compete against each other and consequently oppose any centralization. The two views are predicated on the observer's image of government. Traditional economists interpreting government as benevolent agents of the society at large are inclined to advocate more centralized public decision structures, whereas political economists who focus more on the dark side of government, take the opposite view. Our analysis is in the political economy tradition and addresses two closely related questions: first, how does increasing economic integration impact on the efficiency of governments in a federal system, and, second, what are the consequences of a globalizing environment for the optimal design of a federal constitution?

In analyzing these questions we focus on a single aspect of endogenous federal policy determination, namely on the fact that increasing economic integration makes government performance more comparable. Our focus on political yardstick competition in a model which disregards interjurisdictional mobility of tax bases thus complements literature on tax competition.

Our general result calls for a federal structure which becomes more decentralized as economic integration deepens - decentralization meaning that the number of lower-tier government's should be rather increased than decreased and that the federal governments policy responsibilities should be reduced and shifted to the provinces. This conclusion will be

welcomed by all those of us who observe, for whatever reasons, government centralization (for example in the European Union) with a healthy dose of reservation if not apprehension. Nevertheless, academic integrity requires to emphasize that our constitutional policy recommendation is, of course, predicated on the specific focus of our study. Political yardstick competition is an important consequence of globalization – but by far not the only one. A balanced investigation into optimal constitutional design not only needs to consider all pertinent determinants but also a richer model encompassing, for example, more institutional details of public decision making and an endogenous treatment of the size of the whole public sector.



Table 1: Globalization and the optimal federal constitution

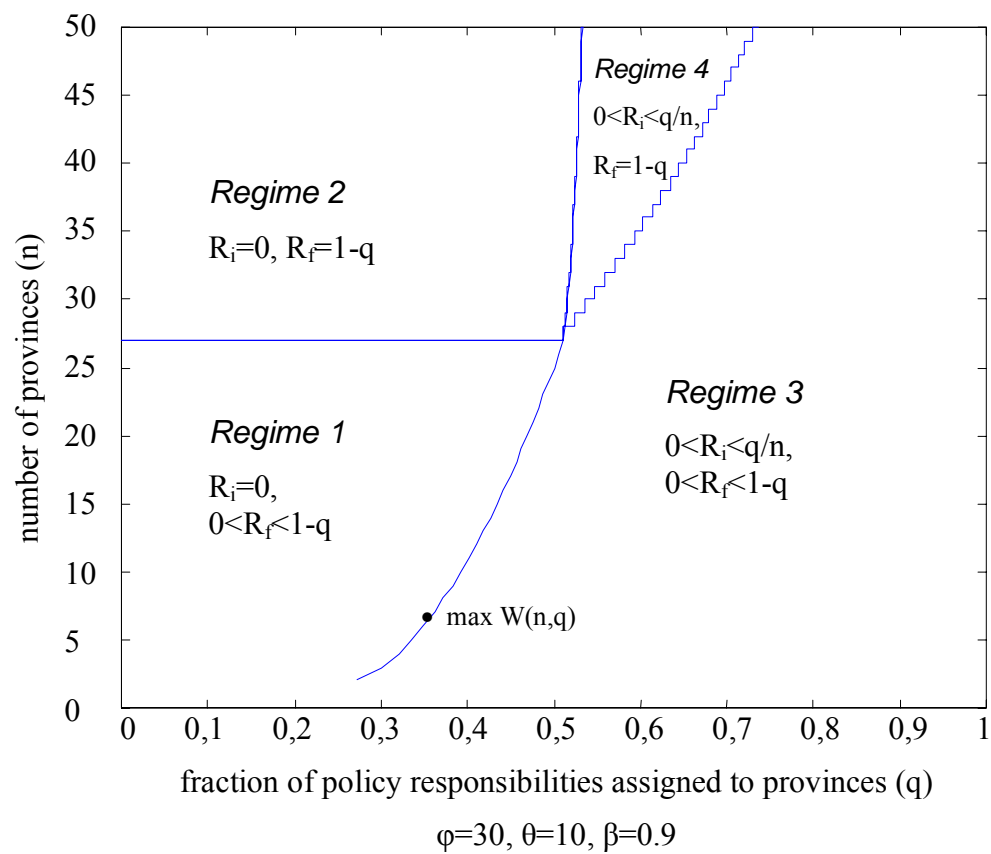
	$\varphi=10$	$\varphi=15$	$\varphi=20$	$\varphi=30$	$\varphi=40$	$\varphi=50$
$\theta=1$	<b>100</b> 55.46% <i>0.5546</i>	<b>4</b> 39.11% <i>0.5737</i>	<b>5</b> 39.92% <i>0.5832</i>	<b>7</b> 40.74% <i>0.5925</i>	<b>10</b> 41.92% <i>0.5972</i>	<b>12</b> 42.03% <i>0.6000</i>
$\theta=5$	<b>100</b> 56.47% <i>0.5647</i>	<b>100</b> 56.47% <i>0.5647</i>	<b>5</b> 37.42% <i>0.5658</i>	<b>7</b> 39.37% <i>0.5831</i>	<b>10</b> 41.25% <i>0.5924</i>	<b>12</b> 41.75% <i>0.5981</i>
$\theta=10$	<b>100</b> 54.57% <i>0.5457</i>	<b>100</b> 54.57% <i>0.5457</i>	<b>5</b> 33.68% <i>0.5399</i>	<b>7</b> 36.15% <i>0.5610</i>	<b>10</b> 38.37% <i>0.5724</i>	<b>12</b> 39.09% <i>0.5797</i>
$\theta=20$	<b>100</b> 51.94% <i>0.5194</i>	<b>100</b> 51.94% <i>0.5194</i>	<b>4</b> 27.91% <i>0.5125</i>	<b>7</b> 32.52% <i>0.5360</i>	<b>9</b> 34.15% <i>0.5492</i>	<b>11</b> 35.21% <i>0.5576</i>
$\theta=30$	<b>100</b> 50.41% <i>0.5401</i>	<b>100</b> 50.41% <i>0.5401</i>	<b>4</b> 25.97% <i>0.4994</i>	<b>7</b> 30.54% <i>0.5231</i>	<b>9</b> 32.35% <i>0.5369</i>	<b>11</b> 33.47% <i>0.5457</i>
$\theta=50$	<b>100</b> 48.73% <i>0.4873</i>	<b>100</b> 48.73% <i>0.4873</i>	<b>4</b> 24.05% <i>0.4864</i>	<b>6</b> 27.57% <i>0.5102</i>	<b>9</b> 30.50% <i>0.5242</i>	<b>11</b> 31.68% <i>0.5335</i>

n: bold entries, q: percentage values, W: entries in italics

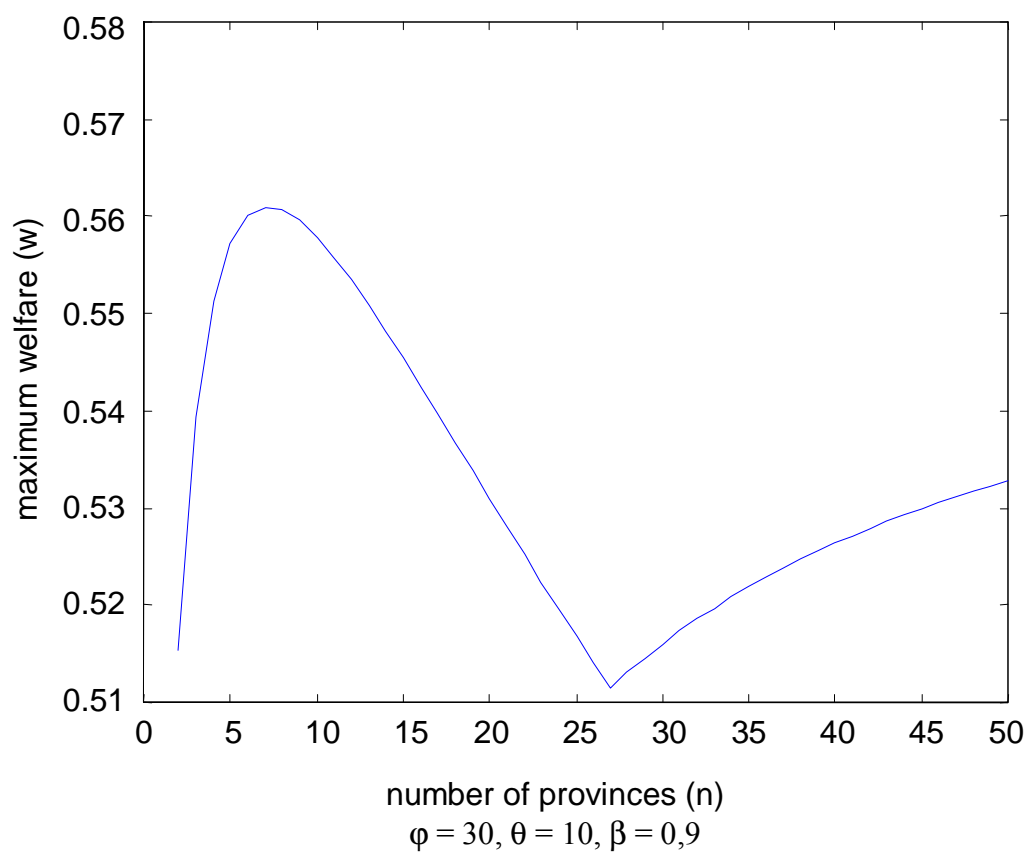
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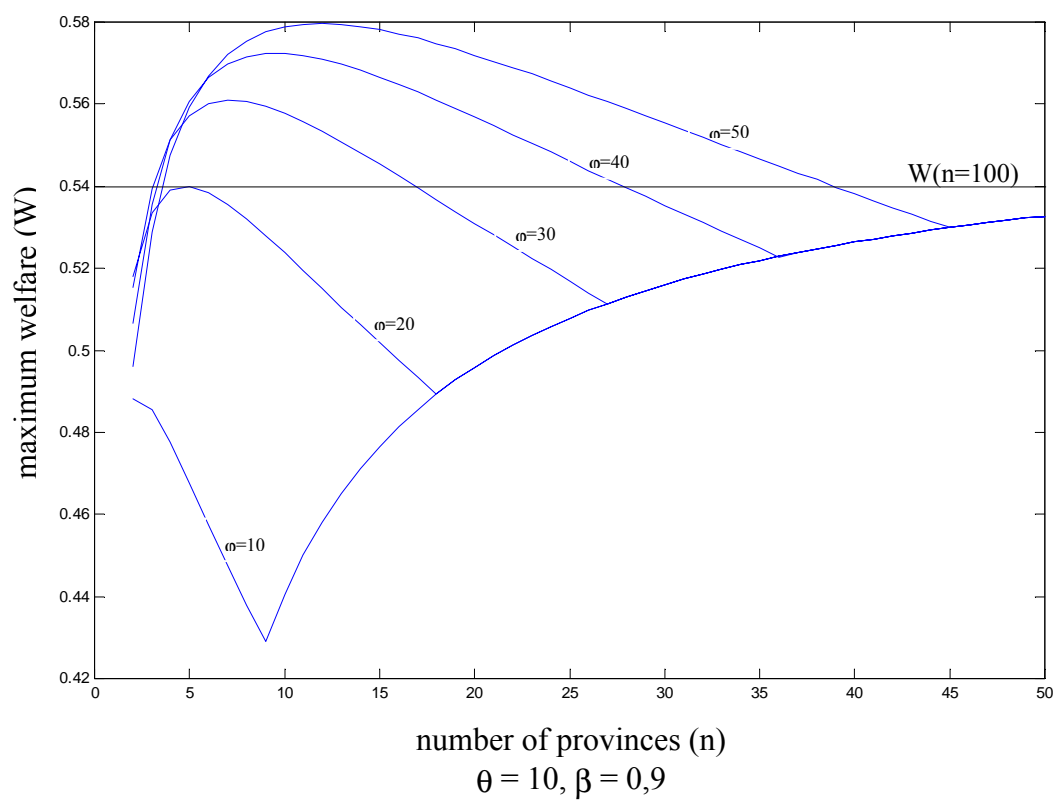
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**Figure 1**

**Figure 2**

**Figure 3**