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FEDERAL INSTITUTIONS AND THE DEMOCRATIC TRANSITION: LEARNING FROM SOUTH AFRICA

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ABSTRACT

We present a model of a peaceful transition in South Africa from white, elite rule under apartheid to a multi-racial democracy. We ask how can the emerging majority credibly promise not to exploit the once ruling elite? Under South Africa's "democratic federalism" the constitution creates an annual policy game where the new majority and the elite each control one policy instrument of importance to the other. The game has a stable, stationary democratic equilibrium that the elite prefer to autocratic rule. For the elite, the move to democracy means higher tax rates, but also higher economic growth; democracy is preferred to apartheid if the elite's rate of time preference is less than the transition's rate of return.

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FEDERAL INSTITUTIONS AND THE DEMOCRATIC TRANSITION:
Learning from South Africa

by

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"(I)t may not be enough to work purely on one-person one-vote, because every national group would like to see that the people of their flesh and blood are in the government. The ordinary man . . . must look to our structures and see that as a colored man I am represented . . . and an Indian must also be able to say, 'I am represented' . . . and the whites must say, 'I have representation.' . . . *Especially in the first few years of the democratic government we may have to do something to show that the system has got an inbuilt mechanism which makes it impossible for one group to suppress the other.*" Nelson Mandela, from at Speech in Stellenbosch, May, 1991 (As quoted in Waldmeir, pp. 213-214; Italics added.)

I. Introduction

On October 11, 1996 the National Parliament of the new Republic of South Africa (RSA) unanimously approved a new democratic constitution. The constitution emerged from over six years of negotiations between South Africa's once ruling white elite represented by the National Party (NP) led by F. W. de Klerk and the long oppressed Black and Asian majorities represented by the African National Congress (ANC) led by Nelson Mandela. The crucial parameters of the new constitution had been put in place by an Interim Constitution, approved in April, 1994, in time to validate the election of Nelson Mandela as the country's new president. The National Parliament was elected at the same time and charged with drafting the final constitution. In addition to explicitly stating citizen rights, the crucial feature of this new constitution was the creation of nine provinces, with provincial boundaries set with the expectation that the National Party would have political control in two provinces: the rural Northern Cape and the urban Western Cape. Provinces were assigned policy responsibility for the provision of K-12 education, health care services, and welfare payments. At the time of the transition, a federal fiscal constitution was crucial for the National Party's final willingness to accept democracy.[1]

In this paper, we develop a model that explains how the institutions of federalism can provide self-

[1] Waldmeir (1997) and Steytler and Mettler (2001) provide detailed accounts of the bargaining positions of the two parties as they negotiated the interim and final constitutions.

enforcing protections for the economic interests of the once ruling elite without using threats of coups or violence. In this sense, our work provides a *peaceful alternative* to Acemoglu and Robinson's (2006) own study of the democratic transition. Section II details the requirements necessary for democratic federalism to be the mutually preferred transition alternative by both the new majority and the old ruling minority. Section III specifies a model of fiscal redistribution in which taxes on the elite and redistributive services and transfers are set by democratic politics governed by either unitary and federal constitutions. In the unitary state, the new majority sets tax rates and the elite minority is taxed to the peak of its revenue hill. In the federal state, provincial boundaries are drawn to create an elite-run province with majority residents. Redistributive taxation is decided by the majority controlled central government, but now provinces, including the elite-run provinces, are assigned fiscal responsibility for the provision of at least some redistributive services – K-12 education, basic health care, and welfare transfers. Federal governance creates a "hostage" game between a majority controlled central government and the elite-run provinces that provide important redistributive services to at least some majority residents. Our central result, Proposition 1, provides the conditions under which this policy game has an equilibrium level of redistributive taxation that is less than the peak of the elite's revenue hill, where the endogenous choice of democratic institutions enforces this equilibrium. Section IV then calibrates the model to the South African political economy in 1994; we find the observed fiscal allocations from 1996 to 2006 are sustainable as a long-run policy equilibrium.

Section V evaluates the long-run economic performance of South Africa's federal democracy for majority and minority residents. Compared to the alternative of remaining in apartheid, the lifetime economic gains are sizeable for all South Africans. We also compare the federal outcomes to what might occur were the federal equilibrium to collapse and South Africa to become a de facto unitary democracy (a serious possibility in the era of post-Mandela politics). Even so, unitary governance strongly dominates apartheid for both the majority and minority residents. The long-run economic performance of federal

governance is modestly better than its unitary alternative, but either form of democracy appears sufficient, *ex post,* to economically justify leaving apartheid. Proposition 1 shows that the federal contract provided the credible *ex ante* assurance that President Mandela felt was essential to the negotiation process itself – namely, "an inbuilt mechanism which makes it impossible for one groups to suppress the other." Section VI suggests the general lessons drawn from the South African experience for other societies hoping to move from autocracy to democracy.

II. Federalism and the Democratic Transition: An Overview

This section specifies the conditions under which an appropriately designed federal constitution might facilitate the peaceful transition from autocracy to democracy. Eight assumptions underlie the analysis. *First,* the oppressed majority does not have sufficient military strength to defeat the current autocratic regime and unilaterally impose a constitution. To escape autocracy, both the oppressed majority and the current ruling elite must accept the new democratic order. *Second,* the oppressed majority is not only a demographic majority, but also a national political majority. This is the reason the elite fears unitary democracy and majority rule. *Third*, once a democratic constitution is in place, the current ruling elite turns over control of its military to the new majority. As a result, neither elite secession nor a military coup d'état restoring the elite to power is possible. *Fourth,* elite residents are free to leave the country after the democratic transition. *Fifth,* majority residents will not choose to leave, but they are free to move from one province to another in the federal democracy. *Sixth*, both the majority and the elite are fully informed as they negotiate the transition to democracy. *Seventh*, constitutional negotiators for the elite and the majority seek a democratic constitution that protects the long-run welfare of their average constituent. *Eighth*, constitutional negotiators recognize that once the constitution is in place elected politicians in the new democracy will seek to maximize the welfare of their constituents.

Specifying a successful federal constitution at the time of transition proceeds in two stages. The first stage of the transition game is the *constitutional stage*. Since neither the majority nor the elite can

unilaterally impose a democratic regime, the new constitution will require the joint approval of both the elite minority and the poor majority. The constitution can be either a *unitary*, or fully centralized, democracy with a single, majority elected central government setting all policies, or a *federal*, or decentralized, democracy where policy responsibilities are shared between the national government and constitutionally created provinces. In the case of a federal democracy, the constitution will specify provincial boundaries and assign policy responsibilities between central and provincial governments. If no, or minimal, taxing powers are given to the provinces, then the constitution must also specify intergovernmental transfers from the central government to the provinces. Both unitary and federal constitutions will allow amendments, subject to approval by a constitutionally required super- majority. In this sense, the constitutional rules and institutions must be self-enforcing.

Under federalism, the constitutionally specified *provincial boundaries* will be described by the share μ of majority residents originally partitioned to live within what we will call the elite populated province(s), where $0 < \mu \leq 1$. Provincial boundaries might allocate an initially large share of majority residents to any elite populated province as the ANC proposed, in which case the majority retains control over any constitutionally assigned provincial services. Alternatively, boundaries might be drawn to give a small share of majority residents to some or all of the elite populated provinces as the NP proposed. In this case, some provinces may be politically controlled by the elite. Once provincial boundaries are drawn, residents are free to move in response to provincial policy choices, and elite residents are free to leave the country. We view the case where $\mu = 0$ as equivalent to unitary governance, where a majority run government taxes a fully separated elite to provide redistributive services and transfers to the majority.[2]

Provincial *service assignment* are specified by $\lambda > 0$, reflecting the relative value or utility that a typical majority resident places on the redistributive services q assigned by the constitution to be provided

[2] Alternatively, when $\mu = 0$, the elite could be given control over redistributive taxation, in which case the constitution codifies elite secession. Early in the negotiations the NP proposed such a constitution, but it was quickly rejected by the ANC; see Waldmeir (1997).

by the provinces. Assigned services such as education, health care, or public housing might be important to a majority resident, in which case λ has a high value, or they can be relatively unimportant (e.g., street lighting, parks and recreation), in which case λ has a low value. For simplicity, we assume elite residents do not receive redistributive services.[3] In the case of unitary governance, all redistributive services are provided by the central government using elite tax revenues. We assume that the center is able to monitor the provision of redistributive services when it is in their interest to do so. For this reason we measure *q* as a service input bundle (which ensures "equal access" to assigned services).

Finally, we allow for the possibility that constitutions might impose a binding constraint on the majority's desire to provide redistributive services, specified as $q = \mathbf{q}$. The majority's preferred level of *q* is decided in the national legislature and, under federal democracy, required of provinces. The central legislature may be constrained to provide $q = \mathbf{q}$, however, set either by the constitution and enforced by an independent judiciary or set and enforced by an executive with veto-proof agenda powers. A constitutional constraint is present in the South African Constitution with provisions protecting the right to a healthy environment (Chapter 2.24.a), adequate housing (Chapter 2.26.1), health care services (Chapter 2.27.1), and a basic education (Chapter 2.29.1.1). This constraint is typically stated as a required minimum; when it binds ($\mathbf{q} \geq q$) and can be enforced by the judiciary, then $q = \mathbf{q}$. A politically-based constraint is possible as well when the constitution grants strong agenda powers to the President, as is the case in South Africa..[4] We represent the regime where $\mathbf{q}$ binds the central legislature by $\kappa = 1$. When constitutionally assigned judicial and/or executive powers are weak and a legislative majority can set *q* as it wishes, then $\kappa = 0$.

The attractiveness of any constitution requires an understanding of how its formal rules – specified

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[3] Elite residents certainly consume education and health care. In our model the elite receive their services either from the private sector or from the public sector paid for through non-redistributive taxation.

[4] The national executive enjoys agenda powers when they can present the majority controlled, national legislature with an all-or-nothing choice of policies constructed to achieve the executives preferred allocation. The executive agenda strategy is conditioned by the legislature's status quo option; see Romer and Rosenthal (1979). While that paper focuses on an executive wishing to spend more than the legislature's preferred allocation, the same analysis applies to an executive wishing to spend less.

here by μ, λ, and κ – constrain and therefore define the choice of valued public policies. The second stage of the transition game is therefore the *annual policy stage*. We study redistributive fiscal policies. Government(s) choose a constitutionally allowed redistributive tax rate paid by the elite (τ) to fund redistributive public services (q) and lump-sum transfers (b) for the new majority. The elite do not receive either q or b. Assigned central government policies are set by a majority elected national government. Provincial government policies are decided by a majority of residents in each province. Provinces allocate their resources to their constitutionally-assigned service responsibilities, and if any funding remains, to lump-sum transfers. We allow elite politicians in elite-run provinces to allocate some or all of their revenues not spent on q to elite services or to elite tax relief, allocations we call "elite capture" measured by the share φ ($0 \leq \varphi \leq 1$) of potential lump-sum transfers so allocated. Since the elite does not control the national government, elite capture is not possible in unitary democracies.

We solve this two-stage transition game by backward induction. First, at the policy stage, for any choice of the democratic constitution there will emerge a set of policy outcomes in each stage, or year, t of the policy game – τ_t, q_t, b_t,, and φ_t – which define the utilities of the typical majority and elite resident in that stage. For a typical majority resident this will be:

$$\omega_t(\bullet) = W_t + f(q_t, b_t, \varphi_t | \mu, \lambda),$$

and for the typical elite resident:

$$y_t(\bullet) = Y_t + h(\tau_t, b_t, \varphi_t | \mu, \lambda),$$

where the policy stage game detailed in Section III specifies:

$$\tau_t = \tau(\mu, \lambda | \wp_t); \; q_t = \kappa \cdot \mathbf{q} + (1 - \kappa) \cdot q(\mu, \lambda | \wp_t); \; b_t = b(\mu, \lambda | \wp_t); \; \varphi_t = \varphi(\mu, \lambda | \wp_t),$$

with W_t and Y_t being the majority and elite residents' pre-transfer and pre-tax incomes, respectively, and $\wp_t$ a vector of state variables describing the wider economy. W_t and Y_t and $\wp_t$ are assumed to be exogenous.

Given the outcomes of the policy stage, the value of any constitution will then be the discounted present value of all future utilities that follow from the choice of (μ, λ, κ). For majority residents:

$$V_M(\mu, \lambda, \kappa) = \sum \delta^t \cdot \omega_t(\mu, \lambda, \kappa | W_t, \wp_t),$$

while for elite residents:

$$V_E(\mu, \lambda, \kappa) = \sum \delta^t \cdot y_t(\mu, \lambda, \kappa | Y_t, \wp_t),$$

where δ is the discount factor bounded as $0 < \delta \leq 1$ specified as $\delta = 1/(1 + r)$ with r equals the majority's and elite's rate of time preference (possibly different), and where and $t = 0 \ldots \infty$. For negotiations at the constitutional stage, the set of feasible democratic constitutions will be those for which both $V_M(\mu, \lambda, \kappa)$ and $V_E(\mu, \lambda, \kappa)$ are greater than or equal to their autocratic alternatives:

$$V_M(F) = V_M(\mu > 0, \lambda > 0, \kappa) \geq V_M(A) \text{ and } V_E(F) = V_E(\mu > 0, \lambda > 0, \kappa) \geq V_E(A),$$

under federalism ($\mu > 0$) and:

$$V_M(U) = V_M(\mu = 0, \lambda > 0, \kappa) \geq V_M(A) \text{ and } V_E(U) = V_E(\mu = 0, \lambda > 0, \kappa) \geq V_E(A),$$

under unitary governance ($\mu = 0$). Majority and elite welfares under autocracy (A) are exogenous.

A federal constitution specifying provincial borders ($\mu>0$), assignment ($\lambda>0$), and service constraints (κ) will be *sufficient* for the peaceful transition to democracy if both the majority and the elite prefer either federal or unitary democracies to autocracy, but between the democratic constitutions federalism is mutually preferred to unitary governance: $V_M(F) > V_M(U) > V_M(A)$ *and* $V_E(F) > V_E(U) > V_E(A)$. The federal constitution becomes *necessary and sufficient* for the transition when both parties prefer a federal democracy but the elite prefers autocracy to a unitary democracy: $V_M(F) > V_M(U) > V_M(A)$ *and* $V_E(F) > V_E(A) > V_E(U)$. Other rank-ordering of federal, unitary, and autocratic constitutions are possible, but it will be these rankings where federalism facilitates the transition to democracy.[5]

Whether a peaceful democratic transition occurs depends crucially on exactly how constitutional

[5] Since for the federal form of governance, μ, λ, and κ can assume a variety of values, one can search for that specification of the federal constitution that allows for a successful transition. There may be many specifications of (μ, λ, κ) that qualify, but it also possible that none do. In this case, either a unitary democracy results or autocracy remains. *Unitary democracy* occurs in this full information environment when there is no pareto advantage to federalism for the majority and the elite prefers at least unitary governance to autocracy: $V_M(U) > V_M(F) > V_M(A)$ and $V_E(F) > V_E(U) > V_E(A)$. Finally, since approval by both the elite and the majority are needed for the transition to democracy, *no transition* occurs when autocracy remains the elite's preferred option: $V_E(A) > V_E(F) > V_E(U)$.

rules determine annual policy outcomes. Drawing that connection requires an explicit specification of the policy-making process. Section III provides one model of that process, where (μ, λ, κ) jointly determine (τ_t, q_t, b_t, and φ_t) as equilibrium outcomes to an infinitely repeated policy stage game. Given policy outcomes, we can estimate $V_M(\bullet)$ and $V_E(\bullet)$ and evaluate a constitution's ability to facilitate the democratic transition.

III. Constitutions and Redistributive Fiscal Policies

Redistributive fiscal policies are decided in the annual fiscal policy (stage) game, given the underlying political economy and fiscal constitution.

A. Political Economy: The underlying political economy is defined by public service technologies and by elite and majority demographics, incomes, and preferences.

Public Sector Technologies and Costs: Redistributive public services are produced by a production technology specified as:

$$q = a(\mathrm{X/M}),$$

where *(*X/M*)* is public employees (X) per majority resident (M) and *a* is employee productivity measured by years of training. There are three classes of public employees: elite providers with a_e years of training, majority providers with a_m years of training, and untrained majority providers with a_u years of training: $a_e > a_m > a_u$. We assume there are a sufficient number of elite public employees to meet any chosen level of *q* for majority residents in any constitutionally established elite run province(s). Further, we assume elite public employees will only work, or do so at full efficiency, in elite-run provinces. Either elite workers choose to live in elite, typically urban, provinces and refuse to relocate to majority-run, typically rural, provinces, or that only elected elite officials can motivate elite worker performance. Finally, there may be a constraint on the supply of trained majority providers, where *m* is the percent of majority residents that can be serviced by trained majority providers and (1 - *m*) is the percent of majority residents serviced by untrained majority providers, $1 \geq m \geq 0$.

For simplicity we assume all public employees are paid a common civil service wage, *S*, set by civil

service bargaining. Separate public wages could be allowed for the three sets of workers, but we assume such wages do not perfectly reflect differences in employee productivity. The cost per majority resident of providing q is $s(q) = S\cdot(X/M)$, or $s_e(q) = S\cdot(q/a_e) < s_m(q) = S\cdot(q/a_m) < s_u(q) = S\cdot(q/a_u)$, using elite, majority trained, and majority untrained providers, respectively. It is the elite's control over the low cost technology for the provision of public services that will provide the elite with a basis for bargaining with the majority for less than a fully exploitative redistributive tax rate.

Demographics: At the date of the transition, there are M oppressed majority adults and N_0 ruling elite adults, where $M > N_0$. Majority residents remain within the country, and there is no population growth. Elite residents may exit the country, or more generally, stay within the country but "drop out" of the taxable economy depending upon the policy choices of the government(s). The relevant policy choice for an elite resident's exit decision is the redistributive tax rate per elite resident used to finance redistributive public services and transfers: τ. We assume $N(\tau) = N_0 - \beta\tau$, where $\beta \geq 0$ measures the exit response of elite residents with respect to redistributive taxation. Redistributive tax revenues are $\tau\cdot N(\tau) = N_0\tau - \beta\tau^2$, and the redistribution maximizing tax rate is: $\tau_U = N_0/2\beta$, the rate that will be chosen when the majority controls a unitary democracy. Our analysis seeks to specify the conditions where the equilibrium redistributive tax rate chosen under federal governance, denoted as τ_F, might be less than τ_U.

Private Incomes: Majority adults earn W_0 at the time of the transition decision, while elite adults earn Y_0, where $Y_0 > W_0$. The transition to democracy from autocracy may or may not stimulate economic growth.

Preferences: Elite residents care only about their after-redistributive tax incomes, *y,* allowing for elite capture in elite run provinces at rate φ of any centrally-funded income transfers intended for majority residents. Elite residents do not consume redistributive public services. Elite resident's annual welfare is (year subscript omitted):

$$y(\bullet) = Y - \tau + \varphi\cdot b.$$

Majority residents care about their private income, W, plus redistributive income transfers after possible elite capture, $(1 - \varphi)\cdot b$, plus redistributive services, *q*. Majority residents do not pay redistributive taxes. Their annual welfare is (year subscript omitted):

$$\omega(\bullet) = W + (1 - \varphi)\cdot b + \lambda\cdot\upsilon(q),$$

where λ is the majority resident's preference "weight" for constitutionally assigned redistributive services.

B. Constitutions: We assume the constitution uses simple majority rule to elect governments. We abstract from the details of executive and legislative institutions to focus instead on the hierarchical design of democracy – unitary or federal governance. Since $M > N_0$ ($\geq N$), all policies decided by a unitary democracy will be controlled by the new majority. In a federal democracy provinces where the elite has a local majority will choose elite favored policies. The federal constitution defines borders, service and tax assignment, and minimum service standards.

Borders (μ): We specify provincial borders by the percent of the majority population (μ) assigned to an elite-controlled province(s): $\mu = M_e/M > 0$. To ensure elite political control of at least one province under federalism it will necessary to respect an upper bound on μ which we define below. In specifying this constraint we recognize that the majority can leave elite provinces and that the elite can leave the country, or perhaps more likely, the taxable economy in response to redistributive taxation.

Assignment (λ): We allocate service responsibilities between central and provincial levels of government to ensure the elite's political control over services valued by the majority and for which the elite has a production advantage – that is, for services where *q* is highly valued ($\lambda > 0$) and $s_m(q) > s_e(q)$. Responsibility for setting the redistributive tax rate on the elite is given to the central government. In unitary democracies all spending and tax responsibilities are assigned to the national government.

Service Standards (κ): Standards for the provision of redistributive services may be imposed on the majority controlled central legislature either by an independent court enforcing a binding constitutional standard or by an executive with veto-proof agenda powers, where **q** is the binding service standard. When

the standard applies, $\kappa = 1$ and $q = \mathbf{q}$. When the central legislature is free to select its own preferred level q, denoted as $q = q^*(\mu, \lambda; \wp_i)$, then $\kappa = 0$. We specify fiscal *policy* (τ, q) and feasible federal constitutions (μ, λ) for both regimes.

Constitutional Enforcement: Only constitutions that are sustainable (i.e., self-enforcing) in the second-stage policy game will be considered by the elite and the majority as credible constitutions when playing the first-stage constitutional game. In our specification, a unitary constitution is always sustainable. We focus on finding sustainable constitutions that implement *democratic federalism.* Writing a federal constitution is not enough. The majority controlled central government may ignore the provincial government assignment and provide redistributive services directly from centrally raised redistributive taxes, an outcome we call *de facto unitary governance.* Alternatively, the central government might have provincial governments provide redistributive services, but set the redistributive tax rate at its revenue maximum, We call this policy regime *administrative federalism*, suggesting that all important fiscal choices reflect the preferences of the central government majority only. Only in *democratic federalism* are elite preferences reflected in fiscal choices.

C. Elite and Majority Resident Welfare: All fiscal policies are decided subject to the aggregate public sector redistributive budget constraint specified generally as:

$$s(q) + b = g(\tau) = [\tau N(\tau) - Z]/M,$$

where s(q) is the cost per majority resident of providing redistributive services, *b* is a lump-sum redistributive transfer per majority resident, $g(\tau)$ is total redistributive spending per majority resident, $\tau \cdot N(\tau)$ is total redistributive revenues from the imposition of a redistributive tax rate, *Z* allows for payments to (> 0) or from (< 0) parties outside the elite-majority fiscal agreement, and M is the majority population.

Under federal democracies, redistributive taxes are raised centrally, *Z* is paid or received, and all remaining funds are distributed as an intergovernmental transfer of $g(\tau)$ per majority resident from the central government to the provinces. We assume that redistributive services and intergovernmental transfers

are equal across all provinces. This is the simplest specification for fiscal policy consistent with our assumption of mobile majority residents and the need to have majority citizens residing in all provinces.[6] From their intergovernmental transfer, provinces provide assigned services, after which all remaining funds are distributed by the province as a lump-sum grant. Residents in majority controlled provinces receive a basic grant $b_m = g(\tau) - s_m(q)$. Majority residents residing in elite controlled provinces receive a basic grant net of elite capture of $(1 - \varphi)b_e = (1 - \varphi)[g(\tau) - s_e(q)]$. Captured revenues are allocated to provincially provided (non-redistributive) services in elite neighborhoods, e.g., parks, extra security, improved roads.[7]

The rate of elite capture will be either of two values: φ^L and φ^H. The lower value (φ^L) is set by the ability of the majority residents in the elite province to organize costly protests when capture is observed. These protests are assumed to impose a cost ρ on each elite resident. The elite provincial leadership will therefore push φ to the point where capture remains just unobserved, φ^L. The upper value φ^H is set by the desire of majority residents to exit the elite province for a majority run province; the more attractive is the elite province to majority residents, the higher will be φ^H.[8] We treat φ^L and φ^H as exogenous and assume $0 < \varphi^L < \varphi^H \leq 1$.

The level of redistributive services q provided in each province is set by the provincial government to maximize the welfare of the provinces' controlling electorates. In elite provinces, q will be set as low

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[6] Not surprisingly, giving the central government the ability to manipulate grants to elite provinces in this world of full information – in effect, allowing complete price discrimination – will allow the majority to extract all the surplus from the transition to democracy. Our simple model of uniform grants can be extended in this direction without difficulty.

[7] There is an extensive literature estimating "fungibility" ($\varphi > 0$) of intergovernmental transfers where money intended for lower income recipients is channeled into middle class services; see, for example, Duggan (2000) and Gordon (2004).

[8] A typical majority resident receives $W + (g - s_m(q)) + \lambda \cdot \upsilon(q)$ in a majority province and $W + (1 - \varphi)[g - s_e(q)] + \lambda \cdot \upsilon(q) + E$ in an elite province, where E is their saved costs of exit, or equivalently, the amenity value of living in the elite province. For common values of q across provinces (see below), the value of φ which leaves the majority resident just indifferent between staying or leaving the elite province defines φ^H:

$$\varphi \leq \varphi^H = ([E + (s_m(q) - s_e(q))]/[g - s_e(q)] \leq 1.$$

Elite provinces with strong majority attachments will allow high rates of elite capture.

as possible, subject to a central government mandate specified as either **q** or q*. In majority provinces, q is also set at the centrally enforced standard of either of **q** or q*, for two reasons. First, majority provinces will always prefer to finance *q* using central taxation of the elite. Second, majority provinces are a majority in the central government, and if q* applies there will be no reason for any majority province to deviate from the central legislature's choice. If **q** applies, the constraint is enforced. Thus, both elite and majority provinces provide a common level of redistributive services to majority residents, either **q** or q*.

Under *democratic federalism* (*F*), the central government selects a redistributive tax rate τ_F and intergovernmental transfers $g_F = g(\tau_F)$. The welfare of a majority resident in an elite province is then:

$$\omega_e(F; \varphi^{L, H}) = W + (1 - \varphi^{L, H})[g_F - s_e(q)] + \lambda \cdot \upsilon(q),$$

depending on whether the elite chooses low or high capture. Welfare for majority residents in a majority-controlled province is specified similarly, except that there is no capture:

$$\omega_m(F) = W + [g_F - s_m(q)] + \lambda \cdot \upsilon(q).$$

The majority's political leadership is assumed to be interested in the welfare of the average majority resident, equal to the weighted average of the welfare of majority residents residing in elite province(s) and the welfare of majority residents residing in majority province(s), where the weights are the share of all majority residents residing in each type of province:

$$\omega(F; \varphi^{L, H}) = \mu\omega_e(F; \varphi^{L, H}) + (1 - \mu)\omega_m(F).$$

In equilibrium, majority residents initially allocated to the elite province (M_e) by the constitution's choice of μ ($= M_e/M$) remain in the elite province. They will exit if the elite leadership chooses $\varphi > \varphi^H$. Since this will mean all majority residents leave the province, the elite province receives no central government financing, and thus there can be no capture. The elite leadership will therefore choose $\varphi \leq \varphi^H$, and therefore the constitutionally assigned value of $\mu = (M_e/M)$ holds in equilibrium. Average majority resident welfare under democratic federalism is therefore:

$$\omega(F; \varphi^{L, H}) = W + g_F[1 - \varphi^{L, H} \cdot \mu] - s_F(q) + \varphi^{L, H} \cdot \mu \cdot s_e(q) + \lambda \cdot \upsilon(q), \qquad (1L, 1H)$$

where $s_F(q)$ is the national average cost of service input provision under federalism: $s_F(q) = \mu \cdot s_e(q) + (1 - \mu) \cdot s_m(q)$. The majority prefers low capture.

Under *administrative federalism* (*A*), the redistributive tax rate is set at τ_U with $g_U = g(\tau_U)$. However, because *q* and *b* are still administered by the provinces, elite capture is possible in elite provinces. The weighted average welfare for the typical majority resident under administrative federalism is therefore:

$$\omega(A; \varphi^{L, H}) = W + g_U[1 - \varphi^{L, H} \cdot \mu] - s_F(q) + \varphi^{L, H} \cdot \mu \cdot s_e(q) + \lambda \cdot \upsilon(q), \qquad (2L, 2H)$$

Under constitutional or de facto *unitary democracy* (*U*), the redistributive tax rate is again set at τ_U with $g_U = g(\tau_U)$, but now *q* is provided directly by the majority-run central government. Elite public employees exit the public sector. Under this assumption, the cost of providing *q* using a single unitary government is therefore $s_U(q) = m \cdot s_m(q) + (1 - m) \cdot s_u(q)$, where *m* is the share of majority residents that can be serviced by trained majority providers. Because elite providers are no longer available, public sector costs rise for any value of *q*: $s_U(q) > s_F(q)$. The redistributive grant to each majority resident under unitary democracy will be $b = g(\tau) - s_U(q)$. Since there are no elite provinces, there is no elite capture. The average majority resident's welfare is therefore given by:

$$\omega(U) = W + [g_U - s_U(q)] + \lambda \cdot \upsilon(q).$$

Elite residents do not receive redistributive services. Under *democratic federalism*, where $\tau = \tau_F$,, $g_F = g(\tau_F)$, and elite capture is allowed, elite resident welfare is:

$$y(F; \varphi^L) = Y - \tau_F + \varphi^L \cdot [g_F - s_e(q)] \cdot [M_e/N(\tau_F)], \qquad (4L)$$

for low capture, and:

$$y(F; \varphi^H) = [Y - \rho] - \tau_F + \varphi^H \cdot [g_F - s_e(q)] \cdot [M_e/N(\tau_F)], \qquad (4H)$$

for high capture, when majority residents in the elite province imposes protest costs ρ; the size of ρ is exogenous. Under *administrative federalism*, where $\tau = \tau_U$, and $g_U = g(\tau_U)$, elite resident welfare is:

$$y(A; \varphi^L) = Y - \tau_U + \varphi^L \cdot [g_U - s_e(q)] \cdot [M_e/N(\tau_U)], \text{ and,} \qquad (5L)$$

$$y(A; \varphi^H) = [Y - \rho] - \tau_U + \varphi^H \cdot [g_U - s_e(q)] \cdot [M_e/N(\tau_U)], \qquad (5H)$$

for low and high capture, respectively. Finally, under *unitary democracy*, without provinces and thus no capture, the elite resident's welfare is:

$$y(U) = Y - \tau_U. \qquad (6)$$

For any rate of capture, elite residents prefer democratic federalism to administrative federalism and administrative federalism to unitary governance. In all regimes, the elite prefers lower redistributive taxes. Finally, whether the elite prefers low or high capture depends on the net gain per elite resident from high capture compared to high capture's "protest penalty" of ρ.

Table 1 summarizes the pay-offs in any single year of the fiscal policy game for typical majority and elite residents. If $\kappa = 1$ and the constitution's minimal redistributive service standard $\mathbf{q}$ is a binding constraint, then $q = \mathbf{q}$. We call this constitutional regime the ***q*-Regime**. If constitutional constraint is not binding, then $q^* = q^*(\mu, \lambda; \wp_t) > \mathbf{q}$. We call this regime the *q*-Regime*. We solve the policy game for each regime. We present evidence below that President Mandela chose to hold central government policies in the $\mathbf{q}$-Regime, but that President Mbeki allowed ANC majority preferences to set a $q^* > \mathbf{q}$ and move the federal contract into a q*-Regime.

D. Deciding Fiscal Policies: Fiscal strategies in any given year are assumed to be chosen simultaneously. The central government can use provinces and set $\tau = \tau_F < \tau_U$ (Strategy F), use provinces but set $\tau = \tau_U$ (Strategy, A), or ignore provinces, create a unitary democracy, and set $\tau = \tau_U$ (Strategy U). The elite run provinces can adopt either a low (Strategy φ^L) or high (Strategy φ^H) rate of capture. In Table 1, Cells (1) and (4) define pay-offs under democratic federalism, cells (2) and (5) under administrative federalism, and cells (3) and (6) under unitary governance.

To obtain $\tau_F < \tau_U$, the majority must prefer average majority welfare in cells (1) or (4) in Table 1 as an equilibrium outcome. Since $\tau_U > \tau_F$ and thus $g_U > g_F$, however, the majority will always be tempted in any single budget period to defect from the federal allocation of τ_F to τ_U, either to administrative federalism or unitary governance. The elite clearly prefers to have the majority choose τ_F, but they too may

be tempted to defect from the equilibrium federal allocation of cell (1) to high capture in cell (4) if the returns from high capture φ^H are attractive enough. Thus the federal fiscal allocation in cell (1) cannot be a stable, long-run equilibrium allocation when the fiscal policy game is played only once, or more generally, a finite number of times.

We seek to specify the conditions on the federal constitution under which the federal fiscal allocation at cell (1) will be a sustainable equilibrium of the annual fiscal policy game. To discourage defection requires first, that both the majority and the elite have a credible punishment strategy if the other defects from the federal allocation, and second, that the punishment strategy imposes sufficient harm on the defecting party that they prefer to remain in the federal allocation.

If the elite defects from the federal agreement and selects high capture (φ^H), the majority's credible punishment strategy is to raise taxes to τ_U but retain provinces (cell 5), or to raise taxes to τ_U but shut down provinces (cell 6). If the majority were to defect and select high taxes (τ_U), the elite's punishment strategy would be to adopt high capture (cell 5). For high capture to be a credible elite punishment, however, three conditions must hold: (i) the elite majority must prefer φ^H to φ^L when the majority defects; (ii) the elite must be a political majority in at least one province so they can implement φ^H; and (iii) provinces must remain as viable fiscal jurisdictions, even when the majority defects from democratic federalism. Formally:

DEFINITION: CREDIBLE ELITE PUNISHMENT. *The high capture strategy will be a credible punishment strategy when:*

> *(i) The elite prefers the high capture strategy to low capture when the majority defects to administrative federalism, i.e.,* $y(A; \varphi^H) > y(A; \varphi^L)$;
>
> *(ii) The elite remains a political majority in at least one province, i.e.,* $N(\tau_U) \geq M_e$; *and,*
>
> *(iii) The poor majority prefers provinces and administrative federalism as their defection alternative –* $\omega(A; \varphi^L) > \omega(U)$ *– and as their punishment strategy when the elite defects –* $\omega(A; \varphi^H) > \omega(U)$.

These three requirements define two constraints on the federal constitution. The first, called the *Border Constraint*, specifies lower and upper bounds for the constitutional parameter μ and ensures that conditions

(i) and (ii) are met. The second, called the *Assignment Constraint*, specifies lower and upper bounds for values for **q** for the **q**-Regime ($\kappa = 1$) or for values for λ for the q*-Regime ($\kappa = 0$).

*Border and Assignment Constraints in the **q**-Regime:* Condition (i) requires the elite to prefer the strategy φ^H whenever the majority defects from federalism to administrative federalism . In the **q**-Regime this requires:

$$y(A; \varphi^H) > y(A; \varphi^L) \Leftrightarrow (\varphi^H - \varphi^L)[g_U - s_e(\mathbf{q})][M_e/N(\tau_U)] > \rho,$$

or:

$$(M_e/M) = \mu > \{\rho[N(\tau_U)/M]\}/\{(\varphi^H - \varphi^L)[g_U - s_e(\mathbf{q})]\} \equiv \mu^{min}(\mathbf{q}), \quad (7)$$

where μ is the fraction of the nation's majority residents who reside in the elite province. We use a strict inequality, assuming that the elite prefers to cooperate rather than defect, all else equal. For φ^H to be credible, there must be enough majority residents in the elite province so that the additional resources captured using φ^H exceed the costs imposed by local political protests when capture is high. But the elite must still be a political majority in their province. Because condition (ii) must also hold μ cannot be too large. Thus $N(\tau_U) \geq M_e$, or dividing by M:

$$N(\tau_U)/M = \mu^{max} \geq \mu = (M_e/M). \quad (8)$$

For high capture to be a credible punishment strategy for a given **q**, the constitutionally mandated population size of the elite province must satisfy the ***q**-Border Constraint* specified as:

$$\mu^{max} \geq \mu > \mu^{min}(\mathbf{q}). \quad (9)$$

Condition (iii) for credible elite punishments requires that if the central government defects or punishes the elite, it continues to do so within the federal structure where provinces still have fiscal responsibilities – that is, within administrative federalism and not unitary governance. For the majority's defection strategy, condition (iii) holds when:

$$\omega(A; \varphi^L) > \omega(U) \Leftrightarrow s_U(\mathbf{q}) - [s_F(\mathbf{q}) - \varphi^L \cdot \mu \cdot s_e(\mathbf{q})] > \varphi^L \cdot \mu \cdot g_U,$$

where the LHS of the fully specified inequality represents the additional expenditures needed to provide **q**

under unitary governance and the RHS represents the savings in less capture by adopting unitary governance. This inequality holds when **q** is sufficiently large, defined by:

$$\mathbf{q} > \mathbf{q}^{\min}(\mu; \varphi^{L}) = (\varphi^{L}\cdot\mu\cdot g_{U})/[S\cdot\hat{a}(\mu; \varphi^{L})]. \tag{10}$$

Raising **q** reduces the basic grant available for capture, and therefore favors using administrative federalism. For the majority's punishment strategy, condition (iii) requires:

$$\omega(A; \varphi^{H}) > \omega(U) \Leftrightarrow s_{U}(\mathbf{q}) - [s_{F}(\mathbf{q}) - \varphi^{H}\cdot\mu\cdot s_{e}(\mathbf{q})] > \varphi^{H}\cdot\mu\cdot g_{U},$$

which holds when **q** now meets the constraint:

$$\mathbf{q} > \mathbf{q}^{\min}(\mu; \varphi^{H}) = (\varphi^{H}\cdot\mu\cdot g_{U})/[S\cdot\hat{a}(\mu; \varphi^{H})]. \tag{11}$$

The binding constraint will be eq. (11).[9]

But **q** cannot be set too high either. As **q** increases, the net return to capture declines for the elite and may eventually fall below the amount needed for the elite to find the high capture strategy a preferred response to defection. The maximum value of **q** that protects φ^{H} as a credible punishment strategy will be that **q** (= $\mathbf{q}^{\max}$) where the $\mu = \mu^{\min}(\mathbf{q})$ just holds for the constitutionally chosen value of μ. From eq. (7),

$$\mathbf{q}^{\max}(\mu) = \{g_{U}\cdot(\varphi^{H} - \varphi^{L})\cdot\mu - \rho\cdot[N(\tau_{U})/M]\}/[(\varphi^{H} - \varphi^{L})]\cdot\mu\cdot(S/a_{e})]. \tag{12}$$

The constitutional ***q**-Assignment Constraint* is defined by:

$$\mathbf{q}^{\max}(\mu) \geq \mathbf{q} > \mathbf{q}^{\min}(\mu; \varphi^{H}). \tag{13**q**}$$

When both the **q**-Border and **q**-Assignment Constraints are met, the elite's use of φ^{H} is a credible punishment response to the majority's defection from the federal fiscal allocation of $\tau_{F} < \tau_{U}$. It follows:

LEMMA 1: CREDIBLE ELITE PUNISHMENTS IN THE q-REGIME. *For political economies satisfying the **q**-Border and **q**-Assignment Constraints, the high capture strategy will be a credible punishment strategy for the elite whenever the majority adopts a revenue-maximizing (centralizing) redistributive tax rate.* (Proof: See Appendix.)

Figure 1 illustrates the feasible constitutional values of μ and **q** sufficient to ensure credible elite punishments for South Africa. The **q**-Border Constraint requires that μ lie above the $\mu^{\min}(\mathbf{q})$ curve and below

[9] From the definitions of $s_{U}(q)$, $s_{F}(q)$, and $s_{e}(q)$: $\hat{a}(\mu; \varphi^{L,H}) = \mu\cdot[(1/a_{m}) - (1/a_{e})] + (1 - m)\cdot[(1/a_{u}) - (1/a_{m})] + (\mu\cdot\varphi^{L,H}/a_{e}) > 0$. From these definition $\hat{a}(\mu; \varphi^{L,H})$ and the fact that $\varphi^{H} > \varphi^{L}$, $\mathbf{q}^{\min}(\mu; \varphi^{H}) > \mathbf{q}^{\min}(\mu; \varphi^{L})$ for all values of μ.

the μ^{max} line. The **q**-Assignment Constraint requires that **q** lie to the right of the $\mathbf{q}^{min}(\mu; \varphi^H)$ curve and at or to the left of $\mathbf{q}^{max}(\mu)$. The shaded area shows values of μ and **q** where the constraints are jointly satisfied.

Border and Assignment Constraints in the q-Regime:* In the case where neither a judicial or executive constraint is binding on the central legislature, redistributive services will be set the preferences of the majority in the central legislature. We specify the majority's preferred level of q from $\partial\omega/\partial q = 0$, where the majority's marginal benefits of providing q equals its marginal cost in each of the three constitutional regimes, conditional upon the elite's choice of capture:

$$(F, \varphi^L): \lambda\cdot\upsilon'(q) = p_L(\mu) \equiv s_F'(q) - \varphi^L\cdot\mu\cdot s_e'(q) \Rightarrow q^* = q^*(\mu, \lambda; \varphi^L) = q^*_L(\mu, \lambda)$$

$$(F, \varphi^H): \lambda\cdot\upsilon'(q) = p_H(\mu) \equiv s_F'(q) - \varphi^H\cdot\mu\cdot s_e'(q) \Rightarrow q^* = q^*(\mu, \lambda; \varphi^H) = q^*_H(\mu, \lambda)$$

$$(A, \varphi^L): \lambda\cdot\upsilon'(q) = p_L(\mu) \equiv s_F'(q) - \varphi^L\cdot\mu\cdot s_e'(q) \Rightarrow q^* = q^*(\mu, \lambda; \varphi^L) = q^*_L(\mu, \lambda)$$

$$(A, \varphi^H): \lambda\cdot\upsilon'(q) = p_H(\mu) \equiv s_F'(q) - \varphi^H\cdot\mu\cdot s_e'(q) \Rightarrow q^* = q^*(\mu, \lambda; \varphi^H) = q^*_H(\mu, \lambda)$$

$$(U): \lambda\cdot\upsilon'(q) = p_U \equiv s_U'(q) \Rightarrow q^* = q^*_U(\lambda)$$

The unit prices of q in the two federal regimes, $p_L(\mu)$ and $p_H(\mu)$, fall as μ, the share of majority residents benefitting from low cost elite providers, increases.[10] Thus, $\partial q^*_L/\partial\mu > 0$ and $\partial q^*_H/\partial\mu > 0$. Majority benefits from q rise as λ rises. Thus $\partial q^*_L/\partial\lambda > 0$ and $\partial q^*_H/\partial\lambda > 0$ as well. Finally, because the prices for q under low or high capture are similar for the *F* and *A* constitutions, the majority funds the same level of q in these regimes, denoted as $q^*_L(\mu, \lambda)$ and $q^*_H(\mu, \lambda)$, respectively. Under unitary governance, there are not elite provinces ($\mu = 0$) and thus no capture. Since $s_U'(q) > s_F'(q)$ and $\varphi^H > \varphi^L$, $p_U > p_L(\mu) > p_H(\mu)$ for all $\mu > 0$. We assume $\upsilon''(q) < 0$; therefore $q^*_U(\lambda) < q^*_L(\mu, \lambda) < q^*_H(\mu, \lambda)$. Border and assignment constraints can now be specified conditional on μ and λ and the majority's choice of q.

As before, the border constraint follows from the requirement that the elite province must adopt the high capture strategy when the majority defects to administrative federalism. Condition (i) for credible high

[10] This follows directly from the definitions of $p_L(\mu)$ and $p_H(\mu)$ and the facts that $a_e > a_m$ and $1 > \varphi^L$.

capture now requires:[11]

$$y(A; q^*_H, \varphi^H) > y(A; q^*_L, \varphi^L) \Leftrightarrow \{\varphi^H \cdot [g_U - s_e(q^*_H(\mu, \lambda))] - \varphi^L \cdot [g_U - s_e(q^*_L(\mu, \lambda))]\} \cdot [M_e/N(\tau_U)] > \rho,$$

or:

$$(M_e/M) = \mu > \{\rho[N(\tau_U)/M]\}/\{\varphi^H \cdot [g_U - s_e(q^*_H(\mu, \lambda))] - \varphi^L \cdot [g_U - s_e(q^*_L(\mu, \lambda))]\} = \mu^{min}, \qquad (14)$$

where for pair of values of μ and q^*_H there is an associated value of λ and thus of q^*_L which then allows us to specify a value for $\mu^{min} = \mu^{min}(q^*_H)$. Condition (ii) requiring elite political control sets the upper bound of μ^{max}, again set by equation (8). Together, the *q*-Border Constraint* is specified as:

$$\mu^{max} \geq \mu > \mu^{min}(q^*_H). \qquad (9^*)$$

The *q*-Assignment Constraint* is specified from condition (iii) for credible elite punishments defined for majority chosen values of *q** as $\omega(A; \mu, q^*_L(\mu, \lambda), \varphi^L) > \omega(U; q_U^*(\lambda))$ to ensure provinces survive the majority's decision to defect and $\omega(A; \mu, q^*_H(\mu, \lambda), \varphi^H) > \omega(U; q_U^*(\lambda))$ to ensure provinces survive the majority's decision to punish any defecting elite province. As with the **q**-Regime, the binding assignment constraint will be defined by the requirement that provinces survive the majority's punishment decision. From Table 1's specifications of $\omega(A; \mu, q^*_H(\mu, \lambda), \varphi^H)$ and $\omega(U; q_U^*(\lambda))$, this requirement reduces to:

$$[\upsilon(q^*_H(\mu, \lambda)) - p_H(\mu) \cdot q^*_H(\mu, \lambda)] - [\upsilon(q^*_U(\lambda)) - p_U \cdot q^*_U(\lambda)] > \varphi^H \cdot \mu \cdot g_U, \qquad (15)$$

where the LHS of (15) measures the difference between the consumer surplus earned by a typical majority resident under administrative federalism when the price of assigned services is $p_H(\mu)$ and that surplus earned by the majority resident under unitary democracy when the price of a comparable service bundle is p_U. Since $p_U > p_H(\mu)$, consumer surplus is greater under administrative federalism. Because of elite capture, however, administrative federalism also imposes an income loss $\varphi^H \cdot \mu \cdot g_U$ on the average majority resident. To meet the q*-Assignment Constraint, assigned services – indexed by λ – must generate a gain in consumer surplus from adopting administrative federalism rather than unitary governance that exceeds the income loss of elite

[11] We are implicitly assuming that high capture is profitable so that: $\varphi^H \cdot [g_U - s_e(q^*_H(\mu,\lambda))] - \varphi^L \cdot [g_U - s_e(q^*_L(\mu, \lambda))] > 0$. This constraint places an absolute value upper bound on the majority's price elasticity of demand for assigned goods, generally no larger than 2.

capture. The more important are assigned services to the majority ($\lambda\uparrow$), the larger becomes the gain in consumer surplus from moving to administrative federalism from unitary governance, and thus the more likely that condition (iii) will hold. The value of λ where the inequality in eq. (15) just holds defines a minimal value for λ, denoted as $\lambda^{min} = \lambda^{min}(\mu)$. For each value of μ there is an associated value of q^*_H that defines the minimal q^*_H consistent with a credible elite punishment: $q^{*min}_H(\mu) = q^*_H(\mu, \lambda^{min}(\mu))$.

As in the case for an exogenous **q**, here too there is an upper bound on majority demanded *q* consistent with a feasible federal allocation, now specified as an upper limit on λ. If the assigned services are too important, the majority demands (and can enforce) a high value of $q = q^*_H(\mu, \lambda)$ which reduces the amount of resources that can be captured by the elite when adopting strategy φ^H. Given μ and the cost of high capture, ρ, there is a value of λ for which high capture is no longer a credible choice for the elite. This maximal value for λ, denoted λ^{max}, is defined by $\mu^{max} = \mu^{min}(\lambda)$: $\lambda^{max} = \lambda^{max}(\mu)$. For each value of μ, there is a maximal q^*_H consistent with a credible elite punishment specified as: $q^{*max}_H(\mu) = q^*_H(\mu, \lambda^{max}(\mu))$. Given a choice of provincial borders μ, $q^{*min}_H(\mu)$ and $q^{*max}_H(\mu)$ define the lower and upper bounds for q^*_H – and implicitly the bounds on service assignment, λ – for the *q*-Assignment Constraint*:

$$q^{*max}_H(\mu) \geq q^*_H(\mu, \lambda) > q^{*min}_H(\mu). \qquad (13q^*)$$

When the q*-Border and q*-Assignment Constraints are jointly satisfied, the elite's use of φ^H is a credible punishment response to the majority's defection from τ_F in the q*-Regime. Thus,

LEMMA 2: CREDIBLE PUNISHMENTS IN THE q*-REGIME. *For political economies satisfying the q*-Border and q*-Assignment Constraints, the high capture strategy will be a credible punishment strategy whenever the majority adopts a revenue-maximizing (centralizing) redistributive tax rate.* (Proof: See Appendix.)

The shaded area in Figure 2 shows the set of provincial borders (μ) and values of $q^*_H(\mu, \lambda)$ that satisfy the q*-Border and q*-Assignment Constraints for the South African economy.

Comparing the coordinates of the shaded areas in Figures 1 and 2 (points *ABC*) shows that for South Africa the set of federal constitutions allowing credible elite punishments in the q*-Regime is a subset of credible constitutions in the **q-**Regime. This result holds generally as Lemma 3:

LEMMA 3: FEASIBLE FEDERAL CONSTITUTIONS**:** *The set of feasible constitutions allowing democratic federalism is smaller in the q*-Regime than the* ***q*****-Regime. For any elite provincial border (*μ*), the level of minimally acceptable assignment must satisfy,* $q^{*min}_{H}(\mu) > \mathbf{q}(\mu)$*. For any common* $q_H^* = \mathbf{q}$*, the size of the minimally acceptable elite province must satisfy* $\mu^{min}(q_H^*) > \mu^{min}(\mathbf{q})$*. The maximal size of the elite province,* μ^{max}*, is the same in both the q*- and* ***q****-Regime.* (Proof: See Appendix.)

Allowing the majority legislature the right to choose the level of constitutionally assigned redistributive services narrows the set of constitutions which can sustain credible elite punishments, thus reducing the set of constitutions that can potentially sustain a federal fiscal allocation in the long run. We offer evidence below that South Africa may need a strong court or a strong executive committed to the **q**-Regime to guarantee the long-run viability of its federal democracy.

Ensuring the feasibility of majority and elite punishments does not guarantee that a federal fiscal allocation can exist as a long-run equilibrium of the annual policy game. A federal allocation will only survive if punishments for deviating from (τ_F, φ^L) are sufficient to discourage defections. Formally:

DEFINITION: SUSTAINABLE FEDERAL ALLOCATIONS: *The strategy pair (F,* φ^L*) will be a sustainable fiscal allocation if that pair is a subgame-perfect Nash equilibrium for the infinitely repeated fiscal policy game.*

Under democratic federalism, the majority sets $\tau_F < \tau_U$ and provides intergovernmental redistributive transfers of $g_F < g_U$. The elite selects φ^L. In each budget period the majority and elite residents are better off under democratic federalism than they might be under joint defection to administrative federalism with high capture.

Proposition 1 defines the conditions for when democratic federalism is an equilibrium by specifying minimum and maximum bounds on central government tax rates and intergovernmental transfers. We do so for the case where majority and elite residents both play "grim trigger" strategies in an infinitely repeated fiscal policy game. Under the grim trigger strategy, the elite plays $\varphi^L < \varphi^H$, but were the majority to defect from democratic federalism select τ_U, the elite would punish the majority by selecting φ^H forever.[12]

[12] It is useful to ask whether the elite could select a "tighter" threshold tax rate less than τ_U for the implementation of its punishment strategy, φ^H. For elite punishments limited to a known upper rate of capture, as here, the answer is *no*. Announcing a lower threshold tax rate, say $\tau < \tau_U$, for implementing φ^H would not be credible. Once the lower threshold τ was crossed and φ^H imposed, no further punishment is possible. Given a fixed φ^H (see fn. 10),

Similarly, the majority plays $\tau_F < \tau_U$ but were the elite to defect from the federal allocation and play φ^H, the majority would respond by playing τ_U forever.[13]

The minimal tax rate (τ^{min}) and associated intergovernmental transfer (g^{min}) defines the minimal redistribution required for the majority to find the strategy pair (F, φ^L) its preferred long-run outcome, rather than defect to (A, φ^L) and run the risk of (A, φ^H). The maximal tax rate (τ^{max}) and associated transfer (g^{max}) defines the maximal level of redistribution the elite will accept in (F, φ^L), rather than defect to (F, φ^H) and then too run the risk of (A, φ^H) as a long-run equilibrium. For a subgame perfect equilibrium for the annual fiscal policy game,

$$\tau^{max} \geq \tau_F > \tau_F{}^{min}, \textit{ or equivalently, } g^{max} \geq g_F > g^{min},$$

must hold. We state our central proposition using the bounds $g^{max} \geq g_F > g^{min}$.

PROPOSITION 1: SUSTAINABLE DEMOCRATIC FEDERALISM: *For a political economy satisfying the payoffs of Table 1 and our Border and Assignment Constraints, there exists a grim trigger strategy equilibrium in which democratic federalism is sustainable, and in that equilibrium:*

> *1) The central government majority chooses a level of intergovernmental transfers (tax rate) bounded between a maximal grant (tax rate) acceptable to the elite and a minimal grant (tax rate) acceptable to the majority specified as:*
>
> $$g_U > g^{max}(\kappa, \delta) \geq g_F > g^{min}(\kappa, \delta) > 0,$$
>
> *conditional the presence of a binding constitutional redistributive service standard ($\kappa = 1$ or 0), and a common discount factor bounded as $0 < \delta \leq 1$; and,*
>
> *2) The elite province(s) adopts the fiscal strategy φ^L.*

The complete specifications for the g^{max} and g^{min} bounds for the **q-** and q*-Regimes are given in the Appendix along with an outline of the proof.

A variety of comparative static properties follow directly from the specifications of $g^{max}(\kappa, \delta)$ and

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the majority's optimal strategy is to then raise taxes to τ_U; see Table 1 (cell 2H). The elite's only credible threshold for its trigger strategy is therefore τ_U. It would be instructive to consider whether credible elite punishment "schedules" could be designed which might allow a more aggressive trigger strategy and thus a tighter upper limit for τ_F.

[13] These grim trigger strategies are the most extreme form of punishment one player can impose on the other for defection in this game and therefore give democratic federalism its best chance of being sustained; see Gibbons (1992, p. 99).

$g^{min}(\kappa, \delta)$. Of particular importance for the prospects for South Africa's democracy are the consequences of changes in κ and δ. As the majority and elite become less patient and δ declines, $g^{min}(\kappa, \delta)$ increases and $g^{max}(\kappa, \delta)$ declines. This narrows the range of federally sustainable redistributions.[14] From Lemma 3, federal constitutions that are sustainable under the **q** regime ($\kappa = 1$) may not be under the q* ($\kappa = 0$) regime. To date, Presidents Mandela and Mbeki appear to have succeeded in enforcing a **q** regime, but recent budgets suggest pressure for more redistributive spending and a risk of a q* regime. In a q* regime, South Africa's federal democracy is no longer sustainable.

IV. Is South Africa's New Federal Democracy Sustainable?

There is little doubt that South Africa's transition from autocracy to democracy would not have occurred had the majority ANC and the two major minority parties, the elite NP and the tribally based Zulu Inkata Freedom Party, not been willing to accept a federal fiscal constitution with at least one politically protected province for each minority party, and with each province promised significant, but not fully autonomous, fiscal powers.[15] It was only after this agreement was reached in mid-April of 1994, codified as the Interim Constitution, could democratic elections could go forward. By all measures, the elections were a success. Ninety percent of the population voted in a peaceful and honest election, with Nelson Mandela Present. The NP emerged as the leading opposition party with 21 percent of the national vote. Finally, as expected, the NP and IFP each won political control over their own province, Western Cape and KwaZulu-Natal respectively.[16]

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[14] Comparative statics for the model's other important exogenous parameters can also be specified. A larger outside obligation or less outside aid (Z), a greater majority population (M),a lower rate of maximal elite capture(φ^H, holding φ^L fixed), and a larger penalty for high capture(ρ) each increases $g^{max}(\kappa, \delta)$ and reduces or leaves unchanged $g^{min}(\kappa, \delta)$. Thus the bargaining range for acceptable redistribution expands. Higher values of a_e relative to a_m and a_u lowers both $g^{max}(\kappa, \delta)$ and $g^{min}(\kappa, \delta)$; no qualitative predictions are possible for these changes.

[15] Waldmeir (1997, Chapter 13).

[16] Provincial borders were originally drawn to facilitate a NP victory in the Northern Cape as well to accommodate the rural whites; see Muthien and Khosa (1998). While the white landowners voted for the NP, the white farmhands failed to vote and the Northern Cape was won by the ANC by a small majority. It was remained an ANC province ever since.

While the Interim Constitution created independent provinces and the ground rules for Presidential and Parliamentary elections, it left the fiscal details of the new federal system largely unspecified. The Final Constitution, approved in 1996, filled the gap by specifying the assignment responsibilities of the central and provincial governments, allowable provincial taxes, and the role for intergovernmental transfers. In addition, the Constitution created a Financial and Fiscal Commission (FFC) to propose and review all fiscal matters pertaining to provincial governments, All FFC recommendations are reviewed and possibly amended by the Finance Department, then approved by the President, and finally voted upon by Parliament as part of the national budget. Currently, and for the foreseeable future, the Presidency and Parliament are tightly controlled by the ANC with the party leader currently serving as President. Given their control over the ANC, Presidents Mandela and Mbeki have served as veto-proof agenda-setters for South African fiscal policy.

Table 2 summarizes the present structure of intergovernmental finance, listing aggregate central government revenues, total redistributive grants per capita (g_F) for the country as a whole, for the elite-run Western Cape and the other, majority-run provinces, provincial spending for assigned redistributive services in the elite ($s_e(q)$) and majority provinces ($s_m(q)$), and the remaining basic grant available to the elite (b_e) and majority provinces (b_m) to fund other provincial services. Three facts are evident: 1) Provincial governments have been given a significant role in the provision of redistributive services, funded entirely by grants from the central government; 2) the elite Western Cape receives approximately 20 percent less in assigned services grants, $s_e(q)$, consistent with their efficiency advantage in providing services; and 3) basic service grants, b_e, available for capture by the elite are significant. The question now arises: Is this structure of redistributive public finance consistent with sustainable federal governance? Specifically: Are the requirements of Lemma 1 or 2 satisfied, and if so, is the resulting level of redistributive spending consistent with the predictions of our Proposition 1?

A. *Political Economy*: Table 3 summarizes our best estimates of the economic and demographic

parameters needed to calibrate the South African economy at the time of transition.[17] The initial, pre-democracy elite and majority voting age populations were N_0 = 9.6 million and M = 25 million residents. Elite and majority pre-democracy incomes are Y_0 = 86,000 (real 2000) Rand/Elite Adult (≃$22,000 USD in 1996) and W_o = 9,700 (real 2000) Rand/Majority Adult (≃ $2,500 USD), respectively. Because no South African data were available to directly estimate the elite's response to redistributive taxation, we calibrated β to imply a plausible peak to the national revenue hill from elite resident taxation. Setting β = .00015 implies a revenue maximizing tax rate of approximately 67 percent.[18]

Estimates of the elite's potential rate of capture of unallocated grants are from recent estimates of the rates of capture by bureaucrats running Ugandan local schools: φ^L = .20 and φ^H = .85.[19] Protest costs borne by elite residents from engaging in high capture was set at .02 of elite resident income or ρ = 1720 (real 2000) Rand/Elite Resident; .02 (s.e. = .008) is our estimate of the percentage loss in elite income from the Black unions' power during the latter stages of apartheid; see Section V, Table 5.

Public employee productivity is assumed to be proportional to their years of training; we use as our estimates of a_e, a_m, and a_u the years of schooling of white (elite) teachers (= 17 years), certified Black and Colored (trained majority) teachers (a_m = 14 years), and uncertified Black (untrained majority) teachers (a_u = 7 years), respectively. The fraction of the majority population that can be serviced by trained majority public employees (m) under unitary governance was computed knowing the eligible majority population and the number of trained majority teachers and primary care medical providers: m = .825. Our estimate of the

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[17] A Data Appendix available upon request provides the details and data sources for Table 3.

[18] Setting β = .00015 implies a revenue-maximizing redistributive tax rate per elite resident of 32,000 Rand, or approximately 37 percent as the maximal share of elite income (Y_0) that can be allocated to fiscal redistribution. The required tax rate on individual personal incomes needed to fund central government expenditures other than redistributive aid is approximately 30 percent. As a point of comparison, a recent estimate for the revenue maximizing tax rate on taxable personal income for middle and upper income U.S. households is 71 percent; see Gruber and Saiz (2002). Based on a sensitivity analysis, we fine that all conclusions below are robust up to values of β = .00025. Setting β = .00025 implies a revenue maximizing tax rate on elite incomes of .52, well below any estimate of the maximal national tax rate for middle and upper income households.

[19] See Reinikka and Svensson (2003, 2004).

common public employee salary S is the average salary for teachers in 2001. The total cost per majority resident of providing any level of redistributive services in elite and majority provinces and under unitary governance are summarized in Table 3.

The discount factor is set at $\delta = .97$, consistent with the real rate of return on ten year South African bonds averaged over 1996-2006 of $r = .03$. Majority preferences for redistributive services, q, are represented as $\lambda \cdot \upsilon(q) = \lambda \cdot \ln(q)$, where λ is estimated to be at least 4123 from the most recent expenditure for redistributive services under the assumption that this budget was set by majority, ANC preferences.[20]

Finally, our estimate of Z as payments to ($Z > 0$) or from ($Z < 0$) parties outside the elite-majority agreement is set at $Z = 600$ Million (Real 2000) Rand, or about $100 million. This is our estimate of the original homeland payments made to King Zwelithini and the Zulu nation under apartheid. In the new South Africa these payments have been made as "supplemental" transfers to the IFP controlled province of KwaZulu-Natal as the likely price for having IFP agree to the Interim Constitution and peaceful elections in April, 1994.[21]

B. Federal Constitution: The boundaries of the Western Cape were drawn to ensure a province for the NP elite, while the borders for KwaZula-Natal were adjusted to give the IFP control of that province.[22] For purposes of this analysis of redistributive fiscal policies, we treat KwaZula-Natal as a majority (low-income) province. Based upon election outcomes and the population of the Western Cape, we allocate 18.4

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[20] For a log-linear specification of preferences, the demand specification for q* is: $q^*_L = \lambda / p_L(\mu)$. Thus $\lambda = q^*_L \cdot p_L(\mu)$. We estimate $p_L(\mu) = 5355$ R/q^*_L for this political economy. The last budget reported in Table 2 implies an average value of $q = .77$. If so, then if $q^*_L = .77$ and $p_L(\mu) = 5355$ R/q^*_L, then $\lambda = 4123$. We treat $\lambda = 4123$ as a lower bound estimate of ANC preferences, since we have good reasons to suspect that these last budgets were in fact constrained budgets, though responsive to growing pressure on Mbeki from the ANC rank and file to be more redistributive. See *Financial Times*, September 21, 2007, p. 4, "Boost for Zuma's Leadership Campaign."

[21] See Waldmeir (1997, Chapter 13).

[22] See Muthien and Khosa (1998), particularly pp. 43-49.

percent of South Africa's voting-age majority population to the Western Cape. Thus $\mu = .184$.[23]

The final constitution designated the delivery of primary health care, K-12 education, and social welfare transfers and services as provincial responsibilities. The elite holds a strong training (productivity advantage) over majority public servants in the provision of these services. From 1996-2000, the FFC recommended, the Finance Department and President Mandela accepted, and the ANC controlled Parliament approved the following standards for provisional provided redistributive services: 1 teacher per 38 school-aged children, 3.5 preventive health care clinic visits a year for each majority adult and child for health care, and 4500 (real 2000) Rand for each eligible (elderly, disabled, child in poverty) majority resident for social security transfers. Together, these targets require redistributive grants sufficient to fund the equivalent of .038 public employees per majority resident.[24] Assuming an average value of $a = 14$ years of training, we estimate the target level of redistributive services as recommended by the FFC and approved by Parliament as $q = 14 \cdot (.038) = .53$ public employee training-years per majority resident. To fund this standard, intergovernmental service transfers of 1636R/Capita are needed in the majority provinces and 1,346R/Capita in the elite province.[25] These funding levels are very close to those reported in Table 2 for the last two fiscal years of the Mandela administration, FY 98/99 and FY 99/00. We conclude the Mandela presidency is a **q**-

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[23] In the 2004 Western Cape elections, the ANC won 45 percent of the vote, while a four-party coalition of elite parties won 51 percent of the vote; see www.elections.org.za. We therefore define $\mu = (M_e/M)$ so that $N(\tau_F)/[M_e + N(\tau_F)] = .51$. $N(\tau_F)$ is estimated to be only slightly larger than 4.8 Million. Thus $M_e = 4.6$ Million, and $\mu = (M_e/M) = 4.6M/25M = .184$.

[24] The value of (X/M) is estimated from FFC targets and the assumption that (1) each majority adult has one child requiring .026 education professionals per majority resident; (2) each medical professional can provide 3.5 visits to each of 500 majority residents a year requiring .002 health care professionals per majority resident; and (3) that approximately 17 percent of the majority population qualifies for some form of income assistance for an average spending per majority resident of 765 Rand per year or, in fiscally equivalent units of a public employee, about .0095 public employees per majority resident. Together the mandates require funding sufficient to pay for .0375 public employees per majority resident. See FFC, *The Allocation of Financial Resources Between the National and Provincial Governments*, *FY 1996/97*, September 8, 1995, p. ii.

[25] Required spending per majority adult to support $\mathbf{q} = .53$ equals $S \cdot (X/M) = S \cdot (\mathbf{q}/a) = 80{,}000 \cdot (.53/14) = 3030$ Rand/Majority Adult. The average ratio of majority adults to total population is .54 (=25M/46M), implying a required redistributive service grant *per capita* of 1636R/Capita (= 3030 x .54). To fund $\mathbf{q} = .53$ in the elite province, $S \cdot (\mathbf{q}/a) = 80{,}000 \cdot (.53/17) = 2494$R/Majority Adult is required or approximately 1,346R/Capita (= 2494 x .54).

Regime with the **q** standard set by the FFC and enforced by President Mandela's agenda powers.

Provincial budgets for redistributive services under President Mbeki show a significant break from the Mandela budgets. For the Mbeki years, the required level of redistributive services rose from q = .56 in FY 00/01 to q = .77 in FY 05/06.[26] While the Mandela presidency is plausibly viewed as a **q**-Regime, the Mbeki presidency may be either a **q**-Regime with a more redistributive president *or* a q*-Regime with the president acquiescing to the redistributive preferences of the ANC Parliament. Knowing which regime applies is crucial for predicting the credibility of elite punishment and thus the long-run sustainability of democratic federalism in South Africa. Current events in South Africa suggest that Mbeki has been a strong President, holding in check the redistributive preferences of the ANC rank and file, now finding a credible voice in the candidacy of Jacob Zuma for head of the ANC.[27] If so, then the **q**-Regime applies for the Mbeki presidency as well and we need to ask: Are the Border and Assignment Constraints of Lemma 1 met?

C. Credibility of Elite Punishments: Given the political economy of Table 3, the fully shaded area of Figure 1 shows the set of all constitutionally chosen borders (μ) and mandated assignments (**q**) that will satisfy the Border and Assignment Constraints of Lemma 1. The upper bound for μ is the maximal share of the majority population that can be allocated to the Western Cape to ensure that the elite is always in political control: $\mu^{max} = N(\tau_U)/M = 4.8m./25m. = .192$. The lower bound for μ, the line $\mu^{min}(\mathbf{q})$, is from the Border Constraint and specifies the minimal share of the majority population that must be allocated to the elite province so that φ^H is a credible punishment. The constitution's choice of $\mu = .184$ and the FFC-specified and Mandela enforced value of $\mathbf{q} = .53$ falls just within the required set for credible elite punishments: $\mathbf{q}^{max}(\mu = .184) = .71 \geq \mathbf{q} = .53 > .50 = \mathbf{q}^{min}(\mu = .184; \varphi^H = .85)$. The conditions for Lemma 1 hold for the Mandela Presidency.

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[26] Estimated as the weighted average value of q in elite and majority provinces, where q in each province is computed as redistributive spending per person in that province from Table 2, divided by majority residents/person in each province then divided by (S/a_e) for elite provinces and (S/a_m) for majority provinces.

[27] See *Financial Times*, September 21, 2007, p. 4, "Boost for Zuma's Leadership Campaign."

Matters are less clear for the last years of the Mbeki presidency. Up to FY 04/05, the Mbeki administration set $\mathbf{q} \leq .71$ in each year, but in FY 05/06, $\mathbf{q} = .77$. This required level of redistributive services lies outside the set of sustainable federal constitutions for a **q**-Regime, though just barely; see Figure 1. A small reduction in our estimate of the cost of high capture (ρ) from 1,720R/Elite Adult to 1,550R/Elite Adult restores the credibility of the elite's punishment strategy when $\mathbf{q} = .77$; lower values of ρ shift $\mu^{min}(\mathbf{q})$ downward in Figure 1. We have estimated ρ by the annual average costs to elite incomes of Black union influence in the last years of apartheid; a value of ρ = 1,550R/Elite Adult is well within the confidence interval of this estimate.[28] Mbeki appears to be pushing, or is being pushed towards, the limits of sustainable federalism.

Sustainability of the federal arrangement appears even more uncertain if the we interpret the last years of the Mbeki presidency as yielding to the redistributive preferences of the ANC majority. If so, then $q = .77$ is not a measure of Mbeki's constrained choice of redistributive services, but rather an estimate of the ANC majority's preference for q in democratic federalism. In this case the q*-Regime applies and the requirements of Lemma 2 must be met. For $\lambda = 4123$, we estimate $q_H^*(\mu = .184; \lambda = 4123) = .86$,[29] which lies well outside the estimated bounds of the Assignment Constraint for sustainable democratic federalism: $q^*_H{}^{max}(\mu = .184) = .69 \geq q^*_H(\mu; \lambda) > .59 = q^*_H{}^{min}(\mu = .184)$; see Figure 2. Again we can estimate that value of ρ that would be just sufficient to move $q_H^* = .86$ inside the set of sustainable constitutions through a downward shift of the q*-Regime's Border Constraint, $\mu^{min}(q^*_H)$. If ρ were to fall to 1200R/Elite Adult – approximately one standard deviation below our best estimate – then South Africa's federal constitution would just meet the Border and Assignment Constraints of Lemma 2. Consistent with Lemma 3, the pareto

[28] See Section V and Table 5 where we estimate the effect of organized Black unions (COSATU) on the annual rate of growth of South Africans' incomes as .02 (s.e. = .008). Assuming elite incomes at the start of democracy equal 86,000R, then the mean effect of union-type protests would be 1,720R with a 95 percent confidence interval of 3096R to 344R.

[29] The ANC's demand for q in the case of high capture will be $\lambda \cdot \upsilon'(q_H^*) = 4123/q_H^* = 4{,}793 = p_H(\mu = .184)$, or $q_H^* = 4123/4793 = .86$.

efficient, federal equilibrium is more difficult to sustain when majority preferences set the level of required redistributive services.

D. ***Redistributive Fiscal Policies***: Table 4 predicts the level and distribution of intergovernmental transfers for the Mandela and Mbeki presidencies under the assumption that the both presidents are successful agenda-setters and the **q**-Regime applies. In the case of the Mbeki presidency with **q** = .77, we have adjusted the costs of protest, ρ, to equal 1,550R/Elite Adult to ensure the conditions of Lemma 1 hold. We then use the results of Proposition 1 with Administrative Federalism as the majority's credible punishment to compute the bounds for aggregate redistributive transfers: $g^{max} \geq g_F > g^{min}$.

Mandela's redistributive budgets were favorable to the elite on two counts. First, mandated redistributive services were set at **q** = .53, well below the maximal level of **q** = .71 consistent with sustainable federalism; see Figure 1. This left roughly half of redistributive intergovernmental transfers as unconstrained aid susceptible to elite capture. Second, the aggregate level of redistributive spending fell well below the range predicted by Proposition 1 consistent with elite and majority bargaining powers: g^{max} = 32934R $\geq g_F >$ 3068R = g^{min}. By setting actual redistributive transfers at 2100R per capita (see Table 2), President Mandela chose to use only 2/3's of the redistributive potential available within democratic federalism. Mandela, it appears, took to heart his admonition in his 1991 Stellenbosch speech that "especially in the first few years of the democratic government we may have to do something to show that the system has got an inbuilt mechanism which makes it impossible for one group to suppress the other." We have argued that sustainable democratic federalism is such a mechanism.

Mbeki's presidency, however, has been testing the redistributive limits of democratic federalism. First, mandated redistributive services have been increased in each budget and currently lie just at (**q** = .71) or outside (**q** = .77) the set of sustainable constitutions; see Figure 1. Second, aggregate redistributive transfers have increased steadily in each of Mbeki's six budgets; today's total transfers per capita of 3061R are very near the predicted range from Proposition 1: g^{max} = 3293R $\geq g_F >$ 3142R. On both dimensions

President Mbeki has moved the federal fiscal contract to near the limits of sustainability.

The question now remains: Anticipating that the Mandela budgets would be short-lived and the federal fiscal contract may be pushed to its redistributive maximum, did the elite make the right decision in agreeing to a peaceful democratic transition? Section V provides an answer.

V. The Economic Value of the Democratic Transition

The value of the democratic transition for South Africa's majority and elite residents equals the difference between the present value of economic welfare under democracy and that under apartheid. Under unitary governance this equals $\Delta V_M(U) = V_M(U) - V_M(A)$ for majority residents and $\Delta V_E(U) = V_E(U) - V_E(A)$ for elite residents. Under federal governance, $\Delta V_M(F) = V_M(F) - V_M(A)$ and $\Delta V_E(F) = V_E(F) - V_E(A)$ apply. A peaceful transition occurs when $\Delta V_M(U) > 0$ and $\Delta V_E(U) > 0$ or $\Delta V_M(F) > 0$ and $\Delta V_E(F) > 0$ hold. Using the results of the second stage policy game in Section IV to estimate annual utilities, we can then compute the ΔV's for the first stage constitution game and evaluate the transition choice. Table 6 provides these estimates.

With the continuation of apartheid, the typical majority resident is assumed to receive their market wage W = 9,700R per year (Table 3) adjusted each year by our estimates (Table 5) for South Africa's rate of growth of income under the apartheid regime. Also under apartheid, the average majority resident is assumed to receive redistributive services through homeland governments of $q = .16$.[30] The elite resident under apartheid is assumed to receive their market wage of Y = 86,000R per year (Table 3) also adjusted each year by the apartheid regime's rate of growth (Table 5). Netted from elite incomes are the annual real costs of homeland payments for q plus expenditures for military, police, and prisons. Together, we estimate

[30] During the last years of apartheid, homeland budgets averaged 26.3 Billion (2000) Rand per year or about 1052Rand for each of the 25 million majority adult residents; Development Bank of South Africa, *Annual Report*, Various Years. We assume these services were provided by trained and untrained majority providers at a cost of 6714 Rand per unit of q (Table 3; $s_U(q)$). Thus q = .16 = 1052R/6714R. This is probably a generous estimate, given that a significant share of homeland payments were thought to go to the personal use of the homelands' tribal leaders.

these annual tax costs of apartheid as 6,250 Rand per elite adult resident.[31]

Under democracy the typical majority resident receives their initial market wage of 9,700R per year now adjusted by our estimates of income growth under democracy (Table 5). Under democracy, the majority resident receives a significant increase in redistributive services, initially to $\mathbf{q} = .53$ under Mandela and then to $\mathbf{q} = .77$ in the last year of the Mbeki presidency. If South Africa remains a federal government, then we hold $\mathbf{q} = .77$ as the limit of redistributive services consistent with democratic federalism. If, however, the federal contract collapses and South Africa becomes a de facto unitary democracy, then we set $q = q^*_U (\lambda = 4123) = .61$ as required for the majority choice of redistributive services.

The elite resident under democracy receives their initial wage of 86,000R per year, again adjusted annually by income growth under democracy (Table 5). Expenditures for military, police, and prisons are still required under democracy. We estimate the annual tax costs per elite resident of these services at 8,145R.[32] Democracy's most significant fiscal consequence for elite welfare, however, is the large increase in redistributive taxation. If South Africa remains a federal government, the elite's annual tax costs for redistribution, net of any savings from provincial capture, are estimated as 29,242R per elite resident.[33] Under unitary democracy, the elite's annual tax costs for redistribution will be 32,000 Rand per elite resident; see Table 3. There is no capture. Total annual tax burdens per elite resident will be 37,387R under a federal democracy and 40,145R under unitary democracy. Democracy will need to provide a significant

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[31] Average annual expenditures for military, police, and Justice Department services over the period 1977-1993 totaled 33.7 Billion (2000) Rand per year; South African Department of Information, Perskor, South Africa, Various Years. Average annual homeland expenditures were 26.3 Billion (2000) Rand per year; Development Bank of South Africa, Annual Report, Various Years. Total expenditures are therefore 60 Billion Rand, which when allocated over the 9.6 million elite adults, averages to 6,250Rand per elite adult resident.

[32] Total spending for military, police, and prisons has averaged 39.1 Billion (2000) Rand per year since the end of apartheid. Under redistributive taxation, the elite population is estimated to be 4.8 million adults. Thus, the annual tax burden per elite resident for security spending will be 8,145R (= 39,100 Million Rand/4.8 Million Elite Adults).

[33] In the federal equilibrium, there will be approximately 5.1 million adult elite residents and 25 million adult majority residents. Taxes paid to the central government by each elite resident support g_F will be $(25/5.1)\cdot(6098) = 29,892$; see Table 4. Elite capture at the rate of $\varphi^L = .20$ equals $.20\cdot[g_F - s_e(q)][M_e/N(\tau_F)] = .20[6098 - 2494]\cdot(4.6/5.1) = 650$R/Elite Resident. The net tax burden will therefore be 29,892 - 650 = 29,242R.

growth dividend above apartheid for the elite to favor a transition to democracy.

Table 5 estimates this growth dividend by comparing the rates of growth of income in South Africa under apartheid (1950-1993) to growth during the first seven years (1994-2000) of the new democracy. The apartheid years can be divided into three regimes. The early years, 1950 -1975, were largely peaceful and allowed South Africa's full participation in the world economy. That changed in 1976 with the Soweto massacre of innocent school children protesting the requirement they be taught in Afrikaans. The international community responded with a series of increasingly constraining trade sanctions lasting until 1993. We represent this regime by the indicator variable SANC = 1 for 1976-1993 (0 otherwise). The third regime began in 1985 with the formation of the activist union federation known as The Congress of South African Trade Unions or COSATU. We represent this regime by the indicator variable COSATU = 1for 1985-1993 (0 otherwise). The post-apartheid years are represented by the indicator variable DEM = 1 for 1994-2000 (0 otherwise).

Table 5, column 1 provides estimates of the effects of each regime on South Africa's real rate of growth. The average rate of growth for the 25 peaceful years of apartheid was 2.431 percent per annum (SANC = COSATU = DEM = 0). For the nine years of sanctions only, the growth rate fell to .877 percent per annum (= 2.431 - 1.554). From 1985 to 1993, when both sanctions and strong unions were in force , the annual growth of the apartheid economy became negative, -1.222 percent per annum (= 2.431 - 1.554 - 2.099). Democracy restored a positive rate of growth of .666 percent per annum (= 2.431 - 1.765) as trade sanctions were lifted (SANC = 0) and COSATU adhered to ANC economic policies (COSATU = 0).

Table 5, columns 2-4 illustrates the paths through which each regime impacted growth. Country growth depends fundamentally upon trade openness (OPEN = (Exports + Imports)/GDP)) and the rate of domestic investment (INV = Gross Investment/GDP); see col. 2. Sanctions had their primary effect through restricted trade (col. 3), while strong unions limited both trade (col. 3) and the rate of domestic investment (col. 4) during apartheid. Democracy's positive impact on growth has been through improved trade openness

(col. 3); at least as of 2000, there has been no significant improvement in the rate of domestic investment under democracy (col. 4).[34] Since 2000, we separately estimate the economy to be growing at an average annual rate of 2.5 percent per annum; we use 2.5 percent as our estimate of the future rate of growth for this economy.[35]

Table 6 computes the long-run economic benefits for majority and elite residents from the transition from apartheid to either a federal or unitary democracy. Annual utility for majority residents under apartheid equals $\omega_t(A) = W_t + \lambda \cdot \upsilon(q_t = .16)$, $\omega_t(F; \varphi^L)$ under democratic federalism, and $\omega_t(U)$ under unitary democracy. In each case we specify $\lambda \cdot \upsilon(q_t) = 4123 \cdot \ln(q_t)$ as the utility value of redistributive services to majority residents. Annual utility for elite residents equals $y_t(A) = Y_t - 6{,}250$ under apartheid, $y_t(F; \varphi^L)$ under democratic federalism, and $y_t(U)$ under unitary democracy. Utilities are discounted at a real rate of interest of .03 ($\delta = .97$) over a horizon of 70 years, beginning from1994, the date of the transition decision.

For majority residents, both federal and unitary democracies are unambiguously preferred to apartheid, even from this strictly economic perspective. Majority residents gain from improved economic growth and receive a larger redistributive transfer. Federal governance is preferred, though only slightly. The lifetime welfare gain for a young majority resident is 596,000 Rand (≃ $99,300) by moving to a federal democracy and 576,000 Rand (≃$96,000) by moving to a unitary democracy.

Importantly elite residents also benefit economically from the transition to democracy. Though redistributive taxation is significantly higher under both federal and unitary democracies, the growth dividend from abandoning apartheid is more than compensating over the long-run. Elite residents prefer federal democracy, since it controls maximal transfers and allows capture in the elite province of spending

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[34] Trade openness improves from a value of 34.374 under apartheid (= 52.038 - 12.198 - 5.466) to a value of 48.129 under democracy (= 52.038 - 3.909). For anecdotal evidence on the importance of trade sanctions, see Waldmeir (1997, pp. 23 and 56) and Hufbauer, Schott, and Elliott (1990; pp. 221-248). The rate of investment, however, does not change between the last years of apartheid and the first years of democracy: 8.201 (= 14.777 - .203 -.6.366) under apartheid vs. 7.635 (= 14.777 - 7.142) under the first years of democracy.

[35] Source: South African Reserve Bank, www.reservebank.co.za, Time Series KBP6244J.

not required for redistributive services. Both effects are modest, however. The lifetime welfare gain for a young elite resident of moving to a federal or unitary democracy is equal to about 2.2 million Rand (≃ $367,000). While the young elite clearly gain, older elite residents might not. Elite residents would need to live to at least 2014 under federalism and to 2016 under unitary governance for democracy's higher growth to compensate in a present value sense for democracy's higher taxes; see Table 6. For South Africa's young elite, the internal rate of return for moving from apartheid to a federal or unitary democracy is .122 or .116, respectively. Elite residents with a real rate of time preference less than .122 ($\delta \geq .89$) prefer democracy to apartheid.

For both the majority and elite residents of South Africa moving from apartheid to democracy made good economic sense, primarily by undoing the dysfunctional private economy created by the repressive apartheid regime. Both outside sanctions and inside economic pressures from organized labor imposed large penalties on the private economy.[36] While the institutions of democratic federalism as implemented in South Africa add to the gains of the transition, we see with 20-20 hindsight that they may not have been necessary to the original democratic agreement. (Unitary democracy appears nearly as beneficial.) Still, from our analysis in Sections III and IV, federalism did provide the basis for a credible promise by the majority not to fully exploit the economic wealth of the minority. It was only with this credible promise in hand that negotiations could move forward to the election of Nelson Mandela as the President of the new South Africa.

VI. Concluding Remarks

South Africa's transition from autocracy to democracy stands as one of the significant political events of the last century. The transition was peacefully negotiated, the democratic bargain is holding, and the majority and elite residents of South Africa have, on average, shared in the significant economic dividend

[36] It is useful to ask whether either sanction or COSATU alone would have been enough to make the transition attractive. Perhaps not. Sanctions alone would have reduced the apartheid growth rate to .88 per annum (= 2.431 - 1.554), implying a "break-even" date (ΔNPV $\geq$ 0) for the elite of 2037 and an internal rate of return to the transition of .063. COSATU alone would have reduced the apartheid rate of growth to .33 per annum (= 2.431 - 2.099) with an implied "break-even" data of 2026 and a transition internal rate of return of .086.

arising from the new democracy. Our model and its application to the South African transition also suggest three general lessons for what might be required to facilitate the move from autocracy to democracy in other settings.

First, if all parties in autocracy have the ability to veto the new democratic regime, then the democratic transition must provide additional economic resources sufficient to ensure all parties can be made better off by the transition. There must be either a "peace dividend" from reduced outlays for military or police expenditures or a "growth dividend" from improved resource allocations and higher growth. It is the growth dividend that has proven so valuable for South Africans.

Second, all parties capable of blocking the democratic agreement must share in the benefits that the agreement creates, and each party's gains must be credibly protected against subsequent exploitation by the other agreeing parties. Providing these credible protections is the responsibility for democracy's new institutions. Giving minorities control over the military is certainly one option. Alternatively, one can use democratic institutions to create "hostage" games where each party to the new constitution can use a non-exploitable asset to penalize the other parties if they deviate from the agreed to division of the democratic dividend. In South Africa, these institutions were created by the federal constitution which utilized and protected the elite's human capital advantage in providing education, health care, and welfare administration. Elite provinces "control" the provision of important public services to the majority; the majority central government "controls" elite after-tax incomes. While federal institutions are one example of our approach, one can imagine other applications for other transition economies. For example, capital market institutions and ownership rights might be designed to recognize elite human capital advantages in finance and firm management.

Third, since the benefits of democracy may be delayed, some or all of the negotiating parties may need to be sufficiently patient – that is, δ must be sufficiently high – to ensure that long-run gains from the transition exceed short-run costs. Older elites, or those with plans to retire to Switzerland, may not find the

gains from a peaceful transition to democracy sufficiently attractive. In such cases, armed conflict may be the only option for the oppressed majority. Fortunately, South Africa's ruling elite took the long view. As F. W. de Klerk stated just after the elections of 1994: "We could have clung to power for another five to ten years...(b)ut it was the way towards destruction."[37]

Finally, these general lessons help to place our work in the wider debate as to the relative contributions of institutions or endowments to long-run economic growth. The South Africa experience provides a clear example of where institutional design – federalism – facilitated the democratic transition and it was the democratic transition that allowed subsequent country growth. At the same time, it was the elite's substantial endowment of human capital that gave reason and content to the institutions that allowed the democratic transition. In our analysis of South Africa, both institutions and endowments matter.

[37] Waldmeir (1997), p. 273.

REFERENCES

Acemoglu, Daron., Simon Johnson, and James Robinson (2006), *Economic Origins of Dictatorship and Democracy*, New York, NY: Cambridge University Press.

Duggan, Mark (2000), "Hospital Ownership and Public Medical Spending," *Quarterly Journal of Economics*, Vol. 115 November, 1343-1375.

Gibbons, Robert (1992), *Game Theory for Applied Economists*, Princeton, N.J.: Princeton University Press.

Gordon, Nora (2004), "Do Federal Funds Boost School Spending? Evidence from Title I," *Journal of Public Economics*, Vol. 88, August, 1771-1792.

Gruber, John and Emmanuel Saez (2002), "The Elasticity of Taxable Income: Evidence and Implications,"*Journal of Public Economics*, Vol. 84, April, 1-32.

Hufbauer, Geoffrey, Jeffrey Schott, and Kimberly Elliot (1990), *Economic Sanctions Reconsidered: History and Current Policy* (2nd Edition), Washington, D.C.: Institute for International Economics.

Muthien, Yvonne and Meshack Khosa, (1998), "Demarcating the New Provinces: A Critical Reflection on the Process," in Y. Muthien and M. Khosa (eds.), *Regionalism in the New South Africa*, Brookfield, U.S.: Ashgate, 23-56.

Reinikka, Ritva. and Jakob Svensson (2003), "The Power of Information: Evidence From a Newspaper Campaign to Reduce Capture," Mimeo. World Bank, December.

Reinikka, Ritva and Jakob Svensson (2004), "Local Capture: Evidence From a Central Government Transfer Program in Uganda," *Quarterly Journal of Economics*, Vol. 119, May, 679-709.

Romer, Thomas and Howard Rosenthal (1979), "Bureaucrats vs. Voters: On the Political Economy of Resource Allocation by Direct Democracy," *Quarterly Journal of Economics*, Vol. 93, May, 562-587.

Steytler, Nico and Johann Mettler (2001), "Federal Arrangements as a Peacemaking Device During South Africa's Transition to Democracy," *Publius: The Journal of Federalism*, Vol. 31, Fall, pp. 93-106.

Waldmeir, Patty (1997), *Anatomy of a Miracle: The End of Apartheid and the Birth of the New South Africa,* New York: W. W. Norton and Company.

TABLE 1: THE POLICY GAME

MAJORITY PAYOFFS per MAJORITY CITIZEN

STRATEGIES	MAJORITY STRATEGY F: (τ_F; PROVINCES > 1)	MAJORITY STRATEGY A: (τ_U; PROVINCES > 1)	MAJORITY STRATEGY U: (τ_U)
ELITE STRATEGY: φ^L	(1L) $\omega(F; \varphi^L) = W + g_F[1 - \varphi^L \cdot \mu] - s_F(q) + \phi^L \cdot \mu \cdot s_e(q) + \lambda\upsilon(q)$	(2L) $\omega(A; \varphi^L) = W + g_U[1 - \varphi^L \cdot \mu] - s_F(q) + \varphi^L \cdot \mu \cdot s_e(q) + \lambda\upsilon(q)$	(3) $\omega(U) = W + g_U - s_U(q) + \lambda\upsilon(q)$
ELITE STRATEGY: φ^H	(1H) $\omega(F; \varphi^H) = W + g_F[1 - \varphi^H \cdot \mu] - s_F(q) + \varphi^H \cdot \mu \cdot s_e(q) + \lambda\upsilon(q)$	(2H) $\omega(A; \varphi^H) = W + g_U[1 - \varphi^H \cdot \mu] - s_F(q) + \varphi^H \cdot \mu \cdot s_e(q) + \lambda\upsilon(q)$	(3) $\omega(U) = W + g_U - s_U(q) + \lambda\upsilon(q)$

ELITE PAYOFFS per ELITE CITIZEN

STRATEGIES	MAJORITY STRATEGY F: (τ_F; PROVINCES > 1)	MAJORITY STRATEGY A: (τ_U; PROVINCES > 1)	MAJORITY STRATEGY U: (τ_U)
ELITE STRATEGY: φ^L	(4L) $y(F; \varphi^L) = Y - \tau_F + \varphi^L \cdot [g_F - s_e(q)] \cdot [M_e / N(\tau_F)]$	(5L) $y(A; \varphi^L) = Y - \tau_U + \varphi^L \cdot [g_U - s_e(q)] \cdot [M_e / N(\tau_U)]$	(6) $y(U) = Y - \tau_U$
ELITE STRATEGY: φ^H	(4H) $y(F; \varphi^H) = [Y - \rho] - \tau_F + \varphi^H \cdot [g_F - s_e(q)] \cdot [M_e / N(\tau_F)]$	(5H) $y(A; \varphi^H) = [Y - \rho] - \tau_U + \varphi^H \cdot [g_U - s_e(q)] \cdot [M_e / N(\tau_U)]$	(6) $y(U) = Y - \tau_U$

TABLE 2: RSA INTERGOVERNMENTAL TRANSFERS: Real (2000) Rand per Capita[†]

FISCAL YEAR	Cen Gov. Revenues	g_F National Average	g_F Western Cape	$s_e(q)$ Western Cape	b_e Western Cape	g_F Maj. Provinces	$s_m(q)$ Maj. Provinces	b_m Maj. Provinces
1995/96	4237	2189	2923	1371	1552	2119	1356	763
1996/97	3938	2030	2587	1334	1253	1978	1345	633
1997/98	(3942)*	(2000)*	(2424)*	(1250)*	(1174)*	(1959)*	(1332)*	(627)*
1998/99	4265	2154	2206	1398	808	2149	1709	440
1999/00	4093	2108	2097	1368	729	2110	1674	436
2000/01	6636	2242	2185	1455	730	2247	1778	469
2001/02	5570	2302	2196	1494	702	2313	1826	487
2002/03	5674	2430	2254	1577	677	2448	1927	521
2003/04	5928	2640	2207	1713	494	2682	2094	588
2004/05	6495	2952	2570	1916	654	2989	2341	648
2005/06	6787	3061	2694	1986	708	3096	2428	668

SOURCES: FY: 1995/96 to 1997/98: Financial and Fiscal Commission, *The Allocation of Financial Resources Between the National and Provincial Governments: FY 1997/98*, Tables 2, 3, 6b. FY 1998/99 to 2005/06: Minister of Finance, *Division of Revenue Bill, Various Years,* Part 4: Provincial Allocations.

[†]*COLUMN DEFINITIONS*: For the purposes of this analysis, all allocations to KwaZula-Natal except the special Z grant (see Table 3) are included as part of the allocations to "Other Provinces." Central Government Revenues = Total revenues per capita raised by central government taxation; g_F = Total intergovernmental transfers per capita paid to the province(s), averaged over all provinces (National Average), for the Western Cape, and for all other provinces excluding the Western Cape (Ave. Other Provinces); $s(q)$ = Assigned service grants per capita to fund 5-17 education, primary health care services for (lower income) citizens qualifying for medical assistance, and social security grants for the elderly, disabled, and children, for the Western Cape ($s_e(q)$) and the average for all other provinces ($s_m(q)$); and b = "basic grant" per capita to fund all other provincial services and is defined as $b = g_F - s(q)$.

*Data for FY 1997/98 is based upon projected grants provided in the FFC, *The Allocation of Financial Resources Between the National and Provincial Governments: FY 1997/98*, Table 6b.

TABLE 3: POLITICAL ECONOMY OF SOUTH AFRICA[†]

DEMOGRAPHICS and INCOMES

N_0 = 9.6 Million Elite Adults
M = 25 Million Majority Adults
Y = 86,000 (Real 2000) Rand/Elite Adult
W = 9,700 (Real 2000) Rand/Majority Adult
β = .00015

ELITE CAPTURE:

φ^L = .20 (Rate of Capture per Rand of Basic Grant)
φ^H = .85 (Rate of Capture per Rand of Basic Grant)
ρ = 1720 (Real 2000) Rand/Elite Adult (Protest Cost if $\varphi > \varphi^L$)

REDISTRIBUTIVE SERVICE TECHNOLOGY

a_e = 17 (Years of Training; Elite Public Employee)
a_m = 14 (Years of Training; Trained Majority Public Employee)
a_u = 7 (Years of Training; Untrained Majority Public Employee)
m = .825 (Share of Majority Residents Serviced by Trained Majority)

REDISTRIBUTIVE SERVICE COSTS

S = 80,000 (Real 2000) Rand/Public Employee (Average Uniform Salary)
$s_e(q) = (S/a_e)\cdot q = (80{,}000/17)\cdot q = 4{,}706\cdot q$ (Real 2000) Rand/Majority Adult
$s_m(q) = (S/a_m)\cdot q = (80{,}000/14)\cdot q = 5{,}714\cdot q$ (Real 2000) Rand/Majority Adult
$s_u(q) = (S/a_u)\cdot q = (80{,}000/7)\cdot q = 11{,}428\cdot q$ (Real 2000) Rand/Majority Adult
$s_U(q) = m\cdot s_m(q) + (1 - m)\cdot s_u(q) = 6{,}714\cdot q$ (Real 2000) Rand/Majority Adult

DISCOUNT FACTOR and REDISTRIBUTIVE PREFERENCES

δ = .97

$\lambda\cdot\upsilon(q) = \lambda\cdot\ln(q)$, where $\lambda \geq 4123$.

SPECIAL INTEREST PAYMENTS

Z = 600 Million (Real 2000) Rand

[†] Source: Data Appendix available upon request.

TABLE 4: RSA INTERGOVERNMENTAL TRANSFERS: PREDICTED[†]

(Transfers per Majority Adult Resident, Real 2000 Rand; *Transfers per Capita, Real 2000 Rand*[††])

REGIME	q	MAJORITY'S PUNISHMENT	g^{min}	$g^{max} = g_F$	$s_e(\mathbf{q})$	b_e	$s_m(\mathbf{q})$	b_m
MANDELA **q**-Regime	.53	Administrative Federalism	5682; *3068*	6098; *3293*	2494; *1347*	3604; *1946*	3028; *1635*	3070; *1658*
MBEKI **q**-Regime	.71	Administrative Federalism	5785; *3124*	6098; *3293*	3341; *1804*	2758; *1489*	4057; *2191*	2041; *1102*
MBEKI **q**-Regime	.77	Administrative Federalism	5819; *3142*	6098; *3293*	3623; *1956*	2475; *1337*	4400; *2376*	1698; *917*

[†] *COLUMN DEFINITIONS*: q is the level of redistributive services in that regime. Z is the level of exogenous payments (Z> 0) or transfers received (Z < 0) by the redistributive budget. MAJORITY'S PUNISHMENT is the preferred long-run punishment strategy of the majority if the elite chooses to adopt the high (φ^H) capture strategy; g^{min} = minimal intergovernmental transfer per majority adult resident (*per capita*) that will be accepted by the majority under democratic federalism, given the majority's credible punishment option; g^{max} = Maximal intergovernmental transfer per majority adult resident (*per capita*) that will be paid by the elite under democratic federalism, given the majority's credible punishment option; $s_e(\mathbf{q})$ = Intergovernmental transfer per majority adult resident (*per capita)* required to provide the assigned level of redistributive public services per majority resident in the elite province; b_e = Basic grant per majority adult resident (*per capita*) in the elite province available to fund other provincial services, defined as $b_e = g^{max} - s_e(\mathbf{q})$; $s_m(\mathbf{q})$ = Intergovernmental transfer per majority adult resident (*per capita*) required to provide the assigned level of redistributive public services per majority resident in majority provinces*;* b_m = Basic grant per majority adult resident (*per capita*) in majority provinces to fund other provincial services, defined as $b_m = g^{max} - s_m(\mathbf{q})$.

[††] *TRANSFERS PER CAPITA* (Italics): The calibration model estimates intergovernmental transfers per majority adult resident. For purposes of comparisons to Table 2, intergovernmental transfers per capita are computed as (Transfers per majority adult)·(Majority Adults/Population), where (Majority Adults/Population) = (25 m./46m) = .54.

TABLE 5: ECONOMIC GROWTH UNDER APARTHEID*: 1950-2000*[†]

INDEPENDENT VARIABLES	GROWTH RATE (1)	GROWTH RATE (2)	OPEN (3)	INV (4)
Constant	2.431 (.355)*	-6.938 (1.539)*	52.038 (.531)*	14.777 (.487)*
OPEN	-	.137 (.037)*	-	-
INV	-	.147 (.069)*	-	-
SANC	-1.554 (.659)*	-	-12.198 (.998)*	-.203 (.916)
COSATU	-2.099 (.772)*	-	-5.466 (1.176)*	-6.366 (1.079)*
DEM	-1.765 (.818)*	-	-3.909 (1.241)*	-7.142 (1.139)*
R^2(Adj)	.345	.345	.869	.600

[†] Dependent variable is South Africa's annual real rate of growth of GDP per capita. Independent variables include: OPEN (exports plus imports as a percentage of GDP), INV (gross investment as a share of GDP), DEM (1 for the years 1994-2000; 0 otherwise), SANC (1 for the years 1976-1993; 0 otherwise), and COSATU (1 for the years 1985-1993; 0 otherwise). *Source*: GROWTH RATE, OPEN, and INV are from the Penn World Tables, 6.1 and correspond to the PWT variables GRGDPCH, OPENK, and KI, respectively. OPEN is the ratio of (Exports + Imports)/GDP measured in percent and INV is ratio Gross Investment/GDP also measured as a percent. DEM, SANC, and COSATU are defined in the text.

* Significant at the 5% level; standard errors within parentheses.

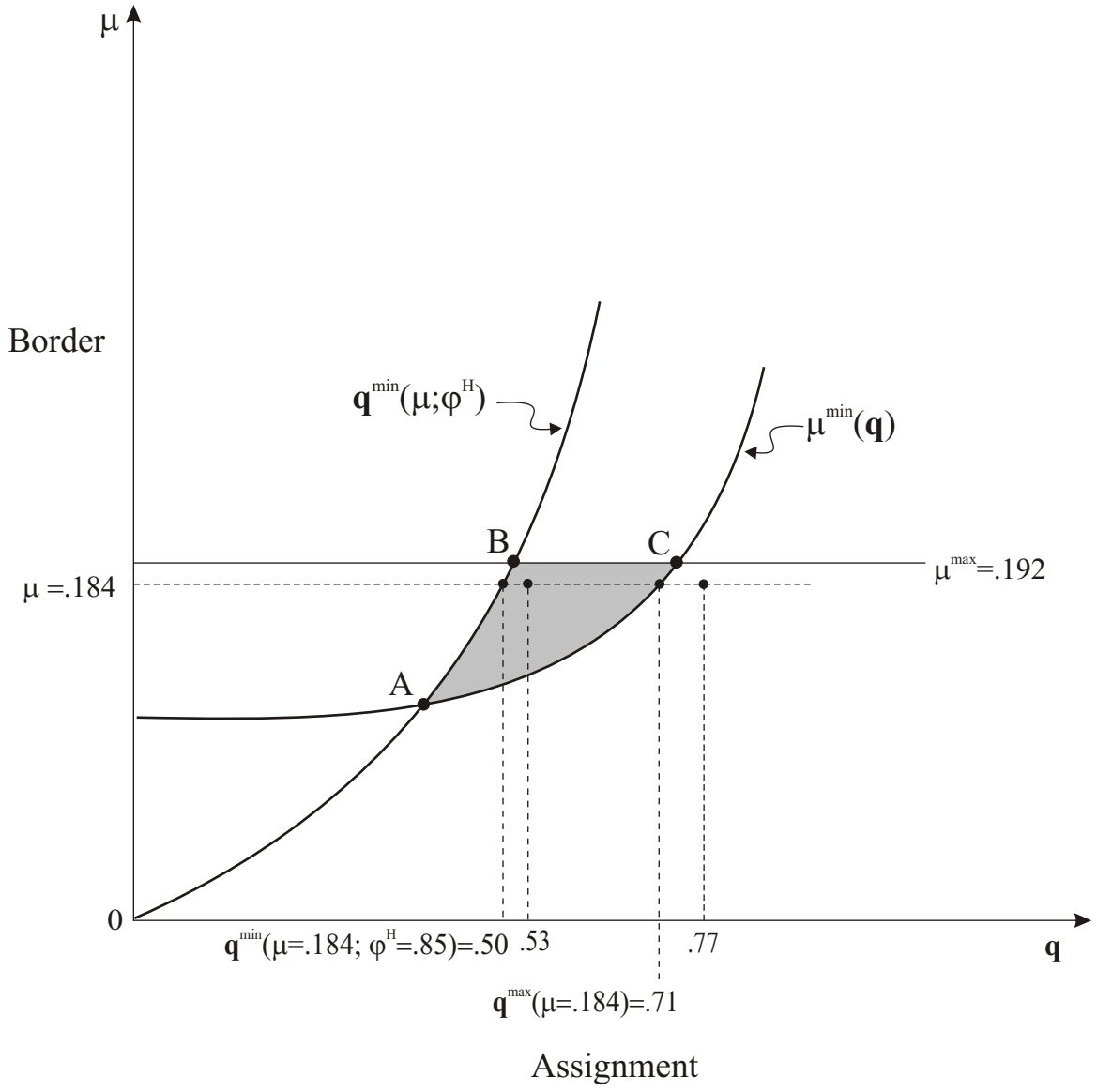
TABLE 6: NET ECONOMIC GAINS FROM THE DEMOCRATIC TRANSITION[†]

	YEARS UNTIL $\Delta V \geq 0$	ΔV: 70 YEAR HORIZON	DEMOCRACY'S INTERNAL RATE OF RETURN
MAJORITY			
Unitary	0	$V_M(U) - V_M(A) = 575{,}739$ Rand	∞
Federal	0	$V_M(F) - V_M(A) = 595{,}660$ Rand	∞
ELITE			
Unitary	22 Years	$V_E(U) - V_E(A) = 2{,}179{,}985$ Rand	.116
Federal	20 Years	$V_E(F) - V_E(A) = 2{,}243{,}683$ Rand	.122

[†]*COLUMN DEFINITIONS*: *Years until* $\Delta V \geq 0$ are the number of years until the net present value gains in after-tax incomes in moving from apartheid to each form of democracy just exceeds zero. ΔV *for a 70 year horizon* is the net present value gains in after-tax income in moving from apartheid to each form of democracy. *Democracy's Internal Rate of Return* is defined by that discount rate where net present value of after-tax incomes under democracy are just equal to the net present value of after-tax incomes under apartheid so that ΔV for the full 70 year horizon is just equal to 0. Since majority welfare is larger under the first year of democracy onward, the internal rate of return for the majority is infinite.

SPECIFICATION OF ΔV: *For majority residents*: $W_{Dt} = W_0(1 + g_D)^t$ under unitary or federal democracy and $W_{At} = W_0(1 + g_A)^t$ under apartheid, where $W_0 = 9{,}700$, g_D is the growth rate under democracy specified as an incremental increase from .0067 to .025 over the ten years from 1996-2005 and as .025 for all years beyond 2006 and $g_A = -.012$; see text. The estimates of $V_M(\bullet)$ for majority residents includes the value of receiving redistributive services under apartheid ($q = .16$) and then under democracy specified separately for the Mandela presidency ($q = .53$), the Mbeki presidency (rising from $q = .53$ to .77),and then $q = .77$ for all subsequent years if the federal regime applies and $q^*_U = .61$ if the unitary regime applies. Annual transfers are set equal to actual transfers for the Mandela years and Mbeki years of democracy, and then $g_U = 6120$R and $g_F = 6098$R thereafter. Estimates of ΔV for majority residents allow for capture in the elite-run province and for higher costs of providing redistributive services in the majority-run province. *For elite residents*: $Y_{Dt} = Y_0(1 + g_D)^t$ under unitary or federal democracy and $Y_{At} = Y_0(1 + g_A)^t$ under apartheid, where $Y_0 = 86{,}000$ Rand and g_D and g_A are specified as above. Annual (real) taxes include taxes for homeland payments and security under apartheid and for redistributive transfers and security payments under democracy. A discount rate of .03 ($\delta = .97$) is used for the computation of ΔV for both the majority and elite residents.

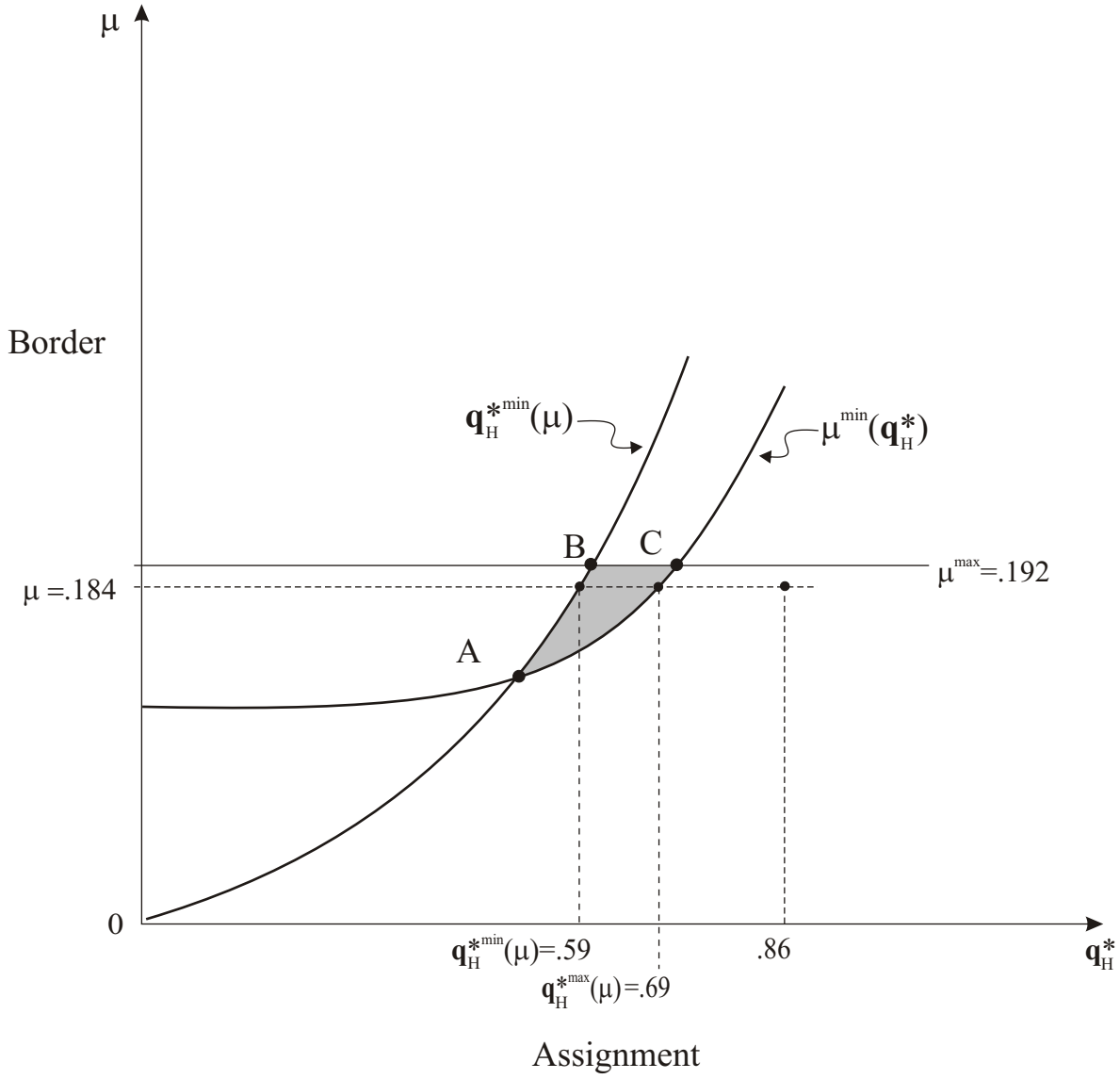
Figure 1: Feasible Federalism for the **q**-Regime



Coordinates for Points:

A: μ = .120; **q** = .39
B: μ = .192; **q** = .51
C: μ = .192; **q** = .73

Figure 2: Feasible Federalism for the **q***-Regime



Coordinates for Points:

A: $\mu = .133$; $q_H^* = .48$
B: $\mu = .192$; $q_H^* = .61$
C: $\mu = .192$; $q_H^* = .71$

APPENDIX: *Specifying Sustainable Democratic Federalism*

We outline the proofs here. The algebraic details are provided in a Technical Appendix available from the authors upon request.

LEMMA 1: CREDIBLE PUNISHMENTS IN THE EXOGENOUS q-REGIME. *For political economies satisfying the **q**-Border and **q**-Assignment Constraints, the high capture strategy will be a credible punishment strategy for the elite whenever the majority adopts a revenue-maximizing (centralizing) redistributive tax rate.*

OUTLINE OF PROOF: To show sufficiency of the **q**-Border and **q**-Assignment Constraints for meeting the three conditions for high capture, φ^H, to be a credible elite punishment, first show that if the upper bound on the **q**-Assignment Constraint is met, then $g_U - \rho/(\varphi^H - \varphi^L) \geq \mathbf{Sq}/a_e = s_e(\mathbf{q})$ or $1 \geq \rho/(\varphi^H - \varphi^L)\cdot[g_U - s_e(\mathbf{q})]$. Multiplying both sides through by $N(\tau_U)/M$ then shows that $\mu^{max} \geq \mu = M_e/M$, and therefore $N(\tau_U) \geq M_e$, satisfying condition (ii) for a credible punishment. If the lower bound on the **q**-Border Constraint is met, then $\mu = M_e/M > \{\rho[N(\tau_U)/M]\}/\{(\varphi^H - \varphi^L)[g_U - s_e(\mathbf{q})]\}$, which implies, $(\varphi^H - \varphi^L)[g_U - s_e(\mathbf{q})][M_e/N(\tau_U)] > \rho$. Adding $(Y - \tau_U)$ to both sides and re-arranging terms gives $y(A; \varphi^H) > y(A; \varphi^L)$, satisfying condition (i) for a credible elite punishment. Finally, from the lower bound of the assignment constraint, $\mathbf{q} > (\mu \cdot g_U \cdot \varphi^H)/[S \cdot \hat{a}(\mu)]$. Multiplying both sides by $S \cdot \hat{a}(\mu)$ and using the definitions for $s_e(q)$, $s_m(q)$, $s_u(q)$, $s_F(\mathbf{q})$, and $s_U(\mathbf{q})$, will give $[s_U(\mathbf{q}) - s_F(\mathbf{q})] > \varphi^H \cdot \mu \cdot [g_U - s_e(\mathbf{q})]$. Adding $W + g_U + \upsilon(\mathbf{q})$ to both sides and again re-arranging terms and using the definitions of $\omega(A; \varphi^H)$ and $\omega(U)$, we have $\omega(A; \varphi^H) > \omega(U)$. And since $\omega(A; \varphi^L) > \omega(A; \varphi^H)$ for $\varphi^H > \varphi^L$, it also follows that $\omega(A; \varphi^L) > \omega(U)$ as well. Thus condition (iii) for a credible punishment is met. Necessity is shown in the complete Technical Appendix.

LEMMA 2: CREDIBLE PUNISHMENTS IN THE ENDOGENOUS q*-REGIME. *For political economies satisfying the q*-Border and q*-Assignment Constraints, the high capture strategy will be a credible punishment strategy whenever the majority adopts a revenue-maximizing (centralizing) redistributive tax rate.*

OUTLINE OF PROOF: For sufficiency, use the same argument as for Lemma 1 to show that if the upper bound of the q*-Border Constraint is met, then $N(\tau_U) \geq M_e$ and condition (ii) for the a credible punishment is satisfied. If the lower bound of the q*-Border Constraint is met, then by the argument presented above for Lemma 1, condition (i) for a credible punishment holds. Finally, to show that condition (iii) is met when the q*-Assignment Constraint holds, note that because $\upsilon'(q) > 0$ and $\upsilon''(q) < 0$, the majority's preferences for q are single-peaked. If the assignment constraint is to holds for a given λ and $q^*_H(\mu, \lambda)$ is the preferred level of q for those values of μ and λ, then any $q \neq q^*_H(\mu, \lambda)$ gives the majority less utility than that obtained at $q^*_H(\mu, \lambda)$. This is the case for the two values of q equal to either $q^{*max}_H(\mu)$ and $q^{*min}_H(\mu)$. By definition, $q^{*max}_H(\mu)$ and $q^{*min}_H(\mu)$ give a majority utility equal to that available under unitary governance – $\omega(U; q_U^*(\lambda))$. Thus $\omega(A; \varphi^H) = \omega(A; \mu, q^*_H(\mu, \lambda), \varphi^H) > \omega(U; q_U^*(\lambda)) = \omega(U)$. By a similar argument if $q^{*max}_L(\mu) > q^*_L(\mu, \lambda) > q^{*min}_L(\mu)$ is met, then $\omega(A; \varphi^L) = \omega(A; \mu, q^{*max}_H(\mu, \lambda), \varphi^L) > \omega(U; q_U^*(\lambda)) = \omega(A; \varphi^L)$. Thus condition (iii) will be met when $q^{*max}_H(\mu) > q^*_H(\mu, \lambda) > q^{*min}_H(\mu)$ and when $q^{*max}_L(\mu) > q^*_L(\mu, \lambda) > q^{*min}_L(\mu)$ both hold. However, since $\omega(A; \varphi^L) > \omega(A; \varphi^H)$ for a common value of λ and a given value of q, the majority's "utility hill" for the φ^H regime lies everywhere inside the "utility hill" for the φ^L regime, and thus for any common utility such as $\omega(U)$, the bounds on allowable q*'s set by the φ^H regime will be "tighter" than the bounds set by the φ^L regime. Thus meeting q*-Assignment Constraint defined by $q^{*max}_H(\mu) > q^*_H(\mu, \lambda) > q^{*min}_H(\mu)$ assures both constraints are met and condition (iii) holds. Necessity is shown in the complete Technical Appendix.

LEMMA 3: FEASIBLE FEDERAL CONSTITUTIONS**:** *When the Border and Assignment Constraints for Lemmas 1 and 2 are met, the set of feasible constitutions allowing democratic federalism is smaller in the q*-Regime than the* ***q****-Regime. For any elite provincial border (*μ*), the level of minimally acceptable assignment must satisfy,* $q^{*min}_H(\mu) > \mathbf{q}(\mu)$*. For any common* $q_H^* = \mathbf{q}$*, the size of the minimally acceptable elite province must satisfy* $\mu^{min}(q_H^*) > \mu^{min}(\mathbf{q})$*. The maximal size of the elite province,* μ^{max}*, is the same in both the q*- and* ***q****-Regime.*

OUTLINE OF PROOF: First, to show that $\mu^{min}(q_H^*) > \mu^{min}(\mathbf{q})$ for common values $q_H^* = \mathbf{q}$, we proceed by construction. Since $q_H^*(\mu,\lambda) > q_L^*(\mu,\lambda)$, it will be true that $0 > -\varphi^L\cdot[s_e(q^{*}_H(\mu,\lambda)) - s_e(q^{*}_L(\mu,\lambda))]$. Under the assumption that $q_H^*(\mu,\lambda) = \mathbf{q}$, it will also be true that $(\varphi^H - \varphi^L)\cdot[g_U - s_e(\mathbf{q})] > (\varphi^H - \varphi^L)\cdot[g_U - s_e(q^{*}_H(\mu,\lambda))] - \varphi^L\cdot[s_e(q^{*}_H(\mu,\lambda)) - s_e(q^{*}_L(\mu,\lambda))]$. Adding $[\varphi^L\cdot g_U - \varphi^L\cdot g_U]$ to the RHS and rearranging terms, implies that $\rho[N(\tau_U)/M]\}/\{\varphi^H\cdot[g_U - s_e(q^{*}_H(\mu,\lambda))] - \varphi^L\cdot[g_U - s_e(q^{*}_L(\mu,\lambda))]\} \equiv \mu^{min}(q^{*}_H) > \mu^{min}(\mathbf{q}) \equiv \{\rho[N(\tau_U)/M]\}/\{(\varphi^H - \varphi^L)[g_U - s_e(\mathbf{q})]\}$,for common values of $q_H^*(\mu,\lambda) = \mathbf{q}$. Second, when the Assignment Constraints for the two regimes hold, we know $[\upsilon(q_H^{*min}(\mu)) - p_H(\mu)\cdot q_H^{*min}(\mu)] - [\upsilon(q^{*}_U) - p_U\cdot q^{*}_U] = \varphi^H\cdot\mu\cdot g_U = \mathbf{q}^{min}(\mu)\cdot S\cdot\hat{a}(\mu;\varphi^H)$, must hold from the definitions of $q_H^{*min}(\mu)$ and $\mathbf{q}^{min}(\mu)$ given by eqs. (11) and (15) of the text. Next, since $q_H^{*min}(\mu) \neq q^{*}_U$ when demand curves slope downward, it will also be true that $[\upsilon(q^{*}_U) - p_U\cdot q^{*}_U] > [\upsilon(q_H^{*min}(\mu)) - p_U\cdot q_H^{*min}(\mu)]$,since q_U^* is optimal for the price p_U. Re-arrange this expression and add $[p_U\cdot q^{*}_U - p_H(\mu)\cdot q_H^{*min}(\mu)]$ to both sides. This gives: $[p_U - p_H(\mu)]\cdot q_H^{*min}(\mu) > [\upsilon(q_H^{*min}(\mu)) - p_H(\mu)\cdot q_H^{*min}(\mu)] - [\upsilon(q^{*}_U) - p_U\cdot q^{*}_U] = \mathbf{q}^{min}(\mu)\cdot S\cdot\hat{a}(\mu)$, using the step above. Finally, from the definitions of p_U, $p_H(\mu)$, and $\hat{a}(\mu;\varphi^H)$ (see text), we can show $[p_U - p_H(\mu)]\cdot q_H^{*min}(\mu) = [S\cdot\hat{a}(\mu;\varphi^H)]\cdot q_H^{*min}(\mu)$. Thus $[S\cdot\hat{a}(\mu;\varphi^H)]\cdot q_H^{*min}(\mu) > \mathbf{q}^{min}(\mu)\cdot[S\cdot\hat{a}(\mu;\varphi^H)]$, from which it follows that $q_H^{*min}(\mu) > \mathbf{q}^{min}(\mu)$. This completes the proof of Lemma 3.

PROPOSITION 1: SUSTAINABLE DEMOCRATIC FEDERALISM: *For a political economy satisfying the payoffs of Table 1 and our Border and Assignment Constraints, there exists a grim trigger strategy equilibrium in which democratic federalism is sustainable, and in that equilibrium:*

> *1) The central government majority chooses a level of intergovernmental transfers (tax rate) bounded between a maximal grant (tax rate) acceptable to the elite and a minimal grant (tax rate) acceptable to the majority specified as:*
>
> $$g_U > g^{max}(\kappa, \delta) \geq g_F > g^{min}(\kappa, \delta) > 0,$$
>
> *conditional upon the presence of a binding constitutional redistributive service standard (*κ *= 1 or 0), and a common discount factor bounded as* $0 < \delta \leq 1$*; and,*
>
> *2) The elite province(s) adopts the fiscal strategy* φ^L*.*

We prove existence of a democratic federalism as a subgame perfect Nash equilibrium for each of the two cases above – $\kappa = 1, 0$ – for at least some discount factor bounded as $0 < \delta \leq 1$. A Nash equilibrium is subgame-perfect if each players' strategies constitute a Nash equilibrium of every subgame. Here the subgame is the annual policy game as described in Table 1, repeated in each fiscal year, forever. To show that the trigger strategy Nash equilibrium is subgame-perfect, we must show the trigger strategy is a Nash equilibrium for each play of the policy game. The proof moves in three steps. *STEP 1*: Specify the minimal grant the majority will accept and the maximal grant (tax rate) the elite will allow such that the majority and elite prefer democratic federalism when the other prefers democratic federalism. The minimal grant acceptable to the majority will be unambiguously positive, while the maximal grant that the elite will be pay

will be less than that available from maximal taxation. *STEP* 2: Show that the elite's maximal grant is larger than the majority's minimal grant for the potentially most favorable discount factor, $\delta = 1$:

$$\Re(\kappa, \delta = 1) = g^{max}(\kappa, 1) - g^{min}(\kappa, 1) > 0.$$

If $\Re(\kappa, \delta = 1) > 0$, then there is a economically feasible fiscal policy in the annual policy game that will sustain democratic federalism, at least for infinitely far-sighted majority and elite residents ($\delta = 1$). *STEP 3:* Show that the more general specification $\Re(\kappa, \delta) = g^{max}(\kappa, \delta) - g^{min}(\kappa, \delta)$ is a continuous function of δ, implying there is a $\delta < 1$(though perhaps only slightly less than 1) where $\Re(\kappa, \delta) > 0$ continues to hold. The full details of the algebra for STEPS 1-3 is provided in the longer Technical Appendix available upon request. The specifications for $g^{max}(\kappa = 1, \delta)$, $g^{min}(\kappa = 1, \delta)$,$g^{max}(\kappa = 0, \delta)$, and $g^{min}(\kappa = 0, \delta)$ are below as:

q*-*REGIME: $g_F^{max}(\delta; \kappa = 1) > g_F > g_F^{min}(\delta; \kappa = 1)$.

$$g_F^{max}(\delta; \kappa = 1) = [\tau_F^{max}(\delta; 1)\cdot N\{\tau_F^{max}(\delta; 1)\} - Z]/M, \text{ where } \tau_F \leq \tau_F^{max}(\delta; 1) =$$

$$[1/(1 - \varphi^L\cdot\mu)]\cdot\{\tau_U\cdot(1-\varphi^H\cdot\mu)+\rho+\mu\cdot[(M\cdot s_e(\mathbf{q}) + Z)/N(\tau_F^{max})]\cdot[\varphi^H\cdot(N(\tau_F^{max})/N(\tau_U)) - \varphi^L] - Q_e(\delta; 1)\},$$

$$Q_e(\delta; 1) = \{(\tau_U - \tau_F^{max})(1 - \varphi^H\cdot\mu) + (\varphi^H\cdot\mu)\cdot[(M\cdot s_e(\mathbf{q}) + Z)/N(\tau_F^{max})]\cdot[(N(\tau_F^{max})/N(\tau_U)) - 1]\}(1 - \delta).$$

$$g_F^{min}(\delta; \kappa = 1) = [1/(1 - \varphi^L\cdot\mu)]\cdot\{g_U\cdot(1-\varphi^H\cdot\mu) + \mu\cdot(\varphi^H - \varphi^L)\cdot s_e(\mathbf{q}) + Q_m(\delta; 1)\},$$

$$Q_m(\delta; 1) = \mu\cdot(\varphi^H - \varphi^L)\cdot[g_U - s_e(\mathbf{q})](1 - \delta).$$

q**-*REGIME: $g_F^{max}(\delta; \kappa = 0) > g_F > g_F^{min}(\delta; \kappa = 0)$.

$$g_F^{max}(\delta; \kappa = 0) = [\tau_F^{max}(\delta; 0)\cdot N\{\tau_F^{max}(\delta; 0)\} - Z]/M, \text{ where } \tau_F \leq \tau_F^{max}(\delta; 0) =$$

$$[1/(1-\varphi^L\cdot\mu)]\{\tau_U(1-\varphi^H\mu) + \rho + \varphi^H\mu\cdot[(M\cdot s_e(q_H^*)+Z)/N(\tau_U)] - (\varphi^L\cdot\mu)\cdot[(M\cdot s_e(q_L^*)+Z)/N(\tau_F^{max})] - Q_e(\delta; 0)\},$$

$$Q_e(\delta; 0) = \{(\tau_U - \tau_F^{max})(1 - \varphi^H\mu) + (\varphi^H\cdot\mu)\cdot[(M\cdot s_e(q_H^*) + Z)/N(\tau_F)]\cdot[(N(\tau_F^{max})/N(\tau_U)) - 1]\}(1 - \delta).$$

$$g_F^{min}(\delta; \kappa = 0) = [1/(1 - \varphi^L\cdot\mu)]\cdot\{g_U\cdot(1 - \varphi^H\cdot\mu) - \Delta CS(q_L^*, q_H^*) + Q_m(\delta; 0)\}, \text{ where:}$$

$$\Delta CS(q_L^*, q_H^*) = [\lambda\upsilon(q_L^*) - p_L(\mu)\cdot q_L^*] - [\lambda\upsilon(q_H^*) - p_H(\mu)\cdot q_H^*],$$

$$Q_m(\delta; 0) = \{\Delta CS(q_L^*, q_H^*) + g_U\cdot\mu(\varphi^H - \varphi^L)\}\cdot(1 - \delta).$$