Strategic Constitutional Choice in an Autocracy: The 1980 Constitution in Chile*

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Abstract

In a spatial model of political bargaining we show that there exists a constitution which a sufficiently patient autocrat would want to design and the parties forming a succeeding constitutional assembly would accept as a basis for negotiations on constitutional reform. A middle class in favor of redistribution discourages constitution writing. Increases in middle class wealth encourage constitution writing unless taxation is "too effective" in redistributing wealth. We relate our findings to the so-called "Pinochet Constitution" in Chile.

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1 Introduction

Chile's transformation from autocracy to democracy unfolded under the rules of the 1980 constitution which was promulgated by the Junta. After an eight year transitory period president Pinochet stood for re-election under the terms of the constitution. Following his electoral defeat, the Chilean parties of the Center and the Right negotiated constitutional amendments which were adopted by plebiscite as part of a reform constitution in 1989. In the process, the constitutional status quo was only marginally modified (see Barros, 2002, and Montes/Vial, 2005).

This paper addresses the autocratic choice problem in a model of political bargaining. It answers the question of why an autocrat would want to design a constitution that the parties forming a succeeding constitutional assembly would accept as a basis for negotiations on constitutional reform. We show that if a process which starts from an accepted status quo produces less volatile outcomes than an open bargaining process or conflict, acceptable constitutions exist which offer a positive pay-off to the clientele of the autocrat. If the autocrat is patient and wishes to promote objectives of his clientele, he can select a constitution to influence policies after transition to democracy.

In order to analyze the autocratic choice situation we further develop the simple spatial model of Michalak/Pech (2013) to take account of endogenous formation of bargaining coalitions. The model allows to investigate the impact of middle class wealth on the choice of the autocrat. If the middle class is in favor of redistribution, feasible constitutions offer no ultimate safeguard against redistribution although constitution writing may still pay off on average. An increase in middle class wealth strengthens the autocrat's incentives to write a constitution unless redistribution is "too profitable" for a member of the benefited economic class. Whilst our result is qualified and obtained in a highly stylized setting, it gives support to the widespread view that a middle class which is interested in maintaining property rights is a prerequisite for constitutional stability.[1]

Our results also point to the possibility of autocratic commitment:[2] If only a constitution which has constrained the autocrat in the past enjoys sufficient credibility to serve as a template for constitutional reform, an autocrat may voluntarily choose to abide by a self-imposed constitution.[3]

[1] See e.g. Ordeshook (1997), Easterly (2001).

[2] Authoritarianism is generally assumed to involve the capability to overturn outcomes of the institutionalized political process (Przeworski/Wallerstein, 1988), hence any commitment must be voluntary. North/Weingast (1989) see the inability to commit not to change rules as a severe disadvantage to authoritarianism.

[3] The negotiating parties need to accept the constitution which was handed down as a status quo point. There are two problems with a status quo constitution which had not effectively constrained the government in the past. Firstly, it may lack focal point property. A constitution which was ineffective in the past, may be replaced by any other reference point such as the

In their rationalization of the 1980 constitution, Barros (2002) and Montes/Vial (2005) put a different emphasis. For Barros, the Junta's need for short term stabilization prevailed over the motive of long-term liberalization. He sees the 1980 constitution as a compromise between different factions of the Junta and as partial fulfillment of a promise of non-permanency of authoritarian rule (Barros, 179 pp). Montes and Vial argue that given the self-image and justification of the junta, it makes sense to see their effort at institution building under the aspect of forging a bulwark against a perceived Marxist threat.

The constitution consisted of two parts: A permanent part which laid the basis of Republican institutions and a transitory part which confirmed the status quo of the dictatorship. At the same time, it limited the term of the Junta and ultimately set out a transition to civilian government within a "self-protected democracy" (Barros, 2002, p 169). It is, therefore, not implausible that the Junta ultimately intended to design a constitutional order for a succeeding democratic government. Whether Pinochhet was driving force or reluctant follower in this process has been disputed.[4] Yet he was probably aware of the potential role of constitution in establishing a post-transition status quo: In 1977 he had met with Hayek, who to some extent supported the idea of transitional dictatorship, and received a copy of Hayek's "Model Constitution" (see Farrant/McPhail/Berger, 2012). The constitution set a definite term limit on Pinochet's presidency because in its permanent part it ruled out re-election of the president. Taking into account that he did not expect defeat in 1988 (Montes/Vial, 2012) the constitution effectively limited his tenure to 16 years, a sufficiently long spell to justify our modeling assumption that any change of type of government is exogenous to the constitution.

1.1 The Chilean transition in a model of autocratic choice

We consider a model with three main constituencies: The poor favor redistribution and are represented by the party of the Left. The middle class may or may not prefer redistribution and is represented by the Center Party. The wealthy are represented by the party of the Right and also form the constituency of the autocrat. We assume that the autocrat shares its preferences.[5] In a considerable

constitution of another country. Yet once there is no focal point, choosing the reference point will become part of the bargaining process itself - similar to the case of bargaining in the absence of a default constitution. Secondly, the public may not invest trust in a process based on a constitution which had failed to effectively constrain the government in the past (see Brown, 2011). This may explain why the Egyptian constitution did not play a similar role to the Pinochet constitution when the Mubarak regime was overturned.

[4]Barros forcefully argues in favor of the latter.

[5]In this we assume that the intertemporal agency problem between the elite and the autocrat has been resolved. Typically, autocracies are sustained by the exchange of economic advan-

simplification of the drafting process in Chile in our paper we assume that there is a single autocrat who is in a position to choose to write a constitution.[6] In the absence of a written constitution, a process of de novo constitution writing unfolds after the demise of the autocrat. Crucially, we assume that the outcome of this process can only be predicted with some uncertainty.

If there is a status quo constitution when the autocrat leaves office, representatives of the different political groups may decide to embark on a constitutional reform process which is based on the existing constitution. For this process to have sufficient credibility at least two of the three parties need to come together and negotiate the reform constitution. This assumption is motivated by the Chilean experience where representatives of the parties of the Right and Center negotiated the constitutional reform proposal. Moreover, we assume that in joining the bargaining process over constitutional reform, the two parties accept the constitutional status quo as reversion outcome if negotiations fail. In the case of Chile, Pinochet was opposed to starting any negotiations on constitutional amendments but eventually gave in (Montes/Vial, 2005). As for the other parties, it is quite plausible that outright rejection of the constitutional status quo would have resulted in a situation of open conflict or a protracted, informal bargaining process with uncertain outcomes. We think of this scenario as a reversion to the state without constitution. We also require that in the end all three parties give their consent to the constitutional reform package. This assumption is not implausible as the reform constitution needs to earn, either by formal or factual requirement, widespread support. An alternative justification is that in the case where one party disagrees, this party may precipitate conflict, thereby enforcing the conflict outcome as the default outcome.

The model captures the basic elements of the Chilean transition process: After electoral defeat of Pinochet, representatives of the parties of the center and and the Right negotiated the new constitutional settlement. Left-wing parties were not admitted under the 1980 constitution and it was one of the results of the constitutional bargain to admit parties which were of the left but not anti-system. The reformed constitution was put before a referendum where it obtained widespread support, even by parts the left, which initially opposed the constitutional reform project (see e.g. Tapia, 1987).

Section 2 sets up the model. Section 3 introduces the reference model of de novo design of the constitution. Section 4 solves the constitutional choice problem

tages for support. Therefore, it is plausible that farsighted members of the elite are willing to trade support for favorable legislation at the constitutional level provided that they expect this legislation to serve their interest in the long run.

[6]Here we ignore that the 1980 constitution itself was already the result of a collective effort as it had received input from constitutional lawyers and, as Barros argues, emerged as a compromise between members of the Junta.

of the autocrat in a static model of choice. Section 5 explores the effect of small changes of middle class wealth. Section 6 introduces the intertemporal model of constitutional choice. Section 7 discusses alternative modeling assumptions. Section 8 relates our results to the Chilean experience.

2 The model

A constitution c is a pair (x,t), representing a country's basic choices[7] on redistribution - associated with t - and a social policy dimension x which might be measured along a scale such as as liberalism versus authoritarianism, secularism versus Catholicism, or the relative importance of the social solidarity principle versus the free market principle.[8] The policy space is $X \times T = \Re \times [0,1]$. There are three socio-economic groups,[9] the clientele of the junta, R, the middle class, M, and the working class, L with population shares s_R, s_M and s_L, $\sum s_i = 1$. Each group is represented by a representative citizen with their gross wealth $w_R > w_M > w_L$. The utility function of a citizen belonging to class i is $u_i = v_i(x) + w_i^n$ where w_i^n is citizen i's net wealth after taxes and transfers and where $v_i = -\alpha_i|x - x_i|^2$ captures the loss associated with realizations on the social policy scale where x_i, $i = L, M$ is the bliss point of the respective group. We assume that $x_M = 0$, $x_L = 1$, $\alpha_L = \alpha_M = \alpha > 0$ and $\alpha_R = 0$. With the latter assumption we maintain that R is only interested in maximizing net wealth. Such an assumption is not implausible if R mainly consists of a rich elite which has the means to isolate itself from dealing with society at large.

Redistributive policies can be reduced to the choice of a wealth tax $t \in [0,1]$ which is levied on wealth available for redistribution. Tax revenue is evenly distributed among the population. Denoting average wealth for distribution $\overline{w}$, utility for group i is

$$u_i(x,t) = v_i(x) + (1-t)w_i + t\overline{w}$$

[7] What is missing from our model are rules governing choices such as electoral rules yet as we argue below, in Chile's case electoral rules favored conservative policies. We also ignore individual concerns of members of the regime such as illegitimate acquisition of property or human rights violations, the letter being a main issue for the Chilean Junta. Such concerns may be captured by R's participation constraint.

[8] Kitschelt (1996) finds that the majority of policy choices can be subsumed under a distributional/communitarian dimension. Schofield/Caitafe (2007) use a labor-capital dimension and hard currency-soft currency dimension in order to explain electoral positions in Argentina in the early 1990s.

[9] We do not explicitly model the military as a player. One may think of the military as a factor which inflicts on some parties a greater expected cost of freely negotiating the constitution.

In virtually all economies, average wealth exceeds the wealth of the median citizen so that simple electoral models predict democracy to yield majorities in favor of expropriatory taxation. Keeping the argument simple but enriching the model sufficiently to explain the empirical variety of observations we assume that taxes cause efficiency losses. Efficiency losses reduce the value of wealth which is available for redistribution, in particular if redistributive policies target capital invested in production. We assume that of w_R only a share $\Theta_R < 1$ is available for redistribution and only a share $\Theta_M < 1$ of w_M. A natural assumption is $\Theta_R w_R > \Theta_M w_M$. Thus, average wealth available for redistribution is $\overline{w} = s_R\Theta_R w_R + s_M\Theta_M w_M + s_L w_L$. We define the wealth gap of each group relative to average available wealth as $\Delta_M = w_M - \overline{w} \lesseqgtr 0$, $\Delta_L = w_L - \overline{w} < 0$ and $\Delta_R = w_R - \overline{w} > 0$.[10]

3 De novo design of the constitution

In the absence of a status quo constitution or if the reform process based on the autocrat's constitution is rejected by at least one party, the constitution has to be designed from scratch. Crucially, the outcome of this process can only be predicted with some uncertainty. Ex ante, the outcome takes the form of a lottery $\ell = \{(x, t, \pi(x, t))\}$ where x and t take at least two different values with strictly positive probability $\pi(x, t)$. The associated expected utility $u_i(\ell)$ defines the default outcome u_i^0 for each group. We define the set I of constitutions, i.e. final outcomes of the constitutional reform process, which are weakly preferred by all players to the lottery ℓ:

Definition 1. I is the set of outcomes which are weakly preferred by all players to de novo design of the constitution, $I = \{x, t|(x, t) \succsim_i \ell\}, i = L, M, R$.

To see that I is non-empty, let the expected value of x and t from the lottery ℓ be (x^0, t^0). From concavity of v and linearity of u in t the set of outcomes which are acceptable for all players over entering free negotiations is non empty and contains at least the policy point where the expected values x^0 and t^0 are offered. Moreover, I is a meaningful, i.e. non trivial choice set:

Lemma 1. *I is non-empty, convex and does not vanish.*

Proof. I is non-empty and does not vanish, i.e. there are points which are strictly preferred by L, M and R to their default outcomes: Because preferences represented by u_i are convex, $u_i(\ell) \leq u_i(x^0, t^0)$ for all i. Moreover, because u_i is continuous and differentiable there exists a point (x^0, t'), $t' < t^0$, which M and L prefer

[10] From the definition it follows that in the limit, as $\Theta_M w_M \to \Theta_R w_R$ we have $-\Delta_L = w_L(1 - s_L) - (1 - s_L)\Theta_M w_M$ and $\Delta_M = w_L s_L - s_L\Theta_M w_M$ and, hence, $\Delta_M = \frac{s_L}{1-s_L}|\Delta_L|$.

to the default outcome and which is strictly preferred by R. I is convex because players' better-sets are convex, hence the intersection, I, is also convex. □

We rationalize the lottery ℓ by a model of conflict or bargaining in the shadow of conflict:[11] Assume each party may find itself in a position to impose or propose a policy point and that π_j is the probability of this happening. Moreover, we assume that the cost of further descent into conflict or continued bargaining are such that an offer of a party's most preferred policy point is accepted by all other parties. Thus, if L wins, the policy realization (t, x) is $(1, x_L)$ and if M wins, the policy realization is $(1, x_M)$ for $w_M < \overline{w}$ and $(0, x_M)$ for $w_M > \overline{w}$. If R wins, it selects a tax rate of zero and, being indifferent about x, mixes x_M and x_L with probabilities π_M and π_L. For agent $i = L, M, R$, expected utility from de novo design of the constitution is

$$\begin{aligned} u_i^0 &= \frac{\pi_M}{\pi_M + \pi_L} v_i(x_M) + \frac{\pi_L}{\pi_M + \pi_L} v_i(x_L) + (1 - \pi_L) w_i + \pi_L \overline{w} - K_i \\ \text{if } w_M &> \overline{w}, \qquad (1) \\ u_i^0 &= \frac{\pi_M}{\pi_M + \pi_L} v_i(x_M) + \frac{\pi_L}{\pi_M + \pi_L} v_i(x_L) + \pi_R w_i + (1 - \pi_R) \overline{w} - K_i \\ \text{if } w_M &< \overline{w}. \qquad (2) \end{aligned}$$

where K_i is the cost incurred by party i when it enters the de novo design stage. While K_i may assume the value zero for some i, it is crucial that $\pi_i > 0$ for all i for our results to hold. In the following we focus on the case where K_i are sufficiently small to exlude the corner points $(0, 0)$ and $(1, 1)$ from I.

4 Choice of a constitutional template c^* in the static model

At the bargaining stage, a bargaining coalition S forms of two or three players where bargaining takes the form of a player $i \in S$ proposing a reform constitution (x, t) as a take-it-or-leave-it offer to the other members of the bargaining coalition with an ex-ante probability of $P_i(S)$ and any player k who is unhappy with the bargaining outcome can realize her default pay-off u_k^0 by invoking the conflict scenario. Crucially, there are no side payments.[12]

Assume that the autocrat has handed down a constitutional template $c = (x^c, t^c)$. A constitution not in the Pareto-set I will be rationally objected by at least one player when the status quo outcome is implemented. Therefore, we focus on status quo constitutions handed down by the autocrat which are included in I.

[11] See e.g. Grossman (2002) for a related model of conflict.

[12] See our discussion in section 7.

Given I, a status quo constitution c and a bargaining coalition $\{i, j\}$ formed by two players, a rational proposal by player i, (x, t), will maximize $u_i(x, t)$ subject to to $(x, t) \in I$ and subject to the other player, j, realizing her reversion outcome from rejecting the reform constitution and ending up with c, $u_j(x^c, t^c)$. A status quo constitution c is acceptable to the members of a bargaining coalition S as a basis of their negotiations, if each member i's expected pay-off under the bargaining protocol given c, $EU_{i|\{c,S\}}$ is at least as great as her default pay-off u_i^0.

An equilibrium consists of a status quo constitution c, a coalition of bargainers and bargaining moves. We say that given c, in equilibrium a bargaining coalition S may form unless there is a coalition of bargainers of at least two players which is strictly preferred by all its members. Unlike for the bargaining game itself, which can be analyzed in a non-cooperative framework, there is no simple bargaining protocol which implements such a selection rule. Therefore, our definition of equilibrium borrows from the core:

Definition 2. An equilibrium of the game consists of a choice for the constitutional status quo, c^*, a bargaining coalition of at least two players and bargaining moves such that no player wants to single-handedly deviate and no two or three actors strictly prefer entering negotiations with each other.

A priori it is not clear that this game has a well-defined solution: Let $\{i, j\}$ denominate a coalition of i and j and $\{i, j\} \succ_{ij} \{i, k\}$ if the expected pay off from bargaining between i and j is higher for i and j than either's expected pay off if bargaining takes place between i and k. The core of the coalition formation game is empty if (and only if) there is a sequence of the kind $\{i, k\} \succ_{ik} \{i, j\}$, $\{i, j\} \succ_{ij} \{i, k\}$ and $\{k, j\} \succ_{kj} \{k, i\}$. As we show in lemma 3 below, with the equilibrium constitution c^* M is indifferent between negotiating with R and L. Hence not all three strict preference relations can simultaneously hold at c^*.

Figure 1 depicts the bargaining situation where M has more than average wealth. In the diagram, the set I is the space bounded by the indifference curves corresponding to the default utility levels l^0 for L, m^0 for M and r^0, which is the minimum of the tax rate corresponding to R's reversion utility level and $t = 1$. $MCCL$ is the contract curve of L and M. l^0 is downward sloping in $x < 1$ and m^0 is downward sloping in $x \geq 0$. Let p^{ij} be the proposal which i makes as proposal maker to responder j and the proposal p^{ji} which j makes as proposer to responder i. Assume that M and R bargain. Given c, M proposes to R the point p^{MR} with the tax rate t^c and her most preferred x on L's participation constraint l^0. As R wants to minimize t, his proposal is given by the intersection of l^0 and m^0. If M and L were to bargain with each other, M would propose to L point p^{ML} which maximizes M's utility given L's continuation utility level on l^0. L would offer M her default utility level m^0 and also satisfy R's default utility level r^0.

Lemma 2. *Assume $w_M > \overline{w}$. Then the constitution c^* selected by the autocrat is Pareto-efficient.*

Proof. First, consider the case where I excludes $x > 1$. Suppose R selects c such that there is a Pareto-better allocation c' (i.e R selects c on the left-hand side of CC). In this case, there is also c'' with $t'' < t^c$, $x'' > x^c$, $u_M(c'') > u_M(c)$ and $u_L(c'') = u_L(c)$. Then R realizes a strictly smaller tax rate with each proposal and each S in $\{c'', S\}$ than with $\{c, S\}$ with the exception of $\{c'', \{L, M\}\}$ where R realizes a smaller or equal tax rate.

Secondly, consider the case where I includes $x > 1$. Suppose R considers c with $x > 1$. Then $c' = (1, t')$ where t' satifies $u_L(1, t') = u_L(c)$ is Pareto-efficient and it gives R a lower tax rate with every proposal in a bargaining coalition including R. Moreover, p^{ML} in $\{M, L\}$ is not affected and as $u_M(c') > u_M(c)$, in $\{M, L\}$ the proposal p^{LM} based on c' comes with a lower tax rate than the proposal based on c. Moreover, with c, L proposes $t^c > t'$ in grand coalition bargaining, so c' is also preferred by R if the grand coalition forms. □

As a consequence of lemma 2, the equilibrium constitution c^* is located on the right-hand-side of the vertical part of the contract curve of L and M, CC, and in the range $x \leq 1$: In this range, any move which is agreed by L and M is opposed by R. At the equilibrium constitution c^*, M is indifferent between bargaining with L and R:

Lemma 3. *Assume $w_M > \overline{w}$ and R wants to design a constitution for negotiations between R and M. In equilibrium, R must offer M a constitution c^* such that she is indifferent between negotiating with R or L.*

Proof. Observe that each player strictly prefers to be included in two player negotiations over being the out player in a two player coalition or negotiating in a three-player coalition. The latter point can be seen by noting that because the equilibrium constitution is Pareto-efficient by lemma 2, in equilibrium a three-player coalition always implements the status quo constitution c.

So assume only two-player coalitions form and suppose that given c, M would strictly prefer negotiating with L to negotiating with R. As L also prefers being included in negotiations and R suffers a loss if excluded, this cannot be in R's interest. Next suppose that M strictly prefers negotiating with R. Now R would benefit by extracting a rent from M because in equilibrium there is a trade-offf between M's pay-off $EU_{M|\{c,\{M,R\}\}}$ and R's pay-off $EU_{R|\{c,\{M,R\}\}}$ as we demonstrate:

As figure 1 illustrates, if in the range $x < 1$, c moves in the direction of increased x and downwards along indifference curve m^0, M's expected utility in a coalition with R is reduced and R's expected utility increases: Any such sequence of moves results in a move of p^{MR} and p^{RM} downward and right along L's participation

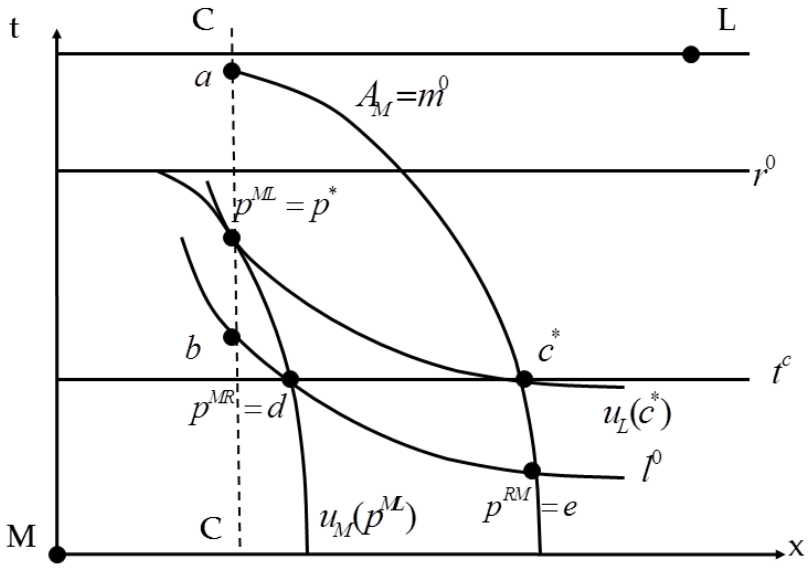

Figure 1: Equilibrium constitution when $w_M > \overline{w}$

constraint. Because R prefers smaller t and M's indifference curves cross l^0 from above, the trade-off obtains, as claimed. Moreover, because R's problem is to maximize a quasi-concave function on a convex set, any increasing sequence must lead to the overall optimum.

Finally, consider the case where I includes $x = 1$ and let c move downwards along the vertical line $x = 1$. This move does not affect p^{RM} which is selected at the minimum of I but it results in a move of p^{MR} downward and right, as above. □

This result does not extend to the case $w_M < \overline{w}$ (see the proof of lemma 5). Note that although M is indifferent between negotiating with R and L, in equilibrium M must settle for negotiations with R. Otherwise, R would have wanted to deviate and design an optimal constitution for negotiations with L.

The following lemma provides a characterization of equilibrium for the case where R designs the constitution to negotiate with above-average effective wealth M and the constraint on t is not binding.[13] It turns out that the equilibrium

[13]The constrained case is considered in the proof of proposition 1.

constitution c^* is located on m^0 if in the range $x < 1$ or on the intersection of the vertical line $x = 1$ and the betterset $B_M = \{(x,t)|u_M(x,t) \geq u_M^0\}$. We denominate this set A_M.[14]

Lemma 4. *Assume that $w_M > \overline{w}$ and the non-negativity constraint on t is not binding. If M is predicted to negotiate with R, in equilibrium c^* must satisfy lemma 2 and the following conditions: (a) c^* must lie on the same indifference curve of L as the induced proposal p^{ML}. (b) The induced proposals $p^{ML} \in CCL$ and p^{MR} lie on the same indifference curve of M. (c) c^* lies on A_M and gives M at least her continuation utility u_M^0. (d) p^{MR} lies on l^0 and gives L her continuation utility u_L^0.*

Proof. See part A of the appendix. □

Now consider the case where M has less than average effective wealth:

Lemma 5. *Assume that $w_M < \overline{w}$. If R is predicted to negotiate with L or with M, in equilibrium c^* must be located on r^0 and M offers R his default pay-off.*

Proof. Suppose a constitution is selected in $I \backslash r^0$ such as c' in figure 2. M and R realize $p^{MR'}$ when M proposes or $p^{RM'}$ when R proposes, the latter giving M $u_M(c')$. If M bargains with L, L proposes $p^{LM'}$ on r^0 and M proposes $p^{ML'}$ on p^{ML}. By construction, $u_M(p^{ML'}) \geq u_M(c')$ and $u_L(p^{ML'}) \geq u_L(c')$ and an analogous relation holds for $p^{LM'}$ benefitting L. To see that one relationship must be strict note that if c' is in the minimal point of I, $p^{ML'} \in I \backslash \{c'\}$ and $p^{ML'} \in I \backslash \{c'\}$ Pareto-dominate c' for M and L. If c' is selected in any other point in I, points in the set $\{x,t|u_M(x,t) \geq u_M(c')\} \cap \{x,t|u_L(x,t) \geq u_L(c')\}$ Pareto-dominate c', as illustrated in figure 2. Thus M and L prefer negotiating with each other over negotiating with R. Hence, c' cannot be located in $I \backslash r^0$.

Point b in figure 2, in the intersection of r^0 and m^0 constitutes an equilibrium constitution for $S = \{M, R\}$: M's proposals in a coalition with R is p^{MR} at point a in the intersection of r^0 and R proposes p^{RM}, the minimal point in I which satisfies L's participation constraint and $u_M(p^{RM}) \geq u_M(c)$. In a coalition of M and L, point b is realized with certainty, so M realizes a smaller pay off in $\{M, L\}$ than in $\{M, R\}$. However, moving c to the left, m would realize a higher indifference curve and R would need to propose to M a higher tax rate than in p^{RM}. □

Even in the case where where $w_M < \overline{w}$, the autocrat prefers handing down a constitution in the static model as long R has positive probability of proposing in a coalition with M or L. This contrasts to Michalak/Pech (2013) where bargaining coalitions are exogenous: There, in the case where L and M are predicted to

[14] Formally, $A_M = (m_0 \cap \{(x,t)|x < 1\}) \cup (B_M \cap \{(x,t)|x = 1\})$.

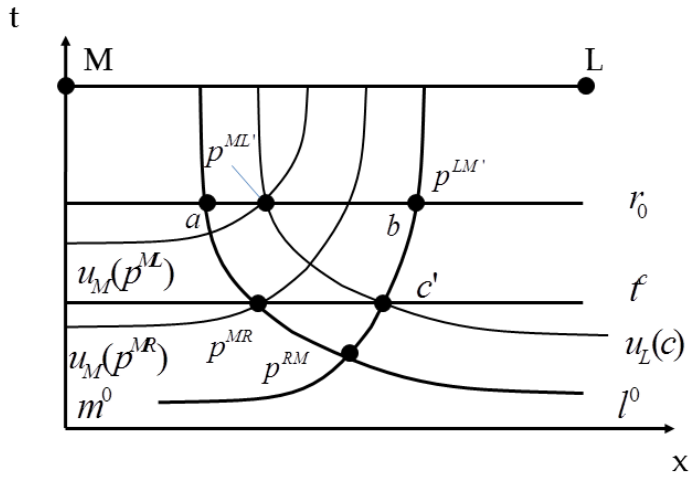

Figure 2: The case $w_M < \overline{w}$: With constitution c', M prefers bargaining with L.

negotiate a positive value fails to be created for R. If bargaining coalitions are endogenous and $w_M < \overline{w}$, the coalition of L and M never forms because under the optimal constitution M (or L) realizes a higher pay-off when negotiating with R. Note that unlike in the case of lemma 3, R cannot benefit from lowering M's pay-off because they realize a corner solution.

Proposition 1 summarizes and extends our results:

Proposition 1. *For the static model of constitutional choice there exists a constitution which the autocrat wants to hand down. Moreover, it is an equilibrium for the reform negotiations to take place between R and M and the equilibrium constitution written for this bargaining coalition is unique.*

Proof. See part B of the appendix. □

Note that the optimal constitution is not unique, i.e. there is an optimal constitution for $\{L, R\}$ and an optimal constitution for $\{M, R\}$. Because we want to provide an explanation for the historic precedence, we focus on the case where R bargains with M.

Remark 1. Assume $P_M(\{M, R\}) = P_L(\{L, R\})$ and $w_M > \overline{w}$. R is indifferent between designing a constitution for M - when M and R are predicted to bargain - or for L - if L and R are predicted to bargain. While R prefers to be included in a bargaining coalition, M and L are indifferent between bargaining with R or with each other.

Proof. See part C of the appendix. □

Although ex ante R is indifferent between designing a constitution for M or L, once c is designed to support negotiations with M, R strictly prefers bargaining with M rather than L unless a corner solution is realized where all bargains give R a tax of zero.

Proposition 2. *Assume $w_M > \overline{w}$. The constitution c^* distorts the (Pareto-efficient for L and M) choice of policy x.*

Proof. See part D of the appendix. □

In contrast to inefficiency results obtained in dynamic spatial legislative bargaining models such as Baron/Diermeier/Fong (2012), c implements a Pareto-efficient policy point but although R is indifferent about x, it does not pick a point on the vertical part of the contract curve of L and M, CC. The motive is similar as in Baron/Diermeier/Fong: There, a status quo point outside of the Parto-field strengthens the bargaining position of a future proposal maker against

the party currently left outside of the governing coalition. In our model, the autocrat wants to simultaneously weaken the bargaining position of the Left and the Center party in negotiations with the Right and, hence, distorts the policy x by selecting a point off the vertical part of the contract curve CC: Strengthening L would directly work against the interests of R while strengthening M would require a compromise on tax in order not to violate L's participation constraint.

5 The effect of middle class wealth

Although by proposition 1 a constitution which is preferred to the default outcome by the bargainers as well as the out-party of a two-player coalition generally exists, the constitution offers different levels of safeguards against redistribution: From lemma 5 we know that in the case $w_M < \overline{w}$ the tax rate of the status quo constitution coincides with R's default tax rate in the absence of a constitution. So at least in the case where M (or L) proposes in a bargaining coalition with R, the constitution offers no additional safeguard against redistribution. As middle class wealth switches from a wealth-level slightly below to a wealth level slightly above average wealth, the default tax rate decreases whilst the pay-off for R from designing a constitution increases by a strictly positive, discrete magnitude:

Proposition 3. *Assume that the non-negativity constraint on t^c is not binding and $\pi_M >> 0$. For $\Delta_M \to 0$ and $K_i = 0$, a switch in middle class wealth from $w_M = \overline{w}^-$ to $w_M = \overline{w}^+$, increases R's pay-off from designing a constitution by a strictly positive, discrete magnitude.*

Proof. See part E of the appendix. □

Next, we provide comparative statics results for incremental increases of w_M:

Proposition 4. *Assume that the non-negativity constraint on t^c is not binding, $w_M > \overline{w}$ and $\pi_L = \pi_M$. For s_M and/or Θ_M sufficiently small, R's pay-off from designing a constitution increases as M gets richer.*

Proof. See part F of the appendix. □

Generally, the effect of an increase in middle class wealth on the equilibrium constitution and induced tax policies is ambiguous: An increase in w_M shifts the m^0 curve downwards in the range $x < \sqrt{\frac{\pi_L}{\pi_L+\pi_M}}$ and the l^0 curve upwards in the range $x > 1 - \sqrt{\frac{\pi_M}{\pi_L+\pi_M}}$[15]: As M becomes richer, she becomes relatively more

[15]Differentiating $t_{|l^0}$ for fixed x gives $-s_M\Theta_M \frac{-\alpha}{(w_L-\overline{w})^2}[\frac{\pi_M}{\pi_L+\pi_M} - (1-x)^2]$ and differentiating $t_{|m^0}$ gives $(1-s_M\Theta_M)\frac{-\alpha}{(w_M-\overline{w})^2}[\frac{\pi_L}{\pi_L+\pi_M} - x^2]$ where we have used $\Delta_i = w_i - \overline{w}$ and the definition of $\overline{w}$.

averse to taxation compared to the policy goal. The countervailing effect results because as M becomes richer, the value of confiscatory taxation in the conflict scenario increases and for L the attractiveness of taxation increases relative to the policy goal. Hence, L will demand a higher tax rate to satisfy her participation constraint. The latter effect is weakened when taxation is less effective in raising the income of a representative member of the left, i.e. if the effectiveness ratio Θ decreases, or if the size of the middle class s_M decreases.

6 A model of intertemporal constitutional choice

The previous section has introduced a static model of constitutional choice where the autocrat can choose the constitution for his successor government without incurring any cost such as being bound by the constitution himself. In practice, it is likely to be a condition for a constitution to be considered as a template that it has actually been adhered to for some time before the regime's demise.[16] In addition, the autocrat may not know the precise date of his demise and, therefore, will want to write and implement the constitution at a time when the probability that he will be in post for another day is still greater than zero. On the other hand, the consequences of successfully handing down a constitution might be felt for a long time. Therefore, it is reasonable to assume that the autocrat will attach non zero weights to the cost which he incurs by not realizing his preferred policy outcome $t = 0$ during the time when he has to abide by the constitution himself and to the gains which are realized at the time when his successors deliver preferred policy outcomes. We assume, that depending on the expected length of time in both states and the discount rate of the autocrat, these weights assume the values $(1-\delta)$ and δ. We take the weights to be exogenous even if $(1-\delta)$ depends positively on his time in office which might be dependent on the constitutional choice of the autocrat. The problem of the autocrat is to choose among the constitutions which form an equilibrium in the second stage of the game the one which gives him the highest total benefit

$$W^R(c) = (1-\delta)u_R(c) + \delta EU_{R|\{c,\{M,R\}\}} \tag{3}$$

where $EU_{R|\{c,\{M,R\}\}}$ is the expected pay-off for R if c is the constitution and the bargaining coalition is $\{M, R\}$ The autocrat wants to write a constitution if there exists $c \in I$ such that

[16] See footnote 3. In the example of Chile which motivates this paper, the ultimate cost of adhering to the constitution came in the form of accepting electoral defeat.

$$W_R(c) > (1-\delta)u_R(t=0) + \delta u_R^0 \tag{4}$$

Prima facie it is not clear whether the autocrat wants to select the equilibrium constitution from the static problem when facing the dynamic problem:[17] In the dynamic model, the autocrat could face a trade off between paying lower taxes today and having an optimally designed constitution after transition. However, if the autocrat lowers t^c compared to to the optimal constitution c^* of the static model, it becomes more attractive for M to bargain with L rather than R thus violating lemma 3. Hence we have:

Lemma 6. *If the autocrat wants to hand down a constitution in the dynamic setting he selects the same constitution as in the static setting of proposition 1.*

Proof. The autocrat might want to choose a constitution c^* which gives him a lower tax rate in period 1. This would require moving c^* downwards and, considering the second stage problem, moving it along m^0.

In the unconstrained case, because p^{ML} fulfills condition (a) in lemma 4 by construction, moving c^* results in a violation of condition (b) of lemma 4 and M would prefer negotiating with L as p^{MR} moves down along l^0, thus violating lemma 3. Finally, if the constraint $t^c \geq 0$ is binding, t^c cannot be reduced. □

Thus proposition 1 continues to characterize the constitutional choice in the dynamic model. Because in the static model there always exists a constitution which the autocrat prefers over the default outcome, it is immediate that for sufficiently great δ the autocrat wants to write a constitution whilst for $\delta \to 0$ no constitution with $t^c > 0$ can be supported. There is an intermediate range, in which the autocrat's decision to write a constitution depends on the parameters of the model.

Proposition 5. *Assume that R's pay-off from designing a constitution increases in w_M. There are pairs $(\underline{w}_M, \underline{\delta})$ such that for $w_M > \underline{w}_M$ and/or $\delta > \underline{\delta}$ the autocrat strictly prefers handing down a constitution.*

Proof. Obvious from the fact that by proposition 1, in the static model there exists a constitution which the autocrat wants to hand down and, hence for $\delta = 1$, there also exists such a constitution in the dynamic model. □

[17] In dynamic spatial models of government formation and policy choice the proposal maker may have incentives to distort the policy of a static equilibrium in order to decrease the demand of another party when it joins the government formed in the following period, see Baron, Diermeier and Fong (2012). In our setting, however, the autocrat designs the constitution to support bargaining with one particular agent and is constrained in exploiting this agent by the condition in lemma 3.

It is worth stressing that (3) and (4) represent a time-consistent policy rule: If a juncture is reached where the autocrat has to choose between the expected outcome from abiding by the constitutional process, $EU_{R|\{c,S\}}$, or the default outcome from conflict, u_R^0, he will want to abide by the constitutional process.

7 Different modeling assumptions

In contrast to the two dimensions/three party case where weak incentives for constitution writing exist even with two parties in favour of redistribution, reducing the dimensionality of political conflict to a conflict over tax, destroys any incentives for constitution writing unless there is an exogenous cost to conflict: Assume only L and R are in the political arena and support by both is necessary for the constitutional reform process to succeed. Also assume, that there is a positive cost to conflict K_L for the left party. In this case, the smallest acceptable tax rate for L, t_L^{min}, is less than the expected tax rate under the conflict scenario t^0 . The autocrat now chooses $c = (t_L^{min})$, the left party accepts the constitution c and t_L^{min} is realized with certainty. Because $t_L^{min} < t^0$, the autocrat realizes a surplus. If, on the other hand, $K_L = 0$, there is no advantage to writing a constitution.[18] In the case with two dimensions and three parties, R can still obtain an advantage when he is proposing against the default tax rate by making concessions on the policy dimension x.

We may also consider a model where players can make side payments to other political parties. Ex post the efficient policy is always realized and the proposal maker fulfills the participation constraints of all players. Raising a player's pay off in the status quo constitution above her default pay off makes it costly to include this player into negotiations over the reform constitution. Because the most costly player will be excluded from negotiations, any increase in the pay off of the autocrat's clientele in the status quo constitution needs to be matched by an increase in some other player's pay off. So an autocrat who wants to make sure that an advantaged party of the Right will form a bargaining coalition with the Center needs to write into the constitution matching benefits for the Left party. Increasing the pay-off of the Left party under the constitution for a given tax rate implies distorting the policy along the x-dimension in favor of the Left party, so the policy point implemented in the status quo constitution is also inefficient. The implication that the Left party is favored by the constitution is clearly at odds with the Chilean case and might be difficult to square with empirical data more generally.

[18] Risk aversion with respect to wealth has the same effect as assuming costs of conflict.

8 Reappraising the 1980 constitution of Chile

The 1980 constitution was worked out by the Junta based on a draft formulated by the Constituent Commission - a committee of conservative constitutional lawyers mainly drawn from the Right and complemented by some Christian Democrats (Barros, 2002) and approved in a controversial plebiscite. After Pinochet was defeated when running for re-election in 1988 under the terms of the constitution, negotiations on constitutional reform were conducted between representatives of the Center-Left (Concertacion) and the Right (RN) with the government weighing in on some issues.[19] The negotiations were mainly about procedure and composition of decision making bodies yet the rules adopted had a lasting impact on policies. Because the ultimately approved document kept appointed senators in place, the right was going to be able to block legislation in the senate. As a consequence, the neo-liberal reforms introduced by the regime were continued yet the incoming Aylwin administration was able to increase the progressivity of the tax system. The most important change was the rewording of article 8 which had banned Marxist parties to allow political pluralism. This enabled parties of the left which were not anti-system to run in elections.

Overall, the Concertacion wrestled relatively minor concessions from the Right and the constitutional settlement resulted in a consolidation of the economic policy framework brought in by the Pinochet regime. It is not obvious that the bargain over the reform constitution included issues of minor salience for the Right - contrary to what our model assumes. Yet the overall assessment of the developments was of a reduction in political polarization (Montes/Vial). The Concertacion ended up as the dominant political force and was able to go on about day-to-day politics as long as it did not cross the red lines which the Right was able to defend by making use of the constitutional safeguards. It is not quite clear whether the 1980 constitution satisfied the participation constraint of the left - yet with a receding threat of intervention by the military, it might have been only the change in article 8 which ensured the acceptability of the constitution. In the end, the reform proposal was supported by the unions and the Catholic church and only the Communist Party called for a boycot of the referendum on the constitution.

9 Conclusion

The model demonstrates that the selection of a constitutional status quo point by an autocrat representing a rich elite will be effective as a check on redistributive policies which a succeeding constitutional assembly may pursue in order to buy off

[19] For an overview see Montes/Vial (2005) and Barros (2002).

the Left. The case of the Chilean constitution of 1980 confirms that an autocratic government may successfully pursue such a strategy.

A switch of effective middle class wealth from below to above average wealth has a large positive effect on the desirability of constitution writing. More generally, the relationship between the pay-off to the autocrat and middle class wealth is ambiguous. A positive effect can only be shown if taxation is not "too effective" in redistributing wealth. With lump sum taxation and a larger size of the middle class the demand for redistribution may increase due to the participation constraint of the Left.[20] If the claimed effect of middle class size is counter-intuitive, one has to bear in mind that one assumption of the model is that the default outcome of the Left depends on its probability of winning a conflict which is taken to be exogenous. As the middle class grows at the expense of the poor, this is likely to affect the probability of winning conflict. On the other hand, if the poor ultimately vanish, the former middle class has to take its role as the polity approaches the dichotomous, one-dimensional case.

References

[1] Baron, D., Diermeier, D., Fong, P. (2012), A Dynamic Theory of Parliamentary Democracy, Economic Theory 49: 703-738.

[2] Barros, R., Constitutionalism and Dictatorship. Pinochet, the Junta, and the 1980 Constitution, Cambridge University Press, Cambride UK, 2002.

[3] Brown N (2011) The Egyptian constitution's rulebook for change, foreign policy. http://foreignpolicy.com/2011/02/03/the-egyptian-constitutions-rulebook-for-change/ Accessed 3 February 2011

[4] Easterly, William (2001), Middle Class Consensus and Economic Development, Journal of Economic Growth 6: 317-35.

[5] Farrant, A., McPhail, E., Berger, S. (2012), Preventing the "Abuses" of Democracy: Hayek, the "Military Usurper" and Transitional Dictatorship in Chile? American Journal of Economics and Sociology 71: 513-538.

[6] Grossman, H. (2002), Constitution or Conflict?, NBER Working Paper 8733.

[7] Kitschelt, H. (1996), The Transformation of European Social Democracy, Cambridge University Press.

[20] In a benchmark case with equal group size and lump sum taxation an increase in effective wealth of the middle class translates into an increase in the reversion outcome for the Left which may increase the expected tax rate under the constitutional process.

[8] Michalak, K., Pech, G. (2013), Stable Constitutions in Political Transition, in: Schofield, N., Caballero, G., Kselman, D. (eds) , Advances in Political Economy, Springer 2013.

[9] Montes, J. Esteban, Vial, T. (2005), The Constitution Building Process in Chile: The Authoritarian Roots of a Stable Democracy, International Institute for Democracy and Electoral Assistance, Stockholm.

[10] North, D. C., Weingast, B. (1989), Constitutions and Commitment: The Evolution of Institutions Governing Public Choice in Seventeeth Century England, Journal of Economic History 49: 803-832.

[11] Ordeshook, Peter (1997), Constitutions for New Democracies: Reflections of Turmoil or Agents of Stability? Public Choice 90: 55-72.

[12] Pech, G. (2008), Rationality and the Legal Order, in: Economics, Rational Choice and Normative Philosophy, ed. by Tom Boylan and Ruvin Gekker, Routledge Series Frontiers of Political Economy.

[13] Przeworski, A., Wallerstein, M. (1988), Structural Dependence of the State on Capital, American Political Science Review 82: 12-29

[14] Schofield, N., Caitafe, G. (2007), A Model of Political Competition with Activists Applied to the Elections of 1989 and 1995 in Argentina, Mathematical Social Sciences 53: 213-231

[15] Tapia, J. (1987), Sobre el uso de la 'legalidad' de la dictatura, Cauce 113 (22 June): 22-29.

10 Appendix

10.1 Appendix A, proof of lemma 4

The four conditions describe an equilibrium: We obtain p^{ML} as M's maximum given the indifference contour $u_L(c^*)$, so (a) is fulfilled by any rational proposal of M to L. If (b) is fulfilled, the pay-off of M is equal when proposing in the coalitions $\{M, L\}$ and $\{M, R\}$. Because as responder M receives $u_M(c^*)$, she receives the same pay-off as responder in the coalitions $\{M, L\}$ and $\{M, R\}$. So (a) and (b) fulfill lemma 3. By (c) the constitution c^* is sustainable and by (d) M's proposal to R is in I.

To see that these conditions are also necessary, consider moving c^* downwards along m^0.[21] Because p^{ML} fulfills (a) by construction, this results in a violation of condition (b) and M would prefer negotiating with M as p^{MR} moves down along l^0. If c^* moves up, R's pay-off is smaller in the case where M proposes and unaffected when R proposes.

Suppose c^* moves left to c' along the iso-tax line t^c and away from A_M in violation of (c). As M enjoys greater utility at c', $u_M(c^*)$ shifts right to $u_M(c')$. As R's proposal has to fulfill l^0 and offer $u_M(c')$, $p^{RM\prime}$ is above and right of point p^{RM} with a higher tax. In the case where M proposes, she offers t^c as with c^*.

Finally, consider $c^* = a$. This fulfills all conditions, except condition (d). In this case, however, R realizes a smaller expected pay-off when negotiating with M than for the solution with $p^{MR} \in l^0$. Hence, conditions (a) - (d) are also necessary.

Given c^*, negotiations between M and R are compatible with equilibrium: R is not better off when negotiating with L: In this coalition, L proposes c^* and R proposes c^* but this is worse for R than p^{RM}. L would prefer negotiating with M - where L proposes the intercept of m^0 and r^0 - but as we have shown, M is indifferent. Finally, in three-way negotiations where all agents have to agree on a proposal c^* is realized irrespective of the proposer, so R and M strictly prefer negotiating with each other.

10.2 Appendix B, proof of proposition 1

10.2.1 Case $w_M > \overline{w}$

lemma 4 characterizes an equilibrium solution in the case $w_M > \overline{w}$ when the non-negativity constraint on t is not binding. For this case we show that a constitution which satisfies lemma 4 generally and uniquely exists in section 1 and extend this result in section 2 and 3.

1) Let $g(t) = \{x', t' | (x', t') \in CCL \wedge u_L(x', t') = u_L(x, t) \text{ for } (x, t) \in A_M\}$ and $h(x', t') = \{t | (x, t) \in l^0 \wedge u_M(x', t') = u_M(x, t)\}$. g maps the tax rate corresponding to c into CCL through L's indifference curve relation. h maps a point on CCL back into the tax rate corresponding to point d in figure 1 through M's indifference curve relation. By lemma 4, the tax rate in d corrsponds to the tax rate in c. A fixed point of the mapping $h(g(t))$ must, therefore, be the tax rate t^c corresponding to c such that c satisfies the conditions in lemma 4.

Denominate t^b the tax rate associated with b the point in the intersection of

[21] Note that c^* cannot coincide with point e, where tax is minimized in I: Suppose it did. Then p^{ML} coincides with c^* so that m^0 coincides with $u_M(p^{ML})$ and l^0 coincides with $u_L(c^*)$. But because p^{ML} is on the contract curve of M and L this implies that m^0 is tangential to l^0 from which follows that I vanishes, contradicting lemma 1 which states that I is non-empty and does not vanish.

l^0 and CCL and t^e the tax rate in e, the point in the intersection of A_M and l^0 where tax is minimized. Define $\overline{t} = t^b$ and $\underline{t} = t^e$.

Observe that $h(g(\overline{t})) < \overline{t}$): This follows because in CCL the indifference curve corresponding to $u_M(x', t')$ cuts $u_L(x', t')$ from below and l^0 is decreasing in x. Moreover, $h(g(\underline{t})) > \underline{t}$. g maps tax rates into increasing points on CCL as measured by u_L. h maps increasing points on CCL into decreasing tax rate t. Thus, $h(g(t))$ is decreasing in t. Hence, $h(g(t))$ has a unique fixed point.

2) The constraint $t \geq 0$ is binding.

In this case it is impossible to construct a constitution with $t^c \geq 0$, i.e. $u_L(p^*)$ cuts m^0 (or m^1) below the $t = 0$ line. Now $c^{*\prime}$ is located on the $t = 0$ line, hence R realizes $t = 0$ with every proposal.

Assume that l^0 intersects $t = 0$ on the left of CC: M's proposals in a coalition with L or with R, p^{ML} and p^{MR}, are located at point d in the intersection of $t = 0$ and l^0 with $u_M(p^{ML}) = u_M(d)$. When L proposes to M or R to M or L, the proposal is $c^{*\prime}$. So for any location of $c^{*\prime}$ in I and on $t = 0$, M is indifferent between negotiating with R and L.

Now assume that l^0 intersects $t = 0$ on the right of CC: M's proposal in a coalition with R, p^{MR}, is located at the intersection of the $t = 0$-line and l^0 and M's proposals in a coalition with L, p^{ML}, is on CC and satisifies $u_L(p^{ML}) \geq u_L(c)$. Hence, $c^{*\prime}$ must be selected in the intersection of l^0 and $t = 0$ to ensure M is indifferent between forming a coalition with R or L. Note that in both cases, L is not indifferent between negotiating with R and M but as R and M are indifferent between their choice of coalition partners, so $\{M, R\}$ is core stable at $c^{*\prime}$.

10.2.2 Case $w_M < \overline{w}$

By lemma 5, t^c coincides with r^0 and M offers R his default pay-off. When R proposes, he needs to offer to M the maximum of $u_M(c^*)$ and u_M^0, so in equilibrium R selects c^* in the intersection of m^0 and r^0. By lemma 1, R realizes a strictly better point than his default pay-off when he is the proposer.

10.3 Appendix C, proof of remark 1

We show that the autocrat is indifferent between designing a constitution for M and for L in the case $w_M > \overline{w}$:

(1) Interior solution, i.e. p^{ML} is located on CCL.

Designing a contract c^* for M: $c^* \in A_M$ and p^{ML} is on the contract curve CCL. Policy proposals satisfy $p^{ML} \sim_L c^*$, $p^{MR} \in u_L^0$ and $p^{MR} \sim_M p^{ML}$. Moreover, $p^{MR} \sim_R c^*$

Designing a contract c^{**} for L: $c^{**} \in l_0$ and p^{LM} is on the contract curve CCL. Policy proposals satisfy $p^{LM} \sim_M c^{**}$, $p^{LR} \sim_L p^{LM}$ and $p^{LR} \in A_M$. Moreover,

$p^{LR} \sim_R c^*$.

It can be seen that c^{**} coincides with $p^{MR}(c^*)$ and $p^{LR}(c^{**})$ coincides with c^* so that, by construction, both constitutions assign the same tax rate t^c. Existence and uniqueness of c^{**} can be shown along the same lines as uniqueness of c^*. By duality, $p^{LM}(c^{**}) = p^{ML}(c^*)$.

R realizes t^c when he receives a proposal from M in $\{M, R\}$ under c^* and when he receives a proposal from L in $\{L, R\}$ under c^{**}. If R proposes, he realizes the minimal tax rate in I in either coalition. Hence, R is indifferent between designing a constitution for L and designing a constitution for M.

c^{**} is also compatible with a core stable equilibrium because, given c^{**}, L is indifferent between bargaining with M and R: If L bargains with M, she realizes $u_L(c^{**})$ as responder and the point $p^{LM}(c^{**})$ as proposer. If L bargains with R, she realizes $u_L(c^{**})$ as responder and the point $p^{LR}(c^{**})$ as proposer. Because $p^{LM}(c^{**})$ coincides with $p^{ML}(c^*)$ and $p^{LR}(c^{**})$ with c^*, by construction $p^{LM}(c^{**}) \sim_L p^{LR}(c^{**})$.

(2) Constrained solution

In case the constraint $t \geq 0$ is binding, p^{RL} is located in the intersection of l^0 and $t = 0$ (or in the intersection of $x = 1$ and $t = 0$ in the case of appendix part B, case 2 and c^{**} is selected on $t = 0$ to support this equilibrium. As R realizes $t = 0$ in every coalition, he is indifferent over the choice of bargaining coalition.

10.4 Appendix D, Proof of proposition 2

By lemma 4, c^* must be located on m^0. Suppose c^* is also efficient, i.e. located at point a in the intersection of CC and m^0. Then M proposes $p^{ML} = a$ and $p^{MR} = a$, violating condition (d) of lemma 4.

10.5 Appendix E, proof of proposition 3

Setting $u_i(x,t) = u_i^0$ we obtain the indifference curve equations m^0, l^0 and r^0 as

$$t_{|m^0} = \frac{\alpha}{\Delta_M}\left(\frac{\pi_L}{\pi_L + \pi_M} - x^2\right) + \pi_L + (1-\gamma)\pi_M + \frac{K_M}{\Delta_M}, \tag{5}$$

$$t_{|l^0} = \frac{\alpha}{\Delta_L}\left(\frac{\pi_M}{\pi_L + \pi_M} - (1-x)^2\right) + \pi_L + (1-\gamma)\pi_M + \frac{K_L}{\Delta_L}, \tag{6}$$

$$t_{|r^0} = \pi_L + (1-\gamma)\pi_M + \frac{K_R}{\Delta_L}, \tag{7}$$

where $\gamma = 1$ for $w_M > \overline{w}$ and 0 else. For $K_i = 0$ the intersections of l^0 and m^0 with $t = \pi_L$ for $w_M > \overline{w}$ and $t = \pi_L + \pi_M$ for $w_M < \overline{w}$ are given by $x_1 = 1 - \sqrt{\frac{\pi_M}{\pi_L + \pi_M}}$ and $x_2 = \sqrt{\frac{\pi_L}{\pi_L + \pi_M}}$ where $x_2 > x_1$ for $0 < \pi_i < 1$.

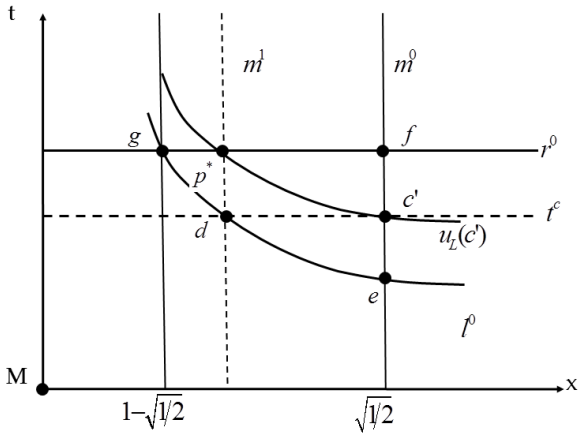

Figure 3: Illustration of the proof of proposition 3.

r^0 switches from $t = \pi_M + \pi_L$ to $t = \pi_L$ and l^0 shifts downwards by π_M while m^0 approaches the vertical line $x = \sqrt{\frac{\pi_L}{\pi_L + \pi_M}}$ as $\Delta_M \to 0$. By lemma 5, c is located on $t = \pi_L + \pi_M$ for $w_M < \overline{w}$. For $w_M > \overline{w}$, c must be located below $t = \pi_L$:

Let e be the point in the intersection of l^0 and m^0, f in the intersection of m^0 and r^0 and g in the intersection of r^0 and l^0. Moreover, let d denominate the endogenously determined point where the line $t = t^c$ intersects with l^0 and let $\widehat{x}$ be the x-value corresponding to point d. Figure 3 depicts the relationship for the symmetric case $\pi_L = \pi_M$.

Assume that p^* is located on the line r^0. Applying the conditions in lemma 4 we get (a) $u_L(x^c, t^c) = u_L(x^*, t^c)$, (b) $u_M(\widehat{x}, t^c) = u_M(x^*, t^*)$, (c) $u_M(x^c, t^c) = u_M^0$ and (d) $u_L(\widehat{x}, t^c) = u_L^0$ with $t^* = \pi_L$.

By lemma 2, the Euclidian distance $||e - f|| > 0$. So suppose that $||c - f|| = \epsilon$ with $\epsilon \to 0$. Construct p^* in the intersection of $u_L(c')$ and r^0. $||p^* - f|| \to 0$ and $||d - g|| \to 0$. However, f and g are on different indifference curves of M, so d and p^* violate condition (b).

This shows that for $w_M > \overline{w}$, the vertical distance between c and r^0 is strictly positive.[22] Because in $\{M, R\}$, M proposes $t^c << \pi_L$, R's pay-off with the constitution is strictly greater than his default pay-off. On the other hand, for $w_M < \overline{w}$, M proposes $t^c = \pi_L + \pi_M$ by lemma 5, guaranteeing R only his default pay-off.

So consider the proposal by R in coalition $\{M, R\}$. If R proposes, he realizes

[22]The construction in figure 3 can be used to show that in the constrained case c^* is located at the midpoint of $\overline{fe}$.

the point e in the intersection of l^0 and m^0. As this point is translated by π_M as w switches from $w_M \to \overline{w}^-$ to $w_M \to \overline{w}^+$, R's pay-off difference compared to his default pay-off is not affected.

10.6 Appendix F, proof of proposition 4

In the absence of a constitution, R realizes $u_R^0 = (1-\pi_L)w_R + \pi_L\overline{w}$. With a constitution pay-offs are $(1-t^c)w_R + t^c\overline{w}$ if M proposes and $(1-t^e)w_R + t^e\overline{w}$ if R proposes. So if $\frac{dt^c}{dw_M} < 0$ and $\frac{dt^e}{dw_M} < 0$, R's advantage from designing a constitution unambiguously increases in w_M.

First, we demonstrate under which conditions $\frac{dt^e}{dw_M} < 0$ holds. Differentiating the equations for l^0 and m^0,

$$u_L(x^e, t^e) = u_L^0,$$
$$u_M(x^e, t^e) = u_M^0,$$

we obtain

$$\begin{bmatrix} -2\alpha(1-x^e) & -\Delta_L \\ -2\alpha x^e & -\Delta_M \end{bmatrix} \begin{bmatrix} dx \\ dt \end{bmatrix} = \begin{bmatrix} s_M\Theta_M\pi_L \\ 1-\pi_L+s_M\Theta_M\pi_L \end{bmatrix} dw_M$$

.

Solving for dx^e/dw_M and dt/dw_M we obtain

$$\begin{bmatrix} \frac{dx}{dw_M} \\ \frac{dt}{dw_M} \end{bmatrix} = \frac{1}{D} \begin{bmatrix} -\Delta_M & \Delta_L \\ 2\alpha x^e & -2\alpha(1-x^e) \end{bmatrix} \begin{bmatrix} s_M\Theta_M\pi_L \\ 1-\pi_L+s_M\Theta_M\pi_L \end{bmatrix}$$

with $D = 2\alpha(1-x^e)\Delta_M - 2\alpha x^e\Delta_L > 0$ for $\Delta_M \geq 0$. This gives $\frac{dt}{dw_M} = \frac{2\alpha}{D}[s_M\Theta_M\pi_L - (1-x)(1-\pi_L+s_M\Theta_M\pi_L)]$. It is immediate that for $s_M\Theta_M$ sufficiently small this expression is negative.

Next, we demonstrate under which conditions $\frac{dt^c}{dw_M} < 0$ holds: Rewriting the conditions in lemma 4 we obtain

$$u_L(x^c, t^c) - u_L(x^*, t^*) = 0 \text{ (a)}$$

$$u_M(\widehat{x}, t^c) - u_M(x^*, t^*) = 0 \text{ (b)}$$

$$u_M(x^c, t^c) - u_M^0 = 0 \text{ (c)}$$

$$u_L(\widehat{x}, t^c) - u_L^0 = 0 \text{ (d)}$$

where we have denominated $\widehat{x}$ the x-value associated with p^{MR} at point d in figure 1. Recall that the tax associated with p^{MR} is t^c. t^* and x^* are the tax rate and policy realization with p^*, corresponding to p^{ML}.

We need to distinguish between the cases where p^* (corresponding to p^{ML} is on the horizontal and vertical part of the contract curve of L and M.

10.6.1 The constraint $t \leq r^0$ is not binding

In this case, p^* is located on CC, the vertical part of the contract curve of L and M and x^* coincides with the efficient point x^{eff}. At x^{eff}, the following condition holds:

$$\frac{dv_M/dx}{dv_L/dx} = \frac{\Delta_M}{\Delta_L},$$

$$\text{or } \frac{x}{1-x} = \frac{\Delta_M}{|\Delta_L|}.$$

Implicitly differentiating we obtain

$$\frac{x'}{x} - \frac{(1-x)'}{1-x} = \frac{\Delta'_M}{\Delta_M} - \frac{|\Delta_L|'}{|\Delta_L|},$$

from which we obtain

$$\frac{dx}{dw_M}\frac{1}{x} = \frac{\frac{1-s_M\Theta_M}{\Delta_M} - \frac{s_M\Theta_M}{|\Delta_L|}}{[1+\frac{\Delta_M}{|\Delta_L|}]} = \beta$$

Because $\Delta_M < \frac{s_L}{1-s_L}|\Delta_L|$, β is always positive.[23]

Intuitively, as w_M increases, M's indifference curve gets flatter, the efficient solution (and CC) moves right and the motive to have lower taxation gets stronger relative to the policy goal. We treat x^* as an exogenous function of w_M, hence we write $\overline{x}^*$.

Differentiating (a) - (d) we get

[23]Note that the condition is $\frac{\Delta_M}{|\Delta_L|} < \frac{1-s_M\Theta_M}{s_M\Theta_M}$. We can show that if $\frac{\Delta_M}{|\Delta_L|} < \frac{s_L}{1-s_L}$ then the condition is fulfilled because $\frac{1-k}{k} < \frac{1-ak}{ak}$.

$$\begin{bmatrix} 0 & \Delta_L & 2\alpha(1-x^c) & -\Delta_L \\ -2\alpha\hat{x} & \Delta_M & 0 & -\Delta_M \\ 0 & 0 & -2\alpha x^c & -\Delta_M \\ 2\alpha(1-\hat{x}) & 0 & 0 & -\Delta_L \end{bmatrix} \begin{bmatrix} d\hat{x} \\ dt^* \\ dx^c \\ dt^c \end{bmatrix} =$$
$$\begin{bmatrix} 2\alpha\beta(1-\bar{x}^*)\bar{x}^* + s_M\Theta_M(t^*-t^c) \\ -2\alpha\beta(\bar{x}^*)^2 - (1-s_M\Theta_M)(t^*-t^c) \\ -(1-s_M\Theta_M)(\pi_L - t^c) \\ s_M\Theta_M(\pi_L - t^c) \end{bmatrix} dw_M$$

It turns out that this system of equations can be reduced to

$$\begin{bmatrix} 2\alpha\hat{x}\Delta_L & 2\alpha(1-x^c)\Delta_M & 0 \\ 0 & -2\alpha x^c & -\Delta_M \\ 2\alpha(1-\hat{x}) & 0 & -\Delta_L \end{bmatrix} \begin{bmatrix} d\hat{x} \\ dx^c \\ dt^c \end{bmatrix} =$$
$$\begin{bmatrix} \Delta_M\left(2\alpha\beta(1-\bar{x}^*)\bar{x}^* + s_M\Theta_M(t^*-t^c)\right) + \Delta_L\left(2\alpha\beta(\bar{x}^*)^2 + (1-s_M\Theta_M)(t^*-t^c)\right) \\ -(1-s_M\Theta_M)(\pi_L - t^c) \\ s_M\Theta_M(\pi_L - t^c) \end{bmatrix} dw_M$$

With the determinant $D = 4\alpha^2\hat{x}x^c(\Delta_L)^2 + 4\alpha^2(1-\hat{x})(1-x^c)(\Delta_M)^2 > 0$ we obtain the policy functions

$$\begin{bmatrix} \frac{d\hat{x}}{dw_M} \\ \frac{dx^c}{dw_M} \\ \frac{dt^c}{dw_M} \end{bmatrix} = \frac{1}{D}\begin{bmatrix} 2\alpha x^c\Delta_L & 2\alpha(1-x^c)\Delta_M\Delta_L & -2\alpha(1-x^c)(\Delta_M)^2 \\ -2\alpha(1-\hat{x})\Delta_M & -2\alpha\hat{x}(\Delta_L)^2 & 2\alpha\hat{x}\Delta_L\Delta_M \\ 4\alpha^2(1-\hat{x})x^c & 4\alpha^2(1-\hat{x})(1-x^c)\Delta_M & -4\alpha^2x^c\hat{x}\Delta_L \end{bmatrix} v$$

where

$$v = \begin{bmatrix} \Delta_M\left(2\alpha\beta(1-\bar{x}^*)\bar{x}^* + s_M\Theta_M(t^*-t^c)\right) + \Delta_L\left(2\alpha\beta(\bar{x}^*)^2 + (1-s_M\Theta_M)(t^*-t^c)\right) \\ -(1-s_M\Theta_M)(\pi_L - t^c) \\ s_M\Theta_M(\pi_L - t^c) \end{bmatrix}$$

Using $\frac{\bar{x}^*}{1-\bar{x}^*} = \frac{\Delta_M}{|\Delta_L|}$, v simplifies to

$$v = \begin{bmatrix} \left(s_M\Theta_M\Delta_M + (1-s_M\Theta_M)\Delta_L\right)(t^*-t^c) \\ (1-s_M\Theta_M)(\pi^L - t^c) \\ s_M\Theta_M(\pi^L - t^c) \end{bmatrix}$$

Using $\pi_L \geq t^c$ and $t^* \geq t^c$ and recalling $\Delta_L < 0$, we get $\frac{dt^c}{dw_M} < 0$ for $s_M\Theta_M$ sufficiently small.

10.6.2 The constraint $t \leq r^0$ is binding.

In this case, p^* is located on r^0, i.e. $t^* = \pi_L$ and x^* adjusts along r^0.

$$\begin{bmatrix} 0 & -2\alpha(1-x^*) & 2\alpha(1-x^c) & -\Delta_L \\ -2\alpha\hat{x} & 2\alpha x^* & 0 & -\Delta_M \\ 0 & 0 & -2\alpha x^c & -\Delta_M \\ 2\alpha(1-\hat{x}) & 0 & 0 & -\Delta_L \end{bmatrix} \begin{bmatrix} d\hat{x} \\ dx^* \\ dx^c \\ dt^c \end{bmatrix} = \begin{bmatrix} s_M\Theta_M(t^*-t^c) \\ -(1-s_M\Theta_M)(t^*-t^c) \\ -(1-s_M\Theta_M)(\pi_L-t^c) \\ s_M\Theta_M(\pi_L-t^c) \end{bmatrix} dw_M$$

reduce to

$$\begin{bmatrix} -4\alpha^2\hat{x}(1-x^*) & 4\alpha^2x^*(1-x^c) & -2\alpha[x^*\Delta_L+(1-x^*)\Delta_M] \\ 0 & -2\alpha x^c & -\Delta_M \\ 2\alpha(1-\hat{x}) & 0 & -\Delta_L \end{bmatrix} \begin{bmatrix} d\hat{x} \\ dx^c \\ dt^c \end{bmatrix} = \begin{bmatrix} 2\alpha(t^*-t^c)[s_M\Theta_Mx^*-(1-s_M\Theta_M)(1-x^*)] \\ -(1-s_M\Theta_M)(\pi_L-t^c) \\ s_M\Theta_M(\pi_L-t^c) \end{bmatrix} dw_M$$

We have $D = -8\alpha^3\widehat{x}(1-x^*)x^c\Delta_L - 8\alpha^3(1-\widehat{x})x^*(1-x^c)\Delta_M - 8\alpha^3[x^*\Delta_L + (1-x^*)\Delta_M]$.

Observe that as the constraint is binding, x^* must be on $r^0 \cap I$ and, using $\pi_L = \pi_M$, $x^* \geq 1 - \sqrt{\frac{1}{2}}$ whilst the constitution c must be situated on the right of the intercept of m^0 and, hence, $x^c \geq \sqrt{\frac{1}{2}}$.

From the efficiency condition, we know that $\frac{x^{eff}}{1-x^{eff}} = \frac{\Delta_M}{|\Delta_L|}$.

Hence, $\widehat{x} > x^{eff}$ and $\frac{\widehat{x}}{1-\widehat{x}} > \frac{\Delta_M}{|\Delta_L|}$.

So the first two terms in the expression of D yield a positive number:

$$\begin{aligned} &\widehat{x}(1-x^*)x^c|\Delta_L| \\ &\qquad > x^{eff}\sqrt{\frac{1}{2}}(1-\sqrt{\frac{1}{2}})|\Delta_L| \\ &\qquad = (1-x^{eff})(1-\sqrt{\frac{1}{2}})\sqrt{\frac{1}{2}}\Delta_L\frac{x^{eff}}{1-x^{eff}} \\ &\qquad \geq (1-\widehat{x})x^*(1-x^c)\Delta_M \end{aligned}$$

and the third term is positive as

$$
\begin{aligned}
&|\Delta_L| x^* \\
&\qquad > x^{eff} |\Delta_L| \\
&\qquad \geq x^{eff} |\Delta_L| \frac{1 - x^*}{1 - x^{eff}} \\
&\qquad = \Delta_M (1 - x^*)
\end{aligned}
$$

where we have used $x^* \geq x^{eff}$ and $\frac{x^{eff}}{1-x^{eff}} = \frac{\Delta_M}{|\Delta_L|}$.
With $D > 0$, the sign of $\frac{dt^c}{dw_M}$ is negative for sufficiently small $s_M \Theta_M$.

10.7 Appendix G

This appendix is not intended for publication but provides some derivatives to facilitate the work of the referees.

$$\frac{u_L}{dt} = -\Delta_L > 0 \forall t$$

$$\frac{u_L}{dx} = 2\alpha(1 - x)$$

$$\frac{u_L(\overline{x}^*, t)}{dw_M} = 2\alpha\beta(1 - \overline{x}^*)\overline{x}^* + s_M \Theta_M t$$

$$\frac{u_L(x, t)}{dw_M} = s_M \Theta_M t$$

$$\frac{u_M}{dt} = -\Delta_M < 0$$

$$\frac{u_M}{dx} = -2\alpha x$$

$$\frac{u_M(t, \overline{x}^*)}{dw_M} = -2\alpha\beta(\overline{x}^*)^2 + 1 - t(1 - s_M \Theta_M)$$

$$\frac{u_M(x, t)}{dw_M} = 1 - t(1 - s_M \Theta_M)$$

$$\frac{du_L^0}{dw_M} = \pi_L(s_M \Theta_M)$$

$$\frac{du_M^0}{dw_M} = 1 - \pi_L(1 - s_M \Theta_M)$$