

**THE QURAN AND THE
SWORD –
THE STRATEGIC
GAME BETWEEN
AUTOCRATIC POWER,
THE MILITARY AND
THE CLERICS**



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Abstract

This paper elucidates the willingness of an autocrat to push through institutional reforms in a context where traditional authorities represented by religious clerics are averse to them and where the military, who have their own preferences about reforms, control the means of repression and can potentially make a coup. In this complex political economy game with three players, we show that although the autocrat always wants to co-opt the military, this is not necessarily true of the clerics. We examine successively the case where the size of the army is exogenously given and the case where it is chosen by the autocrat. Our empirical foray reveals that the dominant regime in contemporary Muslim countries is the regime of double cooption. Exclusive co-option of the military has characterized only a few regimes in which the autocrat's intrinsic legitimacy and the loyalty of his army were both very strong while the organizational effectiveness of religious movements was rather low. Radical institutional reforms could then be implemented. Another polar case obtains when ultra-conservative clerics are powerful enough to block any institutional reform that they dislike, a situation more likely when abundant oil resources create the conditions of a rent economy. More frequently, the autocrat resorts to a double-edged tactic: pleasing the official clerics by slowing the pace of reforms, and ensuring the loyalty of the military to be able to put down an opposition instigated by rebel clerics.

JEL Classification: D02, D72, N40, O57, P48, Z12

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1 Introduction

Political Economy as a subfield has quickly developed during the last decades and it has addressed a number of interesting issues such as the effect of political decentralization, the functioning of autocracy, the role of ethnicity, the impact of different election systems, etc. In tackling autocracies, attention has been paid to repression and co-optation as instruments of power, yet two forces have been noticeably absent from the analysis: the military (or, more generally, the deep state including the army, the police and the intelligence service) and the religious clerics. Unlike political scientists, economists have thus largely failed to take account of the role of the military as a full-fledged actor and not only as an actor hidden behind repression technology. Important exceptions are Egorov and Sonin (2014), Besley and Robinson (2010), Acemoglu et al., (2009, 2010), Leon (2014, 2017), and Aney and Ko (2015). The situation is identical as far as the role of clerics is concerned, if we except the recent contributions of Auriol and Platteau (2017a, 2017b) discussed below, and a few other works (for example, Minarik, sd).

Works where the military and the religious clerics or religious organizations are featured simultaneously as separate actors are simply non-existent in the economics literature.¹ This gap needs to be bridged not least because in many autocratic developing countries (including Russia and some ex-Soviet republics), the army, intelligence and the police play a significant role while ordinary people are under the strong influence of traditional authorities, religious authorities in particular. In the Muslim world, and in some countries of South and Southeast Asia (think of Myanmar and Sri Lanka, for example), the three-player relationship takes on the form of strategic interactions between an autocratic ruler, a centralized army, and a decentralized body of religious clerics (since a specific feature of Islam and Buddhism is the absence of a hierarchical organization resembling a church).

¹While in many of the political economy models only two actors (the ruler and the opposition) are playing, a growing literature considers two types of opposition: the citizens and the elites with the latter being defined either generically or specifically (Bove et al., 2017).

The idea that an autocrat can co-opt, or buy off the loyalty of, key political players is well accepted by economists and political scientists alike. Much less common is the application of the same idea to religious clerics and men in uniform, two categories that are typically considered to be guided by values and ethical principles, hence largely immune to corruption. That such an application is warranted is attested by abundant evidence about the granting of material privileges and private benefits to both religious officials and military officers (see, in particular, Lapidus, 2002 and Platteau, 2017 for the former, and Siddiqa, 2017 for the latter). While the military are important because they own the means of repression, the clerics' critical role is in legitimizing the autocrat's regime (Coulson, 1964; Hourani, 1991; Lee, 2014; Kepel, 2005; Platteau, 2008; Cosgel, Miceli, and Rubin, 2012; Rubin, 2017).

This last role is especially significant because uncontrolled clerics, owing to their status and prestige, constitute a potential threat insofar as they are able to lead a revolution against the regime. The magnitude of the threat depends positively on the fraction of dissenting clerics while the military have the capacity not only of putting down such a revolution but also of staging a coup against any ruler, whether civilian or religious. To maintain himself in power and simultaneously achieve as high a rent as possible, the autocrat has three instruments available to him: the defence budget, perks to both military and religious players, and the intensity of progressive institutional reforms that encroach upon their privileges and therefore antagonize them. This last dimension of the problem is critical for long-term development because these reforms are expected to contribute to the emancipation of the individual from erstwhile collective or communal authorities, to the rise of competence-based considerations at the expense of status-based ones, and to the removal of the associated discriminations and inequalities, those involving gender in particular.

Which are the equilibrium outcomes possible in such a setup and which are the key factors determining which equilibrium prevails is a challenging question at the heart of the present endeavour. In particular, do we expect the autocrat to sometimes bypass the clerics or the military, and when will

he choose a high or a low level of reforms? Answers are not straightforward because several trade-offs are involved: moderating reforms versus enhancing co-option, cajoling clerics versus cajoling the military, building a strong military to beat back clerics versus limiting the army's strength to avoid a coup. Besides probing into these issues, we want to highlight the relevance of our theoretical foray by following the same comparative illustrative approach as in Auriol and Platteau (2017a, 2017b), and Platteau (2008, 2011, 2017). That is, we succinctly discuss a number of important regime cases that correspond to different types of politico-military-religious equilibrium derived in the theory. These analytical narratives testify to the critical role of theory in helping to sort out and organize a diverse and thick empirical material. Also, they drive attention to key political economy factors that are behind observed variations in the scope of institutional reforms enacted by different autocratic regimes.

The empirically dominant regime is one of double co-option of clerics and military, a regime that may be optimal even when the autocrat chooses the size of his army on the basis of strictly internal security considerations. Equilibria in which only the military are co-opted are possible, unlike equilibria in which only clerics are co-opted. Under exclusive co-option of the military, reforms are always more important than under double co-option. In the latter, the clerics' aversion to reforms may be either underplayed or overplayed in the sense of receiving a smaller or a greater weight than the preference of the military in the autocrat's objective function. Overplaying occurs when the army is of a sufficiently small size, whether fixed exogenously or chosen by the autocrat.

The outline of the paper is as follows. Section 2, provides some prolegomena by explaining in what sense our three-agent model builds upon the two-player model of Auriol and Platteau (2017a). Section 3 describes its setup and time structure before depicting the behaviour of the military and the clerics. Section 4 proceeds by analyzing the autocrat's optimal choice. This is done in two successive steps. We initially assume that the size of the army is exogenously fixed and then relax that assumption to analyze the general case where the ruler chooses the intensity of the reforms, the

perks of the clerics and the military, and now the army size as well. Section 5 adduces illustrative evidence in the form of regime case studies that are regrouped into analytically meaningful categories. Section 6 summarizes the main results of our theoretical and empirical forays, and it proposes an interpretation of the Arab Spring that fits in with the analytical perspective adopted in the paper.

2 Prolegomena

In Auriol and Platteau (2017a, 2017b), a formal model is developed to analyze strategic interactions between an autocratic ruler and religious clerics. It has the following characteristics. The ruler maximizes his income defined as a rent extracted from national output minus expenses related to the co-optation of clerics. The latter are agents whose function consists of, and prestige is derived from, enforcing respect of religious tenets and rituals. At the same time, they are seducible (or corruptible) but to a varying extent since their preferences reflecting the trade-off between material benefits and moral uprightness are heterogeneous. The autocrat is eager to co-opt as many of them as possible because owing to their status and prestige they exert a great influence on (uneducated) masses and can therefore potentially lead a popular rebellion against the regime. He has two instruments: the "wage" paid to the clerics in order to reward their political allegiance, and the policy mix which clerics may be more or less hostile to. In the first version of the model (2017a), the policy mix is reduced to a choice of the level of progressive reforms under the assumption that as the ruler adopts more such reforms the more antagonized are the clerics. In the second version (2017b), he chooses both a level of progressive reforms and a measure of corruption. The more pervasive corruption the more hostile the clerics. In sum, the autocrat chooses the extent of religious co-optation -the higher the wage paid to the clerics the more of them he is able to enlist in support of his regime- and a policy mix that can more or less enhance his legitimacy in the eyes of the clerics.

Political stability is achieved when all the clerics are bought off while

instability exists when only a fraction of them are co-opted, thereby creating a risk of rebellion. The choice between political stability and instability is made under the conditions of a decentralized religion, a setting that can be modified to analyze the case where the autocrat is confronted with a centralized religion. In this alternative setup, the clerics belong to a centralized structure headed by an undisputed authority. When seeking to co-opt clerics, the autocrat then bargains with that authority, and when a deal is done, all the clerics are automatically enlisted.

Albeit rich in the insights that it provides, the above framework ignores the role of the military which is hard to deny in autocracies. The military are important to cajole because they control the means of violent repression that an autocrat may need. They obey a hierarchical structure that resembles a centralized religion. If that feature is added, there are now three agents interacting strategically. Like the clerics, the men in uniform hold values (let us call them patriotic values) but are at the same time sensitive to the appeal of material advantages. Specifically they may care about direct transfers such as wages or defence budgets. They may also care about specific policies that provide them with economic gains, in particular the economic rents derived from productive assets that they are allowed to own and control. By offering them sufficient perks, the ruler can thus expect to buy the allegiance of the army. His problem is nonetheless more complicated because there are now two potential sources of opposition that need to be tamed to the best possible extent. Since resources are limited, the ruler may have hard choices to make. If the religion is decentralized, the option remains open that only a fraction of the clerics are co-opted at equilibrium.

3 The model

We consider an economy with an autocratic ruler, an army and a clerical body. In the baseline model we assume that the size of the military is fixed at $M \in [0, 1]$. It is a measure of the power of the army. For instance, it may reflect the fraction of the active population enrolled in the military. In

the first stage of the game, the Ruler has three instruments at his disposal: i) the extent of the reforms, denoted by α , ii) the wages (or perks) paid to the religious clerics, w_c , and iii) the wages (or perks) paid to the Military, w_m . The clerics do not like the reforms, but some are more willing than others to trade them against some monetary compensation. In the second stage of the game, the clerics who are dissatisfied by the Ruler's offer may instigate a revolution in the hope of overthrowing him and establishing a "religious republic".

The success of such revolution depends negatively on the repression that the military command structure may choose to exert to defend the regime. In the event that the clerics-led revolution fails, there is a third stage in which the Military has the choice between staying out of political power and keeping the regime in place, and meddling in politics to get rid of the ruling clique through a coup. For the Ruler, therefore, the probability to stay in power depends on his ability to prevent both a successful religious revolution and/or a successful military coup. Paying high wages to the clerics or mitigating the extent of modernization reforms helps avoid the advent of a religious revolution. Similarly paying high wages or providing large economic rents to the military is susceptible of reducing the risk of a coup and simultaneously increasing the army's incentive to crush a clerics-led revolution. Clearly, the equilibrium of the strategic interaction between the clerics and the military will ultimately depend on how the Ruler plays them off against each other.

3.1 Time structure of the game

Consider the following static game and time structure:

Step 1: The Ruler, a collective agent standing for the autocrat and his surrounding clique, chooses the intensity of the reforms, α , the wage paid to the supporting clerics, w_c , the wage paid to the members of the army, w_m , and the size of the defence budget (if the regime stays in place). The reform provides net economic gains to the prevailing regime, denoted by $R(\alpha)$ where $R'(\alpha) > 0$ and $R''(\alpha) < 0$. The Ruler's national legitimacy is measured by L_0 , which is known not only by himself but also by the

Military, the collective agent standing for the single command structure of the army.

Step 2: Each religious cleric needs to decide whether to support or not the regime. Supporting the autocrat entails a risk for the cleric i (e.g., of ruining his religious credibility and authority). This risk decreases with the local legitimacy of the Ruler as perceived in the local environment of the cleric i . We suppose that this local legitimacy takes the following form $L_i = L_0 + \epsilon_i$ where ϵ_i is uniformly distributed in $[-\epsilon, \epsilon]$. In other words, the clerics are scattered over the national territory and over different networks between which the local legitimacy of the Ruler varies. Thus, this legitimacy may be stronger or smaller in remote rural areas depending on the reach of the regime's propaganda and the congruence of its past policies with the aspirations and values of the local population (typically, authoritarian regimes are more popular in rural areas and small towns than in big cities). The fraction of supporting clerics is γ , and they receive their wage w_c from the ruling regime.

Step 3: In front of the opposition led by $1 - \gamma$ clerics, the Military decides whether to put it down or not.

Step 4 : - In case of repression, the revolution fails when the strength of the clerics' opposition is smaller than the strength of the regime. The former depends positively on the fraction of clerics $1 - \gamma$ opposing the regime. As for the latter, it depends positively on the degree of national legitimacy of the ruler, L_0 , and the extent of repression applied by the military, $\lambda M I_m$, where I_m is an indicator function such that $I_m = 0$ when the Military, of size M , does not repress and $I_m = 1$ when it does, and $\lambda > 0$ is a parameter capturing the efficiency of the Military at violence. Formally, the revolution fails when $S_C(1 - \gamma) < S_R(L_0, \lambda M I_m)$. For convenience we assume that the strength of the cleric opposition is a linear increasing function written simply as $S_C(1 - \gamma) = s(1 - \gamma)$, with $s > 0$. Likewise, the strength of the regime is a linear separable function of L_0 and $\lambda M I_m$: $S_R(L_0, \lambda M I_m) = L_0 + \lambda M I_m$. With these notations, the revolution fails

and the Ruler stays in power when the following condition is satisfied:

$$s(1 - \gamma) \leq L_0 + \lambda MI_m \quad (1)$$

- If the clerics-led revolution succeeds with no military repression, the new religious regime (i.e., theocracy) pays to the existing Military a wage w_m^c if there is no coup, and then implements a reform programme denoted by α^c that we normalize to $\alpha^c = 0$.

Step 5 : The Military decides to make a coup or not. When it makes a coup, it pays a cost $C(M)$ decreasing in the size of the army and concave (i.e., $C'(M) < 0$ and $C''(M) < 0$), with $C(0) > 0$ large enough.² In the succeeding military regime, the army takes control of the economy and implements its own reform programme α_δ^m .

3.2 The military: analysis of coups

When the Military makes a coup, his benefit from seizing power is:

$$R_m^\delta = \max_\alpha \{ \delta R(\alpha) - \theta^m V(\alpha) \} \quad (2)$$

where $R(\alpha)$ is the national revenue generated by the military regime when it implements a reform of intensity α . We assume that δ measures the relative inefficiency of the Military in carrying out reforms compared to the civilian autocrat, so that $\delta \leq 1$. The parameter $\theta^m (> 0)$ reflects the degree of aversion of the men in uniform toward reforms, while $V(\alpha)$ stands for the ideological cost of undertaking these reforms. We assume that $V(\alpha)$ is increasing convex (ie. $V'(\alpha) > 0$ and $V''(\alpha) > 0$) and $V(0) = V'(0) = 0$.

The optimal reform programme, α_δ^m , of the Military will be the solution to (2) given by the first order condition $\delta R'(\alpha) = \theta^m V'(\alpha)$. It is easy to check that under our assumptions ($R(\alpha)$ increasing concave, and $V(\alpha)$ increasing convex), α_δ^m is increasing in δ : $\frac{d\alpha_\delta^m}{d\delta} = \frac{R'(\alpha)}{\theta^m V''(\alpha) - \delta R''(\alpha)} \geq 0$. The equilibrium payoff of the Military when in power can be written:

$$R_m^\delta = \delta R(\alpha_\delta^m) - \theta^m V(\alpha_\delta^m). \quad (3)$$

²These conditions imply that there exists a threshold M^{\max} such that $C(M) = 0$ for all $M \geq M^{\max}$.

By contrast, the income of the M army men when they have successfully put down a clerics-led rebellion and refrained from making a coup afterwards is Mw_m , where w_m is the per capita wage paid by the Ruler while staying in power. We deduce that to avoid a coup following a successful military containment of a rebellion, it must be the case that:

$$Mw_m - \theta^m V(\alpha) \geq R_m^\delta - C(M) \quad (4)$$

If, on the other hand, the Military chooses to let the rebellion follow its course, the incumbent government is replaced by a religious government which implements its best policy mix, $\alpha^c = 0$, and the payoff of the Military depends on whether he wants to carry a coup against the religious clerics or not. If he does not, the Military gets $w_m^c M - \theta^m V(0) = w_m^c M$, while in the opposite case, he receives $R_m^\delta - C(M)$. To avoid a coup, a religious government should therefore ensure that:

$$Mw_m^c \geq R_m^\delta - C(M) \quad (5)$$

Note that the incentive compatibility (IC) constraint of the religious government against an army coup is less constraining than the IC constraint of the incumbent against a coup, as long as the latter wants to implement a reform mix $\alpha > 0$. Specifically, the religious government's constraint is binding if and only if that government needs to pay a positive wage to the Military (beyond the reservation wage normalized to 0) to prevent an army's coup. This will be the case if and only if $C(M) < R_m^\delta$, otherwise condition (5) is strictly satisfied when the religious government does not pay any wage (i.e. $w_m^c = 0$). From this, it follows that the incentive compatible constraint of the religious government against an army coup is binding if and only if $M \geq C^{-1}(R_m^\delta) = M_c$. Two cases can be discussed.

i) $M \geq M_c$: the Military is indifferent between repression and passivity against a rebellion and we assume naturally that the Ruler is ready to pay a small wage premium to the Military so as to tilt his decision in favor of repression. In such a case, it is clear that as long as the revolution is anticipated to fail when the Military chooses to put it down (i.e., as long as $s(1 - \gamma) \leq L_0 + \lambda M$), the Military will always choose to prevent the

religious clerics from acceding to power. He is indeed certain to obtain a slightly higher income (in the presence or absence of a coup) under the secular incumbent than under an alternative religious regime. The wage bill paid by the Ruler to the military is given by:

$$w_m M = \max [\theta^m V(\alpha) + R_m^\delta - C(M); 0] \quad (6)$$

Note that in such a case $C(M) \leq C(M_c) < \theta^m V(\alpha) + R_m^\delta$, and as long as $\alpha > 0$, the military coup's constraint is always binding (since a religious government would not make any reform) so that the wage bill is simply

$$w_m M = \theta^m V(\alpha) + R_m^\delta - C(M)$$

ii) $M < M_c$: the Military, who never attempts a coup against any ruling religious government, receives his reservation payoff (normalized to 0). As a consequence, the Military accepts to put down the rebellion and to support the Ruler (as long as such repressed revolution is anticipated to fail) if and only if $w_m M - \theta^m V(\alpha) \geq 0$. The wage bill that the Ruler needs to pay to the Military is then given by

$$w_m M = \theta^m V(\alpha)$$

The preceding discussion can be summarized by the following constraint: assuming that a repressed revolution fails to succeed, the Ruler will stay in power if

$$w_m M \geq \max [\theta^m V(\alpha) + R_m^\delta - C(M), \theta^m V(\alpha)]$$

Clearly, the wage paid to the Military can never be nil.

3.3 The clerical body

We focus on decentralized religions. The clerical body is composed of a continuum of individuals with different levels of conviction and commitment to the faith. We assume that each member independently and identically distributed on $[0, \bar{\theta}]$ with a continuous distribution density $f(\theta)$. The mean value of θ_i is $\theta^c = \int_0^{\bar{\theta}} \theta f(\theta) d\theta$, which is the distance between the (average)

measure of the values held by the religious clerics and the autocrat (as in Auriol and Platteau 2017a). In other words, both the religious clerics and the Military have an ideological bias against reforms. In general, however, this bias is smaller for the latter than for the former, i.e., $\theta^m < \theta^c$, and one distinct possibility is that θ^m is very small, reflecting near agreement between the Military and the Ruler.

Under a decentralized religion, each cleric has to choose whether to support the autocrat, and hence compromise himself with the current political regime, or to oppose the Ruler's policies by refusing to endorse them. In the latter instance, the change of utility of the cleric is 0 (the status quo utility) since in equilibrium the religious republic is never implemented (see supra). It remains true that by refusing to endorse the autocrat, clerics constitute a threat to the regime since the Ruler needs legitimization from religious officials to maintain his hold on power. If instead the decision is to support the autocrat, the utility of a cleric i depends on his type $\theta_i \in [0, \bar{\theta}]$, that reflects his degree of aversion towards reforms, on the extent of reforms implemented by the Ruler, $\alpha \geq 0$, on the monetary transfer or compensation obtained from the same, $w_c \geq 0$, and on the risk of having his religious standing dented as a result of his cooperation with the political regime, as measured by $1 - p_i \in [0, 1]$ (with p_i the probability that the cleric i will not lose his standing or ministry by supporting the autocrat). That is,

$$U(\theta_i, w_c, \alpha, p_i) = p_i w_c - \theta_i V(\alpha) \quad (7)$$

where, as before, $V(\alpha)$ stands for the ideological cost of endorsing the Ruler's reforms. An important feature of the above specification is that while the material benefit from supporting the regime is random, the psychological or ideological cost is certain and paid upfront.

3.3.1 Individuals' choice to support the autocrat

The choice to support the regime depends on the risk to lose one's religious office by compromising with the autocrat and his clique. This probability depends on the local legitimacy of the autocrat, on the local efficiency of the army, and on the level of religious opposition against the regime (i.e., the

fraction of clerics opposing the regime). To be more specific, the probability p_i that a cleric i stays in office when he endorses the autocrat with local legitimacy $L_i = L_0 + \epsilon_i$, where ϵ_i is uniformly distributed in $[-\epsilon, \epsilon]$, when he expects a fraction $1 - \gamma^e$ of fellow clerics to make the opposite choice of antagonizing the regime, and when he knows that the Military possesses strength λM , can be written:

$$p_i = P(\text{stayinoffice}/L_i) = P(s(1 - \gamma^e) \leq L_i + \lambda M - \mu_i) \quad (8)$$

where μ_i is a random chock on the local efficiency of the Military, which is distributed independently and uniformly on $[-\mu, \mu]$. Intuitively, like the Ruler's legitimacy, the effectiveness of the Military varies across regions and networks in which clerics are found. Typically the shape of the military repressive technology is affected by several geographic and demographic factors, such as urban density and roughness of terrain. We have that³

$p_i = \frac{L_i + \lambda M - s(1 - \gamma^e) + \mu}{2\mu}$. Given this probability, there exists a threshold value of the (local) legitimacy of the Ruler, $L^*(\theta)$, such that a cleric of the type θ is indifferent between supporting and opposing the regime. From (7), this threshold is characterized by: $P(\text{stayinoffice}/L^*(\theta)) = \frac{\theta V(\alpha)}{w_c}$ or

$$\frac{L^*(\theta) + \lambda M - s(1 - \gamma^e) + \mu}{2\mu} = \frac{\theta V(\alpha)}{w_c} \quad (9)$$

We deduce that when $L_i \geq L^*(\theta)$, a cleric of type θ supports the Ruler. He chooses to enter into opposition when $L_i < L^*(\theta)$.

3.3.2 National clerical support for the autocrat

The proportion of clerics who support the Ruler is : $\gamma^* = \int_0^{\bar{\theta}} P(L_i \geq L^*(\theta)) f(\theta) d\theta$. We deduce that⁴

$$\gamma^* = \frac{\epsilon + L_0 - \bar{L}^*}{2\epsilon} \quad (10)$$

where $\bar{L}^* = \int_0^{\bar{\theta}} L^*(\theta) f(\theta) d\theta$.

³Indeed, $p_i = P(\mu_i \leq L_i + \lambda M - s(1 - \gamma^e)) = \int_{-\mu}^{L_i + \lambda M - s(1 - \gamma^e)} \frac{d\mu_i}{2\mu}$.

⁴ $\gamma^* = \int_0^{\bar{\theta}} P(\epsilon_i \geq L^*(\theta) - L_0) f(\theta) d\theta$ $\gamma^* = \int_0^{\bar{\theta}} \frac{\epsilon + L_0 - L^*(\theta)}{2\epsilon} f(\theta) d\theta$.

Similarly integrating (9) over all types of clerics yields:

$$\int_0^{\bar{\theta}} \frac{L^*(\theta) + \lambda M - s(1 - \gamma^e) + \mu}{2\mu} f(\theta) d\theta = \int_0^{\bar{\theta}} \frac{\theta V(\alpha)}{w_c} f(\theta) d\theta \quad (11)$$

which is equivalent to:

$$\frac{\bar{L}^* + \lambda M - s(1 - \gamma^e) + \mu}{2\mu} = \frac{\theta^c V(\alpha)}{w_c} \quad (12)$$

Under rational expectations of the equilibrium number of clerics supporting the regime, we have that $\gamma^e = \gamma^*$. We make the following assumption

Assumption 1 $\mu \geq \epsilon > \frac{s}{2}$.

Assumption 1 implies that there is enough variance of the local legitimacy and of the efficiency of the army to ensure the existence of a unique equilibrium. We can then show the following result.

Proposition 1 *Under the assumption $2\epsilon > s$, the equilibrium fraction of clerics supporting the regime in the Perfect Nash Equilibrium writes as:*

$$\gamma^*(M, \alpha, w_c) = \max \left\{ \min \left\{ 1 - \frac{2\mu}{2\epsilon - s} \frac{\theta^c V(\alpha)}{w_c} + \frac{\lambda M + L_0}{2\epsilon - s} + \frac{\mu - \epsilon}{2\epsilon - s}, 1 \right\}, 0 \right\} \quad (13)$$

Proof. See Appendix 7.1. ■

As one would expect, the opposition to the autocrat by the clerical mass decreases with the rent the religious clerics get in exchange for their support, w^c , the autocrat's national legitimacy, L_0 , and the repressive power of the army, λM . It increases with the level of reforms implemented by the autocrat, α , and the (average value of) cleric aversion to reforms, θ^c .

4 Optimal choice of the ruler

We are now in a position to consider the first stage of the game, namely the optimal policy choices of the ruler (α, w_c, w_m, M) . The problem is:

$$\begin{aligned} & \max_{\alpha, w_c, w_m, M} R(\alpha) - \gamma^* w_c - w_m M \\ \text{s.c.} \quad & \gamma^* = \gamma^*(M, \alpha, w_c) \text{ solution to (13)} \\ & L_0 + \lambda M \geq s(1 - \gamma^*) \quad (\text{nrc}) \\ & w_m M \geq \max [\theta^m V(\alpha) + R_m^\delta - C(M), \theta^m V(\alpha)] \quad (\text{nmc}) \end{aligned}$$

The Ruler maximizes his net rents under the threat of a revolution and a subsequent military coup. Since there are no other sources of uncertainty, and there is full information between the Ruler and the Military, no actual change of regime occurs at the optimum and no coup is undertaken by the Military, thanks to the no-regime-change constraint (*nrc*) and to the no-military-coup constraint (*nmc*). Nevertheless these constraints restrain the autocrat actions.

4.1 Fixed military size M

In the base case model, the military size, M , is a fixed parameter, and the Ruler has only three instruments available to him: α, w_c, w_m . This corresponds to situations where changing the size of the army is not possible for the Ruler. This can be because this size is essentially a legacy of the past that may not be easily modified, because the country's army is largely financed by foreign governments driven by their own geo-political motives, or because the Ruler himself chooses the strength of the Military on the basis of objectives bypassed in the model. We can think, in particular, of foreign policy objectives such as the need to counter perceived foreign threats, and ambitious plans to expand the national territory or intervene in foreign battlegrounds to assert or defend the country's interests. Not infrequently, these three considerations are simultaneously at play (think of Egypt, Pakistan, and Afghanistan, for example).

4.1.1 Analysis of the Ruler's problem

Note first that the no-military coup constraint (*nmc*) will always be binding since, everything else given, the Ruler always wants to minimize the wage bill $w_m M$ paid to the Military, and $w_m M$ only enters into the constraint (*nmc*).

Second, in order to solve the Ruler's optimization problem, it is useful

to write the different values of γ^* in (13) in terms of the value of $x = \frac{\theta^c V(\alpha)}{w_c}$:

$$\gamma^* = \begin{cases} 0 & \text{if } \frac{\lambda M + L_0}{2\mu} + \frac{2\epsilon - s}{2\mu} + \frac{\mu - \epsilon}{2\mu} < x \\ 1 - \frac{2\mu}{2\epsilon - s}x + \frac{\lambda M + L_0}{2\epsilon - s} + \frac{\mu - \epsilon}{2\epsilon - s} & \text{if } x \in \left[\frac{\lambda M + L_0}{2\mu} + \frac{\mu - \epsilon}{2\mu}, \frac{\lambda M + L_0}{2\mu} + \frac{2\epsilon - s}{2\mu} + \frac{\mu - \epsilon}{2\mu} \right] \\ 1 & \text{if } x < \frac{\lambda M + L_0}{2\mu} + \frac{\mu - \epsilon}{2\mu} \end{cases} \quad (14)$$

This implies that the no-regime-change constraint (*nrc*) under military repression $s(1 - \gamma^*) \leq L_0 + \lambda M$ writes as:

$$\begin{aligned} s &\leq L_0 + \lambda M && \text{if } \frac{\lambda M + L_0}{2\mu} + \frac{2\epsilon - s}{2\mu} + \frac{\mu - \epsilon}{2\mu} < x \\ x &\leq \frac{(\lambda M + L_0)\epsilon}{s\mu} + \frac{\mu - \epsilon}{2\mu} && \text{if } x \in \left[\frac{\lambda M + L_0}{2\mu} + \frac{\mu - \epsilon}{2\mu}, \frac{\lambda M + L_0}{2\mu} + \frac{2\epsilon - s}{2\mu} + \frac{\mu - \epsilon}{2\mu} \right] \\ 0 &\leq L_0 + \lambda M && \text{if } x < \frac{\lambda M + L_0}{2\mu} + \frac{\mu - \epsilon}{2\mu} \end{aligned}$$

Clearly, the (*nrc*) constraint is always satisfied when $s \leq L_0 + \lambda M$ since, even if all clerics enter into opposition, they are unable to defeat the Ruler. Therefore, it is binding only when $s > L_0 + \lambda M$, or alternatively when $M < \frac{s - L_0}{\lambda}$, that is, when the Military is relatively weak. In this case the (*nrc*) constraint requires that $x \leq \frac{(\lambda M + L_0)\epsilon}{s\mu} + \frac{\mu - \epsilon}{2\mu} = \bar{x}(M)$. Bearing in mind the definition of x , the above (*nrc*) constraint indicates that, for a given intensity of reforms, the wage paid to the religious clerics must be high enough to prompt a sufficient number of them to come in support of the Ruler. Formally, w_c must be sufficiently large to cause x to be smaller than $\bar{x}(M)$.

Two subcases need to be distinguished depending on whether the (*nrc*) constraint can be binding or not.

CASE I: We start with the case where the no-regime-change (*nrc*) constraint is never binding: $M \geq \frac{s - L_0}{\lambda}$, meaning that the religious clerics are not a threat to the regime. In this instance, given that the Ruler wants to minimize the wage bill paid to the clerics, w_c will be set to $w_c = 0$. The problem of the Ruler then rewrites as :

$$\begin{aligned} \max_{\alpha, w_m} \quad & R(\alpha) - w_m M \\ \text{s.t.} \quad & w_m M = \max [\theta^m V(\alpha) + R_m^\delta - C(M), \theta^m V(\alpha)] \end{aligned} \quad (nmc)$$

and the optimal reform policy solves:

$$\max_{\alpha} R(\alpha) - \theta^m V(\alpha) - \max [R_m^\delta - C(M), 0]$$

Let $\alpha^*(y)$ be so that:

$$R'(\alpha) = yV'(\alpha). \quad (15)$$

Equation (15) implies that

$$\frac{d\alpha^*(y)}{dy} = \frac{-V'(\alpha)}{-R''(\alpha) + yV''(\alpha)} \leq 0. \quad (16)$$

In other words, when $y \geq 0$ increases, the optimal level of reforms decreases.

The optimal interior level of reform is such that $R'(\alpha) = \theta^m V'(\alpha)$. By virtue of (15) it is given by

$$\alpha^m = \alpha^*(\theta^m). \quad (17)$$

The wage bill paid to the Military is

$$w_m^* M = \theta^m V(\alpha^m) + \max [R_m^\delta - C(M), 0]$$

and the equilibrium payoff for the Ruler is

$$W(M) = R(\alpha^m) - \theta^m V(\alpha^m) - \max [R_m^\delta - C(M), 0]$$

We can thus conclude that for $M \geq \frac{s-L_0}{\lambda}$, the optimal policy vector (α, w_c, w_m) is given by:

$$(\alpha^{op}, w_c^{op}, w_m^{op}) = \{\alpha^m, w_c = 0, w_m = w_m^* > 0\}$$

CASE II: We continue with the case where the no-regime-change (*nrc*) constraint is binding, which requires that $M < \frac{s-L_0}{\lambda}$. After substituting the interior value of γ^* , as given in (14), in the constraint $s(1 - \gamma^*) \leq L_0 + \lambda M$, we find that the IC (*nrc*) constraint can be written as:

$$x \leq \bar{x}(M) \quad (18)$$

with

$$\bar{x}(M) = \frac{(\lambda M + L_0)\epsilon}{s\mu} + \frac{\mu - \epsilon}{2\mu} < 1 \quad \text{if } \mu \geq \epsilon, \quad (19)$$

which is true under A1.

With the change of variable $x = \frac{\theta^c V(\alpha)}{w_c}$, the problem of the Ruler writes as

$$\begin{aligned} \max_{\alpha, x, w_m} \quad & R(\alpha) - \left[1 - \frac{2\mu}{2\epsilon-s}x + \frac{\lambda M + L_0}{2\epsilon-s} + \frac{\mu-\epsilon}{2\epsilon-s} \right] \frac{\theta^c V(\alpha)}{x} - w_m M \\ \text{s.c.} \quad & 0 \leq x \leq \bar{x}(M) \end{aligned}$$

$$\text{and } w_m M \geq \theta^m V(\alpha) + \max[R_m^\delta - C(M), 0] \quad (nmc)$$

Since the maximand is increasing in x , the (nrc) constraint is binding with $x = \bar{x}(M)$ so that, after substituting for $\bar{x}(M)$ using (19), the Ruler's objective function becomes:⁵

$$\begin{aligned} \max_{\alpha, w_m \geq 0} \quad & R(\alpha) - \theta^c V(\alpha) \left[\frac{\epsilon + \mu}{2\epsilon \bar{x}(M)} - \frac{\mu}{\epsilon} \right] - w_m M \\ \text{s.c.} \quad & w_m M \geq \theta^m V(\alpha) + \max[R_m^\delta - C(M), 0] \quad (nmc) \end{aligned}$$

Given that the constraint (nmc) is also binding, the Ruler finally solves:

$$\max_{\alpha \geq 0} R(\alpha) - \theta^c V(\alpha) \left(\frac{\epsilon + \mu}{2\epsilon \bar{x}(M)} - \frac{\mu}{\epsilon} \right) - \theta^m V(\alpha) - \max(R_m^\delta - C(M), 0)$$

Let

$$\Theta(M) = \theta^c \left(\frac{\epsilon + \mu}{2\epsilon \bar{x}(M)} - \frac{\mu}{\epsilon} \right) + \theta^m. \quad (20)$$

Θ is a measure of the opposition to reforms in the society (i.e., it is a weighted sum of the opposition to reforms by the military and the clerical class). The optimal interior level of reform is given by:

$$\alpha^1(M) = \alpha^*(\Theta(M)) \quad (21)$$

where the function $\alpha^*(\Theta)$ defined in (15) is decreasing in Θ . Since $\bar{x}(M)$ defined in (19) is increasing in M , $\Theta(M)$ is decreasing in M . We deduce that $\frac{d\alpha^1(M)}{dM} = \frac{d\alpha^*(\Theta)}{d\Theta} \frac{d\Theta}{dM} \geq 0$. Moreover, we have that $\alpha^1(M) < \alpha^m$: as expected, the equilibrium reform mix is smaller than in the regime where the (nrc) constraint is never binding.

⁵The objective function is $R(\alpha) - \frac{\theta^c V(\alpha)}{\bar{x}(M)} \left[1 + \frac{\mu-\epsilon}{2\epsilon} + \frac{\bar{x}(M)s\mu}{(2\epsilon-s)\epsilon} - \frac{2\mu\bar{x}(M)}{2\epsilon-s} \right] - w_m M = R(\alpha) - \theta^c V(\alpha) \left[\frac{\epsilon+\mu}{2\epsilon\bar{x}(M)} + \frac{s\mu}{(2\epsilon-s)\epsilon} - \frac{2\mu}{2\epsilon-s} \right] - w_m M$.

The equilibrium wage paid by the Ruler to the clerics and the wage bill paid to the Military are given by, respectively:

$$\begin{aligned} w_c &= w_c^* = \frac{\theta^c V(\alpha^1(M))}{\bar{x}(M)} \\ w_m^* M &= \theta^m V(\alpha^1(M)) + \max [R_m^\delta - C(M), 0] \end{aligned}$$

and the equilibrium payoff of the Ruler writes as :

$$W(M) = R(\alpha^1(M)) - \Theta(M) V(\alpha^1(M)) - \max[R_m^\delta - C(M), 0]$$

Bearing in mind the effect going through $\alpha^1(M)$, and that $R_m^\delta > C(M)$, an increase in M prompts the Ruler to raise the wage bill accrued to the Military, $w_m^* M$. As for the effect of such an increase on the wage of the clerics, w_c^* , it is ambiguous. This is because the induced increase in $\alpha^1(M)$ makes the value of the numerator higher while that of the denominator, $\bar{x}(M)$, also increases as a direct consequence of the rise of M .

From the above wage equation, it is also evident that the wage of the clerics and the intensity of reforms are strategic complements: the more reforms the Ruler wants to implement the higher the wage he needs to pay to the clerics. And vice-versa.

Summarizing, we have been able to show that for $M \leq \frac{s-L_0}{\lambda}$, the optimal policy vector (α, w_c, w_m) is given by:

$$(\alpha^{op}, w_c^{op}, w_m^{op}) = \{\alpha^1(M), w_c^* > 0, w_m^* > 0\}$$

4.1.2 Results and discussion

Bearing in mind that $R_m^\delta = C(M_c)$ by definition, we deduce that $M_c \leq \frac{s-L_0}{\lambda}$ if and only if $R_m^\delta \geq C(\frac{s-L_0}{\lambda})$, where $\frac{s-L_0}{\lambda}$ and M_c are the minimum sizes of the army ensuring that it will be induced to repress a religious rebellion and to stage a coup against a religious government, respectively. By comparing M with these two threshold values, we can draw a full picture of the Ruler's optimal policy at any level of military force, M , as summarized in the following proposition:

Proposition 2 *The solution of the Ruler's optimization problem at any level of military force, M , is:*

- If $R_m^\delta \leq C(\frac{s-L_0}{\lambda})$ (ie. $\frac{s-L_0}{\lambda} \leq M_c$), the optimal policy vector is:

$$(\alpha^{op}, w_c^{op}, w_m^{op}) = \begin{cases} \alpha^1(M), w_c^* > 0, w_m^* > 0 & \text{if } M < \frac{s-L_0}{\lambda} \text{ regime A} \\ \quad \text{with } w_m^* M = \theta^m V(\alpha^1(M)) & \\ \alpha^m, w_c = 0, w_m^* > 0 & \text{if } M \in [\frac{s-L_0}{\lambda}, M_c] \text{ regime B} \\ \quad \text{with } w_m^* M = \theta^m V(\alpha^m) & \\ \alpha^m, w_c = 0, w_m^* > 0 & \text{if } M_c < M \text{ regime B'} \\ \quad \text{with } w_m^* M = \theta^m V(\alpha^m) + R_m^\delta - C(M) & \end{cases}$$

- If $R_m^\delta > C(\frac{s-L_0}{\lambda})$ (ie. $\frac{s-L_0}{\lambda} > M_c$), the optimal policy vector is:

$$(\alpha^{op}, w_c^{op}, w_m^{op}) = \begin{cases} \alpha^1(M), w_c^* > 0, w_m^* > 0 & \text{if } M < M_c \text{ regime A} \\ \quad \text{with } w_m^* M = \theta^m V(\alpha^1(M)) & \\ \alpha^1(M), w_c^* > 0, w_m^* > 0 & \text{if } M \in [M_c, \frac{s-L_0}{\lambda}] \text{ regime A' } \\ \quad \text{with } w_m^* M = \theta^m V(\alpha^1(M)) + R_m^\delta - C(M) & \\ \alpha^m, w_c = 0, w_m^* > 0 & \text{if } \frac{s-L_0}{\lambda} \leq M \text{ regime B'} \\ \quad \text{with } w_m^* M = \theta^m V(\alpha^m) + R_m^\delta - C(M) & \end{cases}$$

It is immediately apparent that the typology of regimes is asymmetrical in the sense that the Ruler can never ignore the Military, yet can sometimes ignore the religious clerics. This asymmetry is caused by the fact that the former have the ability to beat back the latter while the opposite is not true. Otherwise, they are analogously averse to progressive reforms, albeit to a different extent and under a different organizational structure (centralized for the Military and decentralized for the clerics).

The optimal level of reforms $\alpha^{op}(M)$ is represented in Figures 1 and 2. It is monotonic in the size of the military M , and it reaches a maximum once M becomes equal to the threshold $\frac{s-L_0}{\lambda}$ if $R_m^\delta \leq C(\frac{s-L_0}{\lambda})$, and to the threshold M_c if $R_m^\delta > C(\frac{s-L_0}{\lambda})$. Typically, the Ruler has two tools to promote his reforms: carrot (i.e., material privileges) and stick (i.e., military repression). When the military are weak, only the carrot is effective to deter a rebellion and the clerics need to be seduced with some positive wage, $w_c > 0$. At the same time the military should also receive a wage just to keep them on the side of the incumbent regime so that they prefer to defeat the religious rebellion while accepting the Ruler's optimal policy

mix. When the military are strong, however, the stick is used to keep religious leaders in line, but it comes at a cost. When the army is powerful enough, it needs to be tamed through material privileges in order to prevent a coup against the autocratic rule. More specifically, there are two different regimes, with one variant for each, depending on the capacity for coup and the strength of the men in uniform. We discuss them below.

Under regime A, the military are very weak: $M \leq \min(M_c, \frac{s-L_0}{\lambda})$. They cannot prevent a full rebellion (one supported by the entire clerical body) nor do they wish to stage a coup against a religious conservative government that does not implement reforms. The autocrat therefore faces a threat of regime change coming from a clerics-led revolution. There are then two main challenges to his authority: reducing the resistance coming from the religious leaders, but also making sure that the military accept to repress the rebellion if such rebellion occurs. To achieve these two objectives, he does two things. First, he relies on seduction (ie, a positive wage $w_c > 0$) to mitigate the clerics' resistance and push through his reforms which can only be modest, though. This translates into high perks and privileges for the clerics. At the same time, since the military do not like reforms either, the autocrat needs to give some moderate perks to the army to afford their support in the event of a clerics-led rebellion. In order to minimize the perks to both players, he takes due account of their preferences. Here is therefore a mild, double co-option regime with relatively few reforms undertaken because of the threat of clerics, and with a weak and passive army that nevertheless needs to be seduced to stay on the side of the current regime. When the power of the army increases and M goes up, the wage bill paid to the military, $w_m^* M$, increases and the autocrat is able to implement more reforms ($\alpha^1(M)$ increases with M). As for the privileges awarded to the clerics, they can either increase or decrease and, even in the latter instance, the effect is not to cause a greater threat to the regime's stability.

Under regime A', a variant of regime A, the military are still too weak to prevent a full rebellion ($M \leq \frac{s-L_0}{\lambda}$), but they are strong enough to stage a credible coup against a religious conservative regime that shuns

any reform ($M > M_c$). In such a case, the autocrat must pay attention not only to the threat of regime change by a clerics-led revolution, which has not vanished, but also to the risk of a subsequent military coup. The magnitude of reforms is thus limited both by the military coup constraint and the change-of-regime constraint. What we have is again a double co-option regime but now because both the military and the clerics are more powerful, they can extract larger perks from the autocrat. This is evident from the definitions of the two equilibrium wages (w_m^* and w_c^*) under Case II, once it is understood that the magnitude of reforms, $\alpha^1(M) = \alpha^*(\Theta)$ as defined in (21), is greater under *regime A'* than under *regime A*, as attested by Figure 2.

Thus, although the generous perks and privileges that the autocrat distributes to secure his hold on power make the reforms costly, the reform effort is simultaneously increased. Moreover, inside the two double co-option regimes, the intensity of reforms is a decreasing function of $\Theta = \theta^c \left(\frac{\epsilon + \mu}{2\epsilon\bar{x}(M)} - \frac{\mu}{\epsilon} \right) + \theta^m$. Since Θ increases both with θ^c and θ^m , it is intuitive that when the opposition to reforms by the military or by the clerics rises, the optimal pace of reforms decreases (see 16), since both matter in the double co-option regime. Whether the effect on reforms of a marginal increase in aversion of the religious clerics is stronger or weaker than the effect of a marginal increase in aversion of the military critically depends on the size of the army, M . When $\epsilon = \mu$, $\Theta = \theta^c \left(\frac{s}{\lambda M + L_0} - 1 \right) + \theta^m$, so that the former effect outweighs the latter if and only if $M \leq \frac{s}{2\lambda} - \frac{L_0}{\lambda}$, which is obviously more restrictive than the condition $M \leq \frac{s - L_0}{\lambda}$ under which regimes *A* and *A'* are relevant. In words, the aversion of the clerics for reforms carries a stronger weight than the aversion of the military if the army size is below a certain threshold. Finally, as is evident from the associated conditions $R_m^\delta > C(\frac{s - L_0}{\lambda})$ and $M > M_c$, *regime A'* is more likely to occur than *regime A* when λ and L_0 are lower, and when s and δ are higher (since a high δ makes for a high R_m^δ).

Note that, in line with what has been said earlier, the pivotal threshold that determines the existence of double co-option is the no-regime-threat threshold, $\frac{s - L_0}{\lambda}$, not the no-coup threshold, M_c . This is reflected in the

fact that *regime A* is the only possible double co-option regime when the no-regime-threat threshold is below the no-coup threshold, while *regime A'* becomes feasible only when the latter is below the former. It is obviously when the army size is below the no-regime-threat threshold that the clerics wield greatest bargaining power.

Under *regime B*, we have that $M \in [\frac{s-L_0}{\lambda}, M_c]$: the autocrat enjoys sufficiently strong legitimacy that even with an army of moderate size (too weak to stage a coup against a religious conservative government), military repression is effective enough to tame any popular rebellion instigated by the religious clerics. In these conditions, the latter cannot threaten the regime and they receive zero perk. The main challenge for the autocratic ruler is to convince the military to stay on his side when a rebellion occurs. This is done by choosing a level of reforms, α_m , that takes their ideological preferences into account. However, because they are not capable of staging a coup, they receive moderate perks, which do not depend on their strength.

Lastly, under *regime B'*, the size of the army is very large: $M \geq \max\{M_c, \frac{s-L_0}{\lambda}\}$. It is very powerful compared to the religious leaders, who are weak. There is no threat of a regime change by a clerics-led revolution. The main threat to the autocrat comes from the possibility of a military coup against himself. The military have the choice between staying out of politics and supporting the ruling regime, which depends on the congruence between the economic interests of the two players, and becoming directly involved in public affairs and getting rid of the autocrat through a coup. To keep this risk at bay, the autocrat chooses to extend high rents and privileges to the army. These are increasing with its size M and, at the limit, he simply becomes a puppet in the hands of the military. Concomitantly, the autocrat chooses a rather ambitious programme of reforms, α^m , which can nonetheless be moderated if the military's aversion to them is strong.

In the course of this discussion, an interesting property of the composite aversion parameter Θ has emerged, which we now sum up in the following proposition.

Proposition 3 *When the religious clerics pose an effective threat to the*

autocratic regime implying that $M \leq \frac{s-L_0}{\lambda}$, and when $\epsilon = \mu$, the aversion of the clerics to reforms carries more weight than the aversion of the military if the size of the army is below a threshold defined by $M \leq \frac{s}{2\lambda} - \frac{L_0}{\lambda}$. Otherwise, it is the preference of the military that is amplified in the autocrat's objective function.

Proof. These results are immediately derived from the definition $\Theta = \theta^c \left(\frac{s}{\lambda M + L_0} - 1 \right) + \theta^m$ that obtains when $\epsilon = \mu$. ■

Before turning to the complete model with endogenous army size, a final remark is in order. It is reasonable to assume that the efficiency of the military in confronting a popular rebellion led by clerics is lower when the values of the former are close to those of the latter. In other words, when θ^m is high and therefore close to θ^c , the motivation of the men in uniform to fight a clerics-led rebellion is dampened. Formally, assuming that $\theta^c > \theta^m$, we can write: $\lambda = \lambda(\theta^c - \theta^m)$, with $\lambda' > 0$, $\lambda(0) = 0$. A high value of θ^m can thus yield two compounding positive effects on Θ , and hence two compounding negative effects on $\alpha^1(M) = \alpha^*(\Theta)$: the direct effect caused by a high θ^m , and the indirect effect following from the induced decrease in λ , which itself causes the weight of θ^c to grow in Θ .

4.2 Endogenous choice of the military

So far we have focused on situations where the size of the military was fixed by exogenous forces, either external or internal. However, there are cases where the autocrat is able to choose the size of the army. He then has available two instruments to influence the behaviour of the men in uniform: perks and privileges, and the defence budget that determines the army's size. In this section we study the optimal size of the military from the autocrat's point of view. We have seen that to stay in power he needs to prevent both a successful clerics-led popular revolution and a successful military coup. Providing enough defense resources to the army will help reduce the religious risk, but presents the drawback of increasing the risk of a successful military coup. Paying high wages and providing large

economic rents to the military has the effect of reducing their incentive to meddle in politics and simultaneously increasing their incentive to crush a clerics-led revolution. But a well-paid army without the means to defend the government would not be terribly effective. The choice of the optimal army size is thus trading off those different concerns. In order to address this issue, we need to consider two specifications of the Ruler's objective function depending on how R_m^δ compares to $C(\frac{s-L_0}{\lambda})$.

- For $R_m^\delta \leq C(\frac{s-L_0}{\lambda})$ (ie. $\frac{s-L_0}{\lambda} \leq M_c$), the payoff function of the Ruler is

$$W(M) = \begin{cases} R(\alpha^1(M)) - \Theta V(\alpha^1(M)) & \text{if } M < \frac{s-L_0}{\lambda} \\ R(\alpha^m) - \theta^m V(\alpha^m) & \text{if } M \in [\frac{s-L_0}{\lambda}, M_c] \\ R(\alpha^m) - \theta^m V(\alpha^m) + C(M) - R_m^\delta & \text{if } M_c < M \end{cases}$$

- For $R_m^\delta > C(\frac{s-L_0}{\lambda})$. (ie. $\frac{s-L_0}{\lambda} > M_c$), we have:

$$W(M) = \begin{cases} R(\alpha^1(M)) - \Theta V(\alpha^1(M)) & \text{if } M < M_c \\ R(\alpha^1(M)) - \Theta V(\alpha^1(M)) + C(M) - R_m^\delta & \text{if } M \in [M_c, \frac{s-L_0}{\lambda}] \\ R(\alpha^m) - \theta^m V(\alpha^m) + C(M) - R_m^\delta & \text{if } \frac{s-L_0}{\lambda} \leq M \end{cases}$$

Taking the derivatives of the value functions and applying the envelope theorem yields:

- For $R_m^\delta \leq C(\frac{s-L_0}{\lambda})$:

$$W'(M) = \begin{cases} \frac{\lambda\theta^c}{s[\bar{x}(M)]^2} \frac{\epsilon+\mu}{2\mu} V(\alpha^1(M)) & \text{if } M < \frac{s-L_0}{\lambda} \\ 0 & \text{if } M \in [\frac{s-L_0}{\lambda}, M_c] \\ C'(M) & \text{if } M_c \leq M \end{cases} \quad (22)$$

- For $R_m^\delta > C(\frac{s-L_0}{\lambda})$:

$$W'(M) = \begin{cases} \frac{\lambda\theta^c}{s[\bar{x}(M)]^2} \frac{\epsilon+\mu}{2\mu} V(\alpha^1(M)) & \text{if } M < M_c \\ \frac{\lambda\theta^c}{s[\bar{x}(M)]^2} \frac{\epsilon+\mu}{2\mu} V(\alpha^1(M)) + C'(M) & \text{if } M \in [M_c, \frac{s-L_0}{\lambda}] \\ C'(M) & \text{if } \frac{s-L_0}{\lambda} \leq M \end{cases} \quad (23)$$

When the functions $R(\cdot)$, $C(\cdot)$ are concave enough and $V(\cdot)$ is convex enough, it can be shown that the value function $W(M)$ is concave in the

size of the army, M . Moreover, from (22) and (23), it is evident that $W(M)$ is increasing in M for $M < \min(M_c, \frac{s-L_0}{\lambda})$, and decreasing in M for $M > \max(M_c, \frac{s-L_0}{\lambda})$. The optimal army size then lies necessarily between $\min(M_c, \frac{s-L_0}{\lambda})$ and $\max(M_c, \frac{s-L_0}{\lambda})$. The next proposition depicts the equilibrium values of the optimal army size distinguishing between the two aforementioned cases, and taking into account the possibility of several shapes of the function $W(M)$ in the second case.

Proposition 4 *The optimal size of the army from the Ruler's point of view is as follows.*

- If $R_m^\delta < C(\frac{s-L_0}{\lambda})$, then

$$M^{op} = \left\{ M \in \left[\frac{s-L_0}{\lambda}, M_c \right] \right\} \quad \text{regime B}$$

- If $R_m^\delta \geq C(\frac{s-L_0}{\lambda})$, then⁶

$$M^{op} = \begin{cases} (M_c)_- \\ M^* \in \left] M_c, \frac{s-L_0}{\lambda} \right[\\ (\frac{s-L_0}{\lambda})_+ \end{cases} \quad \begin{cases} \text{if } W'_+(M_c) < 0 & \text{regime A'} \\ \text{if } W'_+(M_c) > 0 > W'_-(\frac{s-L_0}{\lambda}) & \text{regime A'} \\ \text{if } 0 \leq W'_-(\frac{s-L_0}{\lambda}) & \text{regime B'} \end{cases}$$

Proof. See Appendix 7.2 ■

Obviously, if the Ruler is sufficiently powerful to choose the size of the army, he never picks a regime where the latter is super weak (i.e., when $M < \min(M_c, \frac{s-L_0}{\lambda})$). Such an army would be so weak that given its moderate preference for reforms, it would not be a credible threat to an alternative religious government. It therefore needs to be bought off with the purpose of beating back a clerics-led rebellion when secular reforms are enacted by the Ruler. Moreover, a weak army would not be able to crush a rebellion if it chooses to.

The optimal regime for the Ruler then depends on how easy it is to meet these challenges: eradicate rebellions and enlist the support of the

⁶We denote $W'_+(M)$ the right-side derivative of $W(\cdot)$ at point M and $W'_-(M)$ the left-side derivative of $W(\cdot)$ at M .

military for his reforms. When $R_m^\delta < C(\frac{s-L_0}{\lambda})$ (or $\frac{s-L_0}{\lambda} < M_c$), the Ruler does not need a strong army to counter the threat of a rebellion instigated by the clerics. The problem is how to induce the military to confront such rebellions. The Ruler's best choice is a regime with no co-option of clerics, a moderately-sized army, and a reform mix essentially driven by the preference of the military (*regime B*). Bearing in mind that the latter cannot get more than their reservation level under any alternative regime, the Ruler is able to obtain their cooperation against moderate perks. Once the threat of a religious rebellion is under control (ie. $M \geq \frac{s-L_0}{\lambda}$), he is indifferent to the size of the army as long as it remains below M_c . The reason is that M_c is the critical level at which the military become powerful enough to extract large perks because of their enhanced capacity to stage a coup.

When $R_m^\delta > C(\frac{s-L_0}{\lambda})$, the Ruler needs a strong army to defeat any popular rebellion instigated by clerics. The problem is that such an army will be a serious threat to his own regime, thus justifying the payment of large perks to the military in order to prevent a coup. In this case, depending on how costly it is to buy off the clerics as compared to the military, the Ruler will either opt for a double co-option regime in which both the military and the clerics receive positive rents (*regime A'*), or for a regime with no co-option of the clerics but a larger army size given by $M^{op} = \frac{s-L_0}{\lambda} +$ (*regime B'*). Under *regime A'*, when $W'_+(M_c) < 0$, the military receive moderate rents as a way to induce them to put down rebellions. They do not represent a serious threat to the regime, though, since the size of the army is only moderately strong at M^* when $W'_+(M_c) > 0 > W'_-(\frac{s-L_0}{\lambda})$. As for the clerics, they receive perks and are therefore prompted to support the Ruler: the regime is thus one of double co-option. Under *regime B'*, finally, the military, which are very powerful, get positive rents whereas the clerics, who are weak in comparison, do not represent a threat to the regime and therefore receive no perk. They are not paid. The magnitude of the reforms is $\alpha^m = \alpha^1(\frac{s-L_0}{\lambda})$, which is again driven by the preference of the military. Hence this regime is characterized by a very strong army and a politically subdued religious class.

5 Regime case studies

There is no easy route toward testing our theory, as this would require a complex set of data pertaining to a large number of countries and many variables involved are very hard to measure. In particular, we do not know how to measure continuously the intensity of (progressive) reforms enacted by a political regime, or the degree of aversion to these reforms of both the clerics and the military. Equally difficult is the task of precisely measuring the amount of perks received by these two categories of agents. In this final section of the paper, our objective is much less ambitious but probably more realistic. Focusing on post-World War II Muslim autocracies, we thus intend to construct a reasoned typology in the light of our theory. More precisely, we succinctly discuss a number of important country or regime cases regrouped on the basis of configurations of dichotomized values of the model's variables that we can plausibly assign to them. This comparative approach therefore contains analytical narratives about different types of politico-military-religious equilibrium prevailing in (various groups of) autocratic countries where a decentralized religion (Islam) dominates. To discuss regimes rather than country cases is more meaningful because exogenous events (military defeats against a foreign army, fall in oil prices, for example) have often intervened in the long period separating the end of World War II from the present. The closest effort in a similar direction is found in Platteau (2017: Chap. 10) and Auriol and Platteau (2017b). In these accounts, however, attention is focused on strategic interactions between the autocratic ruler and the religious clerics while the role of the military is essentially ignored.

5.1 Strong popular legitimacy of the autocrat

To begin with, *Turkey under* Mustapha Kemal *Ataturk* (1923-1938), *Egypt under* Gamal Abdel Nasser (1952-1970), and *Tunisia under* Habib *Bourguiba* (1957-1987) fall into a first category of regimes characterized by the strong popular legitimacy of the autocratic leader (high values of L_0) and the strong loyalty of the military, police, and secret ser-

vices. While Ataturk gained a lot of prestige from his military victory against Greek troops in the battle of the Dardanelles, Nasser won the rewards of overthrowing king Faruk who was too compromising with the British colonial power and of defending the national interests of an independent Egypt. As for Bourguiba, he came out of the anti-colonial struggle with a wide aura and his highly charismatic character helped him win much support in the population. The strong loyalty of the state defence establishment is reflected in low values of θ^m (weak aversion to progressive reforms) and possibly high values of λ (high effectiveness of the military in exerting violence, as a result of strong motivation of top officers).

The above configuration of key parameters implies that we are in the case $R_m^\delta < C(\frac{s-L_0}{\lambda})$, where the two thresholds $\frac{s-L_0}{\lambda}$ and M_c are low with the latter higher than the former. The relevant regime is thus *regime B* in which since they do not constitute a threat the clerics do not need to be seduced ($w_c = 0$), and reforms are adopted by the Ruler with magnitude $\alpha^{op} = \alpha^m$. Furthermore, because θ^m is low, the predicted value of α^m is high. On the other hand, to the extent that the Ruler is able to choose the size of the army, the theory predicts that it will be anywhere between $\frac{s-L_0}{\lambda}$ and M_c , which corresponds to a rather narrow interval insofar as the two bounds are low. The optimal army is therefore of a moderate size. In our three regimes, this is apparently borne out only for Bourguiba while in the other two cases external factors and foreign policy objectives played a big role in determining a defence budget significantly larger than the amount predicted by the theory. In the particular cases of Egypt and Turkey, a large army was not a serious threat to the president: both Nasser and Ataturk were directly coming from the army, and there was little antagonism or disagreement between them. The Egyptian and Turkish military bodies were strongly loyal to Nasser and Ataturk, respectively, and they espoused the secular-nationalist values that inspired the actions of their political leader.

The central message from the above is therefore that the three autocratic leaders were in a position to push through important institutional reforms, particularly secular and progressive reforms that encroach upon

the erstwhile privileges and prerogatives of traditional agencies such as religious authorities. This expectation is fully supported by the evidence regarding the achievements of their regimes. In Tunisia, this is amply attested by Bourguiba's promulgation of the Personal Status Code (in 1956, when he was Prime Minister), which aimed at strengthening the nuclear family and reducing existing inequalities between men and women.⁷ A few years later (1961), he absorbed the two existing sharia courts into the state judicial system and the main mosque-university complex (al-Nahda) into the state education system (Platteau, 2017: 382-8). While in Tunisia Bourguiba was keen to vindicate his reforms in the name of a new interpretation of the sharia, the bold reforms enacted by Ataturk were entirely justified by the need to modernize and Westernize Turkey's institutions. His approach to Islam has thus been characterized as one of "assertive secularism", inspired by the French Jacobite model (Kuru, 2009). It succeeded in suppressing autonomous Islamic institutions and excluding religion from the public sphere, confining the role of the ulama to the realm of family law (Zurcher, 2004).

As for Nasser, he sought to modernize the institutions of official Islam, particularly the prestigious al-Azhar mosque-university complex, by stripping it from its religious endowment and preventing it from holding sharia courts (Lee, 2014: 61). During the latter part of his rule, however, Nasser's prestige was eroded (military defeats against Israel affected his popularity) and he was confronted with a more effective opposition from religious clerics (the Muslim Brothers), which forced him to be more compromising. His regime then started to resemble the successor regimes of Sadat and Mubarak to which we shall return.

Another, less well-known, regime under which a strong leader achieved important secular reforms is the regime of General Abd al-Karim Qasim in Iraq (1958-1963). After leading the revolution against the Hashemite monarchy established by the British colonial power, he started imposing

⁷The Code thus prohibited polygamy, granted the women the right of divorce and to approve arranged marriages, expanded women's existing rights in matters of inheritance and child custody, set minimum ages for marriage, and ended the male right of repudiation.

state control of all Islamic institutions. Later, he promulgated the Law of Personal Status (1963), which forbade polygamy and stipulated complete equality between men and women in inheritance matters (Baram, 2014: 47-54). This was the most progressive gender-related institutional change in the whole Arab world even to this date.⁸

5.2 Weak autocrat and strong religious leaders

Saudi Arabia lies at the other opposite end of our regime spectrum. Before it was formed as a modern national entity, the country was a set of different tribes and heterogeneous regions (with Mecca and Medina much more conservative than other areas, the coastal part of the Nadj province in particular). The question of national identity was therefore a hugely difficult task, complicated by the fact that the (founding) family of Abd al Aziz Ibn Saud (1902-1953) lacked any strong connection with tribal confederations, so that his intrinsic legitimacy was low. He therefore chose to form a military-religious alliance with Wahhabi religious leaders (the mutawwa) and their powerful militia known as the Ikhwan (the Brothers). When the Ikhwan rebelled against Ibn Saud in the late 1920s because he gave in to British pressures to stop his conquest of the whole of Arabia, the Wahhabi ulama rescued him by condemning the illegitimate insubordination of the Ikhwan.

Founded much earlier by Muhammad Ibn Abd al-Wahhab (1703-1792), the Wahhabi doctrine was thus adopted by the Saudis as the ideology of the new nation. Anchored in the deep-rooted patriarchal values of the Bedouin society, it is profoundly puritanical and allergic to all sorts of innovations. At the same time, this ultra-conservative brand of Islam sticks to a principle that is generally accepted even among moderate Muslim scholars: to avoid chaos and anarchy, all Muslims should obey a secular ruler however despotic (Lee, 2014: 222-33; Platteau, 2017: 125-37). In the case of Saudi Arabia, this proclivity was enhanced by the fact that Wahhabism was a rather

⁸The regime of king Amanullah (1919-1929) in Afghanistan was equally impressive if judged by the boldness of its secular reforms. However, because he underestimated the strength of religious and tribal opposition, Amanullah was quickly overthrown after enacting them (Barfield, 2010: 190-202).

obscure doctrine that would never have gained traction if the Saudis did not make the political decision to give it an official existence and to extend its influence as a way to project their power outwards. In the words of Lee (2014): "Saudi Arabia is the possession of a family, not the vanguard of a religion" (p.220). But Wahhabism was especially useful not only for the purpose of building a new nation based on a strong monarchy but also because it served to project the country as a major regional player. For the latter role, Wahhabism has the advantage that its doctrine appears more true to the original message of Islam than the versions prevailing in rival countries and that it supplies a concept of jihadism justifying the use of violence for an expansion inside the Arab world itself (Platteau, 2017: 434).

In the context of such a strong alliance, the king must pay a lot attention to the preferences of the clerics. We thus expect him to distribute large rewards to them as well as to forsake (secular) reforms in order to meet their ultra-conservative demands. The price to pay for the use of the second arm of the autocrat's tactic is actually small: Saudi Arabia being a rent economy based on huge and valuable oil resources, the function $R(\alpha)$ rapidly flattens so that not much income is lost as a result of the absence of reforms (Auriol and Platteau, 2017a). To see this point, consider the limit case where the secular reforms have no impact at all on the autocrat's wealth: $R(\alpha) = \bar{R}$. There would then be no point in antagonizing the clerics with modernization reforms and the Ruler would choose $\alpha^{op} = 0$. More generally, we are in the case where $R'(\alpha)$ is very low in (15).

Whatever the relevant definition of y , the equilibrium magnitude of reforms is thus predicted to be very small. Moreover, since $x = \bar{x}(M)$, the wage paid to the clerics varies positively with the product $\theta^c V(\alpha)$ and with s , while it varies negatively with L_0 . Despite a high θ^c , the product $\theta^c V(\alpha)$ is small due to the (very) low value of α . On the other hand, the low intrinsic legitimacy of the monarchy combined with a strong effectiveness of religious leadership push the clerics' wage up. Overall, the theory predicts that shunning institutional reforms, which comes at a low cost, takes precedence over the payment of generous perks as a way to entice the cler-

ics. For the same reason, monarchy is able to enlist the support of a very large proportion of them (γ^* is close to one). The equilibrium is a super conservative society ruled according to puritan religious principles, and in which the influence of the clerics on the monarch's policies is paramount.

The above conclusion leaves aside the role of the army which we now consider. In the absence of external or foreign policy considerations, the Saudi king would keep it at a minimum level so that he would not have to share his rents with the men in uniform. Yet, because of the Saud family's strong ambition of gaining a leadership position in the Arabian peninsula and in the wider Arab world, the army size has exceeded the optimal size determined in our model. As a matter of fact, whichever the indicator used, Saudi Arabia comes out as one of the most militarized countries in the world.⁹

Moreover, Saudi Arabia satisfies the condition $R_m^\delta > C(\frac{s-L_0}{\lambda})$, since R_m^δ is high and L_0 is low. As $\frac{s-L_0}{\lambda}$ is high, it is likely to exceed M_c , and the prevailing regime is either A or A' , the two possible types of double co-option. Hence, α^{op} is equal to $\alpha^1(M)$, which is quite small (see above) even though M is relatively large as a result of the king's foreign ambitions. The (nmc) constraint must be taken into account since it is indeed very tempting for the military to seize power through a coup when huge resource rents are available, especially so if they are able to exploit the resource relatively efficiently, that is, if we are in a rent economy with a flat $R(\alpha)$ function and δ close to 1. The Ruler then needs to grant enough privileges and pay high enough wages to the military to counter such a threat: w_m^* is high because R_m^δ is large.

That the large co-option of the clerics and the military by the monarch

⁹In particular, it occupies the top position in terms of military expenditures per capita, and the second position in terms of military expenditures measured as a proportion of the Gross Domestic Product, or as a proportion of government spending (source: dataset of the Stockholm Peace Research Institute). Moreover, it occupies the 21th position (just behind Turkey) according to the Global Militarization Index (GMI), which depicts the relative weight and importance of the military apparatus of one state in relation to its society (source: dataset of the Bonn International Center for Conversion). More precisely, the GMI rests on (i) the comparison of military expenditures with the GDP of the country and its health expenditures, (ii) the contrast between the total number of (para)military forces and the number of physicians and the overall population, and (iii) the ratio of the number of heavy weapons available and the overall population.

has been quite effective has been attested on several occasions. In particular, the loyalty of the army and the official clerics was manifested on the occasion of the occupation of the Grand Mosque in 1979, when Juhayman al-Utaibi and hundreds of armed followers denounced the Saudi monarchy for corruption and promoting Westernisation, and again in the 1990s when the Saudi regime was threatened by Islamist protests and jihadi attacks. In both cases, the state sought authorization of the Council of Senior Ulama to use force to put down the rebellion, and the military duly followed suit (Ayubi, 1991, pp. 100-103; Lee, 2014, pp. 228, 233).¹⁰

The Saudi regime is aptly described as an equilibrium of immobilism made possible by the availability of formidable oil rents. It is perhaps no coincidence that the new strong man of Saudi Arabia, prince Mohammed Ben Salman, has recently embarked upon a number of secular reforms with the dual objective of diversifying the economy of the country and modernizing its institutions. Whether he can succeed in shaking a well-entrenched politico-religious equilibrium remains to be seen.

In *the Islamic Republic of Iran* (started in 1979), the president has to deal with powerful (Shi'a) clerics and religious militia the most well-known of which are the Revolutionary Guards (the "Pasdaran") and the morality police and virtue squads. These religious organizations and all the agencies tied to them constitute a genuine "deep state" connected to the country's supreme ayatollah, himself a very conservative personality. In such a context, the president's strength is tightly constrained and the national army does not wield much independent power and influence. Formally, this regime case is close to that of Saudi Arabia, including with respect to the shape of $R(\alpha)$ since Iran also possesses considerable oil resources. Therefore, α^{op} is small, yet not so small as in Saudi Arabia insofar as the Iranian economy is more diversified than its Saudi counterpart. It

¹⁰Interestingly, several of the leaders of the Mecca takeover movement were from Najdi nomadic tribes traditionally opposed to the political hegemony of the Saudi family. Their grandfathers belonged to tribes (Utaiba, Matir, and Yam tribes) which had fought against al-Aziz ibn Saud in previous generations. Two-thirds of the forty-one Saudi citizens who were executed in January 1980 actually came from the relatively underprivileged Nadj region, with one-fourth of them belonging to the antagonistic Utaiba tribe alone (Ayubi, 1991, p. 103).

is therefore not surprising that the supporting religious clerics and their associates (the Guards in particular) may receive non-negligible benefits under the form of exorbitant economic privileges and exclusive rights to produce, trade and import strategic goods and services. The Guards have thus succeeded in getting enmeshed in the ownership and management of lucrative business ventures constituting 25 percent or more of the Iranian economy (Lee, 2014: 204).

Aside from the structure of the economy, there is another difference between Saudi Arabia and the Islamic Republic of Iran: in the latter, co-optation of the clerics is far from complete. The reason is that, from the very beginning, Khomeini's doctrine according to which Iran must be governed by the leading jurist of Islam (the "velayat-e faqih"), acting as placeholder for the Hidden Imam, was rejected by a number of leading clerics who believed that clerical involvement in politics would sully Islam (Platteau, 2017: 184).¹¹ Tensions between religious hardliners, who support the regime (around the supreme ayatollah Ali Khamenei who succeeded to Khomeini), and clerics centered around the sacred city of Qom, who believe that the clergy's role is to advise not to rule, has grown over the years. This is so much so that the Expediency Council, a government watchdog, has started to crack down on Qom's clergy. (Economist, 2019: 30-31).

Such strong heterogeneity of the clerical body probably explains why relatively high perks are granted to the fraction of the Iranian clerics who are loyal to the ayatollah regime. It is thus the case that γ^* is smaller in Iran than in Saudi Arabia. Bearing in mind that γ^* decreases with $\frac{\theta^c V(\alpha)}{w_c}$, this implies that the latter composite variable is higher in the case of Iran. Since θ^c , which measures the average aversion of the clerics to reforms, is significantly smaller in Iran, the ratio of $V(\alpha)$ to w_c must be comparatively high at equilibrium. The logic of our model therefore predicts that the Iranian regime is less (ultra-) conservative than the Saudi one, which we

¹¹Their stance is actually in keeping with Twelver Shi'ism whose cardinal principle provides that no temporal authority can earn legitimacy until the Mahdi (who vanished from sight in 874) has returned to earth. Establishing and sustaining a theocratic state thus totally contradicts this strand of Islam (Benraad, 2015: 32).

observe in reality. Finally, the analysis of the role of the military is, *mutatis mutandis*, similar to that proposed for Saudi Arabia (Note that Iran, too, has foreign ambitions and it perceives to be the object of serious external threats).

5.3 Strong army and strong clerics

In between the above two polar cases lay the great majority of postwar Muslim regimes. Under these regimes, the military can credibly threaten to make a coup and the clerics can credibly threaten to trigger a change of regime. Therefore, the army's top commanders and a sufficiently large number of clerics need to be bought into submission to the sovereign. As a consequence, material advantages need to be granted to them and radical institutional reforms are avoided especially when the values of the military are close to those of the clerics and are conservative. If the autocrat were able to choose the army size, it would be neither too small, so that the success of a religious rebellion can be prevented, nor too large, lest the army itself should be tempted to make a coup. In most countries examined here, a major feature is the existence of a strong army whose size has been determined by important external ambitions or perceived (or fabricated) threats coming from neighbours. It is revealing that based on a variety of indicators, Algeria, (post-Nasser) Egypt, and to a lesser extent Pakistan and Sudan come out as strongly militarized countries.¹²

In Egypt, it is enmity with the neighbouring state of Israel, in Pakistan the perceived threat from neighbouring India, and in Algeria the legacy of the liberation war against France, that was a central factor behind the

¹²For example, in the world ranking based on the Global Militarization Index (GMI), Algeria occupies the 15th position and Egypt the 28th while Pakistan is found in the 58th position and Sudan in the 60th (2017 data). If military expenditures are measured as a percentage of the GDP, two of the four countries appear in the list of the world's 15 highest-ranked countries: Algeria (5th rank with a proportion of 5.7 percent) and Pakistan (14th rank with 3.5 percent). If these expenditures are alternatively measured as a percentage of government spending, three of them are featured in list of the world's 10 highest-ranked countries: Sudan (in the top position: 30.9 percent), Pakistan (7th position: 16.7 percent), and Algeria (8th position: 16.1 percent). Finally, if we look at the ratio per thousand inhabitants of total military (active, reserve, and paramilitary) personnel (2018 data), we again find that the same countries rank quite highly: Egypt (13.5 percent), Algeria (11.4 percent), Sudan (5.6 percent), and Pakistan (3.1 percent).

emergence of a powerful army. The important point, however, is that M is not so large or so effective that it can eliminate the risk of a cleric-led rebellion, even when due account is taken of the existence of strong intelligence and internal security services. This is largely because dissenting clerics (those with a comparatively high θ^c) tend to be regrouped in strong organizations: the Muslim Brothers in Egypt and Sudan, the Front of Islamic Salvation (FIS) in Algeria, and numerous Islamic outfits and madrasa-based movements in Pakistan. In terms of our model, the organizational strength of the religious opposition is reflected in high values of the parameter s . Combined with low values of the autocrat's legitimacy, L_0 , this causes the ratio $\frac{s-L_0}{\lambda}$ to be large enough to exceed M : $M < \frac{s-L_0}{\lambda}$. This inequality is even more likely to hold if λ is small, such as happens when the preferences of the military are close to those of the clerics (see the example of Pakistan below, which will serve to illustrate our remark following Proposition 3).

Whether $R_m^\delta > C(\frac{s-L_0}{\lambda})$ or not is hard to determine a priori. In countries richly endowed in oil and gas resources, such as Algeria and Sudan (before the secession of the south), this inequality plausibly holds. Yet, whichever the relationship between R_m^δ and $C(\frac{s-L_0}{\lambda})$, the equilibrium level of reforms is $\alpha^{op} = \alpha^*(\Theta) = \alpha^1(M)$, corresponding to *regime A* or *A'*. More reforms are implemented in the four aforementioned countries than in Saudi Arabia and Iran where θ^c is significantly higher. Yet, as pointed out at the end of Section 4.1, when θ^m is high and therefore close to θ^c , the optimal level of reforms is predicted to be low on a double ground: Θ is large both because θ^m is high (the direct effect) and because the weight of θ^c is large as a consequence of the small value of λ (the indirect effect).

We can now provide more details about each of the selected regime cases. We begin with the regime of **Zia ul-Haq** (1977-1988) **in Pakistan**, under which a powerful army and powerful clerics coexisted and shared a strong aversion to progressive institutional reforms. It is under Zia that the country's military, intelligence service and police, which largely escaped civilian control, came to be formed of many religiously committed

cadres and Zia's loyalists.¹³ The coziness between the military commanding structure and the clerics, not only the urban ulama of the official establishment but also the Sufi masters and shrine guardians of the countryside or remote towns, was thus closer than ever (Malik and Malik, 2017; Martin, 2016). It is therefore no surprise that for the first time in the short history of Pakistan, Islamization acquired legitimacy and the backing of the state, thereby guaranteeing a wide support from religious parties and movements. In a revealing move, Zia presented the military as "the ideological vanguard of an Islamic state", and he vowed to bring not only the army but also the economy, the judiciary, and the education system closer in line with the sharia (Haqqani, 2005: 132-3, 146-8; Abbas, 2005: 101-108). He actually took many drastic steps in that direction and, among the most reactionary ones were his infamous Hudood Ordinances, his Blasphemy Law, and his laws against (religious) minorities (Zaman, 1998: 72-3; Abbas, 2005: 103-6; Haqqani, 2005: 140-5).¹⁴

Moreover, under Zia's rule the army perfected the practice of using Islamic parties and radical Islamic groups "as pawns in domestic and international politics" (Cohen, 2004: 113). Unlike other Pakistani rulers, Zia was even ready to grant clerics, religious leaders and parties a significant role in the the civilian administration and the affairs of the state, going as far as allowing Islamist journalists to operate within the government-owned media (Haqqani, 2005: 132, 148-9). As for the military, not only were their role and interest in politics entrenched (Khan Mohmand, 2019: 74-76), but they also benefitted from enormous privileges and opportunities for personal enrichment, particularly in the form of participation in, and ownership of, luxury properties as well as highly profitable and well-sheltered business firms forming the Milbus complex.¹⁵ Revealingly, not only did Zia

¹³Pakistan's intelligence sector operates in a legal vacuum and does not fall under the authority of the federal government. Yet, it is under the control of the high command of the army (Shah, 2014: 273).

¹⁴While the Hudood Ordinances made the victim of a rape practically guilty of fornication, the Blasphemy Law carried a mandatory sentence of death or life imprisonment for anyone making derogatory remarks against the sacred person of the Prophet or for desecrating the Quran.

¹⁵The Defence Housing Authority (DHA) developed a sprawling property empire that includes the entire district of Clifton, a swanky suburb of Karachi with half a million

expand Milbus considerably, but he also took active measures to establish the military's financial autonomy and he empowered senior commanders by putting special secret funds at their free disposal (Siddiqi, 2017: 161-5).

It is important to avoid the temptation to consider Zia as a simple representative of the army, thus confounding the roles of the Ruler and the Military. Besides being an army man and a religious zealot, Zia was above all a shrewd politician adept at using religious forces against his political opponents (Platteau, 2017: 215). And although he did not hesitate to manipulate extremist religious organizations, he knew where to stop and his most radical measures were not necessarily implemented. In any case, the institutional setup of Pakistan cannot be compared with the setup of Saudi Arabia and the Emirates of the Persian Gulf where traditional Islamic law has remained the fundamental law up to the present day (Coulson, 1964: 151-5). Still, it is striking that Zia's regime has left a deep imprint on the polity and the entire makeup of Pakistan. As a matter of fact, none of his successors, including civilians (Benazir Bhutto, Nawaz Sharif, and Imran Khan), has dared effectively challenge the obscure interference and the unhealthy alliance of both the military and the radical clerics in the country's affairs.

The regimes of Anwar *al-Sadat* (1970-1981) and Hosni *Mubarak* (1981-2011) *in Egypt* differ from Zia's regime in two senses. First, the body of religiousclerics is rather sharply divided between the official establishment of al-Azhar, on the one hand, and the Muslim Brotherhood and movements or organizations of the extreme religious right (such as the Islamic Group -"Jama'at Islamiya"- and "Excommunication and Exodus"- "Takfir wa-l Hijra"), on the other hand. Second, the values of the military differ from those of the Muslim Brothers and other religious organizations. Both Sadat and Mubarak have therefore worked in close cooperation with the army whose top commanders hold secular values (i.e., it corresponds

residents and 15km of beachfront, and the entire south-east quarter of Lahore, in which the main business district is located. Pakistan's supreme court admonished the DHA for ignoring orders to open its accounts to public scrutiny, and a judge remarked that the agency "seems like a government operating within the government", while another went so far as saying that "You people run your business by using widows and martyrs as a shield, and you pocket royalties in their name" (Economist, May 11-18 2019).

to a rather small θ^m), and they have systematically sought to co-opt al-Azhar's official clerics and to gain the support of the Muslim Brothers. Because members of the religious establishment can be bought at a reasonable price, coopting them proved rather easy while attempts to court the Muslim Brothers were met with variable success.¹⁶ It corresponds to a case where only a partial co-option of the religious class is optimal (i.e., γ^* is significantly smaller than one).

By appearing to give in to the Brother's demand for the gradual Islamization of the Egyptian state, Sadat nevertheless played a dangerous game because he was not actually prepared to make such a move. Moreover, the adverse effects of his liberalization policies on the popular masses prompted the Brothers to organize social protests while their prestige simultaneously increased as a result of their effective and benevolent efforts to relieve poverty. More important, Sadat's decision to strike peace with Israel was considered as an act of treason by many Egyptians, including the Brothers and the extreme religious right.

The support of al-Azhar clerics remained unbending, however, as witnessed by their fatwa, called the "Religious Legal Verdict", that provided religious sanctioning of the peace treaty and the Camp David Agreement (Ramadan, 1993: 169; Kepel, 2005: 51). Yet, Sadat overestimated its impact as well as the army's willingness to intervene against demonstrators denouncing peace with the erstwhile enemy: $\theta^c - \theta^m$ is small when the issue of Israel becomes salient, and λ becomes also small as a result. He was assassinated by a religious extremist from the "al-Jihad" group.

Mubarak learned the lesson and was more cautious in dealing with Islamists. He pursued the same liberal economic policies as Sadat and continued the strategic partnership between Egypt and the United States by engaging his country on the side of the US in the first Gulf War. This

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Sadat tried to woo the Muslim Brothers when he let them take control of the prestigious professional associations of engineers, doctors, lawyers, scientists, and pharmacists, and when he appointed a well-known religious fundamentalist (Muhammad Uthman Ismail) as governor of Asyut province (Cook, 2012: 123-5). Likewise, he encouraged the movement called Islamic Community to take over the Egyptian Student Union (Dreyfuss, 2005: 154; Ayubi, 1991: 74-5).

move obeyed a constant preoccupation of Egyptian leadership to obtain sophisticated weaponry and financial assistance for the army (including the military, the intelligence service, and the police), so that it can enhance its external dissuasive power and beat back active religious movements. Confronted with unabating and determined political opposition, Mubarak chose to demonize the Brothers by conflating them with religious extremist groups.¹⁷ The religious support for his regime was thus limited to the official clerics of al-Azhar whose own credibility was dented by their unconditional justification of Mubarak's policies and their refusal to denounce the deeply authoritarian character of the Egyptian state (Platteau, 2017: 196-200). As a consequence, the society became polarized between ordinary Egyptians and a narrow business elite tightly linked to a deep state constituted by top military, "intelligence barons" and police officers who themselves enjoyed enormous economic privileges.

Closer to Zia's Pakistan than to Sadat's and Mubarak's Egypt are the regimes of Houari Boumedienne (1965-1978) and Chadli Bendjedid (1986-1992) in *Algeria* and the regimes of Muhammad al-Nimeiri (1969-1989) and Omer al-Bashir (1989-2019) in *Sudan*.

Under Boumedienne (first as prime minister, then as president), a bizarre alliance was sealed between the new socialist, anti-imperialist regime and the ulama represented by the Supreme Islamic Council. This alliance was motivated by the need to obtain a religious defense of socialism (actually a system of state control of the economy) and an active support for the regime (through religious speeches) whenever political opposition manifested itself in street demonstrations (Tamzali, 2007: 199-202; Laribi, 2007: 53-4). In fact, Boumedienne chose to use Islam to counteract any opposition movement and prevent the emergence of a genuine civil society. He did not hesitate to give free rein to the most reactionary clerics among the ulama. In particular, he granted them the right to lead the Arabization of the country (with disastrous consequences), to manage the

¹⁷This is despite the fact that "There never was a single, essential character of the Muslim Brotherhood, because the Brothers themselves never fully agreed with one another" about most issues (Kirkpatrick, 2018: 122). In addition, they had long renounced the use of violent means.

education system (including the right to rewrite school textbooks), and to even meddle in mundane matters like dress code, alcohol consumption, etc.

He also strove to reach out to extremist religious forces beyond the influence of the official Muslim establishment and propagated their messages of hatred through a number of unofficial mosques and schools harboring an independent Muslim community life (Lapidus, 1988: 697; Chachoua, 2001). Clearly, the regime went quite far in co-opting religious clerics, including those of radical stripe, and this was done with the consent of the army (and intelligence service) which were always acting behind the scene. Like in Saudi Arabia, this strategy was feasible because of the presence of natural resources that could be exploited without significant modernization efforts. Members of the Algerian deep state amply participated in the rents extracted from the state exploitation of abundant natural gas resources.

Chadli essentially continued his predecessor's policies: he used Islamist support to defeat the opposition, a strategy justified by the fact that the Islamic Salvation Front (FIS) defended private property rights and justified the intervention of the International Monetary Fund to help rescue Algeria from an economic and financial crisis (Bouamama, 2000: 214-8). As was to be later revealed, the Algerian intelligence agency had infiltrated the FIS and held no less than half of the seats in the Consultative Council (Laribi, 2007: 74). This was allegedly for the purpose of controlling it, yet it is probably closer to the truth to say that the deep state of Algeria cooperated with the FIS (which was officially constituted as a party in 1989), but viewed it as a potentially dangerous ally given the violent character of its most extremist wing.¹⁸ This tactic was apparently repeated for other Islamist outfits.¹⁹

The price paid for the religious support of the regime was high in terms of reforms foregone. It even took the form of a reactionary Family Code (1984), among other concessions. In addition, an unstable situation was

¹⁸Thus, one of the leaders of the FIS, Ali Benhadj, was a puritan cleric who called for the formation of an Islamic state, if necessary by violent means (Bouamama, 2000: chap. 3; Lapidus, 2002: 599-600).

¹⁹Colonel Samraoui thus accused the intelligence service of having placed one of its men at the head of the Islamist organization "El Hijra oua Takfir" ("Exile and Expiation") during the 1980s (Laribi, 2007: 53).

created and when the FIS rose into prominence (especially after its sweeping victory in the 1991 elections), a military clique known as the "eradicationists" refused any compromise with the religious extremists and waged a full-scale war for control of society in the name of secularism. Interestingly, not only middle class bureaucrats and businessmen but also moderate Muslim groups such as the Movement for an Islamic Society (HAMAS) clamoured for a military intervention to rescue the country from chaos (Filiu, 2015: 94-112).

Under the succeeding regimes of Liamine Zeroual (1992-2001) and Abdelaziz Bouteflika (2001-2019), nominal secularism came to be gradually re-established but only at the cost of continued military domination. This was exerted brutally through a shadow clique of so-called decision-makers ("les decideurs") acting as "a cabal of unelected power-brokers" (Laribi, 2007: 190-2; Platteau, 2017: 228-9; Sifaoui, 2019: 106-14). More than ever, the effective power was in the hands of the presidency, the top army commanders, and the intelligence service. It is they who have been in charge of distributing state rents not only to themselves but also to business allies with whom they formed a coalition of potentially antagonistic factions or clans acting behind the scene and putting on a facade of superficial unanimity (Sifaoui, 2019; Laabas and Bouhouche, 2011). Islamist radicals did not disappear, though. On the contrary, they signed an agreement with Bouteflika's regime in 2005 that guaranteed their political survival and their persisting but discreet influence.

Finally, in Sudan, because he himself came from the army, Nimeiri was able to rely on the military to counter political opposition. But he did not consider that the military offered sufficient protection, perhaps because having himself seized power through a coup, he feared the presence of too powerful an army. Here is therefore one of the clearest instances in which the autocrat chose the army size with essentially internal security considerations in mind (in conformity with our model). Because of his overwhelming concern with maintaining himself in power, Nimeiri opted for a double-edged tactic consisting of relying on a moderately-sized army (equal to M_c with $R_m^\delta > C(\frac{s-L_0}{\lambda})$ and $W'_+(M_c) < 0$) and on strong religious

support. Revealingly, he struck an alliance with Islamist factions, going as far as inviting into his government (in 1977) two prominent Islamists, including Hassan al-Turabi, leader of the Muslim Brotherhood and founder of the National Islamic Front (NIF). Appointed attorney-general, Turabi exerted steady pressure for the Islamic reform of the legal system (Lapidus, 1988: 859; Jok, 2007: 74; de Waal, 2015: 69-73).

In 1983, Nimeiri completely reversed his initial secular policy by declaring an "Islamic revolution" and transforming the Sudanese state into an Islamic republic to be governed by Islamic law, with no exemption for non-Muslim regions. Sudanese law was to be immediately reformed according to the sharia, and the so-called September laws gave rise to highly publicised public executions, amputations of limbs for theft, and lashing for alcohol consumption (Jok, 2007: 74-6). Similarly to what Zia ul-Haq did in Pakistan, Nimeiri demanded an oath of unconditional allegiance from all members of the civil service and judiciary, thereby causing the departure of prominent secularists and the dominance of the civil service, the army and the financial sector by Islamists (de Waal, 1997: 88). Members of the NIF and Muslim Brotherhood were left free to gain influence within the civil service, intelligence, and institutions of government in charge of education and welfare.

As soon as he acceded to power, al-Bashir professed his goal of creating a theocratic rather than a democratic state. He promulgated the Sudanese Penal Code (in 1991), which includes a provision on the crime of apostasy, and he actively pursued the Arabization and Islamization policies of the previous junta.²⁰

During the years 1990-1999, al-Turabi was a dominant force in Sudanese politics and he was the speaker of the national assembly. The cost of Islamic support for the regime in Khartoum proved enormous, as attested by the official sanctioning of reactionary tribal customs justified on religious grounds, appalling bloodsheds in Darfur and southern Kordofan, and the eventual secession of the Christian South (in 2014). Inflamed by the

²⁰In a way reminiscent of Zia in Pakistan, al-Bashir formed his own Islamic militia, the People's Defence Force, and training was made compulsory for civil servants, teachers, students and higher-education candidates.

Islamist imperialism of the North, the southern region's rebellion was revived and could not be defeated by the national army (Jok, 2007: 89-90, 120-7). This incapacity of the Sudanese military to deal with an internal insurrection was the consequence of a deliberate choice of the autocratic regime. Not only did it refrain from creating a strong army but it also made no serious attempt to control and disarm the malicious militia which developed in the wake of Islamist movements or as a reaction against them. Worse still, besides the official national army, al-Bashir controlled half a dozen semi-formal military outfits, from the much-feared National Intelligence and Security Services (NISS) to pro-government militias (such as the notorious Janjaweed responsible for mass rape and massacres in Darfur) which he tried to balance against each other in order to stay in power.²¹

As witnessed by the recent popular uprising, which led to the demise of al-Bashir (in early April 2019), such a fragmentary and divisive approach easily leads to fights between soldiers affiliated with different parts of the Sudanese state's defence system (de Waal, 2015: 57-62). In these circumstances, it is difficult to give much weight to the various indicators of military strength and militarization presented earlier. In terms of our model, a convenient way to represent the fragmentation of the Sudanese military is through a low value of λ , which prompted the Ruler to make up for a rather ineffective military by seeking greater religious support.²²

In Table 1, we summarize the above discussion by characterizing the three types of regimes that emerged from our short survey of regime case studies: exclusive co-optation of the military (I), equilibrium of immobilism

²¹In Darfur, for example, there were violent incidents in which "government-armed paramilitaries fought against one another and against the army, police and security forces, and even different arms of the official security establishment fought one another" (de Waal, 2015: 58).

²²It is debatable whether the situation of the military in Sudan is better represented by a low effectiveness of its internal organization (low λ) or by a decentralized structure of the military (in the way followed for the clerics). A valid reason for sticking to the first solution is that, albeit divided, the defence establishment is still formally under a single command structure, actually close to the presidency (at least until the need to change its holder was felt under intense popular pressure). Furthermore, we obviously require a uniform model to deal with the various regime cases analyzed in this section. Still, the example of Sudan suggests that λ is at least partly chosen by the autocrat, in which case we need to adjust the model in such a way that the Ruler chooses the composite variable λM instead of M . All the results hold *mutatis mutandis*

under double co-option (II), and more common forms of double co-option (III). We can see that in differentiating (II) and (III) from (I), intrinsic legitimacy of the autocrat, the strength of religious organizations, and aversion of clerics to reforms play a significant role while distinguishing between (II) and (III) is largely based on aversion to reforms of the military and the clerics, and the strength of religious organizations.²³

6 Conclusion

6.1 Summing Up

This paper is an attempt to understand variations in the willingness of an autocrat to push through institutional reforms in a context where traditional authorities represented by religious clerics are averse to them and where the military, who have their own preferences about reforms, control the means of repression and can potentially make a coup. This is a complex political economy game in which three key players interact strategically.

A central result is that although the autocrat always has an interest in co-opting the military, this is not necessarily true of the clerics. When the army size is fixed exogenously at a level smaller than the threshold beyond which the military could crush a rebellion supported by the whole clerical body, which we call the exclusive co-option threshold, the autocrat chooses to co-opt the clerics in addition to the military. In the opposite case, he refrains from courting the clerics. In the range where the double co-option regime prevails, the wages paid to the military and the intensity of reforms increase with the army size while the perks to clerics may either increase or decrease.

Under exclusive co-option of the military, reforms are always more important than under double co-option, as they are determined by the military's preferences only. When he chooses the intensity of reforms under the

²³An obvious limitation of our categorization and the underlying model is that the magnitude of s is considered exogenous. Our survey indeed reveals that an autocratic regime may choose to weaken or strengthen organizations of the religious right with the purpose of defeating other political opponents. This feature is not captured in our model where the religious right is either co-opted or not by the autocrat, and the latter's decision is made on the basis of its perceived strength.

double co-option regime, the autocrat gives more weight to the aversion of the clerics than to the aversion of the military provided that the army is of a sufficiently small size.

When the autocrat can freely choose the size of the army, and when the exclusive co-option threshold exceeds the threshold beyond which the military are tempted to stage a coup (against whatever type of government, civilian or religious), the way his utility varies with the size of the army will decide if its optimal size coincides with the former or the latter threshold, or else is lying somewhere between the two. According to intuition, it is when the optimal army size is at the upper level of the exclusive co-option threshold that the interests of the clerics are ignored. If, on the contrary, the threshold for a military coup exceeds the exclusive co-option threshold, the autocrat may choose any army size comprised between the two thresholds, and the regime in which only the military are co-opted always prevails. The main lesson is therefore that, when the autocrat chooses the size of his army, it is not necessarily the case that only the interests of the military will be taken into account.

Our empirical foray has shown that the dominant regime in contemporary Muslim countries is the regime of double co-option. Exclusive co-option of the military has characterized only a few regimes in which the autocrat's intrinsic legitimacy and the loyalty of his army were both very strong while the organizational effectiveness of religious movements was rather low. Radical institutional reforms could then be implemented.

Double co-option regimes, which always involve low intrinsic legitimacy of the autocrat, tend to vary significantly depending upon the proportion of clerics seduced and how well they are treated by him. A polar case arises when ultra-conservative clerics are powerful enough to block any institutional reform that they dislike. This situation is more likely when abundant oil resources create the conditions of a rent economy. In other and more frequent situations, however, the clerics are strongly polarized between official clerics who are loyal and even subservient to the autocratic regime and non-official clerics in open opposition to it. The autocrat then resorts to a double-edged tactic: pleasing the official clerics by slowing the

pace of reforms, on the one hand, and ensuring the loyalty of the military to be able to put down an opposition instigated by rebel clerics, on the other hand.

6.2 What about the Arab Spring?

A specific feature of our model is that sufficient information is available to the autocrat to enable him to prevent the success of a popular rebellion or of military coups. The theory is thus intrinsically pessimistic since it predicts that autocracies will persist. This is unfortunately what we have observed over many centuries in the Muslim world (Blaydes and Chaney, 2013).

Does the Arab Spring nonetheless herald a radical change in this situation, being a prelude to more democratic regimes? We can doubt this in the light of recent experiences, such as Egypt, Algeria, Syria, and Sudan. The same clique remains in power. It is a cabal of business oligarchs allied with top military, intelligence and police officers. These people often belong to different factions or family clans among which accounts may be settled on the occasion of an insurrection. Yet, despite the removal of some figureheads, including presidents, aimed at appeasing popular anger, the logic of the autocratic system and the co-opted nature of its narrow elite are deeply unchanged.

Even the cooperation of official clerics is pursued, as illustrated by the unflinching support of the al-Azhar clerics for the al-Sisi regime in Egypt. The military may come to the forefront to put an end to the mayhem which they have themselves contributed to create, but as several experiences show, that of Pakistan in particular, they may quickly return to the back seat that they occupy behind the scene as soon as the situation is stabilized in the sense of preserving the status quo. That Tunisia seems to be an exception to the rule in all these respects has much to do with the weak role the military have played in that country since its independence.

7 Appendix

7.1 Proof of Proposition 1

Under rational expectations of the equilibrium number of clerics opposing the regime, we have that $\gamma^e = \gamma^*$. Joining equations (10) and (12), for given values of $\lambda M, w_c, \alpha$ and L_0 , the equilibrium number of clerics ($1 - \gamma^*$) opposing the regime and the average equilibrium signal threshold \bar{L}^* are obtained from the system:

$$\begin{aligned} \frac{\bar{L}^* + \lambda M - s(1 - \gamma^*) + \mu}{2\mu} &= \frac{\theta^c V(\alpha)}{w_c} \\ \gamma^* &= \frac{\epsilon + L_0 - \bar{L}^*}{2\epsilon} \end{aligned}$$

Solving for the interior solution in γ^* yields:

$$\gamma^* = 1 - \frac{2\mu}{2\epsilon - s} \frac{\theta^c V(\alpha)}{w_c} + \frac{\lambda M + L_0}{2\epsilon - s} + \frac{\mu - \epsilon}{2\epsilon - s}$$

Restricting γ^* to be between 0 and 1 we obtain (13). QED

$$\bar{x}(M) = \frac{(\lambda M + L_0)\epsilon}{s\mu} + \frac{\mu - \epsilon}{2\mu} < 1 \quad \text{if } \mu \geq \epsilon, \quad (24)$$

Note that at $M = \frac{s-L_0}{\lambda}$ we have that $\bar{x}\left(\frac{s-L_0}{\lambda}\right) = \frac{\mu+\epsilon}{2\mu}$, $\Theta = \theta^m$, and $\Phi = 0$. Therefore, $\alpha^1\left(\frac{s-L_0}{\lambda}\right) = \alpha^*(\theta^m) = \alpha^m$ and $\alpha^2\left(\frac{s-L_0}{\lambda}\right) = \alpha^*(0) = +\infty$.

7.2 Proof of Proposition 3

- For $R_m^\delta \leq C\left(\frac{s-L_0}{\lambda}\right)$ (ie. $\frac{s-L_0}{\lambda} \geq M_c$), the payoff function of the autocrat is

$$W(M) = \begin{cases} R(\alpha^1(M)) - \Theta V(\alpha^1(M)) & \text{if } M < \frac{s-L_0}{\lambda} \\ R(\alpha^m) - \theta^m V(\alpha^m) & \text{if } M \in \left[\frac{s-L_0}{\lambda}, M_c\right] \\ R(\alpha^m) - \theta^m V(\alpha^m) + C(M) - R_m^\delta & \text{if } M_c < M \end{cases}$$

- For $R_m^\delta > C\left(\frac{s-L_0}{\lambda}\right)$. (ie. $\frac{s-L_0}{\lambda} > M_c$), the payoff function of the autocrat is:

$$W(M) = \begin{cases} R(\alpha^1(M)) - \Theta V(\alpha^1(M)) & \text{if } M < M_c \\ R(\alpha^1(M)) - \Theta V(\alpha^1(M)) + C(M) - R_m^\delta & \text{if } M \in \left[M_c, \frac{s-L_0}{\lambda}\right] \\ R(\alpha^m) - \theta^m V(\alpha^m) + C(M) - R_m^\delta & \text{if } \frac{s-L_0}{\lambda} \leq M \end{cases}$$

Taking the derivatives of this value function and applying the envelope theorem provides:

- For $R_m^\delta \leq C(\frac{s-L_0}{\lambda})$:

$$W'(M) = \begin{cases} \frac{\lambda\theta^c}{s[\bar{x}(M)]^2} \frac{\epsilon+\mu}{2\mu} V(\alpha^1(M)) & \text{if } M < \frac{s-L_0}{\lambda} \\ 0 & \text{if } M \in [\frac{s-L_0}{\lambda}, M_c[\\ C'(M) & \text{if } M_c \leq M \end{cases} \quad (25)$$

- For $R_m^\delta > C(\frac{s-L_0}{\lambda})$:

$$W'(M) = \begin{cases} \frac{\lambda\theta^c}{s[\bar{x}(M)]^2} \frac{\epsilon+\mu}{2\mu} V(\alpha^1(M)) & \text{if } M < M_c \\ \frac{\lambda\theta^c}{s[\bar{x}(M)]^2} \frac{\epsilon+\mu}{2\mu} V(\alpha^1(M)) + C'(M) & \text{if } M \in [M_c, \frac{s-L_0}{\lambda}[\\ C'(M) & \text{if } \frac{s-L_0}{\lambda} \leq M \end{cases} \quad (26)$$

From this it is clear that $W(M)$ is increasing in M in the range for $M < \min(M_c, \frac{s-L_0}{\lambda})$. Similarly, $W(M)$ is decreasing in M in the range $\max(M_c, \frac{s-L_0}{\lambda})$ (bearing in mind that $C(M)$ is decreasing in M).

Moreover, differentiation provides

$$\begin{aligned} \frac{d}{dM} \left(\frac{\lambda\theta^c}{s[\bar{x}(M)]^2} \frac{\epsilon+\mu}{2\mu} V(\alpha^1(M)) \right) &= \left(\frac{\lambda}{s} \right)^2 \frac{\left(\frac{\epsilon+\mu}{2\mu} \right)^2}{[\bar{x}(M)]^4} \frac{[\theta^c V'(\alpha^1)]^2}{\Theta V''(\alpha^1) - R''(\alpha^*)} \quad (27) \\ &\quad - \left(\frac{\lambda}{s} \right)^2 \frac{\frac{\epsilon+\mu}{\mu^2}}{[\bar{x}(M)]^3} \theta^c V(\alpha^1) \end{aligned}$$

and

$$\begin{aligned} \frac{d}{dM} \left(\frac{\lambda\theta^c}{s[\bar{x}(M)]^2} \frac{\epsilon+\mu}{2\mu} V(\alpha^1(M)) + C'(M) \right) &= \left(\frac{\lambda}{s} \right)^2 \frac{\left(\frac{\epsilon+\mu}{2\mu} \right)^2}{[\bar{x}(M)]^4} \frac{[\theta^c V'(\alpha^1)]^2}{\Theta V''(\alpha^1) - R''(\alpha^*)} \quad (28) \\ &\quad - \left(\frac{\lambda}{s} \right)^2 \frac{\frac{\epsilon+\mu}{\mu^2}}{[\bar{x}(M)]^3} \theta^c V(\alpha^1) + C''(M) \end{aligned}$$

Therefore when the functions $R(\cdot), C(\cdot)$ are concave enough and $V(\cdot)$ is convex enough and noting that $C(M)$ is concave, these terms on the RHS of (27) and (28) are negative. For all values of M , the value function

$W(M)$ is then concave in the Military size M . To be more specific, since $C''(M) \leq 0$, a sufficient condition for the concavity of the function $W(M)$ is simply that (27) is satisfied. This rewrites as :

$$\frac{\epsilon + \mu}{4\epsilon} \theta^c [V'(\alpha^1)]^2 \leq \bar{x}(M) V(\alpha^1) [\Theta V''(\alpha^1) - R''(\alpha^1)] \quad (29)$$

For instance, consider the identical uniform distributions example, $\epsilon = \mu$, and quadratic utility and payoff functions, $R(\alpha) = R_0 + r\alpha - \varphi \frac{\alpha^2}{2} > 0$ and $V(\alpha) = v \frac{\alpha^2}{2}$ with $r, \varphi, v > 0$. Inequality (29) is then equivalent to $\theta^c - \theta^m \leq \frac{\varphi}{v}$.

- For $R_m^\delta \leq C(\frac{s-L_0}{\lambda})$, from (25) it is clear that the function $W(M)$ is increasing in the range $M < \frac{s-L_0}{\lambda}$, flat in the interval $M \in [\frac{s-L_0}{\lambda}, M_c[$ and decreasing for $M_c \leq M$. Hence the optimal size of the Military $M^{op} \in [\frac{s-L_0}{\lambda}, M_c[$ and regime B prevails.
- For $R_m^\delta > C(\frac{s-L_0}{\lambda})$, the function $W(M)$ is increasing in the range $M \in [0, M_c[$. Then, if the RHS derivative of $W(M)$ at M_c $W'_+(M_c)$ is negative, the concavity of $W(M)$ implies that M^{op} is equal to $(M_c)_-$ and regime A prevails. On the other hand, when the LHS derivative $W(M)$ at $\frac{s-L_0}{\lambda}$ $W'_-(\frac{s-L_0}{\lambda})$ is positive, again the concavity of $W(M)$ and the fact that $W(M)$ is decreasing in the range $M \geq \frac{s-L_0}{\lambda}$ implies that M^{op} is equal to $(\frac{s-L_0}{\lambda})_+$. Finally in the last case where $W'_+(M_c) > 0 > W'_-(\frac{s-L_0}{\lambda})$, we obtain that the interior solution $M^* \in]M_c, \frac{s-L_0}{\lambda}[$ from the FOC

$$W'(M) = C'(M) + \frac{\epsilon + \mu}{2\mu} \frac{\lambda \theta^c}{s [\bar{x}(M)]^2} V(\alpha^1(M)) = 0 \quad (30)$$

QED.

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Fig 1: Optimal reform policy as a function of military size

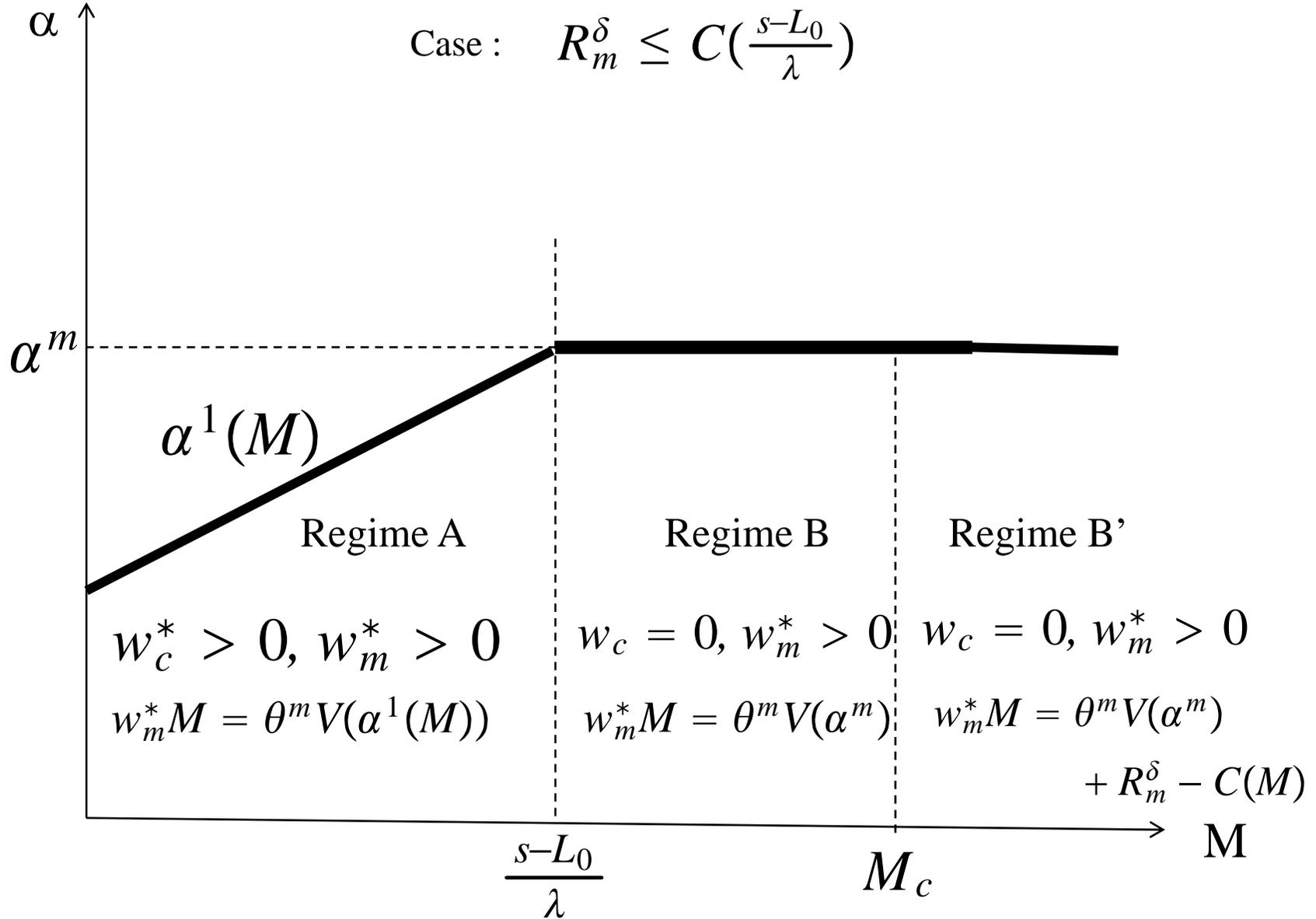


Fig 2: Optimal reform policy as a function of military size

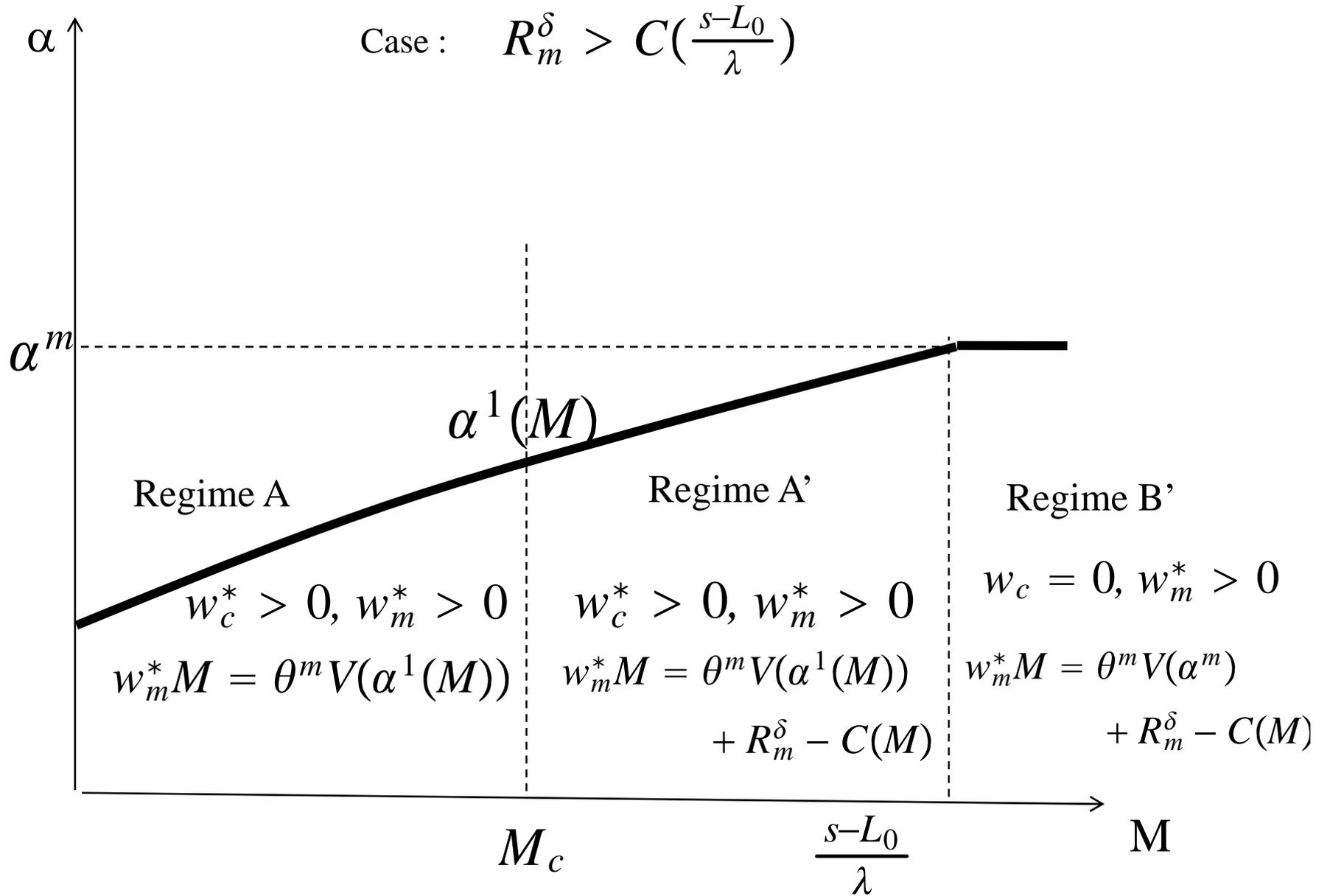


Fig 3: Optimal military size

Case : $R_m^\delta \leq C\left(\frac{s-L_0}{\lambda}\right)$

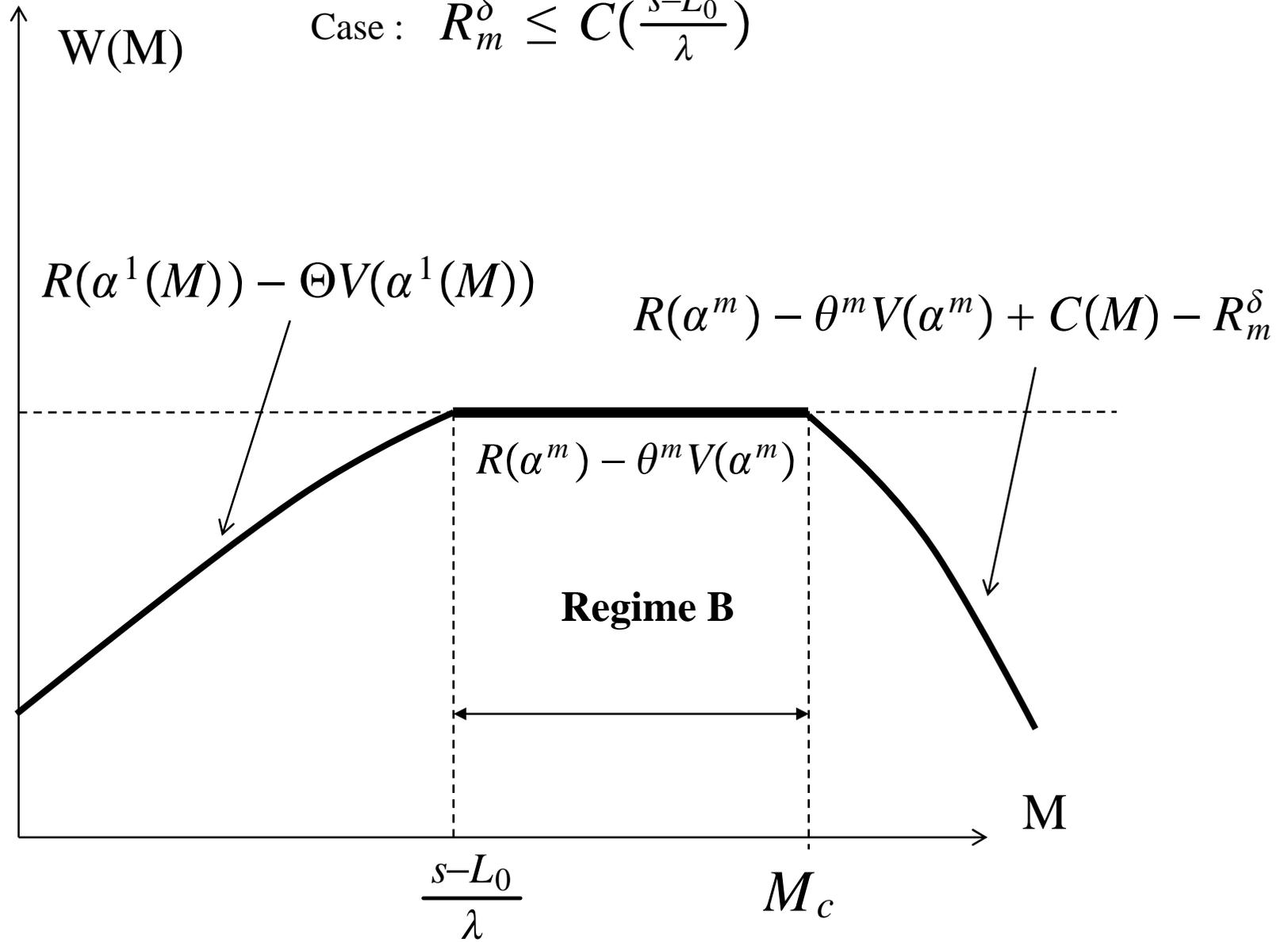


Fig 3: Optimal military size

Case: $R_m^\delta > C\left(\frac{s-L_0}{\lambda}\right)$

$$W'_+(M_c) < 0$$

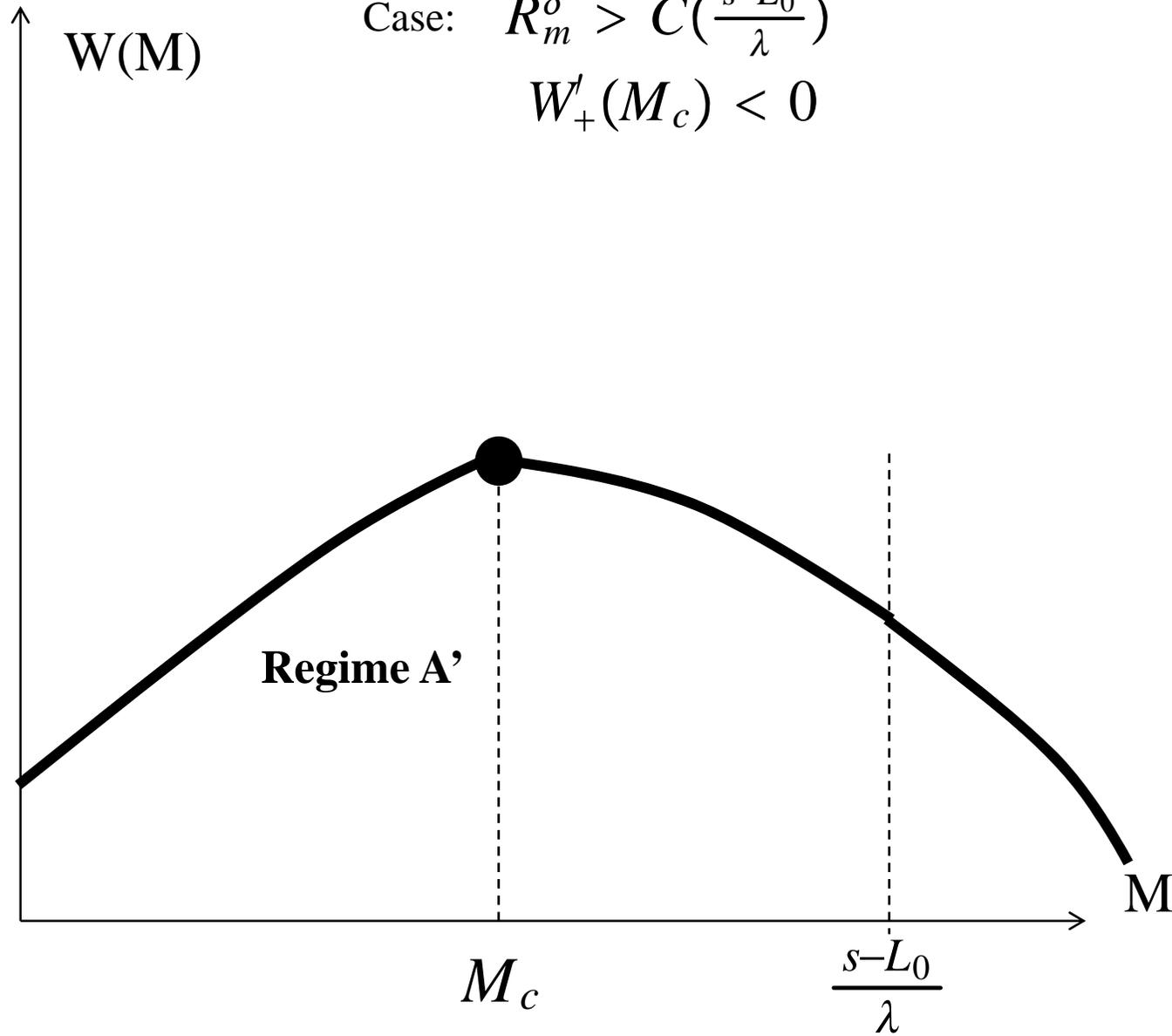


Fig 3: Optimal military size

Case: $R_m^\delta > C\left(\frac{s-L_0}{\lambda}\right)$

$$W'_+(M_c) > 0 > W'_-\left(\frac{s-L_0}{\lambda}\right)$$

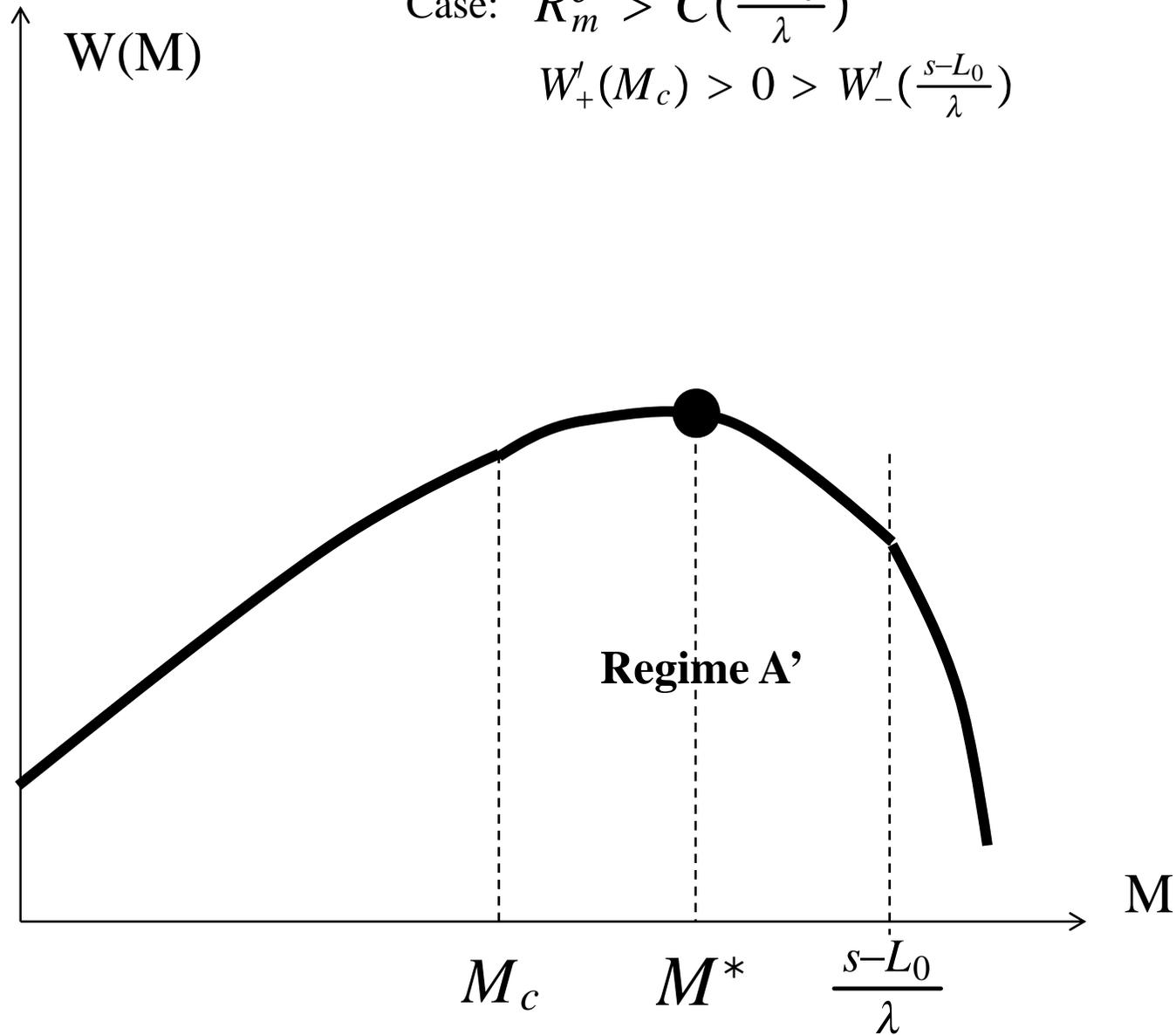


Fig 3: Optimal military size

Case: $R_m^\delta > C\left(\frac{s-L_0}{\lambda}\right)$
 $0 \leq W'_-\left(\frac{s-L_0}{\lambda}\right)$

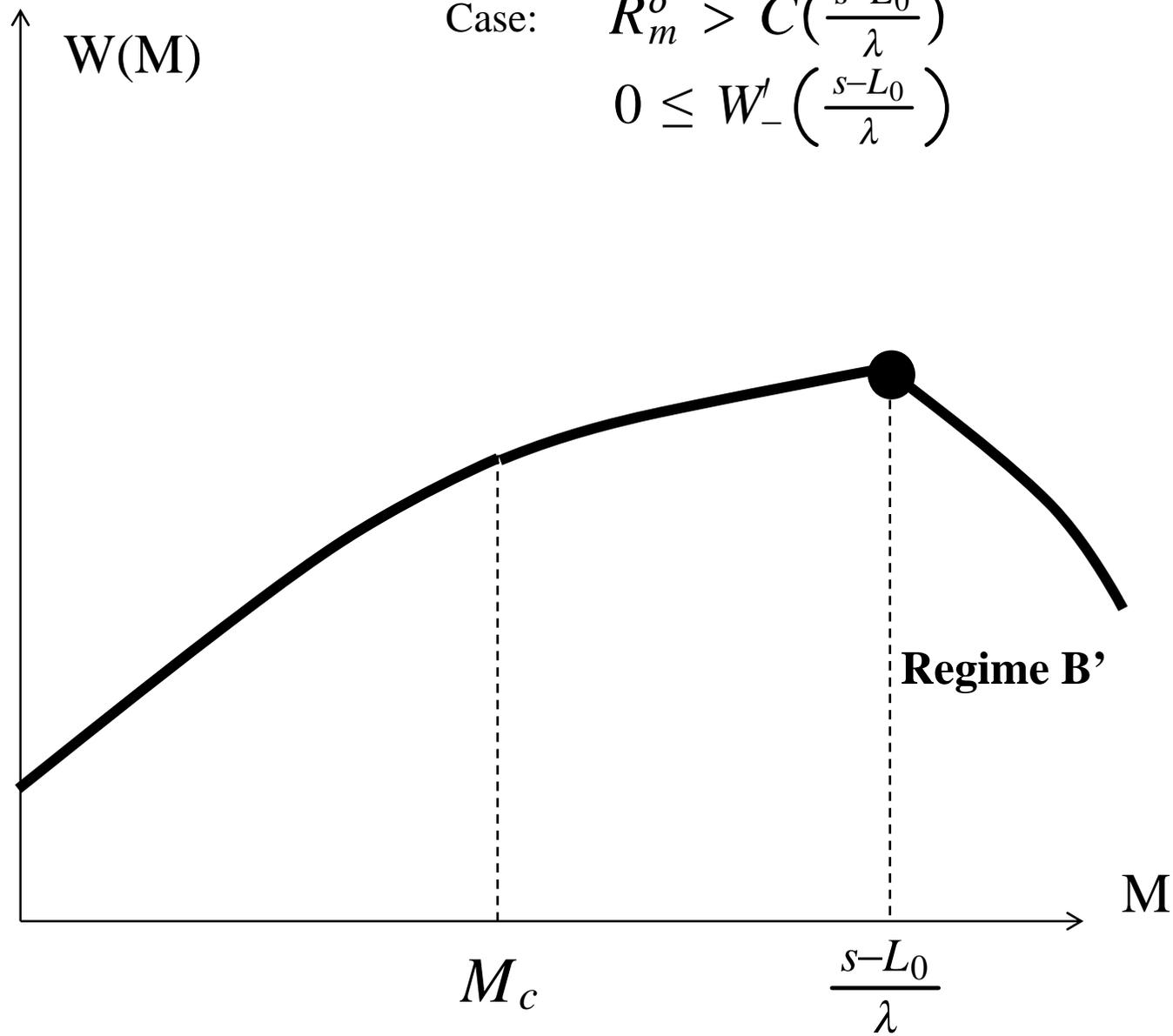


Table 1 : A schematic characterization of a set of case study regimes : linking empirics with theory

<i>Regimes</i>	L_0	λ	θ^m	θ^c	s	M	α
<i>Exclusive co-option of the military (I)</i>	high	high	low	low or interm.	low	high ¹	high
<i>Double co-option (polar case) (II)</i>	low	high or interm.	high	very high	very high	high	very low
<i>Double co-option (III)</i>	low	interm. or low ²	interm. or low ³	interm.	high	high ⁴	low

(1) With the exception of Tunisia (where M was endogenous). (2) Low in Pakistan and Sudan. Intermediate in Algeria and Egypt. (3) Intermediate (perhaps even high) in Pakistan. Intermediate in Sudan. Low in Algeria and Egypt. (4) With the exception of Sudan (where M was endogenous).