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

Keywords: Autocracy, army, instrumentalization of religion, Islam, reforms

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The Quran and the Sword*

The Strategic Game Between Autocratic Power, the Military and the Clerics

Emmanuelle Auriol† Jean-Philippe Platteau‡ Thierry Verdier§

April 2020

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 control the means of repression and can potentially make a coup. We show that although the autocrat always wants to co-opt the military, this is not necessarily true of the clerics. Empirically, the dominant regime in contemporary Muslim countries is the regime of double co-option. Exclusive co-option of the military obtains only where the autocrat's intrinsic legitimacy and the loyalty of his army are strong while the organizational strength of religious movements is rather low. Radical institutional reforms can then be implemented. Rent economies where ultra-conservative clerics are powerful enough to block any institutional reform that they dislike represent another polar case. 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.

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1 Introduction

Long-term economic growth and equitable development require the presence of a state sufficiently strong to reform the existing social and economic order. The question as to whether a democratic or an autocratic state is better suited to the task is unsettled. That democracy is not necessarily a precondition of development is attested by the historical experience of many presently developed countries. What seems undisputable, however, is the need for a "modern" state that has the capacity and the strength to carry out a number of key institutional reforms, in particular growth-promoting reforms that drastically change erstwhile rules and practices.[1]

After independence, many Muslim countries embraced secularization and passed laws to "modernize" their economic system. Yet, over the last decades and under the pressure of Islamist movements, policy reversals occurred in several countries. Why have these movements gained so much importance after the end of the Cold War, and why, in particular, did Saddam Husayn eventually turn from a dogmatic Baathist into an adept of Islam are the kind of questions that we want to address in this paper. Although our illustrative and motivational material comes the Muslim world, Christian countries are also potentially concerned by our investigation. Thus, in some parts of Latin America (most notably in Brazil and Central America) the rapid rise of evangelical Protestantism has influenced politics, particularly in matters of personal behaviour and education.[2]

Because of their pervasive presence in Muslim countries, our setup is that of authoritarian states, whether strong or mildly strong. An authoritarian state is strong if the ruler exclusively relies on an army powerful enough to put down a rebellion led by traditional leaders. Such a strategy is obviously risky since too powerful an army may make a coup against the

[1] Think of measures intended for removing land access rules that hamper efficiency or maintain many people under feudal shackles; for emancipating individuals from the sway of communal or collective prescriptions; for replacing rules emphasizing status or loyalty by merit-based selection and promotion criteria; or for combating forms of social discrimination, against women and low caste members in particular.

[2] For example, Jair Bolsonaro, president of Brazil, has appointed a sceptic of evolution to head the agency that oversees the quality of higher education. Bolsonaro, albeit a Catholic, was rebaptized in the river Jordan by a Pentecostal pastor.

ruler. The alternative strategy consists of building a mildly strong state that co-opts or seduces traditional leaders (including religious clerics) and may therefore be content with a moderately-sized army yet at the cost of more modest reforms. What guides the choice of an autocrat between these two regimes is the key issue that drives the present paper.

In our framework, the military and the religious clerics or religious organizations are featured simultaneously as separate actors. In tackling the problem, we stick to Auriol and Platteau's (2017a, 2017b) approach to the study of the influence of a decentralized body of clerics evoking not only Islam but also Hinduism and Budhism.[3] In particular, clerics are assumed to have heterogeneous income-ethics preferences and, as a consequence, they are unequally seducible or co-optable by the autocrat. On the other hand, we follow the line of mainstream political economy of autocracy by assuming that repression and co-option are the key instruments of power.[4] However, in our model the army is featured as a full-fledged actor rather than as a hidden hand behind the ruler's repressive arm. In this sense our endeavour belongs to a recent economic literature that pays attention to the specific role of the military in actual or potential dictatorships (Egorov and Sonin, 2014; Besley and Robinson 2010; Acemoglu et al., 2009, 2010; Leon, 2014, 2017; and Aney and Ko, 2015). Where we differ from that slowly emerging literature is by considering a three-player strategic game between an autocratic ruler, a centralized army, and a decentralized set of religious clerics.

The autocrat may not be completely free to set the size of his repressive forces on the basis of internal political order considerations. He may be constrained by geopolitical forces that play out on the international level. Thus, ample foreign military assistance may dispense a ruler with the need to co-opt traditional authorities, such as religious leaders, whereas its sudden discontinuation will have the opposite effect. This apparently

[3]Judaism and (American) Protestantism are also largely decentralized religions, yet they prevail in countries that have a democratic rather than an autocratic regime.

[4]While 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).

happened with the end of the Cold War when many developing countries that were clients of the major world powers were suddenly deprived of significant external support. In Muslim autocracies, in particular, the effect was to compel the ruler to revise his political strategy by allowing religious leaders and Islamist movements to exert a greater influence on the social, educational, and judicial levels.[5]

Other forces were simultaneously at work, foremost among which was the rapid international diffusion of Islamist ideologies originated in Pakistan (the ideas of al-Mawdudi) and Saudi Arabia (Wahhabism), and the loss of legitimacy of autocratic regimes crippled by corruption. The combination of these forces and a weaker army had the effect of weakening the autocrats. Because our theory can account for these various factors, it sheds light on the impact of important international circumstances on the internal politics of Muslim countries. In a nutshell, when the autocrat's hold on power, as measured by his legitimacy and the repressive power of his army, declines compared to the influence of the religious leaders, the theory predicts a shift towards policies favoured by Islamist movements.

If 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, its application to religious clerics and men in uniform is unconventional. That such an application is warranted is attested by abundant evidence about the egregious privileges granted to both religious officials and military officers, thus indicating that they are not immune to corruption and not entirely (or mainly) driven by a sense of their mission (see, in particular, Lapidus, 2002 and Platteau, 2017 for the former, and Siddiqa, 2017 and Sayigh, 2019 for the latter). While the military are important because they

[5]Considering that the end of the Cold War occurred around 1990, it is instructive to see how military expenditures as a percentage of Gross Domestic Product evolved in the next two decades. We then find that a general pattern was for this ratio to fall perceptibly in the developing countries for which data are available: Saudi Arabia, Egypt, Pakistan, Oman, Indonesia, for the Muslim world, but also India and SubSaharan Africa taken as a whole. The major exception is Turkey where the ratio slightly increased between 1990 and 2000 only to fall abruptly between 2000 and 2010. In Iran and Morocco, the ratio fell between 1990 and 2000 but increased in the subsequent decade (see World Bank dataset). Trends between 2010 and 2018 are more varied and reflect the intervention of other international events that disturbed the legacy of the post-cold-war environment.

own the means of repression, the critical role of the clerics lays in legitimizing the autocratic regime (Coulson, 1964; Hourani, 1991; Lee, 2014; Kepel, 2005; Platteau, 2008; Cosgel, Miceli, and Rubin, 2012; Rubin, 2017).

Religious legitimization is needed when, owing to their status and prestige, uncontrolled clerics can threaten the regime by stirring (with their preaches) and organising a popular rebellion. The magnitude of this threat depends positively on the fraction of dissenting clerics. As for the military, they 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: the defence budget, perks to both military and religious players, and the magnitude of progressive institutional reforms that encroach upon their privileges.

Which are the equilibrium outcomes and their determinants in such a setup, and how are institutional reforms affected, are the questions behind our economic analysis. A central result is that the double co-option of the clerics and the military (the mildly strong autocracy) may be optimal even when the autocrat is able to choose the size of his army (on the basis of strictly internal stability considerations). For this to obtain, the price of forsaking reforms must not be too high in terms of growth opportunities foregone (like in a rent economy based on rich natural endowments), implying that conservative clerics are not too costly to buy and the autocrat can be content with an army of moderate size. When this condition is violated, equilibria emerge in which only the military are co-opted and a rather large army size is chosen by the autocrat (the strong autocratic state). Equilibria in which only clerics are co-opted never arise. Under exclusive co-option of the military, a regime more likely to be established when the autocrat's legitimacy is strong, the army is loyal, and religious clerics are rather weak, reforms are always more important than under double co-option.

We also 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. In particular, we provide evidence that the double co-option regime is empirically dominant and that legitimacy considerations play an important role in determining the prevailing regime.

Finally, we illustrate the theory by two examples of within-country regime changes drawn from present-day Saudi Arabia and the latter part of Saddam Husayn's rule in Iraq. They vividly highlight the possibility of strong policy reversals. In the first case, the autocrat (Muhammad bin Salman) reduces his reliance on the clerics and concomitantly increases the pace of reforms while the opposite scenario is observed in the second case (under Saddam himself). According to our theory, it is when they become stronger (in terms of support of the military or legitimacy) that autocrats are tempted to end or reduce their effort to obtain the allegiance of religious clerics. Conversely, it is when they become weaker that they seek to court conservative or reactionary leaders whom they had previously ignored or put down.

The outline of the paper is as follows. Section 2 provides some prolegomena explaining how 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, which is done in two successive steps. We initially assume that the army size is fixed and then relax that assumption to analyze the general case where the ruler chooses the magnitude of the reforms, the perks of both clerics and military, and now the army size as well. Section 5 regroups a number of modern Muslim regimes into analytically meaningful categories and depicts the transformation of three regimes hit by a series of exogenous shocks. Section 6 summarizes the main results and proposes an interpretation of the Arab Spring that fits in with the approach of the paper.

2 Prolegomena

In Auriol and Platteau (2017a, 2017b), a ruler maximizes his income defined as a rent extracted from national output minus expenses related to the co-option 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 ignite a popular rebellion against the regime. He has two instruments: the "wage" paid to the clerics in order to reward their political allegiance, and a policy which may antagonise the clerics. In the first version of the model (2017a), the policy consists of institutional reforms that create hostility among the clerics. In the second version (2017b), there is a policy mix comprising the intensities of reforms and corruption. The more pervasive corruption the more hostile the clerics. In sum, the autocrat chooses the extent of religious support through the determination of the clerics' perks and the policy mix.

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. With a decentralized religion, only a fraction of the clerics *may* be co-opted at equilibrium.

Albeit rich in insights, the above framework ignores the role of the military who are important to cajole since they control the means of violent repression. They obey a hierarchical structure that resembles a centralized organization. Like the clerics, the men in uniform hold values: their

patriotic values may be more or less progressive depending on the extent to which their concept of the nation is rooted in modernity rather than in tradition. At the same time, they are sensitive to the appeal of material advantages: they may care about direct transfers such as wages or defence budgets, or about specific policies that provide them with economic gains (think of the economic rents derived from productive assets that they are allowed to own and control). By offering them sufficient perks, the ruler can therefore expect to buy the allegiance of the army. Owing to limited resources and the presence of two potential sources of opposition, the autocrat faces difficult trade-offs: moderating reforms versus paying high wages to co-opted clerics or military, cajoling clerics versus cajoling the military, building a strong military to beat back clerics versus limiting the army's strength.

Before starting to present our model, an important remark is in order. On the theoretical level, nothing precludes tribal or clan leaders from plausibly performing the role of decentralized religious clerics. Not only do they represent localized polities, but they also dislike institutional reforms (in land relations, political governance, education and justice) that encroach upon their erstwhile prerogatives. In this broader perspective, tribal and religious leaders are thus seen as interchangeable actors, not as separate ones. Separating these actors is not straightforward, indeed: the distinction between religious and non-religious traditional authorities may be blurred because their respective values and preferences are often hard to disentangle, at least when clerics stand for the popular religion of the masses (see Platteau, 2017: Chap. 3).[6]

3 The model

We consider an economy with an autocratic ruler, an army and a clerical body. We first describe the time structure of the game before discussing

[6]It is useful to bear in mind that successful conversion from animism to an established religion has typically involved a good measure of blending of local customs with religious rituals and precepts. Just to cite one example, Muslim mullahs in the Pashtun region of Afghanistan have always accepted a syncretization of Islam that recognizes the importance of the Pashtunwali, the tribal code of the Pashtuns.

the way the army and the clerics behave, successively. We will then be ready to analyze the autocrat's problem in the following section.

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 magnitude 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 amount of the defense budget (if the regime stays in place) corresponding to the size or the power of the army, $M \in [0, 1]$. (For instance, it may reflect the fraction of the active population enrolled in the military.) In the baseline model, we assume M to be fixed. 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, 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 environment of the cleric i. We suppose that this local legitimacy takes the following form $L_i = L + \epsilon_i$ 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. 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 stirred 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 opposition is smaller than the strength of the regime. The strength of the opposition, denoted S_C, is a positive function of the fraction of clerics $1-\gamma$ opposing the regime: $S_C = S_C(1-\gamma)$. Correspondingly, the strength of the regime $S_R = S_R(L, \lambda M I_m)$ depends positively on the degree of national legitimacy of the ruler, L, 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 $S_C(1-\gamma) < S_R(L, \lambda M I_m)$. 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 $s(>0)$ measuring the efficiency of the clerics at organizing the rebellion. Likewise, the strength of the regime is a linear separable function of L and $\lambda M I_m$: $S_R(L, \lambda M I_m) = L + \lambda M I_m$. With these notations, the revolution fails and the Ruler stays in power when the following no-regime-change condition is satisfied: $s(1-\gamma) \leq L + \lambda M I_m$.

- 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 program that we normalize to $\alpha^c = 0$.[7]

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.[8] In the succeeding military regime, the army takes control of the economy and implements its own reform program α_δ^m.

[7]In contemporary Muslim theocracies the most puritan clerics are in power. This is a consequence of the decentralized structure of the religion. As shown by Auriol and Platteau (2017a, 2017b) the marginal cleric, who is more radical than the average one, is the pivotal cleric with a decentralized religion. We assume that in case of a successful religious revolution the most extreme clerics are ruling.

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

3.2 The military: analysis of coups

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

$$R_m^{\delta} = \max_{\alpha}\{\delta R(\alpha) - \theta^m V(\alpha)\} \tag{1}$$

where $\delta R(\alpha)$ is the national revenue generated by the military regime when it implements a reform programme of magnitude α. We assume that $\delta \leq 1$ measures the relative inefficiency of the Military in carrying out reforms compared to the civilian autocrat.[9] 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 (i.e., $V'(\alpha) > 0$ and $V"(\alpha) > 0$) and $V(0) = V'(0) = 0$.

The optimal reform program, α_{δ}^m, of the Military is the solution to (1) given by the first order condition: $\delta R'(\alpha) = \theta^m V'(\alpha)$.

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

$$R'(\alpha) = yV'(\alpha). \tag{2}$$

Given our assumptions that $R(\alpha)$ is increasing concave, and $V(\alpha)$ increasing convex, differentiation of (2) implies that $\alpha^*(y)$ decreases with $y \geq 0$:

$$\frac{d\alpha^*(y)}{dy} = \frac{-V'(\alpha)}{-R''(\alpha) + yV''(\alpha)} \leq 0. \tag{3}$$

We deduce that $\alpha_{\delta}^m = \alpha^*\left(\frac{\theta^m}{\delta}\right)$ is decreasing with θ^m and increasing with δ.

The equilibrium payoff of the Military when in power can be written as:

$$R_m^{\delta} = \delta R(\alpha_{\delta}^m) - \theta^m V(\alpha_{\delta}^m). \tag{4}$$

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, the Ruler must offer the military a wage such that:

$$Mw_m - \theta^m V(\alpha) \geq R_m^{\delta} - C(M) \tag{5}$$

[9] Sayigh (2019) thus writes that in Egypt the military economy is "considerably less productive than commonly believed, and certainly far less cost-effective than the military itself portrays" (p. 8).

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 normalized to, $\alpha^c = 0$, 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:

$$M w_m^c \geq R_m^\delta - C(M) \tag{6}$$

Note that the incentive compatibility constraint (6) facing a religious government against an army coup is less constraining than the incentive compatibility constraint (5) facing the incumbent, 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 (6) is strictly satisfied when the religious government does not pay any wage (i.e. $w_m^c = 0$). In other words, this condition is binding iff $M \geq M_c$, where

$$M_c = C^{-1}(R_m^\delta). \tag{7}$$

Two cases can be discussed.

i) $M \geq M_c$: the Military is indifferent between repression and passivity against a rebellion and we assume that the Ruler is ready to pay a small wage premium to the Military so as to tilt the 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 $s(1-\gamma) \leq L + \lambda M$), the Military will always choose to prevent the clerics from acceding to power. The army 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. Indeed once the autocrat has been overthrown the clerics have no incentive to give the army more than the reservation utility. In contrast the autocrat has an incentive to give more

than that to avoid a clerics-led revolution. The clerics in their multitude are always a threat while a demised autocrat is no longer threatening. The wage bill paid by the Ruler to the Military is given by: $w_m M = \max\left[\theta^m V(\alpha) + R_m^\delta - C(M); 0\right]$.

Since by definition $C(M_c) = R_m^\delta$, $C(M)$ is decreasing, and $M_c \leq M$, we deduce that $C(M) \leq C(M_c) < \theta^m V(\alpha) + R_m^\delta$ as long as $\alpha > 0$. Then the military coup's constraint is always binding so that the wage bill is simply

$$w_m M = \theta^m V(\alpha) + R_m^\delta - C(M) > 0 \tag{8}$$

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

$$w_m M = \theta^m V(\alpha) \tag{9}$$

The preceding discussion can be summarized by the following no-military-coup constraint: assuming that a repressed revolution fails to succeed, the Ruler will stay in power if

$$w_m M \geq \theta^m V(\alpha) + \max\left[R_m^\delta - C(M), 0\right] \qquad (nmc)$$

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

Note that in the above discussion we have assumed that making a coup entails an additional cost $C(M)$ compared to repressing a popular rebellion. The idea is that while the organization of a coup requires a great capacity for coordination and for the control of state institutions and the society, fighting against street demonstrators is a more routine task that the army is well prepared to perform.[10]

[10]We could impute a (comparatively small) cost for the latter task, but this would not alter the results of the model. We therefore normalize it to 0, and $C(M)$ is the incremental cost of a coup.

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 identified by a parameter θ. The larger is θ, the more conservative is the cleric. We assume that each member's characteristic, θ, is independently and identically distributed on $[0, \infty)$ with a continuous distribution density $g(\theta)$. The mean value of θ is $\theta^c = \int_0^\infty \theta g(\theta) d\theta$, 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 on average 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. Without their active support he might be overthrown by a popular rebellion. Religious leaders can fuel popular unrest by their preaches without directly participating in a rebellion, or they may be actively involved in the organization of protests. If instead he chooses to support the autocrat, the utility of a cleric depends on his type $\theta \in [0, \infty)$, 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 $1 - p \in [0, 1]$. That is,

$$U(\theta, w_c, \alpha, p) = pw_c - \theta V(\alpha) \tag{10}$$

where p is the probability that the cleric will maintain his standing or keep his ministry by supporting the autocrat, and, 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, w_c, from supporting the regime is uncertain, the psychological or ideological cost, $\theta V(\alpha)$, 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 or influence by compromising with the autocrat and his clique. This probability depends on the local legitimacy of the autocrat, $L_i = L + \epsilon_i$, where ϵ_i is uniformly distributed in $[-\epsilon, \epsilon]$, 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, 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:

$$p_i = P(\text{stay in office}/L_i) = P(s\,(1-\gamma^e) \leq L_i + \lambda M - \mu_i) \qquad (11)$$

where μ_i is a random chock on the local efficiency of the Military, which is distributed independently and uniformly on $[-\epsilon, \epsilon]$.[11] 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 social, geographic and demographic factors, such as ethnic diversity, urban density and roughness of terrain. We have that[12]

$$p_i = \frac{L_i + \lambda M - s\,(1-\gamma^e) + \epsilon}{2\epsilon}. \qquad (12)$$

Given this probability, there exists a threshold value of the (local) legitimacy of the Ruler, $L^*(\theta)$, such that a cleric of type θ is indifferent between

[11] Alternatively, we could take μ_i to be a random chock distributed independently and uniformly on $[-\mu, \mu]$, where $\mu \neq \epsilon$. Our results hold under this more general formulation. The computations are available from the authors upon request.

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

supporting and opposing the regime. From (10), this threshold is characterized by: $P(\text{stay in office}/L^*(\theta)) = \frac{\theta V(\alpha)}{w_c}$ or

$$\frac{L^*(\theta) + \lambda M - s\,(1-\gamma^e) + \epsilon}{2\epsilon} = \frac{\theta V(\alpha)}{w_c} \tag{13}$$

We deduce that when $L_i \geq L^*(\theta)$, a cleric of type θ supports the Ruler. He chooses to enter into opposition when $L_i < L^*(\theta)$. Clearly, the decision crucially depends on the proportion of clerics supporting the Ruler, which needs to be determined.

3.3.2 National clerical support for the autocrat

The proportion of clerics who support the Ruler is : $\gamma^* = \int_0^\infty P(L_i \geq L^*(\theta))g(\theta)d\theta$. We deduce that[13]

$$\gamma^* = \frac{\epsilon + L - \overline{L^*}}{2\epsilon} \tag{14}$$

where $\overline{L^*} = \int_0^\infty L^*(\theta)g(\theta)d\theta$.

Integrating (13) over all types of clerics yields:

$$\int_0^\infty \frac{L^*(\theta) + \lambda M - s\,(1-\gamma^e) + \epsilon}{2\epsilon} g(\theta)d\theta = \int_0^\infty \frac{\theta V(\alpha)}{w_c} g(\theta)d\theta \tag{15}$$

which is equivalent to:

$$\frac{\overline{L^*} + \lambda M - s\,(1-\gamma^e) + \epsilon}{2\epsilon} = \frac{\theta^c V(\alpha)}{w_c} \tag{16}$$

Under rational expectations of the equilibrium number of clerics supporting the regime, we have that $\gamma^e = \gamma^*$ so that we obtain a system of two equations, (14) and (16), with two unknowns, γ^* and $\overline{L^*}$. We make the following assumption:

Assumption 1 $\quad 2\epsilon > s.$

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.

[13] $\gamma^* = \int_0^\infty P\big(\epsilon_i \geq L^*(\theta) - L\big)g(\theta)d\theta = \int_0^\infty \frac{\epsilon + L - L^*(\theta)}{2\epsilon} g(\theta)d\theta.$

Proposition 1 *Under assumption 1, the equilibrium fraction of clerics supporting the regime in the Perfect Nash Equilibrium is:*

$$\gamma^*(M, \alpha, w_c) = \max\left\{\min\left\{1 - \frac{2\epsilon}{2\epsilon - s}\frac{\theta^c V(\alpha)}{w_c} + \frac{\lambda M + L}{2\epsilon - s}, 1\right\}, 0\right\} \tag{17}$$

Proof. See Appendix 7.1. ■

At the interior solution, the opposition to the autocrat by the clerical mass decreases intuitively with the rent the religious clerics get in exchange for their support, w^c, the autocrat's national legitimacy, L, 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). One key variable in the following analysis is

$$F(M) = \frac{L + \lambda M}{s}. \tag{18}$$

It measures the relative force of the autocratic regime compared to the opposition force of the religious leaders. The larger $F(M)$ the more powerful the autocrat's hold on power, and the weaker the threat posed by the religious clerics. The Ruler's problem is then:

$$\begin{aligned} &\max_{\alpha, w_c, w_m, M} \quad R(\alpha) - \gamma^* w_c - w_m M \\ s.c. \quad &\gamma^* = \gamma^*(M, \alpha, w_c) \text{ solution to (17)} \\ &F(M) \geq 1 - \gamma^* \qquad (nrc) \\ &w_m M \geq \theta^m V(\alpha) + \max\left[R_m^\delta - C(M), 0\right] \qquad (nmc) \end{aligned}$$

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 (nrc) and the no-military-coup (nmc) constraints. Nevertheless these constraints restrain the autocrat's actions in a way that will soon become explicit. Of course, we do not deny that coups and regime changes can happen in reality, yet in our setup they can only happen as a result of mistakes, namely a wrong appreciation of some key parameter by the Ruler. For instance, if the Ruler underestimates the military's aversion to reforms, he will offer them a wage bill too low to dissuade them from making a coup, and will be overthrown. But a new, wiser autocrat may one day come up who will correct the mistake of his predecessor and propose a higher wage bill to the ruling junta. The military would then be prompted to quit power and serve the new Ruler.

4.1 Exogenous military size M

In the baseline model, the military size, M, is exogenous, and the Ruler has only three instruments available to him: α, w_c, w_m. This corresponds to situations where choosing the size of the army is not possible for the Ruler. This can be due to the fact that 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, as it was typically the case during the Cold War or more recently with the fight on terrorism, or because the strength of the Military is chosen nationally 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): $w_m M = \theta^m V(\alpha) + \max\left[R_m^\delta - C(M), 0\right]$.

Second, in order to solve the Ruler's optimization problem, it is useful to write the different values of γ^* in (17) in terms of the variable $x = \frac{\theta^c V(\alpha)}{w_c}$, which can be interpreted as the "cost-benefit ratio" of supporting the regime for the average cleric:

$$\gamma^* = \begin{cases} 0 & \text{if } \frac{s}{2\epsilon}F(M) + \frac{2\epsilon - s}{2\epsilon} < x \\ 1 - \frac{2\epsilon}{2\epsilon - s}x + \frac{s}{2\epsilon - s}F(M) & \text{if } x \in \left[\frac{s}{2\epsilon}F(M), \frac{s}{2\epsilon}F(M) + \frac{2\epsilon - s}{2\epsilon}\right] \\ 1 & \text{if } \quad x < \frac{s}{2\epsilon}F(M) \end{cases} \tag{19}$$

Simple inspection of (19) reveals $\gamma^* = \gamma^*(x)$ is a decreasing function of x. Intuitively, the larger is x, the higher the average disutility cost of the reform α compared to the pecuniary benefit religious leaders might get from supporting such reform. Consequently, the smaller the effective clerics' support γ^* for the regime.

Given this, the no-regime-change constraint (nrc) under military repression $1 - \gamma^* \leq F(M)$ can be written as:

$$\begin{array}{rcll} 1 & \leq & F(M) & \text{if } \quad \frac{s}{2\epsilon}F(M) + \frac{2\epsilon - s}{2\epsilon} < x \\ x & \leq & F(M) & \text{if } x \in \left[\frac{s}{2\epsilon}F(M), \frac{s}{2\epsilon}F(M) + \frac{2\epsilon - s}{2\epsilon}\right] \\ 0 & \leq & F(M) & \text{if } \quad x < \frac{s}{2\epsilon}F(M) \end{array}$$

Two sub-cases need to be distinguished depending on whether the (nrc) constraint is binding or not.

CASE I: We start with the case where the no-regime-change (nrc) constraint is never binding. When $1 \leq F(M)$, the religious clerics are not a threat to the regime since, even if all clerics enter into opposition, they are unable to defeat the Ruler. In this instance, given that the Ruler wants to minimize the wage bill paid to the clerics, w_c will be set to $w_c = 0$, which implies $\gamma^* = 0$. The problem of the Ruler then rewrites as :

$$\begin{array}{ll} \max\limits_{\alpha, w_m} & R(\alpha) - w_m M \\ s.c. & w_m M = \theta^m V(\alpha) + \max\left[R_m^\delta - C(M), 0\right] \qquad (nmc) \end{array}$$

and the optimal reform policy solves:

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

The optimal interior level of reform is such that $R'(\alpha) = \theta^m V'(\alpha)$. By virtue of (2) it is given by

$$\alpha^m = \alpha^*(\theta^m). \tag{20}$$

The per capita wage paid to the Military is

$$w_m^{op} = \frac{\theta^m V(\alpha^m) + \max\left[R_m^\delta - C(M), 0\right]}{M} > 0 \tag{21}$$

and the equilibrium payoff for the Ruler is

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

We can thus conclude that for $F(M) \geq 1$, the optimal policy vector is given by:

$$(\alpha^{op}, w_c^{op}, w_m^{op}) = \left(\alpha^*(\theta^m), 0, \frac{\theta^m V(\alpha^m) + \max\left[R_m^\delta - C(M), 0\right]}{M}\right)$$

CASE II: We now proceed with the case where the no-regime-change (nrc) constraint is binding, which requires $F(M) < 1$. That is, were all the clerics to oppose the regime, the Ruler would be overthrown (the Military is relatively weak). Substituting the interior value of γ^*, as given in (19), in the (nrc) constraint $1 - \gamma^* \leq F(M)$ yields: $x \leq F(M)$. Bearing in mind the definition of $x = \frac{\theta^c V(\alpha)}{w_c}$, this constraint indicates that in order to ensure no-regime change, the "cost-benefit ratio" of supporting the regime for the average cleric must be below the threshold $F(M)$. Put otherwise, for a given level of reforms, the wage paid to the religious clerics w_c must be high enough to prompt a sufficient number of them to come in support of the Ruler so that x is lower than $F(M)$. Substituting $w_c = \frac{\theta^c V(\alpha)}{x}$ and $\gamma^* = 1 - \frac{2\epsilon}{2\epsilon - s}x + \frac{s}{2\epsilon - s}F(M)$ in the optimization problem of the Ruler yields:

$$\begin{aligned} & \max_{\alpha, x} R(\alpha) - \left[1 - \frac{2\epsilon}{2\epsilon - s}x + \frac{s}{2\epsilon - s}F(M)\right]\frac{\theta^c V(\alpha)}{x} - w_m M \\ s.c. \quad & 0 \leq x \leq F(M) \qquad (nrc) \\ & w_m M = \theta^m V(\alpha) + \max[R_m^\delta - C(M), 0] \qquad (nmc) \end{aligned}$$

Since the maximand is increasing in x, the (nrc) constraint is binding. Clearly, with $w_c = \frac{\theta^c V(\alpha)}{F(M)}$, the wage of the clerics, w_c, and the magnitude

of reforms, α, are strategic complements. For a given army size, the more reforms the Ruler wants to implement the higher the wage he needs to pay to the clerics. And vice-versa.

Substituting $x = F(M) < 1$ using (18), and substituting the binding constraint (nmc), the Ruler finally solves:

$$\max_{\alpha \geq 0} R(\alpha) - \theta^c V(\alpha) \left[\tfrac{1}{F(M)} - 1 \right] - \theta^m V(\alpha) - \max[R_m^\delta - C(M), 0]$$

This expression is equivalent to $R(\alpha) - \Theta(M) V(\alpha) - \max[R_m^\delta - C(M), 0]$, where

$$\Theta(M) = \theta^c \left(\frac{1 - F(M)}{F(M)} \right) + \theta^m. \tag{22}$$

$\Theta(M)$ 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 by the clerical class). The optimal interior level of reform in this double co-option regime is given by:

$$\alpha^d(M) = \alpha^*(\Theta(M)) \tag{23}$$

where the function $\alpha^*(\Theta)$ defined in (2) is decreasing in Θ. Since $F(M)$ defined in (18) is increasing in M, $\Theta(M)$ is decreasing in M. We deduce that $\frac{d\alpha^d(M)}{dM} = \frac{d\alpha^*(\Theta)}{d\Theta} \frac{d\Theta}{dM} \geq 0$. Moreover, we have that $\alpha^d(M) < \alpha^m$: as expected, the equilibrium reform mix is smaller than in the regime where the (nrc) constraint is never binding.

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

$$w_c^{op} = \frac{\theta^c V(\alpha^d(M))}{F(M)} > 0 \tag{24}$$

$$w_m^{op} = \frac{\theta^m V(\alpha^d(M)) + \max\left[R_m^\delta - C(M), 0\right]}{M} > 0 \tag{25}$$

and the equilibrium payoff of the Ruler writes as :

$$W^{op}(M) = R\left(\alpha^d(M)\right) - \Theta(M) V(\alpha^d(M)) - \max[R_m^\delta - C(M), 0]$$

Summarizing, we have been able to show that for $F(M) < 1$, the optimal policy vector (α, w_c, w_m) is given by:

$$(\alpha^{op}, w_c^{op}, w_m^{op}) = \left(\alpha^*(\Theta), \tfrac{\theta^c V(\alpha^*(\Theta))}{F(M)}, \tfrac{\theta^m V(\alpha^*(\Theta)) + \max\left[R_m^\delta - C(M), 0\right]}{M} \right)$$

4.1.2 Results and discussion

We are now ready to draw a full picture of the Ruler's optimal policy at any level of military force, M. It is summarized in the following proposition:

Proposition 2 *The optimal policy vector* $(\alpha^{op}, w_c^{op}, w_m^{op})$*, which solves the Ruler's optimization problem at any level of military force,* M*, is:*

$$\begin{cases} \alpha^*(\Theta),\ \frac{\theta^c V(\alpha^*(\Theta))}{F(M)},\ \frac{\theta^m V(\alpha^*(\Theta))+\max\{R_m^\delta - C(M),0\}}{M} & \text{if } F(M)<1 \text{ regime } A\&A' \\ \alpha^*(\theta^m),\ 0,\ \frac{\theta^m V(\alpha^*(\theta^m))+\max\{R_m^\delta - C(M),0\}}{M} & \text{if } F(M)\geq 1 \text{ regime } B\&B' \end{cases}$$

Regimes A and B occur whenever $R_m^\delta \leq C(M)$ (i.e., when $M_c \geq M$), while regimes A' and B' occur whenever $R_m^\delta > C(M)$ (i.e., when $M_c < M$).[14]

It is immediately apparent that the typology of regimes is asymmetrical in the sense that the Ruler can never ignore the Military (i.e., $w_m^{op} > 0$), yet can sometimes ignore the religious clerics (i.e., $w_c^{op} = 0$ when $F(M) \geq 1$ in regimes B and B'). 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).

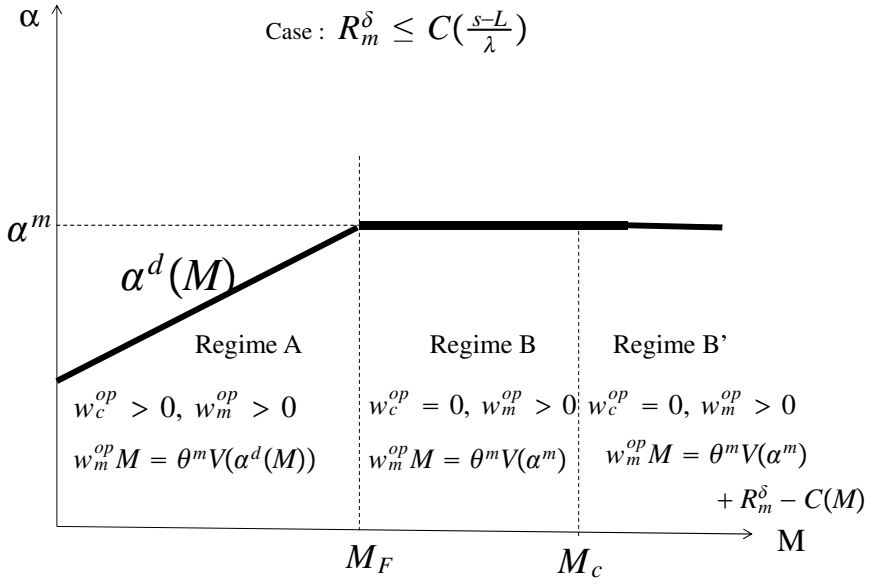
The optimal level of reforms $\alpha^{op}(M)$ is represented in Figure 1. It is monotonic in the size of the military, M, and it reaches a maximum at the threshold

$$M_F = \frac{s-L}{\lambda} \tag{26}$$

which is the minimum size of the army ensuring that it will always successfully repress a religious rebellion (i.e., such that $F(M) = 1$).

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, $w_c^{op} > 0$. At the same time the military should receive a wage sufficient to keep them on the side of the

[14] Bearing in mind that $R_m^\delta = C(M_c)$ by definition, and that $C(M)$ is decreasing in M, we deduce that regimes A and B occur if and only if $C^{-1}\left(R_m^\delta\right) = M_c \geq M$. In this case, the wage of the military is smaller since $\max\{R_m^\delta - C(M), 0\} = 0$.



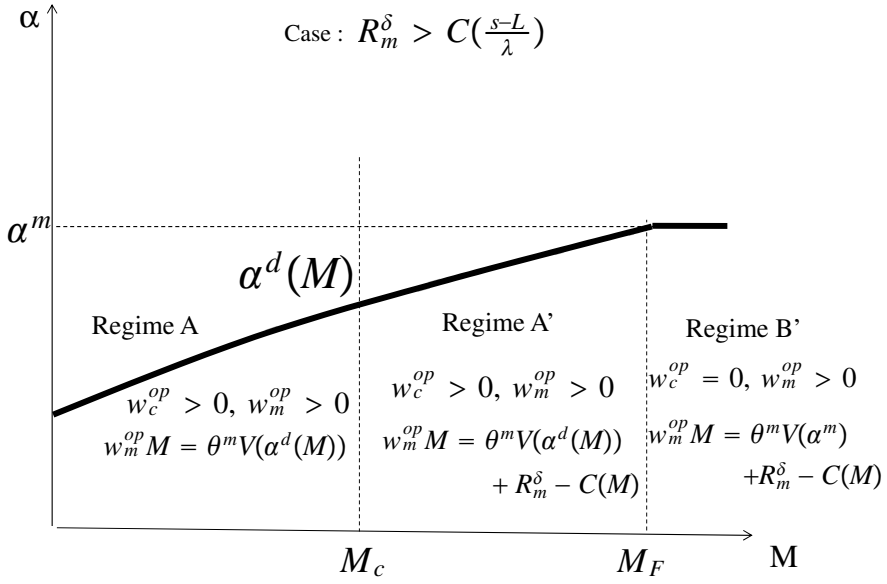


Figure 1: Optimal reform policy as a function of military size

incumbent regime: they will then accept the Ruler's optimal policy mix and agree to defeat a religious rebellion. 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: $M \leq \min\{M_c, M_F\}$. 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: the resistance of the religious leaders, and the risk that the military refuse to repress the rebellion. To counter these two threats, he does two things. First, he relies on seduction (i.e., a positive wage $w_c^{op} > 0$) to mitigate the clerics' resistance and push through his reforms which can only be modest, though. Perks and privileges for the clerics will be higher if their aversion to reforms is stronger. At the same time, since the military do not like reforms either, the autocrat needs to give them some moderate perks so as to afford their support in the event of a clerics-led rebellion. In order to minimize the perks to both types of 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, $w_m^{op}M$, increases and the autocrat is able to implement more reforms ($\alpha^*(\Theta)$ increases with M).

Under regime A', a variant of regime A, the military are still too weak to prevent a full rebellion ($M \leq M_F$), 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, being now more powerful, the military can extract a greater wage bill from the autocrat. This is because $w_m^{op} = \frac{\theta^m V(\alpha^*(\Theta)) + R_m^\delta - C(M)}{M}$, where $R_m^\delta - C(M) > 0$ (this expression is nil under A) and $\alpha^*(\Theta)$ defined in (23) is greater under A' than under A. Indeed, as M is higher, Θ is lower through the effect on $F(M)$ as can be seen from $\Theta = \frac{1-F(M)}{F(M)}\theta^c$. In short, the generous perks and privileges granted by the autocrat make the reforms costlier but also more acceptable, so that the reform effort is increased.

Finally, as is evident from the associated conditions $R_m^\delta > C(M_F)$ and $M > M_c$, regime A' is more likely to occur than regime A when, for a sufficiently large army size, λ and L are lower, and/or when s and δ are higher (since a high δ makes for a high R_m^δ), that is, when the relative strength of the clerics is bigger. In other words, a double co-option regime would not prevail if a large army did not co-exist with a relatively strong rebellion potential on the side of the clerics.

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, M_F, 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 $M \in [M_F, M_c]$: the autocrat enjoys sufficiently strong legitimacy that even with an army of moderate size (i.e., too weak to stage a coup against a religious conservative government), military repression is effective enough to tame any popular rebellion instigated by the 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 ($w_m^* M$ is constant since α^m is constant).

Lastly, under regime B', the size of the army is very large: $M \geq \max\{M_c, M_F\}$. 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, on the one hand, and becoming directly involved in public affairs and getting rid of the autocrat through a coup, on the other hand. 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 programme of reforms, α^m, which maximizes the utility of the men in uniform. It will therefore be moderated if the military's aversion to them is large.

4.1.3 Comparative statics

We are now in a position to study how changes in the exogenous variables of the model affect the pace of reforms, the wages of the military, the level of the perks to the clerics as well as the extent of their support to the regime. There are two main types of parameters to consider: the aversion to reforms (of the clerics, θ^c, and of the army, θ^m), and $F(M)$.

As is apparent from Proposition 2, the key factor driving the Ruler's optimal policy choice is the value of $F(M) = \frac{\lambda M + L}{s}$, which measures the strength of the regime (the popularity of the autocrat, L, plus the repressive capacity at his disposal, λM) relative to the ability of the clerics to stir a rebellion (measured by s). Two cases arise depending on whether $F(M) \geq$

1 or $F(M) < 1$. The first case is easy to deal with because there is no clerics' co-option and the comparative static analysis is straightforward. The second case deserves more attention and its analysis will require more space.

- **Exclusive co-option: all effects**

When $F(M) \geq 1$, the regime is strong. In the associated regimes, B and B', the pace of reforms, which is constant at $\alpha^m = \alpha^*(\theta^m)$, and the clerics' wage, set to zero, are unaffected by changes in $F(M)$ or in θ^c. The antagonized clerics do not endorse the autocrat's policies, no matter what. Their latent opposition to his reforms is maximal: $\gamma^* = 0$. Similarly, an increase in $F(M)$ has no impact on the total budget allocated to the army, $w_m^{op}M$, unless the rise in $F(M)$ is caused by a rise in M and $R_m^{\delta} > C(M)$ (i.e., $M > M_c$), in which case an increase in M prompts the Ruler to increase the total wage bill accrued to the Military. The effect on the individual wage, w_m^{op}, is itself ambiguous. By contrast, if the military become more conservative (i.e., if θ^m increases), the pace of reforms is slowed down and w_m^{op} is decreased provided that $V(\alpha)$ is log convex. Otherwise, the impact of an increase in θ^m on w_m^{op} is ambiguous.

- **Double co-option: effect of an increase in *F(M)***

When $F(M) < 1$, the regime is weak. The associated regimes, A and A', correspond to double co-option. This is the most interesting case since any change in $F(M)$ or θ^c impacts the equilibrium. Here, we start with the effects of the former type of change. Since α^* decreases with Θ, and $\Theta(M) = \theta^c \left(\frac{1-F(M)}{F(M)}\right) + \theta^m$ decreases with $F(M)$, any increase in $F(M)$ in the double co-option regime raises the pace of reforms $\alpha^d(M) = \alpha^*(\Theta(M))$. In turn, this upsets the most conservative clerics who withdraw their support to the Ruler. Hence the fraction of supporting clerics falls, with $\gamma^* = 1 - F(M)$.

To be more specific, an increase in $F(M)$ has two contradictory effects on this fraction. This is evident when we write it extensively as: $\gamma^* = 1 - \frac{2\epsilon}{2\epsilon - s}F(M) + \frac{s}{2\epsilon - s}F(M)$. On the one hand, a stronger regime constitutes

a more powerful deterrent to rebellion, thereby inducing a higher proportion of supporting clerics γ^* (the term $\frac{s}{2\epsilon-s}F(M)$). On the other hand, the more radical reforms undertaken by the Ruler spark a greater hostility among the clerics, which causes a decrease in γ^* (the term $-\frac{2\epsilon}{2\epsilon-s}F(M)$). As it turns out, the "reform effect" outweighs the "deterrent effect", implying that at equilibrium, the level of religious support decreases with $F(M)$.

Like in the case $F(M) \geq 1$, an increase in $F(M)$ has no impact on the total budget allocated to the army, $w_m^{op}M$, unless $R_m^{\delta} > C(M)$ (i.e., unless $M > M_c$) and the rise in $F(M)$ is caused by a rise in M, in which case an increase in M prompts the Ruler to raise $w_m^{op}M$. The effect on the individual wage, w_m^{op}, is again ambiguous.

Finally, the effect of a rise in $F(M)$ on the equilibrium wage of the clerics, w_c^{op}, is also indeterminate. Simple inspection of w_c^{op} in (24) reveals that the induced increase in $\alpha^d(M)$ makes the value of the numerator higher while that of the denominator, $F(M)$, also increases. The following result is shown in Appendix 7.2.

Corollary 1 *The wage of the clerics, w_c^{op}, increases with $F(M) \leq 1$ if and only if*

$$\epsilon_{\alpha}^{V} \cdot \epsilon_{\Theta}^{\alpha^*} > 1 - F(M)\left(\frac{\theta^c - \theta^m}{\theta^c}\right) \tag{27}$$

where $\epsilon_{\alpha}^{V} = \frac{V'(\alpha)}{V(\alpha)}\alpha$ is the elasticity of the clerics' disutility with respect to reforms, and $\epsilon_{\Theta}^{\alpha^*} = \left[\frac{-R"(\alpha)\alpha}{R'(\alpha)} + \frac{V"(\alpha)\alpha}{V'(\alpha)}\right]^{-1}$ is (the absolute value of) the elasticity of optimal reform effort, $\alpha^*(\Theta)$, with respect to Θ.

Intuitively, (27) reflects two opposite effects. First, when $F(M)$ increases, the social aversion to reforms, Θ, diminishes.[15] As a consequence, the equilibrium level of reform chosen by the Ruler $\alpha^*(\Theta)$ goes up. This positive reform effect leads to an increase in the clerics' disutility cost of reform, implying that the Ruler must pay them a larger compensation to obtain their support. At the same time, an increase in $F(M)$ reduces the probability of a successful rebellion, causing a negative deterrent effect

[15]When $F(M)$ increases $\Theta(M)$ gets closer to the Military's aversion to reform, θ^m, rather than to the clerics' aversion to the same, θ^c (with $\theta^c > \theta^m$).

on the clerics' dissidence. The Ruler has thus less need to buy them off. When condition (27) holds, the equilibrium level of reform $\alpha^*(\Theta)$ is quite sensitive to a decrease in social aversion (large enough value of $\epsilon_{\Theta}^{\alpha^*}$), and this also translates into a large effect on the clerics' disutility of reforms (large enough value of ϵ_{α}^{V}). In such a case, the reform disutility effect dominates the deterrent effect and the equilibrium clerics' wage, w_c^{op}, rises with $F(M)$. Conversely, our model suggests that the deterrent effect is likely to dominate, with w_c^{op} decreasing in $F(M)$ (and thus in army size, M) in a resource-rich economy ($R(\alpha)$ is very concave) and in the presence of radical clerics intensely opposed to modernization ($V(\alpha)$ is very convex).

Since $F(M) = \frac{\lambda M + L}{s}$ we conclude that w_c^{op} is increasing in M, λ, and L, and decreasing in s, if and only if condition (27) is satisfied. In the equilibrium regime with double co-option, the wage of the seduced clerics should then increase as a result of any change of structural parameters that induces the Ruler to implement more reforms (i.e, an increase in military efficiency, in the Ruler's legitimacy, or a reduction in the influence or strength of the clerics). Conversely, when condition (27) is violated, the reform effect is weaker than the deterrent effect, and the opposite result obtains.

It is interesting to note that across the different equilibrium regimes, the clerics' wage, w_c^{op}, may be a non monotonic function of the regime's strength. On the one hand, when $F(M) < 1$, the society is in a double co-option regime A or A' and $w_c^{op} = \frac{\theta^c V(\alpha^*(\Theta))}{F(M)} > 0$. As long as the elasticity condition (27) is satisfied for some value of $F(M)$, Corollary 3 indicates that w_c^{op} is increasing in $F(M)$. It is worth noting that since $F(M) \in (0, 1]$, then $1 > 1 - F(M)\left(\frac{\theta^c - \theta^m}{\theta^c}\right) \geq \frac{\theta^m}{\theta^c}$. From (27), it is evident that a sufficient condition for w_c^{op} to be increasing in $F(M)$ is $\epsilon_{\alpha}^{V} \cdot \epsilon_{\Theta}^{\alpha^*} > 1$, while conversely a sufficient condition for w_c^{op} to be decreasing in $F(M)$ is $\epsilon_{\alpha}^{V} \cdot \epsilon_{\Theta}^{\alpha^*} < \frac{\theta^m}{\theta^c}$.

On the other hand, once $F(M) \geq 1$, say because the defence budget M has been increased, the relevant regime becomes B or B' and the clerics do not receive any wage ($w_c^{op} = 0$). This implies a discontinuity in the Ruler's policy. In the vicinity of $F(M) = 1$, small changes in the military efficiency, in the Ruler's legitimacy, or in the influence of the clerics, will

lead to a sharp change in the way the regime deals with religious leaders. We discuss such abrupt policy reversals in some of our case studies.

We provide an example of such non monotonicity with constant cost and revenue elasticities. Let $V(\alpha) = v \cdot \frac{\alpha^{\eta+1}}{\eta+1}$ and $R(\alpha) = R_0 + r \cdot \frac{\alpha^{\rho}}{\rho}$ with $\eta > 0$ and $\rho \in (0,1)$. It is easy to see that $\epsilon_{\alpha}^{V} = 1+\eta$ and that $\epsilon_{\Theta}^{\alpha^*} = \frac{1}{1+\eta-\rho}$. Condition (27) is then always satisfied in the double co-option regimes: $\frac{1+\eta}{1+\eta-\rho} \geq 1 > 1 - F(M)\left(\frac{\theta^c-\theta^m}{\theta^c}\right)$. As a consequence, w_c^{op} is increasing in $F(M)$ if $F(M) < 1$, and equal to 0 if $F(M) \geq 1$, illustrating the possibility of non monotonic patterns.

- **Double co-option: effects of an increase in reform aversion**

Let us now consider the impact of an increase in the aversion to reforms on their magnitude depending on whether the clerics or the military become more conservative. In regimes A and A' this magnitude is $\alpha^*(\Theta)$. Since Θ increases with both θ^c and θ^m, it is intuitive that when the opposition to reforms by the military or the clerics rises, the optimal pace of reforms must decrease. Under double co-option, indeed, the aversion of both groups of agents matters. Whether the effect on reforms of a marginal increase in aversion of the clerics is stronger or weaker than the effect of a marginal increase in aversion of the military critically depends on $F(M)$. Since $\Theta = \theta^c\left(\frac{1}{F(M)} - 1\right) + \theta^m$, the former effect outweighs the latter if and only if $F(M) \leq 0.5$, which is obviously more restrictive than the condition $F(M) \leq 1$ under which regimes A and A' are relevant. In words, it is when the autocratic regime is weak that religious radicalization carries a stronger weight than military radicalization. We collect this result in the following corollary.

Corollary 2 *A marginal increase in the aversion of the clerics to reforms has a greater impact on the pace of reforms than a marginal increase in the aversion of the military if and only if* $F(M) \leq 0.5$

When θ^m increases, not only are reforms moderated but also the wage of the clerics, w_c^{op}, decreases as there is less need to compensate them for

their disutility of reforms (see eq. (24)). Symmetrically when θ^c increases, w_m^{op}, the wage of the military, decreases for the same reason (see eq. (25)).

By contrast, there are two opposite effects on w_c^{op} of an increase of the average reform aversion of the clerics themselves, θ^c. On the one hand, there is the direct positive effect according to which more reform-averse clerics need a larger compensation to support any *given* level of reforms. Hence in equation (24), w_c^{op} moves up following a direct upward shift of θ^c. On the other hand, a higher θ^c also leads to a larger social aversion to reforms, Θ, thereby prompting the Ruler to choose a lower equilibrium level of reforms, $\alpha^d(M) = \alpha^*(\Theta(M))$. This reduces the equilibrium wage of the clerics, w_c^{op}, needed to compensate the disutility of reforms. Which of these two effects dominates depends on the elasticity of the clerics' disutility with respect to reforms, and on the elasticity of optimal reform effort with respect to Θ. The following result is shown in Appendix 7.2.

Corollary 3 *Let $F(M) \in (0,1)$. The clerics' wage, w_c^{op}, increases with θ^c if and only if*

$$\epsilon_\alpha^V \cdot \epsilon_\Theta^{\alpha^*} < 1 + \frac{\theta^m F(M)}{\theta^c (1 - F(M))}. \tag{28}$$

The above condition is more likely to be satisfied if the initial value of θ^c is relatively small (i.e., close to θ^m), and more likely to be violated if θ^c is initially high compared to θ^m. This result is according to intuition: when θ^c is initially small, it is not profitable for the Ruler to respond to a rise in clerics' aversion by backtracking much on his promises of reforms, hence the domination of the first over the second effect. And vice-versa when θ^c is initially high. Note that w_c^{op} can be increasing in both $F(M)$ and θ^c (i.e., conditions (27) and (28) can be simultaneously satisfied as $F(M) > 0$).

For instance, computing condition (28) in the constant elasticity example, where condition (27) is always true, yields:

$$\frac{1+\eta}{1+\eta-\rho} < 1 + \frac{\theta^m F(M)}{\theta^c (1 - F(M))}$$

or, after rearranging terms:

$$\frac{\frac{\rho}{1+\eta-\rho}\frac{\theta^c}{\theta^m}}{1 + \frac{\rho}{1+\eta-\rho}\frac{\theta^c}{\theta^m}} < F(M)$$

This condition is automatically satisfied, for example, if ρ is very small or η very large.

Before turning to the complete model with endogenous army size, a final remark is in order. It is reasonable to think 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 $\alpha^*(\Theta)$: 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

4.2.1 Equilibrium analysis

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: w_m, their perks/privileges, and M, 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 $C(M_F)$.

The payoff function of the Ruler is

$$W(M) = \begin{cases} R\left(\alpha^*(\Theta)\right) - \Theta V(\alpha^*(\Theta)) - \max\{R_m^\delta - C(M), 0\} & \text{if } F(M) < 1 \\ R\left(\alpha^m\right) - \theta^m V(\alpha^m) - \max\{R_m^\delta - C(M), 0\} & \text{if } F(M) \geq 1 \end{cases}$$

When the functions $R\left(.\right), C\left(.\right)$ are concave enough and $V(.)$ is convex enough, it can be shown that the value function $W(M)$ is concave in the size of the army, M. Let M^* be the solution to the following equation:

$$C'(M) + \frac{s\lambda\theta^c}{\left[\lambda M + L\right]^2} V(\alpha^*(\Theta)) = 0 \tag{29}$$

The next proposition depicts the equilibrium values of the optimal army size distinguishing between two cases, and taking into account the possibility of several shapes of the function $W(M)$ in the second case.[16]

Proposition 3 *The optimal size of the army from the Ruler's point of view is as follows.*

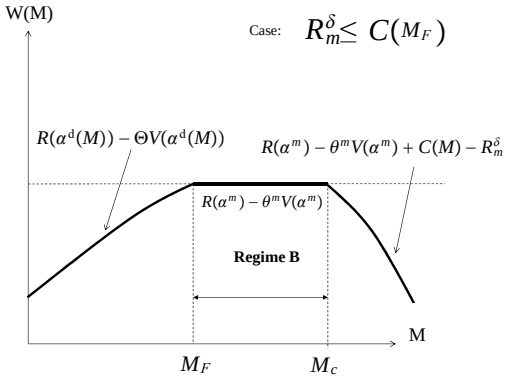
- *If* $R_m^\delta < C(M_F)$*, then* $M^{op} = \{M \in [M_F, M_c]\}$ *regime B*
- *If* $R_m^\delta \geq C(M_F)$*, then*

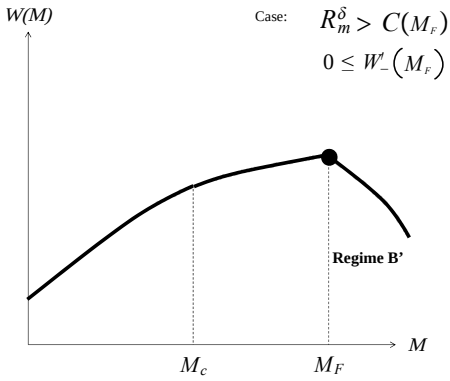
$$M^{op} = \begin{cases} (M_c)_- & \text{if } W'_+(M_c) \leq 0 \quad \text{regime A'} \\ M^* \in]M_c, M_F[& \text{if } W'_+(M_c) > 0 > W'_-(M_F) \quad \text{regime A'} \\ (M_F)_+ & \text{if } 0 \leq W'_-\left(M_F\right) \quad \text{regime B'} \end{cases}$$

Proof. See Appendix 7.3 ■

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 $M < \min\left(M_c, M_F\right)$. 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

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





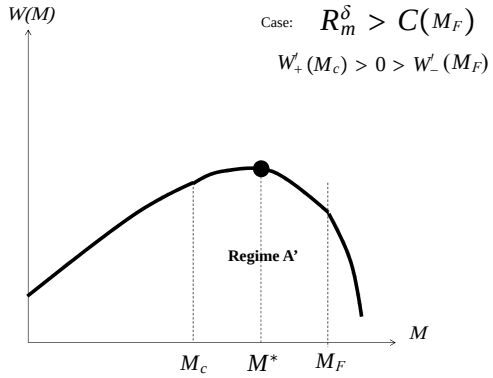


Figure 2: Optimal military size

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 military for his reforms. Figures 2 illustrates the three possible cases B, B' and A'.

When $R_m^\delta < C(M_F)$ (or $M_F < M_c$), 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 (i.e., $M \geq M_F$), he is indifferent to the size of the army as long as it remains below M_c. (Bear in mind that in this range the wage bill paid to the army is constant because the optimal level of reforms does not vary with army size). The reason is that M_c is the critical level at which the military become powerful enough to extract large perks because of their capacity to stage a coup.

When $R_m^\delta > C(M_F)$, 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 $M^{op} = M_{F+}$ (*regime B'*).

To better understand the rationale behind the Ruler's choice of army size when $R_m^\delta > C(M_F)$, it is useful to consider two polar cases. The first limit case corresponds to a rent economy based on huge and valuable oil resources, so that the function $R(\alpha)$ rapidly flattens: little income is lost as

a result of the absence of reforms (Auriol and Platteau, 2017a). In the most extreme instance, secular reforms have no impact at all on the autocrat's wealth, and $R(\alpha) = \overline{R}$. There would then be no point in antagonizing the clerics with modernization reforms and the Ruler would choose $\alpha^{op} = 0$. More generally, $R'(\alpha)$ is low in equation (2), and the value of α^{op} is very small. In the range $M \in [M_c, M_F[$, the first term in the expression $W'(M)$ in (34) is then close to zero even when θ^c is high (see Appendix 7.3). We thus have that $W'(M) < 0$ over the whole range, and the optimal army size is at the lower threshold value, M_c. (For lack of space, this case where the slope of the function $W(M)$ is negative from the point M_c onwards is not shown in Figure 2). The intuition is the following: when conservative clerics are easy to buy because the forsaking of reforms does not harm the economy much, the Ruler does not need a strong army to crush a rebellion.

The opposite polar situation is obtained when the Ruler's rent is very sensitive to institutional reforms because the economy is rather sophisticated and productivity of both labour and capital is strongly dependent on the institutional environment. We then have that $R'(\alpha)$ is high and α^{op} is well above zero. Now, when $M \in [M_c, M_F[$, the first term in the expression $W'(M)$ in (34) is rather high, especially so if θ^c is high. Hence, it is likely that $W'(M) > 0$ over at least part of the interval. The optimal army size may be as large as the level corresponding to the upper threshold, M_F, in which case the Ruler dispenses with clerical co-option. The intuition is that when conservative clerics are costly to buy because economic growth requires institutional reforms, the Ruler will choose a comparatively large army to counter the threat of a rebellion. This threat is serious since a good amount of reforms are made and the Ruler finds it more profitable to pay a large number of army men than to compensate (strongly) reform-averse clerics through high perks. In the intermediate case where $W(M)$ first increases and then decreases in the range $M \in [M_c, M_F[$, what prevails is the interior solution characterized by an army size larger than M_c but smaller than M_F.

4.2.2 Comparative statics of the equilibrium regimes

In this final stage of our analysis, we want to study how changes in the model's structural parameters impact the likelihood of a double co-option regime when the military size is endogenous. The key parameters we are interested in are: the efficiency of the military at repression, λ, and at running the economy, δ, as well as the clerics' and the military's aversion to reforms, θ^c and θ^m. It turns out that to study this problem it is useful to illustrate Proposition 3 in a figure describing the pattern of the different equilibrium regimes in terms of L, the autocrat's legitimacy, and of s, the rebellious strength of the clerics.

Note first that the condition $R_m^\delta < C(M_F)$ delimiting regime B from the other regimes can be restated as $M_F = \frac{s-L}{\lambda} < M_c$ or $s < L + \lambda M_c$. Conversely, the condition $W'_-(M_F) < 0$ that characterizes the boundary of the double co-option region A' can be stated as:

$$W'_-\left(\frac{s-L}{\lambda}\right) = C'\left(\frac{s-L}{\lambda}\right) + \frac{\lambda\theta^c}{s}V(\alpha^m) < 0 \tag{30}$$

as $\Theta = \theta^m$ at $M = M_F$. In the appendix, we show that condition (30) is equivalent to $s > \widetilde{s}(L)$ where $\widetilde{s}(L)$ is an increasing function of L with $d\widetilde{s}/dL \in (0,1)$. Intuitively, the double co-option regime can only arise when the clerics' strength, s, is large enough (i.e., larger than the threshold $\widetilde{s}(L)$, which is itself increasing in the incumbent's legitimacy). Figure 3 depicts the two locus $s = L + \lambda M_c$ and $s = \widetilde{s}(L)$ in the space (L, s), and the way variations in our structural parameters affect them.[17]

These two curves initially intersect at a point I characterized by coordinates $\left(L^I, s^I\right)$, and they determine the three regions corresponding to the equilibrium regimes A', B and B'. Clearly, when s is low and/or the incumbent's legitimacy L is high, there is no religious co-option, and regimes B and B' prevail. Conversely, the double co-option regime obtains when s is relatively high compared to the incumbent's legitimacy, L, and army efficiency, λ. It is straightforward that a high (low) λ translates into high

[17] We consider the parametric case where the clerics' aversion to reforms is large enough and/or the incentive of the military to make a coup is strong enough, so that $-C'(M_c)M_c < \theta^c V(\alpha^m)$.

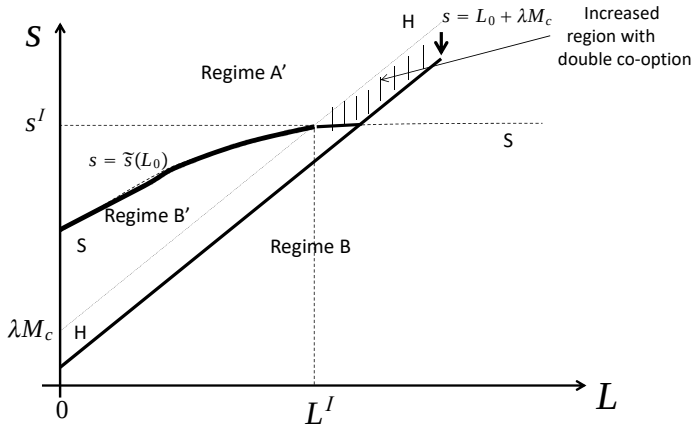
(low) locations of the locus $s = L + \lambda M_c$ and the locus $s = \widetilde{s}(L)$, resulting in a small (large) region for double co-option.

The diagrams displayed in Figure 3 highlights the comparative statics of the effects of the structural parameters (δ, θ^m, θ^c) on the likelihood of a double co-option regime when the military size is endogenous.

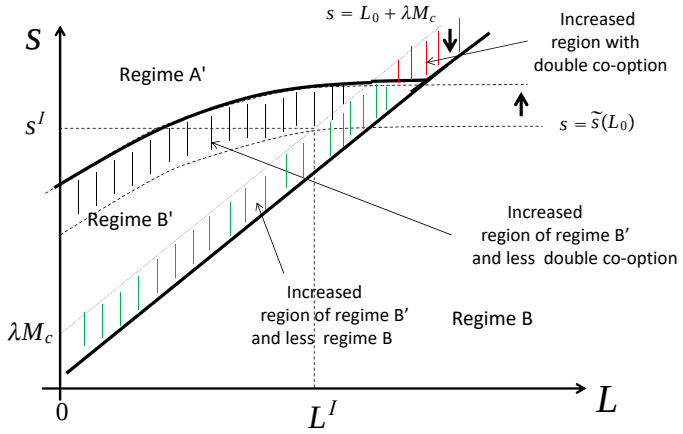
First, an increase in the rents captured by the military in power due to a positive shift of δ yields a larger value of R_m^δ. This corresponds to a decrease of M_c, which induces a downward shift of the locus $s = L + \lambda M_c$ without affecting the other curve $s = \widetilde{s}(L)$. Interestingly, this leads to an expansion of the double co-option region. The intuition is as follows. The Military has now higher incentives to undertake a coup, which prompts the Ruler to decrease M. Given this reduced capacity to deter a rebellion, his optimal political strategy consists of buying off the clerics to maintain himself in power.

Second, a Military more aligned with the Ruler's objectives is reflected in a smaller value of θ^m. This causes an increase in both R_m^δ and α^m. While the latter effect induces an upward shift of the locus $s = \widetilde{s}(L)$, the former effect causes a downward shift of $s = L + \lambda M_c$. This leads to an expansion of the region corresponding to regime B' and to a shrinking of the region corresponding to regime B. The double co-option region is narrowed down for intermediate values of the Ruler's legitimacy and the clerics' strength, while it expands for high enough values of these parameters. This expansion is explained as follows. When the Ruler's legitimacy is strong, he has less need of a powerful army since the clerics are less willing to oppose him. Co-opting the latter is an especially attractive strategy if their rebellious power is important.

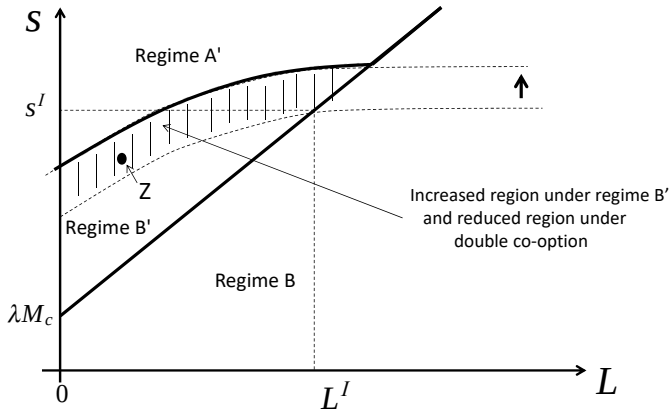
Finally, an increase in θ^c, the average aversion to reforms of the clerics, causes an upward shift of the threshold curve $s = \widetilde{s}(L)$ without affecting the locus $s = L + \lambda M_c$. There ensues an expansion of regime B' while the likelihood of the double co-option regime has become smaller. Let us now look for the intuition behind this result. A more reform-averse clerical body makes the double co-option political strategy more costly at the margin since higher wages need to be paid to the co-opted clerics. In



Increase in the Military's ability to rule, δ



Decrease in military aversion to reform θ^m



Increase in average clerics' aversion to reform, θ_c

Figure 3: Equilibrium regimes with endogenous military size

this case, increasing the size of the military to the point where there is no more need for clerical support becomes a relatively more attractive strategy for the Ruler. In other words, when the strength of the clerics is not too large compared to the regime's legitimacy, the Ruler is tempted to dispense with any religious support and to increase the army size so that it can fully deter a clerics-led rebellion. This is illustrated by point Z in Figure 3. This point was initially located in the double co-option region A' but belongs to region B' after the increase in θ^c.

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.[18] 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 autocratic countries where a decentralized religion (Islam) dominates.

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. Here, we begin by regrouping different empirical regimes in three categories or types derived from the theory (Sections 5.1, 5.2, and 5.3). 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)

[18] In particular, the issue of measuring the magnitude of (progressive) reforms or the degree of aversion to them among the clerics and the military is quite challenging. Equally difficult is the task of measuring the amount of perks paid to both groups.

have often intervened in the long period separating the end of World War II from the present. Of course, because these empirical regimes belong to different countries, inter-country variations in variables that we do not observe or are outside of our model may affect the outcomes which we are interested in. This is why in a last section (Section 5.4), we use our theory to analyze a few cases of regime change occurring inside a given country.

5.1 Strong popular legitimacy of the autocrat and loyal army

To begin with, ***Turkey under*** Mustapha Kemal ***Ataturk*** (1923-1938) 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) and the strong loyalty of the military, police, and secret services. While Ataturk gained a lot of prestige from his military victory against Greek troops in the battle of the Dardanelles, Bourguiba 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 where the force of the regime for any army size $F(M)$ is high. 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 $\alpha^{op} = \alpha^*(\theta^m)$, which is high since θ^m is low. 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 M_F 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. This prediction is borne out only for Tunisia. In Kemalist Turkey, external factors (most notably, a delicate geopolitical situation) and foreign policy objectives played a big role in determining a defence budget significantly

larger than the amount predicted by the theory. It is noteworthy that as predicted by the theory Ataturk did award large perks and privilege to the men in uniforms, from whom he had nothing to fear. A large army was no serious threat to the president: Ataturk was directly coming from the army, and there was little antagonism or disagreement between them. The Turkish military body was strongly loyal to the country's political leader, and they espoused the secular-nationalist values that inspired his actions.

The central message from the above is therefore that the two 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.[19] 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).

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 to impose

[19]The 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 on all Islamic institutions, yet carefully avoided to confront public religiosity. As much as possible, the ulama were kept out of state education, culture, the legal system, and state symbolism. One of Qasim's first major legal reforms was the promulgation of the Law of Personal Status (1963), which forbade polygamy (except with the permission of a judge) 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. As expected, clerics strongly objected the Law on the ground that it opened the door to prescriptions alien to the sharia. But Qasim did not bend, and it was as a result of particularly odious coup managed by Saddam Husayn that he was eventually overthrown.[20]

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 L was low. This is a case where initially $F(M)$ was very low and the relevant regime was one of double co-option. The Saud therefore chose to form a military-religious alliance with Wahhabi religious leaders (the mutawwa) and their powerful militia known as the Ikhwan (the Brothers).

Founded much earlier by Muhammad Ibn Abd al-Wahhab (1703-1792), the Wahhabi doctrine was thus adopted by the Sauds 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

[20]The 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).

(i.e., θ^c is very large). 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). 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 of 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 (i.e., Θ is extremely large). This second arm of the autocrat's tactic was especially attractive because of its low cost: Saudi Arabia being endowed with ample oil resources, its economic growth does not depend much on the institutional environment. This is the first polar case discussed at the end of Subsection 4.2. The equilibrium magnitude of reforms is thus predicted to be very small ($\alpha^*(\Theta) \simeq 0$). The low intrinsic legitimacy L 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 (in terms of growth opportunities foregone), takes precedence over the payment of generous perks as a way to entice the clerics. 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 likely have chosen an army of moderate size. For one thing, $M_F = \frac{s-L}{\lambda}$ is high because s is high (the Ikhwan Brothers had a

powerful militia) and L is low. Moreover, R_m^δ is large (due to considerable resource rents) so that $R_m^\delta > C(M_F)$. Therefore, the prevailing regime is *A'*, corresponding to double co-option. As explained in Subsection 4.2, the theory predicts a rather small army size when few reforms are undertaken.

The army size has nevertheless exceeded the optimal size determined in our model because of the Saud family's strong ambition of gaining a leadership position in the Arabian peninsula and the wider Arab world (initially, Ibn Saud wanted to conquer Bagdad but was prevented from doing so by the resolute opposition of his international protector, England). After the second world war, the determining factor behind the strong Saudi army was no doubt the unabating political support and significant military assistance provided by the United States. The US interests were guided by two main objectives: to secure access to the vast oil resources of the kingdom, and to make its ally a bastion of anti-communism in a highly disputed region. It is therefore not surprising that today Saudi Arabia comes out as one of the most militarized countries in the world, and that to counter the threat of a coup, the king pays ample dividends to the military ($w_m^* M$ is large), especially so because R_m^δ is high.[21]

That the large co-option of the clerics and the military by the monarch 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).[22]

[21]Saudi Arabia occupies the top world 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).

[22]Interestingly, 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

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, the crown prince Muhammad bin Salman (known as MBS), has recently embarked upon a number of secular reforms with the dual objective of diversifying the economy of the country and modernizing its institutions.[23] While the Saudi rulers were initially weak (because of their low legitimacy) and therefore needed to strongly rely on the Wahhabite clerics, they could gradually build a powerful army thanks to the country's immense wealth and the unfailing financial and political support of the major world power. As a result, they are now able to reduce their dependence on the clerics and to implement policy and institutional reforms susceptible of antagonizing them. Seen in this light, the rise to power of MBS does not appear as an anomaly but as a logical consequence of the newly acquired strength of the regime (as reflected in *F(M)*).

Yet, progressive reforms entail huge costs in the form of increased use of brutal force and absolute intolerance toward any dissent. Modernization as conceived by MBS does not include political liberalization, quite the opposite: the concentration of powers in his hands, and the strength and loyalty of the secret services, are unprecedented in the history of Saudi Arabia (Hubbard, 2020). And if the role of religion is toned down, national grandeur is extolled and imperial ambitions are re-asserted with especial vigour. The major objective proclaimed by MBS is thus to make the country become the leader of the Middle East and a major world power.[24] Any

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).

[23]Among the reforms causing the hostility of the clerics are all the measures taken (generally by decree), or announced, with a view to increasing the mobility and the autonomy of women, improving the status of Shia subjects (which includes the removal from school textbooks and television networks of anti-Shia statements or pronouncements), and curbing the religious police (who enforced Sunni supremacy). Measures aimed at rooting out high-level corruption (such as extracting repayments of "stolen" revenues from dozens of prominent princes entrapped in the Ritz Carlton in November 2017) do not arouse opposition among the clerics.

[24]The breaking of diplomatic relations with Qatar, considered to be close to Iran, and the military intervention in Yemen to crush Houthi rebels supported by Iran are steps in this direction.

opponent or dissenter is labeled a traitor, and mutual denunciation and electronic spying of all citizens are systematically used for the purpose of not only crushing critics but also silencing those who express neutral opinions.[25] It is no exaggeration to say that MBS exerts genuine tyranny to achieve his so-called "Vision 2030".

At the present stage, however, progress with the most contentious reforms is disappointing as witnessed by the fact that women are still not allowed to drive and those who dare demonstrate to put pressure on the crown prince are immediately arrested, intimidated and even tortured. Moreover, there are still no Shia members of the top religious authority, no Shia judges sitting on national courts, no Shia police officers or ambassadors. A plausible explanation is that the absolute power claimed by MBS is questioned inside the country: his ruthlessness and megalomania have stirred resistance among part of the elite, even among those who initially supported him (such as Jamal Kashoggi, who ended up being murdered in the Saudi embassy of Turkey on October 2, 2018). This resistance compels MBS to avoid head-on confrontation with the religious establishment, hence his careful treading in matters sensitive for the clerics. In other words, the transition from a mildly strong to a strong autocracy cannot be considered to have been fully accomplished yet in the Saudi kingdom.

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 by 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

[25]For example, just to say that placing ARAMCO on the stock exchange is not a good idea has sent Saudi experts to jail.

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.[26]

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 were the central factors behind the 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 clerics-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) 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 s of the religious opposition, combined with low values of the autocrat's legitimacy, L, are reflected in low values of $F(M) = \frac{L+\lambda M}{s}$. At the equilibrium we expect $M < M_F = \frac{s-L}{\lambda}$, corresponding to *regime A* or *A'*.

In accordance with the theory, the fraction of official clerics supporting the regime is smaller in the four aforementioned countries than in Saudi Arabia, yet is higher than it was in Ataturk's Turkey and Bourguiba's Tunisia. In addition, fewer reforms have been implemented in the same four

[26]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).

countries than in the latter two regimes, but more reforms when compared to Saudi Arabia where θ^c is significantly higher. As pointed out at the end of Section 4.1.3, however, the optimal level of reforms is predicted to be rather low in the specific case (illustrated by Pakistan) where θ^m is high and therefore close to θ^c.

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 (i.e., Θ is very large). 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.[27] 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).[28]

Moreover, under Zia's rule the army perfected the practice of using Islamic parties and radical Islamic groups "as pawns in domestic and in-

[27]Pakistan'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).

[28]While 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.

ternational 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.[29] Revealingly, not only did Zia 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 (Siddiqa, 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. Zia was a shrewd politician adept at subduing the army and 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 of both the military and the radical clerics in the country's affairs that Zia had encouraged and organized.

[29]The 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 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).

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 religious clerics is rather sharply divided between, on the one hand, the official establishment of al-Azhar, and, on the other hand, 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"). Second, the values of the military differ from those of the Muslim Brothers and other extremist religious organizations. Both Sadat and Mubarak have therefore been able to work in close cooperation with the army whose top commanders hold secular values (i.e., it corresponds to a rather low value of θ^m). They have also 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.[30] 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).

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. he 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). As a result of this peace making decision his legitimacy L fell sharply. 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. By appearing to give in to the Brother's demand for the gradual Islamization of the Egyptian state, Sadat played a dangerous game because he was not

[30]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).

actually prepared to make such a move. 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 was also keen to reinforce the army so that he could tamed extremists. 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 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.[31] 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 (see Sayigh, 2019, for evidence on the military economy) and enjoyed the support of the religious officialdom.

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. Boumedienne

[31]This 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.

chose to use Islam to counteract any opposition movement and prevent the emergence of a genuine civil society.[32] In exchange for their support, he did not hesitate to give free rein to the most reactionary clerics among the ulama.[33] In particular, he granted them the right to lead the Arabization of the country (with disastrous consequences), to manage the education system (including the right to rewrite school textbooks), and to even meddle in mundane matters like dress code, alcohol consumption, etc.

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 never far from the presidency and often acted behind the scene. Most notably, Boumedienne encouraged the rise of the Islamic Salvation Front (FIS), whose most radical strand was headed by a puritanical cleric (Ali Belhadj) who called for the formation of an Islamic state, if necessary by violent means (Bouamama, 2000: chap. 3; Lapidus, 2002: 599-600).[34] Like in Saudi Arabia, this double co-option 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 (see Garcon, 2020: 45-47; Malti, 2020: 196-202).

Chadli essentially continued his predecessor's policies: he used Islamist support to defeat the opposition, a strategy justified by the fact that the 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).[35] This tactic was apparently

[32]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).

[33]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).

[34]As was later revealed, the intelligence service actually infiltrated the FIS and held no less than half of the seats in the Consultative Council (Laribi, 2007: 74).

[35]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).

repeated for other Islamist outfits. Consistent with the theory, the price paid for the religious support of the regime was high in terms of reforms foregone. For example, a reactionary Family Code was enacted (1984), and a radical Islamist was appointed as president of the University of Islamic Sciences at Constantine (Platteau, 2017: 227).

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 the section 4.2 of 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 and on strong religious support (regime B). 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 publicized 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. By thus modifying selection and promotion rules, Nimeiri, like Zia in Pakistan, obviously influenced the value of θ^m (which, for the sake of convenience, is assumed to be exogenously fixed in our model).

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.[36]

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).

As witnessed by the popular uprising which caused the demise of al-Bashir (in early April 2019), the incapacity of the Sudanese military to deal with an internal insurrection was the consequence of a deliberate choice of the autocratic regime. Its fragmentary and divisive approach easily leads to fights between soldiers affiliated with different parts of the Sudanese state's defense system (de Waal, 2015: 57-62). 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. 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.

In Table 4, we summarize the above discussion by characterizing the three types of regimes that emerged from our short survey of regime case studies: exclusive co-option of the military with bold reforms (I), dou-

[36]In 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.

Regimes	Parameters					Endogenous variables		
	L_0	λ	θ^m	θ^c	s	M*	α*	γ*
I: Exclusive co-option of the military (Atatürk, Bourguiba, Quasim)	high	high	low	low or medium	low	high[1]	high	nil
II: Double co-option with strong cleric (Saudi Arabia)	low	high or medium	high	very high	very high	high	very low	very high
III: Double co-option with moderate cleric (Zia ul-haq, Al-Asad, Mubarak, Boumédienne, Chadli, al-Nimeiri and al-Bashir)	low	medium or low[2]	medium or low[3]	medium	high	high[4]	low	medium

(1) With the exception of Boumediemne's Tunisia (where M was endogenous).
(2) Low under Zia (Pakistan) and Nimeiri and al-Bashir (Sudan). Medium under Mubarak (Egypt) and Boumedienne and Chadli (Algeria).
(3) Medium (or high) under Zia (Pakistan). Medium under Nimeiri and al-Bashir (Sudan). Low under Mubarak (Egypt) and Boumedienne and Chadli (Algeria).
(4) With the exception of Sudan (where M was endogenous).

Figure 4: A schematic characterization of a set of case study regimes

ble co-option with weak reforms (II), and double co-option with moderate reforms (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 the distinction between (II) and (III) is largely based on aversion to reforms of both the military and the clerics, and the strength of religious organizations.

5.4 Within-country regime changes

The advantage of looking at within-country changes of regimes is that we control for time-invariant country-specific variables. In terms of Fig. 4, a regime change is reflected in a shift from one row to another as caused by a variation of one of the parameters of the model. In the previous subsection, we have actually proposed an illustration of the dynamics of an autocratic regime when we discuss the case of Saudi Arabia. There, an increase in army size largely induced by external forces has allowed the current ruler to reduce his dependence on the clerics and to concomitantly consider long-awaited reforms. The regimes of General Liamine Zeroual (1994-1999) and Abdelaziz Bouteflika (1994-1999) in Algeria offer us a rather similar story. It is sometimes called the regime of the decideurs (decision-makers), "a cabal of unelected power-brokers" (Laribi, 2007: 190-2; Sifaoui, 2019: 106-14)) articulated around two major clans, one linked to the highest officers

corps of the army and the other to the intelligence service.

The rise of Islamist jihadist movements during the 1990s culminated in the seizing of Kabul by the Taliban (1996) and the organization of the Mujahiddin by Usama bin Laden (1999). The Security Council of the United Nations reacted by setting up a special committee in charge of leading the struggle against Al-Qaida, the Taliban, and associated individuals (Resolution 1267). Fears of growing violence were confirmed by the blowing up of the US embassies in Nairobi and Dar-es-Salam (7 August 1998) and, later, of the Twin Towers in New York (12 September 2001). The war against terrorist Islamist organizations declared by Western powers and the UN afforded a formidable protection and military assistance to authoritarian rulers determined to crush not only violent Islamist outfits but also any form of opposition, including moderate religious and non-religious groups or individuals. The best way to conceptualize this exogenous change in our model is through an increase of λ (the repression forces are more effective because illegitimate means and extreme methods have now become acceptable), which is formally equivalent to a rise in M.

What distinguishes the regime of the decideurs from Salman's regime is that, instead of exploiting the sudden increase in repressive power to launch more (secular) reforms, Zeroual and above all Bouteflika opted for a vast expansion of corruption (Malti, 2020: 195-201). The decideurs' regime was thus involved in an unprecedented plunder of the country's riches accompanied by an exceptionally harsh quashing of the Islamic Front (FIS) and other types of opponents who did not fully support it. The intelligence service and a military clique known as the "eradicationists" waged a full-scale war (called the "dirty war") for the total control of society. In the name of secularism and to convince the population of the necessity of a strong rule, they did not hesitate to manipulate violent, allegedly Islamist groups to organize slaughters and nasty mass bombings, especially during the years 1997-98 (Mellah, 2020).[37] Impressed by the regime's effec-

[37]Revealingly, the "Groupe Islamique Arme" (GIA, or Armed Islamic Group), widely considered to be a branch of Al-Qaida, was called by ordinary people the "Islamist Groups of the Army", so evident was the infiltration of key intelligence officials in their structure (G¿ze, 2020: 54). The same applied to the "Groupe Salafiste pour la

tive propaganda, 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).

Let us now turn to an example symmetric to the twin cases of Salman's Saudi Arabia and Bouteflika's Algeria: an exogenous shock caused the fraction of supporting clerics, γ^*, to increase rather than decrease. The example is drawn from modern Iraq, and specifically concerns a major change of tactic under Saddam Husayn's rule.[38]

Post-independent Iraq quickly adopted an authoritarian model of governance justified by a romantic view of pan-Arabic unity and a sort of socialist approach to development (Makiya, 1998: 208-9). The rule of Saddam Husayn, who seized power through brutal force (and was the effective power since the late 1960s), did not depart from this tradition, yet underwent a major change after disastrous wars considerably weakened the regime. In the initial phase, Saddam was eager not to antagonize the official clergy and, besides appointing to positions of responsibility Shi'a clerics whom he wanted to draw into the network of his patronage, he paid lip service to Islamic values whenever the opportunity arose (Tripp, 2000: 209-11). Whether the regime in this initial period is to be described as one of exclusive co-option of the military or one of double co-option with mild seduction of the clerics is a debatable question into which we need not enter here.

What matters for us is the turnaround operated by Husayn toward the end of the 1970s and the early 1980s when major changes occurred in the international environment of the country, namely the rise of Ayatollah Khomeini to power in Iran (1979) and the subsequent stirrings of a Shi'i revolt in southern Iraq, as well as Saddam's catastrophic miscalculation in

Pr®dication et le Combat" (GSPC, or Salafist Group for Preaching and Struggle), which relayed the GIA for executing the dirty work of the regime (it started in 1997 and was especially active in 2010). Finally, the intelligence service apparently placed one of its men at the head of the Islamist organization "Exil et Expiation" (Exile and Expiation) during the 1980s (Laribi, 2007: 53).

[38]Note that the discussion below constitutes a re-interpretation of an example presented in Auriol and Platteau, 2017a, and discussed in more detail in Platteau, 2017: 238-46.

the war with Iran and the invasion of Kuwait.[39] As a result of the wars the army was extremely weak (i.e., λM became quite low). Consistently with our analysis, the response of Saddam Husayn to these shocks is what Baram (2014) calls "a revised, 'Shi'ified' version of his earlier blood-and-soil nationalism adapted to the political necessity of the time" (63). The central motivation behind this metamorphosis was a strategic and cynical calculation aimed at regaining lost legitimacy through continuous appeals to religion. A major step in Saddam's about-face coincided with the 9th Congress of the Regional Command of the Bath (1982) on the occasion of which the significance of religion, together with the primacy of Iraq, was stressed with special vigour (Tripp, 2000: 228). His fear of the allegiances of the Shi'a footsoldiers who formed the bulk of Iraq's conscript army prompted him to stress the Arab identity of the Iraqi Shi'a and the Islamic credentials of the regime.[40]

More ominously, new laws were enacted that were repressive and regressive. Thus, in March 1992, the regime cracked down on nightclubs and discotheques, imposed Ramadan fasting, outlawed prostitution (punishable by death) and banned public alcohol consumption, allowing only non-Muslims to sell spirits. Even more worrying were laws that provided for barbaric penalties.[41] The Islamization of the regime's rhetoric gradually

[39]Some of these adverse shocks, the rise of Khomeini in particular, were clearly not of Saddam's own making, and cannot therefore be considered as endogenous. This is also somehow true of Kuwait's invasion which was probably a snare put up by the United States. As for his declaration of war with Iran, it resulted from his belief that Iran had been considerably weakened by the revolution of the ayatollahs and its army would therefore be easily quashed in a head-on confrontation with the well-trained and well-equipped Iraqi army.

[40]In January 1991, in an act that was clearly unconstitutional, he requested that the words Allah Akbar ('God is great') be written on the Iraqi flag, and publicly declared that the Iraqi flag had become "the banner of jihad and faith ... against the infidel horde" (Baram, 2014: 207-208). His seductive tactics now included the rebuilding of Shi'a mosques and places of pilgrimage, the declaring of Iraqi territory as sacred because it contained the soil of Najaf and Karbala (the two Shi'a holy cities), the imposition of the birthday of the fourth caliph, the imam Ali, as a national holiday, and the extravagant proclamation that he, Saddam, was a descendant of this central figure for all Shi'i Muslim believers, thus reinventing himself as the undisputed religious authority of all people of Iraq (Tripp, 2000: 238; Polk, 2005: 12; Baram, 2014: 63, 221, 261, 329; Benraad, 2015: 76-77).

[41]To illustrate, as per RCC Decree No 59 of June 4, 1994, amputation of the hand at the wrist was introduced to punish theft and robbery -which had become widespread as

intensified and culminated in the so-called "Campaign for the Faith" (1993-2003) which did seriously affect the legal and educational system. Saddam thus embarked upon a massive educational effort to impose the study of the Quran and the Hadith, starting from the first grade of primary school and doubling or tripling the amount of time devoted to it in all Iraqi schools. Concomitantly, separation between boys and girls at school was imposed from the same first grade. Saddam even forced the senior party members to take Quran classes lasting up to two years, and he exerted strong pressures on adults, especially the big merchants, to the same effect. Then, he proceeded by giving the reciting of the Quran a dominant place in the educational system, placing students (at the expense of their school holidays) for months every year in the mosques, and instructing the Ministry of Education to impose new examinations to test every teacher's knowledge of Islam. Religion teachers were offered a bonus over their ordinary salary, and knowledge of the Quran was made a required subject on the general matriculation examination (Baram, 2014: 220-1, 254-58). Finally, women's status, which had improved remarkably during the first decades of the Ba'ath revolution (especially under Quasim), suffered a frontal attack at the height of the faith campaign: they were thus prohibited from travelling abroad unless accompanied by a male relative from the paternal side of their immediate family.

All the above drastic steps were unheard of in Iraqi history. Given Saddam's previous commitment to the Baathist ideology with its emphasis on secularism and Arabism rather than Islam (in 1977, he declared that the sharia was irrelevant to modern life), his strategic U-turn appears odd and even surrealistic. This is especially so because of its obvious economic cost, particularly evident for the measures touching on education and women's status. The fact of the matter is that, to restore his legitimacy, Saddam mostly wanted to please senior Sunni and less senior Shi'a clerics whose prestige and material status were given a major boost consistently with

a result of the deepening economic crisis-, and amputation of the left foot at the ankle was to sanction second offenses. Subsequent decrees enlarged the definition of theft and robbery to make the draconic punishments applicable to unauthorized money changers, forgers of official documents, merchants, and profiteering bakers (Dawisha, 2009: 238; Baram, 2014: 265-67, 321).

the theoretical predictions.[42] As is usual in this type of situation, ordinary people increasingly turned to religion and paid growing attention to the speeches of religious clerics who became more sensitive to their ordeals and less reluctant to assert their views, including criticisms against the regime.

In terms of our theory, Saddam's radical turnabout is best seen as the outcome of an abrupt fall in $F(M)$, the regime's strength, through the diminished size of the army, M, as a result of the dramatic losses suffered during the war with Iran, the reduced efficiency of an army, λ, demoralized by defeats and plagued by the tensions between Sunni officers and Shi'a footsoldiers, and the considerable loss of legitimacy and prestige L of Saddam. All these forces contributed to cause an increase in γ^* (remember that $\gamma^* = 1 - F(M)$). Instead of viewing the change as having happened within a regime of double co-option, we can analyze it as the outcome of a change of regime proper: it then consists of a shift from a regime of exclusive co-option of the military to a regime of double co-option following a drastic reduction in $F(M)$. This interpretation implies that γ^* increased from zero to a positive value. In the new equilibrium, too, and the level of reforms, $\alpha^{op} = \alpha^*(\Theta)$, is considerably lower than before the shock. Under co-option, this comes from the fact that Θ has increased as a result of the fall in $F(M)$. Under a regime shift, α^{op} is equal to $\alpha^*(\Theta)$ and no longer to α^m, which was higher.

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.

[42] In the words of Baram (2014): "by upgrading their socioeconomic status, he [Saddam] could hope to buy off the clerics, and through them gain much-needed public support." (p. 257).

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 are able to 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 wage bill paid to the military and the magnitude of reforms increase with the army size. Our analysis shows that religious support decreases because the positive effect caused by a greater deterrent power of the army is counteracted by the negative effect of a bolder reform program.

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 magnitude of reforms under the 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, it is not necessarily the case that only the interests of the military will be taken into account. Thus, 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), and when the clerics are rather easy to seduce because of the low cost of abstaining from reforms, the autocrat will simultaneously choose to seduce clerics and to equip himself with an army of moderate size. If the former condition is fulfilled but not the latter (clerics are costly to buy because economic growth requires a progressive institutional environment), he will choose a large army size and ignore the clerics. If the former condition is violated (the threshold for the military coup exceeds the exclusive co-option threshold), the regime in which only the military are co-opted always prevails.

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 comparatively 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 abundant oil resources create the conditions of a rent economy. The autocrat does not need to carry out reforms to obtain rents. He chooses the double co-option regime and a very low level of reforms to please the clerics, including the ultra-conservative ones, and enlist them massively. In other and more frequent situations, 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. It implies that only a fraction of the clerics (the moderate ones) endorses the regime's policies. The clerics are then strongly polarized between official clerics, who are loyal and even subservient to the autocratic regime, and non-official clerics, who stand in opposition to it.

Finally, our empirical discussion highlights interesting cases where the pace of reforms, itself determined by the degree of the autocrat's reliance on religious clerics, has changed abruptly in response to new circumstances well captured by parameters of the model.

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, not only autocracies will persist, which is unfortunately what we have observed over many centuries in the Muslim world (Blaydes and Chaney, 2013), but more importantly that they will tend to be stuck in an equilibrium of double co-option with very few economic reforms.

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 regime continues to prevail, led by 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. This is vividly attested in the case of Algeria. The rise of General Gad Salah on the occasion of the "hirak" (movement in Arabic) reflected the domination of the military clan (or mafia as the population calls it) over the clan of the intelligence services led by General Tewfik Mediene and allied to Sad Bouteflika, the brother of the overthrown president (Benderra et al., 2020). The important point is that, despite the removal of some figureheads, including presidents,and the elimination of some rival clans aimed at appeasing popular anger, the logic of the autocratic system and the co-opted nature of its narrow elite remain 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, they tend to return to the back seat as soon as they have found the right front figure to stabilize the country and preserve the status quo (for example, Imran Khan in Pakistan). That in all these respects Tunisia seems to be an exception to the rule has much to do with the weak role the military have played in that country since its independence. Where, however, Tunisia resembles other countries where an Arab Spring took place, such as Egypt, Syria and Algeria, is in the deep divisions that sap its secular democratic movement. These divisions, and the associated personal antagonisms, are the nasty legacy of enduring authoritarian practices within the society and the polity.

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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 (14) and (16), for given values of λ, M, w_c, α and L, the equilibrium number of clerics $(1-\gamma^*)$ opposing the regime and the average equilibrium signal threshold $\overline{L^*}$ are obtained from the system:

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

Solving for the interior solution in γ^* yields:

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

Restricting γ^* to be between 0 and 1 we obtain (17). QED

7.2 Comparative statics on the clerics' wage in the double co-option regime

- **Effect of $F(M)$**

From (24) in the main text, the equilibrium clerics wage writes as:

$$w_c^{op} = \frac{\theta^c V(\alpha^*(\Theta))}{F(M)} \tag{31}$$

and from (22),

$$\Theta = \frac{1 - F(M)}{F(M)}\theta^c + \theta^m$$

Given that $F(M) = \frac{\lambda M + L}{s}$, all the effects of M, λ, s and L on w_c^{op} run through the effect of $F(M)$ on w_c^{op}. Bearing in mind that

$$R'(\alpha^*) = \Theta V'(\alpha^*)$$

we get

$$\begin{aligned}\frac{d\alpha^*}{d\Theta}\frac{\Theta}{\alpha^*} &= \frac{V'(\alpha^*)\Theta}{R"(\alpha^*)\alpha^* - \Theta V"(\alpha^*)\alpha^*} = \frac{R'(\alpha^*)}{R"(\alpha^*)\alpha^* - \Theta V"(\alpha^*)\alpha^*} \\ &= \frac{1}{\frac{R"(\alpha^*)\alpha^*}{R'(\alpha^*)} - \Theta\frac{V"(\alpha^*)\alpha^*}{R'(\alpha^*)}} = \frac{1}{\frac{R"(\alpha^*)\alpha^*}{R'(\alpha^*)} - \frac{V"(\alpha^*)\alpha^*}{V'(\alpha^*)}} < 0\end{aligned}$$

In absolute terms, the elasticity of the magnitude of reforms with respect to social (aggregate) aversion to them is written as:

$$\epsilon_\Theta^{\alpha^*} = -\frac{d\alpha^*}{d\Theta}\frac{\Theta}{\alpha^*} = \frac{1}{\frac{-R"(\alpha^*)\alpha^*}{R'(\alpha^*)} + \frac{V"(\alpha^*)\alpha^*}{V'(\alpha^*)}}$$

Note that this elasticity $\epsilon_\Theta^{\alpha^*}$ depends on the shapes of the revenue function $R(\alpha)$ and the cost function $V(\alpha)$. In particular, it is inversely related to the concavity of $R(\alpha)$ and the convexity of $V(\alpha)$. More specifically, $\epsilon_\Theta^{\alpha^*}$ is expected to be quite high in a resource-rich economy ($R(\alpha)$ is very concave) and in the presence of radical clerics intensely opposed to modernization ($V(\alpha)$ is very convex).

Given that

$$\Theta = \theta^c\left(\frac{1}{F} - 1\right) + \theta^m$$

we have

$$\frac{d\Theta}{dF}\frac{1}{\Theta} = -\frac{\theta^c}{\Theta}\frac{1}{(F)^2}$$

Log differentiation of (31) provides:

$$\frac{dw_c^{op}}{w_c^{op}} = \left[\left(\frac{V'(\alpha^*)\,\alpha^*}{V(\alpha^*)}\right)\cdot\left(\frac{d\alpha^*}{d\Theta}\frac{\Theta}{\alpha^*}\right)\cdot\left(\frac{d\Theta}{dF}\frac{1}{\Theta}\right) - \frac{1}{F}\right]dF$$

or

$$\frac{dw_c^{op}}{dF}\frac{1}{w_c^{op}} = \frac{1}{F}\left[\epsilon_\alpha^V\cdot\epsilon_\Theta^{\alpha^*}\frac{\theta^c}{\Theta}\;\frac{1}{F} - 1\right]$$

where $\epsilon_\alpha^V = \frac{V'(\alpha)}{V(\alpha)}\alpha$ is the cost elasticity of reform for the clerics (more precisely, the elasticity of the clerics' disutility with respect to reform level). Substituting the value of Θ, one gets

$$\frac{dw_c^{op}}{dF}\frac{1}{w_c^{op}} = \frac{1}{F}\left[\epsilon_\alpha^V\cdot\epsilon_\Theta^{\alpha^*}\frac{\theta^c}{\theta^c(1-F)+\theta^m F} - 1\right]$$

Thus, w_c^{op} is increasing in $F(M)$ if and only if

$$\epsilon_\alpha^V\cdot\epsilon_\Theta^{\alpha^*} > \frac{(1-F(M))\,\theta^c + F(M)\theta^m}{\theta^c} \tag{32}$$

which is (27) in the main text.

- **Effect of average clerics' reform aversion, θ^c**

  Log differentiation with respect to θ^c provides $\Theta = \theta^c\left(\frac{1}{F(M)} - 1\right) + \theta^m$

$$\begin{aligned}\frac{dw_c^{op}}{w_c^{op}} &= \frac{d\theta^c}{\theta^c} - \epsilon_\alpha^V\cdot\epsilon_\Theta^{\alpha^*}\cdot\frac{d\theta^c}{\Theta}\frac{1-F}{F}\\ &= \frac{d\theta^c}{\theta^c}\left[1 - \epsilon_\alpha^V\cdot\epsilon_\Theta^{\alpha^*}\frac{\theta^c(1-F)}{\theta^c(1-F)+\theta^m F}\right]\end{aligned}$$

and consequently w_c^{op} to be increasing in θ^c if and only if

$$1 > \epsilon_\alpha^V\cdot\epsilon_\Theta^{\alpha^*}\frac{\theta^c(1-F)}{\theta^c(1-F)+\theta^m F}$$

which is equivalent to (28).

- **Constant elasticity specification and comparative statics of w_c^{op}**

QED.

7.3 Proof of Proposition 3

The payoff function of the Ruler is

$$W(M) = \begin{cases} R\left(\alpha^*(\Theta)\right) - \Theta V(\alpha^*(\Theta)) - \max\{R_m^\delta - C(M), 0\} & \text{if } M < \frac{s-L}{\lambda} \\ R\left(\alpha^m\right) - \theta^m V(\alpha^m) - \max\{R_m^\delta - C(M), 0\} & \text{if } M \geq \frac{s-L}{\lambda} \end{cases}$$

Note that $\frac{d\Theta}{dM} = -\frac{\theta^c \lambda s}{(\lambda M + L)^2}$. Moreover $F(M) = \frac{\lambda M + L}{s} < 1$ so that at $M = \frac{s-L}{\lambda}$ we have that $F\left(\frac{s-L}{\lambda}\right) = 1$ and $\Theta = \theta^m$. Therefore, $\alpha^*(\Theta(\frac{s-L}{\lambda})) = \alpha^*(\theta^m) = \alpha^m$.

Taking the derivatives of the autocrat payoff functions $W(M)$ and applying the envelope theorem yields:

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

$$W'(M) = \begin{cases} V(\alpha^*(\Theta)) \frac{\theta^c \lambda s}{(\lambda M + L_0)^2} & \text{if } M < \frac{s-L}{\lambda} \\ 0 & \text{if } M \in \left[\frac{s-L}{\lambda}, M_c\right[\\ C'(M) & \text{if } M_c \leq M \end{cases} \tag{33}$$

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

$$W'(M) = \begin{cases} V(\alpha^*(\Theta)) \frac{\theta^c \lambda s}{(\lambda M + L_0)^2} & \text{if } M < M_c \\ V(\alpha^*(\Theta)) \frac{\theta^c \lambda s}{(\lambda M + L_0)^2} + C'(M) & \text{if } M \in \left[M_c, \frac{s-L}{\lambda}\right[\\ C'(M) & \text{if } \frac{s-L}{\lambda} \leq M \end{cases} \tag{34}$$

Bearing in mind that $C(M)$ is decreasing in M, from (33) and (34), it is evident that $W(M)$ is increasing in M for $M < \min\left\{M_c, \frac{s-L}{\lambda}\right\}$, and decreasing in M for $M > \max\left\{M_c, \frac{s-L}{\lambda}\right\}$. The optimal army size then lies necessarily between $\min\left\{M_c, \frac{s-L}{\lambda}\right\}$ and $\max\left\{M_c, \frac{s-L}{\lambda}\right\}$.

Differentiation in this range of the parameters provides

$$\begin{aligned} \frac{d}{dM}\left(\frac{\theta^c \lambda s V(\alpha^*(\Theta))}{(\lambda M + L_0)^2}\right) &= \frac{(s\lambda\theta^c)^2}{(\lambda M + L_0)^4} \frac{\left[V'(\alpha^*(\Theta))\right]^2}{\Theta V''(\alpha^*(\Theta)) - R''(\alpha^*(\Theta))} \\ &\quad - \frac{2s\theta^c\lambda^2}{(\lambda M + L_0)^3} V(\alpha^*(\Theta)) \end{aligned} \tag{35}$$

so that

$$\begin{aligned} \frac{d}{dM}\left(\frac{\theta^c \lambda s V(\alpha^*(\Theta))}{(\lambda M + L_0)^2} + C'(M)\right) &= \frac{(s\lambda\theta^c)^2}{(\lambda M + L_0)^4} \frac{\left[V'(\alpha^*(\Theta))\right]^2}{\Theta V''(\alpha^*(\Theta)) - R''(\alpha^*(\Theta))} \\ &\quad - \frac{2s\theta^c\lambda^2}{(\lambda M + L_0)^3} V(\alpha^*(\Theta)) + C"'(M) \end{aligned} \tag{36}$$

Since $C''(M) \leq 0$, a sufficient condition for the concavity of the function $W(M)$ is simply that the RHS of (35) is negative. This rewrites as :

$$s\theta^c \left[V'(\alpha^*(\Theta))\right]^2 \leq 2\left(\lambda M + L_0\right) V(\alpha^*(\Theta)) \left[\Theta V''(\alpha^*(\Theta)) - R''(\alpha^*(\Theta))\right] \quad (37)$$

Therefore when the functions $R(.), C(.)$ are concave enough, and $V(.)$ is convex enough, the term on the RHS of (36) is negative. For all values of M, the objective function $W(M)$ is then concave in the Military size M. For instance, consider the quadratic payoff and disutility 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 (37) is then equivalent to $\theta^c - \theta^m \leq \frac{\varphi}{v}$.

- For $R_m^\delta \leq C(\frac{s-L}{\lambda})$, it is clear that the function $W(M)$ is increasing in the range $M < \frac{s-L}{\lambda}$, flat in the interval $M \in \left[\frac{s-L}{\lambda}, M_c\right[$ and decreasing for $M_c \leq M$. Hence the optimal size of the Military $M^{op} \in \left[\frac{s-L}{\lambda}, M_c\right[$ and regime B prevails.

- For $R_m^\delta > C(\frac{s-L}{\lambda})$, 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 $\frac{s-L}{\lambda}$ $W'_-\left(\frac{s-L}{\lambda}\right)$ is positive, again the concavity of $W(M)$ and the fact that $W(M)$ is decreasing in the range $M \geq \frac{s-L}{\lambda}$ implies that M^{op} is equal to $\left(\frac{s-L}{\lambda}\right)_+$. Finally in the last case where $W'_+(M_c) > 0 > W'_-(\frac{s-L}{\lambda})$, we obtain that the interior solution $M^* \in \left]M_c, \frac{s-L}{\lambda}\right[$ from the FOC

$$W'(M) = C'(M) + \frac{s\lambda\theta^c}{\left[\lambda M + L_0\right]^2} V(\alpha^*(\Theta)) = 0$$

QED.

7.4 Derivation of Figure 3 in the space (L,s)

- **Equilibrium regimes with endogenous military size (Figure 2)**

i) Condition $R_m^\delta = C(\frac{s-L}{\lambda})$, which delimits regime B in Proposition 3, is obviously defined by the locus $s = L + \lambda M_c$ which provides a line with a 45 degrees slope and intercept $s = \lambda M_c$ at $L = 0$

ii) Condition $W'_-\left(\frac{s-L}{\lambda}\right) = 0$, which characterizes the boundary of the double co-option region A', is:

$$W'_-(\frac{s-L}{\lambda}) = C'(\frac{s-L}{\lambda}) + \frac{\lambda\theta^c}{s}V(\alpha^m) = 0$$

as $\Theta = \theta^m$ at $M = \frac{s-L}{\lambda}$. This can be rewritten as

$$-sC'(\frac{s-L}{\lambda}) = \lambda\theta^c V(\alpha^m) \tag{38}$$

The function $\varphi(s) = -sC'(\frac{s-L}{\lambda})$ is an increasing function of s (as $C' < 0$ and $C'' < 0$) with $\varphi(L) = 0$ (assuming $C'(0) = 0$) and $\lim_{s\to\infty}\varphi(s) = +\infty$. Therefore, (38) defines a threshold $s = \widetilde{s}(L) \in [L, +\infty[$. Differentiation provides

$$\frac{d\widetilde{s}}{dL} = \frac{-\frac{s}{\lambda}C''(\frac{s-L}{\lambda})}{-C'(\frac{s-L}{\lambda}) - \frac{s}{\lambda}C''(\frac{s-L}{\lambda})} \in (0,1)$$

and $\widetilde{s}(L)$ is an increasing function of L with $d\widetilde{s}/dL \in (0,1)$.

iii) Note that at $L = 0$, the intercept of the locus $s = L + \lambda M_c$ is obviously λM_c. Conversely, the intercept of the locus $s = \widetilde{s}(L)$ is $\widetilde{s}_0$ characterized by $-\widetilde{s}_0 \cdot C'(\frac{\widetilde{s}_0}{\lambda}) = \lambda\theta^c V(\alpha^m)$. It is easy to see that $\widetilde{s}_0 > \lambda M_c$ as shown in figure ?a) if and only if

$$-M_c \cdot C'(M_c) < \theta^c V(\alpha^m)$$

We assume this condition to be satisfied (ie, M_c is small enough and/or θ^c is large enough).

iv) Finally it is easy to see that the two locus $s = \widetilde{s}(L)$ and $s = L + \lambda M_c$ intersect at the point $\left(L^W, s^W\right)$ such that

$$s = L + \lambda M_c \text{ and } -sC'(\frac{s-L}{\lambda}) = \lambda\theta^c V(\alpha^m)$$

or

$$s^W = \frac{\lambda\theta^c V(\alpha^m)}{-C'(M_c)},\ L^W = \lambda\frac{\theta^c V(\alpha^m) + M_c \cdot C'(M_c)}{-C'(M_c)} > 0$$

Considerations i), ii) , iii) and iv) provide the construction of figure ?a). **QED**.

- **Comparative statics of equilibrium regimes (Figure 3**

i) An increase in λ clearly shifts upwards the locus $s = L + \lambda M_c$, while the impact of a shift of λ on the locus $s = \widetilde{s}(L)$ is obtained by partial differentiation of (38):

$$\frac{\partial \widetilde{s}(L)}{\partial \lambda} = \frac{-s\frac{s-L}{\lambda^2}C''(\frac{s-L}{\lambda}) + \theta^c V(\alpha^m)}{-C'(\frac{s-L}{\lambda}) - \frac{s}{\lambda}C''(\frac{s-L}{\lambda})} > 0$$

Clearly, the locus $s = \widetilde{s}(L)$ is shifted upwards by an increase in λ. These two shifts have the effect of shrinking the region in which double co-option prevails at equilibrium.

ii) An increase in R_m^δ due to a larger value of δ (increased ability of the military to capture rents when in power) translates into a decrease in M_c. This obviously shifts the locus $s = L + \lambda M_c$ downwards while the locus $s = \widetilde{s}(L)$ is not affected. What takes place is thus an expansion of the region with double co-option.

iii) An increase in θ^c obviously does not move the locus $s = L + \lambda M$ while it shifts the locus $s = \widetilde{s}(L)$ upwards. We indeed have that

$$\frac{\partial \widetilde{s}(L)}{\partial \theta^c} = \frac{\lambda V(\alpha^m)}{-C'(\frac{s-L}{\lambda}) - \frac{s}{\lambda}C''(\frac{s-L}{\lambda})} > 0$$

This leads to an enlarged region under regime B' at the expense of the double co-option regime A'.

iv) A decrease in θ^m causes an increase in both R_m^δ and in α^m. The former effect shifts the locus $s = L + \lambda M_c$ downwards while the latter effect shifts the locus $s = \widetilde{s}(L)$ upwards. It is indeed the case that

$$\frac{\partial \widetilde{s}(L)}{\partial \alpha^m} = \frac{\lambda \theta^c V'(\alpha^m)}{-C'(\frac{s-L}{\lambda}) - \frac{s}{\lambda}C''(\frac{s-L}{\lambda})} > 0$$

What happens is an expansion of the region under regime B'. The region under double co-option is enlarged but only for high enough values of s and L (for intermediate values, it is narrowed down).

QED.