

Online Appendix

Structured Stability Spending in Late Modern Empires: Japan, Germany, Ottoman State, and Brazil

JSPS Postdoctoral Fellow (2021-2023)

Tohoku University, Sendai, Japan

austin.mitchell.e7@tohoku.ac.jp

<https://www.austin-mitchell.com/>

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Formal Model

This section provides details about the exact spending functions, proof of the Proposition, and the conditions under which the equilibrium occurs.

Model setup

Table 1 restates the definitions of the model parameters. I adopt parameter notation where lower case Latin letters are actor choices, capitalized Latin letters are sums of allocations or cutpoints that depend on actor choices, and lower case Greek letters are probabilities or exogenous parameters.

Table 1: Model parameters

| Parameter | Definition |
|-----------|--|
| F | empire's finances |
| B | regime's budget |
| r | spending on repression |
| p | spending on the public |
| g | emperor's graft |
| δ | contraction due to conflict |
| ϕ | probability opposition wins a rebellion |
| α | opposition's ability to mobilize |
| σ | share of public spending that promotes rebellion success |

The opposition's probability of winning a conflict is:

$$\phi = \frac{\alpha}{r - \sigma p} \quad (1)$$

I analyze the model by backward induction. First, I determine the conditions under which the opposition will rebel or not. Then I determine the emperor's optimal budget allocation and graft according to when the opposition rebels and does not rebel. Lastly, I assess how the emperor chooses between different budget allocation options.

The opposition's decision criteria of accepting the status quo versus not rebelling is:

$$p \geq \delta(p+g) \left(\frac{\alpha}{r-\sigma p} \right) \quad (2)$$

The emperor's budget constraint is:

$$F = r + p + g \quad (3)$$

Budget allocations under peace

In order for the emperor to secure the regime, they must allocate regime spending such that Equation 2 holds with the budget constraint of Equation 3. This becomes a constrained optimization problem where:

$$\max_{r,p,g} g \quad (4)$$

$$\text{s.t. } p - \delta(p+g) \left(\frac{\alpha}{r-\sigma p} \right) = 0, \quad (5)$$

$$F = r + p + g. \quad (6)$$

If the emperor expects that the opposition will not rebel, they allocate:

$$r^* = (2\sigma + 1) \sqrt{\frac{\alpha\delta(\alpha\delta\sigma + F)}{\sigma + 1}} - 2\alpha\delta\sigma \quad (7)$$

$$p^* = \sqrt{\frac{\alpha\delta(F + \alpha\delta\sigma)}{(\sigma + 1)}} - \alpha\delta \quad (8)$$

$$g^* = -2\sqrt{\alpha\delta(\sigma + 1)(\alpha\delta\sigma + F)} + \alpha(2\delta\sigma + \delta) + F \quad (9)$$

These allocations determine the patterns of regime spending that are the basis of the main hypothesis and Proposition 1. The peacetime budget allocations for r^* , p^* , and g^* require minimal finance, $F > \alpha\delta$.

Proof of Proposition 1

In order to obtain $\frac{\partial r^*}{\partial B}$ and $\frac{\partial p^*}{\partial B}$ for Proposition 1, I define $F = F_b$ in terms of B by:

$$F = B + g \quad (10)$$

$$B = F - g \quad (11)$$

$$B = F - (-2\sqrt{\alpha\delta(\sigma+1)(\alpha\delta\sigma+F)} + \alpha(2\delta\sigma + \delta) + F) \quad (12)$$

$$F_b = \frac{(b + \alpha\delta(2\sigma + 1))^2}{4\alpha\delta(\sigma + 1)} - \alpha\delta\sigma \quad (13)$$

Then plugging in F_b into $\frac{r^*}{B}$ and $\frac{p^*}{B}$ yields:

$$\frac{r^*}{B} = \frac{B(2\sigma + 1) + \alpha\delta}{2B(\sigma + 1)} \quad (14)$$

$$\frac{p^*}{B} = \frac{B - \alpha\delta}{2B(\sigma + 1)} \quad (15)$$

The first derivatives of equations 14 and 15 are:

$$\frac{\partial}{\partial B} \frac{r^*}{B} = -\frac{\alpha\delta}{2B^2(\sigma + 1)} \quad (16)$$

$$\frac{\partial}{\partial B} \frac{p^*}{B} = \frac{\alpha\delta}{2B^2(\sigma + 1)} \quad (17)$$

Proposition 1 that $\frac{\partial}{\partial B}(\frac{r^*}{B}) < 0$ and $\frac{\partial}{\partial B}(\frac{p^*}{B}) > 0$ holds since $\alpha\delta > 0$.

Budget allocations under conflict

When the emperor expects rebellion, the optimization problem becomes:

$$\max_{r_c, p_c, g_c} \delta g_c (1 - \phi_c) \equiv \delta g_c \left(1 - \frac{\alpha}{\delta(r_c - \sigma p_c)} \right) \quad (18)$$

$$\delta F = \delta(r_c + p_c + g_c). \quad (19)$$

When the opposition is rebelling, the emperor allocates r_c and p_c spending on the budget, and allocates g_c in graft. Each of these allocations are reduced by δ in the players' payoffs. The emperor only obtains δg_c if the regime wins the conflict. The optimum allocations are:

$$r_c^* \equiv \frac{\sqrt{\alpha F}}{\delta} \quad (20)$$

$$p_c^* \equiv 0 \quad (21)$$

$$g_c^* \equiv F - \frac{\sqrt{\alpha F}}{\delta} \quad (22)$$

The conflict budget allocations require minimal finance, $F > \frac{\alpha}{\delta}$.

Proof of equilibrium outcomes

Lastly, the emperor must decide if they prefer securing the regime by spending r^* , p^* , and obtaining g^* or if they prefer allowing the opposition to rebel while spending r_c^* , p_c^* , and allocating g_c^* . Note that when there is no rebellion, the emperor simply enjoys graft g^* . But if rebellion occurs, their expected utility is $\delta g_c^* (1 - \phi_c) \equiv \delta g_c^* \left(1 - \frac{\alpha}{\delta r_c^*} \right)$ since the amounts of g_c and r_c are reduced by the

loss of finances δ . The emperor will choose allocations that secure the regime if $S \geq 0$, or:

$$S \equiv g^* - \delta g_c^* \phi_c \geq 0 \quad (23)$$

which is:

$$S \equiv F(1 - \delta) + 2\delta \sqrt{\frac{F\alpha}{\delta}} - 2\sqrt{\alpha\delta \cdot (\sigma + 1)(\alpha\delta\sigma + F)} + \alpha \cdot (2\delta\sigma + \delta - 1) \quad (24)$$

It is not clear just by looking at equation 24 whether S is increasing or decreasing in F or δ . To better understand $\frac{\partial S}{\partial F}$ and $\frac{\partial S}{\partial \delta}$, I plot the security function S across values of finances F and at multiple example values of contraction δ . Figure 1 below provides these comparisons. In the plots, $\alpha = 1$, $\sigma = 0.5$, and $F > \frac{\alpha}{\delta}$.

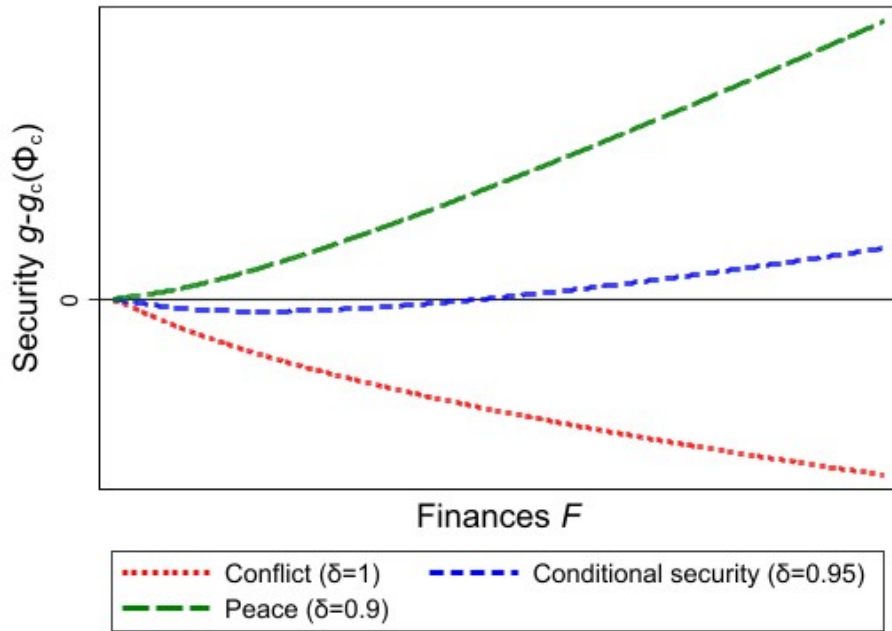


Figure 1: The emperor determines peace versus conflict according to finances and contraction.

When contraction from conflict is negligible, such as $\delta = 1$ in Figure 1, then the emperor prefers a budget allotment that induces conflict but boosts graft. When contraction is substantial, such as $\delta = 0.9$ in Figure 1, emperors always prefer to avoid conflict. Somewhere between negli-

gible and substantial contraction, emperors prefer conflict when regime finances are low but prefer to avoid it when finances are greater. As I discuss in the main text, these conditions correspond to major findings in the comparative politics literature on development and conflict.

The two equilibrium outcomes are:

If $S \geq 0$ then Peace:

Emperor allocates r^* and p^* and the opposition does not rebel.

The emperor receives g^* and the opposition receives p^* .

This requires $F > \alpha\delta$.

If $S < 0$ then Conflict:

Emperor allocates r_c^* and p_c^* and the opposition rebels.

The emperor expects $\delta g_c^*(1 - \phi_c)$ and the opposition expects $\delta g_c^*\phi_c$.

This requires $F > \frac{\alpha}{\delta}$.

Robustness Check: Exclude Pensions

The analysis in the main text includes government and military pension and disability funds within the definition of public spending. These programs were for government employees and the military, not general purpose social insurance. See the section on Case Analysis, below, for plots of the subcategories of public spending for each country.

There are good arguments both for and against including these limited types of pension and disability funding in the operationalization of public spending. On one hand, former government and military employees may be important members of an opposition. Payments to support these groups likely help a regime deter defection and rebellion. On the other hand, these are limited funds that do not benefit the public at large. Nearly no countries during this time period had public pensions systems. Germany created their public system in 1889.

As a robustness check, Table 2 below reports the results for tests where public spending excludes government spending on pensions and disability, specifically in Germany and Turkey. The results from this extended analysis match the results from the main text in direction, magnitude, and statistical significance for all regimes, with the lone exception of public spending during the Bismark era of the German Empire. The marginal effect of 1.208 has the expected sign but is not statistically significant. In the main text this marginal effect is 2.342, and the difference in magnitude between these two values is quite small. The results for the Wilhelm II era of Germany do not change. This means that spending patterns in the earlier Bismark regime conform to the hypothesis less than the Wilhem II regime, which matches the temporary patterns in Japan and Brazil.

Table 2: Results are robust to excluding pensions

| | Repression % | | Public % | |
|---|--------------|---------------------------------|-----------|---------------------------------|
| | (1) | $\frac{\partial y}{\partial x}$ | (2) | $\frac{\partial y}{\partial x}$ |
| Δ (log) Revenue (Meiji Empire of Japan) | -0.892 | -0.892 | -9.128*** | -9.128*** |
| | (2.156) | (2.156) | (1.122) | (1.122) |
| Taisho Japanese Empire $\times \Delta$ (log) Rev. | -19.804*** | -20.696*** | 14.489*** | 5.361** |
| | (6.166) | (4.517) | (2.770) | (2.144) |
| Abdülhamid II Ottoman Empire $\times \Delta$ (log) Rev. | -27.557*** | -28.448*** | 18.913*** | 9.785*** |
| | (6.329) | (5.172) | (3.015) | (2.809) |
| Bismark German Empire $\times \Delta$ (log) Rev. | -2.410 | -3.302* | 10.336*** | 1.208 |
| | (3.947) | (1.925) | (2.276) | (1.220) |
| Wilhelm II German Empire $\times \Delta$ (log) Rev. | -5.434*** | -6.326*** | 16.558*** | 7.430*** |
| | (1.033) | (1.155) | (0.499) | (0.644) |
| Brazilian Empire $\times \Delta$ (log) Rev. | -3.271 | -4.163*** | -3.018 | -12.146*** |
| | (3.344) | (1.234) | (1.836) | (0.739) |
| Brazilian Republic - authoritarian $\times \Delta$ (log) Rev. | 16.163*** | 15.272*** | 3.877*** | -5.251*** |
| | (2.642) | (0.510) | (1.414) | (0.306) |
| First Brazilian Republic $\times \Delta$ (log) Rev. | -9.207*** | -10.099*** | 32.335*** | 23.206*** |
| | (1.782) | (0.403) | (0.898) | (0.241) |
| Post-WWI | -0.198 | | 2.166** | |
| | (1.657) | | (1.069) | |
| Internal conflict | 6.804*** | | -0.307 | |
| | (0.540) | | (0.323) | |
| External conflict | -0.189 | | -0.483 | |
| | (1.412) | | (0.954) | |
| External default | 11.753*** | | 1.080** | |
| | (0.898) | | (0.538) | |
| Time | 0.091 | | -0.089 | |
| | (0.135) | | (0.081) | |
| Taisho Japanese Empire | -1.442** | | -0.968*** | |
| | (0.612) | | (0.330) | |
| Abdülhamid II Ottoman Empire | -4.786 | | 0.784 | |
| | (4.066) | | (2.520) | |
| Bismark German Empire | -1.763 | | -2.982*** | |
| | (1.636) | | (0.974) | |
| Wilhelm II German Empire | -1.694 | | 0.295 | |
| | (1.687) | | (1.122) | |
| Brazilian Empire | -1.267 | | -0.940 | |
| | (1.798) | | (1.099) | |
| Brazilian Republic - authoritarian | -0.122 | | -5.230*** | |
| | (0.297) | | (0.197) | |
| First Brazilian Republic | -13.067*** | | -1.417*** | |
| | (0.136) | | (0.061) | |
| Constant | -1.462 | | 3.960** | |
| | (3.135) | | (1.900) | |
| Observations | 88 | | 88 | |

All models are estimated by OLS with regime fixed effects. Errors clustered by regime are in parentheses for the model results. The marginal effects standard errors are calculated by the delta method. Meiji Japan is the regime base category. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Case Analysis

In this section, I provide details of the regimes that are the basis for the case analysis in the main text. The plots of repression and public spending from the main analysis are reproduced in this Online Appendix for convenience. Additionally, plots of public spending subcategories are also provided.

Meiji and Taisho periods of the Empire of Japan

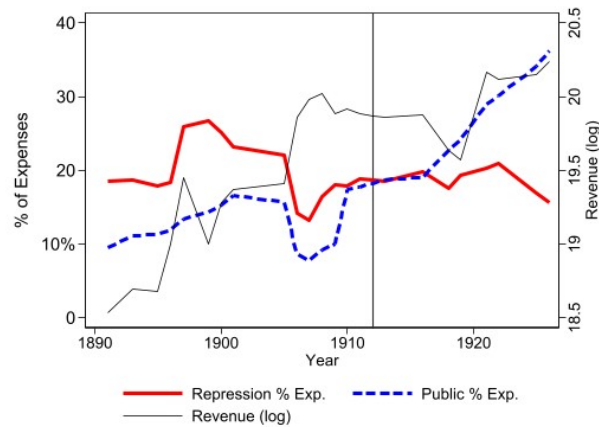


Figure 2: Japan, 1891-1926

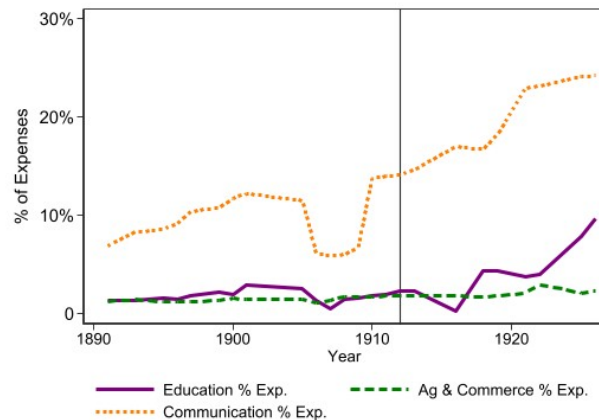


Figure 3: Japan, subcategories of public spending

Japan's Meiji Restoration in 1868 ended the clan-based rule of the Tokugawa Shogunate and installed a new imperial regime with the Emperor of Japan as the head of state. This transition was followed by massive economic restructuring as a means of propping up the fledgling regime with enough economic and military power to resist Western colonial expansion in East Asia. Within a generation the Meiji regime constructed a modern military, built new corporations, subsumed local finance and authority within the central administration, and Japan's samurai warriors replaced their kimonos with Western style suits. By 1886, Japan had already centralized a banking system which included a national currency, converted the tax system from rice into currency, and had recovered from major deflationary finance policies.¹

The military and economic expansion during the Meiji period continued into Japan's Taisho period, though with changes to both the leadership and institutions of the central government. The politics of the Meiji regime were dominated by elder clan elites (*genro*) who maintained a passive, oligarchic rule over the politics of the country. These *genro* were an informal institution that had been carried over from a formal institution of advisors to the Tokugawa. This political structure meant that swift economic policies were made in a somewhat consensual manner, at least among the elites. However, this passive nature of political power in the Meiji regime also meant that the Imperial Japanese Army (*Dai Nippon Teikoku Rikugun*) as well as the Imperial Japanese Navy (*Nihon Kaigun*) were able to wield broad influence in the central administration, partly through the *genro* (Ramseyer and Rosenbluth 1998). For instance the military commander and *genro* leader, Aritomo Yamagata, influenced the dissolution of the Japanese Cabinet in 1908 over the government's response to socialist protests.

Upon the death of Emperor Meiji in 1912, the Taisho period witnessed immediate turmoil between political and military officials. In November of 1912, Prime Minister Saionji sought to limit the army's budget. In response, the minister of the army resigned which again forced the Cab-

¹By the end of the Tokugawa's reign, the samurai had largely been relegated to bureaucratic roles in urban centers rather than their traditional role as warriors keeping order in the countryside.

inet to resign. These political conflicts reflected the nationalist versus institutionalist perspectives for how government ought to be structured. Nationalists viewed that the Emperor should directly wield power while institutionalists preferred the Prime Minister and Diet be primary in politics with the Emperor taking a less active role. This conflict had implications for regime finance, as the nationalists generally supported military expansion and institutionalists wanted political control over the military.

The lack of political control during the Meiji period in Japan meant the government was unable to reduce the share of repression spending as revenues increased, as suggested by the null result for repression spending during the Meiji period. But the subsequent Taisho government, whose political leader stood up to the military to resist increasing military spending, obtained an outcome that appears more consistent with the expectations of the argument. The Taisho administration also increased the share of public spending as revenue increased which contrasts the negative association for public spending in the Meiji regime. The case and data suggest that the Taisho regime sought stability as opposed to simply pleasing military demands.

When we look at the plots of spending in the Empire of Japan from 1891-1926 in Figure 2, we see that there was convergence in spending on repressive capacity and the public which occurred a few years into the Taisho regime. From 1891 to the end of the Meiji in 1911, the share of ordinary expenditures on the army rose but then lowered again between about 1897-1906. This period occurred just after the First Sino-Japanese War in 1884-1895, during the Boxer Rebellion in 1899, and ended just after the Russo-Japanese War in 1904-1905. Japanese imperial aggression was likely a factor in the increase of ordinary expenditures to the army, at the expense of development and welfare funding. Extraordinary expenditures to the military may have exhibited an even greater rise during these conflicts.

After Emperor Meiji died and was replaced by Emperor Taisho in 1912, Prime Minister Kinmochi Saionji sought to curb the excess influence and funding of the Japanese military, in particular the army. Scholars generally assume that Aritomo Yamagata, a forceful military leader

who organized political protests against Yamagata’s budget policies, won the confrontation because it forced the Prime Minister to dissolve his Cabinet and leave office thus reifying the army’s stranglehold on civilian politics (Connors 1987). However, the plots of shares of spending tell a slightly different story. Though the military may have kept *de facto* veto power over policy, after the political crisis of 1912 the trajectory of spending favored economic development and public welfare more than the army. We cannot know for sure whether Saionji’s stand against the military’s demands for control of the budget funding was the cause of the divergence after the crisis, but the plot and model results suggest that the military may have also tempered its demands as a result of Saionji’s stance in order to maintain the authority the military held over the government and to avoid future political crises.

Bismarck and Wilhelm II periods of the German Empire

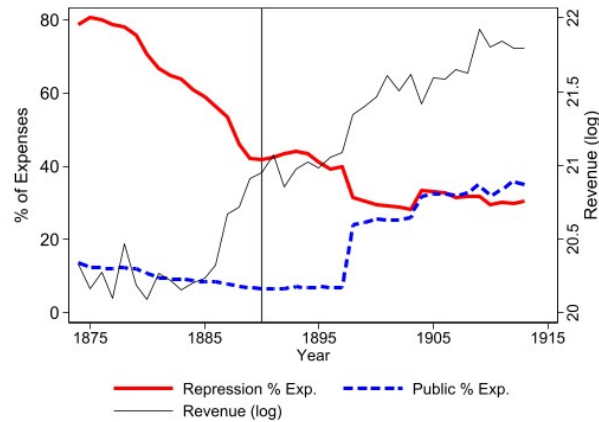


Figure 4: Germany, 1874-1905

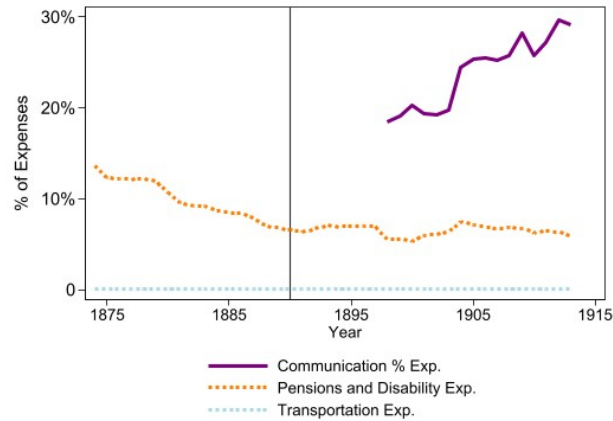


Figure 5: Germany, subcategories of public spending

Note that ordinary expenditures for the Reich’s Post and Telegraph Administration are accounted for beginning in 1898 (as mentioned in the budget document for year 1903).² This change in accounting is apparent in Figure 5. Prior to 1898, the government’s budget documents accounted for nominal extraordinary expenditures for the central government’s post office, but not in ordinary expenditures. This change in accounting is reflected not only in the total ordinary expenditures. The accounting of the revenue generated by the post office also changed in this year.

The German case is also one of centralization and economic development, similar to Japan though these cases have fundamental differences. Unlike Japan, the German Empire formed from the union of multiple independent states which were already fairly modernized at the local level. German states were able to develop strong local government institutions while under the hegemony of the Holy Roman Empire, which continued with Prussia’s rise in central Europe. Similarly to Japan, local German governments had their own security forces but unlike Japan, the German forces were modernized and incorporated into the centralized military rather than disbanded.

The German Empire during both the Bismark and Wilhelm periods made industrial and social welfare policies meant to promote the economic hierarchy while boosting growth. Bismarck famously created social welfare policies to benefit labor as a means of protecting the Conservative

²The 1902 budget document indicates this change in accounting for 1897 as well.

government and economic elites. Before Bismarck left office he oversaw the creation of health insurance, accident insurance, old age and disability insurance. After he left office, social programs continued to develop including laws on workplace safety and child labor. Under Bismarck, Germany also began centralizing administrative institutions such as the Post and Telegraph administration, and began investing in the domestic economy including the construction of a massive railroad infrastructure intended link cities to encourage production and growth. Central government investments in the economy and administrative centralization continued during Wilhelm II's tenure.

The German Empire survived until the economic and political fallout of WWI, after which the democratic Weimar Republic replaced the Empire. The Weimar period ushered in democratic institutions as well as imposed austerity because of wartime debts. Germany utilized paper marks as its currency during 1914-1924, which were printable as opposed to gold marks. When WWI reparation payments began in 1921, the paper mark plummeted in value and the German government printed more marks which created hyperinflation until a new currency was introduced in 1923.

It appears that regimes in which the military had a major influence on the government did not make spending policies consistent with the expectations of the argument (for instance Meiji Japan and the First Brazilian Republic under the military dictatorship), but that aggressive foreign policy without military control of the government was not sufficient to diverting larger shares of revenue to the military instead of spending on growth and welfare. This is evidenced by the fact that the share of repression and public spending during Wilhelm II's leadership in Germany are consistent with the hypothesis. During the preceding Bismarck era, the association for the share of repression spending is not statistically significant, but the association is negative and statistically significant after Bismarck leaves office. We might interpret the fact that spending patterns are consistent with the hypothesis after 1890 during the Wilhem II's era to be evidence of Wilhem's commitment to advancing society through science and technology while also pursuing aggressive foreign policies,

or we might possibly interpret the result as evidence that Wilhelm’s military goals were largely being unfunded and ignored. Regardless, we can contrast the case of late 19th century Germany’s spending against that of Brazil and Japan to infer that when institutions maintain functional civilian control of the budget against pressures from the military then spending patterns evolve predictably.

Abdülhamid II period of the Ottoman Empire

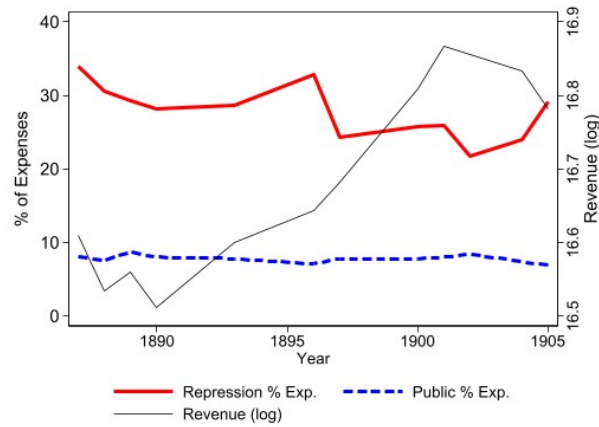


Figure 6: Ottoman Empire, 1887-1905

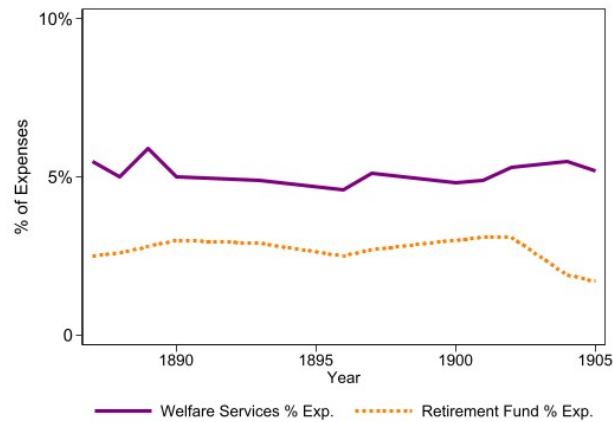


Figure 7: Ottoman Empire, subcategories of public spending

The Ottoman Empire was centuries old compared to the mere decades old regimes in Japan and Germany. The Ottoman Empire had amassed sprawling territories across many different people and cultures. The regime had peaked in the 16th century and was on the decline, especially in the late 19th century. This decline was partially why the regime was pressured to modernize political and economic institutions (Davison 1968, 98-99). The regime's financial difficulties resulted in sovereign default which led their European lenders to construct financial institutions to help the regime manage its debt.

When Abdülhamid II was appointed Sultan in 1876 he promised the reform-minded elites that he would support constitutionalism, however his rule was characterized by the consolidation of power within the executive office to the detriment of even his own cabinet (Pears 1917). Though he initially cooperated with the opposition movement, the Young Turks, to create a constitution in 1876, he soon revoked that constitution and thereafter sought to create a personalistic dictatorship from the office of the sultanate. With his own authority shored up, he unsuccessfully attempted to hold together the faltering regime. Between uprisings on Ottoman held lands and foreign conflict, Abdülhamid's task was quite difficult, though perhaps his unwillingness to trust and support his own military was a mistake that made him ineffective at managing conflicts. The case of the decline of the Ottoman Empire stands in sharp contrast to the growth and expansion enjoyed by Japan and Germany during this time period.

We might expect that the decline of a regime lends towards hardening, backsliding, and a greater focus on repression. We certainly see that in the Ottoman Empire during Sultan Abdülhamid II's tenure. The Empire's territorial holdings had become too vast to manage, and the regime became unable to stop the shedding of its control and authority across its territories beyond Anatolia. The regime responded with violence both against its own residents and against foreign powers. The April Uprising in Bulgaria 1876 (Reid 2000), the massacre of Armenians in 1894–1896 (Bloxham 2007), and the failed Russo-Turkish War in 1877–1878 were major incidents of violent conflict that were symptomatic of the regime's desperation.

However despite the Ottoman's attempts at clinging to their withering power, their patterns of spending hardly waivered. The regime's budgetary policies were consistent with the hypothesis for both repression and public spending. Moreover, the regime maintained a remarkable consistency in their shares of spending over the brief sample period from 1888-1905. The share of repression spending was around 25-30% and public spending remained between 5-10% of total spending over the period. Despite that spending patterns in the declining the Ottoman Empire were highly stable and consistent with the hypothesis, Sultan Abdülhamid II was more concerned with the maintenance of his personal rule than of the prosperity of the Empire.

Abdülhamid took great care to advance himself as a personalistic dictator while the empire crumbled. He had been primarily concerned with his own authority over reform-minded elites within the regime since he viewed any reforms as weakening his authority. He likely went as far as orchestrating a trial to convict Midhat Pasha, a constitutionalist and former Grand Vizier, of murder as a means of using the courts to have him executed. He succeeded in not only eliminating reformers but also reducing the authority of his own cabinet members which provided him personalistic rule (Pears 1917, p47-59). The erasure of a ruling coalition from within the regime is a dream that a power-hungry dictator must keep concealed (Svolik 2012, Ch3). Abdülhamid succeeded by promising to make reforms before he was installed as Sultan but then revoking his promise, acquiescing to a constitution in 1877 to ease pressure by Europeans only to revoke it two years later, and finally subordinating his own ministers into mere bureaucrats.

While he succeeded in his personal goal of amassing authority within the regime, he was neglecting the repressive capacity of the empire. The army was underpaid, underfed, and demoralized. Abdülhamid's own fears of the military led him to resist developing any personal relations within the military. He lost the support of an institution that for centuries been the foundation of the Empire's power (Pears 1917, p183-185). Due to his impatience and neglect, he also fumbled replacing the domestic guardians of the peace, the *zaptiehs*, with a modern gendarmerie based

on English instruction because the officers he had enlisted to oversee the reform quit his service [p187-189].

The Empire of Brazil and First Brazilian Republic

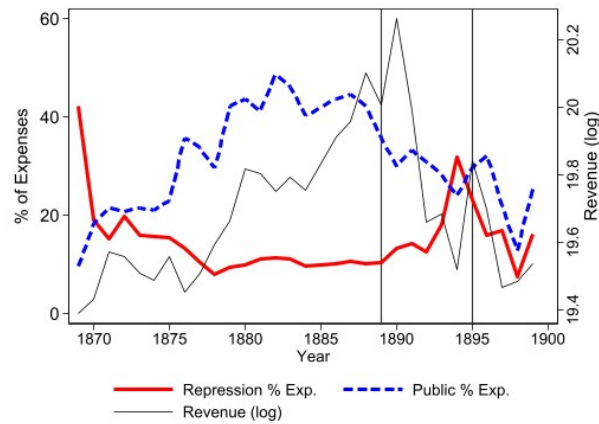


Figure 8: Brazil, 1869-1899

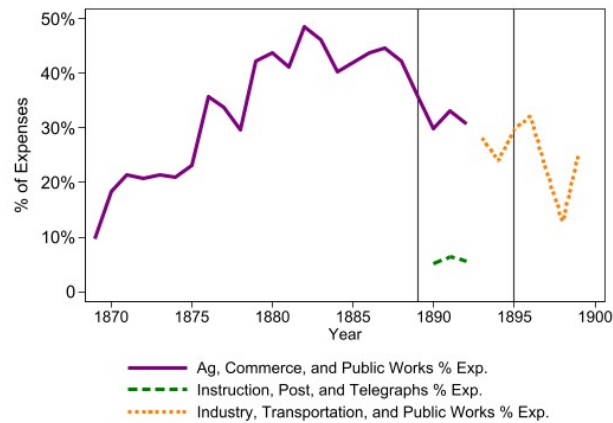


Figure 9: Brazil, subcategories of public spending

Note that in Figure 9, the Ministry of Public Instruction, Post, and Telegraph was assigned responsibilities from the Ministry of Agriculture, Commerce, and Public Works. When it was dissolved, part of its tasks were assigned to the Ministry of Industry, Transportation, and Public Works.

Prior to the First Brazilian Republic, the Brazilian Empire was ruled by a monarch named Pedro II and a parliament that was elected by a very small proportion of the population. The Empire was authoritarian but had some aspects of democratic government, including exchanges of power within the legislature between liberal and conservative parties. Slavery was also legal during the Brazilian Empire and landowners had interests in maintaining the economically and politically exploitative system, one that was not unique to the Western Hemisphere (Sokoloff and Engerman 2000). Moreover despite suffrage for some, voting by laborers was often a requirement demanded by a landowner or economic boss in order to get out the vote for the boss's preferred candidate. Electoral violence and manipulation was so widespread in the Empire that elections were rendered effectively meaningless (Limongi 2014).

Pedro II was fairly liberal and supported the expansion of political rights in the country, especially more than conservative elites preferred. In the 1880s, Pedro II oversaw numerous reforms in electoral institutions but it was his daughter's regency which oversaw the prohibition of slavery during a liberal-majority Parliament. Elites in the country had for years been disgruntled with the institutions of the central government, but it appears that the establishment of slavery was the death knell for Pedro II's rule. Soon after the abolition bill was signed, a military coup removed Pedro II without bloodshed. The elites within the country immediately agreed upon a constitution to replace the monarchy with a republic, but elections were not initially held. Instead, the military assumed control of the executive office from the period of 1889 until they had failed at managing the regime's finances so badly that the military government allowed elections for the presidency in 1894.

The following regime within the Brazilian Republic, while not entirely democratic itself, at least allowed for elections in an oligarchical system by which the executive office was periodically transferred between power families within the two major states in the country. While national political authority remained in the hands of wealthy elites, the reforms of the Republic moved the country towards greater autonomy within the states. Governors became more influential, and

the repressive capacity of the country shifted towards the states as they built their own police forces and state militaries. Comparing the Brazilian Empire to the regimes of its First Republic allows for unique tests of the argument across varying levels of electoral institutions as well under decentralization reforms as opposed to the centralization found in the other cases in the analysis.

It appears that when the military regime came to power, they prioritized spending on the military. However, revenues plummeted during the military regime because of the uncertainty in the political system and the regime's inept handling of finances. Despite when revenues grew or fell, the regime increased the share of funding for the army while mostly decreasing the share of spending on the public. These relationships can be seen in Figure 8 from 1889 to 1894.

Contrast the military regime's performance with the Brazilian Empire twenty years prior. Between 1869 to 1889, the Empire grew their revenues, decreased the share of spending on the army, and increased the share of spending on the public, though the share of public spending peaked and began to decline again in the mid 1880s during the reform period. Before 1870, the share of repression spending outpaced public spending but through the 1870s the share of public spending was greater than the share of repression spending. These relationships are highly consistent with the theoretical model. However, the military regime reversed this trend, and in 1894 the share of spending on the army once again eclipsed the share of public spending.

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