Master thesis

Faculty of Social Sciences

M.Sc. International Public Management and Policy (IMP) 2020-2021

People are not profits: an empirical analysis about claims of *cream-skimming* practices by private prisons.

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Date: 25-06-2021

Word count: 19842 (excluding preliminary matters, references and appendix)

Summary

Private prisons are a multi-billion profit-making industry (Vittert, 2018) currently controlled by a few big corporations in the world: CoreCivic, GEO Group Inc, MTC, G4S and Serco (Mason, 2013). Even though private prisons' existence and desirability are continuously called into question by some, inmates housed in private facilities have increased faster than the total incarcerated population in countries that allow private for-profit corporations to manage and operate prisons (Gotsch and Basti, 2018). In that sense, debates have been ideologically, normatively and empirically based but still mainly reliant on arguments of cost-savings. Considering that the United States houses the world's most significant privately held inmate population (Gotsch and Basti, 2018), this study uses data from the *Census of State and Federal Adult Correctional Facilities* (United States Department of Justice, 2017a) to test *cream-skimming* claims empirically.

After controlling for relevant factors according to the literature, the results from the diverse multilevel models undertaken reveal that private prisons tend to incur in horizontal *cream-skimming*. This means that they are specializing in treating a more homogenous inmate population needs-wise rather than housing a cross-section of inmates. This practice —although opportunistic— is legal; thus, if considered an unintended consequence of policy design, policy-makers can always address it. Findings also point to the fact that enacting laxer or harder legislation impacts the way private prisons act. However, on the central claim of vertical *cream-skimming* practices, this study could not reach conclusive findings as only hints of the possibility of said practice were found by one of the two hypotheses used to test the said claim.

The findings hope to spark interest to take further steps in empirically examining the matter since it continues to be relevant for inmates and policy-makers as more countries in the world consider the possibility of allowing private for-profit corporations to manage and operate prisons fully.

Preface and Acknowledgements

> "A nation should not be judged by how it treats its highest citizens, but its lowest ones."-**Nelson Mandela (1994).**

I firmly believe that social public policy can achieve a significant and tangible impact at the ground level for people's lives, which is where my interest lies. It is my dream to contribute to the well-being of the individuals in society that need the help and the attention of policy-makers the most.

A policy professor at ITAM, my former University, used to say, "if it's not broken, do not try to fix it." For years, something that has been broken, especially in my country (Mexico), is the correctional system and the philosophy we choose to punish people (similar to the United States' approach). I have always been interested in incarcerated people's lives because they are vulnerable to abuse and negligence, as they are invisible to society. The political discourse of politicians trying to be the "toughest on crime" and demonizing people that are in prison has not helped in this regard either.

As part of my Political Science Bachelor's degree, I wrote a thesis about the work and educational programs offered inside the prison, which concluded with a policy proposal to improve the effectiveness that said programs have in the life after the release of the inmates. Thus, this time for my master thesis, I wanted to continue in the same line; however, I wanted to take up the challenge to undertake a quantitative study. Since Mexico is one of the countries currently experimenting with private prisons, it made sense to me to try and see the effect of prison privatization on the inmate population. It was then where I found a gap in the academic research that I thought I could contribute to filling. Writing this thesis was a fun challenge. The process and experience of writing it were made better by all the marvelous people that surround me.

In that line, I dedicate this thesis to Aitana, my sister. I cannot imagine a world in which I would be without you. Thank you for your support always. I admire you and love you forever. Thank you, Mark, for always listening, caring so much, and believing in me no matter what. I also thank my parents, who are always there for me and because all achievements I have ever accomplished are only due to their lifelong efforts. Finally, thank

you, Nora, Giovanni and Sara for always being willing to read my drafts before the thesis circles and for all your helpful comments. A special thank you goes to Asya Zhelyazkova, who patiently helped and advised me through the entire process of writing this thesis.

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Introduction

Background and problem statement

Most countries still use incarceration as their main punishment when a citizen has violated societal rules (Jacobson et al., 2017). The mainstreaming of the imprisonment practice added to the hardening of sentencing policies has generated an ever-increasing world prison population (World Prison Brief, 2018; Jacobson et al., 2017) and overflowing correctional systems that —because of their high overcrowding rates— result in the provision of inadequate and inhumane detention services (Penal Reform International, 2020). For example, as part of the recent COVID-19 crisis, Human Rights and Health Institutions recommended urgent pre-releases of inmates, still —as news outlets point out— the efforts made did not even allow for the World Health Organization's prevention measures to be implemented properly (Equal Justice Initiative, 2021; Kaste, 2020).

To depressurize the public correctional system, and in the hopes of decreasing its costs, some countries have turned —since the 1980s— to the privatization of prisons by allowing private for-profit companies to operate, manage, and in some cases even build and own correctional facilities (Mason, 2013). This approach has hindered the appearance of alternative punishments to incarceration, such as house arrest or community-service sentences, which could also reduce prison overcrowding and costs (UNODC, 2021).

In that sense, being allowed to be part of the management and operation of correctional systems, private firms have thrived as the number of inmates held in private prisons has been expanding (Burkhardt, 2015). This expansion has not happened without controversy and polarization, as a passionate debate on the desirability and performance of private prisons continues to exist (Pozen, 2003). However, the debate between proponents and opposers of prison privatization has remained mainly ideological as both sides have based their arguments on often either untested or unproven assumptions and hypotheses (Kim and Price, 2014; Makarios and Maahs, 2012).

The discussion has mainly been focused on cost matters (Austin and Coventry, 2001). Proponents of prison privatization often argue that private sector involvement allows the government to save costs while making it easier to hold the private service provider responsible for its actions and its results by drafting contracts that set the desired government's terms. In that regard, opposers often argue that private companies' motivation to make a profit will always incentivize them to evade costly responsibilities and obscure practices that are hard to monitor (Dippel and Poyker, 2019) at the expense of the well-being of an already vulnerable inmate population. Former convicts that have experienced both types of imprisonment share that private prisons have, for example, worse food, worse medical care and fewer self-hygiene products (Kim, 2019a).

As part of the said cost-centered debate, it has also been suggested through claims and anecdotes that private prisons have managed to select inmates based on characteristics that will allow the firm to minimize its costs. One such anecdote involves a private prison in Arizona to which inmate classification officials systematically decided not to assign inmates with chronic health or mental issues (Volokh, 2014). Such claims become even more important in the current context where older inmates are increasing more rapidly than younger ones in the inmate population, and the rapidly aging inmate population is increasing the costs of housing them (Mckillop and Boucher, 2018). Also, inmate populations disproportionately present chronic illnesses such as HIV/AIDS or diabetes (Cropsey et al., 2007), which is another characteristic that makes their imprisonment more costly. Finding empirical evidence of purposeful inmate selection based on cost considerations would imply that so far, all cost comparisons between private and public prisons have been distorted. The distortion arising from unaccounted hidden practices resulting in public prisons housing, for example, an older and sicker inmate population (Friedman, 2014), which implies more operative costs than private prisons. However, there is seemingly no empirical study on such cost involving characteristics. Thus, it is within the lack of research about the individual characteristics of a generalized prison inmate population throughout an entire country that this thesis aims to contribute to.

To see if there is an actual systematic variation of the characteristics of individuals held within private and public prisons, which would point to a potential non-random selection of the inmate's housed, the following research question remains a relevant one to answer:

How does privatization affect the composition of the facility population of private and public prisons?

Relevance

Answering such a research question is of scientific relevance because it would contribute to the body of literature (Lehnert et al., 2007) about prison privatization, especially to the primary debate, which centers around cost comparisons between private and public prisons (Kim, 2019b). Furthermore, the fact that the results of academic studies comparing private and public prisons from diverse perspectives have, so far, been mixed (Gaes, 2019; Kim, 2019b; Lundahl et al., 2009) adds to the academic relevance as this study would advance the collective knowledge (Gschwend and Schimmelfennig, 2007). Mainly, this study would seek to shed light on the little research done about inmate composition characteristics that affect private and public prisons' costs. The relevance of the research question is also enhanced since —to our knowledge— it would be the first empirical study to test claims of systematic inmate selection by private prisons with the idea to minimize their costs.

It is also socially relevant because some studies have shown that being housed at a private or public prison can have different effects on the inmate in terms of time served (Mukherjee, 2020) or sentence length (Dippel and Poyker, 2019), for example. In that sense, if this study were to observe that, in fact, systematic differences exist between the inmate populations that a private or a public facility houses, this would point to a possible non-random selection of inmates into specific facilities and risk claims of discrimination, uneven punishment and non-equal treatment. In that sense, since individuals are being affected, the issue concerns society in general due to questions about unequal protection and to socially marginalized minorities in specific because they are incarcerated at disproportionate rates (Burkhardt, 2017; Tonry, 1994).

In that line, the relevance of the research question can also be noted because private prisons are increasingly becoming an essential part of some countries' correctional system (e.g., the United States and the United Kingdom) and progressively more countries (e.g., Jamaica, Panama, Mexico and Peru) are considering making use of or beginning to experiment with private for-profit prisons (Pozen, 2003). Hence, it is imperative to shed clarity on the potential benefits and dangers of prison privatization to help policy-makers generate better suited and encompassing policies and avoid unintended consequences.

Focus of the study

The thesis focuses only on the United States for two main reasons. First, prison privatization is a phenomenon mainly observed in said country and it has always been a matter of passionate debate and controversy because of all the mixed findings when comparing private vs. public prisons performance (Pranis, 2005). Second, as is explained in the research design chapter, it was the only country for which data differentiating private and public prison's characteristics related to their inmate population was found. Said data would also allow us to depart from the usually found case-study designs, which have been said to contribute to the mixed findings (Makarios and Maahs, 2012), and account for relevant controls. In that sense, this research makes use of the *Census of State and Federal Adult Correctional Facilities* of the Bureau of Justice Statistics 2005 (United States Department of Justice, 2017a). The said census is the most recent data-set available that allows for a national comparison of institutional and inmate population characteristics between private and public correctional facilities.

Outline

The first chapter, literature review, begins by defining the concept of prison privatization. It then continues with a small overview of how the privatization of correctional services came about, to afterward revise the relevant academic studies surrounding the main discussion about differences in costs and quality between private and public prisons, which so far have not been able to offer definitive results (Lundahl et al., 2009). As will be seen in the theoretical framework chapter, the study mainly uses the *cream-skimming*

theory —derived from the market incentive theory and usually utilized in academic research about the health sector— as well as the *principal-agent* theory to pose the relevant hypotheses to answer the research question. The research design chapter discusses the chosen cross-sectional large-N approach and the rationale behind the decisions made for the validity and reliability of the study. It addresses the database used and the measurements and operalization of the dependent variables, the key independent variable (private or public prison) and the statistically relevant controls introduced based on the literature. After that, the analysis chapter undertakes several multilevel models and presents the results, further deliberated upon in the discussion. In the final chapter, this thesis offers an overall conclusion that includes a discussion about the limitations of the present study and recommendations for further research.

Literature review

This section begins by providing a definition of the key term of this study: private prisons. It then continues with a small overview of how the privatization of the correctional system came about in the United States (US) and the United Kingdom (UK), as those countries have the largest per capita inmate population and are pioneers in leading prison privatization (Pozen, 2003). Afterward, it undertakes a detailed recount of the empirical studies found in the literature concerning prison privatization. Within that recount, it first presents studies concerned with what has so far been the central matter of the debate: cost and quality comparisons. Then it focuses on literature that has shed some light on the characteristics that differentiate the inmate population of private and public prisons. Furthermore, it deals with literature concerning discrimination in the provision of public services, hence unequal and potentially unfair treatment.

Defining prison privatization

“A private prison is one managed by a nongovernment entity on behalf of the state” (Harding, 2001, p.265), thus implying that the government is contracting out the operations of correctional facilities to private organizations (Hart et al., 1997). When this

thesis speaks of prison privatization, it is essential to specify that it refers to fully managed and operated facilities by for-profit private firms. Theoretically, a government could also allow prisons to be managed and operated by non-profit organizations; however, privately managed prisons by non-profit organizations do not exist in all countries[1] where private prisons exist (Pozen, 2003).

It is relevant to define it as the total management and operation of a facility by a private for-profit entity because —before total private management and operation of prisons were allowed— some countries (e.g., US and UK) employed the private sector to provide a few services. For example, maintenance, food, medical and security services (Camp and Camp, 1984, p.1).

It is also important to note that a variety of structure ownership arrangements exist even when the facility is still fully managed by a private for-profit firm. The most common combinations of full private prison management and physical structure ownership are: 1) managing a facility designed and built privately with their own privately hired staff; 2) managing a purchased facility with its own privately hired staff; and, 3) managing a state-owned and existing facility with its own privately hired staff (Valance, 1991). In that sense, whether a facility was built or bought by the private sector, or owned by the state, as long as a for-profit private firm fully manages it under contract with a government, the facility is considered a private prison.

The privatization of public services

Historically, there has been an expectation that the State has “the responsibility and obligation to provide certain services and functions to its citizens, particularly those that relate to such common fundamental needs as public safety” (Byron and Norma, 2005, p.224). Traditionally seen as an inherently governmental function[2], punishment provision

[1] For example, in the United States and the United Kingdom no private prison exists that is managed and operated by non-profit organizations.

[2] According to the *Federal Activities Inventory Reform Act*, the term is defined as a function "so intimately related to the public interest as to require performance by Federal Government employees" (Aman, 2009, p.87).

in the form of imprisonment is perceived by many as a core governmental function that should be excluded from privatization considerations (Chesterman and Fisher, 2009).

As such, Aman (2009) argues that the decision —which is a highly political one— of what is inherently governmental must be made democratically with transparency, oversight and accountability. Adding to the discussion, Jing (2010) finds that core governmental functions can only be privatized when ideas at the government level change the political environment generating consensus around those new ideas. At the time when the privatization of services started, the right-wing governments of Thatcher and Major in the UK, and the Republican governments of Reagan and H. W. Bush in the US, firmly believed in the opposition to a "big government" that provides all goods publicly, thus rendering it inefficient, and praised the provision of services by the private sector (Pozen, 2003). Those ideas of the moment, added to the instrumental factors discussed hereafter, created the right momentum to privatize a formerly seen core governmental function: correctional facilities.

A movement to privatize prisons began in the US (mid-1980s) and the UK (early 1990s) as a response to a correctional system that was perceived as in crisis after a decade of rapid growth of the incarcerated population, which gave way to overcrowding and inhumane confinement conditions (Burkhardt, 2017; Pozen, 2003) as well as escalating costs (Calvert Hanson, 1991). As such, rather than thinking of other ways to depressurize the system and diminish costs (e.g., shorter sentences or alternative punishments), contracting the service from private companies became a viable political option in a time when demands to imprison were high and the idea that "privatization would yield cost savings through reduced operational expenditure" (Pozen, 2003, p.265) was, although untested, generally accepted[3].

Prison privatization was, however, experienced and faced differently by the UK and the US. In the former, additional factors like the right-wing government's commitment to the privatization of services and the will to diminish the power of the prison workers

[3] According to Pozen (2003), the idea was believed based on the argument that the profit motivation of private companies would incentivize them to be more cost-efficient.

union (Pozen, 2003, p.261) proved to be key. Especially in a context where legal pressures to reduce overcrowding were less and fiscal incentives to allow private companies to construct prisons were weak. In the US, however, the pressure on the system was higher. Many facilities faced trials and court sanctions for “cruel and unusual punishment” due to confinement conditions (Harding, 2001, p.246). Officials were pressured to expand capacity quickly, but voters did not favor issuing state bonds for the construction of more prisons. Thus, inviting private contractors to build new facilities was the best option as it allowed them to bypass voters and use lease-buyback arrangements paid through the operational state budget (Pozen, 2003).

Since pressures to the system were less in the UK, the government's approach to prison privatization proved to be more controlled, cautious and experimental (Pozen, 2003). Their main aim was to generate a market-like environment where competition benefits could be ripped in the form of a system-wide improvement understood as “the notion that different and perhaps better private sector regimes might cause beneficial change in the public sector” (Harding, 2001, p.272). Before allowing private companies to tender for a contract, the Home Office of the UK took four years undertaking studies and hearings to be fully aware of the potential costs and benefits of having private firms manage prisons fully (Pozen, 2003). This ultimately led to “prescriptive, output-based contracts, multiple levels of monitoring, and market testing for existing Prison Service facilities” (Pozen, 2003, p.262) as well as performance-based fees.

In the US, however, the strains to the correctional system, added to the lobbying of correctional-service entrepreneurs and the pressure for “public officials to save money and expand capacity more quickly through privatization” (Pozen, 2003, p.261) allowed for the issue to be mainly focused on cost-efficiency rather than on quality or system-wide improvement. Since private prisons are paid a daily rate per inmate, this context led to inconsistent mechanisms across jurisdictions to make private prisons accountable, making comparisons between private and public prisons harder (Pozen, 2003). In that line, the coming sections discuss the little research done so far to either verify or dissipate the concerns about the performance and effects of prison privatization.

Studies about prison privatization

The privatization of public sector services and organizations is based on the idea that the private sector involvement will allow for the services to be produced more efficiently, leading to a reduction in costs and improved quality (Adamson et al., 1991). Advocates of prison privatization usually use such economic concerns as their main argument and justification for the decision to privatize (Duwe and Clark, 2013; Price and Riccucci, 2005).

According to Pozen (2003), the political affinity with the privatization ideology was enough to overlook the weak pragmatic reasons to privatize prisons in the UK. However, in the US, because of the diffused responsibility for prison management over state and federal offices and a divided Congress, the privatization of the system resulted from several and unequal cost-benefit calculations made by facility administrators (Pozen, 2003, p.269). This inconsistency explains why most of the academic empirical research found about cost comparison between private and public prisons focuses on the US.

In that sense, prison privatization has mainly been studied from the cost and quality perspective and from the perspectives of post-release success/recidivism and system-wide improvements (Kim, 2019b). The evidence has not been conclusive regarding the success of private prisons, when success is defined as offering a higher quality service with fewer costs. Showing —if anything— that "private prisons have a decent if patchy record in the United States, while in the United Kingdom their performance has at least equalled and probably outpaced that of the public sector" (Pozen, 2003, p.272). According to Pozen (2003), more comparative research is done in the US rather than in the UK, as in the latter the debate was more open, politically concentrated and transparent. In that sense, in the UK, most studies to determine possible benefits and costs of private prisons were commissioned by the government before allowing private management contracts in 1991. This centralization faded the independent research impetus on prison privatization in the UK.

On the one hand, some cost comparison studies[4] in the US showing that private prisons cost less are either questionable because of funds they had received from the private prison industry (Gaes, 2019; Friedmann, 2014) or end up concluding that any cost savings found are at the end eroded by other missing considerations. For example, analyzing the impact of privatization on time-served per inmate in Mississippi between 1996 and 2004, Mukherjee (2020) finds that —based on indicators such as infractions— inmates in private prisons end up serving 90 extra days, thus eroding any original cost-savings to the government. Mukherjee (2020) explains that the observed increased percentage of the sentence served resulted from more extensive use of infractions (27% more) towards the privately housed inmate population, which ends up hurting their chances of early release because the parole board considers the behavior in prison to make the decision. In the UK, the last study commissioned by the Home Office between 1998 and 1999 showed that on average private prisons saved 13% more per inmate; however, those savings diluted after accounting for overcrowding in private prisons (Panchamia, 2020; Pozen, 2003)[5].

On the other hand, empirically reviewing 24 independent studies Pratt and Maahs (1999) concluded that “private prisons were no more cost-effective than public prisons, and that other characteristics —such as the facility's economy of scale, age and security level— were the strongest predictors of a prison's daily per diem cost” (p.358). In line with those findings, analyzing cost and quality indicators, Lundahl et al. (2009) reveal that any difference in cost between public and private prisons is not statistically significant, hence making them question the absolute necessity of having private prisons in the correctional system. Adding to the discussion Gaes’ (2019) assessment of the most rigorous reviews of the literature is that, so far, academic findings cannot conclude which type of prison is more efficient.

[4] These include studies conducted by researchers within the University of Florida (1990s), the Vanderbilt University (2008), the Temple University (2014) and several reports of the Reason Foundation (Friedmann, 2014, p.506).

[5] Unfortunately, this information cannot be confirmed or specified further for the present thesis as the links provided by Panchamia (2020) and Pozen (2003) are no longer available and the information could not be reached through the web page of the Home Office.

The inconclusive results gathered so far when comparing costs of public and private prisons have come about from inconsistencies in the methodology (Kim, 2019b; Pozen, 2003). For example, Friedmann (2014) and Kim (2019) acknowledge the lack of methodological rigor in the studies when observing that studies do not consider all relevant factors or control for prison characteristics such as facility age, size and security level or differences in the inmate population. As all said characteristics "can influence the daily cost of incarceration [...] regardless of the ownership of the facility" (Kim, 2019b, p.5) by adding to their maintenance and operational costs. As part of those inmate population differences, Friedmann (2014) addresses individual characteristics such as age, health and gender as *cost-shifting factors* that can add to the operating costs of a prison if more costly inmates are housed in one facility compared to another. For example, young people can generally be assumed to be relatively healthy or healthier than older people, thus diminishing the probability of having more medical expenses or in other words extra costs per inmate. The same argument applies to inmates already known to be sick and in need of special treatments that are expensive. Finally, gender is also cited by Friedmann (2014) as a costly characteristic, according to prison inmate costs data of Florida and Tennessee, because of women's "higher medical expenses" (p.517), for example, obstetrics and gynecology. Other lacking controls that have recently been found to be relevant to achieve more consistent results because they might contribute to differences in the inmate population across prisons include the opening of private prisons (Mukherjee, 2020) and prison overcrowding (Burkhardt, 2015). The former because Mukherjee (2020) observed that private prisons were filled by the government “within two weeks of their opening” (p.2). The latter because it makes sense that if a facility is overcrowded, one would choose to send an inmate to a facility that still has space to house the person.

The need to look into the inmate population

According to Gaes (2019), it is wrong to assume that there are no characteristics inside a correctional facility that could result in biased findings favoring private prison management (p.276). So far, research has assumed that an objective classification of inmates into different security levels is already controlling for any differences in the prison population's composition (Makarios and Maahs, 2012). However, if a foundation for

rigorous cost comparisons is to be built, research needs to account for differences such as the more cost involving characteristics of the prison's inmate population. In that regard, while they aimed to measure recidivism (Duwe and Clark, 2013; Spivak and Sharp 2008) or inmates time served (Mukherjee, 2020) depending on the facility inmates were housed in, only a few studies have furthered our understanding about differences in the housed population across private and public prisons (Kim, 2019b). Still, they have done so at a small scale through case studies that focused only on a few prisons in one specific state within the US.

While qualitatively examining if privatization has brought about cost-savings or merely *cost-shifting* Pranis (2005) finds that, compared to the inmates housed in public prisons, the inmate population in private prisons in Arizona had less-to-none medical and mental-health needs (p.3). According to him, the observed differences are significant enough to suspect that, in Arizona, low-risk and low-need inmates are systematically being assigned to private prisons (Pranis, 2005, p.12).

In that line, Spivak and Sharp (2008) —measuring the performance of private prisons through recidivism— found that in Oklahoma between 1997 and 2001 inmates in private prisons were significantly younger, convicted for non-serious crimes, usually from racial minorities and drug offenders. Spivak, being a case manager himself in a medium-security public prison back in 1998, adds an anecdote about the tendency of case managers to request the transferring of problematic young inmates to private prisons (Spivak and Sharp, 2008, p.504).

Looking into offender recidivism in Minnesota, Duwe and Clark (2013) found that inmates confined at the private *Prairie Correctional Facility* were younger, mentally and physically healthier and with limited criminal histories and thus easier manageable, while the cost of housing them was the same as the cost of inmates housed at Minnesota's public corrections. This led them to conclude that even housing a more manageable inmate population, private facilities cost the same while producing worse recidivism rates (Duwe and Clark, 2013, p.391).

Finally, while examining how private prisons affect the confinement of its inmates and their recidivism rates, Mukherjee (2020) finds that in Mississippi between 1996 and 2004 inmates in private prisons were disproportionately of a black minority, young and uneducated (p.10). The observed “striking differences across inmates in public and private prisons” (Mukherjee, 2020, p.1) gave rise to questions about possible inmate selection based on subjective characteristics.

Furthermore, our literature review brought about two researches by Burkhardt which aim at comparing private and public inmate populations at a broader level than just one state. In the first one, adding to the research on racial disparities in imprisonment to see if they translate into disparate placement, Burkhardt (2015) finds that in 2005 private prisons housed 2% more Hispanics than public prisons and housed 8% fewer Whites (p.33). In the second one, Burkhardt (2017) concludes that “private prisons detain populations that are disproportionately non-white, under federal jurisdiction, and serving short sentences; and they employ officers that are disproportionately female and black or hispanic” (p.24).

Discrimination in public service provision

Individuals and institutions may not discriminate consciously or intentionally. Still, it may instead be an effect of pervasive conventions within a society (Sentas, 2018).

Criminalization trends around the world stem from the original conception of the relationship between state and citizens (Farmer, 2016). In that sense, criminalization practices can be understood based on the views, ideas, stereotypes and attitudes entrenched in a society, and thus may include discriminatory actions. Sometimes criminal conduct is even selectively searched out (Borden, 2016), targeting specific groups. Differential incarceration patterns —pointing to possible discrimination based, for example, on race— exist in the US, the UK, Australia and Canada, where minorities such as blacks, aboriginals and natives are “seven to 16 times likelier than whites to be confined in correctional institutions” (Tonry, 1994, p.97).

The literature about discrimination in the provision of public services is less developed in the correctional system domain. However, there is plenty of research about it in the field of information requests since the enactment of Freedom of Information Laws around the world (Michener et al., 2020; Hemker and Rink, 2017; Distelhorst and Hou, 2014; Ernst et al., 2013; Butler and Broockman, 2011). Some research was also found about differentiation in health-provision services and the insurance sector (Brown et al., 2014; Kuziemko et al., 2013). Said sector presents a similar environment to the current correctional system of the US and the UK in the sense that both private and public instances exist simultaneously to provide the service to the population.

Discrimination in information requests

Michener et al. (2020) found evidence of Brazilian public officials making an effort to profile the person who requested the information. They conclude that identities that are not easily found in search engines or are not affiliated to a recognizable institution receive fewer responses by a fifth. On discrimination by race or ethnicity, Ernst et al. (2013) found that white women in the US were likely to receive better treatment and more information about social programs when requesting information in person than Latin, Asian or African-American women. Likewise, through information requests by email about voter registration Butler and Broockman (2011) undertook an experiment to see if legislators in the US would respond differently to black or white names and found that black names got fewer responses. Following the same methodology, Hemker and Rink (2017) and Distelhorst and Hou (2014) respectively found that Turkish or Rumanian names in Germany, and Muslim names in China were less likely to receive quality assistance and information about programs.

Discrimination in health services

On health provision research, Cheng et al. (2015) utilize a transferring of patients approach and find that in Australia, patients that are sicker and are more costly to treat are 42.7% more likely to be transferred to public hospitals from private ones. In Australia, public and private for-profit hospitals coexist to provide health services for the population in the name of the government. The latter operate "under a fee-for-service funding model"

(Cheng et al., 2015, p.157), where treatment costs are determined by negotiations between the contractor and the private health provider.

Adding to the discussion, Kuziemko et al. (2013) found that, in the US, the *Medicaid* health coverage has incentives to keep low-cost clients and thus offers different care plans to differently costly clients so that the ones that cost the institution more choose to change insurance companies. In that same line, Brown et al. (2014) looked into the *Medicare Advantage Program* in the US. They found that even when the government adjusts the payment it gives to the service providers according to a risk assessment on the expected cost of the client, due to unwell-specified contracts[6] that allow for opportunistic behavior, providers still try to avoid clients with conditions that are not considered within said risk-adjusted formula by incurring in targeted advertising or by offering more benefits to the targeted groups.

Furthermore, Kuschke (2018) observes that in South Africa insurance companies most often differentiate on risk profiles based on gender, age and disability to charge different premiums. The study notes that while insurance companies should be allowed to make a distinction, a differentiation based on individual traits such as the disability's nature is beyond valid economic discrimination and should not be allowed. However, the enactment of a weak legislative framework makes such discriminatory practices easier (Kuschke, 2018, p.54), as its unspecificity opens up the maneuvering space that the insurance companies have.

Finally, focusing their research on nursing homes in the US, Mukamel et al. (2009) make use of a yearly publicly published (since 2002) report card that compares nursing homes to empirically test if nursing homes have since then changed their admissions behavior by choosing to admit “less frail and sick” (p.793) residents to achieve better

[6] Incomplete or unspecified contracts between the government and the private provider is also found in the correctional system. Fully specifying contracts in order to avoid opportunistic behavior has been empirically observed to be impossible (Kyle, 2013). In our case, contracts are not public and thus cannot be accessed (Bukhardt, 2017). And, since the classification mechanism that supposedly assigns inmates into a specific facility based on an objective risk assessment is “opaque and in some places even arbitrary” (Burkardt, 2017, p.25), the possibility of inconsistencies in equal treatment and, thus, a discriminative service provision arises if private prisons house systematically different populations than public prisons (Michener et al, 2020).

scores in said report. They argue that said incentive exists because getting a better score on the report card allows the nursing home to be viewed as a better option by potential clients. Mukamel et al. (2009) indeed find that instead of making “quality improvements such as increased staffing, enhanced training, or improved equipment” (p.795), nursing homes purposely select residents based on their daily sickness levels and on the presence of memory issues (including Alzheimer's disease) to admit only those clients that will allow them to get better scores.

Discrimination in the correctional system

Although unproven, there have also been claims and anecdotes of purposive "client" selection in the correctional system, understood as inmate selection by private prisons to house less costly individuals in their correctional facilities (Volokh, 2013; Duwe and Clark, 2013; Oppel, 2011). Still, there does not seem to be any empirical study on this discriminative selection based on the more cost-involving characteristics of inmates (such as age and medical conditions) to prove or disprove these claims and anecdotes. It is within the lack of research about the individual characteristics of a generalized prison's inmate population throughout an entire country that this thesis aims to contribute to. The aim is to see if there is an actual systematic variation of individuals' characteristics within private and public prisons, pointing to a potential non-random and non-objective selection or assignment.

Contribution of the thesis

To summarize, the present thesis relates to the papers reviewed in this chapter because it seeks to contribute to the cost-related discussion when comparing private and public prisons. It will do so by analyzing if there are in fact systematic differences across the populations housed in private and public prisons that would yield fewer costs for the facility. However, as will be explained further in the research design chapter, it is different from other academic papers in two ways: 1) it departs from the usually found case-study approach, which some have seen as contributing to the problem of the mixed results (Makarios and Mahaas, 2012); and, 2) it seeks to empirically test claims of *cream-skimming* by private prisons (to our knowledge) for the first time. Finally, this thesis will

attempt to improve the methodological rigor by, among other things, making sure it uses the relevant control variables other papers have been criticized for not using.

Theoretical framework

As seen in the literature review, what is known about inmate population characteristics emerged on the side of small-scale case studies mainly focused on comparing private and public prisons' effect on recidivism rates in Oklahoma (Spivak and Sharp, 2008) and Minnesota (Duwe and Clark, 2013). Hence, it would be safe to assume that those studies which only accounted for inmate differences as control variables were not attempting to capture all differences. Thus, the results on inmate population characteristics might lack validity for the entire US inmate population.

As such, this research aims to see if systematic differences exist between the inmate population of public and private prisons system-wide. In that sense, the present thesis bases its theoretical framework on three theories. First, the economic incentive model is presented to derive the primary framework used in this study: the *cream-skimming theory.* After that, an applied version of the *agency theory* is also developed. The relevant hypotheses are derived from said three theories to answer the research question: *how does privatization affect the composition of the facility population of private and public prisons?*

The theories were specifically chosen based on the history and context that allowed for the privatization of the correctional system, as well as on what was found out while undertaking the literature review. Those theories are the basis for understanding the ongoing debate between proponents and opposers of private prisons who still argue for and against their existence mainly based on costs, efficiency and quality.

Economic incentive model

The neoclassical economic paradigm argues that private companies are profit maximizers because to continue to exist they need to make a profit, thus making their main objective

to minimize costs (Laffont and Martimort, 2002). On the other hand, public organizations are said to maximize a variety of objectives that also take into account societal values, expectations and perceptions (Manzoor, 2014).

Theory of the maximizing bureaucrat

In that line, William Niskanen (1968) developed the *theory of the maximizing bureaucrat* after observing that public officials all seemed to strive to increase the budgets of the public organization they were in charge of. Said theory is based on the following two features of public organizations: 1) conditioned by cost and demand, public officials maximize their total budget "subject to the constraint that the budget must be equal to or greater than the minimum total cost at the equilibrium output" (p.293); and, 2) governmental organizations are given a specific budget to deliver a specific output, which effectively assigns them the power to present "the market with an all-or-nothing choice" (p.934).

In his model, Niskanen (1968) explains that when a publicly provided service is in high demand, the public entity will end up getting a higher budget assigned than actually necessary, thus performing its tasks at a higher price. However, for the government to notice that it is giving a higher budget than necessary to the entity, it would need to assign someone to the task of analyzing the cost situation within that public entity carefully. Having a specific worker doing the said analysis would be necessary because the governmental entity itself lacks incentives to know or show its minimal cost necessities to deliver the specific output. After all, it is interested in receiving a higher budget than the minimum needed.

Public correctional facilities as budget maximizers

Public correctional facilities are an example of public entities offering a service in high demand, mainly due to some countries' historic and current incarceration policies. In that line, based on the theory discussed above, it can be argued that rather than being concerned with minimizing their costs, public prisons are budget-maximizers that always attempt to exhaust their assigned budget (Niskanen, 1968; Commission on Privatization,

1988). They try to entirely spend the money to ensure that the organization does not get less for the next term.

Added to that, public prisons also strive for less cost-effectiveness than private prisons for the following reasons:

1) Public prisons are run as not-for-profit organizations because, normatively, a government is not allowed to make profit from the punishment it imparts to its citizens (Privatization of Corrections Hearings, 1986).

2) They are assigned a total budget for their services, which gives them a pricing power similar to a monopoly (Niskanen, 1968).

3) As part of their objectives, they account for the government's higher responsibility to serve and look after its citizens because they know that the final liability for the well-being of the entire inmate population, including the one housed in private prisons, always remains with the government (Commission On Privatization, 1988; Privatization of Corrections Hearings, 1986). In that sense, public prisons are held accountable for general recidivism rates and for the impact rehabilitation programs have in decreasing criminality.

4) Public prisons are generally not faced with the fear of failing. Enough public prisons must always exist so that the government retains its capabilities to take over the management and operations of any former privatized facility and step in and house its entire inmate population in case the private facility goes bankrupt (Commission On Privatization, 1988).

We are aware that the neoclassical economic paradigm has limitations. Also, the belief that the private sector delivers public services at lower costs and more efficiently than the public sector ever could (Harding, 2001; Hart et al., 1997; Vallance, 1991) is contested. In that sense, all assertions and differences between the private and the public sector have to be seen as a matter of degree (Dixit, 2002). Some public organizations are going to be very aware of their costs. For example, the new ones trying to establish a public reputation and prove their worth or the ones struggling with sudden “exogenous

increases in costs" (Niskanen, 1968, p.301-302) after receiving their assigned budget. Still, as explained above, the incentives of public prisons to cut costs are generally considered to be less than those of private prisons (Mulder, 2004).

Private correctional facilities as profit maximizers

While public facilities are paid through an assigned total budget, private firms managing and operating correctional facilities are paid a fixed "daily rate per inmate to cover investment, operating costs, and profit" (Lundhal et al., 2009, p.384). Thus, there are theoretically two ways to make a profit with a fixed fee per inmate: reducing average costs per inmate or housing more inmates while maintaining lower average costs per inmate (Kyle, 2013). Taking that into account, as well as the "fixed or semi-fixed cost structure of operating a prison" (Mookim, 2015, p.31), opposers of prison privatization usually argue that quality will be sacrificed as a result of cost-cutting (Hart et al., 1997). Said argument is put forward because producing high or higher quality is costly (Dixit, 2002). Moreover, since quality is challenging to define appropriately and specific enough in a contract (Mulder, 2004) private prisons can get more profit by lowering quality (Dixit, 2002, p.703). Although scarifying quality is not the only way to minimize costs, decreasing quality is indeed one of the choices a private for-profit company could make as part of a combination of actions that minimizes their costs. In the context of correctional services quality aspects of prisons may include, for example: well-kept facilities (encompassing the physical building, as well as the cells and common areas); sufficient, qualified and well-trained staff; and, offering diverse programs and services for inmates.

There are many ways a private prison might seek to cut costs. On the one hand, as a best-case scenario, the cost reduction could be achieved by utilizing new technologies to manage inmates, such as "CCTV cameras, magnetic key cards and privacy locks" (Panchamia, 2020, p.5). Or by improving operations and processes by minimizing bureaucratic complexities (Edwards, 1996, p.396), requiring several steps, paperwork and permissions such as acquiring goods or services for the inmate population, for example, the phone services used in the prisons (Kukorowski, 2012).

Although said best-case scenario is theoretically possible, it has been observed that the possibility of innovation in this sector is actually scarce (Jing, 2010). This has led opposers of prison privatization to believe that costs are being cut, as the worst-case scenario would imply, by: 1) having less staff or less qualified staff and paying them less, potentially risking safety[7]; 2) by reducing general quality in the form of worse facilities, fewer programs and services offered to the housed population; or, 3) by purposely seeking out and selecting the less disruptive, less costly and more manageable inmates (Jing, 2010; Hart et al., 1997; Edwards, 1996; Vallance, 1991).

There are anecdotal claims, at least from experiences within particular US states (Burkhardt, 2017), of the existence of inmate selection into private prisons based on non-objective criteria. However, is it actually true that privatization enables the selection of inmates based on cost criteria? A system-wide analysis to see if data shows hints of systematic selection based on the cost-variable traits of the inmate population has, to our knowledge, not been done for the correction facility sector. Such practices have been empirically tested in the healthcare sector, where the service is provided by both the government and the private sector. From that literature, the *cream-skimming* theory, explained hereafter, is derived as a more specific framework for the present paper.

Cream-skimming theory

The *cream-skimming* theory is closely related to the economic incentive model discussed above. It relies on the basic arguments and ideas of the said model about the cost minimization incentives of private firms to make a profit.

The *cream-skimming* theory is based on the idea that private service providers can select the "service receivers" or "clients" (in our case, the inmates) subject to their less costly characteristics to get financial gains. The theory has been mainly tested in the health system “where private hospitals coexist with tax-funded public hospitals” (Cheng

[7] The prison sector is mainly labor-oriented. Labor often entails "60% to 70% of the annual operating budget" (Gaes, 2019, p.285), which is why cost saving is often achieved through there. According to Camp and Gaes (2000), the maximum wages in private prisons are 59% lower than in public ones, as is the training they receive, which is why they tend to stay less time in the job.

et al., 2015, p.157). Such coexistence of private and public service providers is also present in the correctional systems of the US and the UK.

In the healthcare sector, *cream-skimming* implies selecting patients for characteristics that entail less expected treatment costs, which allows the health provider to gain financially (Cheng et al., 2015, p.156; Friesner and Rosenman, 2009, p.39). *Cream-skimming* practices have been found in the healthcare sector to be of two kinds: vertical and horizontal (Levaggi and Montefiori, 2003). The former involves offering care only to less costly patients. The latter consists of specializing in the treatment of patients with specific conditions and thus similar needs, which means focusing only on one kind of activity, allowing for time and money savings in the provision of the service (Smith and Cannan, 2003). In our context vertical *cream-skimming* would imply not choosing costly inmates, for example, individuals with disabilities or health issues such as kidney/liver problems or HIV/AIDS. While horizontal *cream-skimming* would mean specializing in housing a homogenous inmate population, for example, those who have recently violated parole or individuals who only need specific counseling/programs such as substance-abuse programs.

According to Levaggi and Montefiori (2003), the *cream-skimming* behavior alters the competitive structure between private and public service providers in the created market system. Also, it makes comparisons of performance hard, as the systematic differences in their customers (in our case, the inmates) alter their daily operational costs by shifting them to the counterpart (Friedmann, 2014). Nevertheless, horizontal *cream-skimming* is deemed legal while vertical *cream-skimming* is an illegal practice. The latter arises from the inability of the government to observe the behavior of the private provider at all times and monitor its compliance with all contractual stipulations. This will be further explained in the next section about the agency theory.

In the case of the correctional system, as discussed in the first section of this chapter, since market mechanisms provide private prisons with incentives to maximize their profits through cost minimization, the possibility exists that they will incur in *cream-skimming* practices.

We are aware that the claims used by opposers of privatization saying that private prisons are the ones using *cream-skimming* practices might be biased. The possibility and incentive of incurring in such behavior may exist not only for private prisons but also for public ones. For example, this study found one case that —while not sharing subsequent proof— narrated that case managers from public facilities used transfers to get rid of problematic inmates[8] (Spivak and Sharp, 2008). Still, as constrained by federal law (8th and 14th Amendments)[9] and several resolutions of court cases (e.g., *Johnson vs. California*, 2005) public facilities must house a cross-section of inmates and only assign inmates to a particular facility according to an objective classification based on risk assessments to ensure safety (Reinhart, 2000). In that sense, public prisons are not free to select which type of inmates to house based on costs or even based on how challenging and problematic an inmate seems to be, as they have a "public safety function" (Friedmann, 2014). Hence one can expect that public correctional facilities cannot systematically discriminate among inmates (Makarios and Maahs, 2012). In that sense, it would be expected that the magnitude of *cream-skimming* would differ between private and public managed prisons, being used more by private correctional facilities. Such evidence of more frequent use of *cream-skimming* practices by the privately managed and operated facilities was indeed found by Mukamel et al. (2009) in for-profit nursing homes relative to government-owned ones.

Assertions about privately operated prisons' *cream-skimming* practices seem to mainly stem from anecdotal evidence or speculations based, in part, on the cost minimization objective of for-profit companies (Laffont and Martimort, 2002). In that sense, based on the theories discussed above, the following hypotheses about vertical and horizontal *cream-skimming* are derived.

[8] While corresponding to a purposely selection practice, this practice does not seem to be based on the idea of cutting costs (the main idea behind the *cream-skimming* theory) but rather on making the lives of the managers and workers of the public prison easier by only housing well-behaved inmates.

[9] About restrain from cruel and unusual punishment and assurance of equal protection, respectively (National Archives, 2020).

Vertical *cream-skimming* (selecting inmates hypotheses)

Private for-profit operators are seeking to maximize their profit. One way to capitalize on their per diem rate is by achieving savings through cutting costs by choosing to house the less costly inmates. Selecting less costly inmates means avoiding old inmates because of increased medical needs, and thus the need for more and better-trained staff and structural accessibility adaptations (McKillop and Boucher, 2018). In that same line, selecting less costly inmates also involves avoiding inmates with chronic illnesses such as HIV/AIDS for which the provision of its medical care and treatment is very costly (Petrella, 2013). Hence, the following hypotheses are possible:

H1: private prisons are less likely to house an old population.

H2: private prisons are less likely to house inmates with HIV/AIDS.

Horizontal *cream-skimming* (specialization hypothesis)

The current paying arrangement between the government and the private contractor for the service provision is based on a predetermined daily rate per inmate (Friedmann, 2014). In that sense, given the set payment structure, private prisons might find it advantageous to specialize and focus their service in a more homogenous inmate population to profit from the said arrangement. Thus, taking the specialization theory into account, which asserts that specialization allows for cost saving in the provision of a service (Smith and Cannan, 2003), the following hypothesis deems possible:

H3: private prisons are more likely to specialize in housing an inmate population with similar needs.

Agency theory applied

When a government decides to allow private companies to manage and operate a correctional facility fully, it is delegating the task of providing correctional services. According to the theory, vertical *cream-skimming practices* arise from the inability of the government to observe the behavior of the private provider at all times (Levaggi and Montefiori, 2003). Thus, private prisons' ability to engage in *cream-skimming* may be

limited depending on the contract and the government's capabilities to monitor the private for-profit provider. As such, the *principal-agent theory* can be applied to our case.

In the *principal-agent* theory, the principal represents the main authority (in our case, the government), who delegates to an agent (in our case, the private for-profit company) the performance of a task or tasks in its name (Ramirez and Wood, 2019). It is based on the idea that the agent has more expertise and information, hence would be better able to do the job than the principal itself. The principal needs to control the agent to ensure that it does not deviate from the contract or the principal's preferences.

In that sense, as explained by Ramirez and Wood (2019), the assumptions of the said theory are: 1) according to available alternatives, the agent chooses which actions to take; 2) said action will have an effect on both their welfares; and, 3) based on what the principal can observe as an outcome, it can either reward or sanction the agent. When the agent has divergent priorities regarding the principal and it has more information than the principal (information asymmetry), the agent has incentives to behave in ways that are against the principal's best interest. This latter situation may particularly arise when desired actions to the principal are hard to observe and costly to undertake by the agent.

Based on the *principal-agent* theory, the information asymmetries create the following three problems: 1) *adverse selection* when the principal is not able to know everything that might be relevant about the agent (such as its motivations and beliefs) for it to perform the task according to what the principal mandates, desires or expects, and thus ends up unintentionally choosing an agent that will be most likely after its own interest; 2) *moral hazard*, when the agent who controls the daily activities acts in its own interest because it believes that it can get away with it due to the inability of the principal to oversee its every movement; and, 3) *agency cost*, which are the costs that arise from the diverging and/or self-interested actions of the agent and are later assumed by the principal (Ramirez and Wood, 2019; Gauld, 2018).

In that sense, to solve the problems that arise from delegating a task, the principal must assert control by either: monitoring extensively or adopting extensive and explicit contracts. In the case of the privatization of the correctional system, when delegating the

provision of the correctional service to a private firm, the government drafts a contract with certain stipulations that it finds desirable. Proponents of prison privatization argue that because of the existence of a contract[10], accountability is actually improved when a prison is privatized because a private firm can be found to be in contract default and thus have its contract terminated[11]. Still, a private firm providing the service to house inmates is also a case characterized by asymmetric information. The private provider has more information about its cost structure in the service provision and can observe the inmates and their characteristics. *Moral hazard* manifests itself after the government (principal) agrees on a contract with the private contractor (agent) because principals cannot observe most of the daily activities of the agent (Gauld, 2018, p.4915), and drafting fully complete, specific and detailed contracts is impossible (Kyle, 2013; Hart et al., 1997) due in part to *bounded rationality*[12].

The self-interested behavior and associated incentive structure of private contractors[13] will most likely lead them to opportunistically hide actions that diverge from the principal's interest and are possible because of deficiencies in the contract (Commission on Privatization, 1988). In that sense, contract and legislation stipulations that modify the incentive structure to align the agent's actions to the principal's desires are crucial (Laffont and Martimort, 2002).

In the correctional system of the US, exerting control to overcome the difficulties that arise from delegating the task of housing an inmate population to the private sector was not necessarily one of the main concerns, as extensive monitoring is a costly task. Legislation requiring that a contract stipulates the appointment of an independent monitor

[10] Such contracts are not very usual when delegation is more direct from a politician or a higher level public official to a lower level one for the management and operation of a public prison (McDonald, 1994).
[11] In the context of the United States, most legislation accounts for termination stipulations (Commission on Privatization, 1988). However, as explained before, part of the euphoria to privatize in the US came from the need to build new facilities faster and cheaper, thus allowing the private firms to build and own the facilities they would be allowed to manage (Pozen, 2003). In that sense, terminating a contract could be challenging because it might mean paying back the original investment of the private company that built the facility (Pozen, 2003; Privatization of Corrections Hearings, 1986).
[12] This refers to the limits that any individual has regarding its possibility to access information and its cognitive capabilities to make an entirely rational decision (Wheeler, 2020).
[13] Both, the self-interested behavior and incentive structure of a private company were theoretically explained in the previous section.

to oversee its compliance cannot be found in all states (Pozen, 2003, p.277). This means that there is a possibility that, depending on the state, the private firm would act according to its self-interest and in opposition to the principal's expectations.

In addition, contracts can provide for flexible arrangements either intentionally or unintentionally since drafting a comprehensive and unambiguous contract is hard. This means that it would be possible for private prison operators in the US to affect the classification process of inmates into their facilities. It is so that opponents to prison privatization seem to believe that private operators have managed to exclude housing inmates that cost more than other inmates due to their characteristics such as age, disabilities or health conditions. Since the present study cannot access the actual contracts drafted between the government and the private contractor as they are not public (Pozen, 2003), privatization legislation acts as the closest mechanism to a contract. In that line, based on the theory discussed above, the following hypotheses are derived.

Legislation based hypotheses

In the United States, the legislation among states varies widely (Calvert Hanson, 1991). Some states enacted lax legislation (e.g., Tennessee, Alaska or West Virginia) where no reference exists as to which duties cannot be delegated to the private contractor (e.g., classifying inmates into a specific correctional facility). This fact opens up the possibility for private prison operators to choose which inmates to house. Some other states enacted harder legislation, including fixed requirements, monitoring provisions, and specification of duties that the government officials may not delegate. For example, the highly prescriptive (Kyle, 2013; Harding, 2001) legislation in Florida declares that private prisons cannot make the final decision about which correctional facility will be responsible for the custody of an inmate. However, they are allowed to send a recommendation to the public official in charge of said classification process to change an inmate's housing facility (Florida State, 1997). This provision in the legislation makes it more difficult for private prison operators to choose which inmates to house.

In that sense, based on agency-risks derived from the *principal-agent theory,* it would be expected that any observed systematic differences in the inmate population

(*cream-skimming* evidence) of private and public prisons will vary in degree according to the "hardness" of the legislation of the state where the prison is located. In this regard, the following hypotheses seem possible:

H4a: a private prison in a state with lax privatization legislation is more likely to house a less old population.

H4b: a private prison in a state with lax privatization legislation is more likely to house fewer inmates with HIV/AIDS.

Research design

The present chapter will discuss the research approach chosen for this thesis to best answer the research question: *How does privatization affect the composition of the facility population of private and public prisons?* It starts by discussing the rationale behind the design used. Then, it continues with a description of the data and database used for the study, and the choices made for the robustness of the results. After that, it presents in detail the measurement and operalization of the variables used since a precise specification will ensure the replicability of this research. It ends with a reflection on the assumptions, validity and reliability of the chosen methodology.

Cross-sectional large N design

An observational study will be conducted in the form of a cross-sectional study that “focuses on variation across individual units” (Kellstedt and Whitten, 2013, p.69) with a large-N design. In this case, the individual spatial units being the adult correctional facilities (private and public) in the US.

The best way to ensure the validity of the answers to our research question would be through an experiment that can control and randomly assign values of the independent variable (Kellstedt and Whitten, 2013). However, it is impossible for the present study to carry out an experiment as that would imply taking identical and empty prison facilities and randomly having some be managed by a private operator and the other by public

employees to see the effect on the inmate population's composition. In that sense, this study will undertake a non-experimental design based on observations and statistical controls. With this kind of design, the risk of lacking internal validity is higher than with an experiment (Kellstedt and Whitten, 2013). Nevertheless, it is the best option available for the present study.

A large-N design was chosen instead of a case-study small-N design because the literature review showed that most of the studies relating to prison privatization had been done based on case studies in Oklahoma (Spivak and Sharp, 2008), Minnesota (Duwe and Clark, 2013) and Mississippi (Mukherjee, 2020). Although the said studies focused on shedding light on issues like recidivism or inmate's time served, their analysis also found some evidence that could hint to *cream-skimming* practices. Still, it is difficult to ensure that their results apply to the national inmate population; thus, this thesis chose a large-N design to identify if large systematic trends exist of inmate selection. In that sense, the design selected by this thesis would increase the external validity. In addition, this thesis will also seek to account for the differences between states.

The theory discussed in the theoretical framework applies to the correctional system of any country in the world that allows correctional facilities to be managed and operated fully, either privately by for-profit companies or publicly by state officials. However, the present research focuses on the US because it is the only country where data was available on diverse prison facility characteristics related to their inmate population (Bureau of Justice Statistics, 2021). Not all states of the US allowed for the privatization of prisons. In that sense, based on the selected large-N design, the present thesis will focus on the 30 states and the federal government of the US that in 2005 had private and public prisons. This means that correctional services were being provided through either publicly or privately managed facilities according to the data-set of the 2005 *Census of State and Federal Adult Correctional Facilities* of the Bureau of Justice Statistics (United States Department of Justice, 2017a). This thesis uses the data-set of 2005 because it is the most recent data on correctional facilities that would allow us to answer our research question through the theoretical framework of *cream-skimming*, which has not been empirically applied to the correctional system. The five-year

periodicity of the Census stopped in 2005. According to the Bureau of Justice Statistics website, a Census with 2019 information will be soon available; however, the information was not available at the time of the elaboration of this thesis.

The advantage of a cross-sectional design is that it allows us to deal with the world as it is without manipulating our independent variable. Still, with this design it is more challenging to make definitive statements about inferred causality (Kellstedt and Whiten, 2013). Therefore, to overcome the risk of lacking internal validity, this thesis must account for all variables that could potentially influence the causal relationship of our dependent and independent variables (Kellstedt and Whitten, 2013). In that sense, based on careful consideration of the previous research on the matter and the literature review undertaken in the first chapter of the present thesis, the following control variables were drawn: facility's security level, facility's size, facility's opening date and facility's overcrowding level.

The second option for a non-experimental large-N design was to take on a time-series study, which would focus on the variation of one unit across time (Kellstedt and Whitten, 2013). However, since the data set used for this research is based on a census that has changed the observations it considers over time, the comparison across time is not possible.

Description of the data-set

As previously explained, the present study uses prison data from the 2005 *Census of State and Federal Adult Correctional Facilities* of the Bureau of Justice Statistics of the US (United States Department of Justice, 2017a), which is the most recent data available showing comprehensive variables. The 2005 version is the seventh edition of the said census which the *Bureau of the Census* conducts through a survey that —as expressed in the "series statement" of the codebook of the Census— provides information about "physical security, age, functions, capacity, court orders for specific conditions, one-day counts and average populations, race/ethnicity of inmates, inmate work assignments, inmate deaths, special inmate counts, assaults, and incidents caused by inmates" (United States Department of Justice, 2017b, p.4).

The original data-set contains 1821 observations, which are the universe of adult correctional facilities surveyed to obtain the information within each of the 50 states of the US and DC, resulting in 366 variables from which this thesis will only use a few relevant ones to undertake its research. The US Census Bureau collected the information from the first of January 2005 until the thirtieth of December of that year.

As explained in the codebook of the Census, the universe of facilities included in the database consists of all adult prisons that by the thirtieth of December 2005 were active (meaning that they had staff and inmates) and thus housing federal or state inmates. The surveying authorities took the 2000 Census results as a baseline to get the population of adult correctional facilities. Afterward, they established contact with the Department of Corrections of each state and inquired to "identify new facilities and facilities that had been closed since June, 2000" (United States Department of Justice, 2017b, p.4).

After deleting all missing values from the relevant variables used by this research (explained hereafter), a database with 784 observations remained. However, to strengthen the internal validity of our study, assure *unit homogeneity*, and make more reliable inferences later (King et al. 1994, p. 91), we decided to filter the data to only keep those states that (in 2005) had public and private prisons. It was also decided only to keep the facilities with the primary function of housing a general adult population, hence, to get rid of the “youthful offender facilities” (United States Department of Justice, 2017b, p.5) per se housing a younger population. After doing that, we get a usable database that contains a big N of 367 adult correctional facilities within 22 states[14].

Measurements of the dependent variable

For the present thesis, we will have diverse measurements of the dependent variable based on the hypothesis that is being tested. A descriptive statistics table is provided in the appendix (Table 1) to summarize all the variables used in this study.

[14] Alaska, Arizona, Arkansas, California, Colorado, Florida, Georgia, Hawaii, Idaho, Kansas, Kentucky, Louisiana, Minnesota, Mississippi, Montana, New Jersey, New Mexico, New York, Oklahoma, Texas, Washington and Wyoming.

For the first hypothesis, the dependent variable will be about the age of the inmate population that is housed in the facilities. The variable is a count variable referring to the number of male and female inmates that are older than 18[15]. Said variable will be called "older" in our analysis. Although a ratio scale would be better, the way the data was gathered and presented in the database does not allow us to differentiate the ages to create the necessary intervals. We are aware, for example, that inmates that are just above 18 cannot be qualified as a risky old population. In that sense, we know that the measurement is not ideal. However, being the only data-set available to us at present — even aware of its limitations— no other or better variable could be used. It also does not go unnoticed that the variable "older" could measure something related to capacity limitations, which is why, to minimize said risk, we will control by design capacity and overcrowding directly related to the matter. The limitation section in the conclusion will further discuss the limitations. A histogram[16] is hereafter presented to represent the variable visually:

[15] Inmates younger than 18 are increasingly found in adult correctional facilities because of a series of legislations that allow and make it easier for juveniles to be prosecuted as adults (Austin et al., 2000).

[16] The said variable was further analyzed to see if it complied with linearity assumptions. First, the assumption of “additivity and linearity” (Gelman and Gill, 2007, p.46) was tested through a jittered strip plot which showed that it was reasonable to make such an assumption and that a slight negative relation between the variable older and the key independent variable of this thesis (public/private prison) exists. The outliers found were excluded from the data to minimize the risk of inaccurate predictions. Second, as explained before, the sample used consists of all the adult correctional facilities that were functional in December 2005. Moreover, the independence assumption is differently understood as our data is nested (see multilevel analysis section) which is why a multilevel model will be applied. Third, heteroskedasticity is expected because of the data structure; thus, a multilevel model will be applied. Still, heteroskedasticity is seen as a minor problem which, according to Gelman and Hill (2007), will not affect the form of our main predictor (p.46). Fourth the distribution found was right-skewed and not perfectly normal; however, multilevel models do not require this assumption to be true (Wiley, 2020).

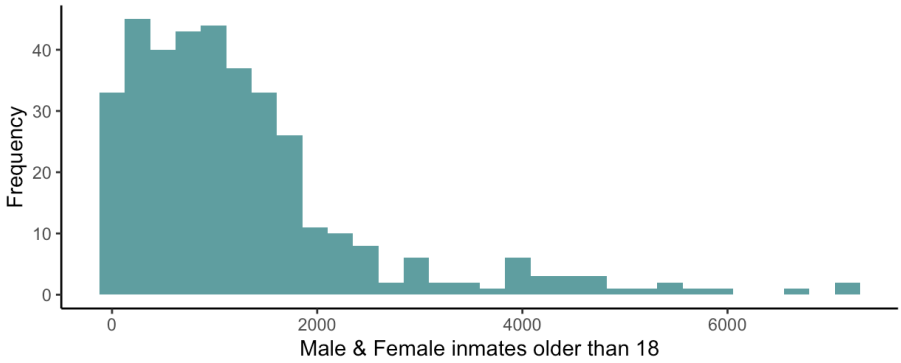

Figure 1. Histogram Male and Female inmates older than 18

For the second hypothesis, the binary variable “HIV/AIDS counseling” —gathered by the Census by inquiring the types "of counseling or special programs" (United States Department of Justice, 2017b, p.7) the facility offers— is used as a proxy to allow us to measure if the facility houses a population with HIV/AIDS which is more costly than housing a healthy population. It is assumed that if a facility offers HIV/AIDS counseling, it also houses a reasonable amount of population with the disease or has the potential to house said population type. Nonetheless, this study is aware that the proxy is not as direct as we would have hoped for to measure the actual population of inmates housed with the disease of HIV/AIDS. In that sense, it is also relevant to note that by using this proxy, an opposing causal mechanism could also apply. Having HIV/AIDS counseling could mean that the facility is investing in providing programs for the inmate population, which represents a cost. According to the economic incentive theory, it would be expected to find that, rather than private facilities, public prisons tend to offer more counseling and programs, which would also be in line with the findings of Makarios and Maahs (2012). However, if this study were to find that private prisons offer more HIV/AIDS counseling, the result would go against the discussed incentives theory and the explanatory mechanism based on the *cream-skimming* theory used by this thesis. In this regard, the proxy used is another data-set limitation encountered on which we will elaborate further in the limitations section of the conclusion. To create the binary variable a 1 was assigned to having HIV/AIDS counseling and a 0 was assigned to not having HIV/AIDS counseling. A bar graph is hereafter presented to represent the binary variable visually:

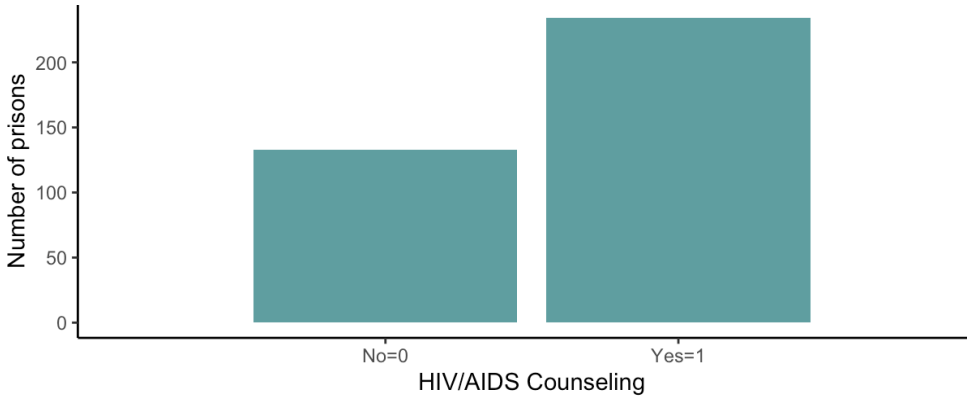

Figure 2. Barplot HIV/AIDS Counseling

For hypothesis three, a binary variable was created where 1 was assigned to the specialized facilities and 0 was assigned to those not specialized. Based on the literature, specialized correctional facilities are defined as those that offer precise services for a subset of the inmate population with similar "special needs" for successful reintegration into society (Cropsey et al., 2007). In that sense, using the database's categorical variable that stands for the main facility function, a 1 was assigned to the category that explains that the main function of the facility is to confine inmates for alcohol/drug treatment, as well as to the category that explains that the facility mainly houses inmates who have returned to custody after violating their parole. On the other hand, a 0 was assigned to the categories that define the primary function as only custodial or confinement (United States Department of Justice, 2017b). A visual representation of the binary variable is hereafter presented through a bar graph:

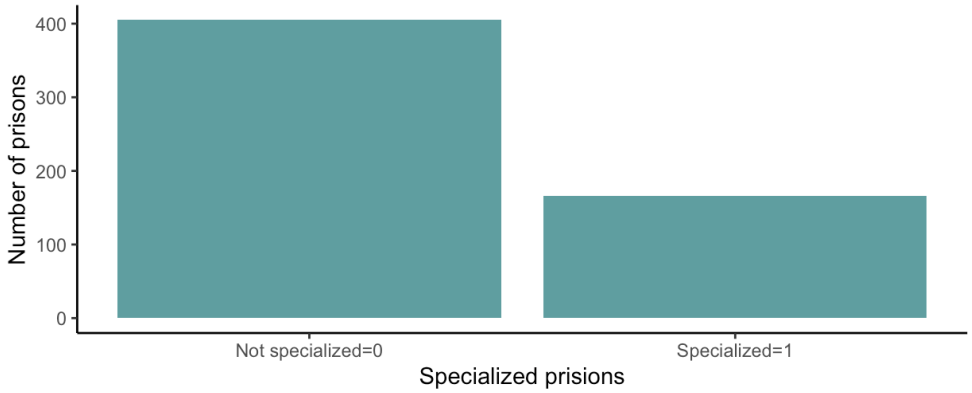

Figure 3. Barplot specialized prisons

For hypothesis four a and b, a new variable was created that allows us to account for the fact that a state may have enacted harder or laxer legislation when privatizing

correctional facilities. The type of legislation may affect the maneuvering space private prisons have to select the inmates they house to cut costs. Using Calvert Hanson's (1991) original classification of correctional privatization legislation, which took scope and coverage of the bill as indicators for the classification, a deep analysis of the text of each state's legislation was undertaken. In that sense, the classification as lax was done based on the observation that the legislation did not specify any requirements for the contract, thus leaving plenty of freedom to choose which inmates they accept. For example, legislation basically only focused on allowing the Director of Corrections, the Commissioner or any other relevant public official to contract a private firm for the management and operation of a correctional facility. In that line, any legislation text was classified as hard provided that it had references to at least three of the following matters. 1) The qualifications/experience of the private firm. 2) Compliance with common facility standards. 3) Provision of services and programs with the same quality as public facilities. 4) a cost-savings requirement compared to what the government would spend housing an inmate in a public facility. 5) Monitoring. 6) non-delegable responsibilities to the private contractor. 7) provisions for the termination of the contract. Table 2 in the appendix shows a more precise sample of the phrasings used for classification into lax or hard legislation. The measurement of the binary variable is lax legislation equals 1 and hard legislation equals 0. A visual representation of the binary variable is hereafter presented through a bar graph:

Figure 4. Barplot Prison Privatization Legislation of the States

Measurement of the key independent variable

Our main independent variable will be the same for all our hypotheses: private or public prisons, as we want to see the effect of a private or public adult correctional facility on our dependent variable. As seen, the dependent variable has diverse measurements depending on the hypothesis that is being tested. For the main independent variable, this study will use the categorical variable called “who operates facility” from the database, which includes facilities that are run at federal-, state-, local- and joint- (state and local) level, as well as facilities run by private enterprises. However, since we are only interested in comparing public and private prisons, we modify said variable so that it becomes a binary variable where all prisons run by the first four governmental levels mentioned are measured as public equal 0. In that sense, the rest of the facilities remain as private to which the measurement of 1 is assigned. Once the binary variable is created, we end up with 34 private facilities and 333 public ones. A visual representation of the binary variable is hereafter presented through a bar graph:

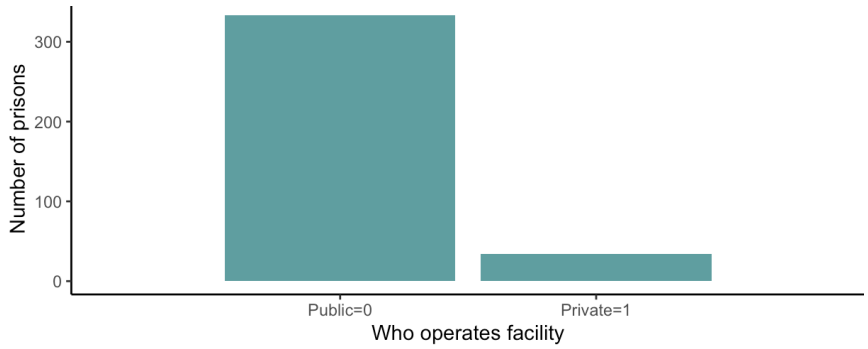

Figure 5. Barplot Who operates the facility

Control variables

According to the literature review, the following control variables were selected to account for the effects of confounding factors (Kellstedt and Whitten, 2013) that may be affecting the type of prison population a private facility is housing.

The first control variable, “facility security level” chosen from the database, is a discrete variable where super-maximum equals 1, high equals 2, medium equals 3 and low equals 4. The variable was chosen based on the literature considering that

governments say that their correctional systems objectively classify inmates based on risk assessments that determine an inmate's placement into a facility (Cropsey et al., 2007; Reinhard, 2000). The fact that "operational costs are directly related to the level of security provided"[17] (Privatization of Corrections Hearings, 1986) was also taken into account for choosing this variable as a control. Figure 6 in the appendix presents a barplot of the variable.

The second control variable taken from the database is “design capacity”, which is a discrete variable defined as “the number of inmates that the facility planners or architects intended for the facility” (United States Department of Justice, 2017b, p.5). The variable is used in this thesis because according to Kim and Price (2014) it affects the inmate population of private facilities. After all, the number of inmates housed in the said facilities is dependent on shortages of the "operational capacity" (p.267) of the public correctional system. The variable also acts as a proxy for facility size, which is a characteristic that affects the operational costs of prisons (Kim, 2019b; Burkhardt, 2015). Figure 7 in the appendix presents a histogram of the variable.

The third control variable is a continuous variable created from dividing the total number of inmates held at the facility up until the 30th of December 2005 by the facility's rated capacity. The rated capacity of a facility is defined as “the maximum number of beds or inmates allocated by a rating official to institutions” (United States Department of Justice, 2017b, p.6). The created variable aims to show whether a facility is overcrowded, meaning that “the demand for space in prisons exceeds the overall capacity of prison places” (European Committee on Crime Problems, 2016, p.5). Taken from the literature (Burkhardt, 2015), the variable is a relevant control because officials responsible for classifying inmates into a facility avoid sending more inmates into already overcrowded facilities. Figure 8 in the appendix presents a histogram of the variable.

Finally, the fourth control variable, "year of construction complete," is a discrete variable that supplies us with information about the year a facility (private or public) was finalized and could be used, meaning that inmates could start to be assigned to said

[17] As higher security facilities have more physical security requirements.

facility. According to Mukherjee (2020), it is a relevant control variable that may affect the population a facility ends up housing because the opening of a private facility leads the authorities to want to fill it as soon as possible, usually "within two weeks of their opening" (p.2). The bar graph found in Figure 9 in the appendix shows the year when the construction of a correctional facility was done, and thus ready for usage. A variable will be created for the analysis to show how old the facility is ("facility's age"); this will be operationalized by subtracting the year the construction of the facility was completed, which is the original variable of the database, to 2005 which is the year the Census was conducted.

Multilevel analysis

To utilize the usual regression model in our case would be problematic since our data is *clustered* or *nested,* meaning that “the observations in the same group are related” (Pillinger, 2021). In other words, the data has a discernible hierarchy (Bell and Jones, 2015; Gelman and Hill, 2007). More specifically, in our case, we have 367 correctional facilities and 22 states; hence, our data is *nested* in the sense that prisons x, y and z are located in state w, and prisons a, b and c are located in state d, and so on. Taking that into account, for the present thesis, the best way to proceed is with a random intercept model that accounts for the variation of the two levels we have. Level 2 being the higher level of the state and Level 1 being the correctional facilities.

This study runs different multilevel analyses to prove or disprove the hypotheses. When the measurement of the dependent variable is discrete (as is the case for H1 and H4.a), a linear random intercept model is used with the form of:

$$y_{ij} = \beta_0 + \beta_1 X_{ij1} + \mu_j + \varepsilon_{ij}$$

$$\varepsilon_{ij} \sim N(0, \sigma_\varepsilon^2)$$

$$\mu_j \sim N(0, \sigma_\mu^2)$$

Where y_{ij} is our dependent variable (which depending on the hypothesis being tested it is measured differently); i represents the correctional facilities clustered in groups

j which in our case are the states. β_0 is the so-called intercept, and β_1 is the coefficient for X_{ij1} which here is representing the series of explanatory variables (independent variable as well as our control variables) included in our model. All of which is followed by the "random part of the model" (Bell and Jones, 2015, p.136), which consists of two independent random terms, the residuals, that represent the variance at the higher (μ_j) and lower level (ε_{ij}). As seen from the formula, the model assumes that μ_j and ε_{ij} are normally distributed.

However, when the measurement of the dependent variable is binary (as is the case for H2, H3 and H4.b) a logistic random intercept model is used with the form of:

$$Pr(y_1 = 1) = logit^{-1}(X_i\beta + \alpha_{j[i]}), for\ i = 1, \ldots, n$$

$$\alpha_j \sim N(\mu_\alpha, \sigma_\alpha^2), for\ j = 1, \ldots, 22$$

Where y_i is our binary dependent variable; i represents the correctional facilities and $j[i]$is the notation for the state $j$containing the facility i. X includes again the series of predictor variables (independent and controls) included in our model. Furthermore, in the second part of the model, the intercept α_j is the grouping in the higher level of states, with a standard deviation for higher level errors of σ_α^2. The model has a sample size of n correctional facilities grouped in 22 states (j).

Assumptions of the analysis

Based on (Wooldrige, 2012, p.510), the random intercept model makes the following assumptions: 1) the explanatory variables do not have a perfect linear relationship; 2) given all predictor variables the expected value of the unobserved effect is constant[18]; and, 3) the variance of the unobserved effect is constant given all predictor variables[19].

The correlations between the explanatory variables of our model were previously tested. As expected, correlations between our explanatory variables exist because of the

[18] As explained before, the control variables were selected carefully and as comprehensively as possible based on the literature and the effect they might have on our dependent variable.
[19] Due to our large-N design, the many observations of the variances will cancel out and get diluted in the aggregate, turning the unobserved effect constant.

nested structure of the database being used. Still, the results show that our main independent variable and the control variables mostly have a low correlation, thus still allowing us to test the variables in the same model. The most prominent correlations found are between Design Capacity and Security Level and Design Capacity and Overcrowding. As seen from the correlations-plot shown hereafter, both the size of the circles and their color relate to the strength of the correlation. In that sense, the bigger the correlation the bigger the circle and the stronger and brighter the color. A correlation of 1 or -1 would have a big circle with a bright red or blue color, respectively. A coefficient correlation matrix with p-values can be found in Table 3 in the appendix for further information.

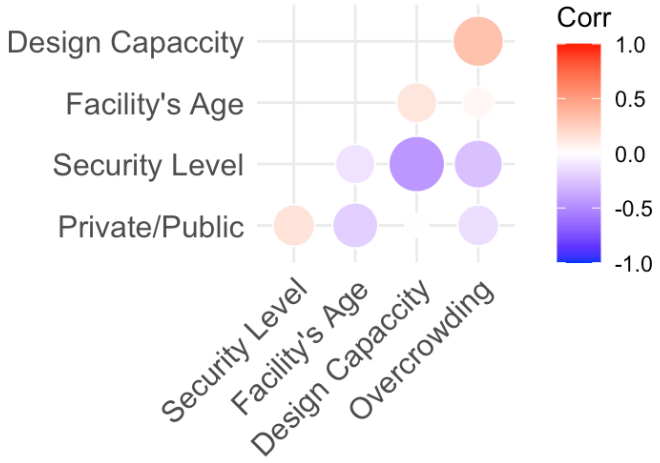

Figure 10. Correlation matrix plot of explanatory variables.

Furthermore, when undertaking a causal study, it is vital to assure the quality of the research by addressing internal and external validity (Bo and Galiani, 2019). The former refers to the ability to infer causation with a high level of confidence, while the latter refers to the ability to generalize the results to a broader population than the one studied (Kellstedt and Whitten, 2013, p.89).

Internal validity

Quantitative research designs are said to sacrifice internal validity because they do not allow the in-depth analysis of a case-study when researching the link between the dependent and independent variables (Blatter and Haverland, 2012). However, when trying to compare the performance of public and private prisons in the US —be it in quality

or cost-savings/efficiency— the usual study design chosen has been case-studies, which might be part of the reasons that the empirical evidence has shown mixed results (Makarios and Maahs, 2012). In that sense, to better contribute to the field, this thesis found it necessary to conduct a large-N study to obtain more generalizable findings. In addition, to strengthen the conditions for causality and thus internal validity, this thesis has added all controls deemed relevant by the literature review due to their possible effect on the dependent variable. Still, because of its cross-sectional design, which per definition should control for all confounding factors, the possibility of having left a relevant factor out needs to be acknowledged (although we have diminished the risk by accounting for all relevant ones found in the literature review). In this regard, due to an ever possible omitted variable problem, this thesis must still be cautious in "its pronouncements about causality" (Kellstedt & Whitten, 2013, p. 88). Finally, it is also important to note that, in our case, inverse causality is directly ruled out because our key independent variable is antecedent to our dependent variable. A correctional facility must first exist for an inmate population to get assigned to it.

External validity

As for external validity, quantitative cross-sectional designs are said to enhance it. Still, it is essential to note that a cross-sectional design does not allow for generalization in time (Bo et al., 2019). Thus, considering that the only available database is the one we use from 2005, generalization to the current inmate population within private and public prisons in the US should be made cautiously as this study does not account for developments over time. Furthermore, for results to be generalizable to a broader population than the correctional facilities of the US, one must consider the privatization policy's context and aims. The former, because privatization schemes and models differ in characteristics which might entail relevant contributing factors to differences observed in the inmate population housed by private and public prisons. Hence, generalization of the results found in this study is limited to countries where the privatization policy focused on decreasing correctional spending and enhancing capacity rapidly, disregarding other policy objectives (e.g., simulating a competitive market).

Analysis and results

This chapter describes and explains the analysis undertaken to prove or disprove each of the hypotheses made based on the relevant theories derived from the literature. Furthermore, it also presents and describes said results. Finally, the findings are subsequently discussed and critically reflected upon in the discussion section.

First, a null model only specifying our two levels (prisons and states) was done for each dependent variable before adding any explanatory variables to the model to know how much variance of the outcome is attributable to the clustering in states (Rense Nieuwenhuis, 2021). That is observed through the intraclass correlation (ICC), which gives us the proportion of the between-state variance versus the total one (Wiley, 2020). As shown by Table 4 in the appendix, the ICC result for the dependent variable "older" suggests that differences across states explain 56% variation. The ICC result for "HIV/AIDS" (49%) suggests that the variability is almost similarly predicted at the prison and state levels. Finally, the ICC result for "specialized" suggests that most variation is explained at the prison level as between-state differences explain only 16%. We thus conclude that —for our case— using multilevel analysis is appropriate.

Subsequently, for hypothesis 1: *private prisons are less likely to house an older population*, three different random intercept models —all grouping by state— were undertaken with the dependent variable "older". The three models undertaken to study hypothesis one as robustly as possible all use this study's main independent variable, which accounts for private/public prison. Model 1 controls by security level (super-maximum, high, medium and low), design capacity, overcrowding and facility age. Model 2 adds the binary variable that accounts for lax/hard legislation as a control to include a state-level variable. Finally, Model 3 allows for a random slope, using the lax/hard legislation variable as the slope.

Table 5. Random intercept model of older inmates in correctional facilities

	Older		
	Model 1	Model 2	Model 3

Private	-217.50***	-215.10***	-215.30***
	(-74.51)	(-74.55)	(-73.17)
High	72.64	78.76	57.64
	(-146.6)	(-146.8)	(-146)
Medium	277.20*	281.70*	266.60*
	(-144.6)	(-144.7)	(-144.5)
Low	83.06	90.41	70.43
	(-151.2)	(-151.4)	(-150.6)
Design Capacity	1.08***	1.09***	1.08***
	(-0.03)	(-0.03)	(-0.03)
Overcrowding	796.30***	792.30***	735.70***
	(-102.2)	(-102.2)	(-100)
Facility's Age	-0.16	-0.22	-0.03
	(-0.71)	(-0.71)	(-0.7)
Lax		149.3	164.1
		(-132.8)	(-148.2)
Constant	-887.10***	-954.60***	-896.00***
	(-191.9)	(-200.3)	(-185.1)
Random Components			
States level variance	794575	76737	13384
Slope (State.Lax) variance			172674
Corr			-0.23
Residual variance	141647	141789	141177
ICC	0.359	0.351	0.39

Note: *p<0.05, **p<0.01, ***p<0.001. Reference categories are: for the independent variable public; for security level super maximum; and, for legislation hard.

The results of all models are highly significant and in line with our hypothesis. The coefficients of "Private" in Table 5 show that private prisons reduce the number of inmates that are older than 18 by approximately 217 persons (depending on the model) in regard to public prisons. The results also show that the medium-security level, the design capacity and the overcrowding of a prison all explained part of the observed differences in the age of the inmate population housed by private and public prisons. Nevertheless, these factors do not account for the total variation observed. Regarding the random-

effects, the ICC in the full models estimates that most variation is explained at the prison level after accounting for the explanatory variables. However, an important part (~36%) is still due to systematic differences between states.

For hypothesis 2: *private prisons are less likely to house inmates with HIV/AIDS*, two logistic random intercept models with fixed slope —grouped by state— were undertaken. A logistic model was chosen considering that the dependent variable used to test this hypothesis is a binary variable that tells us if a facility offers HIV/AIDS counseling. The main independent variable for the model continues to be private/public prison. The controls remain the same for the first model. The second model adds the binary variable that accounts for lax/hard legislation as a control to include a state-level variable.

Table 6. Random intercept model of inmates with HIV/AIDS in correctional facilities

	HIV/AIDS counseling	
	Model 1	Model 2
Private	0.32	0.31
	(-0.47)	(-0.47)
High	-0.93	-0.95
	(-1.05)	(-1.06)
Medium	-0.93	-0.95
	(-1.05)	(-1.05)
Low	-1.11	-1.14
	(-1.08)	(-1.09)
Design Capacity	0.0004	0.0004
	(-0.0003)	(-0.0003)
Overcrowding	2.44**	2.49**
	(-1.11)	(-1.12)
Facility's Age	0.01**	0.01**
	(-0.01)	(-0.01)
Lax		-0.63
		(-0.98)

Constant	-1.77	-1.52
	(-1.64)	(-1.68)
Random Components		
States level variance	4.03	4.04
Residual variance	3.29	3.29
ICC	0.55	0.55

Note: *p<0.05, **p<0.01, ***p<0.001. Reference categories are: for the independent variable public; for security level super maximum; and, for legislation hard.

In a logistic model, the coefficient is not directly interpretable by itself (Breen et al, 2018). Hence there is a need to extract either the marginal effects (probability) or the odds ratio. This thesis chose to estimate the probability because it is the form usually used by academics in their research since it is more intuitive (Bogard, 2016a). For that, we use the "divide by 4 rule" (Gelman and Hill, 2007; Bogard, 2016b) for logistic models. When the first derivative of the logistic function is done to determine its maximal point, the value is $\beta_e^0/(1+e^0)^2 = \beta/4$ (Gelman and Hill, 2007; Turner, 2010). In that sense, in logistic regressions, the coefficients (but not the constant term) can be divided by four "to get an upper bound of the predictive difference corresponding to a unit difference in x" (Gelman and Hill, 2007, p.82). In our case, taking the coefficient of "Private" from Model 1, it would be 0.32/4=0.08. As seen in Table 6, the results are not significant, which is why a third model allowing a varying slope was deemed unnecessary. However, the significance of the coefficients "overcrowding" and "facility's age" show that part of the difference observed in "HIV/AIDS counseling" is explained by how old and overcrowded a facility is. As stated before, the section hereafter will discuss the limitations of the proxy used as the dependent variable. Regarding the random-effects, the ICC in the full models estimates that 55% of the proportion of variance is due to between-state differences after accounting for the above-mentioned explanatory variables.

For hypothesis 3: *private prisons are more likely to specialize in housing an inmate population with similar needs*, three different logistic random intercept models were undertaken based on the binary nature of our dependent variable "specialized". The first two models are logistic random intercept models with a fixed slope and the third allows for a random slope, using as the slope the lax/hard legislation variable; all models group

by state. The main independent variable for the models continues to be private/public prison and the controls also remain the same. The second model adds the binary variable that accounts for lax/hard legislation as a control to include a state-level variable.

Table 7. Random intercept model of specialization of correctional facilities

	Specialized		
	Model 1	Model 2	Model 3
Private	1.88***	1.87***	1.79***
	(-0.38)	(-0.38)	(-0.41)
High	12.63	12.56	13.53
	(-1347)	(-1305)	(-422.8)
Medium	13.5	13.44	14.43
	(-1347)	(-1305)	(-422.8)
Low	15.93	15.87	16.87
	(-1347)	(-1305)	(-422.8)
Design Capacity	-0.001***	-0.001***	-0.001***
	(-0.0003)	(-0.0003)	(-0.0003)
Overcrowding	2.18***	2.18***	2.20***
	(-0.75)	(-0.75)	(-0.75)
Facility's Age	0.01	0.01	0.01
	(-0.01)	(-0.01)	(-0.01)
Lax		-0.02	0.1
		(-0.54)	(-0.54)
Constant	-17.99	-17.91	-18.92
	(-1347)	(-1305)	(-422.7)
Random Components			
States level variance	0.893	0.896	1.13
Slope (State.Lax) variance			0.42
Corr			-0.83
Residual variance	3.29	3.29	3.29
ICC	0.2135	0.214	0.19

Note: *p<0.05, **p<0.01, ***p<0.001. Reference categories are: for the independent variable public; for security level super maximum; and, for legislation hard.

The results are highly significant and in line with our hypothesis. We apply the "divide by 4 rule" for logistic models (Gelman and Hill, 2007, p.82) discussed above. Applying the said rule allows us to get interpretable coefficients through the probability; the results tell us that private prisons have approximately 47% (approximately 45% in Model 3) more probability of specializing in regard to public prisons. The results also show that the design capacity and the overcrowding of a prison explain part of the observed differences in the specialization of a private and public correctional facility. Nevertheless, these factors do not account for the total variation observed. Regarding the random-effects, the ICC in the full models estimates that most variation is explained at the prison level after accounting for the explanatory variables. Only around 21% is due to between-state differences.

For hypothesis 4.a: *a private prison in a state with lax privatization legislation is more likely to house a less old inmate population*, a random intercept model with fixed slope —grouping by state— was undertaken with the dependent variable "older". To test the hypothesis in this case, an interaction between the main independent variable of this thesis (private/public prison) and the binary variable telling us if a state has enacted lax or hard legislation to allow private companies to operate and manage correctional facilities was added. The model controls for security-level (super-maximum, high, medium and low), design capacity, overcrowding and facility's age.

For hypothesis 4.b: *a private prison in a state with lax privatization legislation is more likely to house fewer inmates with HIV/AIDS*, a logistic random intercept model with fixed slope —grouping by state— was undertaken with the binary dependent variable of HIV/AIDS counseling. To test hypothesis 4.b the interaction term between the main independent variable and the binary of lax/hard legislation was again added. The controls remain the same as before.

Table 8. Random intercept model for prisons in states with lax/hard legislation

	Older	HIV/AIDS counseling
	Model	Model
Private	-83.52	0.06

	(-93.48)	(-0.62)
Lax	185.3	-0.7
	(-133.9)	(-0.98)
Private*Lax	-350.00**	0.59
	(-151.5)	(-0.95)
High	84.82	-0.95
	(-145.9)	(-1.06)
Medium	284.00**	-0.96
	(-143.8)	(-1.05)
Low	129.4	-1.22
	(-151.4)	(-1.09)
Design Capacity	1.09***	0.0004
	(-0.03)	(-0.0003)
Overcrowding	791.10***	2.48**
	(-101.6)	(-1.12)
Facility's Age	-0.19	0.01**
	(-0.71)	(-0.01)
Constant	-993.70***	-1.41
	(-200.1)	(-1.69)
Random Components		
States level variance	77102	4.01
Residual variance	139983	3.29
ICC	0.355	0.549

Note: *p<0.05, **p<0.01, ***p<0.001. Reference categories are: for the independent variable public; for legislation hard; for the interaction public*hard; and, for security level super maximum.

The significance of the interaction term in Model 1 means that the combination of the two binomial independent variables has an additional effect to the one of each separate variable[20]. In other words, the significance of the interaction suggests that the

[20] The coefficient for private tells us the difference in inmate population older than 18 between a private prison and a public prison located in a state with hard legislation. The non-significance shows that when a correctional facility is located in a state with hard legislation, whether the prison is private or public does not matter regarding housing an older population.
The coefficient for lax in the table tells us the difference in inmate population older than 18 between a public prison located in a state with lax legislation and a public prison located in a state with hard legislation. It is

differences between the inmate population of private and public prisons are conditional on the softness or hardness of the legislation of the state they are located in. In that sense, the result of the interaction tells us that a private prison located in a state with lax legislation will house approximately 350 fewer inmates that are older than 18 than a private prison located in a state with hard legislation. This finding is in line with our hypothesis. The results also show that the medium-security level, the design capacity and the overcrowding of a prison all explained part of the observed differences in the age of the inmate population housed by private and public prisons. Nevertheless, these factors do not account for the total variation observed.

In the case of Model 2 for hypothesis 4.b, none of the coefficients this study was interested in were significant. However, the result shows that part of the non-significant difference observed is explained by the overcrowding of the facility and its age. The results from the coefficients of the variables in the interaction term bring us to three conclusions: 1) from the coefficient of private, that a private or a public prison in a state with hard legislation does not affect the probability of offering HIV/AIDS counseling; 2) from the coefficient from lax, that a state's hard or lax legislation does not affect the probability of a public prison to offer HIV/AIDS counseling; and, 3) from the interaction-term, that being in a state with hard or lax legislation does not affect the probability of a private prison offering HIV/AIDS counseling. This last result is compelling enough to yield interest for some further examination in another research. A better proxy for the actual housed population with HIV/AIDS would, however, be needed.

Discussion

This chapter discusses the previously presented findings by connecting them to the theoretical framework and critically reflecting upon alternative explanations.

good that the coefficient is not significant because the legislation enacted by each state only addresses private prisons, so we would not expect an effect of said legislation on public prisons.

Vertical *cream-skimming*

The results in Table 5 show that private and public prisons house significantly different inmate populations age-wise, as the former seems to house younger inmates. The observed differences hold even after controlling for other factors (e.g., security level, design capacity, overcrowding and facility's age) that could account for the said differences according to the literature (Cropsey et al., 2007; Kim and Price, 2014; Burkhardt, 2015; Mukherjee, 2020). As explained in the theoretical framework, the fact that private prisons tend to house approximately 217 fewer inmates older than 18 could be the case because of private prison's motivations to minimize costs to make a profit. One way to minimize costs is through *cream-skimming* practices, which means choosing inmates with fewer needs and thus less costly, in this case, the young ones.

However, alternative explanations need to be considered. For example, the possibility that observed age-differences relate more to capacity limitations which would imply pinpointing the date the considerations to assign the inmate to a facility were made and cross-referencing it to the capacity situation in all correctional facilities functioning at the time. Still, to minimize the risk of the results showing capacity limitations, the model controlled for design capacity and overcrowding closely related to the matter. The results showed that design capacity and overcrowding did not explain away the significant differences observed in the ages of the populations housed in private and public facilities. Another more likely alternative explanation seems possible based on Spivak and Sharp (2008) narration about case managers in a public facility in Oklahoma frequently transferring problematic inmates to private facilities to remove them from their care. It can reasonably be thought that the "problematic inmates" could be the younger inmates, thus also explaining the results found by this study (Table 5): private prisons systematically house younger inmates than public prisons. Nonetheless, this scenario could only be happening if all case managers across the country used prison transfers that way. Unfortunately, this alternative explanation remained outside of the scope of the present study. To test if indeed younger inmates are systematically being transferred by public prison's case managers to private facilities, specific data about the inmates being

transferred would be needed, including their age and the transfer direction (public to private facility or vice versa). To our knowledge, such a study has not been done.

In addition, vertical *cream-skimming* cannot fully be claimed by the present study because the second hypothesis used to test said practice was not supported by the undertaken analysis. The results in Table 6 were not significant, telling us that there is no real difference between a private and a public prison regarding the number of inmates housed with HIV/AIDS. Still, even though the results indicate that differences in this regard are non-significant, they go against the vertical *cream-skimming* mechanism in the sense that we would expect private prisons to minimize costs, thus house fewer inmates with HIV/AIDS who are more costly.

An alternative explanation about the observed results might stem from the fact that the proxy available to us is based on HIV/AIDS counseling offered within correctional facilities. In that sense, the results might be pointing to the fact that there are no fundamental differences between private or public prisons regarding the offering of said type of counseling. Still, this would imply an opposing causal mechanism in which private prisons would be investing in providing their prison population with programs. The result calls for further research once a better measurement is available; also because Makarios and Maahs (2012) —using the 2000 *Census of State and Federal Adult Correctional Facilities* to empirically research the effect of ownership of a correctional facility in quality— found that federal facilities offer more and better programs than private facilities, while state prisons do slightly better than private ones in the offer of work-related programs.

Horizontal *cream-skimming*

On the other hand, the results shown in Table 7 seem to firmly uphold horizontal *cream-skimming* practices by showing that private prisons are approximately 47% more likely to specialize in housing an inmate population with similar needs. This means that private prisons provide housing services for inmates that are essentially more homogeneous based on the reasons they are being held for (e.g., parole violation). According to the theory, specializing allows private companies managing and operating the correctional

facilities to focus on more similar tasks due to the similarity of needs of the inmate population instead of providing the service to a cross-section of inmates (Cropsey et al., 2007), which allows for time and money savings in the provision of the service (Smith and Cannan, 2003). Although this practice might be opportunistic, it is legal (Levaggi and Montefiori, 2003). Still, suppose the government would want this situation to change. According to the literature, it could consider changing the payment scheme to account for the fact that running all types of correctional facilities is not the same and does not represent the same risks in terms of profit-making (Levaggi and Montefiori, 2003).

Legislation

Although opposers claim that private prisons incur in *cream-skimming* practices, it is not per se that privatization allows it. More relevant is that such practices are very subtle, thus hard to observe and not easily detected by the government. As addressed in the theoretical framework contracts and legislation are drafted to solve agency problems but they are usually incomplete and present ambiguities that allow maneuvering space. For example, depending on the state a private prison is located in, a vertical *cream-skimming* practice could sometimes even be indirect. Some states specifically disallowed the delegation of the responsibility to classify inmates into a facility but still allowed private prisons to subsequently submit recommendations to change their custody.

In that sense, based on the results shown in Table 8, the way the privatization legislation was enacted in a specific state (laxer or harder) seems to indeed partly explain observed differences in the inmate population of public and private correctional facilities. Private firms managing and operating correctional facilities behave and incur in different practices depending on the state they are in. The results show that private prisons in states that enacted laxer legislation when delegating the correctional services tend to house a significantly less old inmate population than the private prisons in states with harder legislations. Still, the results for the HIV/AIDS part of the vertical *cream-skimming* hypothesis did not show a significant difference between private and public prisons in states with laxer or harder legislation. Based on that, this study cannot make a conclusive

assertion about private prisons in states with laxer legislation systematically incurring in vertical *cream-skimming* practices.

Conclusion

According to the literature, the main objective and justification of the privatization of prisons in the United States were to reduce the correctional system's spending and increase capacity as fast as possible. As such, other important considerations (e.g., generating a market-like environment, experimenting with performance-based compensation schemes or writing prescriptive and output-based contracts) that were more guarded in the United Kingdom, for example, were left aside. Said specific context led to a debate that mainly centered on either affirming (by proponents) or discrediting (by opposers) cost-efficiency claims about private prisons.

In that sense, similarly to the debate, most empirical research has focused on comparing private and public prisons based on their costs and the quality of the service they offer. The results so far have been mixed. In the best-case private prisons have been said to perform equally to public facilities in terms of quality and costs (Panchamia, 2020; Gaes, 2019; Lundahl et al., 2009; Pozen, 2003; Pratt and Maahs, 1999) and in the worst-case they have been said to offer lower quality with same or more costs (Mukherjee, 2020; Duwe and Clark, 2013; Makarios and Maahs, 2012; Spivak and Sharp, 2008).

Choosing a cross-sectional large-N design, this thesis examined a national sample of correctional facilities in the United States intending to see how prison privatization affects the composition of the inmate population of private and public prisons. More specifically, it sought to empirically test the usually heard claim that private prisons engage in *cream-skimming* practices driven by their profit-making motivations and incentives to minimize costs.

Cream-skimming was conceptualized based on the theory as the ability of the private service provider to select the inmate population to get financial gains. As such, it was divided into two sorts of said opportunistic behavior: vertical and horizontal *cream-*

skimming. The former is based on selecting inmates to house only the healthier, best behaved, easier, and thus less costly ones. The latter is based on specializing in housing only inmates with similar needs and conditions (Cheng et al., 2015; Levaggi and Montefiori, 2003).

From those two sorts of *cream-skimming*, the vertical one is an illegal practice and is most pervasive as it discriminates against more costly inmates. It arises from the inability of the government to directly observe this behavior and monitor the private provider's compliance with contractual terms at all times. In that sense, the existence of this practice would also imply that the findings of cost comparison studies are being skewed by not easily observed cost-shifting making private correctional facilities seem a less costly option. Also, allowing private prisons to make a profit from other practices rather than just providing a more efficient service. To test this, the present study controlled for statistically relevant variables (e.g., security level, design capacity, age of facility and overcrowding) based on previous research. The findings lead to the following conclusions.

First, choosing multilevel modeling was the right path since, based on the intraclass correlations of the different models, an important part of the total variation in the composition of the inmate population could be explained by the differences among the states. In that sense, leaving the state level unaccounted for would be a mistake that can lead to inadequate and less reliable results (Kumar, 2021).

Second, only limited evidence was found regarding the existence of vertical *cream-skimming* practices as only one of the two hypotheses meant to test this type of *cream-skimming* proved to be statistically significant. Still, even those statistically significant results should be cautiously interpreted as the variable (older) available to us is not adequate to see necessary age intervals to know if the observed differences in the age are related to private prisons' cost considerations. Caution in interpreting vertical *cream-skimming* from the results is also necessary because the data-set did not provide us with enough relevant variables to test the said practice comprehensively. Nevertheless, even when the present study cannot fully prove the vertical *cream-skimming* claim, it still offers

a first empirical incursion into it. In that sense, the results found hope to spark interest to continue the empirical examination of the matter as it remains relevant for the inmate population and policy-makers.

Third, this thesis found strong evidence that private prisons incur in horizontal *cream-skimming* by specializing the facilities they manage in housing inmates with similar needs (e.g., alcohol/drug treatment or parole violators). This is an important finding because, even if this practice is officially a legal one, it is relevant to know that current privatization arrangements lead private prison providers to specialize in a more homogenous population rather than offering their services to house a cross-section of inmates. In that sense, if policy-makers were to find this behavior as an unintended consequence of the policy design, they can always choose to address it.

Finally, evidence suggests there is an impact of harder or laxer legislation in the behaviors a private firm adopts while managing and operating a correctional facility. However, the results are inconclusive as to whether said impact differs according to the action area. It was found that private prisons located in states that enacted laxer legislation house a significantly younger population than private prisons located in a state with hard legislation. However, on the other hand, being in a state with lax or hard legislation did not seem to impact the existence of HIV/AIDS counseling in private prisons. The fact that the softness or hardness of legislation moderates the observed effects in one case and not another means that hard legislation is not necessary in cases where the behavior is easily discernible and highly visible, without yielding high monitoring costs and oversight efforts by the government. Also, legislation might not affect providing HIV/AIDS counseling because private prisons might find that offering counseling is cheaper than providing the care, health treatment and medicines that inmates with HIV/AIDS need. Still, since the results are restricted by the limitations of the variables used as proxies, this thesis cannot make any conclusions about the relation between the legislation and the incurrence in vertical *cream-skimming* practices.

Even-though the present thesis made use of the data of the 2005 *Census of State and Federal Adult Correctional Facilities* of the Bureau of Justice Statistics (United States

Department of Justice, 2017a) to be able to present an alternative to the usual case-study designs, the choice came with important limitations that will be explicitly mentioned hereafter.

Limitations of the research

The first limitation faced by this study stems from the variable used to analyze if private prisons systematically choose to house a younger population, which does not allow us to create necessary intervals to ensure that the observed age differences relate to cost considerations. Similarly, the second limitation relates to the available variable used to see if private facilities house fewer inmates with HIV/AIDS, based on an inaccurate proxy that may opposingly only be measuring investment in counseling programs. Still, these limitations could not be circumvented since no better or more recent database is available.

In that sense, it is also important to note that with the data to which we had access, this thesis cannot test and rule out alternative explanations or mechanisms that might explain the differences in the inmate population housed by private or public prisons. For example, the results found by this thesis regarding private prisons significantly housing young inmates compared to public facilities could be related to the alternative explanation of public prison case managers systematically transferring young problematic inmates to private facilities. This alternative explanation could be tested in further research.

Also, it is important to note that there are limitations regarding the generalization overtime of the results of this study as the chosen design was only cross-sectional and based on data from 2005. Furthermore, an attempt to generalize the results to countries besides the United States should be made with caution as critical contributing factors to the results might be found in the context and aims of the chosen model of privatization policy.

To our knowledge this study is the first one attempting to empirically test the *cream-skimming* claim in the correctional system through a large-N design. In that sense, we might face omitted variable bias by unintentionally having left out some decisive factors

that could influence the assignment of inmates into private and public prisons, thus generating differences in the housed population. Still, this study tried to reduce said risk as much as possible by controlling for the factors that previous research found relevant.

Further research

Further research would be encouraged to seek access to relevant public officials to create a better instrument and database to test the *cream-skimming* claim and compare private and public prisons. It would also be encouraged that said instrument would allow comparison of private and public prisons in different countries, as data to enable cross-country comparisons of public and private correctional facilities seems to be nonexistent.

However, suppose contact with relevant public officials is not possible. In that case, it is still encouraged to seek replicability by using the new census that might be available in the coming year, which will portray data from 2019. Also, a study with a time-series cross-sectional design would be recommendable for more reliable and generalizable results.

Finally, empirical attempts should also be made to: 1) rule out alternative mechanisms. And 2) to test the *cream-skimming* claim in systems where private prisons can either be managed and operated by for-profit firms or not-for-profit organizations while also coexisting with publicly managed facilities.

Recommendations for policy-makers

Different countries in the world still consider resorting to privatization with the hope to fix some problems (e.g., overcrowding), reduce government spending or improve the efficiency of their correctional system. However, as shown by Kim and Price (2014), privatization has always become institutionalized once allowed. Thus, it is hard to take back or modify.

This study found that, compared to public prisons, private prisons tend to house approximately 217 fewer inmates older than 18. Also, it found that it is approximately 47% more probable that private prisons will choose to specialize in housing a homogenous

inmate population with similar needs rather than housing a cross-section of inmates like public prisons does.

In that sense, based on the said results, which hint —although not conclusively— to the fact that there are indeed differences in the inmate populations that a private facility houses compared to the population a public facility houses, it is relevant for policy-makers to keep equity issues in mind. Mainly after studies have found that inmates that serve their sentence in private prisons tend to spend more time in prison (Mukherjee, 2020), have fewer and worse programs (Makarios and Maahs, 2012), and present higher recidivism rates (Duwe and Clark, 2013; Spvak and Sharp, 2008).

Prioritizing equity issues can be done by evaluating different approaches to privatization and their effects before choosing a final model, because —as the theory explains— vertical *cream-skimming* arises from the government's inability to monitor the private provider at all times, while horizontal *cream-skimming* arises from inaccurate payment schemes that fail to account that different types of facilities represent different costs and risks that make it easier or harder to make a profit (Levaggi and Montefiori, 2003).

It would also be advisable for governments to draft hard legislation with output-based requirements and well-structured evaluation systems, taking into account that this study found that the softness or hardness of legislation influences the behavior of a private provider. Thus, it can impact the differences observed in the inmate population housed by private and public prisons.

Finally, based on the principal-agent theory, it remains crucial for policy-makers to consider its government's capacities for oversight and monitoring and bear in mind the problems that may arise from delegating a task. Thus, make sure to adequately address —in the legislation and/or the contract— how the agent should meet desired objectives to avoid possible undesired behaviors like those found in this study (e.g., choosing to house younger inmates or specializing in housing a homogenous population).

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Appendix

Table 1. Summary of descriptive statistics

Discrete/Continuous Variables	**Min.**	**1st quantile**	**Median**	**Mean**	**3rd quantile**	**Max.**
Older	4	476	995	1277	1608	7172
Design capacity	4	428	919	1091	1482	5108
Overcrowding	0.434	0.963	1	1.076	1.093	2.304
Categorical variables	**Level**		**Frequency**		**Mean**	
HIV/AIDS	Yes=1 No=0		234 133		0.638	
Specialized prisons	Specialized=1 Not Specialized=0		166 405		0.291	
Legislation	Lax=1 Hard=0		188 179		0.512	
Private/Public	Private=1 Public=0		34 333		0.0926	
Security level	Super-maximum=1 High=2 Medium=3 Low=4		8 129 145 85		2.84	

Note: for discrete variables the mean represents the proportion. The control variable that tells us the facility's age was left out on purpose as the levels it takes are at least 96 different values that result from subtracting the year the facility was finished from 2005 the year the Census we base the present research on was conducted. A graphic visualization of the variable "year of construction complete" can be found in Figure 9. And a further description of the variable can be found in the text describing the control variables.

Table 2. Coding examples for the classification of state's legislation into Hard or Lax

State	Legislation text	Classification
Arizona	"The department may contract with any private or public institution [...] contracts [...] **shall conform to the requirements** [...] not be accepted unless the **proposal offers cost savings** to this state. [...] **offers a level and quality of services** that are **at least functionally equal to those** that would be **provided by this state.** [...] The **department shall conduct a biennial comparison** of the services [...] A contract for correctional services shall **not authorize, allow or imply a delegation of authority or responsibility to a prison contractor for** [...]." (Justia US Law, n.d. a)	hard
Arkansas	"Contracts [...] shall be **negotiated with the firm found most qualified**. [...] no contract for correctional services may be entered into unless the private contractor demonstrates that it has: (1) The **qualifications, experience, and management personnel necessary** [...] **Evidence of past performance of similar contracts**; [...] **No contract for correctional services shall authorize, allow, or imply a delegation of authority or responsibility of** [...]" (LexisNexis, 2021)	hard
Florida	"A **contract** [...] shall **maximize the cost savings** of such facilities [...] Be **negotiated with the firm found most qualified.** [...] **contractor has demonstrated** that it has: 1. **The qualifications, experience,** [...] **ability to comply with** applicable laws, court orders, and national correctional **standards.** [...] Require the **contractor to be responsible for** [...] **services**; [...] **programs at least equal** to those provided by the department in comparable facilities. The work and education programs must be designed to reduce recidivism [...] Require the selection and appointment of a full-time contract **monitor.** [...] **A contract entered into under this chapter does not authorize**, allow, or imply **a delegation of authority to the contractor to** [...] **Make a final determination on the custody classification of an inmate.** [...] **Choose the facility to which an inmate is initially assigned or subsequently transferred.** [...] determines that the contract [...] will **result in a cost savings to the state of at least 7 percent over the public provision of a similar facility.**" (Florida State, 1997)	hard
Wyoming	"The state or a local government **may contract with private entities** for the construction, [...] operation, maintenance, purchase or management of facilities [...] **No contract shall be entered into or renewed unless** [...] **contract offers substantial cost savings** to the contracting governmental entity **and at least the same quality of services provided by the state or by similar local governments.** [...] **maintained and operated in accordance with the American correctional association standards** [...] employ an **individual to be responsible for monitoring all aspects of the private contractor's performance under a contract** [...] The board or the local government may [...] **cancel a contract for the private operation of a facility** [...] **No contract for private correctional services under this article shall authorize**, allow or imply a **delegation to a private contractor of authority or responsibility to** [...]." (Justia US Law, n.d. d)	hard
Alaska	"[...] the **commissioner may enter into an agreement with a public or private agency to provide necessary facilities.**" (Alaska Legal Resource Center, 1989)	lax
California	"The Director of Corrections **may enter into contracts,** [...], **with appropriate public or private agencies, to provide housing, sustenance, and supervision** [...]" (Justia US Law, n.d. b)	lax
NewJersey	"[...] the Commissioner of Corrections **may authorize the confinement of eligible inmates in private facilities**." (Justia US Law, n.d. c)	lax

Figure 6. Barplot Security Level

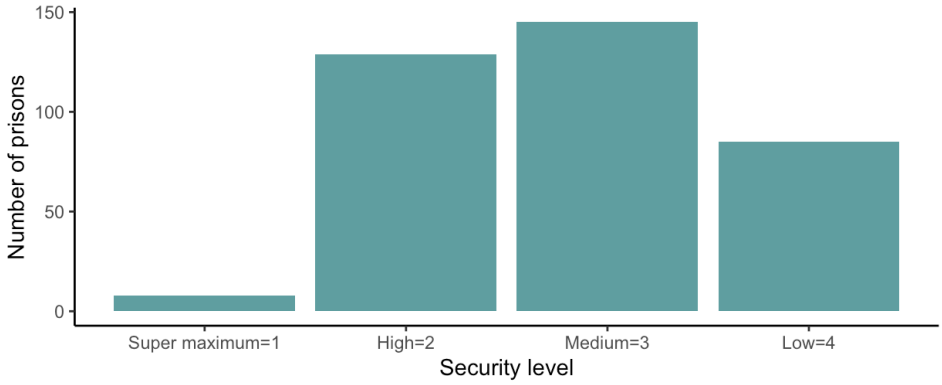

Figure 7. Histogram Design Capacity (size of the facility)

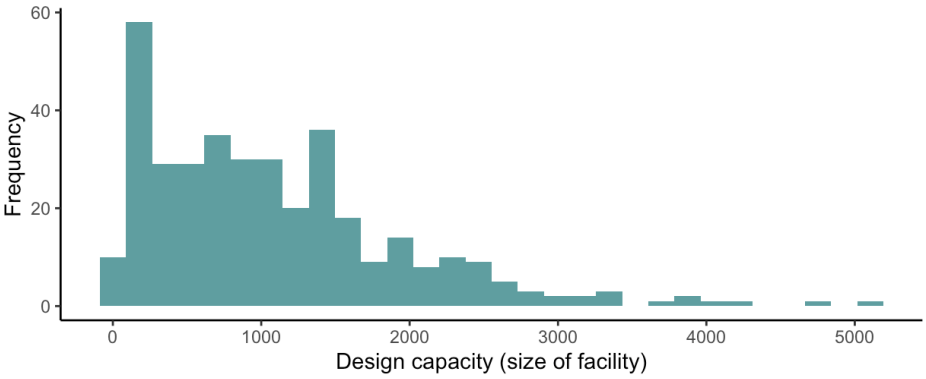

Figure 8. Histogram Overcrowding

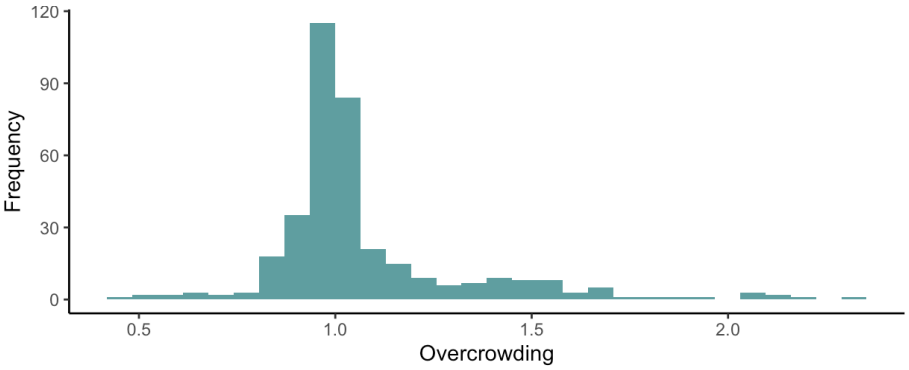

Figure 9. Barplot Year of construction complete

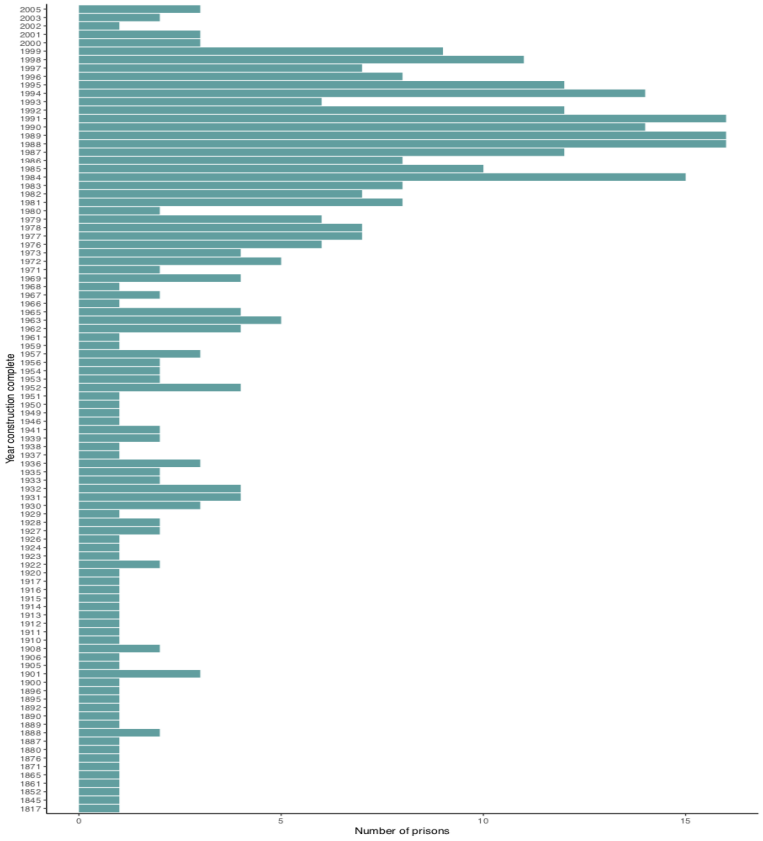

Table 3. Correlation matrix for the key independent variable and the control variables

	Public/private	Security Level	Design Capacity	Facility's Age	Overcrowding
Public/Private	1				
Security Level	0.147 p=0.0047	1			
Design Capacity	-0.008312 p=0.8739	-0.448 p=1.725e-19	1		
Facility's Age	0.213 p=0.000039	0.124 p=1.728e-02	-0.1323 p=1.092e-02	1	
Overcrowding	-0.142 p=0.00628	-0.266 p=2.282e-07	0.321 p=3.216e-10	-0.037 p=0.4779	1

Table 4. Intraclass Correlation for null models

Dependent variable	Older	HIV/AIDS counseling	Specialized
Interclass Correlation	0.56	0.49	0.16