



RESOURCES AND EFFICIENCY IN PRISON UNITS: APPLICATION OF RBV TO PUBLIC ADMINISTRATION

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Abstract

Objective of the study: analyze the relationship between resources and efficiency in closed regime prisons from the perspective of the Resource-Based View (RBV).

Methodology/approach: The methodology used data from SISDEPEN to propose indicators, validated by Expert Judges, for measuring the available resources (inputs) and products (outputs) of prison services, to assess efficiency and verify the relationship between strategically relevant resources (independent variables) and efficiency (dependent variable) of these units, through Data Envelopment Analysis (DEA) and multiple regression analysis.

Originality / relevance: the study lies in the proposal to reinterpret RBV concepts and adapt the VRIO analytical framework for non-competitive contexts, as well as the need to exercise caution when using private sector strategic theories in the public sector.

Main results: the results show that, according to the VRIO analytical and combined framework with the results of multiple regression analysis, the Human resource is significant for the efficiency of prison units, but resources that are considered essential for prison public policies, such as Capacity, Health, Education and Labor, not to show significant results for efficiency.

Theoretical/methodological contributions: The study contributes to the validation of RBV in the public sector and presents a proposal for reinterpreting RBV concepts and adapting the VRIO analytical framework for application in a non-competitive context such as the Public Administration.

Social/management contributions: It also proposes indicators validated by Expert Judges for evaluating prison public policies and supports the use of DEA analysis for the Public Administration.

Keywords: Resource-Based View (RBV); Public Administration; Prisons.

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RECURSOS E EFICIÊNCIA EM UNIDADES PRISIONAIS: APLICAÇÃO DA VBR À ADMINISTRAÇÃO PÚBLICA

Resumo

Objetivo do estudo: analisar a relação entre recursos e eficiência em unidades prisionais de regime fechado, sob a perspectiva da Visão Baseada em Recursos (VBR).

Metodologia/abordagem: empregou-se dados do SISDEPEN para proposição de indicadores, validados por Juízes Especialistas, para mensuração dos recursos disponíveis (*inputs*) e produtos (*outputs*) da prestação de serviços prisionais, visando aferir a eficiência e verificar a relação entre os recursos estrategicamente relevantes (variáveis independentes) e a eficiência (variável dependente) dessas unidades, por meio da análise envoltória de dados (DEA) e da análise de regressão múltipla.

Originalidade/relevância: apresenta proposta de reinterpretação de conceitos da VBR e de adaptação do modelo analítico VRIO para aplicação a um contexto não-competitivo, além de afirmar a necessidade de ponderação no uso de teorias de estratégia da área privada nesse contexto.

Principais resultados: a análise pelo modelo analítico VRIO combinada com os resultados da regressão múltipla evidencia que o recurso Humano é significativo para eficiência das unidades prisionais, mas que recursos descritos como essenciais para políticas públicas prisionais como Capacidade, Saúde, Educação e Laboral não se mostraram significativos para a eficiência.

Contribuições teóricas/metodológicas: valida o uso da VBR para o setor público e apresenta proposta de reinterpretação de conceitos da VBR e de adaptação do modelo analítico VRIO para aplicação a um contexto não-competitivo como da Administração Pública.

Contribuições sociais/ para a gestão: propõe indicadores validados por Juízes Especialistas para avaliação de políticas públicas prisionais e corrobora a análise DEA para a Administração Pública.

Palavras-chave: Visão Baseada em Recursos (VBR); Administração Pública; Unidades Prisionais.

RECURSOS Y EFICIENCIA EN UNIDADES PENITENCIARIAS: APLICACIÓN DE VBR A LA ADMINISTRACIÓN PÚBLICA

Resumen

Propósito del estudio: analizar la relación entre recursos y eficiencia en unidades penitenciarias cerradas, desde la perspectiva de la Vista Basada en Recursos (VBR).

Metodología/enfoque: Se utilizaron datos del SISDEPEN a fin de proponer indicadores, validados por Jueces Expertos, para medir los recursos disponibles (entradas) y productos (salidas) de la prestación de los servicios penitenciarios, con el objetivo de evaluar la eficiencia y verificar la relación entre los recursos estrategicamente relevantes (variables independientes) y eficiencia (variable dependiente) de estas unidades, utilizando análisis envoltante de datos (DEA) y análisis de regresión múltiple.

Originalidad/relevancia: presenta una propuesta de reinterpetación de conceptos VBR y adaptación del modelo analítico VRIO para su aplicación en un contexto no competitivo, además de afirmar la necesidad de consideración en el uso de teorías estratégicas del sector privado en este contexto.

Principales resultados: el análisis utilizando el modelo analítico VRIO combinado con los resultados de la regresión múltiple muestra que el Recurso Humano es significativo para la eficiencia de las unidades penitenciarias, pero que los recursos se describen como esenciales para las políticas públicas penitenciarias como Capacidad, Salud, Educación y Trabajo. no demostró ser significativo para la eficiencia.

Aportaciones teóricas/metodológicas: valida el uso de VBR para el sector público y presenta una propuesta de reinterpetación de conceptos de VBR y adaptación del modelo analítico VRIO para su aplicación en un contexto no competitivo como es la Administración Pública.

Aportes sociales /de gestión: propone indicadores validados por Jueces Expertos para la evaluación de políticas públicas penitenciarias y corrobora el análisis DEA para la Administración Pública.

Palabras clave: Vista basada en recursos (VBR); Administracion Publica; Unidades Penitenciarias.

1 Introduction

Public organizations are created to fulfill government responsibilities, develop public policies and provide services to the general population (Matthews & Shulman, 2005). And even if there is a lack of market to serve as a standard of quality and efficiency in the provision of services, public agencies are obliged to evaluate their actions to ascertain the effectiveness of a policy (da Costa & Castanhar, 2003; Howlett, 2013).

Due to the need for efficiency, researchers' interest intensifies in the search for answers about effective methods and tools for public sector management (Szymaniec-Mlicka, 2014). The directive to improve the services provided makes public administration seek and adapt practices, concepts and theories from private management (Hansen & Ferlie, 2014). One of the proposed solutions is to use the Resource-Based View - RBV (Szymaniec-Mlicka, 2014).

RBV stands out as one of the most accepted and widespread approaches in the strategy field (Melián-González, Batista-Canino & Sánchez-Medina, 2010; Newbert, 2007; Popadiuk, Rivera & Bataglia, 2014) and suggests that the organization performance depends on the resources and capabilities that they control or access (Barney, 1991). Resources and capabilities are essential for implementing public policies, as public policy that must first be equipped with resources that will be processed in activities and actions that transform them into products to be delivered to the target audience (Batista & Domingos, 2017). The focus on available resources makes RBV a promising approach for application in public organizations, since its goal the organization's objective is to generate knowledge and services and distribute them for the public good rather than maximizing profit (Matthews & Shulman, 2005).

Even though Matthews and Shulman's (2005) arguments are justified, few studies employ RBV in public organizations (Szymaniec-Mlicka, 2014), which requires further analysis to identify the relevance of different types of resources for the performance of public organizations (Lee & Whitford, 2012; Lima & Rosa, 2016). It should be noted that RBV is an approach to the field of study of business strategy that is interested in explaining how firms achieve and maintain performance differences in a competitive context (Barney & Arkan, 2001). Although it can be argued that there is competition between public organizations for budget or reputation, it is understood that this is not a dispute for income or consumers, as is observed between private firms (Lee & Whitford, 2012). Therefore, the application of RBV to the public administration context requires adaptations (Bryson, Ackermann & Eden, 2007).

Aiming at fulfilling the lack of a competitive environment, the authors propose adopting efficiency, understood as the adequacy between means and ends, that is, inputs allocated and

products intended by public intervention (Oliveira & de Paula, 2014), as a criterion variable. Public organizations operate in an environment in which the decision-making process is open to political influence and the objectives of public interventions are ambiguous and complex (Hansen & Ferlie, 2014). Efficiency constitutes a relatively simple metric that allows a comparative analysis between different organizations and interacts with the effectiveness expected from public policies. Efficiency assessment is necessary for the public sector, as public agencies do not have a competitive market to serve as a benchmark for the quality of services and effectiveness in obtaining results (da Costa & Castanhar, 2003; Howlett, 2013).

Several resources are available to public organizations, but not all of them are directly associated with efficiency. Specifically, the present work focuses on prison units, although the theme of prison performance is relevant to the justice system, public administration and society (Chies, 2015; Salla, 2017; Williams & Campbell, 2021). This object of study has little analysis in the organizational management or public policies (Cesaroni & Lamberti, 2014). Criminal enforcement is one of the main areas of action in the criminal justice system and is a service offered exclusively by the State (Ferreira & Fontoura, 2008). The need to maintain efficient public spending in the public security sector is a challenge, as the prison population has increased (Brazil, 2019), and such growth which increasingly requires planning, operational intelligence, and coordination (Pereira Filho, Pianto & Souza, 2010). Furthermore, there is a need to advance in the use of empirical evidence to guide the development of correctional and penal public policies (Kopittke & Ramos, 2021; Tubex, 2015).

Based on the arguments presented, this work proposes to answer the following question: which resources are associated with efficiency in Prison Units? The aim is to analyze the relationship between resources and efficiency in Prison Units based on the application of RBV and reinterpretation of the VRIO model (Barney & Hesterly, 2007) for application to a non-competitive context.

2 Theoretical Reference

RBV analyzes the relationship between available resources and performance (Barney, 1991; Dierickx & Cool, 1989; Grant, 1991), based on the assumptions that firms are heterogeneous and that resources have limited mobility (Barney, 1991; Newbert, 2007; Priem & Butler, 2001). Based on the premise that organizations are sets of resources (Penrose, 1959), RBV adopts an inward-looking perspective on the organization to explain persistent performance differences between organizations (Barney & Arikan, 2001). Resources are

understood as all tangible and intangible assets associated in a semipermanent to the firm (Wernerfelt, 1984). This includes capabilities, processes organizational attributes, information and knowledge that firms mobilize and use for implementing their strategies (Barney, 1991).

Different ways of classifying resources are proposed in the RBV literature (Melián-González et al., 2010). Barney (1991) classifies different resources into three main categories: physical, human and organizational. Grant (1991) suggests six main categories of resources: financial, physical, human, technological, reputation and organizational.

There are other resource typologies, as well as suggestions for new resources as generators of competitive advantage, where bargaining power stands out, outsourcing, Information Systems (IS), e-commerce, Knowledge Management (KM), reputation and strategic alliances and others, however, the theories that gave rise to RBV converge towards a common core, around which the idea circulates that resources internal resources that firms own and control are responsible for sustaining strategic competitiveness (Przyczynski & Bitencourt, 2011).

According to this convergence and to maintain a theoretical basis when study and development of the work, the research will adopt the typology brought by Barney and Hesterly (2007) who classify resources into four broad categories: financial, physical, human and organizational, as shown in Table 1.

Table 1

Resource Definitions Applied to RBV According to Barney and Hesterly (2007)

Resources	Tipology	Examples/Observations
Financial	Include all money, any source, that firms use to create and implement strategies.	Organizational resources are a attribute of groups of people.
Physical	Includes all physical technology used in a company	Company plant and equipment (software and hardware), its geographic location and its access to raw materials
Humans	Include training, experience, judgment, intelligence, relationships and individual managers vision and employees in a company	Not limited to entrepreneurs and managers seniors, but to all company employees.
Organizational	Organizational resources are a attribute of groups of people.	They include the formal reporting structure of the company; its formal and informal systems of planning, control and coordination; your culture and reputation; as well as relationships informal activities between group within the firm and between the company and those in its environment

Source: Prepared by the authors based on Barney and Hesterly (2007).

RBV adopts assumptions that are consistent with other management theories strategy, such as the search for maximizing results and the rationality of managers (Barney & Arikan, 2001). RBV, however, have two additional assumptions that distinguish and which, if considered together, allow us to explain why some organizations surpass others: resource heterogeneity and imperfect resource mobility (Barney & Arikan, 2001; Barney & Hesterly, 2007).

The heterogeneity of resources, in line with the work of Penrose (1959), presupposes that different organizations have different sets of resources, even though they operate in the same field of activity. The difference in available resources would explain why some organizations perform better than others (Barney & Hesterly, 2007).

Imperfect immobility, in turn, allows existing performance differences to remain long-lasting (Barney & Arikan, 2001). If resources were distributed in homogeneous shape, were perfectly mobile, or easily acquired, it would not be feasible to maintain superior performance or competitive advantages (Barney 1991; Grant, 1991; Peteraf, 1993).

An organization's competitive advantage would be its access to resources differentials, scarce and not accessible to other organizations (Hoffmann, Molina-Morales & Martínez-Fernández, 2011). An organization's competitive advantage would be therefore, in the use of its resources to implement a value strategy not feasible to be implemented by another competitor (Barney, 1991).

Resource imperfect mobility would be reinforced by characteristics affecting the processes of generation and development, such as: path dependence, causal ambiguity, and social complexity (Dierickx & Cool, 1989; Barney, 1991; Peteraf, 1993).

Path dependence refers to the process and time invested for the development of a resource (Dierickx & Cool, 1989). Causal ambiguity and social complexity address the difficulty of associating a strategic resource and the organization's performance, whether due to the difficulty in identifying which resource effectively provides such performance, whether due to the complexity of the allocation of the organization's resources (Barney & Hesterly, 2007; Peteraf, 1993). In either case, there is difficulty in emulating the strategy implemented by the competition.

Resources limit organizations' growth possibilities (Penrose, 1959), so that not all resources are strategically relevant (Barney, 1991). Thus, organizations have diverse and some common resources, but the main issue for RBV is to identify strategic and non-strategic resources. A strategic resource (know-how, human capital, etc.) contributes significantly

towards creating sustainable competitive advantage and success organizational, as opposed to a non-strategic resource, whose contribution is insignificant (Carmeli & Cohen, 2001)

Not all a firm’s resources are strategically relevant (Barney, 1991). Strategic resources, which enable firms to achieve superior performance, are naturally scarce (Peteraf, 1993). To evaluate and identify resource’s strategic role, Barney (1991) proposes the evaluation of three characteristics related to resources: (i) value; (ii) rarity; and (iii) imitability. From this perspective, they present a framework which proposes the analysis of the company’s resources and its competitive potential based on four questions: value, rarity, imitability and organization (VRIO), as shown in Table 2.

Table 2

Questions for Resource-Based Analysis of Internal Strengths and Weaknesses

Question	Question
Of value	Does the resource enable a firm to exploit an environmental opportunity and/or neutralize an environmental threat?
Of rarity	Is the resource currently controlled by only a small number of competing firms?
Of imitability	Do firms without the resource face a cost disadvantage in obtaining or developing it?
From the organization	Are the firms’s other policies and procedures organized to support the exploitation of its valuable, rare, and costly-to-imitate resources?

Source: Barney and Hesterly (2007).

The value of a resource would be associated with its ability to take advantage of opportunities or reduce threats for the organization (Barney, 1991). The presence of a valuable but common resource would position the organization in a situation of competitive parity, not providing performance superior to the average of other organizations. On the other hand, the possession of a non-valuable resource would be a source of competitive disadvantage (Barney & Hesterly, 2007), negatively impacting performance.

If, in addition to being valuable, the resource is also rare, its strategic allocation would provide a competitive advantage for the organization (Barney, 1991), that is, the organization would perform better than others, even if temporary (Barney & Arian, 2001).

If these resources are also difficult to imitate or replace by competition, they would be able to provide a sustainable competitive advantage (lasting) for the organization, derived from the possibility of developing a strategy unique, difficult to duplicate by the competition (Barney, 1991; Dierickx & Cool, 1989; Grant, 1991). Resources with these three characteristics would be capable of generating persistent superior performance for the organization (Barney & Arian, 2001), being considered strategic (Barney & Hesterly, 2007). This system is important

for identifying resources and thus define the relationship between the VRIO framework and organizational strengths and weaknesses, as shown in Table 3:

Table 3

VRIO Framework, Organizational Strengths and Weaknesses and Competitive Implications

Resource or capacity is:					
Valuable?	Rare ?	Costly to imitate?	Explored by organization?	Strength or Weakness	Competitive Implications
no	-	-	no	weakness	Competitive Parity Disadvantage
yes	no	-	↑ ↓	strength	Competitive Parity Advantage
yes	yes	no		Strength and competitive competence	Temporary competitive advantage
yes	yes	yes	yes	Strength and competence distinctive sustainable	Sustainable competitive advantage

Source: Barney and Hesterly (2007).

It is important to note that value is an attribute related to the resource itself. The rarity and the possibility of imitation, however, are inherently comparative aspects that require the assessment of the existing resource in the organization in relation to the availability of similar resources in other organizations present in the environment in which it operates (Newbert, 2007). Likewise, competitive advantage and superior performance are relative concepts (Lee & Whitford, 2012) and require comparative references for their application.

This need for comparability makes the application of RBV somewhat difficult. It is not uncommon for empirical studies with RBV to analyze an isolated resource (e.g. Goddard & Simm, 2017) or apply RBV to study a single organization (e.g. Soares & da Rosa, 2021).

According to Ray, Barney and Muhanna (2004), the analysis of the relationship of a single resource and performance is problematic since the organization can rely with differential resources for certain activities and inferior resources in others, so that the superior performance initially provided by a strategic resource would be overshadowed by inferior resource performance. The analysis of an isolated organization, in turn, it does not allow adequate comparison between resources to identify their rarity, so that the identification of strategic resources is harmed.

Although RBV is a theoretical approach designed for application in the competitive context of private organizations, it has also been suggested and applied to the study of public organizations. Matthews and Shulman (2005) propose that notions of advantage sustained competitiveness and the resource-based view have application for organizations in the public

sector, but this application is limited to situations where competition is sanctioned and possible. Similarly, Azevedo Barbosa and Machado (2013) explain that RBV can be adopted in the public sector if there is competition between representative organizations of this sector with its counterparts or even with private firms.

In this sense, researches with the application of RBV in the context of public administration in which there is competition between public organizations, for example, in tourist activity (Massukado & Teixeira, 2008; Vieira, Hoffmann & Alberton, 2018), comparing the performance of cities or agencies (Goddard & Simm, 2017; Iglesias-Antelo, López-Lopez & Vásquez-Sanmartín, 2021; Soares & da Rosa, 2021) or in encouraging development of private or commercial activities (Pereira, de Oliveira, Komesu, Pereira & Gomes, 2018).

Alternative perspectives advocate the application of RBV in public organizations even in situations where there is no competitive environment. Pablo, Reay, Dewald and Casebeer (2007) argue that RBV, by emphasizing the use of accessible resources, is relevant to the public sector, which focuses on internally available resources for generating public services. For Pee and Kankanhalli (2016), despite its origins in the private sector, RBV is increasingly being applied as a theoretical basis to study public organizations, which also rely on public resources and capabilities to deliver value to society.

RBV provides useful implications for public management by enabling identification of distinctive resources capable of improving the organization performance (Bryson et al., 2007; Szymaniec-Mlicka, 2014). The arguments for applying RBV in non-competitive contexts establish that, ultimately, RBV is dedicated to explaining superior value-creation processes based on resource allocation (Hansen & Ferlie, 2014), an aspect also valid for public administration.

Based on these arguments, different variables can be used to application of RBV to the context of public organizations, such as efficiency (Hansen & Ferlie, 2014), effectiveness (Lee & Whitford, 2012) or even innovation (Barbosa & Machado, 2013; Hoai, Hung & Nguyen, 2022). Such metrics provide a comparative perspective that allows the performance evaluation of different organizations, even in the absence of market competition and, consequently, the analysis of the relationship between existing resources and efficiency.

Pereira Filho, Pianto and Souza (2010) and Farah (2016) highlight the importance of efficiency for government action. For Oliveira and De Paula (2014), efficiency is the adequacy between means and ends, that is, between resources and intended results of governmental intervention. Howlett (2013) highlights the need for discussions about efficiency allocation for the correct administration of public affairs and the guidance of decision-making based on

empirical evidence. The efficiency criterion requests comparison. Therefore, benchmarking is a fundamental method of determining the appropriate level of performance of public policies and consists of comparing internal performance and results with those of other organizations involved in similar activities. This is a systematic effort to compare your products, services and practices with similar organizations, especially those with superior performance (Wu, Ramesh, Howlett & Fritzen, 2014).

The different identifications and classifications of resources used in RBV research in the public sector offer scope for interpretation, analysis, and categorization of strategic resources. To identify the main resources used in recent articles with the application of RBV to the public sector, a literature search was carried out in scientific journals and specialized search engines, such as Google Scholar, SPELL and Scielo, with the keywords “resource-based vision”, “sector”, “public”, “Resource-based View” and “Public Sector”. The summary of the papers and reported resources, according to the interpretation of the typology applied by the authors, is listed in Table 4.

Table 4

Resources Used in Studies on RBV in the Public Sector

Author(s)	Resource Typology
Carmeli e Tishler (2004)	Organizational
Matthews e Shulman (2005)	Financial, Physical, Human and Organizational
Ridder, Bruns e Spier (2005)	Financial, Human, Organizational and Technological
Pablo et al. (2007)	Organizational
Ackermann e Eden (2007)	Organizational
Massukado e Teixeira (2008)	Financial, Physical, Human and Organizational
Melián-González; Batista-Canino e Sánchez-Medina (2010)	Human and Physicists
Krishnan e Teo (2012)	Physical and Technological
Lee e Whitford (2013)	Financial, Physical, Human and Organizational
De Azevedo Barbosa e Machado (2013)	Physical, Human and Technological
Santana (2014)	Financial, Physical, Human and Organizational
Carnasciali e Bulgacov (2014)	Financial, Physical and Human
Barrutia e Echebarría (2015)	Organizational and Reputational
Andrews; Beynon e McDermott (2016)	Organizational
Pee e Kankanhalli (2016)	Human and Organizational
Goddard e Simm (2017)	Human and Organizational
Corrêa (2017)	Physical, Human and Organizational
Pereira et al. (2018)	Physical, Organizational and Reputational
Vieira, Hoffmann e Alberton (2018)	Financial
Andrade (2019)	Physical, Human and Organizational
Soares (2019).	Financial, Physical, Human and Organizational

Source: Prepared by the authors.

Based on Table 4, financial resources were used in 42.85% and physical resources in 57.14% of the studies in the bibliographic review. Technological and reputational resources were adopted in the same proportion as 14.29% of studies. Human and organizational resources held the leading role, being the subject of 66.66% and 76.19% of studies, respectively.

Although the literature review carried out did not identify studies that apply RBV to the context of prison units, the specific literature on the topic presents evidence of the relevance of certain resources for prison management and the process of resocialization of inmates. Nunes (2020) highlights that the adequate provision of health and rehabilitation services, as well as the adequate presence of criminal agents contributes to the success of federal prisons. It is worth highlighting the incipient development of indicators in the national literature on the performance of the prison system (Cabral, 2006), making it a challenge for management to define and measure the performance of prisons, in part, due to the complexity of the Brazilian prison system (Zonatto, 2020).

The provision of health services, educational opportunities, and professional training are legal guidelines established for national prisons (Fonseca & Bonfim Filho, 2019). Despite the difficulties in their adequate provision (José & Leite, 2020; Nunes, 2020; da Silva, 2020), such services directly contribute to the process of social reintegration of the inmate (Fonseca & Bonfim Filho, 2019). In this sense, it is understood that the availability of resources for education, training and health is relevant to the performance of prison units.

Another aspect to be observed is the physical capacity of the prison establishment. For Cesaroni and Lamberti (2014), there is a negative relationship between overcrowding and the efficiency of prison units, indicating that occupancy saturation compromises the provision of socialization services. Similarly, Torquato and Barbosa (2020) highlight the negative effects of the disproportion between the number of prisoners and the number of prison officers, hindering the implementation of prison policies. De Araújo (2020) highlights the need for training prison officers to develop practices and routines in prison units and for the successful implementation of penitentiary policies.

Thus, based on the researched references, the use of different typologies in relation to the classification of resources is extracted, but the typology proposed by Barney and Hesterly (2007) of physical, human, financial and organizational resources is predominantly adopted, which consistently strengthens the adoption of this typology in this research.

3 Method

This research is characterized as descriptive and cross-sectional in design, according to the classification of Sampieri, Collado and Lucio (2013). The data analyzed are from primary and secondary sources. The main analysis techniques used are quantitative in nature, however there is a brief qualitative stage used for validation by Expert Judges of the indicators proposed for the analyses.

According to Butler and Johnson (1997), the requirements for analyzing the efficiency of a prison unit increase as security levels increase. Therefore, assessments of prison units must consider these differences to make fair comparisons. In this sense, of the 1,444 (one thousand four hundred and forty-four) penal establishments that make up the Brazilian national penitentiary system, considering the differences between the types of prison regimes (open, semi-open and closed). The study carried out a selection delimiting how unit as of analysis the penitentiaries, understood as prison establishments intended exclusively for provisional prisoners and convicts who are in a closed regime or subject to a differentiated disciplinary regime (Brazil, 1984). This cut adopts the Brazilian's prison regime with more uniform characteristics, and which has the highest level of systematized information in SISDEPEN and other open government sources, allowing comparability, systematization and accessibility of data due to characteristics, destination and public reached by the penal services.

Thus, for the purposes of this research, we propose to analyze the 373 units classified as “Establishment intended for serving sentences in a closed regime” according to the classification established in the SISDEPEN database, disregarding the 5 (five) federal prisons due to the low prison population and their specific purpose differing from other penitentiaries (Nunes, 2020; Torquato & Barbosa, 2020).

3.1 Indicators

Secondary source data were extracted from SISDEPEN, a system that synthesizes information about Brazilian penal establishments, collecting information on the prison capacity, the number of health modules, vacancies for educational activities, vacancies for labor workshops, employees who work in the prison system and the prison population. The extraction was carried out in May 2021 and refers to the year 2019 (most updated information available at the time).

To prepare the result indicators, data were selected that portrayed the products of work processes and the provision of penal services, such as the number of inmates in labor therapy programs; in educational activity, and health information such as the consolidated number of consultations and procedures.

Based on the available information, we sought to propose indicators that reflected the resources (inputs) and results (outputs) of public policies for the prison system, assuming that the objective of the criminal execution system is to prevent recidivism and promote treatment, rehabilitation and family, professional and social reintegration of inmates (Ferreira & Fontoura, 2008) correlating them with the typology of Barney and Hesterly (2007), as described in Table 5.

Table 5

Outcome Variables / Resource

SISDEPEN variable (typology)	Description
Capacity of the establishment (Physical Resource)	Number of available spaces (occupations in closed, deactivated or unfit for use cells not included).
Health module – select all items available at the establishment (Physical Resource)	Quantities of modules such as medical offices; Dental; material collection room, dressing room, vaccine sutures room and nursing station; observation cell; infirmary cell with solarium; toilet for patients, toilets for healthcare staff; pharmacy or medicine dispensing stock room; central sterilized material purge; washing and decontamination room; sterilization room; locker rooms; cleaning material deposit; multidisciplinary clinical care room; procedure room; x-ray room; diagnostic laboratory; waiting cell; solarium for patients and others.
Education module – mark all items available at the establishment (Physical Resource)	Sum of classroom space capacity; Computers room; meeting room with society; meeting room; library; teachers’ room and other(s).
Workshop module – mark all items available at the establishment (Physical Resource)	Sum of vacancy capacity for modules such as production room; establishment of supervision control room; Sanitary; stock; loading and unloading and other(s).
Numbers of servers workings in the prison system	Active public servants, according to formal function: Permanent, commissioned, outsourced or temporary.
Prison population	Number of people deprived of liberty by nature of the prison and type of regime to which they are subjected. (For convicted and provisional persons, simultaneously, for the purposes of this form, the conviction situation prevails, if a closed or semi-open sentence serving regime is in force). Prison population values related to monitoring were removed.

SISDEPEN variable (typology)	Description
Amount of people deprived of liberty in labor therapy programs (result)	Total number of people deprived of liberty carrying out activities labor in all sectors (primary, secondary and tertiary)
Amount of people deprived of liberty in educational activity (result)	Number of people deprived of liberty in educational activities. (sum of all levels: literacy, elementary, secondary, higher education, technical course, initial and continuing training course, program of redemption through study, reading, sport and educational activities complementary video library, leisure and culture.
Health information – total for the semester. (result)	Number of consultations that people deprived of liberty underwent during the period, (sum of medical consultations carried out externally and in establishment, psychological, dental. Excluding the variables that represent the number of exams and tests, surgical interventions, vaccines and other procedures such as sutures and dressings).

Source: Prepared by the authors based on the INFOPEN Form.

All indicators were weighted by the prison population variable to allow comparability between prison units. Table 6 presents the indicators, its typologies, calculation formulas and measurement object.

Table 6

Resource and Result Indicators

Indicador	Calculation	Object
Capacity	$\frac{\text{capacity of the establishment}}{\text{prison population}}$	Resource: vacancies in the prison system.
Health	$\frac{\sum \text{n}^\circ \text{ de of health modules}}{\text{prison population}}$	Resource: health structure.
Education	$\frac{\sum \text{number of vacancies available}}{\text{prison population}}$	Resource: vacancies for policies public educations programs.
Labor	$\frac{\sum \text{number of vacancies available}}{\text{prison population}}$	Resource: vacancies for policies public labor training programs.
Human	$\frac{\sum \text{employees who work in the prison}}{\text{prison population}}$	Resource: resources humans.
Trained	$\frac{\sum \text{prisoners in labor therapy programs}}{\text{prison population}}$	Resource: training labor.
Instructed	$\frac{\sum \text{of prisoners in educational activity}}{\text{prison population}}$	Resource: education.
Consulted	$\frac{\sum \text{Healthcare Information of}}{\text{prison population}}$	Resource: health.

Source: Prepared by the authors.

Due to the lack of literature that sets out indicators for prison organizations, a qualitative approach was added to the study through interviews and semi-structured questionnaires

submitting the proposed indicators to experts to validate its applicability for research purposes. Validation was carried out with 4 (four) Expert Judges, all public security professionals, with advanced academic training (2 with doctorate and 2 with master’s degree), with previous experience in positions of direction in public security and prison administration.

The semi-structured interviews with the Experts aimed to present the indicators and their purposes, discuss the relevance of these resources for prison management and collect the expert's assessment of the proposed indicator and its suitability for reflect the intended resource or outcome. Each indicator was evaluated on a scale of “does not meet”, “partially meets” and “meets”. All indicators presented had at least 75% of responses in the “meet” category and no responses in the “does not meet”, so that the indicators were considered valid for the proposed purposes in the research, as shown in Table 7.

Table 7

Summary of Indicator Validation

Indicador	1(%)	2 (%)	3 (%)	Expert Judges’s Observations
Capacity	-	25	75	-
Health	-	25	75	-
Education	-	-	100	-
Labor	-	-	100	-
Human	-	25	75	-
Training	-	25	75	-
Financial	-	100	-	- Index criticized for the impossibility of identifying amounts allocated to the Prison Unit. - Index does not allow checking the actual use of the resource, only which was allocated to the State Government. - Values are allocated too much to the operational area and little or the management area
Trained	-	-	100	-
Instructed	-	-	100	-
Consulted	-	25	75	-
Graduates	-	-	100	-

1 (does not meet the purpose); 2 (partially meets the purpose) and 3 (meets the purpose)

Source: Prepared by the authors.

It was decided to remove the indicator that reflected financial resources, as there is no available database that indicates how much financial resources were allocated to each prison unit, which made the indicator inaccurate, and its use would result in loss of framework accuracy. Thus, the principle of parsimony was privileged in the choice of variables by avoiding selecting variables that may contain substantial measurement errors or that are mask the effect of more useful variables (Hair et al, 2019).

3.2 Data analysis

Data Envelopment Analysis (DEA) and multiple regression analysis were used for data analysis. The DEA enables the use of multiple variables and indicators to assess efficiency and has been applied with success in studying efficiency in several areas (Butler & Johnson, 1997; Cooper, Seiford & Zhu, 2011; Peña, 2008). Using the electronic spreadsheet, the data were consolidated, equalized, and segregated into variables classified as resources (inputs) or results (outputs). Afterwards, data were checked for possible mistakes in typing (errors, duplicate data); identification of missing data (missing values) or identification of outliers.

Data Envelopment Analysis (DEA) is a non-parametric method that uses linear programming to calculate the comparative efficiency of Decision Making Units (DMU) (Meza, Neto & Ribeiro, 2005; Senra, Nanci, Mello & Meza, 2007). The objective of DEA is to compare a certain number of DMUs that perform similar tasks and differ in the quantities of inputs that they consume and the outputs that they produce (Meza, Neto & Ribeiro, 2005). Since it is a non-parametric technique, DEA analysis does not make assumptions about the functional relationship between inputs and products, defining the relative values that can be produced based on observation and comparison of data from organizations or activities of the analyzed set, highlighting the relative efficiencies of each organization and identifying efficient organizations (Gomes & Ferreira, 2020).

The DEA is a tool that provides managers and planners with an objective method for evaluating resource allocation efficiency and guide budget decisions, establish greater credibility with the public, provide managers with a means of demonstrating the effectiveness of existing programs (Butler & Johnson, 1997). The technique can contribute to the management of prison units by offering a general assessment of relative efficiency, identifying exemplary units; identify specific areas where administrators can make improvements to prisons that appear to be less efficient and, finally, identify a reference group of operations efficient prison system that provides benchmarks for administrators (Butler & Johnson, 1997).

DEA was used to evaluate the efficiency of prison units and analysis were performed using the OSDEA-GUI software. The number of DMUs adopted in the present research represents a large number for DEA analysis, since in the literature there are almost no applications with DMUs greater than 150 (one hundred and fifty). In relation to the variables, the total of 8 (eight) variables, including Resource and Result Indicators, it is considered enough, as in many real applications, due to the characteristics of efficiency analysis, work with a maximum of 10 variables (Meza, Neto & Ribeiro, 2005).

Each prison unit was considered a DMU. We chose to analyze DEA with the output-oriented CCR framework, as it studies efficiency from the perspective of DMU's ability to maximize its products while maintaining the volume of resources. The use of CCR is justified due to the function of the public manager to allocate available resources, aiming to expand the provision of public services. (Silva & Crisóstomo, 2019).

Therefore, for DEA analysis resource indicators were considered as inputs (Capacity, Health, Education, Labor and Human) and result indicators as outputs (Skilled, Instructed and Consulted) (according to Table 8). DEA results identified efficient prison units, as well as the distances from inefficient units to the efficiency curve.

Table 8

Framework for Calculating the Efficiency of the Prison Unit

DMU	Resource indicator (inputs) (*)	Result indicator (Outputs) (*)	Result Value Efficiency
Prison Unity of Close Regime	Capacity	Trained	Prison Unity Efficiency
	Health		
	Education	Instructed	
	Labor		
	Human	Consulted	

Note: (*) extracted from Table 6 – Resource and result indicators.

Source: Prepared by the authors.

From the identification of the prison units' efficiency, multiple regression analysis was used to verify the association between Resources (independent variables) and the Efficiency of prison units (dependent variable). The research adopts the use of the regression analysis as appropriate as it allows the best unbiased linear estimate and due to the high number of experimental subjects (346 experimental subjects, equivalent to 92.76% of Brazilian penitentiaries). The assumptions of Homoscedasticity and value of $N > 30$ are also met. The regression analyzes were carried out with the SPSS software according to the model shown in Table 9.

Table 9

Model for Multiple Regression Analysis

Dependent Variable	Independent Variables
Prison Unit Efficiency (*)	Capacity (**) Health (**) Education (**) Labor (**) Human (**)

Note: (*) extracted from the DEA Analysis, according to Table 8 - Framework for calculating the Unit's efficiency Prison. (**) calculated according to Table 6 – Resource and result indicators.

Source: Prepared by the authors.

4 Results

The research universe covers the 346 Brazilian prison units of closed regime. Table 10 portrays the prison unit's distribution by region and state:

Table 10

Summary of Brazilian Closed Regime Prison Units

Region	State	Number of Prison Unit
North	TO	3
	AC	3
	RO	16
	RR	1
	PA	26
	AM	2
	AP	1
Northeast	BA	1
	SE	2
	AL	4
	PB	11
	PE	9
	RN	4
	CE	9
	PI	7
MA	3	
Midwest	MT	8
	MS	22
	GO	23
	DF	2
Southeast	ES	12
	RJ	14
	MG	20
	SP	63
South	SC	9
	PR	17
	RS	54
Total		346

Source: Prepared by the authors.

Table 11 presents the descriptive statistics analysis for each Indicator, including the Mean and the associated standard deviation:

Table 11

Descriptive Statistical Summary

Variable/ Indicator	Mean	Error Deviation	N
Efficiency	0,501	0,272	346
Capacity	0,687	0,342	346
Heath	0,19	0,019	346
Education	0,138	0,159	346
Labor	0,073	0,135	346
Human	0,051	0,049	346
Trained	0,247	0,259	346
Instructed	0,209	0,227	346
Consulted	2,304	2,085	346

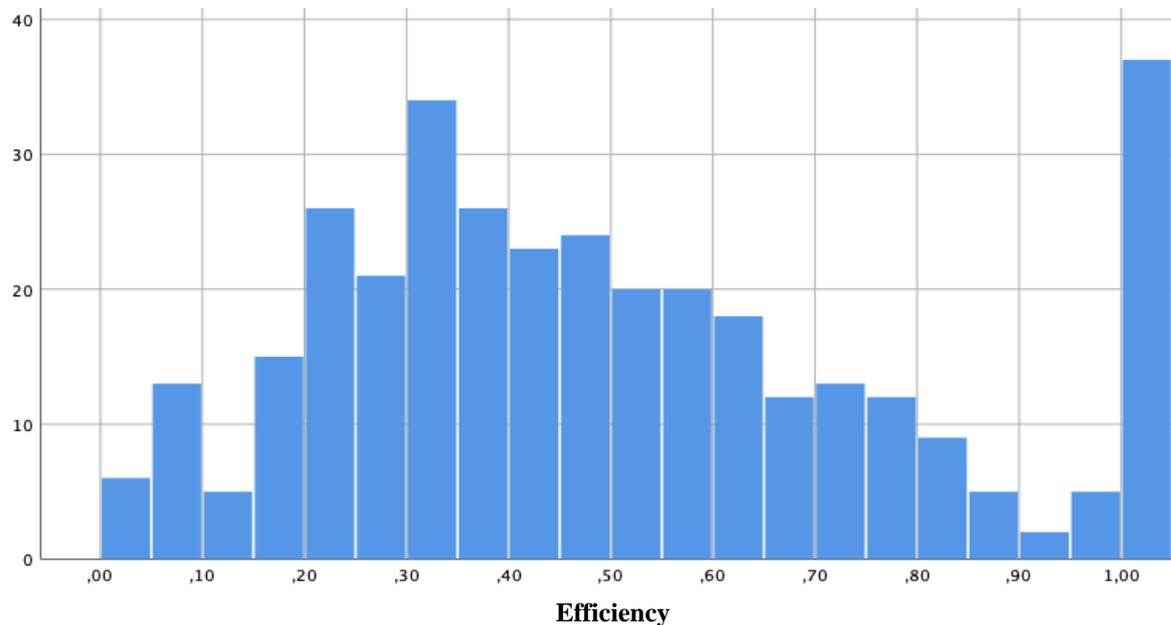
Source: Prepared by the authors.

DEA results using the output-oriented CCR framework with constant returns gave rise to a ranking of prison units in which 37 (thirty-seven) were considered efficient (value = 1) and 309 (three hundred and nine) were considered inefficient (value < 1), that is, a ratio of 10.69% efficient to 89.31% inefficient.

Figure 1 shows the amount of prison units by efficiency level. It is observed that the highest concentration of efficiency (with 210 observations) is between the range of 0.20 and 0.60, indicating significant margins for improving resource allocation. The result confirms the arguments of Butler and Jonhson (1997) and Cesaroni and Lamberti (2014) for the applicability of DEA analysis in prison institutions and corroborates its applicability to other Public Organizations.

Figure 1

Distribution of Prison Units by Efficiency Level



Source: Prepared by the authors.

After identifying efficiency, multiple regression analysis was carried out. The Efficiency of the Prison Unit identified in the DEA analysis was used as dependent variable and Capacity, Health, Education, Labor, Human resources as independent variables. The resulting model proved to be significant ($p\text{-value} < 0.000$), with an R^2 coefficient 0.168. It is observed, however, that some variables (Health, Education and Labor) showed non-significant results ($p > 0.05$). No multicollinearity problems were observed ($VIF < 2$). Table 12 presents the regression analysis results.

Table 12

Multiple Regression Analysis

Variable	Coeficientes			t	Sig.	Estatistics of Collinearity
	No Standard		Standardized			
	B	Erro				
(Constant)	0,654	0,031	-	20,275	0,000	-
Capacity	-0,314	0,044	-0,397	-4,404	0,000	1,275
Health	-1,540	0,885	-0,106	-2,198	0,083	1,517
Education	0,193	0,101	0,113	0,988	0,057	1,428
Labor	0,177	0,105	0,088	1,114	0,092	1,105
Human	1,044	0,324	0,188	4,465	0,001	1,392
R^2				0,168		
ANOVA				0,000		

Source: Prepared by the authors.

It can be verified from Table 10 that Health, Education and Labor resources did not present significant results, indicating their non-association with the Prison Units' Efficiency. However, according to the Experts consulted, the Education and Labor resources are relevant to prison public policies due to the allocation of productive time and attention of prisoners, avoiding idleness, and making the unit more peaceful and less confrontational.

Although these resources may be considered valuable, they are not associated with superior performance, in a way that cannot be understood as strategic resources, since strategic resources affect and enhance the performance of public organizations (Szymaniec-Mlicka, 2014). Considering that these resources do not generate a positive or negative effect on efficiency, following the arguments by Barney (1991) and Barney and Hesterly (2007), it is understood that these resources position organizations on a competitive parity with others.

The lack of association between Education and Labor resources and Efficiency can be explained by the difficulties in obtaining public policy's results in educational activities in the prison environment. As pointed out by José and Leite (2020), problems with evasion, especially when considering the specificities of the prison environment such as high turnover of inmates due to constant prison transfers, or schedule conflicts with other activities such as sunbathing or religious practices, affect the results of educational and work actions.

Da Silva (2020) complements this perspective by identifying problems such as lack of adequate infrastructure, lack of specific teaching material, diversity in students' profiles (age and training) and strict disciplinary system. Additionally, it is highlighted the difficulty in accepting the prisoner himself in using the penal service offered, especially in the face of competing demands from families, religious institutions and criminal factions themselves (Nunes, 2020). The difficulties highlighted in obtaining results with the resources applied to Labor and Education public policies explain the absence of association with Efficiency, according to the results found.

The Health resource did not present a significant association with the Efficiency of prison units, highlighting a resource that generates competitive parity for organizations. Health resources considered include, among others: medical and dental offices, material and dressing and suture collection rooms, nursing station, observation cell; clinical care room, in addition to material and of professionals.

The implementation and maintenance of healthcare resources in prisons requires huge volumes of resources that are destined to exclusively serve a population extremely restricted, making it unfeasible to open it to the general population. That disproportion between allocated

inputs and the possibility of service explains the absence of relationship between the Health resource and Efficiency.

The Capacity resource presented a significant result, however with the coefficient negative beta, indicating an inversely proportional relationship with the Efficiency. The presence of such a feature would therefore have a negative influence on the Efficiency of the units. Considering the arguments of Barney (1991) and Barney and Hesterly (2007), resources that negatively impact the organization's performance are sources of competitive disadvantages, as they place the organization in an inferior situation to other organizations.

The Capacity resource reflects the availability of physical space available of the prison unit. It allows the prison administration to better plan its actions and activities, facilitating the process of resocialization of the convicted person through, for example, a process of criminal individualization, separating provisional prisoners from definitive, primary of repeat offenders, light crimes of serious crimes, qualifying them with study and work (Fonseca & Bonfim Filho, 2019).

A possible explanation for the inefficiency is prison overcrowding. registered in the Brazilian prison system (FBSP, 2021) which prevents any policy public is carried out due to the terrible conditions of incarceration that end up giving the penalty a single retributionist function, and not a resocializing one (Fonseca & Bonfim Filho, 2019). Similar results were found by Cesaroni and Lamberti (2014) who also found a negative association between overcrowding and efficiency technique in the Italian prison system.

Regression analysis results indicate that the Human resource is associated significant and positive way to Efficiency, which indicates its relationship to value creation superior for organizations (Hansen & Ferlie, 2014). This result allows us to identify the mentioned resource as strategic for prison units and corroborates the arguments of Lee and Whitford (2013) that personnel resources have positive impacts on the effectiveness of public organizations. For Pee and Kankanhalli (2016), human resources are central aspects to knowledge management and capacity development in the public sector. Public organizations capable of maintaining superior performance throughout the time typically employ distinctive skills based on knowledge and capabilities of its human resources (Bryson et al., 2007). For Szymaniec-Mlicka (2014), human resources are relevant for public organizations located in environments dynamic. The results found here seem to indicate that human resources also prove to be relevant for relatively unstable environments such as that of organizations in the prison system.

The development of qualified human resources is essential for the success of public organizations (Szymaniec-Mlicka, 2014), as public sector managers need of strong managerial

skills to meet organizational goals (Pablo et al., 2007). Corroborating this perspective, one of the Specialist Judge consulted argues that the great difference between prison units would be found in the available human resources and not in the equipment, normally standardized and generating little difference between units.

In the complex context of the Brazilian prison system, human resources are necessary for facing the existing critical situation and are essential for the development of appropriate practices and routines in spaces of deprivation and freedom restriction (de Araújo, 2020). Torquato and Barbosa (2020) describe the lack of trained human resources as an aspect of inefficiency in the provision of penitentiary services that compromise the results of prison units. The same authors highlight that these obstacles are even more relevant due to the inability of prison units to develop the necessary human resources (Torquato & Barbosa, 2020), corroborating the perspective that human resources are rare and difficult to imitate, when not path-dependent (Barney, 1991), and can be considered strategic.

Table 13 summarizes the results found, indicating the result of the different resources (disadvantage, parity or competitive advantage), as well as their classification as “Strategic” for prison units.

Table 13

Summary of Strategic Resources for the Efficiency of the Prison Unit

Resource	Significant	Beta	Result for Organization	Strategic?
Capacity	Yes	Negative	Disadvantage	No
Health	No	-	Competitive Parity	No
Education	No	-	Competitive Parity	No
Labor	No	-	Competitive Parity	No
Human	Yes	Positive	Competitive Advantage	Yes

Source: Prepared by the authors.

In this context, based on a managerial perspective, it can be concluded that the indicators that presented a negative standardized beta, that is, that have a negative influence on efficiency, or that did not present statistical significance, that is, do not influence efficiency, they imply resources that do not have characteristics that qualify as strategic, since they do not induce competitive advantage (Barney & Hesterly, 2007). On the contrary, these resources can be considered as causing competitive disadvantage or mere competitive parity.

Resources that have a positive and significant effect on the unit's efficiency present the characteristics brought by the VRIO model that signal its strategic nature. These resources provide a competitive advantage that enables superior performance compared to comparison units in terms of efficiency and stand out as potential benchmarks for public policy.

4.1 Application of the VRIO Framework to Public Organizations in non-competitive environments

From a managerial perspective, the results could suggest the reduction or even the elimination of spending on Health, Education and Labor resources. This perspective, however, it does not appear to be feasible from a broader objective of resocialization and social reintegration policies. A significant part of the objectives of these policies focuses on expanding the occupation of those deprived of freedom (work and education) and improvements in medical and psychological assistance (health).

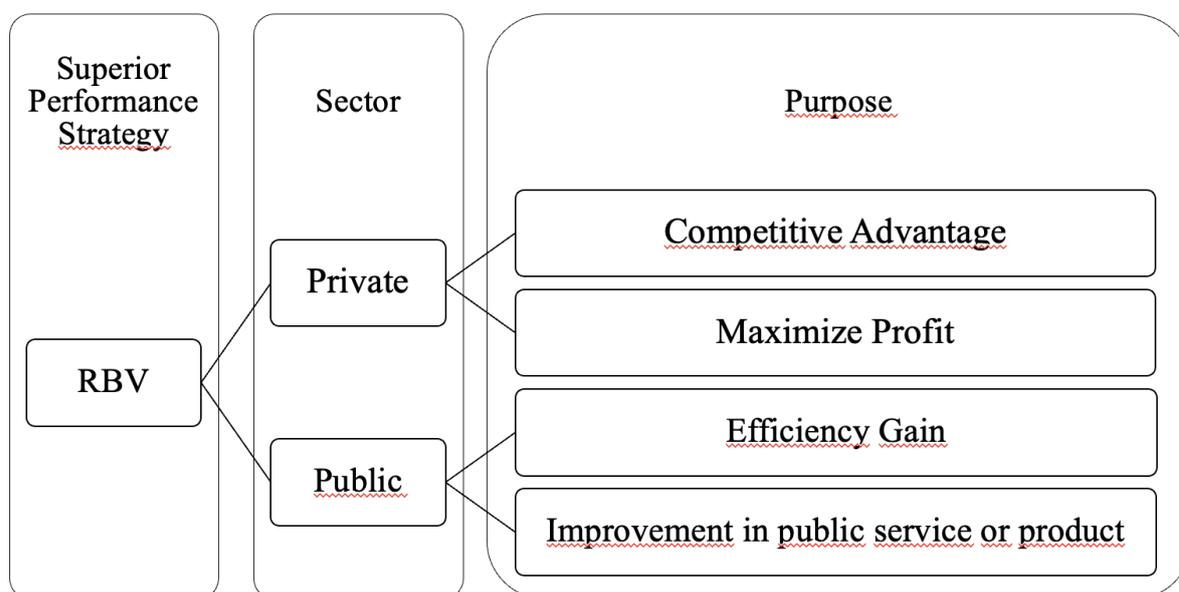
The approximation of management techniques and the import of private sector models and frameworks are necessary and beneficial for the evolution of public management. It should, however, be noted that the problems faced by public organizations and their operating context are often complex and different from those of private firms. Perspectives focused solely on efficiency, process improvement or increased productivity may prove to be reductionist and generate actions that may not contribute to solving the public problems faced.

RBV has practical application for public management, but its application must not be uncritical or nonreflective about the context of implementation, execution and evaluation of public policy. In this sense, based on the results, it is appropriate to reinterpret the VRIO model for its application in the context of public organizations that do not operate in a competitive environment.

The superior performance achieved through competitive advantage to increase profitability in the private sector would require reinterpretation to adopt a perspective close to superior performance through efficiency gains for improvement in the public services or products (Figure 2). Efficiency is an aspect demanded by government policies (Farah, 2016; Pereira Filho, Pianto e Souza, 2010) that allows comparability between different organizations (Wu, Ramesh, Howlett & Fritzen, 2014), even in the absence of market competition.

Figure 2

Proposal for Reinterpreting the RBV for Public Administration



Source: Prepared by the authors.

The impossibility of imitation or substitution are positive differentiating aspects of resources from the original perspective of RBV (Barney, 1991), as they provide the mechanism of isolation (Peteraf, 1993), necessary for the generation and maintenance of the competitive advantage. From a public perspective, in a non-competitive environment, the impossibility of imitation and substitution prevent the resource application for the development of comprehensive public policies. Although unique resources continue to be positive and should be employed by the organizations that have them, given the impossibility of providing for the application in other organizations, it is understood that these resources cannot serve as drivers for the elaboration of broad public policies, which aim to serve the entire universe of potential beneficiaries of State action.

Unlike competitive environments, for application in public policies it is desirable that the valuable resource is also capable of being replicated with a view to provide accessible benchmarking (Wu, Ramesh, Howlett & Fritzen, 2014) for other public organizations. We therefore propose a reinterpretation of the VRIO framework proposed by Barney and Hesterly (2007) focusing on the application of RBV in contexts not competitiveness of public organizations (Table 14).

Table 14

Reinterpretation of the VRIO Framework for Application to Public Organizations in Non-Competitive Environments

Valuable	Rare	Possible imitation	Competitive implication
No	-	-	Competitive disadvantage.
Yes	No	-	Competitive parity.
Yes	Yes	No	Idiosyncratic Resource Strategy for the organization, but inappropriate for public policy guidance
Yes	Yes	Yes	Strategic resource capable of guiding public policies.

Source: proposed by the authors adapted from Barney and Hesterly (2007).

As in the original framework, the presence of non-valuable or valuable resources and would often result in situations of competitive disadvantage and competitive parity, respectively. As an alternative to the original framework, in non-competitive environments, if the resource is valuable, rare, but impossible to imitate or replicate, that resource would be idiosyncratic, with strategic application restricted to the organization that owns or accesses it, but it would not be suitable for guiding public policies. If the resource is valuable, rare and capable of imitation, this would be a strategic resource to guide the improvement of public intervention in other agencies.

5 Conclusions

This research aimed to analyze the relationship between resources and efficiency in prison units. Specifically, closed regime prison units were analyzed. To achieve the proposed objective, data was collected from secondary sources and indicators of resources and products of penitentiary policies were proposed. The indicators were validated by Expert Judges with academic training and experience in the management of security and prison policies. Considering the scarcity of studies on the management of prison units, it is understood that the proposed and validated indicators constitute a practical contribution of the present work.

DEA analysis was used to measure the efficiency of prison units. Non-efficient units and efficient units were identified and the distances between such units, enabling a relative efficiency metric between both of them. Even though there is no competition between the different prison units, the comparison of efficiencies made it possible to apply RBV and analyze the relationship between available resources and the efficiency of the units, identifying the effect of different types of resources (disadvantage, parity or competitive advantage), as well as classifying them as Strategic for the prison units analyzed. The application proposal

presented can be replicated to other non-competitive contexts, enabling expanding the scope of application of RBV in public organizations. It is understood that this is a second contribution of the present work.

From the identification of the efficiency of prison units, the multiple regression analysis was used to verify the relationship between resources and efficiency. The results showed that only the Human resource was significant for the Efficiency of prison units, corroborating the findings of previous studies that also applied RBV to government organizations and reinforcing the need to develop skills in public servants to face the different problems of society.

Health, Education and Labor resources were not related to Efficiency of prison units, being characterized as resources that generate competitive parity. The prison capacity resource, in turn, proved to be significant, but with a negative association with the Efficiency of prison units, characterized as resources that lead to competitive disadvantage.

The present study corroborates the perspective that RBV can be used within context of public organizations (Bryson et al., 2007; Matthews & Shulman, 2005; Pablo et al., 2007; Pee & Kankahalli, 2016). The results, however, invite reflection on the application of RBV to a non-competitive environment. Unlike proposed for the environment business, the generation of public policies demands resources that can be widely replicated to better guide government action. So, an adaptation to the VRIO framework (Barney & Hesterly, 2007) was proposed to be more adequate it for the public context studied. The proposed reinterpretation of the VRIO framework is another contribution of the present paper that allows to expand the RBV practical applicability to public administration. It should be noted that few studies have applied empirically RBV to public administration (Carmeli & Tishler, 2004; Lima & Rosa, 2016; Szymaniec-Mlicka, 2014).

The present work has its limitations. The first of these refers to the sample. Even though the research covered a significant set of prison units in closed regime, the sample used is not representative of all unit formats of the prison system, which prevents the results generalization to all prison units in other regimes. A second limitation is related to the identified resources. The resources identified were restricted to available secondary data and did not represent all types of resources used in prison units.

As a research's agenda, future studies can be directed to mapping other resources available in the units (e.g. financial, organizational) and complement the analyzes carried out. Future studies could replicate the proposed method for other types of unit's prisons to verify whether the results found would be typical of the unit's penitentiaries studied. It is also

suggested that the research method used be applied to other sectors of public administration to identify their strategic resources and the continuity of studies on the application of RBV and efficiency in Administration Public.

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