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Measuring the Efficiency of Brazilian Courts from 2006 to 2008: What Do the Numbers Tell Us?

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ABSTRACT

This paper uses a linear optimization method called Data Envelopment Analysis (DEA) to measure the efficiency of Brazilian State Courts during the years of 2006 to 2008. Our results show that relative efficiency varies substantially across the states. There is a group of courts that consistently top performs in the sample. On the other hand, there is a group of consistent poor performers, as well a group of average performers. Yet, the biggest problem seems to be with a group of State Courts with very unstable results, which might indicate serious problems in data collection and/or measurement. DEA also shows that the lack of resources should not be pointed as the main reason for inefficiency, since inefficient courts could improve the number of adjudications without changing the level of resources employed.

Keywords: Efficiency, Courts, DEA
JEL Codes: K4, D02, C14

1. Introduction

Since the beginning of the 20th century, the Brazilian Judiciary has been considered as in a state of crisis. More recently, the declaration of the new Constitution in 1988, placed a sudden and gigantic burden on the Judiciary. The opening of the economy, the establishment of political democracy, and the implementation of many inadequate policies by the central government have led to thousands of lawsuits. Courts clearly have not been able to respond to all these demands. That courts in Brazil are inefficient is a well-understood and oft-stated fact. Yet, the crucial question "How bad are they?" has never been answered. One cannot offer a good evaluation without reliable empirical data, and the World Bank showed this several years ago (2002). Unfortunately, almost all juridical research carried out in Brazil is based on qualitative analysis, without numerical basis. This comes as no surprise if one remembers that discussions about courts have been restricted to judicial circles, and that, due to the absence of quantitative courses in most Brazilian law schools, this means that empirical research has rarely been carried out. Also, researchers from other fields, such as economics and management, have shown little interest in analyzing judicial matters.

The purpose of this paper is to objectively measure court efficiency in Brazil. We employ a linear optimization method called Data Envelopment Analysis (DEA) to measure efficiency of Brazilian State Courts for three years, starting in 2006. Our results show that relative efficiency varies substantially across the states. In contrast to conventional wisdom, courts are not "equally bad". Moreover, efficiency performance has little to do with the level of available resources, since inefficient courts could do better without increasing the amount of resources employed. Results also show that data collection in some courts might be very problematic. Finally, we provide some preliminary evidence linking court management and organization with efficiency performance.

2. First Glance Evaluation of Brazilian Judiciary

Overall, Brazilian Judiciary has a very poor track record. An objective picture is hard to get due to the lack of official measures until very recently, and due to disparate numbers by the few available studies. Yet, all of them show a gloomy scenario. An average process is believed to take no less than 1,000 to 1,500 days, although officials affirm that for the Supreme Court (STF), it takes 14 years to be completed (Fuck, 2008). The heavy workload faced by the judges causes this long delay: each Brazilian judge is on average responsible for 10,000 cases at any moment in time. The rate of appeals is also high. The World Bank (2004) estimated that, between 1993 and 2003, the ratio of cases judged in the second-degree courts and those judged in the first-degree courts varied from 0.5 (in the last year of the survey) to 1.0 (in 1999 and 2000).

Judicial demand is also highly concentrated in some courts. A survey carried out by

the Ministry of Justice in 2007 indicated that State Justice Courts account for 73% of all judicial services in Brazil, and that there is a marked concentration in the state of São Paulo, which adjudicates almost half of all cases in the country.

Judiciary staff members usually credit inefficiency to the lack of resources. Judges and judicial employees argue that human and material resources at all levels are not sufficient to deal with the large number of cases. In recent years, the greatest concern is the continued under-utilization of modern electronic procedures. However, legal experts, who are not involved in the daily operations of the courts, point to different explanations. In their view, knowing how to wisely manage available resources is more important than demanding for more (e.g., Dakolias 1999). Empirical evidence, such as in Buscaglia & Ulen (1997), shows that the amount of resources is not correlated with judicial efficiency in many countries of the world. Finally, some high-rank judges also agree that increasing the amount of resources is not the solution for the problem, and it is not even realistic to demand it, since it is unlikely that the central government will allocate more budget to the Judiciary (Mendes, 2008).

Another traditional explanation for court inefficiency is the very bureaucratic procedural law that Brazil inherited from the Portuguese and the civil law traditions. This is agreed as one of the primary reasons of inefficiency in Brazilian courts. Slackness, a complex system of procedural rules, and an overemphasis on format are traces still present in the law today. In addition to that, criticisms are often directed to the ease of appealing to judicial decisions. Some lawyers respond to this point by arguing that the large number of appeals is unavoidable because it minimizes trial errors and guarantees the due legal process. Yet, because a lawsuit takes so much time and money, many people avoid the courts because they do not feel they can count on the judicial system to make their rights respected. This is contrary to the guarantee of the due legal process. Moreover, the evidence also shows that large number of appeals is not being used to correct "wrong" decisions made by lower courts: Rosenn (1998) shows that 90% of all decisions made in first instance courts is maintained by judges in the appellate courts.

Do the elements above explain it all? Not really. As one can observe, they are all related to *external* factors, elements that are beyond the control of those working *within* the Judiciary. Surely, there are *internal* factors that could also be accounted for judicial inefficiency.

A "New" Explanation: Poor Administrative Management

The Brazilian public sector has no tradition in professional management. Managerial sciences have evolved quite satisfactorily, but there have been no spillovers to the public sector.

Some experts identify poor court management as the most serious problem in the

Brazilian Judiciary. Sherwood (2007) shows that each court has a president who is responsible for its budget, material resources, information technology, personnel hiring and training, etc. By law, every court president must be a judge, but managerial training is not traditionally offered in law schools in the country. Thus, the author concludes that the judicial system in Brazil is managed by amateurs. The need to devote a large part of their scarce time to administrative matters leaves judges unable to issue speedy and high-quality decisions. Dakolias (1999) shows that Brazilian judges spend, on average, 65% of their working time involved with non-judicial, bureaucratic duties[1].

Speaking to the United States of America in the 1970s, but with regards to the same problem of Brazil today, Justice Warren Burger said:

> "More money and more judges alone is not the primary solution. Some of what is wrong is due to the failure to apply the techniques of modern business to the administration or management or the purely mechanical operation of the courts" (Burger, speech at the American Bar Association on August, 10, 1970 *in* Dalton & Singer, 2009).

Also as a direct consequence of poor management, judicial staff does not get the right incentives to perform its duties in efficient manner. As for example, anecdotal cases show high resistance of employees to the implementation of modern technology. As courts start adopting electronic procedures, they do not abandon the old, paperwork procedures simply because they were not trained for, and thus do not trust, the new and more efficient procedures. The result is *more* work in order to keep both procedures – the new and the old – simultaneously working.

In addition to that, judicial employees may have very low morale at their workplace, especially due to low levels of human capital. If able personnel managers are absent under such circumstances, it is hardly likely that employees will deliver their jobs efficiently. One main result of a survey done by the Ministry of Justice (2007) shows that, the most productive judicial back-offices were those in which staff members considered themselves motivated at the workplace, and satisfied with the leadership. The same study admits that the importance of these workers, who are the people running the judicial system everyday, has long been underestimated.

Sometimes, incentives may be inadequate even for judges. Since courts are overloaded, and since the procedural law allows for many different instances of appeals – whereby a single case may be decided by several different magistrates, in different phases of the process – judges, especially those in first-degree courts, have no incentives to perform a

1 Corresponding numbers are 70% for Argentina and Peru, and 0% in Germany and Singapore.

complete and careful analysis of the case.

The elements just presented above indicate some of the factors that may explain inefficiency in Brazilian courts. In the remaining of this paper we will analyze this same topic in a quantitative manner.

3. Methodology and Data

We will use Data Envelopment Analysis (DEA) to evaluate court efficiency. DEA is one of the methods based on the calculations of production frontiers; another well-known method of this type is Stochastic Frontier Analysis (SFA). These models were derived from concepts of the microeconomic theory, and therefore, are frequently used in economic research. Yet, they differ greatly among themselves and are classified into different categories: statistics *versus* non-statistic, stochastic *versus* non-stochastic, parametric *versus* non-parametric, etc. SFA is basically a statistic, stochastic and parametric model; DEA, on the other hand, is non-parametric, non-statistic, and non-stochastic, although recent advancements have been able to incorporate stochastic elements in its models (e.g., Grosskopf, 1996; Ferrier & Hirschberg, 1997; Simar & Wilson, 1998, 2000, e 2007; Post, 2001; Daraio & Simar, 2005). DEA is based on linear programming optimization calculations.

DEA differs to most parametric models in a significant manner, since it does not assume direct *a priori* knowledge of the production function. It identifies the best performers in a sample of observed units, creates a frontier based on the top performers, and then, evaluates the performance of all other units by measuring their distance to the frontier. This is very different to what statistic regression models do, since they calculate an "average" behavior or a central tendency. As Cooper, Seiford & Tone (2007) show, the difference in the DEA approach not only creates different efficiency evaluations, but also generates very different policy and management recommendations. Specifically, DEA highlights the best performers as potential benchmarks, what is difficult to be done by regression models, since they lose information of individual units.

Another important characteristic of DEA is its ability to deal with a large number of variables and restrictions. This is particularly interesting when dealing with multi-product firms. Also, the possibility to incorporate many restrictions has led to several recent advancements in the method, with the inclusion of more sophisticated restrictions, which better reflect the constraints faced by the firms in their real environments. Examples of these recent models include DEA with environmental variables, non-discretionary variables, categorical units, undesirable outputs, measurements over time, stochastic elements, etc[2]. The flexibility of the DEA methodology makes it a field rich in recent developments.

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2 Cooper et al (2007) present a brief overview of recent developments in DEA models.

The Theoretical Model

DEA's flexibility does not mean it is a-theoretical; instead, it is consistent with the microeconomic theory of the firm, and adopts many of its concepts. It assumes that the production possibility set, T, is made up by feasible combinations of vectors of inputs, X, and outputs, Y. Let $x \in \Re_+^m$ be a vector of *m* inputs, and $y \in \Re_+^s$ a vector of *s* outputs. Then, T may be represented by two subsets:

$$Y(x) \equiv \{y \mid (x, y) \in T\}$$
$$X(y) \equiv \{x \mid (x, y) \in T\}$$

Since Y is a function of X, and X is a function of Y, if Y is known for every x, and X is known for every y, then T is known indirectly. T's frontier constitutes the production frontier, and is the objective basis of comparison for all Decision Making Units (DMUs). Each DMU may be represented by a combination of (x, y). Efficient units are located on the frontier, while inefficient ones are within T, but away from the frontier. DEA measures *relative* efficiency of different DMUs based on the analysis of inputs employed and outputs produced by each unit.

Assumptions coming from the microeconomic theory include:

(1) T, Y and X are convex sets: if $(x, y), (x', y') \in T, \alpha \in [0, 1] \Rightarrow \alpha (x, y) + (1 - \alpha)(x', y') \in T$. Y and X are also bounded and closed.

(2) A positive amount of inputs is necessary for the production of a positive amount of outputs: if $y > 0$, then $x \neq 0$. Also, if $x \geq 0 \Rightarrow y \geq 0$.

(3) It is possible to freely dispose outputs and inputs: if $(x, y) \in T, x' \geq x \Rightarrow (x', y) \in T$; if $(x, y) \in T, y' \leq y \Rightarrow (x, y') \in T$. It is also possible, under the weak version, that $x' = \alpha x$, and/or $y' = y\alpha^{-1}$ for $\alpha \geq 1$.

(4) It is possible to proportionally resize the scale of any productive process in T: if $(x, y) \in T \Rightarrow \alpha(x, y) \in T$, for any $\alpha \geq 0$.

Following Simar & Wilson (2001), one may recall Shephard (1970), who provides a distance function in outputs for an observed production possibility, (x, y), to the frontier of T:

$$D(x, y) \equiv \inf\{\theta \mid (x, \theta^{-1}y) \in T\}, \qquad (1)$$

Details about the variables and their meanings will be discussed later. For now, one needs only to attain to the fact that this distance shows the maximum feasible augmentation in y, an observed output vector, letting x constant. Calling each of the observed production possibility points a DMU, $\theta = D = 1$ for efficient DMUs, all others have $\theta = D < 1$. DEA finds a linear combination of observed efficient DMUs that employ, at most, as many inputs as the unit being evaluated, but which produce a fraction of θ more of outputs than this inefficient unit does.

We can also write expression (1) as a linear programming problem:

$$[D(x,y)]^{-1} = \max\{\theta \mid \theta y \leq \lambda Y, x \geq X\lambda\} \qquad (2)$$

DEA and the Public Sector

DEA is widely used in industrial engineering as a tool for production optimization. However, it has also been frequently applied to non-traditional firms, such as those in the public sector. In fact, the first paper introducing the DEA methodology was that of Charnes, Cooper and Rhodes, in 1978, in which the authors aimed at "evaluating activities of not-for-profits entities participating in public programs". Since then, scholars have used DEA for many different sectors, mainly due to some of the attractive features that make it very appropriate for analyzing non-traditional firms. First, it is difficult to accurately model the production function in these cases, and it is even harder to confidently assume knowledge of the distribution of the error term. This makes parametric methods, such as regression models and Stochastic Frontiers, unsuited for adequate analysis. Some studies (e.g., Souza, 2001) suggest that DEA has other several advantages when dealing with non-traditional sectors: less influence of random impacts over the final results; no need to stipulate input and output market prices; and no need to assume profit maximization or cost minimization behaviors. Under such circumstances – which seem to be exactly the case of the Judiciary – DEA is the most appropriate methodology. It is not surprising that DEA is the most commonly used method for measuring court efficiency. A brief survey in the literature shows that most of the papers attempting to measure it around the world employ DEA[3].

The Output Oriented, Constant Returns to Scale CCR Model

Differences in the many DEA models may be summarized into: assumptions of returns to scale, input and/or output orientations, and, for the models of variable returns to scale, radial or non-radial metrics. Charnes et al (1994) point out that the envelopment frontier is identical in all cases, but the projection point, i.e., the basis of comparison for a inefficient unit (about which we will discuss later), is different across the models.

The DEA model employed here is the one originally developed by Charnes, Cooper and Rhodes (1978), known as the CCR model, which assumes constant returns to scale. In fact, there is no absolute consensus over this topic in the literature. Among those who assume variant returns to scale, there is also disagreement whether it is increasing or decreasing, for example, Beenstock & Haitovsky (2004) *vs.* Sousa & Schwengber (2005). Yet, the results of Dalton & Singer (2009) for American courts, and Kittelsen & Førsund (1992), for Norwegian courts, seem to indicate one common point: courts that are smaller in size and handle less complex cases are those more likely to show increasing returns to scale. This characteristic does not seem to be observed in larger, metropolitan courts. At the same time, there have been very few papers that found evidence of decreasing returns to scale, the one example being

3 This survey is available upon request.

Beenstock & Haitovsky (2004) in Israel. To further support our assumption of constant returns to scale, Lewin et al (1982) and Schneider (2005) assume it for the American Criminal Courts and the German Labor Courts, respectively. Finally, Pedraja-Chaparro & Salinas-Jimenez (1996) regress efficiency scores on the size of Spanish Courts. None of the coefficients was significant, which convinced them to assume constant returns to scale.

Not only the literature induces us to adopt this assumption, but also the knowledge of some characteristics of the functioning of the Brazilian Judiciary: (i) its high bureaucracy, that mandates each judicial case to follow dozens of specific and individual procedures; (ii) the infrequent use of jurisprudence, which means that judges rarely use the same decision for similar cases: they would go through the case from the beginning, analyzing all its details, in a case-by-base process.

DEA employed here is, furthermore, output oriented; in other words, it analyses by how much a court can increase the level of output, while maintaining a constant level of inputs. The alternative is to run an *input oriented DEA*, which in turn analyses how much input a Court could save, while maintaining a constant level of output. Choosing the "right" orientation is a matter of evaluating the power that managers actually have. The structure of the Brazilian Judiciary suggests that those who run courts have little leverage on the level of inputs, since this is defined by law. Thus, it seems that court managers have more decision power over the level of *outputs* produced.

Having this in mind, the linear programming problem (2) could be written as:

$$\begin{aligned} &\max_{\phi,\lambda,s+,s-} z_0 = \phi + \varepsilon s^+ + \varepsilon s^- \\ &st \quad \phi Y_0 - Y\lambda + s^+ = 0 \\ &X\lambda + s^- = X_0 \\ &\lambda, s^+, s^- \geq 0 \end{aligned} \tag{3}$$

Because this is an output oriented model, instead of θ, which is a number between 0 and 1, we need a $\phi = \theta^{-1} \geq 1$. ϕ shows the *increase* in the amount of outputs needed to transform a inefficient DMU into an efficient one.

If a specific DMU has an optimal value of z_0, it is an efficient unit and lies on the production frontier. An inefficient DMU, *(X_0, Y_0)*, may become efficient if it is projected to an efficient point, $(\hat{X}_0, \hat{Y}_0)$, which lies on the frontier. This point may not be empirically observable; yet, in such cases, $(\hat{X}_0, \hat{Y}_0)$ will be a convex combination of efficient DMUs actually observed in the sample. In other words, $\hat{X}_0 = \Sigma \lambda_k^* X_k$ and $\hat{Y}_0 = \Sigma \lambda_k^* Y_k$ where $\lambda_k^* \geq 0, \forall k$ is a vector of empirically observed weights attached to each X_k and Y_k of efficient units. The maximum increase in output may be achieved by multiplying ϕ to the inefficient DMU's outputs vector, Y_0. Variables, s^+ and s^-, tell us that, in order to be efficient, a DMU must also have all slacks equal to zero. s^- measures the excessive amount of inputs employed by an

inefficient unit, and s^+ the lack in the quantity of outputs produced by this same unit. The difference between the slack variables and ϕ is that, the latter is a proportional measure applied to the *entire* vector. In the output oriented case, ϕ indicates the proportional increase applied to *all* outputs of an inefficient unit. As Charnes et al (1994) show, "[this increase] is applied simultaneously to all [outputs] and results in a radial movement toward the envelopment surface" (p. 32). Instead, s^+ is a vector containing independent measures to be applied to *each* individual output. Mathematically, s^+ and s^- are vectors, while ϕ is a scalar. Finally, ε is a non-Archimedean constant, or, a non-real number. Its presence guarantees that all variables are restricted to positive values (Cooper et al 2007).

Problem (3) is the primal problem, or the *envelopment form*. DEA solves it *n* times, one for each observed DMU in the sample. There is also the *multiplier form*, or the dual problem:

$$\begin{aligned} &\min_{\mu,v} q_0 = v^T X_0 \\ &st \quad \mu^T Y_0 = 1 \\ &\mu^T Y + v^T X \geq 0 \\ &\mu^T \geq \varepsilon \mathbf{1} \\ &v^T \geq \varepsilon \mathbf{1} \end{aligned} \qquad (4)$$

v e μ are the weights associated, respectively, to the vector of inputs and to the vector of outputs of each observed DMU. They come from DEA empirical calculations, and are the best available combinations: it means that, if v e μ are applied to the vectors of outputs and inputs, the DMU is able to produce the largest amount of outputs. The dual problem aims at finding a supporting hyperplane above all DMUs, which minimizes its distance to the inefficient unit that is being evaluated (Charnes et al, 1994). A DMU is efficient if and only if has se $z_0^* = q_0^* = 1$.

Data and Variables

Data for our analysis come from the annual reports "Justiça em Números" published by CNJ, the National Council of Justice. They cover Federal Courts, State Courts, and Labor Courts, but we focus only on State Courts. Numbers are provided by each State and include a long list of measures: expenditures, number of judges, number of employees, number of new filings, backlog, appeals, adjudications, etc. Here, we analyze data of the three most recent years, 2006 to 2008.

Two outputs were used: the number of adjudications in the first and in the second-degree courts. Each of these was divided by a measure of "workload", which in turn, consists of the number of filings in the current year added to the number of pending cases from the previous year. For example, the first-degree Court in the State of Paraná adjudicated 701,969

cases in 2008. There, 678,447 new cases were filed in the same year, and 2,107,906 cases were pending on December 31, 2007. Therefore, the ratio of adjudications controlled by workload was 0.2519. In order to avoid very small numbers, we multiplied the above ratio by 100. Thus, a value of 25.19 was entered as Paraná's output for DEA calculations. Controlling output by workload is crucial, given the high disparities of judicial demand across different states.

Three inputs were used: the number of judges, the number of auxiliary staff, and the number of computers. All of these variables were weighted. The former two were weighted by "workload", as we did for outputs. This was done in order to consider the *relative amounts of inputs*, instead of the absolute values, since these latter are determined by law, and are inflexible to the oscillations in judicial workload. Again, in order to avoid small numbers, we multiplied the resulting ratio by 100,000. Thus, one could read the "weighted number of judges" as the number of judges available for every 100,000 cases in the courts. The number of available computers was weighted by the number of internal users, as provided by the report[4].

4. Results and Analysis

Tables 1 to 3 present the efficiency measures of the State Courts in decreasing order:

Table 1: Efficiency Measures Year 2006

Rio Grande do Sul	1.000

4 Computer users include judges, internal and outsourced employees, interns and other hired workers who "regularly use computers in the year considered". All variable definitions were provided in the report appendices.

Rio de Janeiro	1.000

Acre	1.000

Alagoas	1.000

Paraná	1.000

Goiás	1.000

São Paulo	0.882

Rio Grande do Norte	0.802

Rondônia	0.786

Amapá	0.780

Mato Grosso do Sul	0.757

Mato Grosso	0.715

Sergipe	0.705

Distrito Federal	0.643

Pará	0.601

Minas Gerais	0.591

Santa Catarina	0.586
Maranhão	0.570

Paraíba	0.527
Piauí	0.513

Amazonas	0.486
Roraima	0.423

Espírito Santo	0.389
Tocantins	0.330

Pernambuco	0.305
Bahia	0.287
Ceará	0.152

Mean 0.660

Table 2: Efficiency Measures Year 2007

Rio de Janeiro	1.000

Paraná	1.000

Rio Grande do Sul	
Roraima	

Tocantins	0.398
Maranhão	0.381

Espírito Santo	
Bahia	
Piauí	

Mean 0.590

Table 3: Efficiency Measures Year 2008

Rio de Janeiro	1.000
Rio Grande do Sul	1.000

Santa Catarina	0.613
Distrito Federal	0.552
Mato Grosso do Sul	0.549

Amapá	0.532
Ceará	0.497
Amazonas	0.491
Espírito Santo	0.422
Pará	0.395
Bahia	0.349

Roraima	0.344	Acre		1.000	0.702	0.764
Mean	0.67					

As expected for this short period of time, average efficiency did not alter significantly. In three years, Brazilian State Courts had performance scores around 0.60 and 0.68; however, if one discards the perfectly efficient units, average efficiency falls to 0.56, 0.54 and 0.64, respectively for the years 2006, 2007, and 2008. Before getting any conclusions from the numbers above, we should take a better look at the same scores in a cross-year panel in order to better compare them and reflect about what might be happening with each State Court during this period of time. Data now is organized in alphabetical order of the name of the states.

Table 4: Panel of Efficiency Measures – 2006 to 2008

	2006	**2007**	**2008**

Alagoas	1.000	0.535	0.792

Amapá	0.780	0.700	0.532

Amazonas	0.486	0.327	0.491

Bahia	0.287	0.275	0.349

Ceará	0.152	0.581	0.497

Distrito Federal	0.643	0.635	0.552

Espírito Santo	0.389	0.373	0.422

Goiás	1.000	0.978	0.887

Maranhão	0.570	0.381	0.688

Mato Grosso	0.715	0.647	0.886

Mato Grosso do Sul	0.757	0.521	0.549

Minas Gerais	0.591	0.492	0.681

Pará	0.601	0.331	0.395

Paraíba	0.527	0.448	0.726

Paraná	1.000	1.000	0.887

Pernambuco	0.305	0.294	0.436

Piauí	0.513	0.228	1.000

Rio de Janeiro	1.000	1.000	1.000
Rio Grande do Norte	0.802	0.906	0.935

Rio Grande do Sul	1.000	1.000	1.000
Rondônia	0.786	0.706	0.777

Roraima	0.423	0.436	0.344
Santa Catarina	0.586	0.564	0.613
São Paulo	0.882	0.821	0.878

Sergipe	0.705	0.649	0.717
Tocantins	0.330	0.398	0.462

At first glance, it is clear that many states show consistent numbers throughout the time. On the one side, there is the group of very efficient units: Rio de Janeiro, Rio Grande do Sul, Paraná, Goiás and Rio Grande do Norte. Also, among the consistent top performers is São Paulo. Since it is by far, the State Court with the heaviest workload in the country, this result shows that, taking into account the relative amount of resources it employs, it can produce a proportionally and relatively high amount of judicial decisions. On the other side, there are the consistently inefficient courts: Bahia, Pernambuco, Espírito Santo, Roraima, Tocantins and Amazonas. Finally, there are those states that consistently perform "just average": Distrito Federal and Santa Catarina. For all these states – even those with consistent poor performances – the problem is not that worrying. States with good performances – and these also include Acre, Rondônia and Sergipe – need only to make sure they know the exact reasons of their good scores, and "keep it going". It is however important to remember, once more, that DEA results are *relative* ones. This means that Rio de Janeiro and Rio Grande do Sul, the two courts with perfect scores in all three years, are not necessarily making their citizens 100% satisfied with the judicial services they offer. They could still improve the efficiency levels *in absolute terms*. The situation of the average performers is also manageable. With the above results, one could conclude that there is still room for improvement, and they could achieve it by taking the top performers as benchmarking cases. The State Court of Acre, for instances, had sent a group of its managers to visit the Court in Rio de Janeiro (without knowing our DEA results!) to learn more about the way the *cariocas* organize themselves. Finally, even the consistent poor performers should know that it is possible to deal with their situation. Some urgent measures must be taken to diagnose the

causes of their inefficient functioning and, furthermore, to change their *modus operandi*. Again, one way to start doing it is to check whether the top performers have anything useful to show them.

The greatest problem, however, is with some states that show very unstable results in this three-year period. The most extreme cases seem to be those of Ceará, Maranhão, Paraíba, and Piauí. Four additional states (Alagoas, Amapá, Mato Grosso do Sul and Pará) presented consistent numbers in two years, but an "odd" result in the third one. The main problem here is that one cannot derive any conclusion about what is going on in these courts from the numbers they provided. Previous experiences tell us that the most likely reason for these inconsistencies is precarious collection and/or measurement of data. The collection of national judicial statistics in Brazilian courts started in 2003. At the beginning, the quality of the data was very questionable: many states presented blanks in their data, making them useless for a temporal panel. Clearly, the quality of data has been improving greatly throughout the years, especially because State Courts are now legally mandated to gather and send all statistics to CNJ, which by its turn, has punitive power over all judicial members. Yet, six years later, data is still not perfect. The case of Piauí is a typical example. It appears scoring a perfect "1.0" DEA score in year 2008; but, in reality, one of the most important statistics related to the number of adjudications was missing in the report, and we had to fill this gap with the corresponding average value of the two previous years. Despite our efforts to create "reasonable" gap-filling rules, it seems that the process did not turn out to be very reliable[5].

In addition to cross-year analysis, we could further access the reliability of the performance results by using a tool DEA provides us: the comparison to peer groups.

Reliability of Efficiency Measures by Peers

The next table shows a robustness test for the efficiency measures; one evaluates the frequency in which an efficient DMU serves as peer for inefficient units.

Table 5: Frequency of Efficient Units as Peers - 2006 to 2008

Efficient Units 2006	N. of times it is peer (Total = 21)

5 Two additional State Courts presented data gaps in 2008: Mato Grosso and Mato Grosso do Sul; in 2007, only Mato Grosso do Sul had any blank with the data we used; in 2006, Rio Grande do Norte, Piauí, Ceará and Paraná showed gaps of some kind. Thus, one should be very cautious when reading the results for these states, especially those that are consistently failing to present complete data.

Rio Grande do Sul	19
Acre	15

Rio de Janeiro	14
Alagoas	6

Paraná	1
Goiás	0

Efficient Units 2007	N. of times it is peer (Total = 24)
Rio de Janeiro	19

Paraná	18
Rio Grande do Sul	12
Efficient Units 2008	**N. of times it is peer (Total = 24)**

Rio de Janeiro	23
Rio Grande do Sul	22
Piauí	1

One may remember from the theory that peers are used to calculate the projection points of inefficient DMUs. If efficient units are being used as peers, this means they are the basis of comparison for inefficient ones, and can, thus, be considered "representatives" (Cooper et al, 2007). Pedraja-Chaparro & Salinas-Jimenéz (1996) call them "genuinely efficient" DMUs. On the contrary, if an efficient DMU does not show up as peer for others, or does it only a few times, we should be cautious about the result. It might be the case that this unit has an unusual production function and/or that it has different input weights, as compared to other units.

With this in mind, we can very confidently affirm that, not only Rio de Janeiro and Rio Grande do Sul are the two perfectly efficient units during this three-year period, but also, that they are consistently representatives or "genuinely efficient" units. One could derive additional and similar conclusions from the two tables above. The combination of these two sets of information might add reliability to the efficiency results and to the analyses we have just achieved.

5. Conclusions

Given the above results, what might one conclude? First, systematic data collection and publication by the Judiciary Power in Brazil is a recent event, and some efforts of coordination and standardization are still needed, especially for some specific State Courts.

The second conclusion that may be derived from DEA results is that the lack of material resources cannot be blamed as the main reason for low levels of efficiency in Brazilian courts. DEA shows that all inefficient State Courts could further improve their level of efficiency, even if inputs – i.e., human and material resources – were kept constant. Third, as discussed in the "Diagnosis" part of this paper, one might suspect that the presence of skillful managerial leaders is an important determinant of the level of efficiency in the courts. As a clear indication of the importance given to managerial and organizational issues, the State Court of Rio de Janeiro searched for and got the ISO 9001:2000 certification, the well-known international standard for quality in services. The certification first came in December 2006. In fact, the World Bank presented in 2004 a very detailed report about the situation in the Brazilian Judiciary (World Bank, 2004), in which it identified some "best practices" among the State Courts. The exemplary case was that of Rio de Janeiro. The second case highlighted by the World Bank was (surprise!) Rio Grande do Sul.

We carried out a very preliminary survey based on information of websites, and it indicates further evidence of some correlation between quality of management/internal organization and efficiency performance. A second stage of this research should include a more in-depth analysis of the differences in the internal organization of efficient courts as compared to inefficient ones. We hope to be able to reach more objective conclusions about the relationship between these two variables in future works.

One of the most fruitful results of DEA is the possibility to identify (or confirm) the best practices in the country. Differently to what common sense tells us, there are some consistently efficient courts in the Brazilian Judiciary. These courts have been able to efficiently manage human and material resources, while carrying out their main function: solving judicial conflicts among parties. Surely, the other State Courts should look at them with more careful eyes.

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