Civil justice: a methodological analysis for assessing efficiency

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Abstract

The efficiency of judiciary offices may be connected to different variables. In the aim of deriving a unique statistical measure of the efficiency of each Court of first instance, based on different input and output variables, we applied a Data Envelopment Analysis (DEA), able to produce an efficiency index varying between 0 and 1 (unity representing major efficiency). Given that the resources available in the different judiciary offices are fixed (i.e. the eventual offices organigram variation), we chose to apply an output-oriented DEA model. We further analysed the potential influence of the activity of the Council on the performance of judgmental offices measured in terms of organisation variables, through Beta Regression models on the efficiencies resulted from DEA models.

Keywords: Judicial efficiency, output oriented DEA, beta regression.

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1. Introduction

In the last years there has been an increasing interest at the international level for the organisation of the different judicial systems. The need of a compared analysis of the performances of the judicial systems led to the importance of measuring the efficiency of the offices also according to their organisational aspects. Economic literature defines the efficiency meanly as (Landi *et al.*, 2016):

- the capacity, given the available resources, to solve controversies in a reasonable time;
- the quality of sentences, in terms of accuracy and certainty of decisions;
- the independence of the judgment (both in terms of impartial judges' decisions and of independence between the different degrees of judgement).

While the last two efficiency dimensions are not easy to be measured, nowadays the duration of proceedings is one of the indicators mainly used in order to measure the efficiency together to the percentage of ultra triennial pending proceedings, the clearance rate (ratio between resolved and new incoming proceedings), the disposal rate (ratio between resolved proceedings and workload, computed as sum of initial pending proceedings and resolved cases), etc. Just because of the existence of various judicial performance indexes and their different composition, it is not simple to assess uniquely and in a clear and synthetic way the efficiency of a judicial office. The main purpose of this study is the one of producing a unique efficiency measure for the Courts of first instance (in Italy they are 140), basing on the already existent indicators, which allows at the same time a proper assessment of the phenomena and a comparative analysis among the different offices by considering also their organisational resources. The second purpose of the study is the one of analysing the efficiency outcomes obtained by a first analysis and their relation with the organisational capacity of the judicial offices, in the aim of verifying the existence of a possible impact of the activities of the Superior Council of Judiciary (CSM) taken in the last years in order to improve the organisational capacities of the judicial offices. In section 2 materials and DEA method used will be illustrated, in section 3 the effective organisation of the judicial offices and the measured efficiency

is presented (for the whole civil sector and for the two civil sub sectors), in section 4 conclusions are illustrated.

2. Materials and DEA Method

In the aim of deriving a statistical measure of the efficiency of each italian Court of first instance, based on different input and output variables, we applied a Data Envelopment Analysis (DEA). DEA methods consist in linear programming models which locate the best offices and allow locating the other offices by comparison. As alternative we could choose to compute a composite indicator by considering many variables usually accounted for to understand office judicial efficiency; however the choice of proper weights to weigh the composite indicator with would risk to be very arbitrary and to produce politic debates. To assess the efficiency of units, the linear programme is needed to be solved as many times as the number of the units, each time changing the reference unit; the optimisation problem is solved by producing a frontier of efficient units (Courts). These models are non-parametric and the relation existing between performance and endowment of resources is not mathematically exploited; this point is very important in the judiciary context, such as in public administrations, given the difficulty in defining objectively relations among performance indicators and their priorities. DEA models produce efficiency indexes which vary between 0 (no efficiency) and 1 (perfect efficiency) and can be of two different type: *input-oriented* and *output-oriented* DEA models. In the first case, efficient units are the ones using a lower number of resources to obtain a given output, in the second case the efficient units are the ones that with a given number of resources available (input) obtain the greatest possible output. We applied an *output-oriented* DEA model given that the endowment of available resources in the different judicial offices is fixed or can be modified only through measures taken or approved by the Ministry of Justice or/and by the Superior Council of Judiciary; let us consider for example the eventual working staff variation in the judicial offices. In detail, the chosen DEA model produces an efficiency frontier made of a virtual combination of units producing an higher output with the same input; units are dominated, proportionally or not proportionally in terms of output, by units standing on the frontier. The goal is to estimate judicial office efficiency by maximizing the output variables (such as intra triennial proceedings) by remaining fixed the input variables (such as the Judicial personnel coverage rate), see Pardieri *et al.*, 2000. Hence, the efficiency measure of a given civil office obtained by the output-oriented

DEA model indicates how much the office produces given its possibilities: *i.e.* a value of estimated efficiency equal to 0,8 indicates that the office produces at the 80% of its possibilities and basing on the same endowment of resources it could obtain an output greater than 20% of the one obtained.

DEA models are based on data belonging to the quarter monitoring of the Ministry of Justice referring to the year 2018 and concerning both the whole civil sector and the two sub-civil sectors of Civil litigation, whose data are contained in the SICID (Sistema Informativo Contenzioso Civile Distrettuale) register, and of Insolvency Procedures registered in the SIECIC register (Sistema Informativo Esecuzioni Civili Individuali e Concorsuali). The input variables considered in the DEA model are:

- Judicial personnel coverage rate, year 2018 (Judicial present personnel/ judge working staff in courts);
- Number of incoming cases over the judge working staff in courts in the civil sector (standardised variable).

These variables have been chosen because the office, to carry out its judicial activity, needs to have both a proper judicial working staff coverage and a sustainable workload per each judge (represented by the number of incoming proceedings per judge).

The output variables taken into consideration are the ones synthesising the productivity of an office both in terms of duration and in terms of disposal capacity, in detail:

- The percentage of infra-triennial pending proceedings (enrolled in the last three years) over the total of pending proceedings at the 31/12/2018;
- Ratio between ultra-triennial proceedings 2017 and ultra-triennial proceedings 2018;
- Number of resolved proceedings over the working staff assigned to the civil sector;
- Clearance rate (resolved over incoming cases).

These indicators measure the "state of health" of an office and its productivity. Indicators have been computed such that their direction was

coherent with the goals of the study; for example, it has been considered the percentage of infra-triennial pending cases given that our purpose is the one of maximizing the percentage of recent backlog, just because an office to be efficient has to reduce the backlog, in particular the ultra-triennial one.

In the following are reported the results from the model, both for the whole civil sector and for the two considered sub civil sectors, and also the dimensional and geographical distribution of the offices according to the efficiency indexes obtained.

2.1 Results from the DEA model

Table 1 shows the most efficient courts of first instance according to the DEA model (efficiency score equal to 1), together with the dimension, the geographical division judicial offices belong to, the percentage of infra-triennial proceedings and the clearance rate.

As we can notice, the most efficient offices are located mainly in the North of Italy (Biella, Bolzano, Ferrara, Gorizia, Ivrea, Novara and Savona) and are especially small or medium small Courts. There are five offices in the South of Italy (Avezzano, Campobasso, Crotone, Napoli Nord, e Tempio Pausania) and one office of the Centre (Livorno).

Table 1 - Efficient Italian Courts of first instance and their characteristics

Courts	Dimension	Geographical distribution	% **Infra-triennial pending cases**	Clearance rate
Avezzano	Small	South	0.84	0.11
Biella	Small	North	0.75	1.05
Bolzano	Medium Small	North	0.89	1.04
Campobasso	Small	South	0.82	1.05
Crotone	Medium Small	South	0.72	1.28
Ferrara	Medium Small	North	0.93	1.07
Gorizia	Small	North	0.88	1.08
Ivrea	Medium Small	North	0.9	1.07
Livorno	Medium Small	Centre	0.81	1.12
Napoli Nord	Medium big	South	0.93	0.84
Novara	Small	North	0.78	1.15
Savona	Medium Small	North	0.87	1.13
Tempio Pausania	Small	South	0.57	0.99

A particular case among the efficient Courts is just the one of Napoli Nord, an office located in the South of Italy of medium big dimension, with an increased number of ultra-triennial pending proceedings between 2017 and 2018, a number of resolved proceedings per judge not much high and a clearance rate lower than unity but also with the lowest percentage of ultra-triennial pending proceedings due to the fact that, being build recently, it didn't have the time to rack up backlog.

The map below gives a graphic representation of the distribution of the Courts of first instance in Italy according to the efficiency index resulted from the DEA model.

Figure 1 - Distribution of the Italian Courts according to the efficiency indexes obtained through DEA

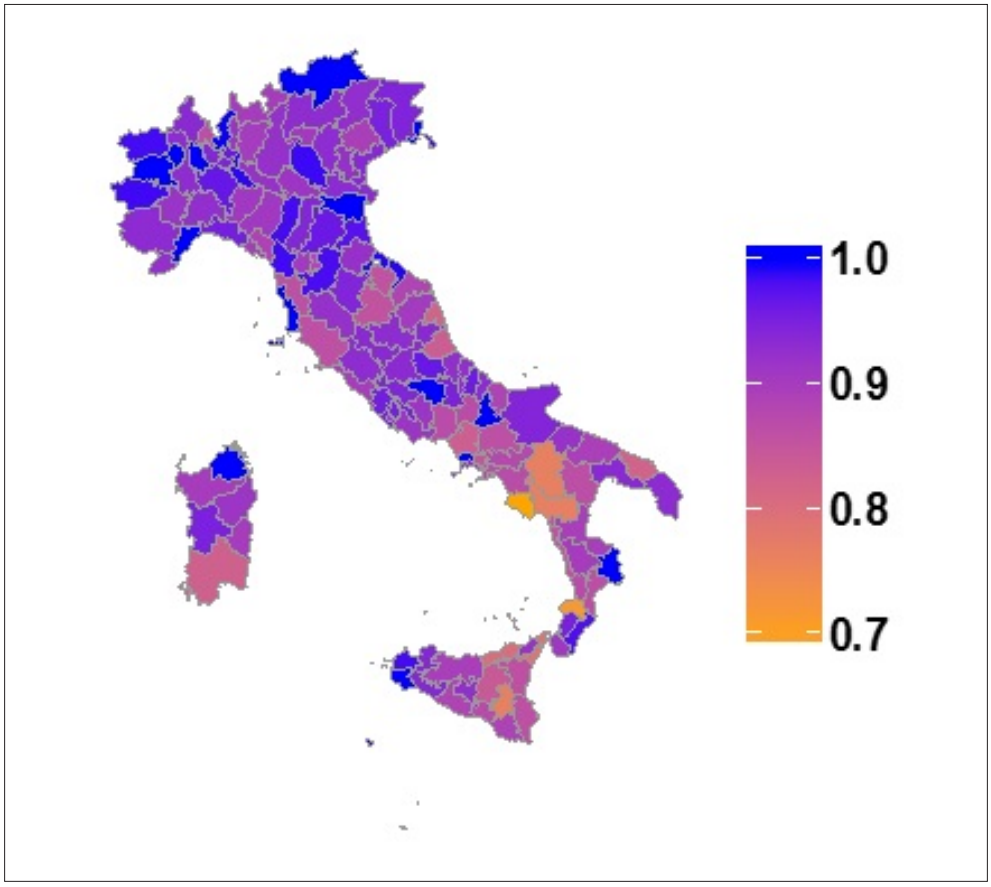


Table 2 shows the number of offices which have increased or not increased the estimated efficiency (through the DEA model) between 2017 and 2018 per dimension of the Courts. The Courts of Gorizia, Ferrara, Ivrea, Napoli Nord and Savona are among the most efficient in both considered years. Generally the 61% of the offices (86 Courts) has increased the estimated efficiency through the DEA model between the 2017 and the 2018 or has maintained the maximum efficiency, equal to unity; for the other offices the efficiency indicator has remained the same or has decreased. The following offices have increased the efficiency in 2018: the big and metropolitan Courts; the 55,6% of the medium big offices, the 63% of the medium small courts and the 56,9% of the small offices.

Tables 3 and 4 show the list of offices estimated as the most efficient according to the DEA models applied to the same input - output variables mentioned before but related respectively to the civil litigations sector (SICID) and to the insolvency procedures (SIECIC). As far as the SICID sector is concerned, the efficient offices and the related output indicators are listed in Table 3. Some offices, such as Ivrea, Napoli Nord, Savona and Ferrara confirm their position of best offices also in the civil litigations sector, characterising especially for a consistent number of infra-triennial pending proceedings and for a good clearance rate (equal or greater to 1).

Table 2 - Distribution of the offices which have increased or not increased the efficiency between the 2017 and the 2018

Dimension	Efficiency increase 2017/2018	No efficiency increase 2017/2018	Total
Big	3		3
Metropolitan	3		3
Medium big	10	8	18
Medium small	41	24	65
Small	29	22	51
Total	86	54	140

Table 3 - Efficient Italian Courts of first instance and their characteristics - SICID

Courts	Dimension	Geographical distribution	% Infra-triennial pending cases	Clearance rate
Aosta	Small	North	0.95	1
Arezzo	Medium small	Centre	0.86	1
Ferrara	Medium small	North	0.96	1
Gorizia	Small	North	0.91	1
Isernia	Small	South	0.62	1.1
Ivrea	Medium small	North	0.95	1.1
Lodi	Small	North	0.9	1
Napoli Nord	Medium big	South	0.95	0.9
Rieti	Small	Centre	0.8	1.1
Savona	Medium small	North	0.96	1.1
Sulmona	Small	South	0.98	1
Tivoli	Medium small	Centre	0.83	0.9
Trieste	Medium small	North	0.94	0.9

Table 4 - Efficient Italian Courts of first instance and their characteristics - SIECIC

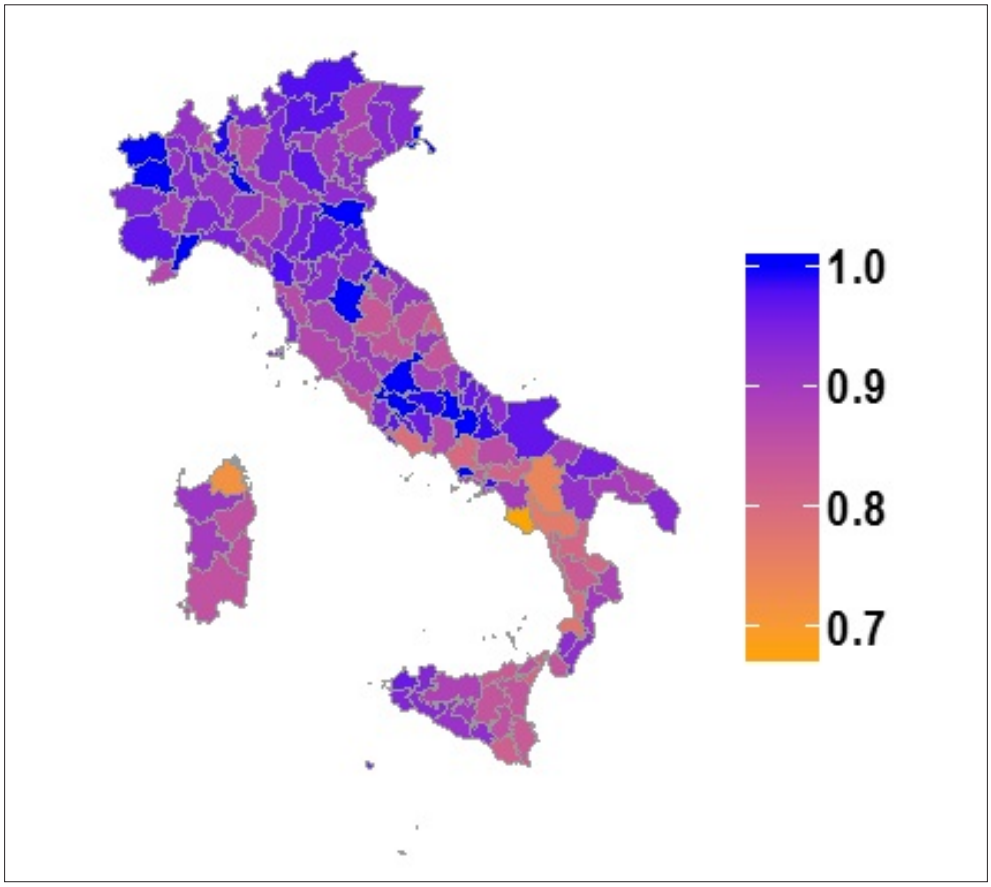
Courts	Dimension	Geographical distribution	% Infra-triennial pending cases	Clearance rate
Biella	Small	North	0.57	1.27
Catanzaro	Medium small	South	0.88	0.87
Ferrara	Medium small	North	0.89	1.21
Livorno	Medium small	Centre	0.62	1.33
Napoli	Metropolitan	South	0.79	1.14
Novara	Small	North	0.68	1.43
Tempio Pausania	Small	South	0.45	1.10

In the insolvency procedures sector, the efficiency index resulted from the DEA model varies more across the territory and medium values of the index are registered also in the North of Italy (see Figure 3).

3. Judicial offices organisation and measured efficiency

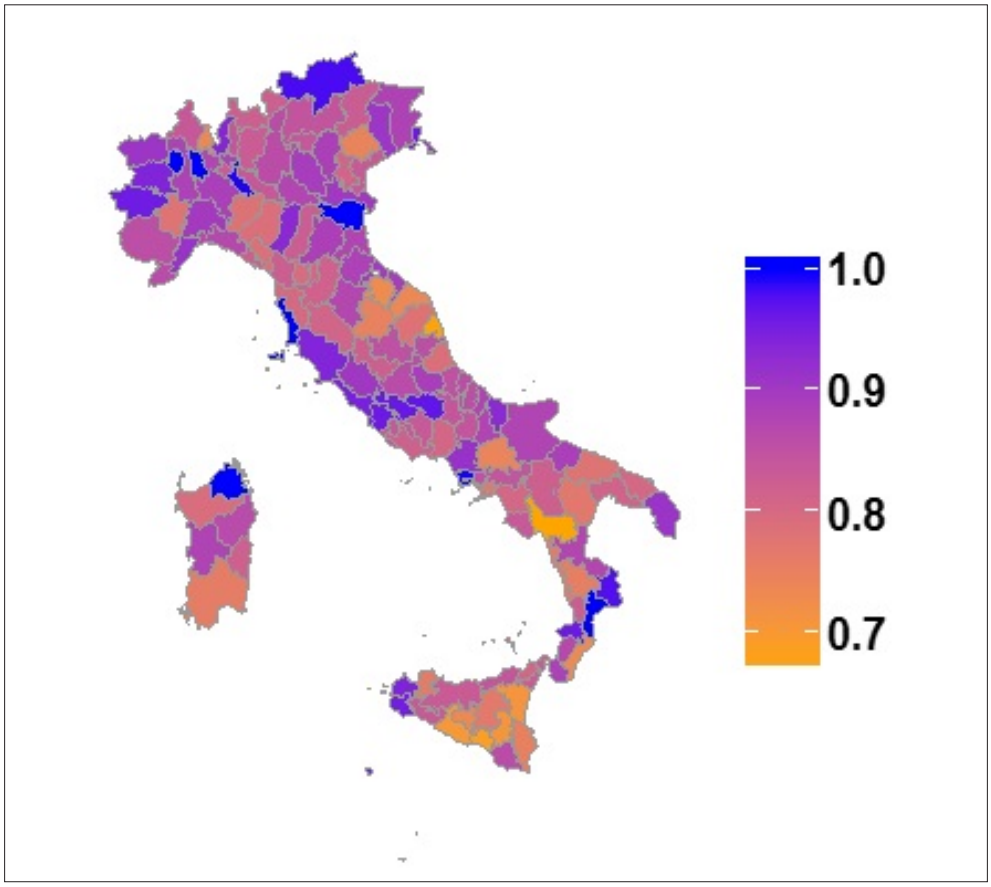
The Superior Council of Judiciary and in particular the VII Commission, has made an effort to spread among the heads of the offices a greater organisational culture, focussing the attention on the reduction of the civil pending proceedings, mainly on the more ancient enrolled cases for whom the probability to incur in economical sanctions (L.Pinto 24 march 2001, n. 89) for the length of the proceedings duration is higher. With the D.L. 98/2011 provisions have been emanated aiming at improving the efficiency of the judiciary system and the quick resolving of the controversies through the introduction of the management programmes. The management programmes, yearly filled by the Courts of first and second instance, have become during the time an important tool of planning and support of the judicial activity of the offices monitored by the Superior Council of Judiciary whose duty is also the analysis of the data resulting from them. In the management programmes deposited within the 31 of January 2018, judgmental offices had to indicate the percentage of ancient pending proceedings (ultra triennial for the Courts of first instance and ultra biennial for the Court of second instance) they would try to dispose of within the 31 December of the year 2018. This kind of data has been taken into consideration for the construction of a variable "Planning capacity" given by the ratio between the real disposal, measured as the difference between the ultra triennial pending proceedings at the end of 2018 and the ones at the end of 2017 and the goal (in terms of pending cases to be dispose of) planned by the heads of the offices in the management programmes for the year 2018. This variable related to the planning capacity has been categorised in three classes, according to the value assumed:

Figure 2 - Distribution of the italian Courts according to the efficiency indexes obtained through DEA - Sicid



- Courts with *adequate target* planning capacity have a value of the index between 0.5 and 1.5 extremes included;
- Courts with *under target* planning capacity have an index higher of 1.5; such offices are considered *prudent* in the definition of the goal, in fact the real decreasing or the backlog is higher (more of the 50%) than the goal of reduction indicated in the management programmes;
- Courts with *over target* planning capacity have an index smaller than 0.5.

Figure 3 - Distribution of the italian Courts according to the efficiency indexes obtained through DEA - Siecic



When it is mentioned in the text *not adequate* planning capacity it is related to Courts with under or over target planning capacity. The planning capacity variable and other indicators directly available or constructed on the base of the Justice Ministry data, have been used in order to analyse the existence of an eventual effect on the efficiency previously measured through the DEA models. The goal is twofold: on one hand the one of verifying the congruity between organisational capacity and real levels of judicial efficiency of the offices and thus the utility of the used planning tools, on the other hand the potential influence of the Council activity on such planning in order to improve the performance of the same offices.

3.1 The Beta regression model

The statistical model chosen for our purpose is the Beta Regression model; this choice is linked to the fact that the rv Beta has support in (0,1) and thus it is adequate to model variables such as ratios and proportions; such variable does not belong to the exponential family but the model based on its distribution is similar to a generalised linear model. We hypothesise $y_1, \ldots, y_n$ independent realisations of the rv $Y_i \simeq Beta(\mu_i, \phi)$, where μ_i and φ are respectively mean and precision parameter unknown; $x_1, \ldots, x_k$ constants known and fixed (k<n) and $\beta=(\beta_1, \ldots, \beta_k)$ vector of unknown parameters ($\beta_k \in$ R).. The formalisation of the model is the following

$$g(\mu_i) = \sum_{j=1}^{k} x_{ij}\beta_j = \eta_i$$

where $g(.)$ is the link function, mapping the mean from a subspace of R to all R, there are possible different choices (logit, probit, log log). In our case, the efficiency outcomes resulting from the DEA model assume value in the interval [0,1] extreme included; therefore the transformation $(y(n\ 1) + 0.5)/n$ (see Cribari-Neto *et al.*, 2010) has been applied, n corresponding to the total number of Courts, hence 140. The precision parameter φ, indirectly proportional to the variance of y, has been modelled by considering as explanatory variable the fact that the Court could be district or territorial, given that these two typologies of offices have a different organisation and this fact affects the variability of the distribution.

The Beta regression has been used to study the relation between the technical efficiency (dependent variable) together with the planning capacity, already mentioned, and other explanatory variables (factors which potentially affect and thus explain the efficiency outcome measured) both organisational, territorial and dimensional such as:

- the proceedings duration;
- the geographical division;
- the dimension of the offices;
- the number of *best practises* adopted by the judicial offices in the organisational context;

- the number of specialised sections (because it is assumed that a higher specialisation can produce a quicker disposal of the pending cases related);
- the number of active enterprises per Court, which could have an impact on the efficiency in the sector of the insolvency procedures (securities and real estate executions);
- the judicial working staff variation, as indicator of an organisational change;
- the turnover index (ratio between the number of judges left and the working staff for the years 2014-2018).

Variables which affect the efficiency in a statistical significant way are the duration of proceedings, the geographical division, the planning capacity referred to the last year and the working staff variation.

Three models have been applied: the first one for the whole civil sector, the other two models are one for each specific civil sector (SICID and SIECIC). Here only the results related to the whole civil sector and to the civil litigation one are reported; the results related to the SIECIC are not statistically significant.

Because of a strong association between the duration and the geographical division and the turnover a two step regression has been applied. The first step analysis is a linear regression of the duration where explanatory variables are the geographical division and the turnover. At the second step the residuals from the first step regression representing the duration net of the influence of turnover and geographical divisions is used as an explanatory variable in the beta regression model.

At the first step analysis it can be noticed that the more the turnover increases the more the proceedings duration increases as well (see Figure 4); furthermore North Italy offices are characterised by a duration of civil proceedings significantly smaller if compared with the offices of the Centre (-104 days), while the South offices have a duration of proceedings higher if compared to the ones belonging to the other two geographical divisions (see Table 5).

Figure 4 - Boxplot of the real duration of the proceedings in the civil sector per turnover classes

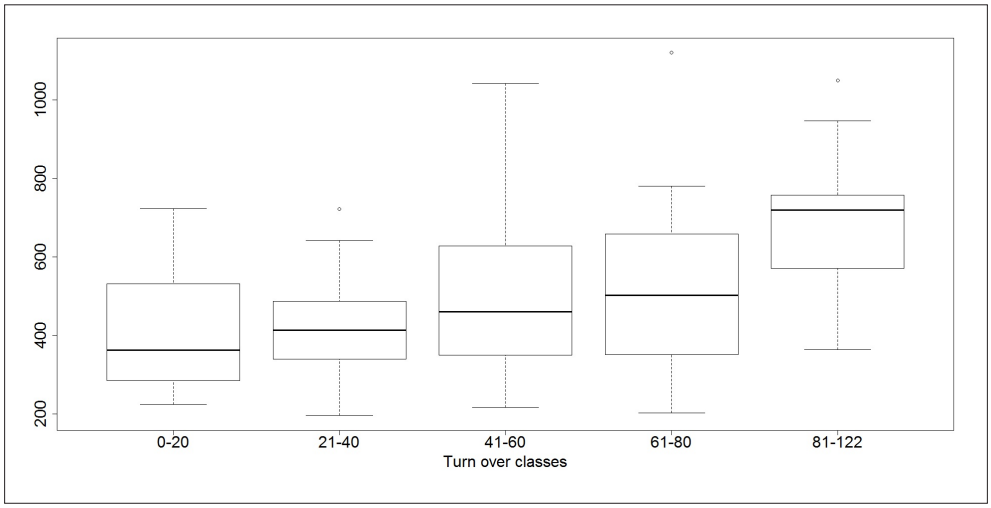


Table 5 - Regression model estimates - first step (a)

Parameter	Estimate	Std. Error	t value	Pr(>|t|)
Intercept	376	35.59	10.57	< 2e-16 ***
North	-104	32.06	-3.23	0.001 **
South	130	30.72	4.23	4.22e-05 ***
Turnover	1.73	0.53	3.24	0.001 **

(a) The statistically significant estimates (at least at the 95%) are the ones to whom correspond the symbols ".", *,**,*** in the column Pr(>|t|).

3.2 Analysis for the whole civil sector

In the following, results derived from the beta regression application (second step regression) on the efficiency measures obtained by using the DEA model, by considering the different exploratory variables already mentioned before are shown; among these independent variables which have the function of proxy of the interventions of the Csm in the aim of improving the organisational capacity of the judicial offices. The results of the statistical model show that, as we can expect, lower is the duration of the proceedings higher is the efficiency, even if the effect of such variable is very low (regression coefficient equal to -0.002, see Table 6) and the offices from the

North of Italy have an efficiency lower than the ones belonging to the other geographical divisions. In detail, the courts of first instance of the North of Italy have an estimated probability of being efficient *versus* not being efficient (ODDS RATIO, OR), higher than 1.6 times if compared to the offices of the Centre and about of 1.8 times if compared to the offices of the South. The interpretation of the estimated parameters through the beta regression is similar to the one of a logistic model (see Agresti, 2017).

Furthermore, offices with a not adequate planning capacity in the 2017 have a minor probability of being efficient in the 2018 *versus* the offices with an adequate target capacity and such estimate is statistically significant. The planning capacity variable related to the considered year (2018) is not significant in the beta regression, however analysing the increase or the not increase of the efficiency between a year and the other (2017-2018), it is clear that the most prudent courts have increased the efficiency more than the ones with an adequate target planning capacity and this fact could be due to the lower tendency to overestimate the goal of reduction of the ultra triennial pending proceedings leading to a more certain achievement of the goal.

Table 6 - Estimates of the beta regression model at the second step (a)

Parameter	Estimate	Std. Error	z value	Pr(>|z|)
Intercept	2.366	0.196	12.098	< 2e-16 ***
Duration (net)	-0.0002	0.0004	-5.183	2.19e-07 ***
North	0.487	0.167	2.914	0.003 **
South	-0.079	0.153	-0.514	0.607
Turnover	-4.079e-05	0.003	-0.014	0.989
Over target planning capacity(last year)	-0.247	0.129	-1.901	0.057.
Under target planning capacity(last year)	0.336	0.269	1.248	0.212
Phi coefficients (precision model with log link)				
Intercept	2.9751	0.1377	21.609	<2e-16 ***
district courts 1	0.6086	0.2961	2.055	0.039 *

.(a) The statistically significant estimates (at least at the 95%) are the ones to whom correspond the symbols ".., *,**,*** in the column Pr(>|z|)

The graphic below shows the trend of the efficiency resulted from the DEA model when the proceedings duration varies; it is possible to notice the decreasing trend of the efficiency of the offices at the increase of the proceedings duration expressed in days.

The geographical distribution besides being linked to the technical efficiency is linked to the planning capacity: the probability of having an adequate target planning capacity (*versus* having a not adequate capacity) of the judgemental courts of first instance of the South of Italy is lower than the one of the offices of the North and of the Centre.

The graphic below shows the distributions of the efficiencies in the different italian geographical divisions (applying a Gaussian Kernel Smoothing); we can notice that for the offices of the North the peak of the curve is closer to 1 (situation of highest efficiency) and the distribution is very concentrated around high values (0.9-1), while for the other geographical divisions the peak is closer to lower values of efficiency and the curves are platykurtic indicating a lower concentration around the maximum value and hence a more dispersed situation embracing both high and low efficiency values.

Furthermore we wanted to verify whether, together with the geographical distribution, the variables representative of the CSM activity, are in some way linked to the planning capacity codified in the three classes already mentioned before. The purpose in this case is the one of verifying whether, the fact that an office has disposed or not the percentage of ultra triennial pending proceedings prefixed and declared in the management programme for the 2017, is linked to other interventions began by the Council always in the aim of improving the judicial efficiency of the judgmental offices (*i.e.* spreading of best practises, number of specialised sections per offices, working staff variation, etc.). Hence a multinomial logistic model has been applied to estimate the probability of having a planning adequate target or under target (prudent offices) capacity *versus* an over target (not adequate) capacity on the base of some variables of intervention and organisation. The variable resulting statistically significant is the one related to the last working staff variation of the offices in the 2016 adopted by the Ministry of Justice, on which the Csm has given a judicial opinion motivated by modifying the initial proposal (see Table 7). The most of the offices which have disposed of how much they had prefixed or more (adequate target capacity or under target offices) has benefited of a variation in positive of the working staff, while the majority of the offices which do not have planning capacity has not obtained an increase or a decrease of the working staff.

Figure 5 - Relation between efficiency and proceedings duration

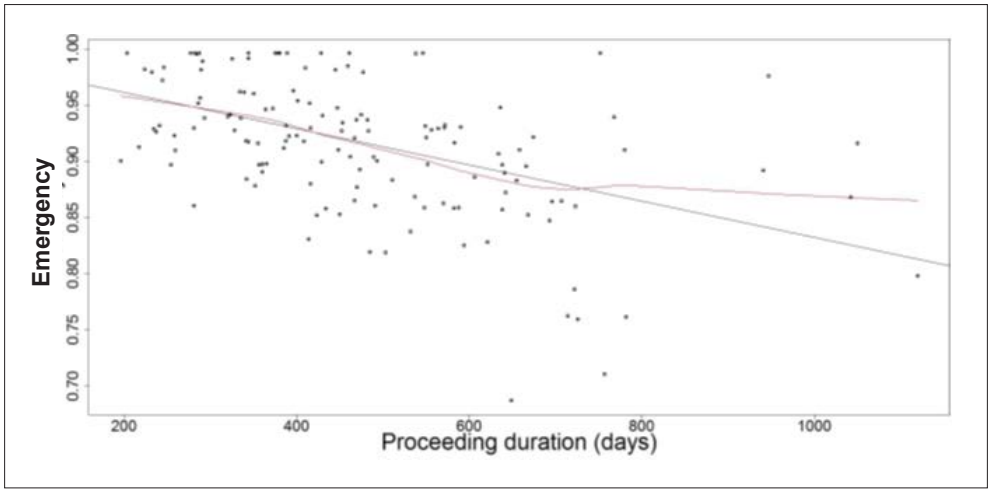


Figure 6 - Efficiency distribution per geographical division

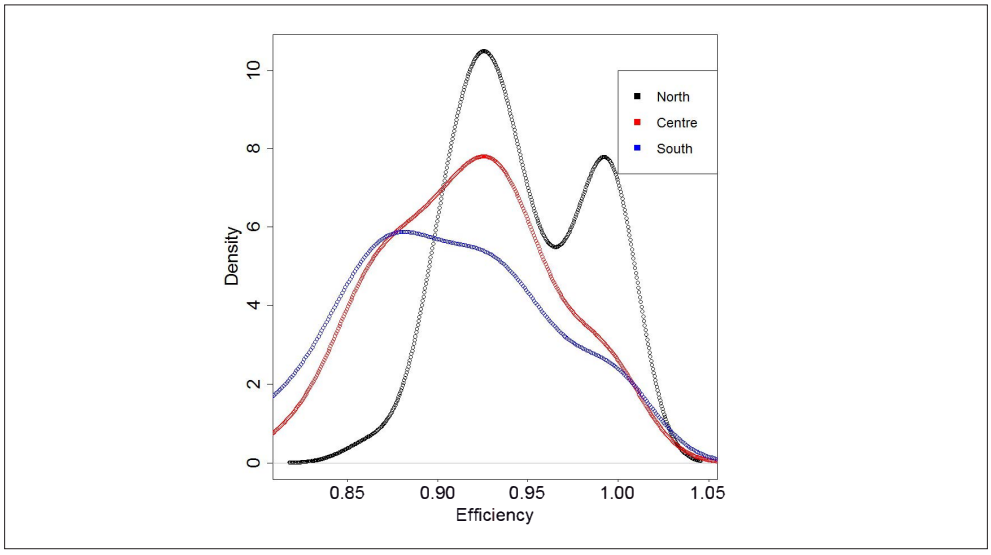


Table 7 - ODDS Ratio of the planning capacity with regard to the variation in terms of increase or decrease of the working staff (multinomial logistic model) (a)

	Intercept	Working staff increase (Ref=No variation)	Working staff decrease (Ref=No variation)
Adequate target capacity	2.12***	2.27**	1.88
Under target	0.19***	2.9	3.55

(a) The statistically significant estimates (at least at the 95%) are the ones to whom correspond the symbols ".", *,**,***

In detail, the Courts in which has been approved an increase of the working staff have a probability of having an adequate target planning capacity (*versus* the Courts which have an over target capacity) of about 2.3 times higher than the offices which did not have obtained any working staff variation: the offices knew how to govern the working staff variation. The positive effects reflect the adequacy of the modifications of the working staff, determined by the Ministry of Justice and by the Superior Council of Judiciary.

3.3 Analysis divided by civil sectors (SICID and SIECIC)

As already mentioned, for the civil litigation sector, the results obtained are similar to the ones got for the whole civil sector (Table 8), both per intensity and per direction of the relations between geographical division, turnover and duration of proceedings; also the influence parameters of these three variables on the efficiency measured through the DEA model are similar (Table 9).

Table 8 - Regression model estimate - first step

Parameter	Estimate	Std.Error	t value	Pr(>t)
Intercept	320.97	39.99	8.03	4.21e-13 ***
North	-106.36	36.02	-2.95	0.00371 **
South	145.19	34.52	4.21	4.68e-05 ***
Turnover	1.632	0.60	2.72	0.00742 **

The statistically significant estimates (at least at the 95%) are the ones to whom correspond the symbols ".", *,**,***

In detail, also for the civil litigation sector, the lower is the proceedings duration (net of the geographical division and the turnover) the greater is the probability of being efficient, even if the intensity of such phenomena is low. Courts from the North of Italy have an estimated probability of being

efficient higher if compared to the offices of the Centre and of the South; then the offices which in the 2017 had a under target planning capacity (and hence are prudent in the definition of the goals) have in the 2018 a probability of being efficient of about 1.6 times higher than the offices with adequate target planning capacity.

Furthermore, an important aspect related to the sub sector of the civil litigation is the one connected to the relation between working staff and efficiencies: offices with a decrease in the number of units in the working staff are characterised for a lower probability of being efficient *versus* the offices which did not have any variation.

As far as the insolvency procedures (SIECIC) are concerned, similar results have been obtained from the two step regressions, while the DEA model does not report statistically significant results but for the geographical distribution (significance at the 90%). For this reason these results are not reported in the following.

Table 9 - Beta regression model estimates at the second step (SICID)

Parameter	Estimate	Std.Error	z value	Pr(>|z|)
Intercept	2.167	0.185	11.695	< 2e-16 ***
Duration	-0.002	0.0004	-5.784	7.3e-09 ***
North	0.572	0.159	3.592	0.000329 ***
South	0.010	0.146	0.069	0.945
Turnover	-0.0003	0.003	-0.116	0.907
Over targ. plan. capacity last year	0.0416	0.130	0.320	0.749
Under targ. plan. capacity last year	0.438	0.208	2.112	0.035 *
Working staff variation +	0.023	0.128	0.184	0.854
Working staff variation -	-0.395	0.173	-2.278	0.023 *
Phi coefficient (*precision model with log link*)				
Intercept	3.107	0.137	22.691	<2e-16 ***
district courts 1	0.496	0.295	1.681	0.0928 .

The statistically significant estimates (at least at the 95%) are the ones to whom correspond the symbols “., *,**,***

4. Conclusions

The results obtained through the application of the DEA models (Data envelopment Analysis), show that the more efficient offices are located mainly in the North and in the Centre of Italy; such results are true both analysing the whole civil sector, the civil litigation and the insolvency procedures sub sectors. Furthermore the increase of the turnover corresponds to the increase of the proceedings duration.

The beta regression models show that the proceeding duration and the geographical distribution affect directly and significantly the first instance judicial efficiency; the decrease of the proceedings duration corresponds to the increase of the efficiency measured through the DEA, furthermore the offices in the North have a significant higher performance if compared to the offices in the Centre and in the South.

The probability of being efficient is lower for the offices with not adequate planning capacity in the 2017, if compared to the offices with an adequate target planning capacity; furthermore the dispersion parameter and thus the variability of the distribution is affected by the kind of Court, district or territorial Court. In the whole civil sector, the increase of the working staff, has not had a significant effect on the measure of the efficiency of the judicial offices yet, but it has contributed to improve the capacity of planning adequately a disposal of the ancient pending cases: the probability of having an adequate target planning capacity is of almost 2,3 times higher in the Courts where has been approved an increase of the working staff if compared to the courts where there has not been any variation. It is clear as the offices knew how to govern the working staff variation, both in the increase, reaching positive prefixed results, and in decrease, not deviating so much from the prefixed goals. The positive effects reflect the adequacy of the modification of the working staff determined by the Ministry of Justice and by the Superior Council of Judiciary. In the sector of Civil litigation (SICID), the beta regression shows similar results as far as the geographical distribution is concerned: furthermore the offices with an under target planning capacity (prudent offices) in the last year have a higher probability of being efficient if compared to the offices with an adequate target capacity.

Furthermore the offices where there has been a decrease in the working staff units have an estimated probability of being efficient lower than Courts where there has been no variation in terms of increasing or decreasing of units. Despite it is not simple to analyse the different reality characterising the organisation of the justice in the Italian Courts, and also the variables which determine directly or indirectly the organisation of the same Courts, this study provides some points of interest. Among these, it has to be underlined the moderate but evident positive impact of the activities taken by the Csm in order to improve the efficiency of the Courts of first instance. In particular, there are evidences of improvement in structuring the management programmes, in the planning capacity of the disposal objectives and in the internal organisation after the working staff variation.

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