EFFECTIVE DURATION OF THE CIVIL PROCEEDINGS IN ITALY – STATISTICAL ANALYSIS

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1. Introduction

Proceeding duration is one of the indicators most used in order to measure the efficiency of a judicial office, which can depend on different factors such as the nature of the cause and its complexity.

All data presented in this contribute are our analysis on Justice Ministry data coming from the data warehouse of the Justice Ministry and relying to the period 1/7/2018 - 30/06/2019.

Measured duration is the effective proceedings duration computed as difference between the exact date when a procedure is concluded and the exact date when it started; this measure differs from the *disposition time* (pending cases/resolved cases) and the *average stock formula duration* ((total initial +final pending proceedings)/2 out of (new enrolled proceedings + resolved ones)/2) which do not consider in the computation the exact date when proceedings started. Knowing that each civil proceeding is characterized by an object code and each object code belongs to a macroarea, one of the goals of this paper is of analysing the existence of a relationship between mean duration, office dimension and their geographical distribution through regression models per type of office (1° - 2° Courts). The same analysis has then been replied by considering only proceedings with the most frequent object codes in terms of total definitions per each macroarea for Courts of first and second instance. A cluster analysis has then been applied to create, where possible, an aggregation of object codes within homogeneous groups per duration classes. Finally, effective duration and disposition time have been compared with respect to the macroarea.

2. Civil proceeding duration, dimension of offices and geographical division

Our elaborations on Justice Ministry data highlight that the mean duration of proceedings resolved in the period July 2018-june 2019 is about 490 days for Courts

of first instance (greater for insolvency procedures ad executions) and 899 days for Courts of second instance (Table 1).

Table 1 – *Exploratory analysis.*

Office	Resolved cases	Mean duration Sicid (days)	Mean duration Siecic (days)	Mean Total duration (days)
Court 1°	2,160,954	448	634	490
Court 2°	141,727	899	-	899

We applied regression models (Ricci, 2006) showing that there is not a statistically significant relation between the mean duration of civil proceedings and the dimension of offices (small, medium, big and metropolitans); however the estimates of the relation between duration and geographical division are statistically significant at 95% for the Courts of first instance and at the 90% for the Courts of second instance. As far as the Courts of first instance concerns, the mean duration in northern Italy is averagely lower than the one in central and southern Italy: in the South, duration is 124 days higher compared to the one of the Centre, in the North is 165 days lower than the Centre. The same direction of estimates can be found in the Courts of second instance even if with different intensity: in the North durations are averagely 271 days lower while in the South durations are 2 months higher than in the Centre of Italy (Table 2).

Table 2 – *Statistical parameters Regression duration- geographical division.*

Office	Parameters	Estimate	Standard Error (SE)	p value
	Intercept	499.48	29.16	<0.0001
Courts I °	North	-165.66	36.06	<0.0001
	South	124.31	34.93	0.0005
	Intercept	885.75	128.07	<0.0001
Courts II°	North	-270.86	153.92	0.09
	South	58.19	143.18	0.69

3. Mean duration variability

If we look at the range (maximum-minimum) of the proceeding duration per macroarea[1], we can see very high values: for example, as far as proceedings of the labour macroarea in Courts of first instance are concerned, the mean duration is of 701 days, the minimum duration is of 83 days while the maximum duration is equal to 2284 days; in Courts of second instance the mean duration is of 788 days and goes from 215 to 1076 days.

An important heterogeneity is visible also in the Civil litigations macroarea where the mean duration goes from a minimum of 1 day to a maximum of 4414 days.

Given to the heterogeneity of mean duration between proceedings per macroarea and object codes inside of them, we decided to focus our attention on object codes related to the most frequent proceedings in terms of resolved cases. This choice is due to the fact that less frequent litigations could behave in a different way even between different offices in terms of proceeding duration, by creating a *bias* in the total distribution.

If we look at the territorial distributions of the resolved proceedings duration for each macroarea and for degree of judgemental offices, both as far as the most frequent resolved proceedings and the total resolved cases are concerned, we can see that they are not equal for all the macroarea.

For example, let us look at the distributions of the Civil litigations in Courts of first instance: the South of Italy is characterized by higher values of the proceeding duration if compared to the North where cases are resolved in about one year and half. Mean duration of proceedings obtained by considering all resolved proceedings is generally lower than the one computed by considering only the 42% of the resolved proceedings; this could be due to the fact that less frequent proceedings with a lower duration lows the total mean down. However this difference is not so high and actually can attest an acceptable level of similarity.

Thus, a different behaviour between the most frequent and total proceedings is true for the Courts of second instance but not for the Courts of first instance: in the latter case, for the majority of the macroarea, the mean duration of sampled proceedings approximates with an acceptable level of precision the mean duration of all resolved proceedings; exceptions are related to the Insolvency procedures and the Voluntary Jurisdiction (VJ) not in matter of family and persons macroarea.

We considered all the resolved cases for the following analysis.

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[1] Macroarea is a group of homogeneous object codes per "materia". In detail, Civ.lit.=Civil litigations, Inj. ord.= injunctive orders, Sec-Exe.=Securities executions, R.Este.Exe.=Real estate executions, Ins.Proc.=Insolvency Procedures, Soc.Sec=Social security, Sp.Proc.=Special proceedings, Sep. Div.=Litigation separations and divorces, VJ in=Voluntary jurisdiction (family & people), VJ not In=Voluntary jurisdiction (not in matter of family & people).

4. A different aggregation of object codes: the cluster analysis

Given to the heterogeneity of the mean duration values of resolved proceedings related to different object codes belonging to each macroarea, we aimed at aggregating differently object codes by identifying *clusters* as homogeneous groups inside and heterogeneous groups between them in terms of mean duration of proceedings; this could have an important role in proceedings complexity classification given the assumption that higher durations are linked to more complex proceedings.

A cluster analysis (Duran and Odell, 2013) has then been applied to all object codes corresponding to resolved cases greater than 10 (to exclude unused object codes), by not diversifying according to the type of office, basing on two classification variables computed for each object codes: *mean proceeding duration and its between offices variability measured though the variation coefficient (VC).* Results have then been analysed separately for Courts of first and second instance.

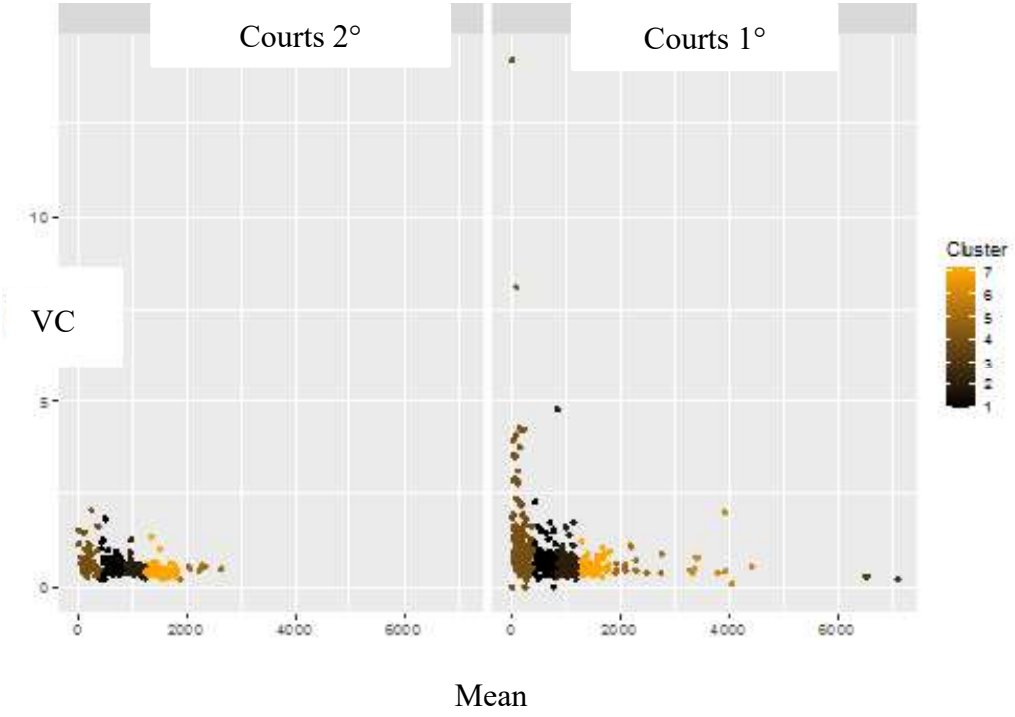
7 clusters have been identified thanking to the *Silhouette* of *Gap-statistics* (Rousseeuw, 1987) technique whose results are represented in the Figure below (Figure 1) where the x-axis shows the mean duration for each object code and the y-axis shows the variation coefficient computed on the mean duration; each point colour identifies the belonging group of every object code.

For example as far as the Courts of 1° instance is concerned, the first group of object codes coming from the Cluster analysis is characterized by the greatest variation coefficient values and the lowest mean and it is represented by the brown colour. Object codes belonging to that first group are codes belonging to different macroareas, susch as Separations and divorces, Labour, Special Proceedings, etc.

As far as the Courts of second instance are concerned, the variability of the considered measures is lower than the one of the Court of first instance offices.

The variable more affecting the clusterization procedure is the mean duration of proceedings, being the variation coefficients values more stable. Higher variability in terms of VCs is registered in the first cluster of Courts of first instance and in the first and second clusters of Courts of second instance (Figure 1).

Figure 1 – *Cluster representation for Courts of 1° and 2° instance.*



4.1 Cluster description

Table 3 summarises cluster characteristics in terms of macroarea object codes belonging to, mean duration, number of object codes and mean variation coefficient, as far as Courts of first instance are concerned. We looked also at the object code with minimum and maximum duration per each macroarea within each cluster so to better understand the cluster representation (we do not report details in this contribution for reasons of brevity).

The first cluster is the one with lower mean proceeding duration (153 days) while the 7th has greater duration (6818 days) and contains codes belonging to Insolvency procedures and Real estate executions macroarea.

Greater VCs and thus greater variability of mean duration between offices is registered for some VJ not in matter of family and persons codes for the 1th and the 2th cluster, for some Real estate executions codes for the third cluster, etc.

Table 3 – *Table Mean of the mean duration and CV per macro area per each cluster –Courts of first instance.*

	Cluster & Macroarea	Mean duration of proceedings	Number of object codes	Mean of the variation coefficient (VC)
Cluster 1	**Cluster 1**	**153**	**135**	**1.31**
	Labour	273	5	1.02
	Insolvency procedures	186	4	0.65
	Securities executions	200	3	1.09
	VJ in matter of family and persons	171	18	0.78
	VJ not in matter of family and persons	113	52	1.77
	Litigation separations and divorce	243	2	0.39
	Civil litigations	206	16	1.00
	Special proceedings	170	30	1.32
	Injunctive orders	31	5	0.77
Cluster 2	**Cluster 2**	**627**	**107**	**0.74**
	Labour	613	45	0.71
	Social securities	640	9	0.45
	Insolvency procedures	807	1	0.64
	VJ in matter of family and persons	611	1	0.76
	VJ not in matter of family and persons	544	6	1.69
	Litigation separations and divorce	653	3	0.30
	Civil litigations	654	37	0.71
	Special proceedings	593	5	0.75
Cluster 3	**Cluster 3**	**1025**	**94**	**0.65**
	Labour	989	13	0.68
	Social securities	899	2	0.60
	Real estate executions	1063	1	0.80
	Civil litigations	1033	78	0.64
Cluster 4	**Cluster 4**	**1459**	**43**	**0.58**
	Labour	1490	1	0.48
	Real estate executions	1663	1	0.29
	Civil litigations	1453	41	0.59
Cluster 5	**Cluster 5**	**2260**	**12**	**0.55**
	Labour	2284	1	0.43
	Insolvency procedures	2416	2	0.49
	Civil litigations	2223	9	0.58
Cluster 6	**Cluster 6**	**3720**	**9**	**0.61**
	Securities executions	3942	1	0.40
	Civil litigations	3692	8	0.63
Cluster 7	**Cluster 7**	**6818**	**2**	**0.23**
	Insolvency procedures	6533	1	0.26
	Real estate executions	7103	1	0.20

For the Courts of second instance proceedings are shorter than Courts of first instance, in fact there are no codes in 6th and 7th cluster, also because of absence of competence in Insolvency procedures and executions.

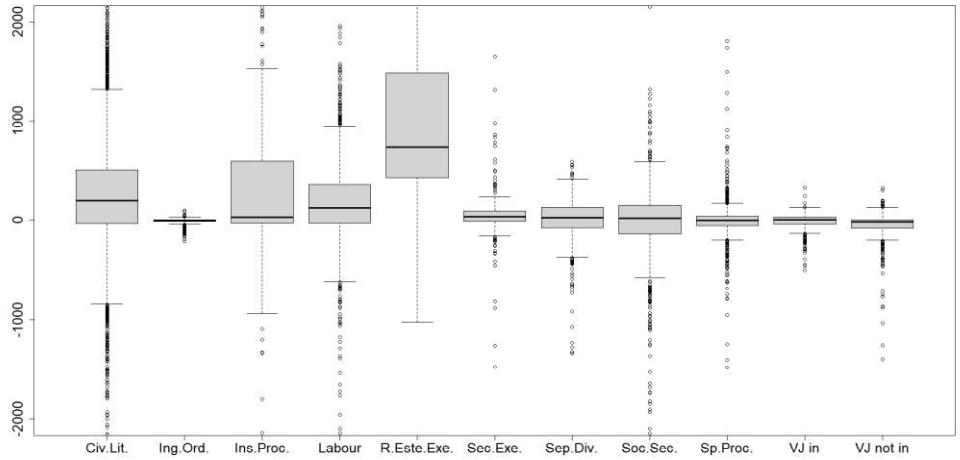
5. Effective duration and disposition time

Even if we decided to focus on the effective duration rather than on the before mentioned other kind of durations, given an assumed higher probability of reliability, we wanted to analyse the differences between the effective duration and the disposition time of proceedings, the latter used at the international level from the Cepej (European Commission for the Efficiency of Justice) as a duration estimate - which does not count for the starting and ending date of proceedings - computed as pending cases out of resolved ones times 365.25 to have duration expressed in days (Calvez *et al*., 2018).

We considered object codes corresponding to pending proceedings and resolved cases greater than 10 without considering "protections and curatorships" whose duration depends on the nature of proceedings and not on the resolving capacity of the judge.

As far as Courts of first instance is concerned, correlation between effective mean duration and disposition time is equal to 0.61 and the Anova or analysis of variance (Kaufmann and Schering, 2014) applied both over the mean effective duration and the disposition time shows that the duration means are statistically significant between the macroarea in both cases even if the model on the effective duration fits better the data. If we look at the difference between the two duration measures per macroarea, we can notice a higher variability in correspondence of the macroarea of civil litigations, executions and Insolvency procedures and labour and social security; median durations of civil litigations and real estate executions are farer away from each other (see Figure 1).

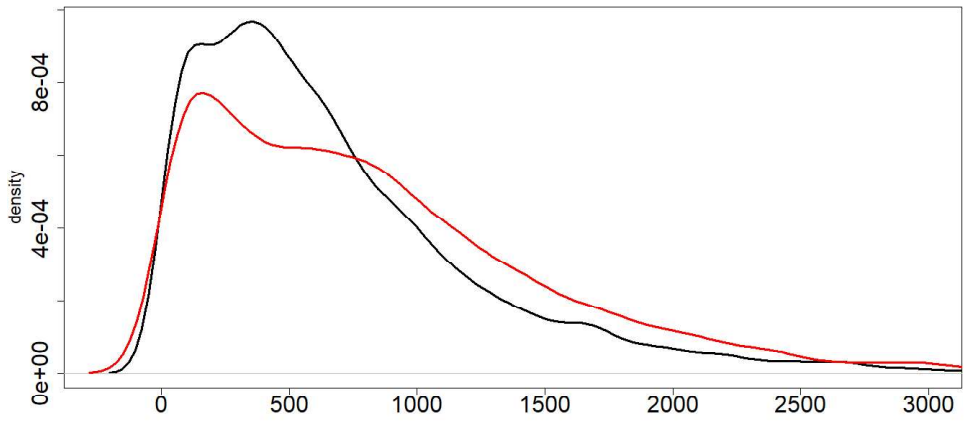
Figure 1 – *Boxplot of the differences between durations – Courts 1°.*



The percentage of difference of duration is more positive in all the macroarea but the injunctive orders, special proceedings and voluntary jurisdiction not in matter of family and person where the disposition time is greater than the effective duration.

The figure below compares the distributions related to the effective duration and the disposition time for Courts of first instance; by looking at the two densities, we can notice that in correspondence of lower durations the effective duration is lower while in correspondence of higher durations the density of the disposition time is lower.

Figure 2– *Effective duration density (red line) vs disposition time (black line).*

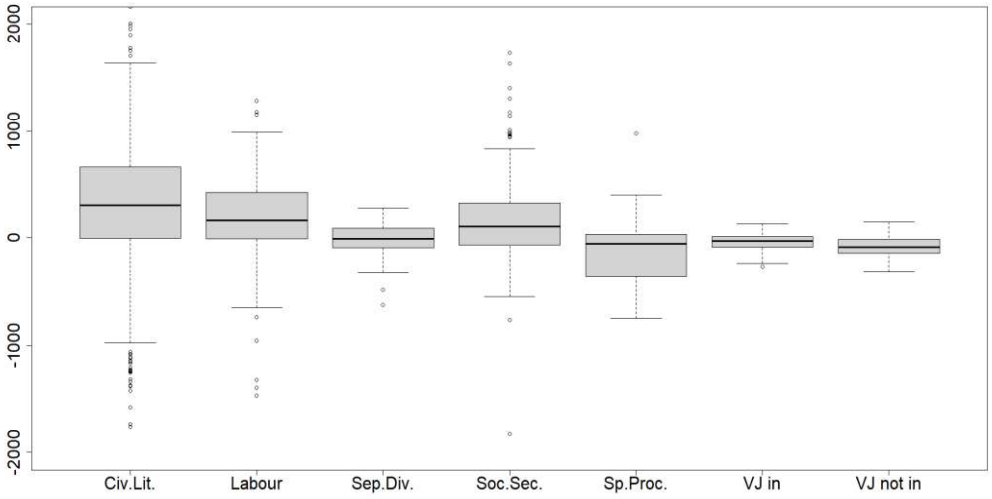


If we look to each macroarea, the two densities can behave differently, for example for the Real estate executions the two curves overlap each other in a different way and for the injunctive orders, the effective duration is greater than the disposition time within 100 days of duration; graphs are divided differently according to the different scale or better to the period in terms of days the two curves overlap each other in or are close to each other (i.e. for injunctive orders 100 days, for civil litigations 3000 days, etc.).

Effective durations and disposition times are similar for the Insolvency procedures, Social Security, Civil litigations Procedures; as far as the securities executions are concerned, the disposition time is higher than the effective time within 200 days of duration, for Voluntary jurisdiction the effective duration is higher than the disposition time within 200-400 days.

For Courts of second instance, the ANOVA (analysis of variance), (Kaufmann and Schering, 2014) applied both on the effective duration and on the disposition time per macroarea, shows that the means of durations are statistically different in both cases but the model on the effective duration fits better the data. Correlation between the two measures is equal to 0.56; the variability is greater than the civil litigations, labour and social security and special proceedings one, however for all the considered macroarea differences between duration in the Courts are in terms of medians closer to zero than the Courts of first instance (Figure 3).

Figure 3 – *Boxplot of the differences between durations-Courts 2°.*



By looking at the densities, considerations are similar to the ones for Courts of first instance even if the shapes are different especially as far as the effective duration is concerned being it the result of a mixture of two densities (we are not showing the related graph for reasons of brevity).

6. Conclusions

The aim of this contribute is of analysing the duration of civil proceedings and its possible connection with offices organization in terms of working staff dimension and their capacity of resolving civil affairs but also with the different complexity of proceedings. Duration is in fact one of the most important efficiency indicators together with ultra triennial/biennal proceedings, number of resolved case, etc., useful to evaluate the performance of judicial offices.

From the analysis on the effective duration of civil proceedings, computed as the difference between the resolving cases date and the enrolling case date, no significant relation between duration and dimension of offices emerges, while a significant difference of duration in the various geographical areas of Italy exists especially for Courts of first instance: northern and central courts are characterized by lower durations if compared to the southern ones. This may be due to a different organization in terms of resolving proceedings and in the different complexity of

proceedings but not in terms of working staff given that there not seems to be a significant relation between duration and dimension of offices according to the regression models applied.

The assumption to conduct a specific analysis by considering only most frequent object codes per each macroarea has been verified: for the majority of macroarea, the distribution of the duration of proceedings with most frequent object codes approximates well the duration of all proceedings in the macroarea. We conducted thus the study over all the object codes.

Because of the variability of object codes duration per macroarea a statistical analysis to aggregate object codes in a different way with respect to the macroarea one has been applied. Through a cluster analysis run without distinguish by type of office, 7 homogeneous groups of civil affairs have been identified; these groups are characterized by similar proceeding durations inside them and very different from each other and give a qualitative vision of the minor or major complexity of proceedings.

This clustering based classification could be considered for the eventual identification of the proceeding weights per object code.

As far as the comparison between effective duration and disposition time (the latter used by the Cepej and thus considered as valid duration estimate) is concerned, both for Courts of first and second instance, results show that the effective mean duration is greater than the disposition time in correspondence of briefs durations, viceversa the disposition time is higher than effective duration for proceedings resolved in more than 3 years. This could be because for brief durations the disposition time is not able by construction to seize the speed of the resolving process. In fact, the disposition time is a duration estimate given by unresolved out of resolved cases and thus it can be very small for brief durations because of the few unresolved proceedings or the many resolved proceedings or both of them.

Furthermore, there are greater or lower differences between the two durations according to the considered macroarea: mean effective duration is lower than the disposition time for example for special proceedings, divorces and separations and voluntary jurisdiction.

Acknowledgements

We thank Stefano Cecini and Paolo Fantini to have read this contribute and given us their opinion about it, both in terms of statistical analysis and interpretations.

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SUMMARY

Effective duration of the civil proceedings in italy - statistical analysis

Statistical analysis has been conducted on the effective duration of civil proceedings: no significant relation between duration and dimension of offices emerges, while it exists with respect to geographical divisions especially for Courts of first instance.

A cluster analysis has been applied to identify homogeneous groups of object codes and thus give a qualitative vision of the minor or major complexity of proceedings.

We finally compared effective duration and disposition time both for Courts of first and second instance, results show that the effective mean duration is greater than the disposition time in correspondence of briefs durations and viceversa the disposition time is higher than effective duration for proceedings resolved in more than 3 years.

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