

New public management: Performance analyses of Italian justice court

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1. Introduction

The new public management (NPM) is an approach to managing public service organizations used in government agencies, both at the local and national levels. In essence, the NPM can be defined as a set of principles and practices aimed at improving the efficiency and effectiveness of public organizations by adopting techniques from the private sector (Gomes & Mendes, 2022). The NPM objectives, as outlined in Pollitt's taxonomy (1997), encompass eight interconnected components: cost reduction, budget limitations, transparency in resource allocation, disaggregation of traditional bureaucratic organizations into separate agencies, decentralization of management authority within public agencies, separation of service provision from procurement, introduction of market-like mechanisms, performance management with goals, indicators, and results, and a shift in public employment from tenure-based, nationally standardized pay and conditions to group contracts, performance-related pay, and local determination of pay and working conditions. Additionally, the NPM emphasizes service quality, setting standards, and customer responsiveness. The NPM also finds specific application in the judicial domain, reflecting the general principles previously defined. Indeed, its implementation aims to enhance public sector management by focusing on performance, bureaucratization, results-based accountability, and efficiency, employing a managerial approach that emphasizes techniques from the private sector. In the judicial system, the application of NPM has led to the adoption of new management practices and processes, such as performance measurement, benchmarking, and customer orientation.

Another aspect to consider is the need to build trust in the legal system. As a crucial institution in any democratic society, the legitimacy of the court system depends on the public trust. Therefore, the application of NPM must focus on increasing public confidence in the court system. This requires particular attention to transparency, accountability, and responsiveness to the public's needs (Langbroek, 2011). The implementation of this approach has resulted in significant improvements in the efficiency and effectiveness of the legal system. For instance, the digitalization process has led to faster and more efficient case processing (Zhou, 2022).

Another improvement stemming from the application of NPM in the legal system is the use of performance measurement and benchmarking. These practices have contributed to enhancing the quality of judicial services by measuring performance and comparing it with benchmarks, using predetermined criteria that are relevant, reliable, and tailored to the unique challenges and complexities of the judicial system (Volacu, 2018). Through this approach, it is possible to identify areas for improvement and implement changes to optimize the quality of judicial services, thus better meeting the needs of the public (Medeiros, 2015).

As NPM is increasingly emerging as a management reality, including in the legal field, this paper aims to apply an existent method to formalise a new composite indicator for measuring the performance and efficiency of Italian judicial offices.

2. Methodology

This paper aims to propose a new way of synthetically evaluating the performance of the procedural processes in Italian courts, considering both dynamic and static components, which are commonly referred to in literature as flow trends and efficiency (Vecchi, 2018). Specifically, the focus is on the courts of Santa Maria Capua Vetere and Matera, this choice is due to the desire to consider two realities with a high differential between input workloads, so that flows of "comparable" nature can be placed under analysis. To achieve these goals, we chose to apply the adjusted Mazziotta Pareto index (AMPI), a non-compensatory composite indicator, to elementary performance indicators collected through a key performance indicator (KPI) approach. The AMPI allows the synthesis of multiple indicators into a single indicator for the civil sections of the mentioned courts, covering the period 2013 - 2022 for the Santa Maria Capua Vetere court, and 2020-2022 for the Matera court. The data were collected by the Office of the Process (UPP), which plays a central role as unit dedicated to data collection and KPI development. All the analyses were conducted using the R programming language.

As the name of the synthetic index suggests, the AMPI is an adjustment of a previously formulated method. It involves a standardization process for individual indicators, making them independent of variability by normalizing them with a mean of 100 and a standard deviation of 10 at the reference time t (Mazziotta and Pareto, 2016), the values thus obtained will be within, approximately, in the range (70; 130) (Mazziotta and Pareto, 2011). Moreover, all indicators are given equal weights, allowing only relative temporal comparisons. AMPI allows absolute comparisons over time, achieved through a different type of normalization. However, this comes at the expense of slightly reduced robustness, as the type of normalization used does not equalize variances as in non-adjusted MPI but makes them like each other.

Regarding the type of normalization used for AMPI, as mentioned earlier, it involves scaling individual indicators based on two "goalposts," which represent the minimum and maximum values within the possible range of each variable for all periods and time units.

To efficiently calculate the goalposts for this type of application, a reference value is used (e.g., the average value of a specific year). Let's define the following terms:

- Inf_{x_j} = the lower value of indicator j for the entire period considered;
- Sup_{x_j} = the upper value of indicator j for the entire period considered;
- Rif_{x_j} = the reference value of indicator j (e.g., the average of a specific year).

the goalpost are:

$$\begin{aligned} Min_{x_j} &= Rif_{x_j} - \Delta_{x_j} & \Delta_{1x_j} &= Sup_{x_j} - Rif_{x_j} \\ Max_{x_j} &= Rif_{x_j} + \Delta_{x_j} & \Delta_{2x_j} &= Rif_{x_j} - Inf_{x_j} \\ & & \Delta_{x_j} &= (\Delta_{1x_j} + \Delta_{2x_j})/2 \end{aligned}$$

where:

In this case, the values of r_{ij} will be approximately within the interval 70-130¹. Once the goalposts are calculated, the application proceeds as follows:

Given a matrix $X = \{x_{ij}\}$ with n rows (units) and m columns (indicators), the normalized matrix $R = \{r_{ij}\}$ is computed using the following formula:

$$r_{ij} = \frac{(x_{ij} - Min_{x_j})}{(Max_{x_j} - Min_{x_j})} 60 + 70$$

In this formula, x_{ij} represents the value of indicator j for unit i , while Min_{x_j} and Max_{x_j} are the reference endpoints for indicator j . If indicator j has a negative polarity, the formula is

¹ According to the Bienaymé-Cebycev theorem, the terms of the distribution inside the interval (70; 130) constitute at least 89 percent of the total terms of the distribution (Mazziotta & Pareto, 2011).

complemented with respect to 200. In both cases, the range of the matrix $R = \{r_{ij}\}$ is computed with the formula: (130 - 70).

Consequently, the range of normalized values is set to (70, 130).

$$MPI_i^{+/-} = M_{r_i} \pm S_{r_i} CV_i \quad \text{where:} \quad CV_i = M_{r_i} / S_{r_i}$$

The AMPI is then calculated using the generalized form, denoted as $MPI_i^{+/-}$: Where M_{r_i} and S_{r_i} represent the mean and standard deviation of the normalized values for unit i , and cv_i is the coefficient of variation for unit i . The sign \pm depends on the type of measured phenomenon. For an increasing or positive composite index, indicating positive variations of the phenomenon (e.g., well-being), MPI_i^- is used. Conversely, for a decreasing or negative composite index, indicating negative variations of the phenomenon (e.g., poverty), MPI_i^+ is used. This approach penalizes units with imbalanced values of normalized indicators by using the product ($S_{r_i} \cdot cv_i$) to favor units with a better balance among different indicators (penalization effect), while considering the average effect (M_{r_i}). AMPI shows the position of each unit with respect to the "goalposts."

3. Construction of the composite indicator.

The indicators considered for developing the synthetic index to evaluate the combined realizability and productive efficiency of the civil section in the courts of Santa Maria Capua Vetere and Matera were selected following a thorough literature analysis (Vecchi, 2018) and correlation analysis among the indicators. Specifically, the selected indicators are as follows:

1. Incoming Workload (CLI): It represents the ratio between new procedures registered during the period and the total procedures at the beginning of the reference period. This indicator expresses the load of new incoming work (Indicator Polarity: Negative).

2. Work Completed (LE): It represents the quantity of work completed on all open cases during the reference period, indicating the disposal of workload during that time (Indicator Polarity: Positive).

3. Turnover Index (IR): It relates the number of cases completed to the number of new cases received. When IR is greater than one, it means that the "topic" manages to handle more cases than it receives (Indicator Polarity: Positive).

4. Turnover Rate (TT): It relates the number of cases completed to the final pending cases. Also known as the rotation index, it describes the tendency of the case flow to renew (Indicator Polarity: Positive).

5. Average Pending Cases (GM): It calculates the ratio between the sum of final pending cases and the sum of initial pending cases, over the sum of new cases and completed cases. This "stock formula" provides an estimate of the days the case remained pending in the workflow (Indicator Polarity: Negative).

It is essential to emphasize that the selection of these indicators, aiming to provide an overall view of the phenomenon, was also driven by the intention to include both static dimension indicators (Incoming Workload and Work Completed) and dynamic dimension indicators (Turnover Rate, Average Pending Cases, and Turnover Index) to ensure a balanced synthesis from this perspective as well.

The Adjusted MPI_i^- index is used since the composite index is "positive," meaning that increasing values of the index correspond to positive variations in the court's efficiency. The "goalposts" are the observed minimum and maximum values for each indicator during the examined period. After polarizing the individual indicators, they all have a positive polarity, as high values of the variables are considered "good" regarding the court's efficiency.

Before examining the analysis, it is essential to note that the data considered for the cases are aggregated by "topic". These generally correspond to the registers used by the official

databases of the Ministry and adopted by the Ministry's dedicated portal for monitoring the quality of justice.

4. Preliminary results

The use of this composite index (AMPI) allows us to monitor the absolute variations over time. These absolute variations are represented through a multiple interconnected line chart. As a result, Figures 1 and 2 will display the overall synthetic trend for each considered “topic”, distinguishable based on the attached legend.

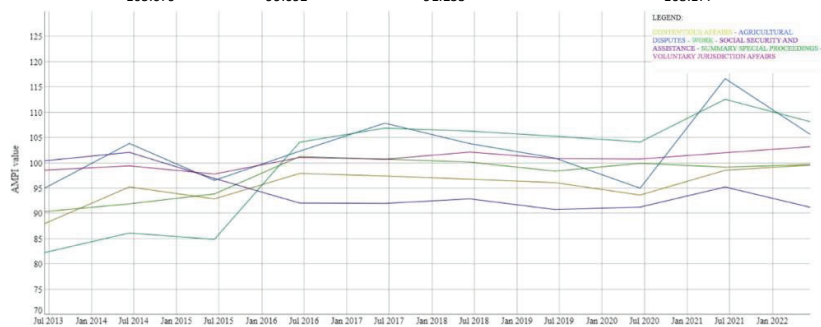
Figure 1 show the trend of each “topic” concerning the civil section of the Santa Maria Capua Vetere court, covering the period from 2013 to 2022. On the other hand, Figure 2 presents the trends related to the Matera court, with reference to the period 2020-2022. In this way, readers can observe the trends for each section within an open-ended range varying between 70 and 130.

Meanwhile, Tables 1 and 2 contain all the values related to the application of AMPI for each year considered, for both courts.

The combination of these two tools will enable us to comprehend the overall trend of each “topic” individually and in relation to others. This approach allows for a comprehensive overview of the efficiency levels of the respective court.

YEARS	CONTENTIOUS AFFAIRS	AGRICULTURAL DISPUTES	WORK	SOCIAL SECURITY AND ASSISTANCE	SUMMARY SPECIAL PROCEEDINGS	VOLUNTARY JURISDICTION AFFAIRS
2013	87.979	94.987	90.379	100.430	82.258	98.583
2014	95.263	103.867	91.909	102.111	86.143	99.431
2015	92.899	96.559	93.878	96.947	84.878	97.819
2016	97.934	102.340	101.282	92.073	104.118	101.092
2017	97.427	107.887	100.758	91.997	106.908	100.739
2018	96.804	103.758	100.188	92.904	106.316	102158
2019	96.122	100.980	98.384	90.794	105.300	100.874
2020	93.656	95.013	99.937	91.277	104.161	100.783
2021	98.554	116.694	99.175	95.251	112.604	102.036
2022	99.579	105.679	99.692	91.233	108.177	103.224

Table 1:



ere tribunal.

Figure 1: Application of the AMPI on the civil section of the Santa Maria Capua Vetere court.

The paragraph describes the efficiency trends of individual “topic” within the Civil section of the Santa Maria Capua Vetere court:

- “Contentious affairs”: Shows a consistently increasing trend with small inflections in 2015 and 2020. The overall positive variation between 2013 and 2022 is more than 12 points, indicating significant improvement.
- “Agricultural disputes”: Exhibits a less stable trend. It shows positive variation from 2013 to 2014, negative variation in 2015, followed by efficiency improvement until 2017. Subsequently, there is a decline until 2020, followed by a strong positive spike in 2021 (21 points). Finally, it decreases in 2022, still showing an overall improvement of just over 10 points.

- “Work”: Demonstrates a growing efficiency trend from 2013 to 2016, with a positive variation of 10 points during this period. It stabilizes afterward, except for a slight negative variation in 2019 compared to 2016.
- “Social security and assistance”: This is the only “topic” that records a decrease in efficiency throughout the considered period, with a negative variation of just over 9 points between 2013 and 2022. The trend is consistently declining, mainly between 2014 and 2016, and remains stable for the remaining period.
- “Summary special proceedings”: Shows the most significant efficiency improvement within the considered period, with a positive variation of 26 points between 2013 and 2022. The main peak occurs between 2015 and 2016, with a positive variation of 20 points, indicating the highest acceleration in the last decade.
- “Voluntary jurisdiction affairs” Presents the most stable trend among all sections, with a positive variation of 5 points between 2013 and 2022, accumulated mainly from 2015 to 2022.

In summary, it can be asserted that, except for the Welfare and Assistance section, the Civil section of the Maria Capua Vetere court has experienced a significant increase in efficiency in the last decade.

As for the Civil section of the Matera court, due to a lack of sufficient data points, the analysis is relatively limited compared to the previous section. Nevertheless, some information can be highlighted, as shown in Table 2 and Figure 2.

Regarding the Contentious affairs topic, there is a gap of approximately 7 points between 2020 and 2023. As for the Voluntary Jurisdiction cases, there are practically the same efficiency points in 2020 and 2022, but there is still a surplus of 5 points in 2021. The efficiency of the Labor “topic” has seen an addition of 5 efficiency points in recent years. Unfortunately, the Welfare and Assistance “topic” shows a small gap, and in 2021, the efficiency dropped by six points. Lastly, concerning the Special Summary Proceedings, it can be argued that it has the worst trend among those considered, as the gap between 2020 and 2022 exceeds 10 points.

YEARS	CONTENTIOUS AFFAIRS	VOLUNTARY JURISDICTION AFFAIRS	WORK	SOCIAL SECURITY AND ASSISTANCE	SUMMARY SPECIAL PROCEEDINGS
2020	96.867	100.513	92.930	107.570	107.559
2021	90.893	104.079	91.991	99.334	102.853
2022	89.085	99.659	95.370	102.305	97.506

Table 2: Tabulated values by year of the synthetic indicator, Civil section of the Matera tribunal.

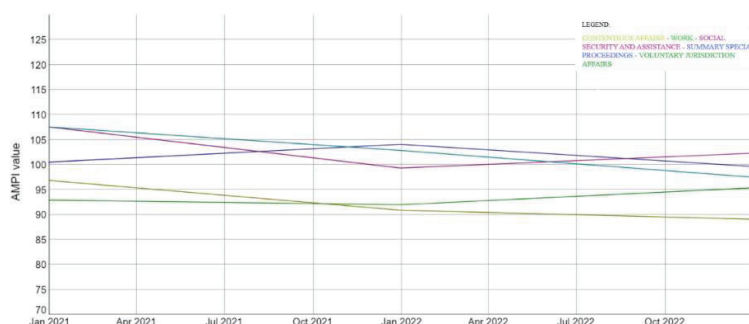


Figure 2: Application of AMPI on the civil section of the Matera court.

5. Conclusions and future investigation

The purpose of this article was to demonstrate the possibility of a subsequent application after considering the individual trends of the indicators. Through these analyses, it becomes

feasible to create an overall picture of the trends in a synthetic and non-compensatory manner. These processes also allow for the identification of absolute variations over time, enabling a concise comparison between the various years within the reference period. One of the primary challenges inherent in the construction of composite indices involves the selection of a methodology facilitating temporal comparisons.

The paper introduces a modified version of the MPI designed to enable temporal comparisons within a non-fully compensatory framework. The newly proposed index operates by rescaling individual indicators within a range of (70; 130), where 100 serves as the midpoint between the two goalposts associated with each indicator. This approach is characterized using a function (the product $S_{ri} CV_i$) to penalize the units with unbalanced values of the normalized indicators. The ‘penalty’ is based on the coefficient of variation and is zero if all the values are equal. The purpose is to favour the units that, means being equal, have a greater balance among the different indicators. Therefore, the adjusted MPI is characterized by the combination of a ‘mean effect’ (M_{ri}) and a ‘penalty effect’ ($S_{ri} CV_i$). To evaluate absolute performance changes over time, it is essential to identify the minimum and maximum values for each indicator across all the years under consideration, or alternatively, these values may be externally determined by the researcher.

Furthermore, the use of this method, in the context of future in-depth analyses, could lead to the establishment of cross-sectional rankings, meaning the comparison of multiple courts. As this synthetic indicator is inherently non-compensatory, it facilitates such applications, making the efficiency differences among different courts visible.

The objectives set for future investigations pertaining to the intention of comprehensively encompassing the entire population residing in the Italian peninsula, thus establishing a veritable national ranking of efficiency concerning judicial offices. This endeavour could also lead to the definition of specific efficiency standards to pursue.

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