



CORTE DEI CONTI

Risk-based audit planning

A data driven scoring method for selecting audited entities

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*Summer school in public auditing and accountability -
Data mining and analytics: what implications for auditing?*



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Building up the annual audit plan on local municipalities and provinces: challenges, needs and data sources

- Main challenges:
 - Number of auditable entities: 309 local jurisdictions (municipalities and provinces);
 - Insufficient HR involved in the audit (3 magistrates and 5 auditors).
- Main needs:
 - Identify the most critical situations in order to prioritize our audit;
 - Reduce the time-lag between the audit and the ongoing management.
- Data sources:
 - Several dataset are available: Public administration database (including financial statements figures), cash transactions dataset (so called SIOPE), questionnaires filled by the local entities' external auditors.

Scoring method based on financial data

- We have built up a dataset combining all the financial data for all the municipalities (downloaded them from the PA database) with some qualitative and quantitative information stemming from the external auditors' questionnaires;
- We have selected variables that are red flags for possible financial problems (represented by ratios):
 - Interest/current income;
 - Primary balance/current income;
 - Procapita tax income;
 - Staff expenditure/current expenditure;
 - Tax and non tax income/current income.
- Result: synthetic weighted index that scores the municipalities.

Synthetic Weighted Index

- For each variable we are not interested in the absolute value but in the value in comparison with the distribution of the variable in the population:
- $SWI_1_{i,t} = SWI \times 1_{i,t} + SWI \times 2_{i,t} + SWI \times 3_{i,t} + SWI \times 4_{i,t} + SWI \times 5_{i,t}$

The index is influenced by:

1. The weight that we have associated to each variable;
 2. The value of the single ratios;
 3. Their distribution in the population: we have scored each result depending on the distance from the mean value for each ratio.
- For each variable the score range is 0-20, 0 being the best percentile and 20 the worst;
 - The SWI range is 0-100, 0 showing a sound and safe financial situation;
 - We have tested the results with correlation analysis, both cross section and time-series: low correlation and high robustness.



Synthetic Weighted Index

CODICE	ANNO 2015	VARIABILI ESPLICATIVE DEL MODELLO					SCORE ATTRIBUITO					100
		INTERESSI PASSIVI/ENTRATE CORRENTI	SALDO CORRENTE PRIMARIO/ENTRATE CORRENTI	ENTRATE TRIBUTARIE PROCAPITE (ABRUZZO=100)	SPESE PERSONALE/SPESE CORRENTI PRIMARIE	ENTRATE TRIB+EXTRATRIBUTARIE/ENTRATE CORRENTI	20	20	20	20	20	
	Amministrazioni comunali											ISC
68001	ABBATEGGIO	12,4	31,7	127,9	20,6	87,6	20,0	2,5	14,6	5,8	5,2	48,1
66001	ACCIANO	2,8	29,8	187,7	27,6	60,3	3,9	3,6	9,6	9,2	18,1	44,4
66002	AIELLI	1,1	21,0	109,4	31,7	95,1	0,7	8,7	16,2	11,2	1,6	38,5
68002	ALANNO	6,6	26,7	107,2	33,4	91,1	11,3	5,4	16,4	12,1	3,5	48,7
67001	ALBA ADRIATICA	5,2	16,9	115,1	17,6	94,1	8,6	11,1	15,7	4,3	2,1	41,8
66003	ALFEDENA	8,1	24,9	164,6	29,4	96,1	14,2	6,5	11,5	10,1	1,2	43,4
69001	ALTINO	4,0	25,0	86,7	22,4	96,5	6,2	6,4	18,2	6,6	1,0	38,4
67002	ANCARANO	5,4	31,2	148,2	28,1	82,4	8,9	2,8	12,9	9,4	7,6	41,7
66004	ANVERSA DEGLI ABRUZZI	2,9	4,7	115,2	28,7	95,2	4,2	18,2	15,7	9,7	1,6	49,5
69002	ARCHI	8,0	34,2	87,1	26,2	90,3	13,9	1,0	18,1	8,5	3,9	45,4

Forward looking analysis based on cash flows

- Cash transactions records are available on a daily basis;
- Opportunity to monitor the municipalities without delays since liquidity shortages show financial problems and anticipate financial distress;
- Massive volume of records (all the single transactions for all the public administration);
- Software to determine the mid-year cash flows for all the municipalities;
- It allows us to:
 - Detect municipalities with liquidity problems;
 - Set a threshold for cash advances by the treasury bank above which there is a high risk that the entity will not be able to return it at year end (20% of the current income);
 - Order the identified entities to take the necessary measures to solve the problems by the end of the year.



Thanks for the attention

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