



Analyzing Water Utilities' Performance: Operational Cost Coverage Ratio

Konstantinos P. Tsagarakis

Business and Environmental Technology Economics Lab

Department of Environmental Engineering

Democritus University of Thrace

Operating Cost Coverage Ratio (OCCR)

- To evaluate the financial performance of a utility, the **Operating Cost Coverage Ratio** is used
- It is defined as the Total Annual Operational Revenues (TAOR) over the Total Annual Operating Costs (TAOC)
- i.e. **OCCR= TAOR/TAOC**

Operating Cost Coverage Ratio (OCCR)

- **TAOR:**

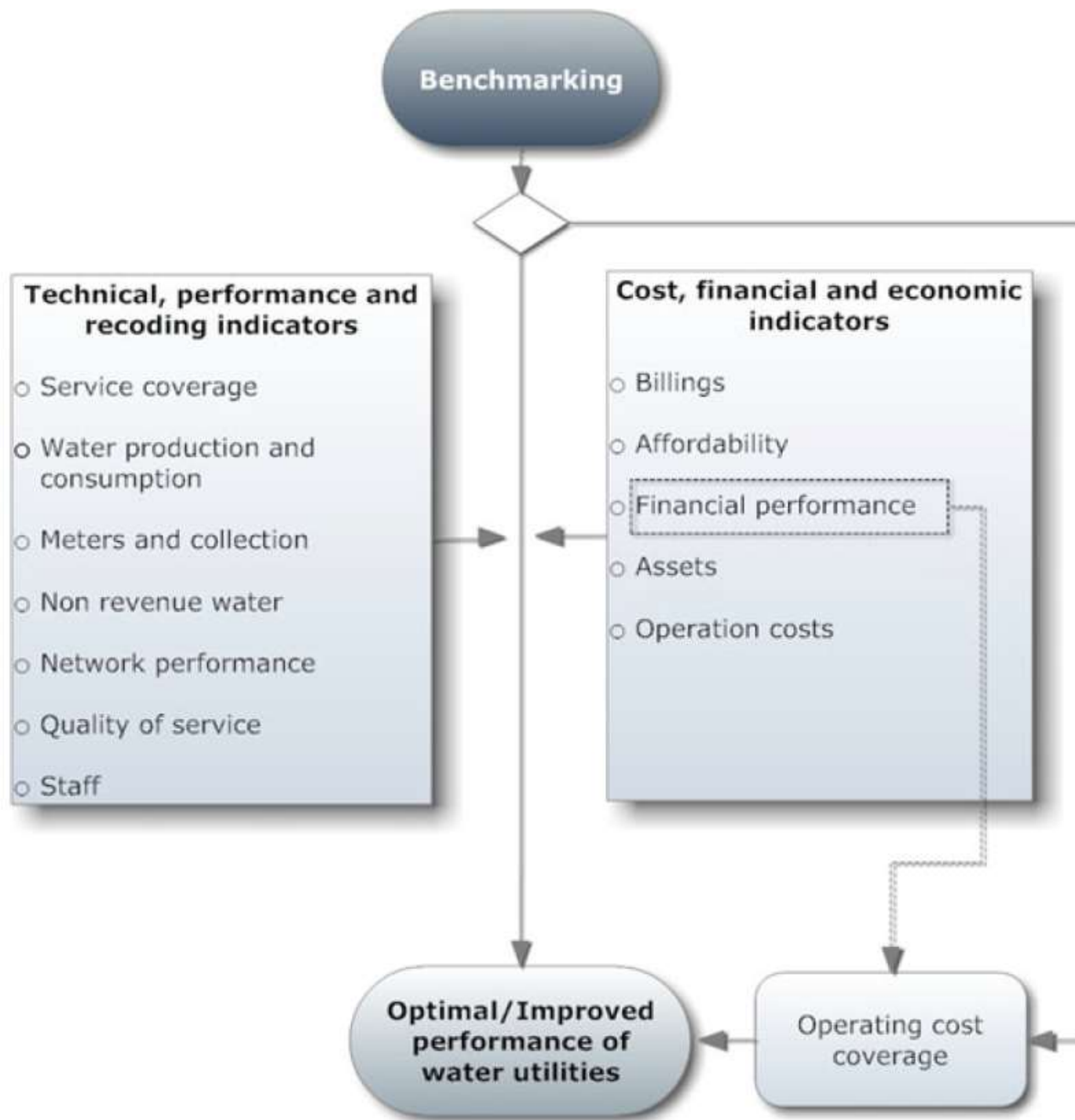
- Total billing of water and wastewater services
- Connection fees
- Well abstraction fees
- Reconnection fees
- Other operational revenues, e.g subsidies, excluding all taxes

- **TAOC:**

- Total labor (salaries, wages, pensions and other benefits)
- Energy and other operational expenses of water and wastewater services (excluding depreciation and financing charges)

Operating Cost Coverage Ratio (OCCR)

- Basic key indicator for evaluating the performance evaluation of water utilities
- Identify the level to which operating costs are covered by revenues
- OCCR=1.40 is regarded by IBNET as a good practice benchmark
- **OCCR:**
 - Comparisons amongst countries
 - Dynamic index that can be monitored through time
 - Use in statistical analysis of broad theoretical findings



The IBNET Database

- **Advantages**

- Easy and free access (not bureaucratic applications/authorizations)
- Provides guidelines for those providing the data and those using the data, thus both parties have the a common reference
- Provides data that otherwise would have been impossible to have access to.

- **Limitations**

- Not all indicators are available for all countries
- Not all years are reported
- Good performing utilities provide data

Despite the limitations, the IBNET database provides ground for research opportunities



The International Benchmarking Network
for Water and Sanitation Utilities



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The International Benchmarking Network for Water and Sanitation Utilities (IBNET)

The International Benchmarking Network for Water and Sanitation Utilities (IBNET) is your direct access to the world largest database for water and sanitation utilities performance data.

IBNET supports and promotes good benchmarking practice among water and sanitation services by :

- **Providing guidance on indicators, definitions;**
- **Facilitating the establishment of national or regional benchmarking schemes;**
- **Undertaking peer group performance comparisons;**

Search DataBase



[The database contains information from more than 2000 utilities from 85 countries.](#)

Tariff Database

[The 2011 IBNET water tariff database](#) reports the water price charged to the domestic users per m³ for the first 15 m³ consumed through the 20 mm (5/8 inch) pipe according to the formula:

Tariff per m³ = [connection fee + volumetric charge per 15 m³ per month + taxes and other fees]/15

The exchange rate to the \$US is as of April 30, 2011



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- Undertaking peer group performance comparisons;
- Establishing links between utilities, utilities associations and regulators.

Data Base

[Search by utility](#)

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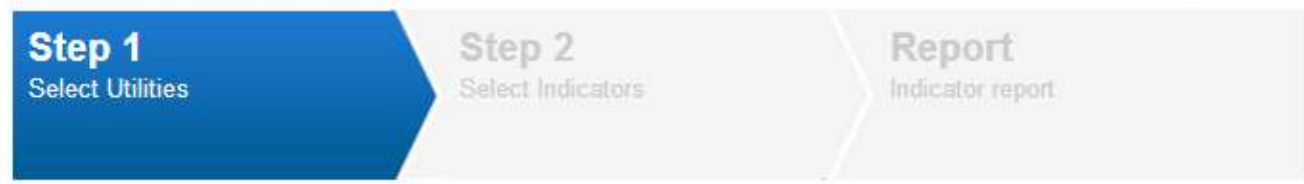
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[Benchmarking](#)



Search by indicator



- Data Base
- Search by utility
 - Search by country
 - Search by indicator**
 - Search by sector
 - Benchmarking

Select Utilities

Filter Utilities

by name **by country and/or population**

Select Countries

Rom	Add all	2 items selected	Remove all
		Poland	-
		Romania	-

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The IBNET Water Supply and Sanitation Performance **Blue Book**

The International Benchmarking Network for Water and Sanitation Utilities Databook

Caroline van den Berg and Alexander Danilenko

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Does Size Matter? Operating Cost Coverage for Water Utilities

Konstantinos P. Tsagarakis

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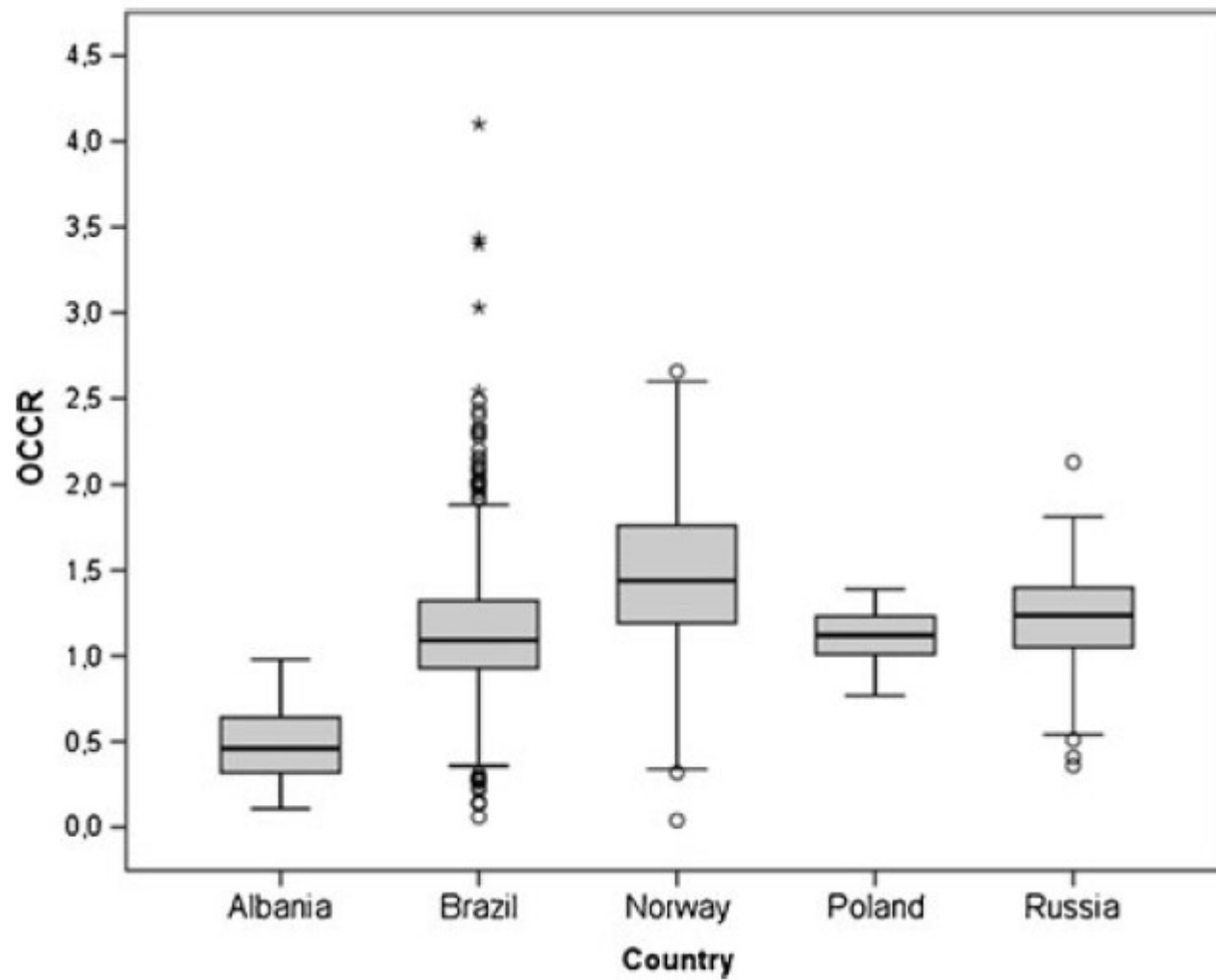
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Abstract This paper compares the operational cost coverage index from 1132 water utilities for five countries (Albania, Brazil, Norway, Russia and Poland). The data used is available through the International Benchmarking Network (IBNET) for Water and Sanitation Utilities. By comparing means or medians of different serving population groups, it was shown that significant financial gains can be achieved by larger utilities. Such analysis can assist decision makers pursue merging of water utilities for profit maximizing purposes. The importance of benchmarking is also emphasized in order to illustrate the utility of the perused statistical analysis.

Statistics for the indicator Operational cost coverage (%) per country

<i>Statistics</i>	<i>Hungary</i>	<i>Poland</i>	<i>Romania</i>	<i>Lithuania</i>	<i>Bulgaria</i>
<i>N</i>	<i>20.0</i>	<i>31.0</i>	<i>18.0</i>	<i>22.0</i>	<i>19.0</i>
<i>Mean</i>	<i>1.0</i>	<i>1.3</i>	<i>1.0</i>	<i>1.2</i>	<i>1.1</i>
<i>STDEV</i>	<i>0.1</i>	<i>0.2</i>	<i>0.0</i>	<i>0.4</i>	<i>0.2</i>
<i>Min</i>	<i>0.8</i>	<i>0.9</i>	<i>0.9</i>	<i>0.6</i>	<i>0.7</i>
<i>25% percentile</i>	<i>0.9</i>	<i>1.1</i>	<i>1.0</i>	<i>0.9</i>	<i>1.0</i>
<i>Median</i>	<i>1.0</i>	<i>1.3</i>	<i>1.0</i>	<i>1.1</i>	<i>1.0</i>
<i>75% percentile</i>	<i>1.1</i>	<i>1.3</i>	<i>1.1</i>	<i>1.3</i>	<i>1.1</i>
<i>Max</i>	<i>1.3</i>	<i>2.3</i>	<i>1.2</i>	<i>2.7</i>	<i>1.9</i>



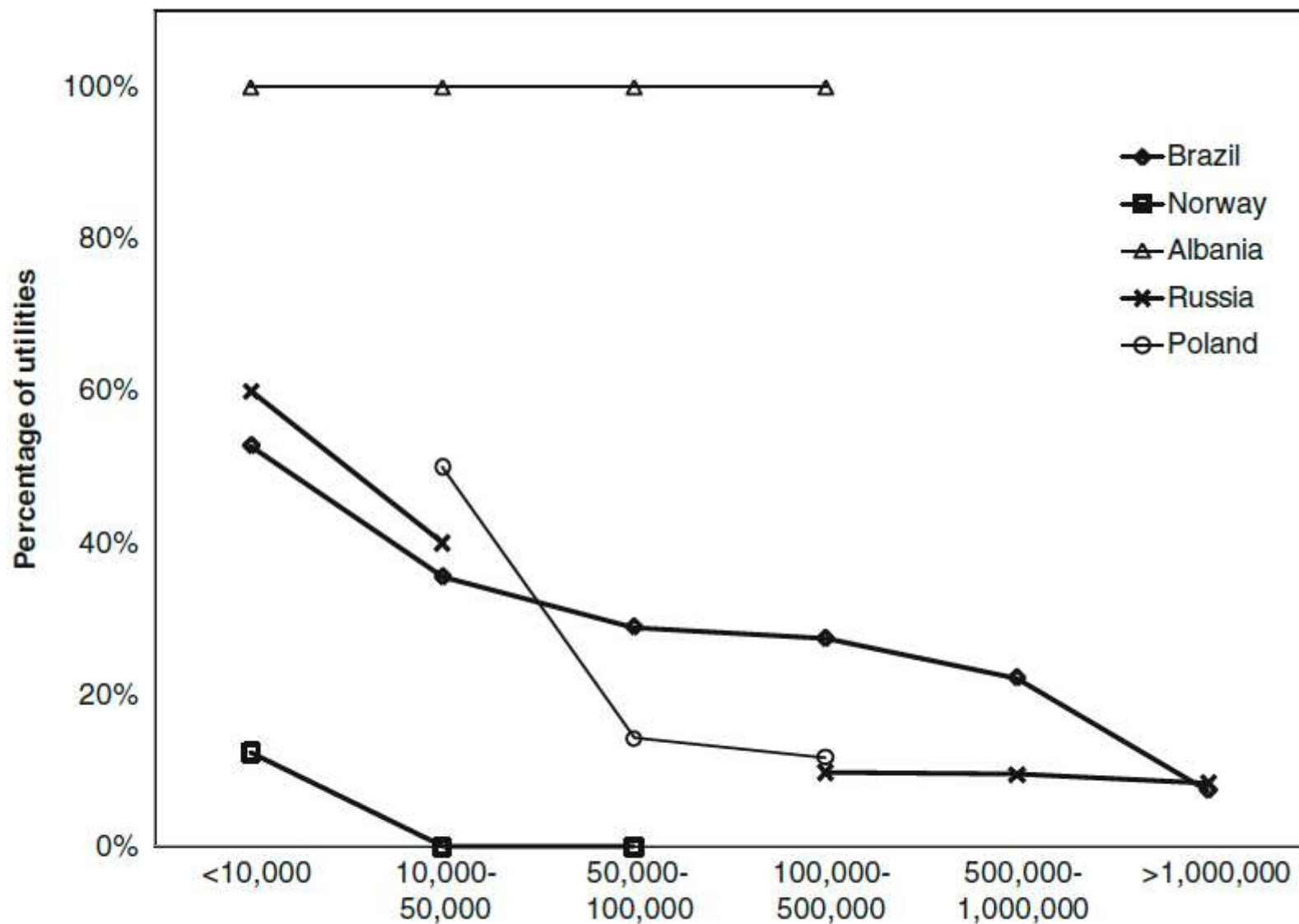


Fig. 3 Percentage of utilities performing OCCR below unity per country according to their size

Table 1 OCCR descriptive statistics for water utilities in Brazil (N=594)

Statistics	Population					
	<10,000 (I)	10,000– 50,000 (II)	50,000– 100,000 (III)	100,000– 500,000 (IV)	500,000– 1,000,000 (V)	>1,000,000 (VI)
n	108	276	90	84	9	27
Mean	0.97	1.16	1.20	1.18	1.24	1.36
Minimum	0.14	0.06	0.45	0.24	0.97	0.93
Maximum	2.43	4.1	3.43	2.3	1.5	2.06
25% Percentile	0.69	0.91	0.97	0.98	1.03	1.15
Median	0.99	1.09	1.09	1.16	1.27	1.31
75% Percentile	1.15	1.32	1.34	1.33	1.47	1.51
Std Deviation	0.40	0.47	0.44	0.32	0.21	0.31

Table 3 OCCR descriptive statistics for water utilities in Russia ($N=88$)

Statistics	Population					
	<10,000 (I)	10,000– 50,000 (II)	50,000– 100,000 (III)	100,000– 500,000 (IV)	500,000– 1,000,000 (V)	>1,000,000 (VI)
n	5	5	4	41	21	12
Mean	0.86	1.00	1.18	1.19	1.33	1.44
Minimum	0.36	0.54	0.98	0.76	0.68	0.41
Maximum	1.53	1.39	1.46	1.62	2.13	1.81
25% Percentile	0.44	0.76	1.01	1.05	1.08	1.39
Median	0.55	1.00	1.15	1.21	1.30	1.54
75% Percentile	1.45	1.24	1.40	1.28	1.62	1.56
Std Deviation	0.54	0.30	0.21	0.18	0.35	0.36

DATA

Data were retrieved by the **IBNET** database.

Water utilities in **12** countries were selected (depending on availability and adequacy):

- Albania (53)
- Australia (61)
- Bangladesh (54)
- Bosnia and Herzegovina (44)
- Brazil (1140)
- New Zealand (40)
- Nigeria (32)
- Peru (44)
- Poland (24)
- South Korea (160)
- Vietnam (80)
- Zimbabwe (30)

OCCR \leq 1

	N	Utilities	Mean	MIN	25% percentile	Median	75% percentile	Max
Brazil	1140	471	7665	55	846	1600	4056	749957
Albania	53	42	5600	238	1112	2170	4031	53525
Bangladesh	54	13	9850	300	850	4350	6633	58440
Zimbabwe	30	10	17125	1836	3099	4659	9346	120766
Bosnia and Herzegovina	44	12	9138	1927	2814	5470	11963	35480
South Korea	160	7	13103	2430	6680	11570	15730	33440
Nigeria	32	26	99934	164	10937	21203	76151	852028
Poland	23	3	37977	17734	17734	22892		73305
New Zealand	40	12	46914	9074	11623	28191	53656	155231
Peru	44	32	52824	4753	13473	29710	52552	276072
Vietnam	80	2	62857	21217	21217	62857		104497
Australia	61	2	280750	38500	38500	280750		523000

OCCR>1

	N	Utilities	Mean	MIN	25% percentile	Median	75% percentile	Max
Bangladesh	54	41	97932	420	1815	3520	5490	3520000
Bosnia and Herzegovina	44	32	10438	1451	3588	6056	10892	67565
Brazil	1140	669	71280	51	2389	6118	18690	8205581
Bosnia and Herzegovina	30	20	21550	707	4838	8499	17725	197128
Albania	53	11	29162	1472	2032	8992	30827	185072
New Zealand	40	28	33709	1956	7615	14380	20904	495738
Poland	23	21	21822	2737	7569	15854	34214	64300
South Korea	160	153	43568	1290	9405	16230	33690	2024500
Peru	44	12	144110	4834	9730	20283	61961	1428460
Australia	61	59	127539	9900	16900	34727	70700	1844000
Nigeria	32	6	31721	4496	11865	35262	49508	52463
Vietnam	80	78	67095	1245	13599	41294	83512	1004980

Number of Water Utilities

$f(a,b)$

Bad performing Utilities

Good Performing Utilities

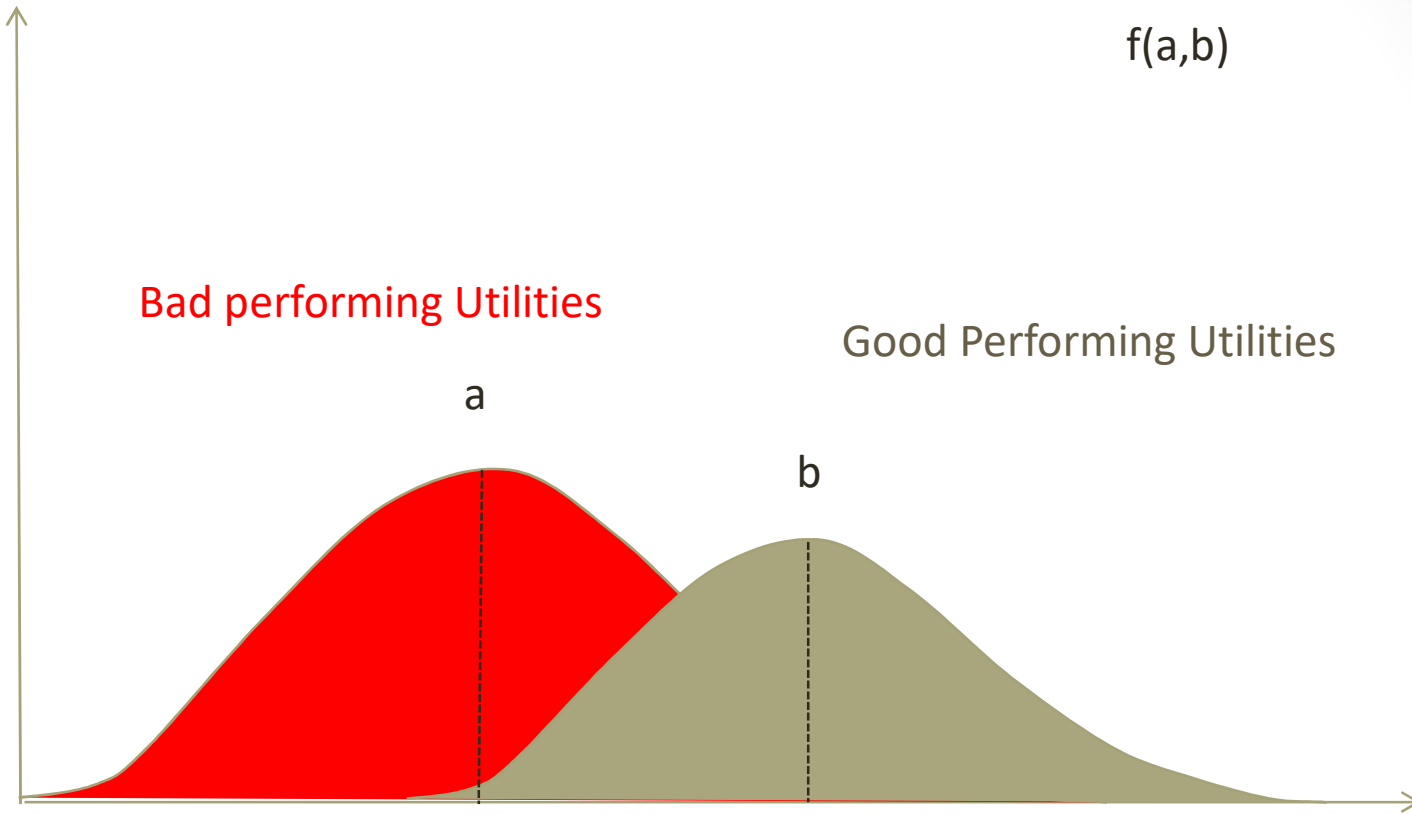
a

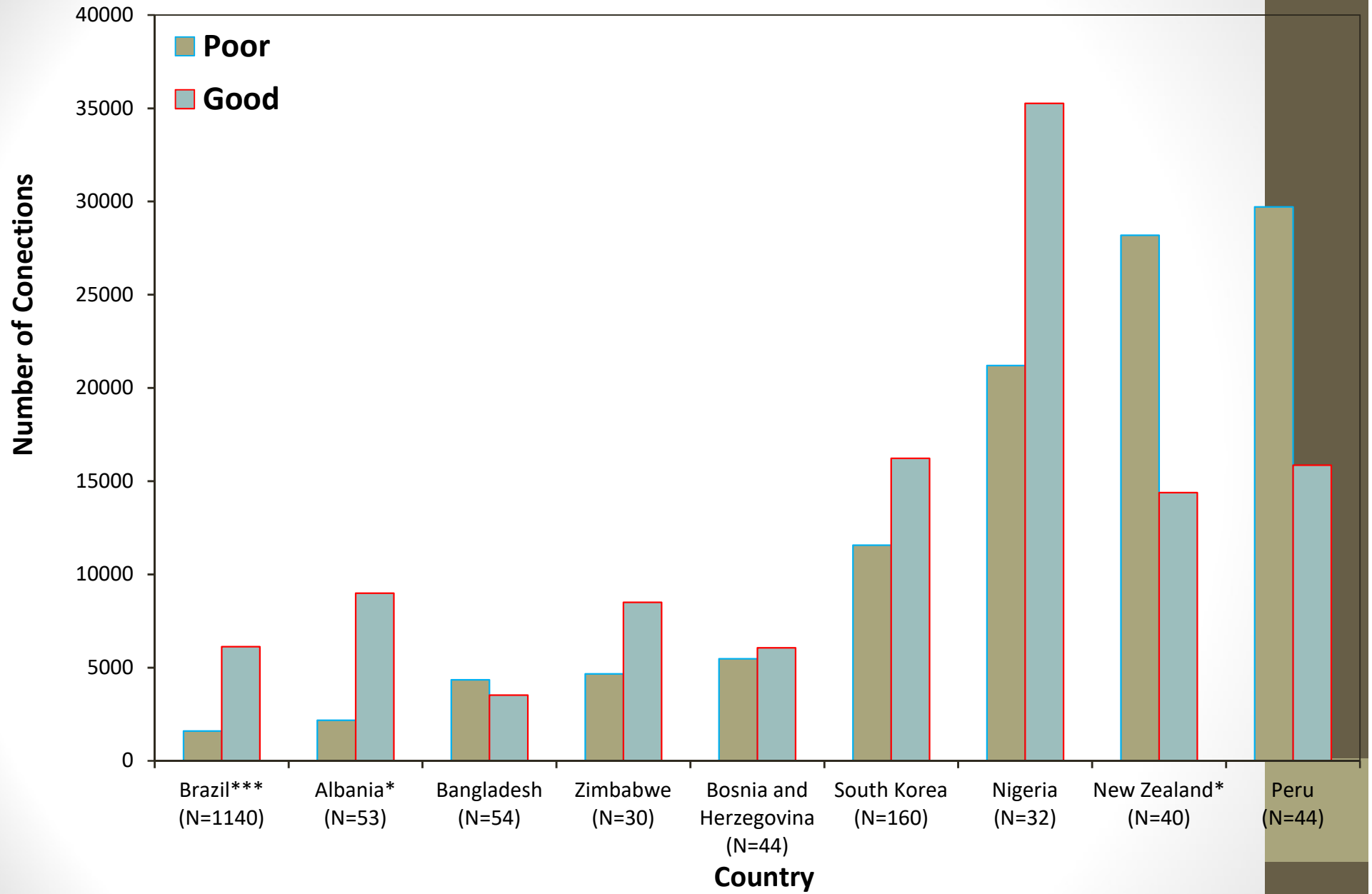
b

Median

Median

Size of Water Utilities





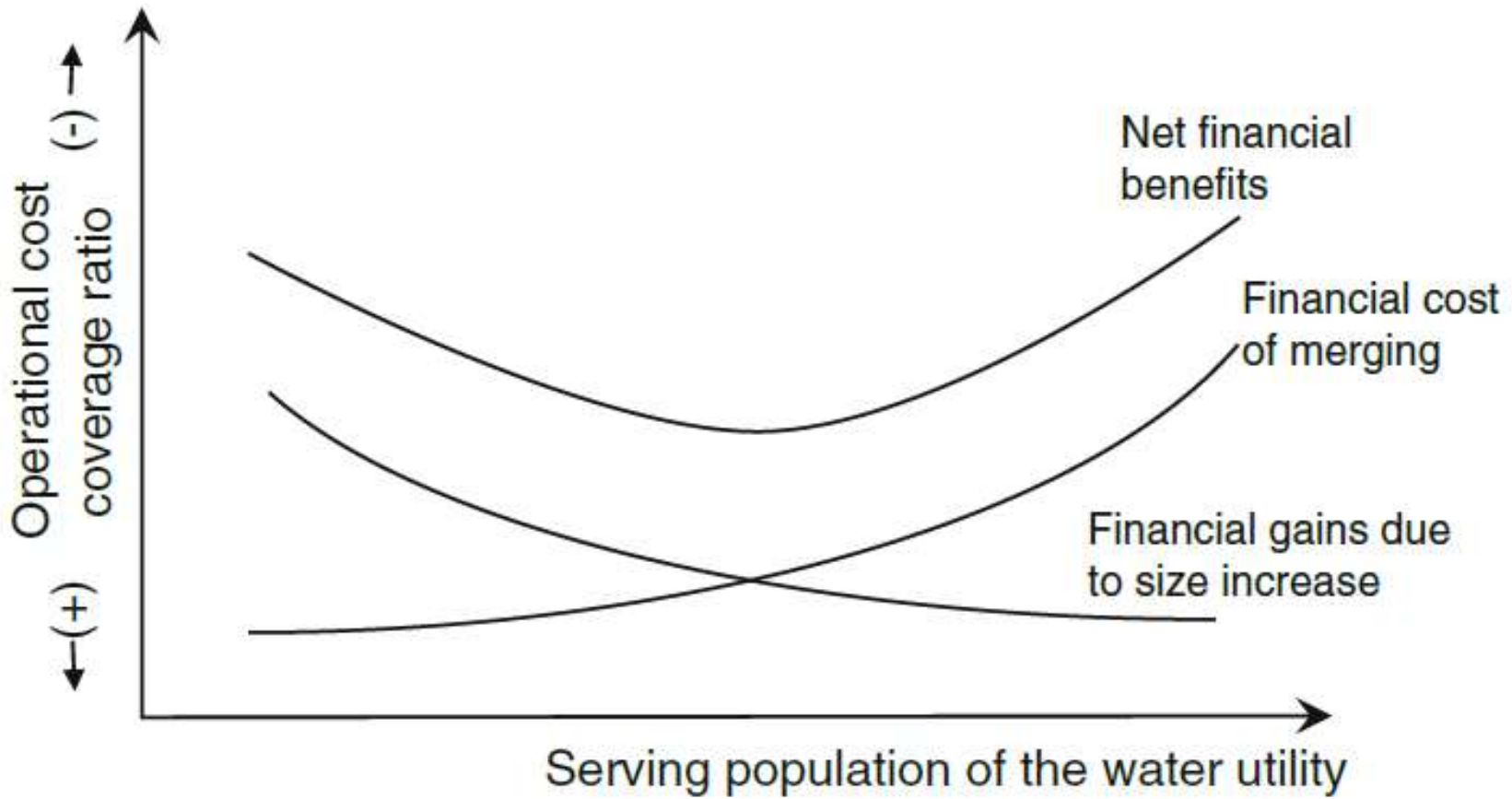
Decide on the OCCR Threshold

Utilities that surpass the 1, 1.4, 1.7
threshold

Country	OCC>1.4	Total Utilities	Percent
Australia	54	61	89%
South Korea	137	160	86%
Vietnam	60	80	75%
Poland	13	23	57%
New Zealand	20	40	50%
Zimbabwe	14	30	47%
Bangladesh	20	54	37%
Brazil	268	1140	24%
Bosnia and Herzegovina	9	44	20%
Nigeria	3	32	9%
Albania	2	53	4%
Peru	1	44	2%

OCCR>1.4

	N	Mean	Minimum	Median	Maximum
Albania	2	2779	2032	2779	3527
Bangladesh	20	20000	420	3630	334370
Bosnia and Herzegovina	9	7181	1460	6040	21266
Peru	1	6879	6879	6879	6879
Brazil	268	107008	51	7100	8205581
Zimbabwe	14	14760	2855	9792	43926
New Zealand	20	41639	2496	13848	495738
South Korea	137	45032	2750	16230	2024500
Poland	13	24517	6993	21743	64300
Vietnam	60	68427	1245	35625	1004980
Australia	54	130382	9900	38138	1844000
Nigeria	3	32347	4496	40084	52463



Conclusions

- Benchmarking can assist decision makers regarding the performance of a water utility
- OCCR is a widely used indicator
- Basic Statistical approaches provides a tool to water utilities to analyse basic indicators.
- Also, to help define the optimum size of water utilities *ceteris paribus*
- Help the utility assess its performance through time