Measuring the Efficiency of Public Transport Lines in Albania using DEA Model

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Abstract - Public transport is considered important to reduce air pollution. For this reason, it is very important to have efficient public transport lines. The purpose is to analyze 15 public transport lines in Albania by using the DEA model. The analysis is based on information about citizens' perceptions of five attributes (frequency, cleanliness, possibility to find a seat, punctuality, and ticket price) of public transport lines. The information is provided by conducting a survey of 120 users of public transport lines. The results indicate that it's important to improve some attributes to increase the use of public transport.

Key-words: DEA Model, public transport, efficiency, input, output

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1 Introduction

Environmental pollution is one of the critical issues the world is facing nowadays. Albania is one of the countries with the highest levels of pollution, where air pollution is present and very concerning. According to the polluted countries map published by the World Health Organization (2022), Albania has the highest level of pollution among the Western Balkan Countries. Also, according to, [1], air quality in Albania didn't meet World Health.

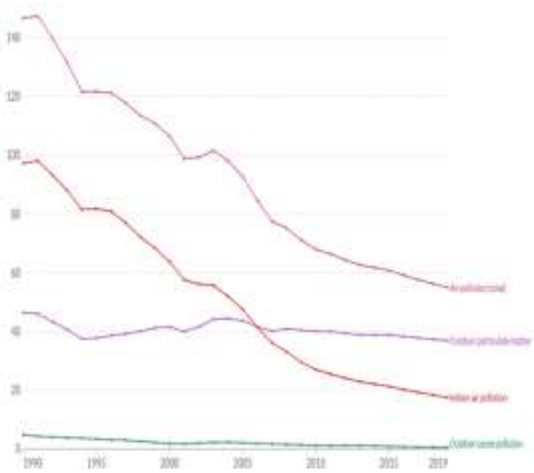


Fig. 1: Death rate from air pollution, Albania, 1990 to 2019. Death rates are given as the number of attributed deaths from pollution per 100,000 populations.
Source: IHME, Global burden of disease [2019]

The full dataset used in Fig. 1 is at the Appendix section. These rates are age-standardized, meaning they assume a constant age structure of the population: this allows for comparison between countries and over time.

Organization guidelines for acceptable PM2.5 exposures. The observed average of PM2.5 exposures in Albania for the present year is 15.4 μg/m3 while the acceptable annual average according to WHO should not exceed 10 μg/m3. Air pollution is the result of many factors such, as the reduction of urban green spaces, non-efficient waste management, or the use of non-conventional fuel. However, the main reason for air pollution in Albania seems to be vehicle emissions, where old diesel vehicles remain problematic. Different ways have been explored to reduce air pollution, especially in urban areas. One of these ways is encouraging citizens to use public transport, [2]. However, in Albania and especially in the capital city of Tirana. There is a very high level of use of private cars. In 2020, Tirana is ranked first, among the European capital with the most polluted air, [3]. This is also confirmed by the measurements of NO2 concentration. The main purpose article analyzes the efficiency of 15 public transport lines and identifies the factors that would improve their performance. The efficiency analysis is conducted by using the DEA mathematical model, which consists of the results of the relative efficiency of similar units that use some inputs and produce some inputs, [4]. To estimate the pollution from public transportation, we will use the Statistics in Tirana's SDS indicate that 36% of residents are active users of public transport; 27% use their private cars; and the rest are classified as using alternatives, such as bicycles, motorcycle, and walking, [5]. The actual public transport fleet consists of 305 buses, out of which only 65 buses comply with Euro-V/VI standards on combustion emissions. According to data provided by the Municipality of Tirana, the combined public transport capacity (seats and standing volume) is 30,365 passengers, with only 31% of this capacity consisting.

2 Literature Review

To investigate the urban public route's efficiency utilizing the "data envelopment analysis (DEA)" technique. To analyze route performance, DEA is using, and performance measures including route design, cost, service, operation, and comfort efficiency. Transit performance was studied by many transportations, [6], showing that the DEA application is very significant in the urban transport area. Moreover, [7], applied a non-parametric DEA procedure to estimate the productive efficiency of a transit system. Furthermore, [8], used DEA to assess the US transit systems' efficiency for five years; they found the existence of positive relations between efficiency and effectiveness Transit system produces multiple outputs consuming multiple inputs. There had been a debate about which of those parameters defines the overall performance of public transit. [9], used operation time, round-trip distance, and the number of the bus stop as inputs to measure operational efficiency whereas commuters who use buses, population 65 and older, and persons with disabilities were used as inputs to measure spatial effectiveness. [10], used fuel consumption, number of full-time workers, and number of operating buses as the input variables. [11], used average travel time per round trip, number of vehicles, operators, and the total number of stops in the round trip as input variables. Input variables can be modified by the researchers as per the requirements and scope of their study as long as they include the major operating and maintenance cost of the system. [12], used output variables: total average number of passengers per day as an effective measure and vehicle km per day as an efficiency measure. The main purpose of this article is to analyse the efficiency of 15 public transport lines and to identify the factors that would improve their performance. The efficiency analysis is conducted by using the DEA mathematical model, which consists of the results of the relative efficiency of similar units that use some inputs and produce some outputs. DEA can employ various output variables as performance indicators as per the scope of the study. Choosing the input and output variables as being a critical state, special attention should be given considering the direction of the study. The model DEA not only enables us to measure the performance of urban lines in the study, but it also shows us the way to improve the efficiency of the transport lines, which during the study, resulted in relatively low performance. The aim is of course to increase competition between urban lines and encourage them to satisfy and fulfill the needs and expectations of the population. The results of the study serve as feedback to improve the quality of public transport in the referred lines and throughout the country.

3 Methodology

The DEA is a non-parametric method applied to compare the efficiency measurement of several units with the same objectives using linear programming. It gives an image of a general measure performance of different units. Firstly, [13], introduced it, and later, [14], extended this technique. A key advantage of DEA was by handled multiple inputs and outputs; this gives comprehensive consideration for analysis units. The inputs and outputs of units depend on the properties of the system analyzed. When the DEA model is used, some limitations of the model must be taken into account, which are: the number of units must be at least twice the sum of the input and output variables; it is a good method to compare a unit with other similar units in the selection, not compared to a "theoretical maximum". Some features that make DEA a very popular and used technique are:1. It enables the use of analyzes with several inputs and several outputs; 2. It does not require any assumption about the functional form connecting inputs and outputs; 3. Units are directly comparable to another unit or a combination of the unit's others; 4. Inputs and outputs can be measured in different measurement units.

DEA is a linear programming problem as formulated in the equation below to determine the efficiency score.

4 Case Study

Albania Public Transport Lines (The Number of Lines n = 15)

The Sample that is taken is 120 users of public transport lines n =120. The information used to conduct the analysis consists of primary data. This information was provided through a questionnaire focused on questions that tend to measure the above attributes (on a scale of 1 to 10, where 1 is the maximal satisfaction and 10 is the minimal level of satisfaction) for 15 public transport lines. The transport lines are[1]: These line are shown in Table 1.

Table 1. The number of transport line

The number of transport lines	Transport Lines
1	Kombinat-Kinostudio
2	Kruje-Tirane
3	Kamez- Qender
4	New Tirana
5	Laprake-Tirane
6	Tirane-Diber
7	Fier-Tirane
8	Fier- New Seman
9	Qyteti Studentit-Jordan Misja
10	Institut – Qender
11	Fushe Kruje-Tirane
12	Kruje-Fushe Kruje
13	Kashar -Yzberisht –Qender
14	Porcelan – Qender
15	Lac-Tiranë

The majority of the respondents are young, which is part of the population which uses more public transport, but there are also respondents of different ages. While in terms of gender, 66% of respondents are female and 34% are male. Regarding employment status 50.4% are employed and 28% are students, while the rest are retirees and unemployed.

Table 2. Variables used, definition, and measure

Input Variables	Output Variables
1. Frequency Refers to the frequency of lines in stations, [15]. On a scale of 1 to 10	**1. Public transport quality perception** Level of satisfaction of citizens using public transport, [17]. On a scale of 1 to 10
2. Punctuality Refers to the opportunity to access the service in the timetable, [16]. On a scale of 1 to 10	
3. Cleanliness Level of cleanliness and presence of garbage in the busses, [16]. On a scale of 1 to 10	
4. Ticket price Structure of the prices of different ticket types, [15]. On a scale of 1 to 10	
5. Possibility to find a seat The possibility of the passengers taking a seat on the bus, [19]. On a scale of 1 to 10	

**Note: Table 2 created by the authors*

[1] 1. Kombinat-Kinostudio, 2. Kruje-Tirana, 3. Kamez - Center, 4. New Tirana, 5 Laprake-Tirane, 6 Tirane-Diber, 7 Fier-Tirane, 8 Fier- New Seman 9. Student City - Jordan Misja, 10. Institute-Center, 11. Fushë Krujë - Tirana 12. Krujë - Fushë Krujë, 13. Kashar - Yzberisht - Center. 14. Porcelan – Center, 15. Lac - Tirana

To measure the efficiency of public transport lines is used the input-oriented DEA model (Table 2).
DEA calculates the efficiency of a unit compared to all units in analysis, choosing the best possible alternative. Technical efficiency in DEA in the presence of some inputs and outputs is determined as the weighted sum of outputs divided by the weighted sum of inputs. The set of weights for a unit should be solved in a way that gives the greatest possible value of technical efficiency information for that unit, meanwhile, the values of the efficiency indicator of other units, for the same set of weights are between 0 and 1. Efficient units have a technical efficiency indicator value of 1, while units that have an indicator value of less than 1 are inefficient, [19], [20]. The efficiency of the unit assessed (U_0) using DEA, is given by the formula:

$$h_0(u,v) = \frac{weighted\ sum\ of\ unit\ output\ U_0}{weighted\ sum\ of\ inputs\ unit\ U_0} = \frac{\sum_{r=1}^{s} y_{r0} \times u_r}{\sum_{i=1}^{m} x_{i0} \times v_i} \qquad (1)$$

Then is set objective function

$$Max: \ \sum_{r=1}^{s} y_{r0} \times u_r \qquad (2)$$

With necessary constraints for each analyzed unit:

1. $\sum_{r=1}^{s} y_{r_0} u_r - \sum_{i=1}^{m} x_{i_0} v_i \le 0$
2. $\sum_{i=1}^{m} x_{io} v_i = 1$
3. $u_r \ge 0 \ and\ v_i \ge 0, \forall r$, and i.

(3)

If this coefficient is equal to 1, the analyzed unit is considered efficient, while if it is smaller than 1, then the analyzed unit is considered relatively inefficient, [19], [20].

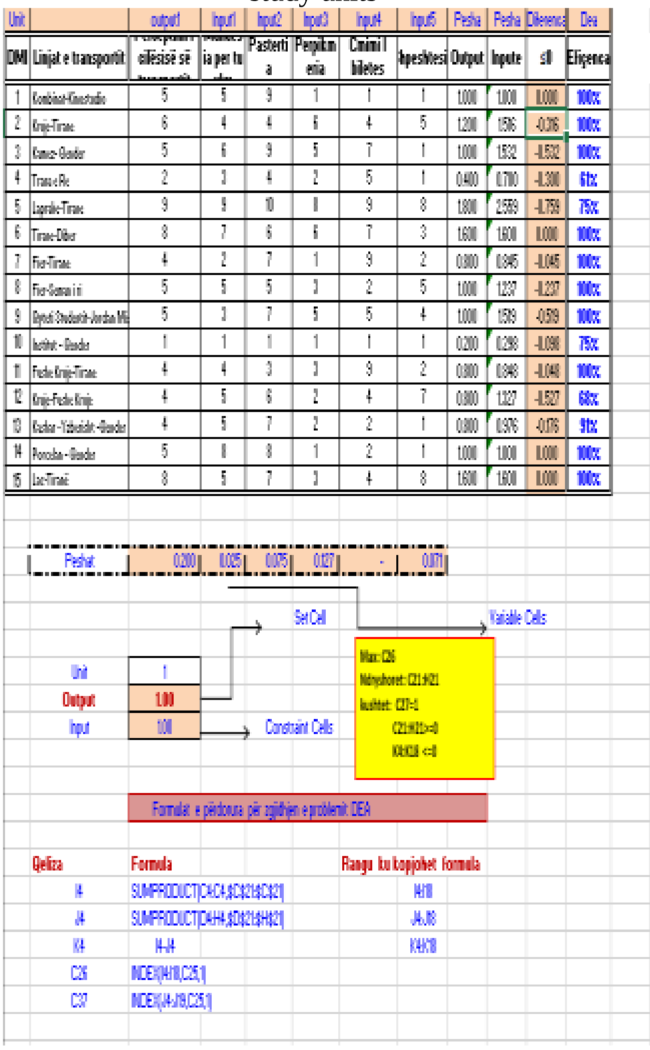
4.1 Data Analysis of Case Study

The linear Programming problem for the study unit is as follows:
Max: $5u_1$ output per unit weight of 1.
Conditions:

$$\begin{cases} 5u_1 - 5v_1 - 9v_2 - 1v_3 - 1v_4 - 1v_5 \le 0 & condition\ of\ efficiency\ of\ unit\ 1 \\ 6u_1 - 4v_1 - 4v_2 - 6v_3 - 4v_4 - 5v_5 \le 0 & condition\ of\ efficiency\ of\ unit\ 2 \\ 5u_1 - 6v_1 - 9v_2 - 5v_3 - 7v_4 - 1v_5 \le 0 & condition\ of\ efficiency\ of\ unit\ 3 \\ \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots & \\ \dots\dots\dots\dots\dots\dots\dots\dots & \\ \dots\dots\dots\dots\dots\dots\dots & \\ 8u_1 - 5v_1 - 7v_2 - 3v_3 - 4v_4 - 8v_5 \le 0 & condition\ of\ efficiency\ of\ unit\ 15 \\ u_1, v_1, v_2, v_3, v_4 \ge 0 & conditions\ not\ negativity \end{cases} \qquad (4)$$

The problem is solved using the computer program Excel (Data, Solver Solution), [18], [19], [20], [21]. Table 3 are presented the results of the DEA analysis of efficiency for unit 1 and other units. Based on this solution we identify the efficient transport lines, which are Kombinat-Kinostudio, Krujë-Tirana, Kamëz-Center, Fier-New Seman, Qyteti Studentit-Jordan Misja, Fush Krujë-Center, Lac-Tirana, and Porcelan- Center, while other transport lines have resulted inefficient. Problem-solving is done by a

Table 3. The results of the DEA analysis for the study units



Unit		output1	Input1	Input2	Input3	Input4	Input5	Pesha	Pesha	Diferenca	Dea
DMU	Linjat e transportit	cilësisë së transportit	ia per tu	Pastertia	Pergjithm enia	Cmimi i biletes	Shpeshtesi	Output	Inpute	s0	Efiçenca
1	Kombinat-Kinostudio	5	5	9	1	1	1	1.000	1.000	0.000	100%
2	Krujë-Tiranë	6	4	4	6	4	5	1.200	1.596	-0.396	100%
3	Kamez-Qender	5	6	9	5	7	1	1.000	1.532	-0.532	100%
4	Tiranë-Re	2	3	4	2	5	1	0.400	0.700	-0.300	61%
5	Laprake-Tiranë	9	9	10	8	9	8	1.800	2.589	-0.789	75%
6	Tiranë-Dibër	8	7	6	6	7	3	1.600	1.600	0.000	100%
7	Fier-Tiranë	4	2	7	1	9	2	0.800	0.845	-0.045	100%
8	Fier-Seman i ri	5	5	5	3	2	5	1.000	1.237	-0.237	100%
9	Qyteti Studentit-Jordan Mi	5	3	7	5	5	4	1.000	1.539	-0.539	100%
10	Instituti - Qender	1	1	1	1	1	1	0.200	0.298	-0.098	75%
11	Fushe Krujë-Tiranë	4	4	3	3	9	2	0.800	0.848	-0.048	100%
12	Krujë-Fushe Krujë	4	5	6	2	4	7	0.800	1.327	-0.527	68%
13	Kodra - Yzberisht - Qender	4	5	7	2	2	1	0.800	0.876	-0.076	91%
14	Porcelan - Qender	5	8	8	1	2	1	1.000	1.000	0.000	100%
15	Lac-Tiranë	8	5	7	3	4	8	1.600	1.600	0.000	100%
	Peshat	0.200	0.025	0.075	0.027	-	0.071				

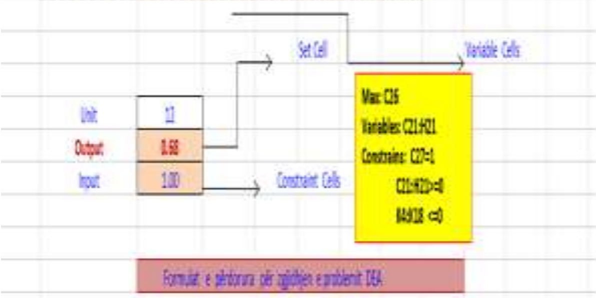
**Note: Table 3 created by the authors, n=15*

The results of the DEA analysis for the study units are presented in Table 3. Also, the model provides the opportunity to improve efficiency for inefficient transport lines, showing the best combination of inputs that increase the level of satisfaction of public transport users. To apply this, we will take into analysis 12 units that have resulted inefficient. Firstly, we have applied for the DEA for the Krujë-

Fush Krujë transport line. Unit 12, Krujë-Fush Krujë resulted from less efficiency than other units of the group, respectively $h_0(u, v) = 68\%$. Then we select the option Sensitivity Report in the Solver Results dialog box. In the results of the Sensitivity Report, the absolute value of shadow prices in the column "Difference", are weights of the composed unit.

Table 4. The results of DEA analysis for the Krujë-Fushe Krujë transport line.

Unit		Output1	Input1	Input2	Input3	Input4	Input5	Weight	Weight	Difference	Dea
DMU	Transport Lines	Public transport quality perception	Possibility to find a seat	Cleanliness	Punctuality	Ticket price	Frequency	Output	Inputs	s0	Efficiency
1	Kombinat-Kinostudio	5	5	9	1	1	1	0.850	0.920	-0.070	100%
2	Krujë-Tirane	6	4	4	6	4	5	1.020	2.020	-1.000	100%
3	Kamez-Qender	5	6	9	5	7	1	0.850	2.080	-1.230	100%
4	Tirana e Re	2	3	4	2	5	1	0.340	0.860	-0.520	62%
5	Laprake-Tirane	9	9	10	8	9	8	1.530	3.020	-1.490	75%
6	Tirane-Diber	8	7	6	6	7	3	1.360	2.160	-0.800	100%
7	Fier-Tirane	4	2	7	1	9	2	0.680	0.780	-0.100	100%
8	Fier-Seman i ri	5	5	5	3	2	5	0.850	1.220	-0.370	100%
9	Qyteti Studentit-Jordan Misja	5	3	7	5	5	4	0.850	1.940	-1.090	100%
10	Institut - Qender	1	1	1	1	1	1	0.170	0.360	-0.190	75%
11	Fushe Krujë-Tirane	4	4	3	3	9	2	0.680	1.080	-0.400	100%
12	Krujë-Fushe Krujë	4	5	6	2	4	7	0.680	1.000	-0.320	68%
13	Kashar-Yzberisht-Qender	4	5	7	2	2	1	0.680	1.070	-0.390	91%
14	Porcelan-Qender	5	8	8	1	2	1	0.850	0.850	0.000	100%
15	Lac-Tiranë	8	5	7	3	4	8	1.360	1.360	0.000	100%
	Weights	0.170	-	0.070	0.290	-	-				



**Note: Table 4 created by the authors*

The results of DEA analysis for the Krujë-Fushe Krujë transport line is presented in Table 4. The hypothetical unit produces output equivalent to the output of the unit under study seeking smaller amounts or equivalent to those used by inefficient units.

Table 5. The results of the sensitivity of unit 12

Microsoft Excel 15.0 Sensitivity Report
Worksheet: Sheet2

Variable Cells

Cell	Name	Final Value	Reduced Cost	Objective Coefficient	Allowable Increase	Allowable Decrease
C21	Peshat Perceptimi i cilësisë së transportit	0.17	0	4	1E+30	4
D21	Peshat Mundesia per tu ulur	0	-0.12	0	0.12	1E+30
E21	Peshat Pastertia	0.07	0	0	1	0.10619469
F21	Peshat Perpikmeria	0.29	0	0	0.13483146	0.33333333
G21	Peshat Cmimi i biletes	0	-0.8	0	0.8	1E+30
H21	Peshat Shpeshtesia	0	-1.4	0	1.4	1E+30

Constraints

Cell	Name	Final Value	Shadow Price	Constraint R.H. Side	Allowable Increase	Allowable Decrease
C27	Input Perceptimi i cilësisë së transportit	1	0.68	1	1E+30	1
K4	Kombinat-Kinostudio s0	-0.07	0.000	0	1E+30	0.07
K5	Kruje-Tirane s0	-1	0.000	0	1E+30	1
K6	Kamez- Qender s0	-1.23	0.000	0	1E+30	1.23
K7	Trana e Re s0	-0.52	0.000	0	1E+30	0.52
K8	Laprake-Tirane s0	-1.49	0.000	0	1E+30	1.49
K9	Tirane-Diber s0	-0.8	0.000	0	1E+30	0.8
K10	Fier-Tirane s0	-0.1	0.000	0	1E+30	0.1
K11	Fier-Seman I ri s0	-0.37	0.000	0	1E+30	0.37
K12	Qyteti Studentit-Jordan Misja s0	-1.09	0.000	0	1E+30	1.09
K13	Institut – Qender s0	-0.19	0.000	0	1E+30	0.19
K14	Fushe Kruje-Tirane s0	-0.4	0.000	0	1E+30	0.4
K15	Kruje-Fushe Kruje s0	-0.32	0.000	0	1E+30	0.32
K16	Kashar -Yzberisht –Qender s0	-0.39	0.000	0	1E+30	0.39
K17	Porcelan – Qender s0	0	0.160	0	0.06034483	0.5
K18	Lac-Tiranë s0	0	0.400	0	0.4	0.7

**Note: Table 5 created by the authors*

Table 6 is presented the best combination of inputs that make unit 12 efficient by DEA.

Table 6. The Composite unit values for unit 12.

The composition values for unit 12

Unit		output1	Input1	Input2	Input3	Input4	Input5	Weight
DMI	Transport Lines	Public transport quality perception	Possibility to find a seat	Cleanliness	Punctuality	Ticket price	Frequency	Composition weights
1	Kombinat-Kinostudio	5	5	9	1	1	1	0.000
2	Kruje-Tirane	6	4	4	6	4	5	0.000
3	Kamez-Qender	5	6	9	5	7	1	0.000
4	Tirana e Re	2	3	4	2	5	1	0.000
5	Laprake-Tirane	9	9	10	8	9	8	0.000
6	Tirane-Diber	8	7	6	6	7	3	0.000
7	Fier-Tirane	4	2	7	1	9	2	0.000
8	Fier-Semani i ri	5	5	5	3	2	5	0.000
9	Qyteti Studentit-Jordan Misja	5	3	7	5	5	4	0.000
10	**Institut - Qender**	1	1	1	1	1	1	0.000
11	Fushe Kruje-Tirane	4	4	3	3	9	2	0.000
12	Kruje-Fushe Kruje	4	5	6	2	4	7	0.000
13	Kashar-Yzberisht-Qender	4	5	7	2	2	1	0.000
14	Porcelan - Qender	5	8	8	1	2	1	0.160
15	Lac-Tiranë	8	5	7	3	4	8	0.400
	Composition values	4	3.28	4.08	1.36	1.92	3.36	
	Extra inputs used	-3.000	-2.280	-3.080	-0.360	-0.910	-2.360	

Note: Table 6 created by the authors

The improved DEA efficiency for unit 12 is shown in Table 7. As we see, it is very important to improve attributes such as punctuality, ticket price, cleanliness, or frequency.

Table 7. Improved DEA efficiency for unit 12

The results of the Dea analysis for the study units

Unit		Output1	Input1	Input2	Input3	Input4	Input5	Weight	Weight	Difference	Dea
DMI	Transport Lines	Public transport quality perception	Possibility to find a seat	Cleanliness	Punctuality	Ticket price	Frequency	Output	Inputs	SE	Efficiency
1	Kombinat-Kinostudio	5	5	9	1	1	1	1.250	1.250	0.000	100%
2	Kruje-Tirane	6	4	4	6	4	5	1.500	1.592	-0.092	100%
3	Kamez-Qender	5	6	9	5	7	1	1.250	2.132	-0.882	100%
4	Tirana e Re	2	3	4	2	5	1	0.500	1.190	-0.690	61%
5	Laprake-Tirane	9	9	10	8	9	8	2.250	3.158	-0.908	75%
6	Tirane-Diber	8	7	6	6	7	3	2.000	2.000	0.000	100%
7	Fier-Tirane	4	2	7	1	9	2	1.000	1.999	-0.999	100%
8	Fier-Semani i ri	5	5	5	3	2	5	1.250	1.323	-0.073	100%
9	Qyteti Studentit-Jordan Misja	5	3	7	5	5	4	1.250	1.912	-0.662	100%
10	Institut - Qender	1	1	1	1	1	1	0.250	0.353	-0.103	75%
11	Fushe Kruje-Tirane	4	4	3	3	9	2	1.000	1.655	-0.655	100%
12	Kruje-Fushe Kruje	4	3.28	4.08	1.36	1.92	3.36	1.000	1.000	0.000	68%
13	Kashar-Yzberisht-Qender	4	5	7	2	2	1	1.000	1.190	-0.190	91%
14	Porcelan - Qender	5	8	8	1	2	1	1.250	1.250	0.000	100%
15	Lac-Tiranë	8	5	7	3	4	8	2.000	2.000	0.000	100%
	Weights	0.250	-	0.112	0.052	0	0.076				

Unit	12
Output	1.00
Input	1.00

Set Cell

Variable Cells

Constraint Cells

Max: C25
Variables: C21:H21
Constrains: C27=1
C22:H21>=0
K4:K18 <=0

Note: Table 7 created by the authors

5 Conclusion and Recommendations

Environmental issues, especially air pollution is one of the most concerning issues in Albania.

It is considered important to use public transport as a way to reduce the high level of emissions of private cars. We have taken in to analyze the efficiency of 15 public transport lines. To conduct the analysis, we have used the input-oriented DEA model, which calculates the efficiency of a unit compared to all units in the analysis, choosing the best possible alternative. The analysis resulted in some efficient transport lines such as Kombinat-Kinostudio, Kruje-Tirana, Kamez-Qender, Fier-New Semani, Qyteti Studentit-Jordan Misja, Fushe Kruje-Qender, Lac-Tirana, and Porcelan-Qender.

We used Solver to improve the efficiency of the Kruje-Fushe Kruje transport line.

For inefficient units exists a linear combination of efficient units that results in a composite unit, which produces at least the same output using the same or fewer inputs than the inefficient unit as in the case of unit 12.

From the efficiency analysis (referring to the result of the sensitivity report), the absolute value of the shadow prices (Shadow Prices), are the weights of the composite unit, which is more efficient than the unit under study 12.

The average of the weights is approximately 40% for unit 15 (Lac-Tirana with 1 efficiency result) and 16% for unit 14 Porcelan-Center with 1 efficiency result) from the composite unit (assumed). This hypothetical unit resulted in the same output as the output of unit 12 but reduced the input perceptions.

6 Recommendation

A recommendation for future research could be the increase of included attributes in the study. Also, a larger sample and extension in other lines could provide an in-depth understanding of the public transport efficiency in Albania.

This study can be used to increase the performance of transport lines to increase the use of public transport.

References:

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APPEDIX

These rates are age-standardized, meaning they assume a constant age structure of the population: this allows for comparison between countries and over time.

Entity	Code	Year	Deaths - C	Deaths - C	Deaths - C	Deaths - C
Albania	ALB	1990	97.25	46.45	146.67	4.79
Albania	ALB	1991	98.11	46.05	147.35	4.36
Albania	ALB	1992	93.29	43.29	139.73	4.07
Albania	ALB	1993	88.01	40.64	131.59	3.9
Albania	ALB	1994	81.51	37.55	121.62	3.67
Albania	ALB	1995	81.76	37.77	121.65	3.42
Albania	ALB	1996	80.92	38.59	121.18	3.08
Albania	ALB	1997	76.98	39.24	117.78	3.02
Albania	ALB	1998	72.16	40.06	113.53	2.6
Albania	ALB	1999	68.41	41.24	110.85	2.2
Albania	ALB	2000	63.7	41.54	106.44	1.8
Albania	ALB	2001	57.58	40	98.9	1.7
Albania	ALB	2002	56.16	41.6	99.31	1.99
Albania	ALB	2003	55.71	44.2	101.61	2.26
Albania	ALB	2004	51.97	44.43	98.06	2.29
Albania	ALB	2005	47.44	43.65	92.59	2.08
Albania	ALB	2006	41.52	41.61	84.49	1.8
Albania	ALB	2007	36.13	40.09	77.55	1.7
Albania	ALB	2008	33.03	40.89	75.18	1.56
Albania	ALB	2009	29.49	40.45	71.06	1.4
Albania	ALB	2010	27.01	40.05	67.93	1.14
Albania	ALB	2011	25.55	40.04	66.38	1.08
Albania	ALB	2012	24.11	39.41	64.31	1.09
Albania	ALB	2013	22.96	38.89	62.67	1.08
Albania	ALB	2014	22.1	38.83	61.76	1.06
Albania	ALB	2015	21.27	38.83	60.8	0.87
Albania	ALB	2016	20.2	38.32	59.14	0.78
Albania	ALB	2017	19.24	37.83	57.63	0.69
Albania	ALB	2018	18.35	37.36	56.23	0.64
Albania	ALB	2019	17.54	36.93	54.94	0.57