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CIVIL ENGINEERING

Analysis of Limousine Service in Riyadh

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Abstract. Most countries in the world today operate something known as a taxi service. Taxi services are regulated by public bodies with respect to entry of new vehicles into the taxi fleet and fare control, among other things. This paper evaluates taxi (or the so called limousine) service in Riyadh with respect to entry control, fare control and operating characteristics. This was achieved by conducting two main surveys: taxi drivers' trip diaries and a traffic field survey, and two limited questionnaires with limousine passengers and firms managers.

It appears that the current (1992) average taxi demand in Riyadh is about 4,080 cars, while the current supply is 5,860. Other interesting results were revealed by this study with respect to fare control and taxi operating characteristics. For example, only 27% of the limousine trips are charged using the fare meter, while the fare of the rest of the trips is set by bargaining, which turned out to be significantly less than the one that would be charged if the fare meter is used.

Introduction

The taxi is the oldest form of public transportation, stemming from for-hire horse-drawn coaches in western cities, rickshas in far eastern cities, and similar vehicles. In its original sense, a "taxi" service implies a vehicle with driver being placed at someone's disposal. The passenger decides where (s)he wants to go, after which the price is determined according to the length of the journey or the time it will take.

Taxi services are regulated by public bodies with respect to some or all of the following items: (1) Entry of new drivers and vehicles into the taxi fleet, or licensing of drivers, (2) Rates or Fares, (3) Area in which each taxi company can operate, (4) Driver training, and (5) Vehicle safety standards.

Control of entry, which has a major influence on the number and role of taxi in a city, varies from no control to a fixed number of licences (*e.g.* New York city has had approximately 11,800 licensed taxis since 1937) [1; p. 601]. The former type of regulation results in a much greater number of taxis, lower rates, but also lower driver earnings than the latter regulation.

Strict public regulation and control of taxi fares are particularly important. If no adequate control exists, overcharging of passengers is a frequent and highly objectionable phenomenon. Fares usually depend on a combination of trip length and time.

Prior to the automobile age, like in other countries, Saudi Arabia has had some sort of taxi service utilizing animal-drawn coaches. This primitive mode was then replaced by a motor-driven vehicle during the third quarter of the twentieth century. For about thirty years, conventional taxis, with owner-operator structure, existed in the Capital city, Riyadh, as the only form of taxi service, with almost no entry control regulation.

However, in 1984 a new form of taxi service was introduced (called limousine service) where only firms are allowed to enter such industry. This caused an increase in the number of limousine cars vacantly cruising the streets looking for passengers. Such condition cause usually higher social costs with respect to congestion, air pollution, noise, and traffic accidents, since they perform more vehicle-km per passenger-km of travel.

Accordingly, a no-more-entry regulation policy of limousine firms was adopted by the Ministry of Communication (MOC) in 1990, due to the presence of over-supply of limousines in the city of Riyadh. Furthermore, MOC predicted that such over-supply would be absorbed by the growth of demand in mid 1992 [2]. This paper is aimed at the evaluation of the entry regulation policy currently imposed in Riyadh. In addition, the paper attempts to analyze the operating characteristics of limousine service in Riyadh. The paper starts by describing the organization of taxis in Saudi Arabia, followed by a brief description of the methodology employed in this study. Based on the study findings, the characteristics of limousine service in Riyadh are then summarized. The evaluation of regulation policies is presented next. The paper concludes with a discussion of major findings and proposes some recommendations.

Organization of Taxis in Saudi Arabia

Historically, organization of vehicular traffic in Saudi Arabia started in the early 1930's. When few automobiles started to exist in the country, security police were

assigned the responsiblity of monitoring their flow on the streets in order to protect the public from its dangers. However, when the number of vehicles increased, a formal Royal Decree was issued to organize the way these vehicles are licensed. The initial law was replaced in 1941 [3; p. 95]. Finally, in 1971 a more comprehensive traffic ordinance was issued which superseded the previous one [4].

The traffic ordinance defines the taxi as "any vehicle equipped to transport passengers for a charge." The only requirements to operate a taxi, according to the ordinance, are to have a valid driving license for that type of vehicle, to be above a certain age (21 years) and not be a government employee. Therefore, all taxis operating at that time were of an owner-operator structure. These taxis used to operate in cities offering both an exclusive ride and shared ride services. Ride fares were unregulated and were left to the market to set.

This regulation scheme was fit for that period of time, where demand for taxi service appears to be satisfied. However, when the country experienced the massive development during the late seventies and early eighties, which specifically required a large number of expatriates to be brought into the country, the existing supply of taxis at the time could not provide the service demanded (both in quantity and quality).

On the other hand, the Highway Transport Statue in the Kingdom, which was issued in 1977, did not elaborate on how taxis are to be organized; it just stated that MOC should organize taxis in a manner so as to assure the coordination between taxi service and other public tranportation modes [5].

Accordingly, MOC intervened to organize taxi services in cities, and introduced a new form of taxi service under the name: "Airport Limousine" service in 1980. This kind of service was licensed to operate only from local airports to different destinations in the neighboring city. Such licensing was issued only to firms, and not to individual owner-operators (like conventional taxis).

Airport limousines were, and still are, not allowed to operate within the city. A firm can be licensed only if it has a fleet of at least 30 limousine vehicles. Licensed firms were required to abide by some regulatory rules such as [5]:

1) The firm should provide 24 hours service through its office(s) and airport stand.
2) Vehicles should be new, and should be replaced every 4 years.
3) The designated color of limousine cars is white, in order to differentiate it from the conventional yellow taxi.

4) Vehicles should be air-conditioned.

5) Other security, safety and comfort measures.

In the same year, the licensing of new conventional taxis in the whole Kingdom was banned [6]. This is reflected in Fig. 1 where the cumulative number of registered taxis in the Kingdom remained constant at 108,033 taxis for four consecutive years (1980-83). The reason for this ruling is not known to the author, but it is suspected that this is related to the new "city limousine" service to be introduced later in 1984.

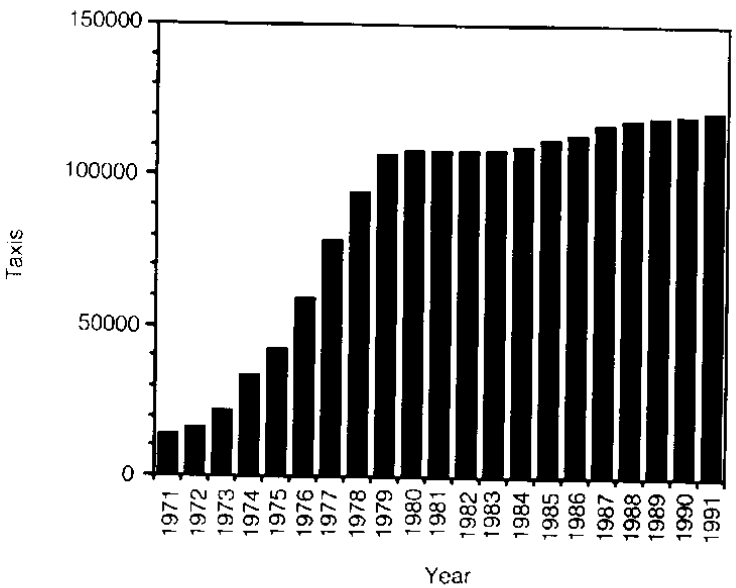

Fig. 1. Cumulative licensed conventional taxis in Saudi Arabia (1971-1991) [7].

In 1984, a total of 7000 taxi licenses were exempted from the ban Kingdom-wise. For Riyadh, the taxi licensing restriction continued two more years, until it was eased in 1986. Figure 2 shows the profile of taxi licensing in Riyadh since 1977, where a sharp decline of the conventional taxis licensing number can be noticed.

Also in 1984, a new service under the name: "City Limousine" was introduced by MOC [5]. This service followed the same rules of airport limousine service licens-

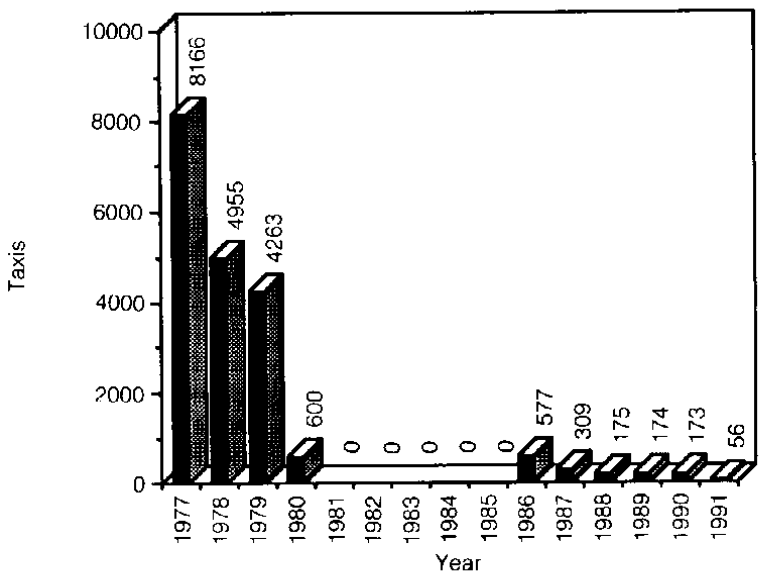

Fig. 2. Licensed conventional taxis in Riyadh (1977-1991) [6].

ing and regulation, except that it is restricted to operate within the city limits only. This ruling attracted many businessmen to start a limousine service firm. Figure 3 shows the growth of such business firms in Riyadh while Fig. 4 shows growth of total limousine fleet size in the city.

At the same time MOC tried to organize the conventional taxis (owner-operators) by issuing an act to organize the taxis in 1984. This act introduced the concept of "taxi services office" which is intended to supervise the services of taxis and organize its operations so as to improve its service and assure its protection from the new competitor [5]. However, this concept was not applied since the act made it voluntary for taxi owner-operators to join these offices. Accordingly, not a single such office was licensed.

On the other hand, city limousine service was able to function very successfully in its first few years. Passengers preferred it over the conventional yellow taxis because its superior quality of service. This led to the decline of taxis business (Fig. 2), despite the efforts of Riyadh traffic department to help them by banning

limousines from operating in certain high demand locations in the central business district.

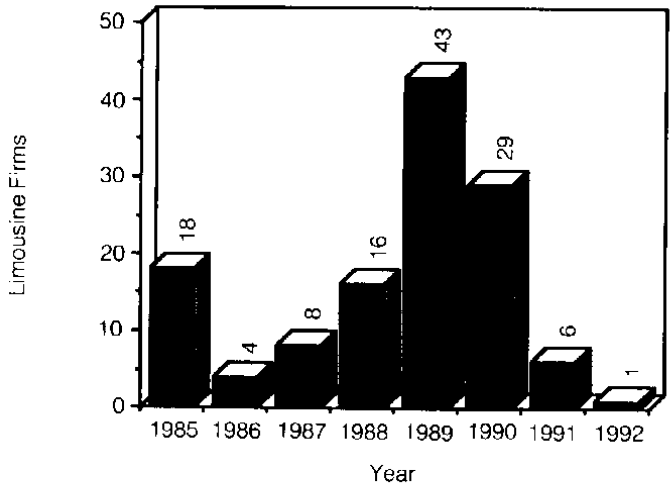

Fig. 3. Licensed limousine firms in Riyadh (1985-1992) [8].

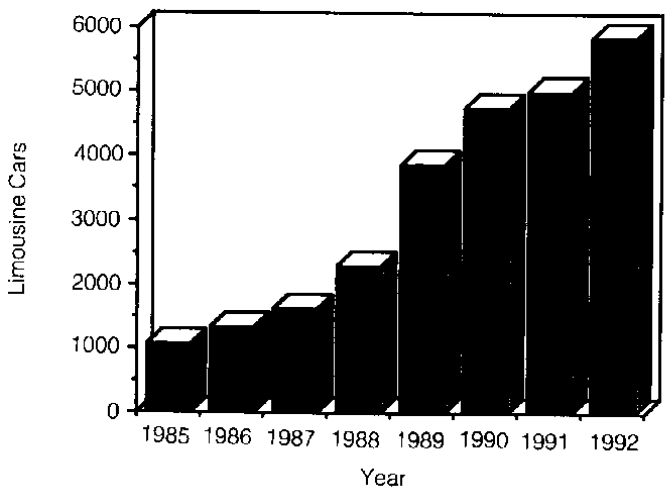

Fig. 4. Cumulative licensed limousine cars in Riyadh (1985-1992) [8].

Due to the above factors, limousines were able to generate reasonable revenues that attracted more businessmen to enter this service industry. However, the number of vacant limousines cruising the streets of Riyadh started to increase dramatically, which triggered MOC to conduct a study in 1990 to evaluate the existing policy regarding limousine industry. The study recommended freezing the number of limousines in Riyadh at its number at that time (118 firms with a fleet of 4,288 cars) [9]. However, MOC adopted a policy that restricts new firms entry into the business, but at the same time did not control the licensed firms from expanding its fleets. Today (1992), there are 125 licensed firms with a total fleet of 5860 cars. It appears that there is a leakage in the regulation enforcement system. The aim of this study is to evaluate the entry regulation policy and, also to analyze the limousine service operating characteristics. Next section describes the study approach.

Study Methodology

Two main surveys were carried out in this study: limousine drivers' trip diary or "logsheet" survey and a field traffic survey. In addition, two limited questionnaire surveys were conducted on a small scale with limousine passengers and limousine firms managers. Each of these four surveys is briefly described below. It should be mentioned that the main thrust of this paper is based on the first two types of surveys.

Limousine driver's logsheet survey

In order to evaluate the limousine service, it was necessary to collect data on its performance measures. However, collection of such data by drivers may be a difficult process; if extensive data are needed or if specific data items are difficult to collect (e.g., income), the limousine drivers may not be able to collect the data.

These data collection problems were minimized by adhering to the following guidelines [10; p. 58]: (1) collect only necessary data items, and (2) select data items which can be readily observed and recorded by a taxi driver. The second guideline underscores the practical limitation of driver-collected data. Drivers may be busy and not accustomed to record-keeping. Thus, the data collection form need to be easy to complete.

A simple logsheet form was designed and used in this study. It condenses a large amount of useful data into a clear, concise format. The form's data fields include:

1) The kilometrage readings and times of the start and finish of each work session performed by the driver between his rest breaks during the day.

2) For each revenue trip, the driver writes down the trip start time, kilometrage in, time delivered, kilometrage out, number of passengers, fare amount, and fare type (with or without using fare meter). Each logsheet form fits 24 such trip records.

A total of 220 driver's logsheet forms were distributed randomly to the drivers of 35 randomly selected limousine firms, and they were asked to record their trip diary on the logsheet form and mail back the completed form using the provided pre-stamped and pre-addressed envelope. Only three drivers responded by mail. Further follow-up resulted in 21 more forms. Thus, the total completed logsheets received were 24 (11%) containing a total of 433 revenue trips data. It is important to notice that the purpose of this survey is to collect data on taxi trips and not on taxi drivers. In other words, the population under study is that of taxi trips. A sample size of 433 trips is sufficient to draw conclusions at a 5 percent statistical significance level (α).

It is worth mentioning that prior to distributing the logsheets to drivers through their firms, a pilot study was performed to distribute the forms directly to the drivers at limousine stands. However, the response was negligible which led to the use of the other approach.

Field traffic survey

A field traffic survey was conducted at five different locations in Riyadh in order to collect data on the number of limousines passing, the number of occupied limousines (and their occupancy), and the number of other public transport vehicles classified by mode (conventional taxis, jitney buses, public transit buses).

The five traffic survey locations were selected based on the following criteria: (1) to cover all parts of the city (city center and the four major geographical directions), (2) to be next to major trip generators/attractors, such as shopping centers, employment centers and hospitals, and (3) to be on high traffic volumes streets.

The survey was conducted on two weekdays (a Saturday and a Tuesday) each at three different times (morning peak, afternoon peak and off-peak; for one hour each). As such a team of 5 surveyors carried out the work in 30 man-hours.

Passengers questionnaire

This questionnaire is aimed at seeking passengers' opinions regarding the various characteristics of the limousine service in Riyadh, and to provide a profile of the socio-economic characteristics of the service users. Five different locations on

Riyadh streets network were selected for the conduct of the survey. The criteria used to select these locations are similar to those mentioned in the traffic survey.

In addition, appropriate time was chosen to distribute the questionnaires for each location depending on its peak traffic period. For example, at shopping locations the survey was conducted in the evening, while for employment centers locations, the survey was done in the morning rush hour.

At each location the survey was conducted for two hours utilizing the services of a traffic police patrol vehicle with its two officers. The policemen helped in stopping all occupied limousine cars passing by the given location, and directing them to the nearby survey team. One questionnaire is handed over to each limousine's passengers, who are then asked either to fill it on the spot or mail it later using a provided pre-stamped and pre-addressed envelope.

A total of 128 occupied limousines were stopped; 69 passengers filled the questionnaire on the spot, while the other 59 took it with them. Of these, only 10 (17%) were received by mail. Thus, a total of 79 completed questionnaires were collected.

Limousine firms questionnaire

The population of limousine firms currently operating in Riyadh is 125 firms. A random sample of 35 firms were considered for this survey. The questionnaire is aimed at collecting data on the limousine firms' fleet, and its operating characteristics. Only 10 firms responded with completed questionnaires. The findings of this and the other surveys are discussed in the next section.

Characteristics of Limousine Service

Structure of industry

On an industry-wide basis, the limousine industry is structured upon a large number of separate firms. Table 1 shows the distribution of firm sizes in Riyadh. On the other hand, limousine firms are legally licensed on an employee-driver basis. However, limousine drivers complain that most limousine firm owners use a leasee-driver form of agreement. In this arrangement, a driver pays a daily fee (ranges between SR 150-200) for use of the vehicle, regardless of the revenues earned by the driver [9].

Table 1. Distribution of firm sizes within Riyadh [8].

Firm size (cars)	Number of firms
≤ 30	92
30 - 50	11
50 - 70	11
≥ 70	11

A third form of organization exists in which an owner-operator (Saudi nationals only) registers his car in one of the limousine firm and pays a monthly fee (not exceeding SR 150) [5]. In return, the owner-operator can use the firm's license and name to operate. This private limousine concept is intended to help individual Saudi owners-operators (especially conventional taxi drivers) to switch to limousine business.

However, the limited collected data show that only 1.11 private limousines are registered per firm. This may be due to the fact that the regulatory body (MOC) made it voluntary for limousine firms to accept such type registration.

Supply characteristics

The most common measure of supply is the ratio of taxis or taxi licenses to population. The population of Riyadh is estimated to be two million in 1990 [9]. Accordingly, the current supply of limousines in Riyadh is about 2.93 cars per 1,000 inhabitants. Figure 5 shows international variations in taxi availability. The supply in Riyadh is obvsiously very high and comes at the end of the spectrum along with Greece and Turkey. It is known that these two countries, unlike Riyadh, receive a large amount of tourists every year.

On the other hand, the field traffic survey shows that limousines represent 82.25% of the total number of public transport vehicles operating in Riyadh; conventional taxis, jitney buses and public transit buses represent 6.15% and 1.26%, respectively.

However, supply share is best measured by vehicle-seats rather than vehicles. The limousine, taxi, jitney and public transit shares are 52.78%, 3.94%, 33.21%, and 11.30%, respectively.

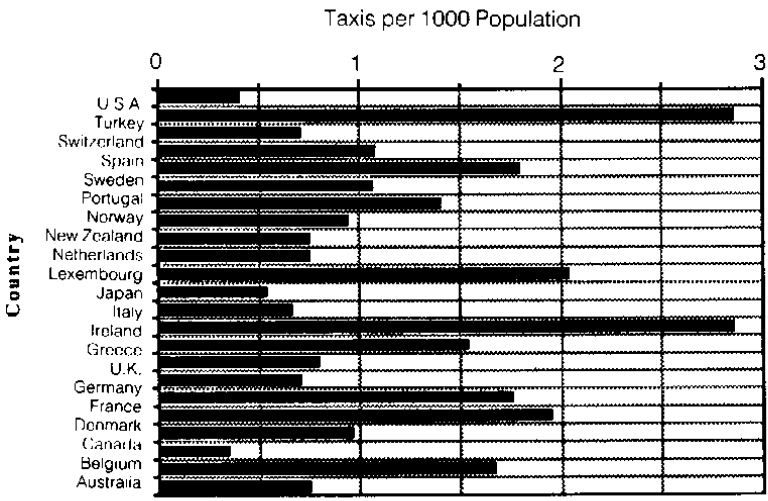

Fig. 5. International Variations in Taxi Availability [11].

Demand characteristics

Three demand characteristics are discussed here: the level of demand, passenger characteristics, and trip characteristics.

Level of demand

Study data show that the mean number of trips served daily is 18.95 per limousine car. The average occupancy per trip is 1.52 passengers. On average, a limousine car operates 6.33 days per week. Therefore, the annual mean number of passengers carried by a limousine car is about 9,500 passengers (6,250 annual trips).

Passenger characteristics

Due to the relatively small sample size of passenger questionnaires responses, the paper will not elaborate on the analysis of these questionnaires. However, the questionnaires show that the majority of limousine passengers are non-Saudi professional males of age between 20-30 years, who earn a monthly income of less than SR.3000, and who do not have access to a private car. Sixteen percent of the passengers use limousines three times or more daily, while 22% and 21% of them use it twice and once daily, respectively.

Trip characteristics

About 45% of limousine trips are for work purposes, which is typical in large cities. Shopping and school purposes constitute 21% and 9%, respectively. 37% of the trips originate from home, while 23% and 19% of the trips originate from work and shopping places, respectively.

The average distance of paid (revenue) trips in Riyadh is 9.30 km, while the average trip time is 18 minutes. In the taxicab industry, the paid kilometers per trip ratio is regarded as the best measure of how far a passenger is carried because most trips are single, point-to-point trips with no stops to broad or discharge passengers. This is in contrast to bus transport where passengers may board or deboard at several points throughout the trip.

Fares

Limousine fare structure in Saudi Arabia follows the meter charge scheme. MOC established national rates that must be followed when setting the fare meters. There are several types of charges that can be placed on meters: (1) flag drop charge, (2) additional kilometerage charge, (3) waiting time charge, and (4) traffic delay (live clock) charge. Only the first three types are adopted by MOC with the following rates [3; p. 233]:

1) Flag drop charge = SR 5.00 (flag drop distance = 2 km)
2) Additional kilometerage charge = SR 0.70 for every 500 meters.
3) Waiting time charge = SR 0.50 for every one minute.

MOC calculated these rates on the basis of a 15% return on investment in cars only [2].

Statistics obtained from the driver's logsheet survey and firms survey led to the construction of Table 2, which compares the study findings with assumptions made by MOC when calculating the fare charging rate. The table shows that the driver is actually paid (SR 950 monthly) less than half what MOC assumed fair (SR 2,000). This, and the fact that most firms demand a fixed daily revenue (SR 150-200) from the driver, have resulted in higher operation hours per day (13.27 hrs), greater daily kilometerage (346.18 km) and more operation days per month (27.1 days). Finally, the data showed that the average cost of a limousine trip is SR 10.00.

Profitability

Profitability depends on three factors: unit cost, unit revenue, and operating efficiency. Consider, for example, cost per vehicle-km and revenue per paid-km. For a firm to be profitable, it wants to minimize its cost per vehicle-km, while maximizing its revenue per revenue-km. However, neither of these actions would produce a profit without also achieving a sufficiently high ratio of paid-kms to total-kms (operating ratio). Operating ratio measures the ability of the firm to minimize the percentage of dead-head, or non-productive kms.

Table 2 shows that the cost per paid kilometer is about SR 1.17, while the mean revenue is about SR 1.35 per revenue kilometer. Thus, it can be estimated that, with an annual revenue kilometerage of 47,000 km, the net revenue (profit) is SR 8,500 per car annually. The high profit margin (15.5%) may explain why limousine service attracted investors.

Table 2. Comparison of limousine operating characteristics.

Item	MOC assumption[$]	Study findings
1. Commercial speed (kph)	25	32.32
2. Operating hours per day	8	13.27
3. Daily kilometerage	200	346.18
4. Operating days per month	25	27.1
5. Operating ratio (% revenue kms)	60%	41.77%
6. Driver monthly salary, SR	2000	950[§]
7. Actual cost per km, SR	0.806	0.4882[§§]
8. Total cost per revenue km, SR	1.30	1.1688[§§]
9. Revenue per revenue km, SR	1.40	1.35
10. Profit per revenue km, SR	0.10	.1812

$ based on [2]

§ from firms questionnaire

§§ calculated based on the same basis of MOC calculations, but using our findings and current prices where applicable.

On the other hand, the current practice of most limousine owners is to charge the driver a fixed daily amount (SR 150-200) regardless of his true revenue. This may be due to the difficulty of controlling the true revenue, since only 27% of the revenue trips are registered by the meter; the fare of the rest of the trips is set by bargaining without using the fare meter. This particular finding is discussed further later.

Furthermore, in the above leasing arrangement the driver is supposed to pay for the fuel. Thus, if the fuel cost (SR 0.0724/km)* is deducted from the cost per km, the average net cost to the owner will be SR 1.096/revenue-km. This amounts to an average daily cost per car of SR 158.54. Thus, an owner tries to ask the driver to pay for the daily cost plus some profit. This may explain the range of the daily fixed charged demanded by the owner (SR 150-200).

Evaluation of Regulation Policy

Entry control

The average number of occupied limousine cars operating in Riyadh can be estimated by multiplying the total supply of limousines times the prevailing operating ratio (revenue-km/total vehicle-km). Table 2 shows that the average prevailing operating ratio is 0.4177; thus the average number of occupied vehicles is 2,448 limousine cars.

However, the prevailing operating ratio should be used as a decision variable to reflect the regulatory agency's preferences regarding the performance of the limousine industry. MOC used an operating ratio of 0.6 in its calculations of fare charging rate (Table 2), which can be used as a policy variable. Thus, the average supply of limousines that matches the prevailing demand is estimated to be 4,080 limousine cars (2,448/0.6). However, the current limousine fleet size is 5,860 cars, reflecting an over-supply of 1,780 limousine cars (43%).

Fare control

It was shown in the previous section that on average only 27% of limousine trips are charged using the fare meter system. The majority of trips are charged by bargaining (flat fare), where the actual trip fare is thought to be less than the one that would be charged if the meter is used. To investigate this, the following hypothesis is tested:

Null Hypothesis, H_0: Average revenue per km for metered trips (REV_m) = average revenue per km for flat fare trips (REV_f), or H_0: $REV_m = REV_f$

Alternate Hypothesis, H_1: $REV_m > REV_f$

* Fuel cost was reduced from SR 0.543/liter, to SR 0.33/liter 5 months past the time the data collection for this study was undertaken.

The following statistics were obtained from the logsheet survey:

Metered fare trips (REV_m)	**Flat fare trips (REV_f)**
X_m = SR 1.77/km	X_f = SR 1.2/km
S_m = SR 0.99/km	S_f = SR 0.97/km
n_m = 115 trips	n_f = 318 trips

The hypothesis test was performed using the standard t-test procedure [12; p. 361]. The calculated t-statistic value is 5.51, while the theoretical $t_{0.05,431} = 1.645$ (one-tail). Since $t_{calculated}$ (5.51) > $t_{critical}$ (1.645), then, as expected, the null hypothesis is rejected. That is the revenue per km for metered trips is significantly greater than that with flat fare.

Furthermore, it is expected that passengers insist on not using the fare meter system in the longer trips than on the shorter ones. The following statistical test was performed to test the null hypothesis that the metered trip distance (D_m) is not different from the flat rate trip distance (D_f), or

$$H_0: D_m = D_f, \text{ and}$$
$$H_1: D_m < D_f$$

The following statistics were obtained from the logsheet survey:

Metered fare distance (D_m)	**Flat fare distance (D_f)**
X_m = 7.48 km	X_f = 9.95 km
S_m = 4.47 km	S_f = 5.93 km
n_m = 110 trips	n_f = 303 trips

The $t_{calculated}$ (− 2.47) < $t_{0.05,431}$ (one tail), thus the null hypothesis is rejected and we concluded that, as expected, D_m is significantly less than D_f.

Concluding Remarks

Taxi entry controls are one of the most important aspects of taxi regulation because they set the number of taxi companies and vehicles allowed to operate. Also, fare regulation is another important aspect of taxicab regulation because the setting of taxi fares often determines how much profit a taxi operator will make. This paper showed that the existing entry and fare controls in Riyadh are not performing well. It appears that there is a 43% over-supply of limousines (1780 cars), and that only 27% of the passengers agree to use the fare meter.

It seems from the analysis that the non-use of the fare meter system benefits the passenger. The reluctance of regulatory agencies to accept market set fare has always been related to fear of overcharing of passengers. However, the current practice in Riyadh seems to be acceptable, although it is not legal. It may be reasonable to legalize such practice, provided that a close monitoring and periodic checks are conducted. Furthermore, the fare meter charging scheme should be further investigated to address the concerns raised by this study and to account for the reduction in fuel prices which took place recently.

The data also point out the need for more reliable data on taxi firms. MOC can properly monitor the operations of limousine firms by requiring the firms to periodically fill out a well designed statistical form showing their operations. Such data can be used to guide the regulation decisions.

Finally, the service provided to the public by the so called limousines is, in fact, the same as the one offered by the conventional taxis. Historical developments caused the adoption of the limousine name to differentiate the two types of service. It is time to combine both services in one taxi service type, as they deserve.

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تحليل خدمة الليموزين في مدينة الرياض

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قسم الهندسة المدنية، كلية الهندسة، جامعة الملك سعود، ص.ب ٨٠٠،

الرياض ١١٤٢١، المملكة العربية السعودية

(استُلم في ١٩٩٢/٦/٢٢م؛ قُبل للنشر في ١٩٩٣/٥/١٧م)

ملخص البحث. عادةً ما تقوم الجهات الرسمية بتنظيم أعداد سيارات الأجرة العاملة في المدينة وتحديد طريقة احتساب أجرة الإركاب. ويُقَوّم هذا البحث خدمة سيارات الأجرة (أو ما يسمى بالليموزين) في مدينة الرياض من حيث تنظيم أعدادها وتعريفة ركوبها وخصائصها التشغيلية. وللقيام بذلك تم إجراء نوعين رئيسين من المسوحات أحدهما بتسجيل خصائص الرحلات التي قامت بها عيّنة مختارة من سيارات الأجرة والآخر حصر مروري ميداني، بالإضافة إلى عمل استبانات محدودة مع الركاب ومسؤولي شركات الليموزين. ويبدو أن متوسط الطلب على سيارات الأجرة في مدينة الرياض حاليًا (١٩٩٢م) هو حوالي ٤,٠٨٠ سيارة ليموزين، بينما العرض الحالي يبلغ ٥,٨٦٠ سيارة. وقد توصل البحث كذلك إلى بعض النتائج المفيدة بخصوص تعريفة الركوب والخصائص التشغيلية لسيارات الأجرة، فعلى سبيل المثال وجد أن ٢٧٪ فقط من الرحلات تتم باستخدام عدّاد الأجرة والباقي يتم بالتفاوض، والاتفاق على أجرة أقل من تلك التي يقوم العدّاد باحتسابها.