

THE IMPACTS OF CUSTOMS CHANGES ON TRAFFIC ACCIDENTS IN JORDAN

تأثير التغييرات في قانون الجمارك على حوادث السير في الاردن

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خلاصة:

نتج عن قرار الحكومة الأردنية بتخفيض الجمارك المفروضة على كل من السيارات الجديدة والمستعملة بالإضافة إلى السماح بمرور السيارات التي يزيد عمرها على خمس سنوات السماح لما يزيد على 72000 مركبة باستخدام شبكة الطرق خلال مدة خمسة عشر شهراً فقط.

وإذاً على إبداعات مجموعات مختلفة بأن هذا القانون الجديد قد نتج عنه زيادة في عدد الحوادث المرورية، قامت الحكومة الأردنية بإلغاء قرارها بعد عام واحد فقط من إقراره. يناقش هذا البحث آثار تغييرات القانون على حوادث المرور. كما توصلنا إلى الاستنتاج بأن هذا التخفيض الجمركي والاستيراد للسيارات القديمة لم يكن له أثر على الحوادث المرورية. وبناء على هذا لم يكن قرار الحكومة بإلغاء هذا القانون حكيماً.

ABSTRACT

As a result of the Jordanian government's decision of reducing the customs on both new and used cars in addition to allowing the taxation of more than five year-old cars, more than 72,000 extra vehicles were allowed to use the road network in just fifteen months.

In response to claims from different groups that the new law has resulted in an increase of traffic accidents, the Jordanian government has cancelled its decision after only one year from passing it. This paper examines the impacts of law changes on traffic accidents. It was concluded that the custom reduction and the importing of old cars have no effect on traffic accidents. Therefore, the government decision of canceling the law was not appropriate.

Key Words: Traffic Accidents, Severity Index, Tax Law.

1. INTRODUCTION

In a step towards encouraging people of low-income rates to purchase private cars, the Jordanian government has accordingly reduced the customs on both new and used cars. Furthermore, it has also allowed the taxation of used cars, with more than five years since the date of their production. Consequently, thousands of used cars have been imported through the free zone and pumped into the road network.

Non-governmental organizations (NGOs) such as Road Accidents' Prevention Society and Jordan Road Society have opposed the government's decision. They argue that tax reduction decision will result in an increase in traffic accidents. They started a campaign, which aims to force the government to cancel the new reduction of customs on cars by writing articles in the newspapers and by holding conferences. On its part, the Jordanian government cancelled the new law and confined the age of imported cars to five years only. The purpose of this paper is to examine the implications resulting from the government's decision that of reducing the customs of cars inflicted on the road traffic accidents.

2. BACKGROUND

The reduction of cars' customs and its cancellation was executed through the following three modifications. First, on 18th of September, 1999 the Cabinet cancelled its decision No. 4996 dated 5/11/1978 which prevented importing used cars and buses that are five years old and more. Moreover, this has allowed the import of cars and buses regardless of their production dates [1]. The custom department defined these used cars as "cars licensed in their country of origin for more than six months and have traveled more than 10,000 km." [1]. accordingly, the following taxes were imposed:

- (1) New Vehicles: A tax reduction of 5% and in accumulating order for each year preceding the production year up to the first seven years, and a tax reduction of 1% for each of the preceding years shall be enforced.
- (2) Used Vehicles: A tax reduction of 15% for each of the first two years of use, 10% for the third year, 5% for each year preceding the four years, and 1% for each year proceeding the past seven years and in accumulating order shall be enforced.

The second modification was introduced on the fourth of July, 2000, where new changes of the first modification were presented [2]. These changes are as follows:
New Vehicles: A tax reduction of 10% for each of the first and second year which precedes the production year and 5% tax reduction for each of the remaining three years and in an accumulating order shall be enforced.

- (1) Used Vehicles: A tax reduction of 15% for the first year, 10% for each of the second and third year, and 5% for each of the fourth and fifth year and in an accumulating order shall be enforced.
- (2) The tax reduction for the new and used vehicles stated above shall be effective only for the first five years.
- (3) Vehicles in the Free Zone, which are granted official permission and vehicles which were purchased prior the issue of this modification in the Official Gazette are to be excluded from the aforementioned three points. Instead the following reductions shall be enforced:
 - a. New Vehicles: A tax reduction of 10% for the first year preceding the production year, 5% for each of the six years preceding the first year, and 1% for each year preceding the past seven years and in an accumulating order shall be enforced.
 - b. Used Vehicles: A tax reduction of 15% for each first two used years, 10% for the third year, 5% for each year of the four years preceding the first three years, and 1% for each year preceding the past seven years and in an accumulating order.

The third and last modifications were introduced on the 29th of August, 2000 which have cancelled paragraphs (a) and (b) above and confined the ages of taxable vehicles to five years. In short, the new law lasted only about eleven months before it was canceled and the restriction on taxation of used vehicles became implemented [3].

3. TRAFFIC CONDITIONS

The volume of traffic on the road network increased remarkably during and after 1999 due to the change in tax law in Jordan. Table 1 shows the total number of registered vehicles in Jordan during the period 1995-2000 [4]. It shows that the percentage increase in number of vehicles through the cited years ranges from 6.5 % to 13%. The highest percentage increase was 13% in year 2000 relative to year 1999. This is due to the permission of importing used vehicles regardless of their age. Table 2 exhibits the total number of vehicles allowed to leave the Free Zone area after the implementation of the new tax reduction law [5]. Table 2 shows that during the year 2000, 56,560 vehicles were checked out of Free Zone. This number is higher than the total increase in registered vehicles between year of 1999 and year 2000 which was only 54,906 vehicles (see table 1). This is due to the fact that part of the checked out vehicles from the Free Zone was re-exported to the neighboring countries. Table 2 emphasizes that the highest number of vehicles checked out of the Free Zone was in July & August, 8758 & 8955 respectively. This is due to government's steps aiming towards canceling the tax-reduction law as discussed earlier, and people were rushing to buy used cars in order to get an advantage tax law reduction before it was cancelled.

Table 1: Total Registered vehicles in Jordan (1995-2000)

Year	1995	1996	1997	1998	1999	2000
Total registered vehicles	321373	342337	362811	389169	418433	473339
Percentage increase	-----	6.5	5.98	7.26	7.5	13

Table 2: Total Number of Vehicles Checked out of the Free Zone in Zarqa

Date	Total number of Vehicles
1-8-1999 to 31-8-1999	3171
1-9-1999 to 30-9-1999	2893
1-10-1999 to 31-10-1999	3217
1-11-1999 to 30-11-1999	3280
1-12-1999 to 31-12-1999	2949
1-1-2000 to 31-1-2000	3929
1-2-2000 to 29-2-2000	3839
1-3-2000 to 31-3-2000	4344
1-4-2000 to 30-4-2000	6329
1-5-2000 to 31-5-2000	7354
1-6-2000 to 30-6-2000	7271
1-7-2000 to 31-7-2000	8758
1-8-2000 to 31-8-2000	8955
1-9-2000 to 30-9-2000	2408
1-10-2000 to 31-10-2000	3373
Total	72070

4. DATA ANALYSIS

4.1. Monthly Distribution of Accidents

Table 3 shows the monthly distribution of accidents for the years 1997 to 2000 [6]. It was observed that the high rate of accidents occurred in January & December during the beginning of winter and due to the extremely poor levels of skid resistance of the roads' surface. The figures in table 3 also show that in July & August, which are summer, months have experienced a high rate of accidents too. This could be due to the presence of many visitors arriving to Jordan during the summer; either native Jordanians working in the Gulf States or tourists. This has resulted in an increase of road usage & consequently an increase in the rate of traffic accidents. Since the impact of the used cars entering from the free zone to Jordan road network will be beyond a single month this entails that their effect on accidents will be evident in the future as well.

Table 4, which developed from Table 3, shows total accident, fatalities, & casualties/injuries from November 1997 to October 2000. The table covers three-year categories, 1997-1998, 1998-1999, & 1999-2000. Since the first tax-reduction law was issued on September of 1999, it was found appropriate to examine the accidents two months after the passing of this law. This means to start investigating the accidents starting from the month of November. Nevertheless, it was a useful idea to examine the accidents before & after the application of the tax-reduction law. Therefore, the year 1997 was chosen as the base year. Figure 1, which was drawn from Table 4 shows that during the periods following the beginning of tax-reduction law starting from November 1999 they were marked by an increasing number of road accidents. This increase lasted from November 1999 to May 2000. It is also noticeable from the figure that the following period starting April 2000 witnessed a slight reduction in road accidents. This fact could be due to the customization of the new vehicle owner with the traffic stream & thus has resulted in fewer accidents. Furthermore, this has resulted in comparable figures from year 1998-1999 & year 1999-2000.

Table 3: Monthly Distributions of Accidents in Jordan (1997-2000).

Month	1997-1998			1998-1999			1999-2000		
	Total accidents	No. of injuries	No. of fatalities	Total accidents	No. of injuries	No. of fatalities	Total accidents	No. of injuries	No. of fatalities
Jan.	3540	1340	54	4518	1694	59	4419	1500	67
Feb.	3244	1313	39	3112	1288	38	2965	1065	42
Mar.	3021	1248	32	3405	1354	44	3634	1493	60
Apr.	2922	1299	54	2909	1384	47	3788	1471	36
May	2992	1319	48	3214	1299	34	4036	1508	51
Jun.	3053	1300	37	3270	1398	72	4112	1622	57
Jul.	3760	1590	66	3703	1639	61	4880	1839	58
Aug.	3529	1596	51	4141	1610	56	4730	1994	61
Sep.	3100	1406	46	3720	1409	60	4351	1738	61
Oct.	3092	1338	55	3887	1425	48	4333	1627	57
Nov.	3228	1264	42	3481	1282	39	4205	1461	56
Dec.	3524	1246	53	3983	1395	54	4877	1677	70
Total	39005	16259	577	43343	17177	612	50330	19015	676

Table 4: Road Accident Data in Jordan from November-October for the Years 1997-2000 Including the Period of Changes in Customs of Vehicles

Month	1997-1998			1998-1999			1999-2000		
	No. of Accidents	Fatalities	Injuries	No. of Accidents	Fatalities	Injuries	No. of Accidents	Fatalities	Injuries
Nov.	3228	42	1264	3481	39	1282	4205	56	1461
Dec.	3524	53	1246	3983	54	1395	4877	70	1677
Jan.	4518	59	1649	4419	67	1500	4847	56	1619
Feb.	3112	38	1288	2965	42	1065	3777	46	1356

4.2 Severity of Accidents

The severity indices were defined through different literature to describe the severity of accidents. They were used for the purpose of comparison the different methods. Jacobs & Hards, had defined the severity index as "the ratio of the number of fatalities divided by the number of casualties" (i.e. fatalities & injuries)[7]. Whereas Morin had defined the severity index as "the ratio of the number of fatalities divided by the number of accident" [8]. Table 5 shows the severity indices of the two definitions as well as the causality per accident in Jordan.

Figure 2 represents the severity indices (fatality / accident) for all road accidents that took place in Jordan during the months of November through October for the years 1997-2000. The figure shows that the tax reduction law has no effect whatsoever on the number of fatality per accident (SI). The severity indices are not far from each other except for June, 1998 where SI was 0.022, which was the highest among all values.

Table 5: Severity of Accidents and the Casualties per Accident in Jordan (1997-2000)

Month	1997-1998			1998-1999			1999-2000		
	SI'	SI''	Casualty per accident	SI'	SI''	Casualty per accident	SI'	SI''	Casualty per accident
Nov.	3.22	0.013	0.14	2.95	0.011	0.38	3.69	0.013	0.36
Dec.	4.1	0.015	0.37	3.73	0.014	0.36	4.0	0.014	0.36
Jan.	3.37	0.013	0.39	4.28	0.015	0.35	3.34	0.012	0.35
Feb.	3.87	0.012	0.43	3.79	0.014	0.37	3.28	0.012	0.37
Mar.	3.15	0.013	0.41	3.86	0.017	0.43	3.90	0.015	0.38
Apr.	3.28	0.016	0.49	2.4	0.01	0.40	3.74	0.016	0.42
May	2.55	0.011	0.41	3.27	0.013	0.39	3.33	0.013	0.39
Jun.	4.9	0.022	0.45	3.39	0.014	0.41	3.78	0.013	0.36
Jul.	3.6	0.016	0.46	3.1	0.012	0.39	2.90	0.012	0.42
Aug.	3.36	0.014	0.40	2.97	0.013	0.43	3.97	0.016	0.41
Sep.	4.1	0.016	0.39	3.35	0.014	0.42	2.64	0.010	0.36
Oct.	3.26	0.012	0.38	3.38	0.013	0.40	3.73	0.013	0.34

$$SI' = \text{Severity Index} = (\# \text{ of fatalities} / \# \text{ of casualties}) * 100$$

$$SI'' = \text{Severity Index} = (\# \text{ of fatalities} / \# \text{ of accidents})$$

Figure 3, which is drawn out from Table 5 represents the severity indices as defined by Jacobs & Hards for all road accidents that occurred in Jordan during the

months November to October for the years (1997-2000). The figure shows that the severity indices for the months of March, April & May are much higher than the previous years (1998, 1999). However, there is no indication that such rise in severity index is related to tax reduction law. However, the severity index during the month of June, 1998 was the highest among all the periods of study. This fact is also emphasized in figure 2, which means that the number of fatality per accident as well as the number of fatality per casualties was the highest in June 1998.

4.3 Casualties per Accident

Jacobs & Fouracre [9] have examined the road accidents in terms of casualties per accident against time to describe the trend of the number of killed & injured people per accident.

Figure 4 highlights the casualties per accident in Jordan during the months of November through October for the years 1997-2000. This figure shows that during the month of November 1999, just two months after the tax-reduction law was passed, through the month of October 2000, just two months after the tax-reduction law was cancelled, the casualties per accident were less than the same periods of 1997-1998 & 1998-1999. The figure explains that the tax-reduction law didn't affect the casualties per accident. On the contrary, the rate of casualties per accidents was less than in the previous years.

4.4 Accident Rates

Accident rates are useful in quantifying the overall risk to individuals on a comparative basis. They generally fall into one of two broad categories: population-based rates and exposure-based rates. Since the change of vehicle's customs and the allowable of taxation of old cars have resulted in an increase of total registered vehicles in Jordan, the comparison of accidents based on the number of registered vehicles, which fall in the first category, are essential to study the impact of this increase on accidents.

Table 6, which was derived from Tables 1 and 3, exhibits the accident, fatality, and injury rates per 10,000 vehicles. The table shows that the fatality and injury rates for year 2000 is less than that of years 1997, 1998 and 1999 whereas the accident rate for year 2000 is slightly higher than that of years 1997 and 1998 and less than of the year 1999. The table shows that the increasing

number of vehicles as a result of the changes in the tax law has had a negligible effect on the rates of accidents, fatalities, and injuries.

Table 6. Accident, Fatality, and Injury Rates per 10,000 vehicles in Jordan (1997-2000)

Rate per 10,000 vehicles	Year			
	1997	1998	1999	2000
Accident Rate	1075	1114	1203	1120
Fatality Rate	15.0	15.7	16.2	14.5
Injury Rate	448.1	441.1	454.4	398.1

Table 7. Percentage increase of total accidents in Jordan

Month	Year	
	1998-1999	1999-2000
Nov.	7.8	20.8
Dec.	13	22.5
Jan.	-2.2	9.7
Feb.	-4.7	27.4
Mar.	6.7	16.1
Apr.	30	1.4
May	26.4	6.9
Jun.	25.8	5.1
Jul.	31.8	0.9
Aug.	14.2	-0.6
Sep.	17	4.4
Oct.	11.5	-7.9

Table 7 and figure 5 which were derived from Table 4 show that by taking the period of 1997-1998 as a base year, the percentage increases of total accidents during the period of November, which is the beginning of implementing of tax-reduction law, to March of the year 1999-2000, were much higher than the same period of 1998-1999. However, the percentage increases of total accidents starting from April through October during the period of 1998-1999 were much higher than that of 1999-2000. Which means that the implementation of customs reduction law has affected the traffic accidents only during the first five months that followed the starting of law implementation.

5. CONCLUSION

The comparison of road accident statistics during the months of November through October for the year 1997 & 1998, and the same months for the 1999 & 2000 during the tax-reduction law was active, show that the tax-reduction law of vehicles on road accidents in Jordan is negligible. The data analysis shows that

there is a slight increase of traffic accidents during the periods following the beginning of tax –reduction starting from November 1999 to May 2000. The analysis of severity of accidents as well as the analysis of casualties show that the tax law changes and allowing importing old cars have no effect on accident severity or the casualties per accidents.

Table 6 shows without any doubts that the increased number of vehicles during the years of 1999 and 2000 didn't have any impacts on accident, fatality, and injury rates. On the contrary, the table exhibits that both the rates of fatalities and the injuries in year 2000 were less than those of the previous years cited in Table 6.

In short, the analysis shows that there was no base whatsoever for the government's decision to cancel the changes in tax law or to cancel the importing of old cars. The impacts of the new law were observed through the number of total accidents, which happened only during the first five months as shown in Table 7.

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Figure 1. Monthly Distribution of Total Accidents

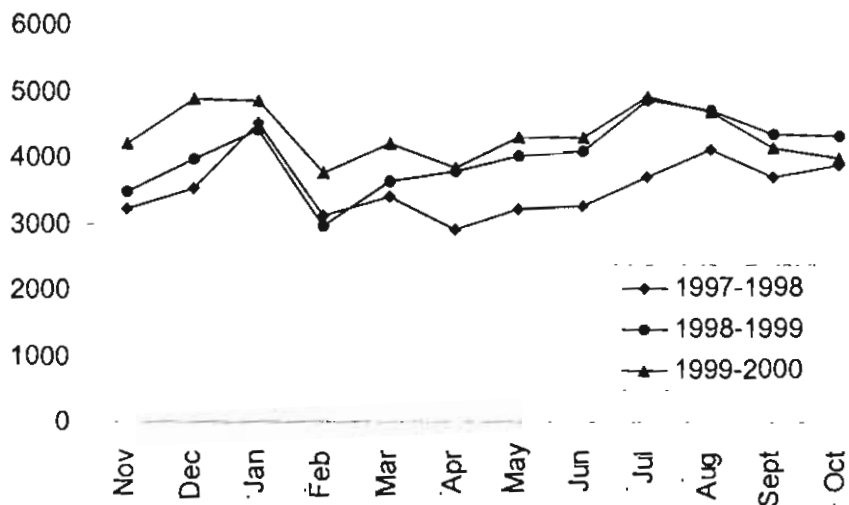


Figure 2. Severity Index (fatality/casualties) as a percentage in Jordan During the Periods of Study

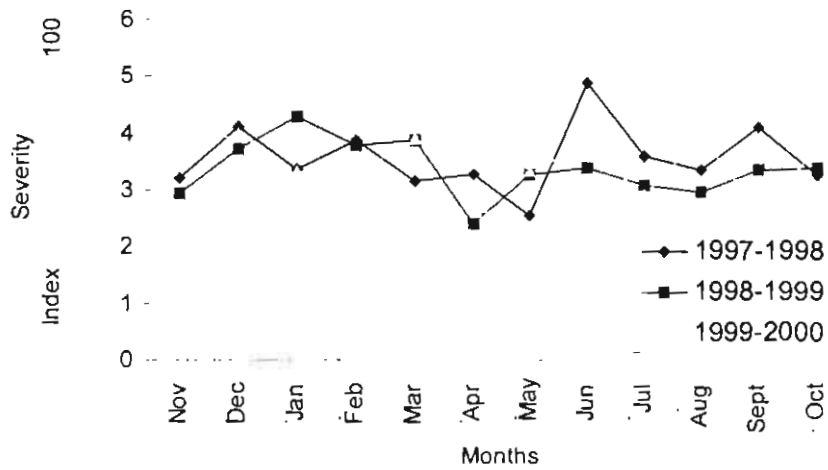


Figure 3. Severity Index(fatality/accidents) in Jordan During the Periods of Study

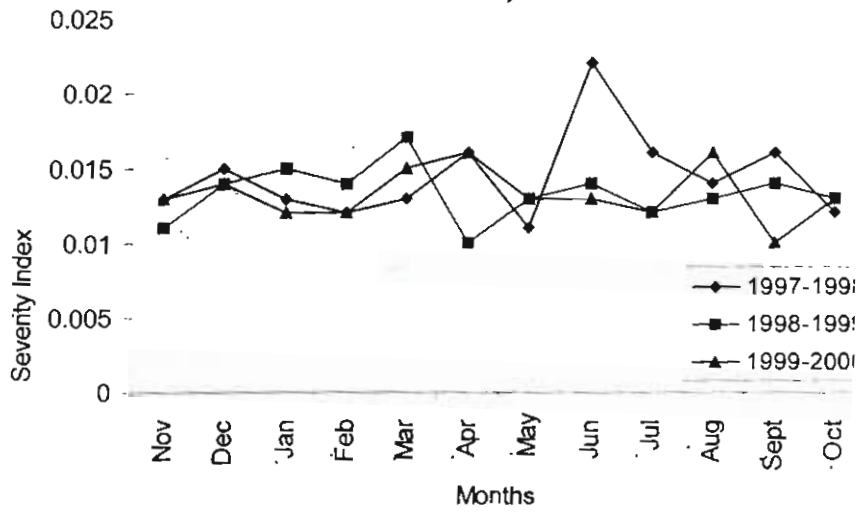


Figure 4. Casualties per Accident During the Periods of Study

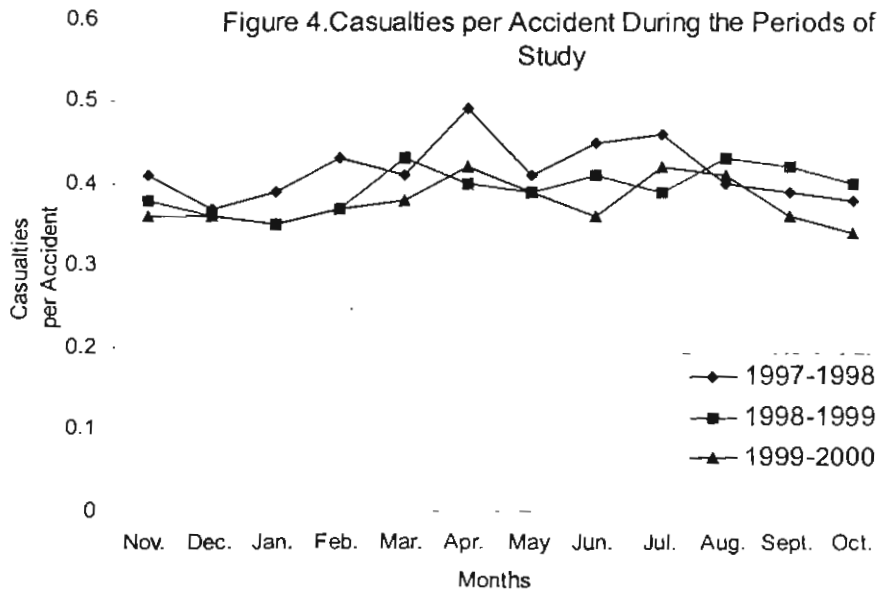


Figure 5. Percentage Increases in Total Traffic Accidents During the Periods of Study.

