Towards Reforming Fossil-Fuel Subsidies in Algeria: Evaluation test of road users' reactions in terms of private cars use and ownership intensity.

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Abstract
The main aim of this article is to assess the road users' acceptability degree of potential increase in the fuel taxes in Algeria. We measure the willingness to pay and its impact on the intensity of using and owning a private car in the future, and that on the assumption ofan increase in fuel prices to the level of prices in the neighbouring countries. For this purpose, we will analyse the data collected from a survey that we have conducted in March 2015.

Key words: Reforming energy subsidies, fuel taxation, fuel Subsidies, private car, traffic congestion.

Vers une réforme de la subvention du carburant fossile en Algérie: Essai d'évaluation des réactions des usagers de la route en termes d'intensité d'usage et d'accès aux voitures particulières

Résumé
L'objectif principal de cet article est d'apprécier le degré d'acceptabilité des usagers de la route d'une augmentation éventuelle des taxes sur le carburant en Algérie. Nous mesurerons la disposition à payer, son impact sur l'intensité d'usage, et la possession future de la voiture particulière et ce, en retenant l'hypothèse d'un niveau des prix des carburants équivalents à ceux de nos voisins. Nous analyserons les données recueillies à partir d'une enquête que nous avons menée en mars 2015.

Mots - clés: Réforme des subventions à l'énergie, taxation du carburant, subventions sur les carburants, voiture particulière, congestion routière.

نحو إصلاح دعم الوقود الأحفوري في الجزائر:محاولة تقييم ردود أفعال مستخدمي الطريق فيما يتعلق بكثافة استعمال وامتلاك السيارات الشخصية

ملخص
يتمثل الهدف الرئيسي لهذا المقال في تقدير درجة قبول مستخدمي الطريق للزيادة المحتملة في الضرائب على الوقود في الجزائر، وهذا من خلال قياس الاستعداد للدفع، ومدى تأثيره على كثافة استعمال وامتلاك السيارة الشخصية في المستقبل. وذلك على افتراض الرفع في سعر الوقود ليصل سعره لمستوى مماثل للأسعار في البلدان المجاورة. لهذا الغرض، سنقوم بتحليل البيانات التي جمعها من خلال الاستبيان الذي أجريناه شهر مارس 2015.

الكلمات المفاتيح: إصلاح دعم الطاقة، ضرائب الوقود، تدعيم الوقود، سيارة شخصية، إزدحام مروري.

Introduction:

Nowadays, in most cities, the private car has become an important and the dominant mode of transport. The increasing dominance of the private car as a mode of transport is due to inherent advantages associated with its use. For this reason, the desire for personal vehicles is powerful and pervasive. The big enthusiasm towards using and owning personal vehicles led the world witnesses a huge development in the private car use. The situation in Algeria is the same, especially that the trends over recent years demonstrate that the fleet is growing rapidly and the country witnesses a mass use of motor vehicles.

Traffic is a sign of mobility and of a dynamic economy. However, excessive dependency on motor vehicles, which exceeds the capacity of available road networks, was bound to have some unforeseen and undesirable consequences on all sides; on the economic, social and the environmental side to the degree that it can be considered among the biggest issues of the era. If not managed effectively, it can cause important economic cost and affect negatively the quality of life instead of making mobility easier. These costs incurred by the community as a whole generally are not paid for by the road users who have caused them. And this requires actions to influence driver behaviour by shaping or reducing travel demand by imposing taxes on fuel or motor vehicles for example.

There are many factors that explain the big enthusiasm for buying cars in Algeria. Basically, the improvement in standards of living, favoured by soaring oil prices and economic growth during the last 15 years, is the most prominent factor that helped the motorization rate increase, as well as: urbanization and urban sprawl; without forgetting the dysfunction of public transport. In addition, there are other historical and socio-cultural factors exacerbating this trend. Moreover, and culturally speaking, the car, besides its being a tool to solve problems of mobility, its considered in the minds of most youth, as a sign, a synonymous for social success. In addition, the Algerians prefer not to travel with their families in collective transport, etc.Yet, in our point of view, there is basically a purely economic factor playing a decisive role in promoting such phenomenon in Algeria, and that was neglected even by specialists in the domain: very cheap fuel. Fuel is the most important source of energy for most means of transport in the world, especially private car, and the fuel prices in Algeria are considered among the most "**competitive**" prices in the world.

The price of oil is of critical importance to today's world economy; given that oil is the largest internationally traded good, both in volume and value terms. Algeria is heavily reliant on oil and natural gas export revenues. In which hydrocarbon exports revenues accounted approximately 97% of Algeria's total export revenues. Oil reserves helped the Algerian government avoid the worst effects of the 2011 uprisings that spread throughout the region by offering benefits and subsidies to its citizens. Yet, nowadays Algeria could not continue on this path because of the unexpected continuous fallout and the decline in oil prices in the last period, which has led many oil-producing nations to reconsider their incredibly costly fuel subsidies.

Therefore; to put it in a nutshell, this is an ideal moment for the Algerian government to recalibrate the fuel subsidies; first because the policy of subsidizing fuel prices represents a heavy burden for the state budget, and second, since the government could use the pressure of outside economic forces to make the argument for internal change, also the natural consequences of dropping oil prices could bring home the reasons for reform. In addition, cutting subsidies when fuel is cheap will make the process less painful for consumers, and this is what the preliminary draft Finance Bill for 2016 intends to, in which the government plans to raise fuel prices through a new tax provision related petroleum products. For this reason**,**we want to know the interviewed sample point of view concerning their reaction toward the use and ownership of private car in case of reforming fossil-fuel subsidies.

According to what we have mentioned above, we can build our research problem as follows:

- **How would the Algerian individual reaction be, in terms of car use and ownership intensity in case of reforming fuel subsidies?**

õ **Sub-questions:**

õ What is the Algerian individual culture over the ownership and the manner of using the private car according to the current fuel prices?

õ At which level does the cheap fuel price in Algeria contribute in increasing the use and ownership of the private cars' rate?

õ What is the possibility of reducing the economic attractiveness of the use and ownership of motor vehicles in Algeria based on increasing motor fuel taxes?

- **Hypotheses:**
- The Algerian individual culture heading towards relying more on private car, according to the current fuel prices;
- The cheap fuel price in Algeria contributes in increasing the use and ownership of the private cars' rate dramatically and significantly;
- There is a big potential that fuel subsidies reforming in Algeria will lead to a reduction in the economic attractiveness of the use and ownership of the private cars since the fuel is considered as a key element in the car exploitation cost construction.

2. Development of the use of private cars in Algeria:

Cars have transformed modern life and are one of the great industrial success stories of the 20th century, because they offer unprecedented freedom, flexibility, convenience, and comfort, and they bestow untold benefits on their owners, for this reasons the desire for personal vehicles is powerful and pervasive.

The big enthusiasm towards using and owning motor vehicles led that the world witnesses a huge development in the use of means of transport, especially the private car. For example,the trends over recent years demonstrate that there were 940 million cars in the world in 2011, while the global car park will reach more than 2.1 billion cars by 2040, increasing at an average of 3.4% p.a. from 2011. Over the period 2011–2040, OECD countries, see the volume of cars rise by close to 130 million. In developing countries, the rise is more critical, with more than a billion additional cars over this period. By 2026, there will be more cars in developing countries than in the OECD**(1)**.

Today's billion vehicles are pumping extraordinary quantities of greenhouse gases into the atmosphere, are draining the world's conventional petroleum supplies, are inciting political skirmishes over oil, and are overwhelming city roads, generating multiple impacts on urban regions and their inhabitants. Among these impacts, we can single out the cost of lost time "*Involving queuing, slower speeds and increased travel times, longer, less predictable travel times, the loss of productive time, reduced time people spend with their families*"**(2)**, accelerated depreciation in infrastructure, increased rates of traffic accidents, noise, as well a psychological and social effects on road users,…etc**(3)**.All these adverse effects have an impact on the national economy, either directly or indirectly, and the evidence available indicates that they are increasing. Even in the most conservative view, conventional motorization, vehicles, and fuels threaten an economic and environmental cataclysm.

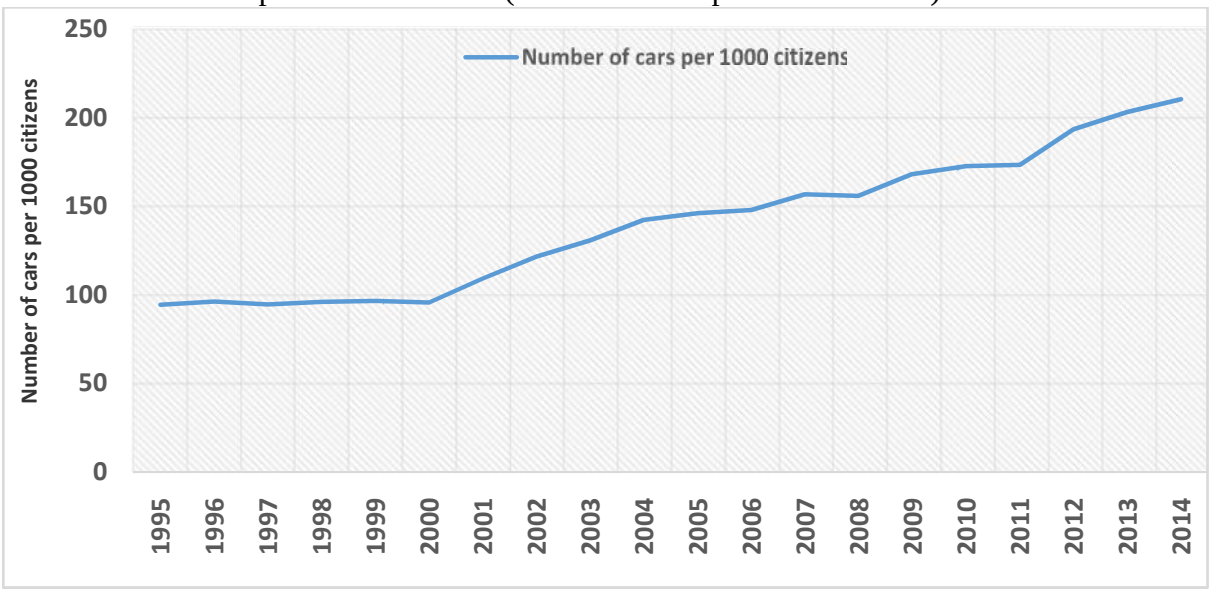
In Algeria the situation is the same, since the country has witnessed an explosion in the rate of motorization. The park has almost doubled during the last twelfth years. The 2014 statistics provide a number of vehicles of all categories, which amounted to 8.3 million units against 2.64 million units in 1995**(4)**. Table N° 1 shows the evolution.

Table No. 01: The Evolution of motorization rate in Algeria. Period: 2000-2014.

Year	Population (Unit:Million)	Park (Unit:Million)	Motorization rate (vehicle for number of inhabitants)
2000	**30.83**	**2.94**	**10.46**
2001	**31.15**	**3.40**	**9.16**
2002	**31.32**	**3.80**	**8.24**
2003	**31.84**	**4.16**	**7.65**
2004	**32.36**	**4.60**	**7.03**
2005	**32.90**	**4.80**	**6.85**
2006	**33.80**	**5.00**	**6.76**
2007	**34.40**	**5.38**	**6.38**
2008	**34.80**	**5.42**	**6.42**
2009	**35.20**	**5.91**	**5.95**
2010	**35.90**	**6.19**	**5.79**
2011	**36.70**	**6.36**	**5.77**
2012	**37.50**	**7.30**	**5.17**
2013	**38.70**	**7.86**	**4.92**
2014	**39.50**	**8.30**	**4.75**

Source: Table created on the basis of the National Office of Statistics and National centre of computer and Customs Statistics (CNIS) Algiers. 2015.

Figure No. 01: Diagram showing the evolution of motorization rate in Algeria during the period: 1995-2014 (motor vehicles per 1000 citizens).



Source: Figure created on the basis of the results of table No. 01.

As shown from the table and from the diagram above, we find a sharp increase recorded since 2000. It is clear that the improvement in living standards of Algerian people in recent years has a direct impact on the growth of motorization rate. In this favourable context, car dealerships have flourished and sales have been boosted by the car loan. So that the Algerians are quickly equipped with cars. Note that the process of buying cars on credit has been frozen in 2009 and a new tax imposed on the purchase of new imported cars.

Despite the freezing of buying cars on credit and imposed tax on new vehicles, the trend has not been curbed. Before frozen car purchase and imposed taxes, Algeria imported between 200,000 and 250,000 vehicles /year. In 2011, a new peak was recorded. This peak is explained through the significant wage increases that known in all activity sectors with retroactive effect from January 2008. Therefore, many Algerians had large wage remnants

enabling them to finance the purchase of a vehicle easily. Today, we are talking about 439,637 vehicles imported in 2014 against 554,263 units in 2013, a decrease of 20.68 % [(5)]. How to explain this decrease? Professionals have analysed this market and found "a drop in demand and a high level of stocks, mainly generated by the orientation of household spending to real estate, especially for housing type leasing of ALDA". The Second factor that weighed in the balance «the decline in car imports comes following decisions taken by the government to clean up the automotive market» in order to stabilize the market. The law of Finance 2014 had introduced several measures, including particular limiting ofthe importation of vehicles to automotive distributors, the ban import of the latter on behalf of other distributors outside their distribution networks, and the requirement to install an industrial activity or service within a period of three (3) years. According to experts, this downward trend in imports of vehicles will continue with the entry into production of the new Renault factory in Oued Tlelat Oran (Algeria). Unlike in Tangier, which most of the production is exported to Europe and the Mediterranean, Oran factory will produce mainly for the Algerian market .It has an initial production capacity of 25,000 units / year, and expects to reach 75,000 units / year in a second step[(6)]. Regarding motorized mobility, a heavy trend in the use of the private car is really here and it is growing.

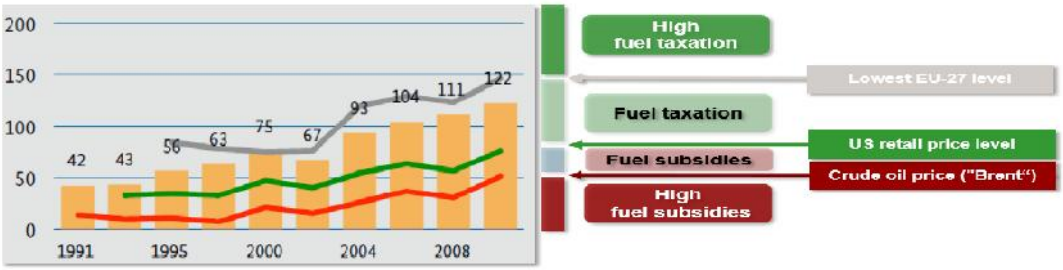
3. Fuel prices policies adopted in the world:

The globalization of world trade led to a convergence in the prices of cars all over the world and the equalization between them, so that disparity in the rate of the price of identical cars does not exceed more than a double or two (2) doubles between any two (2) countries. Whereas fuel prices are completely different, they are in the range of 1 to 208 doubles[(7)]. This big difference is due to the different pricing policies pursued by each country, either by high subsidy of fuel or high taxes imposed on fuel. While the fossil-fuel taxation is taken for granted in many countries, especially the industrialized ones in which it is considered, in some cases as a significant financial source and a mainstay of the state revenues and finance. There are still a number of countries, primarily developing ones, including Algeria, swimming against the mainstream by adopting an opposite policy; that of subsidizing the fuel price. In Algeria, the price of fuel represents on average 10% of the prices charged in Europe and about a quarter of the price in neighbouring countries[(8)]. On another level, this difference in fuel prices between Algeria and its neighbours makes the country a fertile ground for promoting smuggling and encouraging waste of energy, and this represents an obstacle of a progress and improvement of the state tax revenues.

3.1. International fuel prices:

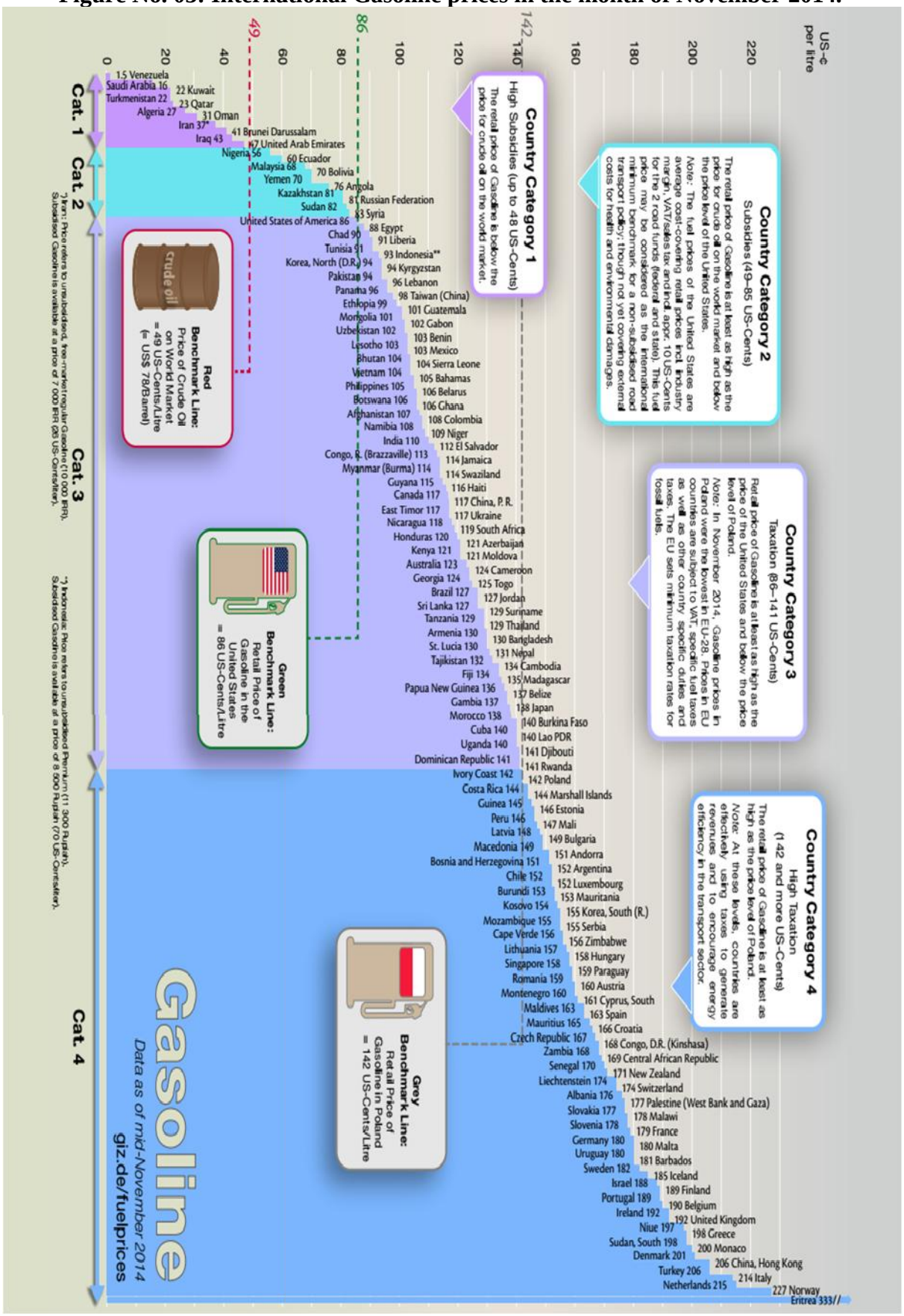
The big difference of fuel prices is due to the pricing policies pursued by each country, according to GTZ investigations, the fuel prices in Algeria are considered among the most "**competitive**" prices in the world. On the global scale, regarding gasoline premium, we find that Algeria occupies the fifth position in terms of the lower prices. For Diesel, it is the fourth cheapest price in the world[(09)]. For example, the price of a litre of diesel is (approximately 17 US-cents) and unleaded gasoline is for 29 US-cents. According to GTZ investigations the fuel prices policies of all countries in the word can be assigned to one (1) of **four (4) CATEGORIES;** and the three following figures (1), (2) and (3) illustrated that:

Figure No. 02: Fuel Price Level – Categorisation.



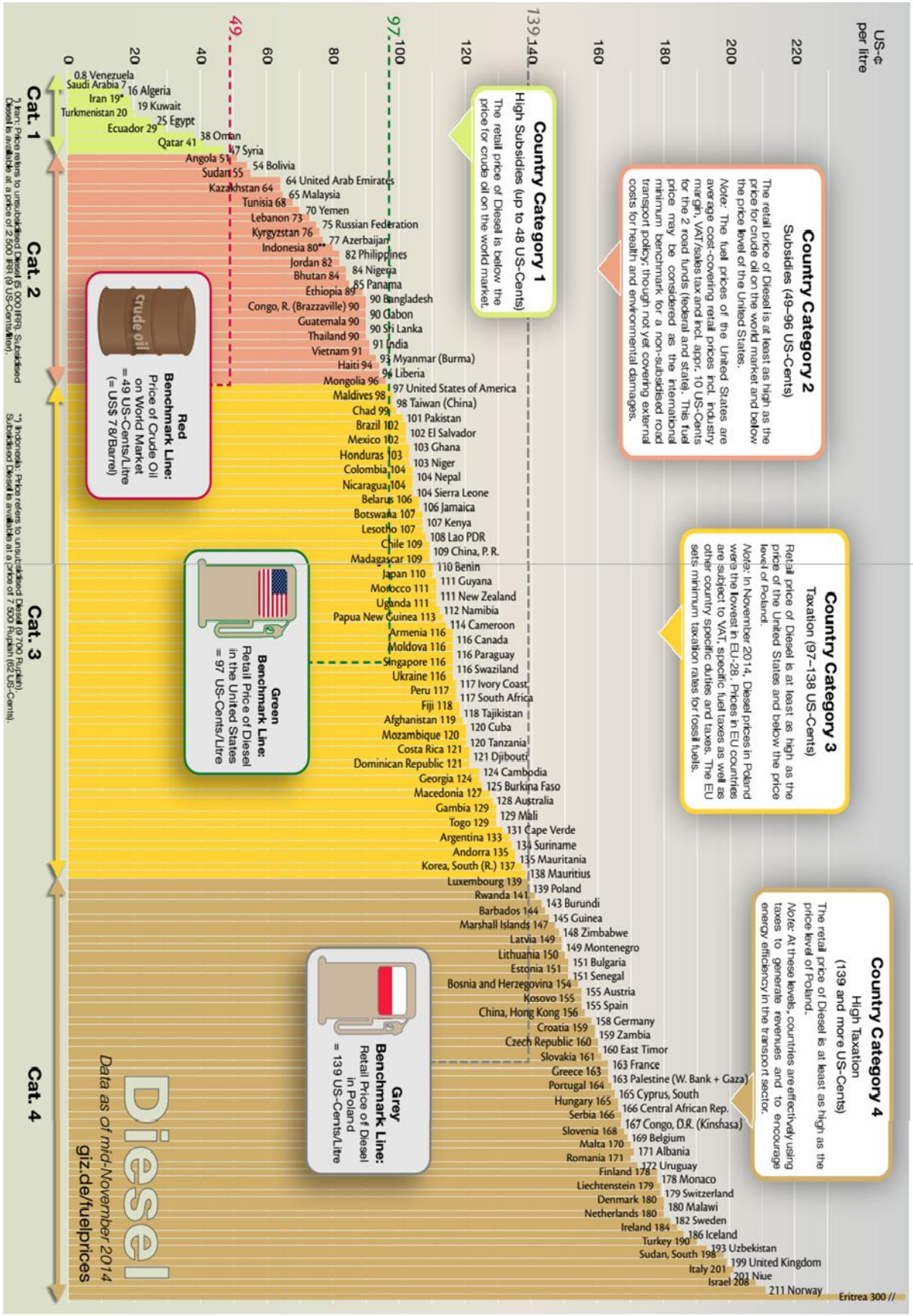
Source: Wanger, Armin. 2014.[(10)]

Figure No. 03: International Gasoline prices in the month of November 2014.



Source: German Technical Cooperation (GTZ), 2014,Op.Cit, P:01.

Figure No. 04: International Diesel prices in the month of November 2014.



Source: German Technical Cooperation (GTZ), 2014,Op.Cit, P02

From the two above figures (3) and (4) we find that the fuel prices policies of all countries in the word can be assigned to one (1) of **four (4) CATEGORIES;**

Country Category one (1): High subsidies (up to 48 US-Cents) the retail price of Diesel or Gasoline is below the price of crude oil on the world market. Algeria belongs to this category.

Country Category two (2): Subsidies (49-96 US-Cents for Diesel) (49-85 US-Cents for Gasoline) the retail price of gasoline and diesel is at least as the price for crude oil on the world market and below the price level of the United States. This fuel price may be considered as the international minimum benchmark for a non-subsidised road transport policy.

Country Category three (3): Taxation (97-138 US-Cents for Diesel) (86-141 US-Cents for gasoline) the retail price of gasoline and diesel is at least as the price of the United States and below the price level of Poland.

Country Category four (4): High Taxation (139and more US-Cents for Diesel) (142 and more US-Cents for gasoline) the retail price of Diesel or Gasoline is at least as high as the price level of Poland(11).

3.2. Subsidizing the price of fuel:

As mentioned before, we find that while taxation of fossil fuels remains a powerful instrument to generate revenues for road infrastructure and its maintenance in industrialized countries, where it's taken for granted, there are still a number of countries primarily developing ones pursue just the opposite policy that is "to subsidy fuel prices".

Although the term "**subsidy**" is widely used in economics, it is rarely defined. Often it is used as an antonym to a tax, i.e. *a government transfer of money to an entity in the private sector*[(12)]. This seems, for instance, to be the case in the Oxford online dictionary where a subsidy is defined as: "*a sum of money granted from public funds to help an industry or business keep the price of a commodity or service low*"[(13)]. Yet there is no universally accepted definition of a subsidy, because there is enormous confusion surrounding the terminology and definition of this word. Government intervention, assistance, transfers and support measures can all generally be considered as a form of subsidy.

The narrowest and perhaps most commonly used definition of a subsidy is a direct cash payment by a government to an energy producer or consumer. However, this is just one way in which governments can stimulate the production or use of a particular fuel or form of energy. Broader definitions attempt to capture other types of government interventions that affect prices or costs, either directly or indirectly. For example, The US Energy Information Administration (US DOE/EIA, 1992) has defined an energy subsidy *as any government action designed to influence energy market outcomes, whether through financial incentives, regulation, research and development or public enterprises*[(14)]. However The Organisation for Economic Co-operation and Development (OECD, 1998), has defined subsidy in general terms as *any measure that keeps prices for consumers below market levels, or for producers above market levels, or that reduce costs for consumers and producers by giving direct or indirect support*[(15)]. In a similar way, the International Energy Agency (IEA, 1999) defined energy subsidies as *any government action that concerns primarily the energy sector that lowers the cost of energy production, raises the price received by energy producers or lowers the price paid by energy consumers*[(16)]. Afterwards OECDdefines a subsidy as "*a result of a government action that confers an advantage on consumers or producers, in order to supplement their income or lower their costs*" [(17)].

Energy subsidies come in two (2) main forms: those designed to reduce the cost of consuming fossil fuels; and those aimed at supporting domestic fossil-fuel production[(18)]. Subsidies aimed at consumers are generally intended to keep fossil-fuel prices low, in order to stimulate certain sectors of the economy or alleviate poverty, by expanding the population's access to energy[(19)].

This research works broadly within these ideas of what a subsidy is. Yet we will adopt the next definition for this paper. The term « fuel subsidies » is understood as a couple of official measures, which:

- In case of **direct subsidy,** make the retail price of fuel cheaper compared to normal industrial commodities, and in this case the consumer doesn't pay the real price of fuel because it doesn't cover the actual cost of the consumed energy.
- In the case of **indirect subsidy,** such as exemption from sales tax/VAT (**Value-added tax**) or via lower-cost domestic fuel production, make the retail price of the fuel cheaper than it is in countries which depend on the world market's price[(20)].

Therefore, it is important to note the distinction between a consumer subsidy as defined above and the *'rent'* that a consumer receives from using energy. The latter is the difference between what is paid for the commodity or service and what it is worth to the consumer. A subsidy lowers the price to the consumer below what it would otherwise be, thus allowing him to obtain a greater rent.

3.3. Estimates of energy subsidies:

The International Agency of Energy estimated the global subsidies for fuel consumption of the year 2010 at the level of 406 billion dollars, compared with 312 billion dollars in 2009[(21)]. According to the agency by their economist spokesman; **Fatih Birol**, *"the global subsidizing for the consumption of fossil fuel is determined to reach 660 billion dollars in 2020, which means 0.7% of global GDP if there isn't any adopted reforms to reduce this kind of government subsidizing*[(22)]. Nobody knows the real number, however, because there is no international framework for regularly monitoring fossil-fuel subsidies.

Table No. 02: Estimates of energy subsidies in Algeria.

	Average Rate of Subsidization (%)	Subsidy ($ per person)	Total Subsidy (% of GDP)	Subsidy by fuel			Total Subsidy (US$ bn)
				Oil	gas	Electricity	
Algeria	**59.80**	**298.40**	**6.60**	**8.46**	**0.00**	**2.13**	**10.59**

Source: Fattouh, Bassam, and Laura El-Katiri, 2012[(23)].

The price of premium Gasoline imported by Algeria at the beginning of last year is assessed by 150 DZD per litre in the international market. While it is sold at, a price of 23 DZD per litre (approximately 29 U.S Cents) for domestic consumers, and it is the official price fixed administratively by the government[(24)]. This means "*a difference*" of 127 DZD (approximately 160 U.S Cents) paid by the state in each litre of imported fuel. This subsidized litre can unfortunately be sold outside the borders of Algeria, which means that this subsidy may be misplaced. In other hand, the imports of Algeria concerning Gasoline and Diesel recorded high elevation in 2011, where it reached 1.3 million tons for Diesel of annual total consumption of 8.9 tons. In the same year, 380 thousand tons of gasoline of all its kinds of the total consumption reached to 3 million tons, equivalent to a total value of 2 billion dollars, and by an annual increase estimated at 77% for diesel and 242% for gasoline[(25)]. Algeria imports petroleum products, mainly from European countries and Russia. In 2013, Algeria imported approximately 75,000 bbl/d of petroleum products[(26)]. The reason for this is due to the decline of the national refining capacity because of maintenance operations for refineries, as well as the rise in consumption caused by the high number of cars and the strong growth of the national economy as well as the spread of the phenomenon of contraband of fuel across the borders. Fuel smuggling not only contributes to illegal contraband trade, but also in many cases substantially exacerbates existing fuel shortages in the Algerian cities. So fuel importing countries should appreciate that all fuel quantities sold usually by local currency is basically a world market product and should be paid for in convertible currency,

whether by governments or consumers.

4. The main characteristics of the sample of the study:

We have conducted an investigation to try to analyse the possibility of fuel taxes contribution in reducing the economic attractiveness of the use and ownership of motor vehicles, especially the private car in order to contribute in limiting its negative effects. Our objective is to know the points of view of the interviewed people taken as sample about the issue of our study. A second element that is sought through this study is that we want to know the users' willingness to pay in case of fuel prices increase. The sample was composed of 263 people. Most of them were interviewed directly.

Table No. 03: The main characteristics of the sample.

Gender	**60.4% male and 39.6% female.**
Age	4% under 18 years old, 72% between 18 and 35 years old, 21% between 36 and 65 years old, and 3% over 65 years.
Education Level	3% primary level or lower and 22% at secondary or middle level, 75% university level.
Occupation	12% unemployed, 36% employed, 10% Independent / Dealer, 4% retired, 36% students, other 2%.
Income	46% less than 15,000 DZD, 17% between 15,000 and 25,000 DZD, 21% between 25,000 and 40,000 DZD, 16% more than 40,000 DZD.
Residence	63% of the town centre, 30% suburban, 7% in the countryside.
Motorization	48% were motor vehicle and 52% do not have a motor vehicle.

Source: Table created on the basis of results of the survey.

5. Survey results:

Through the survey that we have conducted, we obtained the following results;

5.1. The results in terms of individual and motor vehicles:

a) The private car is the main means of transport used or wished by most individuals through their daily mobility, whether major or secondary one, and whether in urban areas or for long distances.

b) It is important to mention that approximately 48% of the sample own a motor vehicle and 95.1% of them are very attached to their vehicles and cannot replace them by another means of transport. However, 52% of the sample do not own a motor vehicle and 93.0% of them make it a future goal and wish to possess a car as soon as their income increases or they find facilities to realize it.

c) Most of the interviewed sample who do not own a car possesses a driver's license (67.4%), and this is what confirms their desire to use or own a private car.

d) Large proportion of those who don't own a private car (46.5%), already drive a vehicle, in other words the use of cars is not limited to a single individual (the owner), whether under the so-called family-car, friends-car, or rental cars from specialized agencies .

e) It is important to mention that approximately 73% of those who own a private car said that they will reduce using their cars in case of providing a developed public transport system. About 15% of them said that they can waive their cars and replace them by a developed public transport, however 12% of the sample who own a car reported continued to use their cars as they were before even in case of providing a developed public transport system.

5.2. The results in terms of the knowledge levels of fuel prices:

a) According to the results of the study, 78% of the interviewed sample, believe that current fuel prices are low (affordable), especially that the price of a litre of diesel is less than the price of a litre of mineral water! Nevertheless 11% of the sample said that current fuel prices are expensive for them. However, 10% of the sample said that they did not know the current price of the fuel.

b) 82% of the interviewed sample know that fuel prices in Algeria are lower than neighbouring countries. However, 18% of them did not know.
c) 57% of the interviewed sample did not know that Algeria imports fuel to cover local demand. (Some were amazed and do not believe this abnormal phenomenon import petroleum products in a country that manufactures and exports oil).
d) About 36% of the interviewed sample said they were not aware that fuel prices in Algeria are subsidised (in the sense that the retail price of fuel in Algeria is below the price for crude oil on the world market).
e) About 67% of the interviewed sample said that they are fed up of suffering from a problem of long waits for a few drops of fuel due to the fact that most of the surveys have been distributed in the provinces of Batna, and Khenchela and they are near states from the Tunisian border, where the process of smuggling is promoted.
f) About 28% of the interviewed sample said that they had been faced with a problem of speculative fuel prices due to the problem of queues for refuelling which lead owners of vehicles to stand for long hours to refuel, and this led to the emergence of parallel trade of fuel in many border states.

5.3. The results in terms of current fuel prices and their relationship to the attractiveness of the motor vehicles:

a) 74% of those who do not own a motor vehicle (52% of the sample) consider that current fuel prices encouraged them to buy one. According to them, the fuel price is affordable (compatible with their purchasing power).
b) 80% of those who already have a motor vehicle, consider that the current fuel price contributes to the increase of the "attractiveness" of the vehicle. They declare that they use their vehicles for long periods and in all types of travel without effective attention to the consumed fuel.
In parallel of the increase of cars number, we have is to consider the indicator, vehicle/km which is also increasing.

5.4. The results in terms of the users' willingness to pay in case of fuel prices increase.

a) Regarding to the highest price for fuel the interviewed of the study sample who ownprivate car are willingness to pay in order to continue to use their private car.
30.1% are willing to pay between 20 and 40 DZD/ per litre of fuel. 38.8% are willing to pay between 40 and 60 DZD/ per litre of fuel. And 30.1% are willing to pay, meanwhile, between 60 and 70 DZD/ per litre of fuel.
b) Regarding to the highest price for fuel the interviewed of the study sample who don't own private car are willingness to pay without changing their desire to purchase a car;
55.8% are willing to pay between 20 and 40 DZD/ per litre of fuel. 20.9% are willing to pay between 40 and 60 DZD/ per litre of fuel. And 23.3% are willing to pay, meanwhile, between 60 and 70 DZD/ per litre of fuel.

5.5. The results in terms of the interviewed sample reaction for the use and ownership of a motor vehicle in case of fuel prices increase:

Compared to the hypothesis of an increase in fuel prices in Algeria to the level of prices in the neighbouring countries (about 70 DZD/ Litre), we obtained the following results:
a) More than two-thirds of the interviewed who already have a motor vehicle (72%) indicated that this will push them to reduce the use of their vehicles to be used only for the necessary travels. While 13% of them said that they will waive their vehicles and replace them by a public transport. And this is a good trend that we should exploit to reduce the negative impacts of motor vehicle dependency. Nevertheless, only 15% of them continued to use their cars as they were before even in case of increasing the fuel prices.
b) More than half of the interviewed (57%) of those who already have a motor vehicle will continue to use their vehicles in urban areas, even in case of increasing the fuel prices. Nevertheless, 43% of them will waiver using their vehicles.

c) Large proportion represented by 79% of the interviewed not owning a motor vehicle and willing to buy one will change their mind.

d) More than two-thirds of the interviewed who do not own a motor vehicle (71%) indicated that the case of fuel prices increase, will push them to lift several people together in one vehicle (sharing car) in order to share the costs of the travel (fuel price).

6. Conclusion:

All the evidence available indicates that Algeria could not continue on this path of subsidizing the fuel prices, which costs the State Treasury a big loss every year as a result of fuel smuggling. This evidence is mentioned by the First Minister who, according to the latest statistics, stated that around 25% of local production is smuggled outside Algeria[(27)]. In the same way, according to a declaration of the Minister of Energy and Mines who stated that around 1.5 billion litres of fuel is illegally exported out of the Algerian borders each year to the neighbouringcountries[(28)]. We take as an example the province of Tlemcen, which consumes more fuel than Algiers, the capital, whereas its inhabitants do not exceed one (1) million inhabitants compared with the latter with its 3 million inhabitants. This can be explained logically and only by fuel smuggling[(29)]. This is what contributes to the failure of local production of fuel to cover its growing demand in the local market. So, as an attempt to cover this deficit, the government recommends importing large quantities of fuel with the price of the International market, which costs the State Treasury a big loss every year, and this is considered as a "gangrene of the national economy". So fuel importing countries should appreciate that all fuel quantities sold usually by local currency is basically a world market product and should be paid for in convertible currency, whether by governments or consumers[(30)]. Also, because of the unexpected continuous fallout and decline in oil prices in the last period. Especially that Algeria is heavily reliant on oil export revenues. In other words, this is an ideal moment for the Algerian government to reconsider the incredibly costly fuel subsidies in order to recalibrate its subsidies as natural consequences of dropping oil prices, and this is what the preliminary draft Finance Bill for 2016 intends to, in which the government plans to raise fuel prices through a new tax provision related petroleum products.

Through the outcomes gained from the field research and survey that we have made, we conclude that the fuel subsidies without rationalizing and strict regulation contributes in increasing their consumption, due to its being a major cause of increasing the rate of the use and ownership of the private car, they can even misplaced, because of smuggling.

The survey shows that the increase of fuel prices in Algeria could be seen as a powerful tool to use in order to limit, if not eradicate, the negative impacts of fossil-fuel subsidies, especially that of private car dependency, by reducing its economic attractiveness to promote a significant transfer model towards public transport, and this, for certain pattern of travel (in particular commuting). Particularly because there possibility to raise the price of fuel as a result of big enthusiasm toward the purchase of private cars in addition to the way the owners stuck to their car which shows strong feeling of ownership those individuals feel toward their car as an intimate belonging.

However, this reform must be taken gradually, in studied stages, and in a cautious manner, because it is not a solution in the short term, since it would be a pressure on the people with low and average income, and limits their social welfare and free mobility in the absence of good quality of public transport. The gradual rising of the fuel price have a double gain from one side, we will have a rational usage of car, for sure, (less energy consumption, less pollution, less congestion, less fuel smuggling as the margin profit will be reduced by increasing fuel prices etc.). From the other side the gradual rising of the fuel price will contribute to total tax revenues of the state so that the state budget will be in a good situation. Therefore, the government can exploit the new revenues derived from fuel taxes in contributing to the financing the investment and maintenance of infrastructure in the transport sector. Also, in contributing to help its citizens to withstand the pressures resulting from raising the price of the fuel through increases the salaries and pensions of its citizens for

example in exchange of increasing the fuel prices and as an indemnity for its high cost, so that the citizens will spend this new revenue in theother living priorities (Education, health ...etc) than to spend it in refueling their vehicles, which will reduce the consumption of the fuel by reducing the daily use of their vehicles to be used only for the necessary travels.

Therefore, the government and the concerned authorities should undertake the responsibility to prepare financial and economic arguments for a public relations campaign in the mass media and make a broad awareness to their citizens and convince them that reforming fossil-fuel subsidies is the solution to get rid of all these problems caused by this subsidizing. On the other hand, the government should guarantee a developed mass public transport system with subsidizing prices to its citizens because its remains a fundamentally impotent congestion management strategy. This is done in order to make the choice of appropriate alternatives and more sustainable forms of transport more attractive to people with low and average income, for better living conditions and for better mobility with appropriate prices and to avoid greater popular resentment and serious socio-political unrest.

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