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Risk Classification and Automobile Insurance Premiums – A study on the Perceptions of Cypriot Policyholders on the Fairness of Automobile Risk Classification Variables

Antonia Zachariadou

MA Risk Management

Risk Classification and Automobile Insurance Premiums – A study on the Perceptions of Cypriot Policyholders on the Fairness of Automobile Risk Classification Variables

By

Antonia Zachariadou

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A dissertation presented in part consideration for the degree of
MA Risk Management.

Abstract

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The intention of this study is to investigate the opinions of Cypriot insured drivers regarding the fairness of particular risk classification variables. Classification variables include, amongst others, age, gender, years of driving experience and driver record. The aim of this research paper is also to establish whether significant associations exist between the opinions of Cypriot insured drivers and a number of demographic and other policyholder characteristics which are used to set premiums in automobile insurance.

A hundred and sixteen usable questionnaires were collected from respondents of different ages across the country of Cyprus. The research revealed that the majority of the respondents considered as fair the practice of charging higher premiums to very young drivers, whilst 80.2% and 88.8% of the respondents considered to some degree unfair charging higher premiums to male drivers and charging higher premiums to unmarried drivers respectively. Almost half of the respondents chose age as the classification variable they considered that should be of highest importance and 31.9% of the respondents chose marital status as the one that they believed should be of least importance in setting automobile insurance premiums. Moreover, even if respondents supported the elimination of specific rating factors, the majority opposed the elimination of all rating factors.

Significant associations were found to exist between charging higher premiums to young drivers and the age of the respondent, and the above practice and the years of driving experience of the respondent. Significant associations were also found to exist between charging higher premiums to male drivers and the gender of the respondent since more male drivers were more likely to oppose the above practice than female drivers. Contrary to the above, no association was found to exist between opinions regarding the elimination of age as a rating factor and the years of driving experience of the respondent.

Acknowledgements
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List of Tables
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Contents
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1 Introduction

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1.1 Background

Automobile insurance companies commonly use classification variables which might include age, occupation, driver record and type of vehicle in order to set premiums (Tryfos, 1980). This results in insureds being classified and entered into risk classes according to their particular characteristics and thus a rate is determined for each risk class (Tryfos, 1980). Classes must be differentiated in terms of the frequency of accidents, the size of expected losses and the drivers' exposure to risk (Kroncke, 1971). Classification systems used to set automobile insurance premiums could vastly differ amongst insurance companies (Tryfos, 1980). More specifically, it could be the case that one insurance company could classify drivers based on their occupation whilst this variable could be completely ignored by the classification system of an alternative insurance company (Tryfos, 1980). As a result, it can be argued that different classification systems can be employed, however, always given that the expected claim costs and expenses vary amongst the risk classes (Tryfos, 1980).

Risk classification can be seen as both essential and good (Schwarze, 2006). In particular, it has been suggested that risk classification can limit the problem of adverse selection (Schwarze, 2006). The problem of adverse selection arises in cases where the risk types cannot be differentiated by the automobile insurance companies (Crocker and Snow, 2000; cited by Schwarze, 2006). As a result, through effective risk classification systems, risk classes can be created in order to differentiate policyholders according to their risk without low risk drivers providing subsidies to higher risk drivers; a situation which is seen as unfair (Schwarze, 2006). In this aspect, risk classification systems are considered to promote social welfare (Schwarze, 2006).

On the contrary however, risk classification systems could also include imperfections. When insurers are classified, they are entered into classes based on characteristics they have in common, thus implying a homogeneous loss experience for each class. However, within a given class, not all drivers will be exactly the same. Some will be above average whilst others will be below and still pay the same premium with the remaining drivers in the same class causing inequities within classes. Moreover, the number of classes can be arbitrary and the creation of compromise since in essence classes need to be small enough to limit the inequities described above but still large enough to produce credible experience. In addition to the above, risk classes must be created on the basis that the driver characteristics taken into consideration in the classification process are good predictors of loss experience. In the case where the contrary is evident the dismissal of the process of classifying drivers would be implied (Kroncke, 1971).

Concepts such as actuarial fairness and equity arguably validate the dissimilar treatment of policyholders with different risks (Launis, 2003). As a result, solidarity in a private insurance system such as automobile is not attainable since solidarity, in the sense that the premium is the

same for all, can only exist in situations where an insurance system is mandatory and hence insureds cannot leave a group after they have entered it without being penalised (Van Praag and Konijn, 1983). It can thus be maintained that in the case of automobile insurance there appears to be a need for a differentiation between the risks that each policyholder faces (McGleenan, 1999). Consequently, appropriate risk classification systems in automobile insurance have the potential of increasing efficiency in the pricing of insurance premiums since automobile insurance companies can offer low-cost insurance in a fair and equitable manner (Stano, 1991).

After a thorough investigation of the automobile insurance literature, it has been concluded that the concept of *fairness* of risk classification variables somewhat differs throughout the automobile insurance literature. For example, the concept of actuarial fairness appears to validate the dissimilar treatment of policyholders with different risks (Launis, 2003). This concept also appears as "actuarial equity" in the research paper by Brown et al., (2007) who state that "actuarial equity means that individuals are not necessarily treated equally but they are treated equitably" (Brown et al., 2007; p.108). As a result, "actuarial fair premiums" can be seen as the premiums which are equal to the expected losses of the policyholder (Tapiero et al., 1986).

In their 2006 paper, Thiery and Van Schoubroeck go a step further and argue that for a risk classification variable to be seen as "fair", firstly the risk classification variable needs to be correlated to the risk itself and secondly, the policyholder needs to have control over the risk factor considered by automobile insurance companies to set premiums (Thiery and Van Schoubroeck, 2006). Gender is an example of a risk classification variable the policyholder has no control over (Thiery and Van Schoubroeck, 2006). Again, there appears to be a different notion of the fairness of risk classification variables in the 1986 study of Maroney and Vickory from the one mentioned above. The authors argue that, for risk classification variables to be seen as fair, they need to have certain characteristics which the authors refer to as standards (Maroney and Vickory, 1986). These include: "homogeneity, separation, reliability, causality, social acceptance, and incentive value" (e.g. Shayer, 1978; cited by Maroney and Vickory, 1986; p.271). These standards will not be dealt with in detail at this point since they are analysed in depth in the literature review section of the paper.

Even though different authors present the concept of fairness of the risk classification variables in a dissimilar way (as illustrated above), they all appear to be in agreement with the fact that risk classification variables should be correlated to the risk itself in order for the classification variable to be considered as fair (e.g. Gaulding, 1995; cited by Thiery and Van Schoubroeck, 2006). As a result, the concept of solidarity cannot exist in the private insurance sector such as automobile insurance (Van Praag and Konijn, 1983). Under the solidarity argument, individuals with the same risk are grouped together and, in cases where policyholders are fortunate enough so as not to suffer losses, they will partly pay for policyholders who do suffer losses (Thiery and Van Schoubroeck, 2006). In the automobile insurance sector this could be seen as *unfair discrimination* since unfair discrimination in insurance premiums can be described as situations where premium differentiations are not correlated to differentiations in expected losses or even in cases where average losses are dissimilar whilst premiums are not (Williams, 1969; cited by Hoy and Lambert, 2000).

Essentially, the term discrimination means the recognition of disparities between two things (Concise Oxford Dictionary, 1990; cited by Brown et al., 2007). Discrimination in an insurance context can be defined as a statistical one (Nickel, 1995; cited by Brown et al., 2007), in which case disparities in premiums are statistically supported and justified (Brown et al., 2007). On the contrary, unfair discrimination can be described as the act of dealing with individuals differently for no apparent or moral reason (Brown et al., 2007). Throughout the remaining of this research paper the terms *fair* and *fairness* of the risk classification variables are used to describe situations where the classification variables are correlated to the risk itself and hence differentiations in automobile insurance premiums are justified by disparities in the expected losses of the policyholder (Tapiero et al., 1986).

There appears to be a great deal of controversy in the automobile insurance literature surrounding the fairness and appropriateness of the risk classification variables used to set automobile insurance premiums. As a result, the main area of focus of this research paper is to provide an in-depth review of the current literature on the fairness of risk classification variables, where all of the above concepts will be dealt with in depth, and, through the primary research, to provide further insight on what is seen as fair and appropriate by insured drivers in the country of Cyprus. It was decided not to include any definitions of fairness in the questionnaire so as not to influence the knowledge of the respondents (e.g. Forgue, 1983). It appears that there are only a limited number of studies which focus on this topic; none which focuses on Cypriot insured drivers. The survey conducted for the purpose of this research paper aims in filling this evident gap in literature by investigating the views of Cypriot customers buying automobile insurance on the fairness of risk classification variables. A detailed assessment of the public opinion on such a controversial subject could partially facilitate regulatory bodies in operating more efficiently and effectively (Forgue, 1983).

1.2 Aim of the study
The intention of this study is to investigate the opinions of Cypriot insured drivers regarding the fairness of particular risk classification variables. The classification variables considered, amongst others, are: age, gender, years of driving experience and driver record.

1.3 Objectives
More specifically, the main objectives of the study are the following:
1. To investigate the views of Cypriot insured drivers on the fairness of risk classification variables such as age, gender, years of experience and driver record.
2. To establish whether significant associations exist between the opinions of Cypriot insured drivers and a number of demographic and other policyholder characteristics which are used to set premiums in automobile insurance.

1.4 Hypotheses
The null hypotheses formed and tested are (similar to Forgue, 1983):
1. There is no significant association between respondent views concerning age as a risk classification variable and the age and the number of years of driving experience of the respondent.

2. There is no significant association between respondent views concerning gender as a risk classification variable and the gender of the respondent.
3. There is no significant association between respondent views concerning driving record as a risk classification variable and the driving record of the respondent.

1.5 Methodology Outline

A hundred and thirty questionnaires were handed out personally to insured drivers of all ages. A total of 116 questionnaires were collected and used for analysis. Mostly closed-ended questions were used in the questionnaire, with tick boxes available to respondents for completion. Face-to-face questionnaires were seen as the most suitable research instrument for the purposes of this research, and it was regarded as the most appropriate to produce an optimum response rate.

After the questionnaires were completed, they were analysed and compared against alternative academic research. The findings were then considered in relation to the aims and objectives of this dissertation paper so as to investigate the views of Cypriot insured drivers regarding the fairness of a number of risk classification variables and to establish whether associations exist between the opinions of the respondents and a number of demographic and other characteristics of the respondents.

1.6 Dissertation Contents

An introduction of the area of focus can be found in Chapter 1, together with an outline of the main aims and objectives of the study. Chapter 1 also provides an outline of the methodology. Chapter 2 provides a critical evaluation of the relevant literature. The process of classifying risk in automobile insurance is introduced, followed by a critical assessment of a number of risk classification variables. The issues of actuarial fairness and discrimination are also reviewed. A detailed explanation of the research design and methodology employed for this research paper can be found in Chapter 3. The key findings of the research as presented and discussed in Chapter 4, whilst Chapter 5 provides the reader with conclusions and recommendations for future research. Lastly, Chapter 6 is used for personal reflection.

2 Automobile Risk Classification

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2.1 Introduction

Automobile insurance premiums are commonly based on a range of classification strategies where variables including age, occupation, use of vehicle, driving record and type of vehicle are considered (Tryfos, 1980). Insureds with similar characteristics are entered in the same risk class and a rate is determined for each class (Tryfos, 1980). Classes must be differentiated in terms of the frequency of accidents, size of losses and the drivers' exposure to risk (Kroncke, 1971).

It is evident that insurance companies often use diverse classification systems (Tryfos, 1980). In particular, one insurance company could classify drivers based on their occupation; whilst another insurance company could possibly ignore that variable completely (Tryfos, 1980). As a result, it has been argued that different classification systems can be used, but always given that the expected claim costs and expenses vary amongst the classes (Tryfos, 1980). This is also supported by Kroncke (1971) who argues that: "In an optimal class system, the class definitions would be based on the most significant measurable factors that determine expected losses and expected expenses." (Kroncke, 1971; p.543)

A potential challenge that insurance companies are often faced with, regardless of the classification variables or driver characteristics considered, is the number of classes used to classify policies (Tryfos, 1980). Specifically, in the case of a "captive" market where the number of insureds would remain constant in spite of the alternatives offered, an insurance company could be faced with the option of setting the same rate for all of its insureds or separating them into various classes and charging each class a different rate (Tryfos, 1980). However, which of the two options should the insurance company take (Tryfos, 1980)? The same author also poses the question of the conditions that might influence such a decision (Tryfos, 1980). In particular, does the number of classes or the number of policyholders included in each class influence such a choice (Tryfos, 1980)?

Over the years, there have been numerous studies whose main focus was to answer the above questions. The study by Tryfos (1980) provides the conclusion that insurance companies in a "captive" market should be indifferent amongst the available classification systems. On the contrary, the opposite holds when the market becomes competitive (Tryfos, 1980). Particularly, in a competitive market, other insurance companies will find it profitable to insure drivers with an expected claim less than the overall market average (Tryfos, 1980). As a result, the competitors will be able to offer a lower price for an insurance policy forcing the first company to separate its policyholders into classes and thus offer dissimilar premiums (Tryfos, 1980). The insurance company will continue to subdivide its classes up to the point where only risk homogeneous classes exist (Tryfos, 1980). Hence, in a competitive market, insurance companies have an incentive to differentiate premiums amongst classes (Tryfos, 1980).

Risk classification has received considerable support with respect to the way it minimises the problem of adverse selection (Schwarze, 2006). It has been argued that the problem of adverse selection crops up when the various risk types cannot be differentiated by the insurance companies (Crocker and Snow, 2000; cited by Schwarze, 2006). In this respect, classification is seen as both essential and good (Schwarze, 2006). Classes differentiate policyholders on the basis

of their risk and thus low risks are not obliged to compensate for high risks; a situation which is seen as unfair (Schwarze, 2006). As a result, classification in this aspect is considered to promote the social benefit of preventing losses (Schwarze, 2006).

However, it has also been argued that the process of classifying drivers based on certain criteria or characteristics includes imperfections (Kroncke, 1971). Specifically, risk classification can promote behaviour on the part of the insurer which does not promote social welfare (Schwarze, 2006). Due to the competitive nature of the insurance market, insurance companies can eradicate high risks from an insurance pool so as to decrease the average cost of providing insurance to the policyholders included in the pool and hence decrease the price of the insurance (Schwarze, 2006). Such a process "inhibits the ability of insurance to spread risk." (Schwarze, 2006; p.187) Additionally, drivers are classified based on characteristics which they have in common since this implies a homogeneous loss experience for each class (Kroncke, 1971). However, within each given class, not all drivers will be exactly the same (Kroncke, 1971). A number of them will be above average whilst others will be below and still pay the same premium with the remaining drivers in the same class (Kroncke, 1971). This will therefore result in inequities within classes (Kroncke, 1971). Additionally, the number of classes can be arbitrary and the creation of compromise since classes need to be small enough to limit the inequities described above, but also sufficiently large to produce credible experience (Kroncke, 1971). And arguably most importantly of all, classes must be created on the basis that the characteristics and criteria considered in the classification procedure are good predictors of loss experience (Kroncke, 1971). The contrary would imply the dismissal of the process of classifying drivers (Kroncke, 1971).

An abundance of literature has been focused on whether the certain factors used to classify drivers are indeed reliable predictors of loss experiences. This, together with the extent to which risk classification variables used in classifying drivers are considered as fair or unfairly discriminatory will be the main focus of the section that follows. Thought this literature review chapter, issues of actuarially fair premiums, solidarity and discriminatory rates will be reviewed.

2.2 The Concepts of Solidarity, Fairness and Discrimination

"Solidarity" has been defined as the "unity (as a group or class) that produces or is based on [a] community of interests, objectives, and standards." (Webster's Ninth New Collegiate Dictionary; cited by Launis, 2003; p.92) Solidarity in insurance implies that one group which might be considered as a low risk group would pay more and hence subsidise other groups which face higher risks (Van Praag and Konijn, 1983). Put differently, in a group made up of individuals with the same risks, policyholders who do not suffer losses will partly pay for policyholders who do suffer losses (Thiery and Van Schoubroeck, 2006). This is often known as "subsidising solidarity" (Thiery and Van

Schoubroeck, 2006). The concept of solidarity is apparent in social insurance systems such as the United Kingdom National Health Service (McGleenan, 1999). More specifically, in the case of health insurance, families which are considered as low risk (e.g. young families) subsidise high risk families which are included in the same group as they are and hence pay the same insurance premium (Van Praag and Konijn, 1983).

It has been argued that solidarity in an insurance system can only exist in cases where an insurance system is mandatory and hence insureds cannot leave a group after they have entered it, otherwise they will be penalised (Van Praag and Konijn, 1983). As a result, the concept of solidarity cannot exist in the private insurance sector such as automobile insurance (Van Praag and Konijn, 1983). More specifically, in the case where an insurer (Insurer A) offers premiums based on no differentiations in the risks that individuals face, low risk individuals will leave that insurer and join Insurer B who can offer the low risk individual the same insurance as Insurer A but cheaper (Van Praag and Konijn, 1983). As a result, the absence of differentiation in prices based on risk *will* be penalised in the private insurance sector and thus the concept of solidarity is untenable in such cases (Van Praag and Konijn, 1983).

Consequently, in the case of automobile insurance and of private insurance in general, there is a need for a differentiation between the risks that each policyholder faces (McGleenan, 1999). Through the process of underwriting, insurance premiums are raised when policyholders face increased risks (McGleenan, 1999). This gives rise to the concept of "actuarial fairness" and equity (McGleenan, 1999). Such concepts validate the dissimilar treatment of policyholders with different risks (Launis, 2003). This is also supported by Brown et al., (2007) who argue that "actuarial equity means that individuals are not necessarily treated equally but they are treated equitably." (Brown et al., 2007; p.108) In turn, the term "actuarial fair premiums" can be used to describe premiums which are equal to the insured's expected losses under a particular insurance policy (Tapiero et al., 1986). As a result, through risk classification methods, insurance companies seek to minimise the phenomenon of subsidising solidarity mentioned above so as "just and fair" premiums are set (Thiery and Van Schoubroeck, 2006). Thus, the groups that policyholders form would be treated equally without one group subsidising another (De Phil and Dhaene, 1998; Corlier, 1998; cited by Thiery and Van Schoubroeck, 2006). Such a phenomenon is described as the "subsidy –aversion argument." (Wils, 1994; cited by Thiery and Van Schoubroeck, 2006)

In addition to the above, it has been suggested that appropriate risk classification methods can increase efficiency in the pricing of insurance premiums, where companies can offer low-cost insurance in a fair and equitable manner (Stano, 1991). Furthermore, numerous commentators have argued that new methods, and risk classification procedures in particular, have been developed so as to surpass opportunistic behaviour on the part of insureds (Richaudeau, 1999). Opportunistic behaviour giving rise to the problem of moral hazard (Bond and Crocker, 1991; Winter, 1992; cited by Richaudeau, 1999) and the problem of adverse selection (Crocker and Snow, 1986; cited by cited by Richaudeau, 1999) could be overcome when insurance companies can discriminate, and hence differentiate policyholders on the basis of their discernible characteristics (Richaudeau, 1999). Such characteristics are assumed to be either correlated to the policyholders'

inherent risk or their attempts to minimise their risk (Richaudeau, 1999).

Nonetheless, it has been argued that risk classification methods also comprise numerous limitations (e.g. Thomas, 2007). In particular, Thomas (2007) suggests that risk classification can be viewed as a process where additional hardship is imposed on the already unfortunate ones by offering higher insurance premiums. As a result, such a view supports that insurance disadvantages, for example in the form of higher premiums, are initiated and caused by the individual (Thomas, 2007). Furthermore, even though risk classification could assign policyholders to their true risk classes, it could also misclassify others (Hoy and Lambert, 2000). When individuals are misclassified, they deal with augmented levels of price differentiations in the form of higher premiums (Hoy and Lambert, 2000). The above could have been avoided in cases where certain classification variables had been omitted from the risk classification process (Hoy and Lambert, 2000).

Moreover, there has been considerable criticism on the subsidy-aversion argument illustrated above. In particular, it has been argued that in cases where the policyholder has no control over the risk factors considered by insurance companies to set premiums and in cases where risk factors do not have a direct causal relation with risk itself then risk classification might be considered as unfair (Thiery and Van Schoubroeck, 2006). As far as controllability is concerned, gender is an example of a risk factor the policyholder has no control over (Thiery and Van Schoubroeck, 2006). As far as the causality argument is concerned, it has been suggested that risk factors such as miles driven or the number of previous accidents have proved superior factors in determining the risk of a driver compared to the gender of the driver (Thiery and Van Schoubroeck, 2006).

The concept of causality illustrated above has also been used in determining whether risk factors used in risk classification methods are seen as fair (Thiery and Van Schoubroeck, 2006). More specifically, there is a necessity for the risk factor to be correlated with risk in order for the risk factor to be considered as fair (Gaulding, 1995; cited by Thiery and Van Schoubroeck, 2006). Exceptions to the above include situations where risk factors are not causally connected to the risk itself (Gaulding, 1995; cited by Thiery and Van Schoubroeck, 2006). As illustrated above, both causality and controllability of the risk factors play an imperative role in determining whether a risk classification method is fair (Thiery and Van Schoubroeck, 2006). An example could include the following: In situations where drivers cause accidents due to an inherently slow reaction time and thus have no control over such a situation, an increase in the premiums paid would not be considered as acceptable or fair under the controllability and causality arguments (Abraham, 1985; cited by Thiery and Van Schoubroeck, 2006).

Maroney and Vickory (1986) offer a dissimilar argument regarding the fairness of risk factors from the ones illustrated above. Specifically, the authors argue that, in order for risk factors used in classification methods to be considered as fair, they need to have certain characteristics known as standards (Maroney and Vickory, 1986). These standards include "homogeneity, separation, reliability, causality, social acceptance, and incentive value" (e.g. Shayer, 1978; cited by Maroney and Vickory, 1986; p.271). These will be defined in what follows.

The standard of homogeneity refers to the need that policyholders with considerable differences in

their expected losses should not be included in the same group, and thus should pay a dissimilar premium (Maroney and Vickory, 1986). The standard of separation implies that groups should be considerably different in terms of expected losses so as they can be distinguished as separate groups (Maroney and Vickory, 1986). The reliability standard ensures that both realistic and apparent differences are used to place policyholders in classification groups (Maroney and Vickory, 1986). As far as the causality standard is concerned, as previously stated, ensures that the classification variables are correlated to expected losses and thus policyholders pay fair premiums (Maroney and Vickory, 1986). Additionally, in order to verify that classification systems are in accordance to public policy, the social acceptability standard is evident (Maroney and Vickory, 1986). The authors conclude that the standard known as incentive value ensures that classification variables considered to classify insureds are within the control of policyholders (Maroney and Vickory, 1986).

As a result, in cases where risks are not identically distributed, risk classification is used to fairly separate policyholders into homogenous classes, with each homogenous class paying matching premiums (Brouhns et al., 2003). Risk classification can thus be defined as "a process in which an insurer develops a number of different categories ("classes") that accurately reflect the varying degrees of risk that members of the classes represent." (Stano, 1991; p.543) As a result, it can be argued that one of the basic principles of risk classification is the dependence of insurance premiums on the risk levels of policyholders, thus resulting in "discrimination" amongst policyholders of varying risk levels (Stano, 1991).

Discrimination in insurance is often characterised as both essential and appropriate (Stano, 1991). There exist numerous definitions of the term "discrimination", some of which will be presented in what follows. Discrimination, based on civil rights law has been defined as the "disparate treatment of individuals on the basis of race, gender, age, religion, or ethnic origin." (Doerpinghaus et al., 2008; p.534) However, the term discrimination fundamentally means the recognition of disparities between two things (Concise Oxford Dictionary, 1990; cited by Brown et al., 2007). As a result, it is not discrimination in its original meaning that should be troubling in an insurance context, rather discrimination in its negative sense (Brown et al., 2007). The latter has been defined as "a form of prejudice since there is a presumption that certain groupings of persons are morally inferior or undeserving of equal treatment normally owing to a stereotype that is held about the group as a whole." (Nickel, 1995; cited by Brown et al., 2007; p.105) Finally, discrimination based on the contexts of insurance is defined as a statistical one (Nickel, 1995; cited by Brown et al., 2007), where differences in premiums are statistically supported and justified (Brown et al., 2007).

It can thus be maintained that price discrimination in insurance may be acceptable when it is established on the grounds that insurance premiums are based on the expected claims costs inflicted on the insurer (Hoy and Lambert, 2000). On the contrary however, unfair discrimination in insurance is not desirable (Stano, 1991). Unfair discrimination can be described as the act of dealing with individuals differently for no apparent or moral reasons (Brown et al., 2007). Unfair discrimination in premiums is also evident in situations where premium differentiations are not correlated to differentiations in expected losses and average expenses or even in cases where average expected losses are dissimilar whilst

premiums are not (Williams, 1969; cited by Hoy and Lambert, 2000). However, there exists a rather important question raised at this point: is it possible for the concept of actuarial equity to morally provide explanations as to why various groups, as classified by insurance companies, are charged higher premiums than others without unfairly discriminating these groups (Brown et al., 2007)? This question will be the main focus of the section that follows where particular risk classification variables will be assessed in terms of both fairness and appropriateness.

2.3 Automobile Risk Classification Variables – Just or Unfair Discrimination?

Over the past few decades, numerous critics have come forward regarding variables such as disability, gender, or race frequently used in risk classification methods employed by insurance companies (Thomas, 2007). Critics of risk classification systems often argue that classification variables imperfectly capture the risks of policyholders (Harrington and Doerpinghaus, 1993). Furthermore, it has been suggested that behind this controversy lies the inability of such critics to appreciate the basic idea of risk classification and possibly the inability of insurance companies to provide sufficient explanations about the rationale of risk classification (Thomas, 2007). "However, this notion that insurers need only explain their principles for them to gain universal acceptance overlooks the fundamental and conceptual nature of the conflicts between risk classification and many contemporary social views and laws." (Thomas, 2007; p.126) As a result, the main objective of this section is to provide a critical evaluation of the various classification variables used by automobile insurance companies to price insurance. In this context, the concepts of fairness and discrimination will also be reviewed.

In the automobile insurance sector classification variables include, amongst others, gender, age, marital status, miles driven, years licensed, place of residence, driving experience, accident record, type of automobile and usage of the automobile (e.g. Holmes, 1971; Kroncke, 1971; Maroney and Vickory, 1986; Spahr and Escolas, 1982; Brown et al., 2007). Due to time and other constrains, only the most influential and controversial of the above will be critically accessed. The critical evaluation will be presented in terms of the classification variables' appropriateness to capture the level of risk policyholders face without unfairly discriminating against certain individuals.

Age

It has been suggested that both young and old drivers are more risky than other age categories (Brown et al., 2007). Even though individual younger and older drivers might not portray this increased risk, these groups as a whole are seen as more risky compared to other age groups (Brown et al., 2007). This increased risk will thus be mirrored in the form of higher premiums (Brown et al., 2007). Various authors have supported the presence of this increased risk that both young and old drivers arguably face. In particular, Mayhew and Simpson (1990) and Mayhew et al. (2003) have suggested that the higher risk of younger and older drivers is a result of the increased number of accidents that these groups of policyholders are likely to be involved in compared to other age groups (Mayhew and Simpson, 1990; Mayhew et al., 2003; cited by Brown et al., 2007). Additionally, the accidents that these age groups have are

considered as more severe and pricey (Braver and Trempel, 2004; Mullins, 2003c, 2004; cited by Brown et al., 2007).

As it has been demonstrated above, insurance companies offer policyholders varying premiums according to the age category of each policyholder (Brown et al., 2007). "These distinctions are based on statistical indicators of potential probability and severity of an accident." (Brown et al., 2007; p.105) For instance, Boyer and Dionne (1989) investigated a random sample of car drivers in Quebec, Canada and concluded that there is a lower likelihood (2%-3%) of drivers over the age of twenty five to be involved in accidents compared to drivers between the ages of sixteen and nineteen. However, it appears that there is a need to comprehend what can be considered as a valid moral explanation for differentiating premiums according to age, which will thus constitute age as an appropriate insurance classification variable (Brown et al., 2007).

Wiegers (1989) acknowledges the fact that statistical analysis validates the increased number of accident losses attributed, for example, to young male drivers (Weigers, 1989; cited by Brown et al., 2007). However, the author holds the position that, in cases where age is used to classify drivers, there would be certain drivers who will be classified as high-risk ones based on their age, and hence placed in a high-risk group, even though, when considered in isolation they are low-risk drivers (Weigers, 1989; cited by Brown et al., 2007). As a result, Weigers (1989) argues that classification systems which consider age as a classification variable would result in such drivers offering subsidies to high-risk drivers (Weigers, 1989; cited by Brown et al., 2007). Consequently, Weigers (1989) implies that the presence of low-risk drivers in high-risk age groups as illustrated above would cut down the overall rates paid by low-risk drivers in general and this is the reason behind the use of age as a classification variable (Weigers, 1989; cited by Brown et al., 2007).

It also appears that in the field of insurance, the *costs* of applying the moral rules, i.e. of ensuring that unjust discrimination is eliminated from the risk classification methods employed by insurance companies, play an imperative role (Brown et al., 2007). More specifically, it has been suggested that the costs involved in obtaining information regarding the characteristics of policyholders would indicate the levels of discrimination which can be eliminated or accepted in risk classification methods (Brown et al., 2007). For example, even though the classification variable known as miles driven is considered as a superior method of classifying drivers since it measures the true exposure of drivers to risk, it is rarely used due to the high costs involved in verifying such information (Brown et al., 2007). Instead, classification variables such as age are used as measures of drivers' expected losses due to the costless nature of obtaining such information (Brown et al., 2007).

"Using age as a risk classification factor may not be a case of unjust discrimination if the differential burdens or advantages it imposes can be justified when it is used as a relevant factor for risk classification." (Brown et al., 2007; p.110) More specifically, statistical evidence exists which illustrates that very young or very old drivers portray higher risk in terms of expected costs of claims (Brown et al., 2007). It has been proposed that the ex ante risk that all young drivers present should be dealt with accordingly when classifying risk (Brown et al., 2007). This argument would therefore support the use of age in classifying drivers without unfairly discriminating policyholders (Brown et al., 2007). An example of the statistical evidence that very

young and very old drivers present higher risks could include the results of Lyman et al. (2002) who "found driver crash involvement rates per capita decreased with age, but that fatal involvement rates per capita increased starting at age 70." (Lyman et al., 2002; cited by Brown et al., 2007)

Mullins (2003a, 2004) indicates that classification systems which exclude age as a classification variable experience higher occurrence and severity of accidents caused by insured drivers (Mullins, 2003a, 2004; cited by Brown et al., 2007). This could be attributed to the fact that when age is excluded from the risk classification process, high-risk drivers pay low premiums resulting in too many of them on the road causing increased numbers of accidents (Mullins, 2003c; cited by Brown et al., 2007). It can thus be concluded that the use of age as a classification variable, even though it results in differentiated premiums, it legitimately discriminates between drivers (Brown et al. 2007).

Nonetheless, it appears that there exist numerous studies which draw the conclusion that age is not a good predictor of loss experience. Such studies include the one by Kroncke (1971) who concluded that, given his sample and method of analysing the data, the use of age was not a good predictor of loss experience in automobile insurance (Kroncke, 1971). Additionally, it has been recognised that age might not be the true causal factor which increases or decreases risk in driving (Maroney and Vickory, 1986). More specifically, the level of maturity and the sense of responsibility of drivers might pose the true causal factor in increasing young drivers' risks (Maroney and Vickory, 1986).

As far as the previously mentioned standards under which the fairness of classification variables is measured, "age scores low as a classification variable when measured for causality and homogeneity. This is because both classes of drivers (younger and older) will contain persons with very different levels of maturity, responsibility, and experience." (Maroney and Vickory, 1986; p.273) Additionally, drivers have no control over their age and thus age as a classification variable offers no incentive to drivers to alter their risky driving habits (Maroney and Vickory, 1986). Moreover, as far as the social acceptability standard is concerned, age also scores low (Maroney and Vickory, 1986).

Furthermore, Kelly and Nielson, in their 2006 paper provide a distinction between what is know as chronological and functional age. The former refers to "the number of years since the birth", whilst the latter is "an indexing tool that equates human ability in terms of common performance standards." (Kelly and Nielson, 2006; p.213) Even though insurance companies have been classifying drivers based on their chronological age, the authors hold the view that functional age is the more representative one in terms of drivers' capabilities and risk exposures, thus they argue that functional age is a fairer measurement (Kelly and Nielson, 2006). However, in their study they provide various justifications as to why age, as used by automobile insurance companies, is a fair and appropriate classification variable (Kelly and Nielson, 2006). Some of the arguments included in the study will be presented in what follows.

The authors argue that in general, 50% more young Canadian drivers were involved in accidents than older drivers (Nicoletta, 2002; cited by Kelly and Nielson, 2006). This evidence appears of great importance since drivers over the age of fifty five drove distances three times more than

younger drivers (Nicoletta, 2002; cited by Kelly and Nielson, 2006). This has been attributed to the abilities of younger drivers (Kelly and Nielson, 2006). In particular, younger drivers, who are therefore novice drivers, pose increased risks (Kelly and Nielson, 2006), since for example they do not comprehend traffic signals (Renge, 2000; cited by Kelly and Nielson, 2006). Additionally, younger drivers engage in risk-taking activities while driving (Clarke et al., 2005; cited by Kelly and Nielson, 2006), with 93% of young Canadian drivers speeding (Kelly and Nielson, 2006). This is also a cause of more accidents in the U.K. (Clarke et al., 2005; cited by Kelly and Nielson, 2006).

In reference to the "actuarial fairness" of age as a classification variable in automobile insurance, the authors support that a point has not yet been reached where age can be excluded from the underwriting process of insurance without creating other major problems, for example, moral hazard (Kelly and Nielson, 2006). Thus, age has proved "an accurate and reliable classification variable" for automobile insurance which is also statistically credible (Kelly and Nielson, 2006; p.219). It is an objective criterion, which is easily verified and particularly cheap to observe (Kelly and Nielson, 2006).

Gender
Gender appears as a more controversial risk classification variable than age since automobile insurance companies are faced with a more challenging task of statistically proving the existence of a correlation between the levels of risk that drivers face and their gender (Maroney and Vickory, 1986). "Due to their traditional predominance in the workplace, men as a class may have driven more miles under more adverse average driving conditions than women, and thus could be expected to have had more accidents than women." (Maroney and Vickory, 1986; p.274) However, the role of men and women has dramatically changed over the past few decades, thus this correlation between higher risk and male drivers may no longer hold statistically (Shayer, 1978; cited by Maroney and Vickory, 1986). This is the main reason why gender, as a risk classification variable in automobile insurance, scores low in relation to the separation standard mentioned above, since it does not adequately differentiate the changes in the expected losses between men and women which are evident due to the changing roles of the two genders over the past decades (Maroney and Vickory, 1986). The only standard under which the variable scores high is the reliability standard and this is due to apparent reasons (Maroney and Vickory, 1986).

The use of gender as a classification variable is also widely opposed by society (Maroney and Vickory, 1986). In particular, the state of Massachusetts, U.S. has abolished of use of gender as a classification variable in the automobile insurance since it was suggested that it unfairly discriminates policyholders (Stone, 1978; cited by Blackmon and Zeckhauser, 1991). In the EU, as of December 2004, discrimination between men and women was prohibited under the "Gender Equality Directive" (Council of the European Union, 2004; cited by Schwarze, 2006; Thiery and Van Schoubroeck, 2006). The directive specifically applied to the insurance sector (Thiery and Van Schoubroeck, 2006). Exceptions to the rule include situations where insurance companies can provide statistical evidence of a correlation between gender and risk (Schwarze, 2006). Even though legislators appear to appreciate that an inherent principle of insurance is risk classification and selection, a number of them are also "greatly concerned that this differentiation process

deprives applicants for insurance of adequate coverage in indispensable insurance services such as motor-vehicle insurance" (Thiery and Van Schoubroeck, 2006; p.191).

It has been suggested that much of this controversy arises from the different views for instance that legislators and insurers hold on what is seen as fair (Thiery and Van Schoubroeck, 2006). In particular, legislators are likely to support an "individualistic" approach to fairness and equality where it is argued that policyholders have a right to be treated equally based on their individual characteristics or capabilities and not to be grouped according to their gender for example (Thiery and Van Schoubroeck, 2006). As a result, under the individualistic approach, a female with a particular expected loss ratio would be charged the same premium as a male with the same expected loss ratio (Thiery and Van Schoubroeck, 2006). On the other hand, insurers hold a "group" approach under which insurance premiums are set based on the group characteristics of individuals, such as their gender (Thiery and Van Schoubroeck, 2006). As a result, automobile insurers' perception of fairness involves the equal treatment of all of women and all of men, thus avoiding one gender offering subsidies to the other (Thiery and Van Schoubroeck, 2006). In view of the fact that it is statistically proven that on average more men are involved in accidents than women, the pricing of automobile insurance offered to men is higher than women (Thiery and Van Schoubroeck, 2006).

Statistical evidence of a correlation between gender and accident frequency and severity is presented in the paper of Spahr and Escolas (1982). The entire accident records of Wyoming, U.S., for the year 1979 was reviewed to conclude that gender correctly predicts accident frequency and, to a lesser extent, accident severity (Spahr and Escolas, 1982). Reasons behind the increased numbers of accidents caused by male drivers include the increased distances travelled by males and their risk-taking behaviour and driving practices (Spahr and Escolas, 1982). As a result, due to the above correlation between gender and accident frequency and severity, the authors conclude that no discriminatory practices are evident in automobile insurance schemes which employ the use of gender as a risk classification variable (Spahr and Escolas, 1982). Boyer and Dionne, in their 1989 research paper also concluded that in the state of Quebec, Canada, male drivers posed a 3.7% higher probability of being involved in an accident than female drivers (Boyer and Dionne, 1989).

Alternative Classification Variables

In a similar way as with age and gender, marital status has also been scrutinised when used as a classification variable in automobile insurance (Maroney and Vickory, 1986). Marital status as a risk classification variable appears to provide both reliable and verifiable information (Maroney and Vickory, 1986). However, much of the controversy surrounding the use of marital status in automobile insurance arises due to the fact that the variable appears to lack "a direct causal connection with risk of loss." (Maroney and Vickory, 1986; p.277) In addition to the above, it offers no incentive for drivers to alter their risky driving habits since it is very unlikely that individuals will refuse to marry in the hope of receiving a lower insurance premium (Maroney and Vickory, 1986).

Another variable under scrutiny is the use of credit scores in automobile classification schemes, which is also known as insurance scores (Brockett and Golden, 2007). It has been suggested that the use of credit scores results in premiums which are based more on the risk each individual driver faces and less on driver characteristics such as age

(Snyder, nd; cited by Boulard, 2004). Furthermore, "credit scoring can give information distinct from standard actuarial variables concerning an individual's biopsychological makeup, which then yields useful underwriting information about how they will react in creating risk of insured automobile losses." (Brockett and Golden, 2007; p.23)

There is an abundance of literature which proves the statistical relation between credit scores and expected losses (Brockett and Golden, 2007). Miller and Smith (2003) showed that credit score was in the top three most significant variables in predicting losses and in some instances the most significant one (Miller and Smith, 2003; cited by Brockett and Golden, 2007). In addition to the above, Tillman and Hobbs (1949) concluded that drivers with bad credit history were involved in up to six times more accidents than drivers with a good credit history (Tillman and Hobbs, 1949; cited by Brockett and Golden, 2007).

Credit scores were also reviewed by Kelly and Nielson (2006). Even though credit scores where found to best capture the risk of the driver amongst the remaining classification variables reviewed, their use could possibly lead to unfair discrimination against both different races and young drivers (Kelly and Nielson, 2006). In particular, it was established that Asian Americans and elderly drivers had the best credit scores and could thus benefit from the use of the variable in calculating premiums (Kelly and Nielson, 2006). On the contrary, there might not be enough information about the credit history of young drivers so as to accurately calculate their credit scores (Kelly and Nielson, 2006). Finally, the authors have reached a consensus that "we have not reached the point where age can be eliminated without creating market disruptions and increases in moral hazard that are themselves undesirable." (Kelly and Nielson, 2006; p. 230) Moreover, Birny Birnbuam, executive director of the Centre of Economic Justice in Austin, Texas, holds the view that the use of credit scores does not pose a measure of financial responsibility and it is not a good predictor of accident claims (Birnbuam, nd; cited by Boulard, 2004). The use of such a classification variable merely poses additional penalties to the already misfortuned ones (Birnbuam, nd; cited by Boulard, 2004). In addition to the above, it has been suggested that credit scores neglect to take into consideration the circumstances which might have resulted in the financial distress of policyholders (Boulard, 2004).

Even though there is a proven correlation between the variable and expected losses, much of the controversy surrounding credit scores as a classification variable is arguably the fact that it is not understood *why* such a correlation exists (Brockett and Golden, 2007). The answer to the question arguably lies "in the fundamentals of human biology, psychology, and behaviour." (Brockett and Golden, 2007; p.25) Credit scores arguably provide information regarding the biochemical and psychobehaviour characteristics of policyholders and in turn, these characteristics can be used as predictors of insurance losses (Brockett and Golden, 2007). The biochemical and psychobehaviour characteristics of an individual can predict an individual's decision making and risk taking behaviour in driving (Brockett and Golden, 2007). As a result, credit scores can provide automobile insurance companies with information regarding the levels of stress, levels of responsibility and distractibility of individuals; all of which have an effect on the driving habits of policyholders and hence on their expected losses (Brockett and Golden, 2007). Emotional distress and

depression, amongst others, were also associated with increased risk-taking behaviour while driving (Donovan et al., 1988; cited by Brockett and Golden, 2007).

Automobile insurance companies in Massachusetts are not allowed to use credit scoring as a classification variable after recent reforms in the legal system (Gusman, 2008). Insurance Commissioner Nonnie Burnes reported that credit scoring should not be used for rating and in underwriting unless she is convinced that it should (Burnes, 2008; cited by Gusman, 2008). The Insurance Commissioner stressed the fact that such reforms would promote the positive features of classification systems in insurance, whilst limiting the features which are damaging to customers (Burnes, 2008; cited by Gusman, 2008).

A different classification variable often used by insurance companies to price automobile insurance is driver record (Butler and Butler, 1989). Driving record, according to the Industry's Sex-Rating Compilation (1979), was defined as the process were prior accidents and/or traffic convictions were used in pricing automobile insurance premiums (Butler and Butler, 1989). Numerous insurance analysts have argued that the use of driver record is actuarially fair and thus justifiable (Butler and Butler, 1989). "Generally, the statistical predictability of driving records is valid if the past is a good predictor of the future." (Kelly and Nielson, 2006)

However, it has been suggested that this classification variable becomes less reliable the older the driver gets (Kelly and Nielson, 2006). In the case where the driving record is used without age as a classification variable, higher premiums would be evident for drivers in the range of 25-65 whilst lower premiums would be enjoyed by younger and older drivers (Kelly and Nielson, 2006). This could result in "greater heterogeneity within all rate classes, and more homogeneity between rate classes." (Kelly and Nielson, 2006; p. 227)

Butler and Butler (1989) argue that, due to the fact that accidents are random events, the use of driving record in pricing automobile premiums results in random premiums; a situation which is contradictory to the basic principles of insurance (Butler and Butler, 1989). Instead, the authors propose the use of miles driven as an alternative (Butler and Butler, 1989). Arguably, miles driven capture the true risk exposure of drivers since additional miles driven would increase the likelihood of an accident occurring (Butler and Butler, 1989). The variable is therefore correlated to expected losses (Butler and Butler, 1989). In this context, it has been implied that, in the case where miles driven are identical amongst drivers, thus resulting in identical probabilities of accidents/losses, the gender of policyholders does not become a predictor of risk (Butler and Butler, 1989).

A classification variable which is arguably ignored in the pricing of insurance is traffic hazard (Mackenzie, 1988). The main reason behind this is the fact that insurance companies often use the place of residence of drivers as a classification variable and not the locations where their accidents over the years have happened (Mackenzie, 1988). Mackenzie (1988) strongly opposes the above practices by stating that "this runs counter to the basic underwriting fundamentals of insurance, which take into consideration how hazards contribute to loss." (Mackenzie, 1988; p.27) In the case where traffic hazards are

being ignored from the insurance rates charged, they are consequently also ignored from the underwriting process (Mackenzie, 1988). Thus, there is a need for insurance companies to be informed on where car accidents have occurred so as they can appropriately estimate the risk of a given automobile (Mackenzie, 1988).

Spahr and Escolas (1982) examined, in the state of Wyoming, U.S., instead of the place of residence of the policyholder i.e. the place where the automobile was garaged as was generally used by insurance commentators, the place where accidents occurred (Spahr and Escolas, 1982). Arguably, this would pose the advantage of avoiding biases in the reported accident frequencies since policyholders, even if they live in a particular territory, they might use different routes for their everyday activities such as shopping or leisure (Spahr and Escolas, 1982). The authors conclude that classification on the basis of geographical area fairly discriminates amongst policyholders since it appears to be a predictor of both the frequency and the severity of accidents (Spahr and Escolas, 1982). On the contrary, Boyer and Dionne (1989) have found that the place of residence as a classification variable is not a predictor of the risks drivers pose. However, the variations in the results between the two studies might be evident due to the differences in the classification variables examined. Spahr and Escolas, (1982) examined the place where the accidents occurred whilst Boyer and Dionne (1989) examined the place of residence as a predictor of risk.

Other methods which can be implemented by insurance companies in order to predict automobile claims and hence set premiums are psychological methods (Haner, 1968). It has been suggested that when classifying drivers according to characteristics such as age, sex, marital status, type of vehicle, this could result in "virtually hundreds of sub-groups of insureds and an extremely complicated rating structure." (Haner, 1968; p.49) As a result, the Grinnell Mutual Reinsurance Company implemented the Youthful Driver Programme for the first time in 1959 (Haner, 1968). The rationale behind the programme was that the risk of each driver can be assessed using psychological methods to evaluate the attitudes and personality characteristics of the driver (Haner, 1968).

Under this method, some basic assumptions are assumed to hold (Haner, 1968). Firstly, the most important variable is assumed to be the driver in terms of having an effect on both the severity and the frequency of automobile accidents, whereas other factors such as the type of vehicle are secondary (Haner, 1968). Secondly, the way people drive is characterised more by the attitude and personality of the driver than his/her knowledge of the legislation, his/her knowledge of the automobile's functions and operations and even his/her driving experience (Haner, 1968). Thirdly, it is assumed that such personality characteristics and attitudes are comparatively permanent, and lastly, it is assumed that these can be segregated and appraised fairly accurately (Haner, 1968). In the case that these assumptions are relatively true, the frequency of claims can be predicted using psychological devices as the ones implemented by the Grinnell Mutual Reinsurance Company in setting premiums for young male drivers (Haner, 1968).

The process employed by the Grinnell Mutual Reinsurance Company in insuring young male drivers is exclusively and completely based on an objective attitude inventory which is taken by the driver (Haner, 1968). The scores of each driver are then calculated on a computer (Haner, 1968). Four scores are possible, where Group I includes young male drivers who are as mature as

adults and are thus seen as a good risk (Haner, 1968). Group IV represents young male drivers with very low scores on the attitude inventory who are therefore seen as immature and a bad risk (Haner, 1968). For this group, premiums are considerably higher than any other group so as to reflect this bad risk (Haner, 1968). Haner (1968), after assessing this method of setting premiums implemented by the Grinnell Mutual Reinsurance Company, has concluded that: "It thus appears that the frequency of accident involvement of youthful drivers can be predicted with a degree of accuracy far beyond chance, using psychometric measures of attitude only and that accident severity as measured by either cost or seriousness of injury can likewise be predicted with a considerable degree of accuracy." (Haner, 1968; p.57) As a result, the underwriting procedure employed by insurance companies could be based solely on *the driver* as a variable (Haner, 1968). Unfortunately, it has not been possible to uncover any current evidence in the literature to indicate as to whether this method is still employed by the company or whether other companies have also implemented it in their underwriting process.

Moreover, when setting insurance premiums, insurers could potentially racially discriminate by raising premiums and therefore limiting the availability of coverage (Harrington and Niehaus, 1998). Due to the fact that racial discrimination is illegal, premiums cannot explicitly depend on a potential policyholder's race (Harrington and Niehaus, 1998). In the case where racial discrimination is practicable however, it could have an effect on premiums in one of two ways (Harrington and Niehaus, 1998). "First, insurers could file rates that exhibit a greater markup over expected costs for rating territories with a higher proportion of minorities, thus causing loss ratios to be negatively related to percent minority population." (Harrington and Niehaus, 1998; p.443) Second, more strict underwriting standards could be implemented to minorities than non-minorities (Harrington and Niehaus, 1998).

As a result, Harrington and Niehaus (1998) conducted a research so as to examine the extent to which racial discrimination affects insurance premiums by investigating whether premiums tend to be higher in areas with an increase minority population (Harrington and Niehaus, 1998). The research was conducted in the state of Missouri in the United States, where the population is racially and demographically diverse (Harrington and Niehaus, 1998). Additionally, the state of Missouri was seen as ideal when considered for this particular research since automobile insurance premiums are set without regulatory intervention and are therefore a result of market forces (Harrington and Niehaus, 1998). The authors, by conducting the above research tested that, in the case where higher premiums were charged to minorities, the expected-loss ratio (the ratio of expected claim costs to premiums) would be lower in areas with a large number of minorities (Harrington and Niehaus, 1998). However, results have shown that a negative correlation is not apparent between loss ratios and the percentage of minority population in the state of Missouri (Harrington and Niehaus, 1998). This implies that racial discrimination does not increase premiums in terms of expected claim costs for the minority population and consequently insurance companies do not profit more from minority populations than non-minority populations (Harrington and Niehaus, 1998).

2.4 Customer Perception of Automobile Risk Classification Variables
As it was illustrated above, there is a great deal of controversy surrounding the fairness and appropriateness of risk classification variables used to set automobile insurance

premiums. For some, risk classification systems are seen as fair and appropriate since they are designed to provide insureds with an affordable insurance coverage (Nowlan, 2000). Under such classification systems, individuals and society as a whole benefit (Nowlan, 2000). For others, risk classification systems pose numerous limitations, for example the problem of moral hazard (Brouhns et al., 2003). More specifically, moral hazard is evident in situations where classification variables fail to capture the potential efforts by policyholders to reduce their risk (Brouhns et al., 2003).

Contrary to what was mentioned in previous sections, the aim of this section is to provide the reader with information regarding the perception of policyholders of automobile risk classification variables. It appears that there are only a limited number of studies which focus on this topic and as a result this section of the literature review will be relatively short. The survey conducted for the purpose of this research paper aims in filling this evident gap in literature by investigating the views of Cypriot customers buying automobile insurance on the fairness of risk classification variables.

In general, consumer perceptions of the price of a product appear to be twofold (Antón et al., 2007). Firstly, customers might view a highly priced product as one of high quality (Dodds et al., 1991; Teas and Agarwal, 2000; cited by Antón et al., 2007). The second appears contradictory to the first and implies that customers perceive a product of low price as a good value for money (Kirmani and Rao, 2000; cited by Antón et al., 2007). In cases where customers perceive prices as unsatisfactory or unfair, when possible, they will change their supplier (Campbell, 1999; Homburg et al., 2005; cited by Antón et al., 2007). Automobile insurance prices are commonly based on a range of classification strategies where variables including age, occupation, use of vehicle, driving record and type of vehicle are considered (Tryfos, 1980). It is therefore of immense importance to investigate how certain classification variables are perceived by policyholders. Such perceptions might in turn provide further insight on the perceptions of policyholders of the final insurance price offered by insurance companies.

It has been suggested that the public's interest in risk classification variables used to set automobile insurance premiums has increased over the past few years (Forgue, 1983). As a result, Forgue (1983) performed a research in the market of Virginia, U.S., where randomly selected drivers were asked of their perceptions regarding risk classification variables used, the premiums resulting from the usage of such variables, together with possible changes that could be evident in the automobile risk classification process (Forgue, 1983). The classification variables considered were "age, sex, marital status, geographic territory, and driving record" (Forgue, 1983; p.323). Results show that 52.7% of the respondents perceived practices such as charging higher premiums to younger than older drivers as unfair to some level (Forgue, 1983). Only 43.4% of the respondents viewed differentiations in automobile insurance premiums based on the geographic territory of the policyholder as unfair (Forgue, 1983). However, the vast majority (77%) of the respondents agreed that charging higher premiums to male drivers was to some degree unfair (Forgue, 1983). Similar results were evident when respondents were asked whether they believed that charging unmarried drivers higher premiums was a fair practice; 80.1% viewed such practices as unfair (Forgue, 1983). The research also focused on which classification variables were seen as the most important and the least important ones by the sample used (Forgue, 1983). Amongst the most important variables were driver record, and make and model of the car (Forgue, 1983). On

the contrary, customers perceived the age, sex and marital status of the insured as the least important variables in setting automobile insurance premiums (Forgue, 1983). As a result, the author concludes that: "These responses strongly indicate that respondents feel most importance should be placed on those factors which are controllable by insureds and/or which are causally related to losses." (Forgue, 1983; p.329)

Even though the vast majority of the respondents supported the elimination of sex and the elimination of marital status as risk classification variables, slightly over one half of the respondents supported the elimination of age (Forgue, 1983). One of the most important findings of the research appears to be the opposition of respondents to the elimination of *all* classification variables from the pricing of automobile insurance (Forgue, 1983). It is therefore suggested that respondents agreed to the use of classification systems in setting automobile insurance premiums, however, they disagreed in the use of some of these variables (Forgue, 1983). Moreover, respondents agreed in increasing the importance of driving record when pricing automobile insurance (Forgue, 1983).

In addition to the above, there appears to be a correlation between the age of respondents and their perception of fairness in charging higher premiums to young policyholders (Forgue, 1983). More specifically, respondents under the age of twenty-one were more likely to view higher premiums charged to young drivers as unfair (Forgue, 1983). Moreover, more male respondents indicated that the use of sex as a classification variable was an unfair practice; however, there was only a small difference between the responses of males and females (Forgue, 1983). Specifically, 79.7% and 73.7% of males and females respectively perceived the use of sex as unfair (Forgue, 1983). As far as marital status is concerned, there appears to be an association between the marital status of respondents and their perceptions of using this variable in classifying risk (Forgue, 1983). "Almost 80 percent of the married respondents indicated that the practice was to some degree unfair. Almost 84 percent of the married respondents to some degree supported an elimination of marital status as a rating factor." (Forgue, 1983; p.335)

Another research conducted by Kensicki and Richmond (1973) aimed in investigating what consumers knew about their automobile insurance and whether they showed any interest in finding out more information about their insurance. Over the years it was assumed that insurance was a complicated matter not easily understood by most consumers, even if insurance companies often offer some information regarding specific coverages (Kensicki and Richmond, 1973). Results showed that consumers were indeed interested in learning more about their automobile insurance (Kensicki and Richmond, 1973). When asked what the primary use of their automobile was, 56% of the respondents "with a pleasure usage rate indicated they principally used their vehicle for pleasure." (Kensicki and Richmond, 1973; p.211) However, it remains unclear whether respondents understood the classification variables correctly (Kensicki and Richmond, 1973). It was thus concluded that there is a need for more education on the part of the insureds so as they can have a better understanding of not only their coverage but also of the process and classification variables used to set automobile insurance premiums (Kensicki and Richmond, 1973).

In countries such as Japan, where the automobile insurance sector is strongly regulated by the government, all insurance companies provide the same products at equivalent prices and thus

there is little need for policyholders to understand the classification variables used to set premiums (Hayakawa et al., 2000). However, counties in the European Union are not as closely regulated and thus there is a need to understand the perceptions customers have on the fairness of risk classification variables. The research that will follow will aim in investigating the above and it will be conducted in the country of Cyprus.

3 Research Design and Methodology

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3.1 Introduction

The objective of Chapter three is to establish the research design and methodology employed so as to satisfy the research objectives of this research paper. Additionally, the chosen design and methods of research will be critically evaluated against existing alternative processes. Consequently, the reliability of the design will be assessed so as to ensure that the selected methods of research are valid under the current practices. This, together with the rationale of the research, the chapter will focus in presenting the ways in which the chosen design and methodology are used as a means of logically progressing from the stated aims and objectives of this research paper presented in Chapter one, all the way to the presentation and analysis of the results from which the conclusion of the research will be drawn.

Chapter three also describes and evaluates the research methodology used to accumulate the data, which is then compared against substitute methods. The sample population will then be described, along with a justification for its selection. At last, the chapter will provide the reader with a review of the research questionnaire with the aim of summarising the response rate and the procedures used to distribute the questionnaire.

3.2 Research Design

As it was expected, the research design during the initial phases of the study has been altered and revised. This was mainly due to a limited understanding of the area of interest at those times. It has thus been extremely challenging to establish the chosen methodology and to avoid any overlapping procedures when developing the research design.

The research paradigm selected was the positivist approach since the research objectives of this dissertation paper implied that research would be focused on quantitative data. The hypotheses tested were derived form existing academic theory, and through the results drawn, an expansion of the current academic theory is manifested (Saunders et al., 2007). This can then be tested through additional research (Saunders et al., 2007).

The deductive approach was used to investigate the views of Cypriot insured drivers on the fairness of risk classification variables such as age, gender, years of experience and driver record. The alternative approach known as the inductive approach was rejected since a very limited amount of academic research currently exists on the topic examined. As a result, it was seen as essential to determine the opinions of Cypriot insured drivers on the fairness of some risk classification variables and to establish whether associations exist between the opinions of Cypriot insured drivers and a number of demographic and other policyholder characteristics which are used to set premiums in automobile insurance instead of exposing reasons as to why these views are held by the sample population. Commonly, the latter approach is perceived as the task of an inductive

approach.

The research strategy chosen was the survey method. This was chosen over substitute methods which might include the experiment method and the case study method (Saunders et al, 2007). These were seen as inappropriate for this research paper since they fit well under different circumstances and other research areas. The survey method was chosen as the most appropriate research strategy since it enables the findings of the research to investigate the views of Cypriot insured drivers on the fairness of a number of risk classification variables and to establish whether associations exist between these opinions and a number of demographic and other policyholder characteristics used to set automobile insurance premiums. Case studies and analytical approaches could have been used in situations where there existed an abundance of research on the chosen topic.

Both time and monetary constraints implied that a longitudinal study was not feasible. Instead, the cross-sectional time horizon was seen as more appropriate since there was not a need for investigating how the views of Cypriot insured drivers changed over time and how and why these were formed in the first place. Instead, the cross-sectional time horizon presented current views on the fairness of risk classification variables at the time that the survey took place.

3.3 Research Methodology

In order to collect the necessary data from the sample population, the questionnaires were handed out to the respondents personally. This was the chosen method since it was expected that the response rate would be higher compared to sending the questionnaires via email or post. Moreover, this method overcame obstacles such as finding the email address or home address of the sample population which would evidently take more time and money to achieve. It was recognised from the initial stages of the construction of the questionnaire that simple questions and clear instructions would be vital in ensuring that the respondents would complete the questionnaire with the least possible bias. It was expected that some of the questions could have been misinterpreted, thus resulting in some of the data being invalid. However, it is believed that this risk was minimised since the questionnaires were handed out personally to the respondents and therefore the researcher was able to clarify any misunderstandings or quarries that the respondents put across regarding particular questions of the questionnaire.

The content of the questionnaire was carefully structured so as to obtain the necessary information from the sample population and to establish the respondents' views on the fairness of a number of risk classification variables. Only quantitative data was ultimately obtained from the questionnaires.

The numerous advantages of the questionnaire as a research instrument were recognised and this was the main reason behind the selection of this research method in collecting the primary data for this research paper. Specifically, the process of collecting primary data through questionnaires is highly standardised and relatively simple, and thus easily comprehended by the respondents. This

could have increased the response rate. Additionally, the research instrument chosen made it feasible to collect the data within a timeframe of ten days; a situation which was suitable for the general programme of research. Due to the large size and the geographical disparity of the sample, an alternative research instrument would have cost more and consumed large amounts of time. More specifically, structured interviews or delivery and collection questionnaires were seen as inappropriate research methods since it would have been impossible to collect the required data within the ten day time frame originally set. The above research instruments could have been more appropriate in cases where the size of the sample population was smaller and less geographically dispersed.

In conclusion, both the benefits as well as the limitations of all of the available research instruments were carefully assessed and it was thus concluded that the most appropriate to be used for the purposes of this research paper was the face-to-face questionnaire. Through the survey, a satisfactory amount of primary data was collected so as the research objectives of the paper would be satisfied. All of the above were achieved within the preset time frame and monetary constraints.

3.4 Rationale of Research Questionnaire
The main focus of this section is to provide the reader with an illustration of the contents of the research questionnaire which can be found in Appendix I. The questionnaire is divided into two sections. The first section includes questions which are used to identify the demographics of the sample population. The first question is a filter question and it identifies whether the respondent is a licensed driver and, in cases where the answer to that question is negative, the questionnaire is not usable. The questionnaire then includes questions which are used to identify the age and gender of the respondent. After a thorough research on the internet of insurance companies operating in the country of Cyprus it was concluded that the age ranges which received increased premiums were typically the 18-24 and over 65 ones. This is the reason behind the selection of the age cells. The questionnaire then continues with a question to identify the number of years the respondent holds their driving license. After the internet search, it was concluded that drivers with less than 2 years driving experience typically pay an increased premium for their motor insurance. A final question is presented to identify whether the respondent has had a traffic accident for which a claim was made to their motor insurance company over the last three years. This question was used to gain some knowledge about the driving record of the respondent. Drivers who have had a claim over the last three years would have their motor insurance premium raised. Due to time and monetary constrains, it was not possible to include additional questions to better understand the driver record of each respondent. This would imply that the size of the sample population would have to increase and that the analysis of the results would become more complicated and time-consuming. All of the above respondent characteristics are used to establish whether associations exists between the opinions of Cypriot insured drivers regarding the fairness of numerous risk classification variables and these policyholder characteristics.

Section 2 of the questionnaire aims in identifying the views of Cypriot insured drivers on the fairness of risk classification variables such as age, gender, years of driving experience and driver record. The views of Cypriot drivers are obtained on how fair they consider an insurance company charging, for example, higher premiums to younger drivers or higher premiums to male or unmarried drivers. Closed response questions were used and it was decided that an even number of categories would be presented to the respondents from which they would have to choose their answer. These categories were denoted by 1 for very unfair, 2 for unfair, 3 for somewhat unfair, 4 for somewhat fair, 5 for fair and 6 for very fair.

The questions that follow aim in identifying which risk classification variable is considered as the most important and the least important in setting automobile insurance premiums by the sample population. The next question identifies the views of the sample population on the charging of the same premium to all drivers regardless of their particular characteristics (e.g. age, gender, previous accidents). This is followed by a question to identify the views of the respondents on how fair they perceive the payment of the same price for motor insurance as a driver who is more risky than they are. The respondent reaction to possible eliminations of a number of risk classification variables is then identified by question 16. The questionnaire finally concludes by asking the sample population to provide a definition of a "fair motor insurance premium". The questionnaire can be found in Appendix I.

3.5 The Sample of the Research

The sampling technique employed for the purpose of this research paper was the convenience sampling technique; a non-probability sampling method. It appeared impossible to obtain the names and addresses of licensed drivers in Cyprus either from Government files or from individual insurance companies so the employment of a systematic random sampling method was not possible. Investigating the views of the entire population of licensed drivers in Cyprus would not have been feasible due to monetary and time constraints. Instead, the convenience sampling technique provided convenient accessibility to the sample population.

In order to ensure that a wide choice of views would be obtained through the research, it was seen as essential that the selected sample would cover a broad geographical region. This would also try and limit one of the major disadvantages of the convenience sampling method. This would be the probability that the sample is not representative of the entire population (Saunders et al., 2007). After gaining the necessary access, schools as well as companies in numerous sectors were visited so as to hand out the questionnaires. This was essential since the opinions of different age groups as well as the views of respondents with different years of driving experience were required for the research. A smaller sample from the population was also used so as to pre-test the questionnaire and to identify and remove potential errors.

A sample size of 130 licensed drivers in Cyprus was obtained. The response rate was an overwhelming 89,2% since 116 usable questionnaires were collected and analysed. This could be seen as a somewhat high response rate since research papers of similar context report a response rate of approximately 53% (e.g. Forgue, 1983). This could be attributed to the method used to

distribute the questionnaires. Instead of mailing out the questionnaires or sending them out via email, they were handed out personally to the respondents and the respondents in turn completed the questionnaires instantly.

As it was mentioned above, the questionnaire contained mostly closed questions so as to ensure that respondents completed the questionnaire with ease. A large number of open ended questions was likely to restrict some respondents from completing the questionnaire since it would require additional time to complete. A covering letter containing a detailed explanation of the purpose of the questionnaire was also handed out. Since the questionnaires were handed out personally to the respondents, it was expected that the response rate would be high. Respondents were also informed that the data they provided by completing and returning the questionnaire would be dealt with the strictest discretion and they were assured that their name would not appear anywhere in this research paper. Table 3.1 provides a summary of the sample demographics and characteristics.

Table 3.1 *Sample demographics and characteristics*

	Frequency	Percentage
Age		
18-24	48	41.40%
25-65	54	46.60%
Over 65	14	12.10%
Gender		
Male	56	48.30%
Female	60	51.70%
Driving Experience		
0-2 Years	19	16.40%
Over 2 years	97	83.60%
Claims Made Over the Past 3 Years		
Yes	25	21.60%
No	91	78.40%

3.6 Method of Analysis

The questionnaires were firstly sorted and coded. The data was then entered into the program known as SPSS 14.0, so as to be analysed. In order to satisfy Objective 1 of the research paper, a simple frequency method of analysis was utilised, which produced the relevant results. The purpose of this method of analysis was to facilitate an understanding of the opinions of the sample on the fairness of risk classification variables such as age, gender, years of driving experience and driver record.

In order to satisfy Objective 2 of the research paper, the chi-square test was performed to assess the likelihood that variables were associated (Saunders et al., 2007). The chi-square test was selected since it is used when ordinal data is collected (Saunders et al., 2007). It has been suggested that rating questions (as the ones used for the purposes of this research paper), where respondents are asked to rate how strongly they support or oppose a practice, gather ordinal data (Saunders et al., 2007). A significance level of 0.05 was selected so as to facilitate the comparison between the results of this research and the results of a similar research by Forgue (1983). Conclusions drawn from the findings of the research are included in the chapter that follows.

4 Analysis and Discussion of Findings

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4.1 Introduction

The main aim of Chapter four is to provide an illustration and discussion of the key findings of the survey. The chapter proceeds with an illustration of the main findings of the survey regarding the views of the respondents on the fairness of risk classification variables. Such variables include, amongst others, age, gender, years of driving experience and driver record. The chapter then proceeds to establish whether associations exist between the opinions of the respondents and a number of demographic and other policyholder characteristics which are used to set automobile insurance premiums.

4.2 Opinions

The total number of questionnaires handed out was 130, from which 116 were completed and usable for analysis. As a result, the response rate was an overwhelming 89,2%, a rate higher that what was initially anticipated.

Respondents were asked to state their views on a number of practices employed by insurance companies in the pricing of automobile insurance (Table 4.1). The majority of the respondents (79.3%) held the view that higher premiums charged to very young drivers was to some degree fair, with 28.4% of the respondents indicating that they viewed such practice as "very fair". These results are dissimilar to the ones obtained by Forgue (1983), since the author concluded that 52.7% of the respondents viewed the above practice as unfair to some degree. When asked their views on charging higher premiums to male drivers, 38.8% of the respondents indicated that they viewed this practice as "very unfair". On the contrary, just 6.9% viewed this practice as "very

fair". A total of 80.2% of the respondents stated that they felt that charging higher premiums to male drivers was to some degree unfair. This result is similar to the one obtained by Forgue, (1983) who found that 77% of the respondents viewed the practice as unfair to some degree. Maroney and Vickory (1983) also state that the use of gender as a classification variable is widely opposed by society. The above result might indicate this opposition.

A total of 88.8% of the respondents viewed the charge of higher premiums to unmarried drivers as unfair to some degree. Almost half of the respondents (49.1%) felt that such a practice was "very unfair". Again, this result is in accordance to the research performed by Forgue (1983) who obtained a similar result as the one illustrated above. More specifically, Forgue (1983) suggested that 80.1% of the sample population reported that they viewed the practice of charging higher premiums to unmarried drivers as unfair to some degree.

Contrary to the above results, charging higher premiums to inexperienced drivers was seen as "very fair" by 37.1% of the respondents. Just 18.1% of the respondents felt that such a practice was to some extent unfair whilst the large majority of 81.9% of the respondents felt that such a practice was to some degree fair. The practice of automobile insurance companies charging higher premiums to drivers with previous traffic violations was seen as "very fair" by 30.2% and "fair" by 38.8% of the respondents. Only 14.7% of the respondents held the view that such a practice was to some degree unfair. The majority of 70.7% of the respondents indicated that they considered to some degree unfair the charging of higher premiums to drivers who drive long distances, with just 4.3% and 8.6% considering the practice as "very fair" and "fair" respectively.

Table 4.1 *Frequencies and percentages of opinions on practices employed by insurance companies in pricing automobile insurance*

Practice	Very Unfair	Unfair	Opinions Somewhat Unfair	Somewhat Fair	Fair	Very Fair
Charging higher premiums to very young drivers	3 (2.6%)	7 (6.0%)	14 (12.1%)	19 (16.4%)	40 (34.50%)	33 (28.4%)
Charging higher premiums to male drivers	45 (38.8%)	31 (26.7%)	17 (14.7%)	9 (7.8%)	6 (5.2%)	8 (6.9%)
Charging higher premiums to unmarried drivers	57 (49.1%)	28 (24.1%)	18 (15.5%)	6 (5.2%)	2 (1.7%)	5 (4.3%)
Charging higher premiums to inexperienced drivers	5 (4.3%)	6 (5.2%)	10 (8.6%)	17 (14.7%)	35 (30.2%)	43 (37.1%)
Charing higher premiums to drivers with previous traffic violations	5 (4.3%)	5 (4.3%)	7 (6.0%)	19 (16.4%)	45 (38.8%)	35 (30.2%)
Charging higher premiums to drivers who drive long distances	21 (18.1%)	36 (31.0%)	25 (21.6%)	19 (16.4%)	10 (8.6%)	5 (4.3%)

When asked to select the risk classification variable that should be of highest importance when setting automobile insurance premiums, 40.5% of the respondents chose age. The list included the following variables: gender of the driver, age of the driver, marital status, previous traffic violation, years of driving experience, distance driven, place of residence of the driver, make and model of the car and car use. The variable known as previous traffic violations was seen as the risk classification variable of highest importance in setting automobile insurance premiums by 33.6% of the respondents. Years of driving experience was selected by 19% of the respondents. Gender and the make and model of the car were selected by 5.2% and 1.7% of the respondents respectively.

When asked about the risk classification variable respondents felt that should be of least importance in setting automobile insurance premiums, respondents selected a wider range of variables than when asked to select the variable that should be of highest importance. In particular, gender was chosen by 31% of the respondents and marital status by 31.9%. The place of residence of the driver was selected by 23.3% of the respondents. Years of driving experience and the use of the car were chosen by 1.7% of the respondents each. The make and model of the car was chosen by 6.9% and the distance driven was chosen by 3.4% of the respondents. Please refer to Table 4.2 for the above results.

The above results are in some cases similar to the ones obtained by Forgue (1983). More specifically, the author concluded that the variables that were selected by the sample population to be of least importance and obtained the highest scores were gender, marital status and place of residence of the driver (Forgue, 1983). These results are similar to the ones obtained by the current research. However, the age of the driver does not appear to be considered as one of the variables that should be of least importance by the sample population of this research, even though it appears to be one in the research by Forgue (1983). Instead, the age of the driver is seen as one of the variables that should be of highest importance in setting automobile insurance premiums by this research. "Previous traffic violations", which appears as "driver record" in Forgue (1983), is considered as one of the variables that should be of highest importance in setting motor insurance premiums by both researches.

Table 4.2 *Frequencies and percentages of opinions on variables that should be of highest and of least importance in setting motor insurance premiums*

Risk Classification Variable	Opinions		
	Highest	Least	

	Importance	Importance
Gender	6 (5.2%)	36 (31.0%)
Age	47 (40.5%)	0
Marital Status	0	37 (31.9%)
Previous Traffic Violations	39 (33.6%)	0
Years of Driving Experience	22 (19.0%)	2 (1.7%)
Distance Driven	0	4 (3.4%)
Place of Residence	0	27 (23.3%)
Make and Model of the Car	2 (1.7%)	8 (6.9%)
Car Use	0	2 (1.7%)

When asked whether respondents considered fair charging the same premium to all drivers regardless of their particular characteristics, 22.4% chose "very unfair" and 31% chose "unfair". Just 4.3% of the respondents considered the above practice as "very fair". When asked whether respondents considered fair paying the same premium for motor insurance as a driver who is more risky than they are, 81% of the respondents indicated that such a practice was to some degree unfair. A total of 58.6% selected either "very unfair" or "unfair", whilst 5.2% considered such a practice as "very fair".

From these results, it can be concluded that the majority of the respondents can understand the importance of the specific characteristics of policyholders and, to varying extent, how these characteristics can influence automobile insurance premiums. For example, the fact that the majority of the respondents reported that they considered to some extent unfair charging the same premium to all drivers regardless of their particular characteristics e.g. their age and gender, indicates that respondents might interpret as "fair" for motor insurance companies to take into consideration these and other characteristics when evaluating the price of motor insurance. The above is also concluded from the results obtained when respondents were asked of their reaction to a possible elimination of all rating factors. 75% of the respondents strongly opposed the above elimination. As a result, even though respondents might support the elimination of some rating factors, they appear to oppose the elimination of all rating factors. These results are in accordance to the ones obtained by Forgue (1983).

Respondents were then asked of their reaction to a possible elimination of a number of rating factors used to price automobile insurance (Table 4.3). The majority of the respondents (67.2%) indicated that to some degree they opposed the elimination of age. As a result, it can be concluded that the social acceptability of age as a rating factor is quite high. This is also suggested when investigating which classification variables are seen as the most important ones to be employed in the pricing of automobile insurance premiums. As it was mentioned above, 40.5% of the respondents viewed age as the variable that should be of highest importance when pricing motor insurance. This result is

contradictory to Maroney and Vickory (1986) who state that the social acceptability of age as a risk classification variable is low.

Similar results were obtained when asked of their opinions on eliminating years of driving experience as a rating factor. More specifically, 64.7% of the respondents opposed to some degree the elimination of driving experience. Contradictory results were obtained when respondents were asked about their reaction to a possible elimination of marital status. In this case, 32.7% of the respondents opposed to some degree such practice, whilst 67.3% supported to some degree such elimination. In particular, almost the majority of the respondents (46.6%) indicated that they "strongly support" the elimination of marital status as a rating factor. The above result is also obtained by Forgue (1983) who reported 84.7% of the sample population supporting to some extent the elimination of marital status (Forgue, 1983).

In addition to the above, over half of the respondents opposed the elimination of previous traffic violations as a rating factor used to price motor insurance. Specifically, 63.9% opposed to some degree the elimination of the above rating factor, with 39.7% indicating that they "strongly oppose" such practice. Only 13.8% and 18.1% chose "support" and "strongly support" respectively for eliminating the above factor.

When asked whether they supported the elimination of age as a rating factor, only to be replaced by years of driving experience, 38% of the respondents indicated that they opposed such elimination to some extent. Therefore, the majority of the respondents (62%) indicated that, to some degree, they supported such elimination. However, different results were obtained when respondents were asked of their reaction to a possible elimination of age only to be substituted with distance driven. In this case, the majority of the respondents opposed to some degree the above (72.4%). The above result indicates that respondents oppose the elimination of age, a variable that the policyholder has no control over, only to be replaced by a variable that policyholders have control over (up to a certain extent).

In eliminating all rating factors and replacing them with psychological tests which will evaluate the risk of each individual driver, 57.8% of the respondents indicated that they opposed the practice to some degree. However, 42.2% of the respondents reported that they supported the above to some degree. As a result, it can be concluded that almost half of the respondents might support the introduction of psychological tests which will evaluate the risk of each individual driver. Such tests would assess the risk of each individual driver by evaluating their attitudes and personality characteristics (Haner, 1968).

When asked of their reaction to a possible elimination of all rating factors, the vast majority of the respondents (88%) held the opinion that they opposed to some degree such elimination. Specifically, 75% of the respondents indicated that they "strongly oppose" the elimination of all rating factors. This result is consistent with the one obtained by Forgue (1983). The author found that approximately 80% of the respondents opposed to some extent the elimination of all rating factors (Forgue, 1983). This indicates that even though the respondents support the elimination of some rating factors, they oppose the elimination of all rating factors (Forgue, 1983).

Table 4.3 *Frequencies and percentages of opinions on possible eliminations of a number*

of rating factors

Risk Classification Variable	Opinions					
	Strongly Oppose	Oppose	Somewhat Oppose	Somewhat Support	Support	Strongly Support
Age	43 (37.1%)	20 (17.2%)	15 (12.9%)	10 (8.6%)	14 (12.1%)	14 (12.1%)
Years of driving experience	42 (36.2%)	22 (19%)	11 (9.5%)	10 (8.6%)	18 (15.5%)	13 (11.2%)
Marital status	21 (18.1%)	10 (8.6%)	7 (6.0%)	10 (8.6%)	14 (12.1%)	54 (46.6%)
Traffic convictions/ Previous accidents	46 (39.7%)	19 (16.4%)	9 (7.8%)	5 (4.3%)	16 (13.8%)	21 (18.1%)
Eliminate age and substitute with years of driving experience	14 (12.1%)	14 (12.1%)	16 (13.8%)	31 (26.7%)	20 (17.2%)	21 (18.1%)
Eliminate age and substitute with distance driven	41 (35.3%)	25 (21.6%)	18 (15.5%)	14 (12.1%)	9 (7.8%)	9 (7.8%)
Eliminate all rating factors and replace them with psychological tests which will evaluate the risk of each individual driver	30 (25.9%)	24 (20.7%)	13 (11.2%)	18 (15.5%)	15 (12.9%)	16 (13.8%)
Eliminate all rating factors	87 (75.0%)	6 (5.2%)	9 (7.8%)	4 (3.4%)	3 (2.6%)	7 (6.0%)

Lastly, respondents were presented with a number of possible definitions for a "fair motor insurance premium". They were asked to select the definition that best suits their perceptions on fair motor insurance premiums. The majority of the respondents (63.8%) selected the definition that a fair insurance premium can be defined as "the insurance premium which is based on the specific characteristics of a policyholder". 21.6% of the respondents selected the definition which states that a fair insurance premium is "the insurance premium which is based on classification variables that the policyholder has control over", whilst 11.2% selected "the insurance premium which is the same for all individuals with the same expected losses/claims". Only 3.4% selected "the insurance premium which is the same for all individuals".

The above results indicate that for the vast majority of the respondents, a fair motor insurance premium is one which is differentiated amongst policyholders. Opinions on the nature of these differentiations appear to vary. In some cases respondents would like to see their premiums differentiated based on their expected claims/ losses, whilst in other cases respondents would like to see their premiums differentiated based on the particular characteristics of the policyholders. If a time comes when automobile insurance companies provide sufficient explanations about the

idea behind risk classification variables and the processes employed to set premiums, it is believed that the above opinions are likely to change.

4.3 Tests of Hypotheses

In order to satisfy Objective 2 of the research paper, the chi-square test was performed so as to establish whether significant associations exist between opinions regarding automobile risk classification variables and a number of demographic and other policyholder characteristics. Please refer to Table 4.4. The null hypotheses formed and tested are (similar to Forgue, 1983):

4. There is no significant association between respondent views concerning age as a risk classification variable and the age and the number of years of driving experience of the respondent.
5. There is no significant association between respondent views concerning gender as a risk classification variable and the gender of the respondent.
6. There is no significant association between respondent views concerning driving record as a risk classification variable and the driving record of the respondent.

The first set of hypotheses assumed that there is no significant association between respondent views concerning age and the age and the number of years of driving experience of the respondent. It appears that there is a significant association between the view of charging higher premiums to young drivers and the age of the respondent. More specifically, respondents between the ages of 25-65 and over 65 were more likely to consider as fair or very fair charging higher premiums to young drivers than respondents below the age of 25. The above results were also found by Forgue (1983).

A significant association was also found to exist between the practice of charging higher premiums to young drivers and the years of driving experience of the respondent. In particular, respondents with more than two years of driving experience were more likely to respond that charging higher premiums to younger drivers was a fair practice. Again, these results are similar to the ones found by Forgue (1983). When testing whether there is an association between views on eliminating age as a rating factor and the age of the respondent, once more a significant association was found to exist. Respondents over the age of 25 were more likely to oppose such elimination than respondents below the age of 25. However, when testing whether an association exists between the views on eliminating age as a rating factor and the driving experience of the respondent, no significant association was found.

A significant association was found to exist between the age of the respondent and views on eliminating age and substituting it with years of driving experience, whilst no association was found to exist between such substitution and the years of driving experience of the respondent. Similarly, no association was found between eliminating age and substituting the variable with distance driven and the age or the years of driving experience of the respondent.

Table 4.4 *Results of tests of hypotheses*

Opinion Variable	Respondent Characteristic	?²	d.f.	n	p
AGE					
Charging higher premiums to young drivers	Age	51.394	10	116	0.000*
Charging higher premiums to young drivers	Years of Driving Experience	33.226	5	116	0.000*
Eliminate age as a rating factor	Age	35.860	10	116	0.000*
Eliminate age as a rating factor	Years of Driving Experience	3.324	5	116	0.650
Eliminate age and substitute with years of driving experience	Age	27.303	10	116	0.002*
Eliminate age and substitute with years of driving experience	Years of Driving Experience	6.850	5	116	0.232
Eliminate age and substitute with distance driven	Age	7.676	10	116	0.660
Eliminate age and substitute with distance driven	Years of Driving Experience	5.099	5	116	0.404
GENDER					
Charging higher premiums to male drivers	Gender	11.931	5	116	0.036*
DRIVER RECORD					
Charging higher premiums to drivers with previous traffic violations	Number of Claims	11.792	5	116	0.038*
Eliminate traffic convictions/Previous Accidents as a rating factor	Number of Claims	6.388	5	116	0.270

*A significant association was found to exist when p ? 0.05

The second set of hypotheses tested whether there is an association between respondent views concerning gender as a risk classification variable and the gender of the respondent. Specifically, a significant association was found to exist between the practice of charging higher premiums to male drivers and the gender of the respondent. This hypothesis was therefore rejected. More male respondents found the practice as either unfair or very unfair than female respondents. Similar

results were obtained by Forgue (1983).

In assessing whether an association exists between respondent views concerning driving record as a risk classification variable and the driving record of the respondent, no association was found to exist between views concerning the elimination of traffic convictions/previous accidents as a rating factor and the number of claims respondents made over the last 3 years. Contrary to the above, a significant association was determined to exist between charging higher premiums to drivers with previous traffic convictions and the number of claims of respondents over the last 3 years. In particular, respondents who made a claim to their motor insurance company over the last 3 years were more likely to consider the above practice as either unfair or very unfair when compared to respondents who did not make a claim.

5 Conclusions and Recommendations
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5.1 Conclusions
The first objective of this research paper was to investigate the views of Cypriot insured drivers on the fairness of risk classification variables such as age, gender, years of experience and driver record. The findings revealed that the majority of Cypriot licensed drivers appeared to consider as fair to some extent the practice of automobile insurance companies charging higher premiums to very young drivers, higher premiums to inexperienced drivers and higher premiums to drivers with previous traffic violations. Conversely, it appears that the majority of the respondents considered as unfair to some degree charging higher premiums to male drivers, to unmarried drivers and to drivers who drive long distances. 40.5% of the respondents chose age as the classification variable that should be of highest importance in setting automobile insurance premiums whilst marital status was seen as the variable that should be of least importance by 31.9% of the respondents. Even though the age of an individual is beyond their control (Kelly and Nielson, 2006), this research has revealed that the respondents considered age as the variable that should be of highest importance in the risk classification process.

In addition to the above, even if respondents supported the elimination of particular rating factors, for example marital status, they strongly opposed the elimination of all rating factors. This result is consistent to the one obtained by Forgue (1983). Moreover, the research revealed that respondents appreciated the importance of the differentiations in automobile insurance premiums; however opinions varied in terms of the nature of these differentiations. Specifically, some respondents agreed that a fair insurance premium can be defined as one which is differentiated on the basis of the claims and expected losses of the policyholder whilst others defined a fair insurance premium as one which is differentiated on the basis of the specific characteristics of a policyholder.

The second objective of this research paper was to establish whether significant associations exist between the opinions of Cypriot insured drivers and a number of demographic and other policyholder characteristics which are used to set premiums in automobile insurance. The research showed that a significant association was found to exist between opinions on charging higher premiums to male drivers and the gender of the respondents. Specifically, male drivers were more likely to consider such practice as unfair compared to female respondents. A significant association was also found to exist between opinions on charging higher premiums to young drivers and the age of the respondent, as well as the years of driving experience of the respondent. Contrary, no significant association was found to exist between the elimination of traffic convictions/previous accidents as a rating factor and the number of claims made by the respondents over the last 3 years.

The inability of insurance companies to provide sufficient explanations about the rationale of risk classification could be the reason behind the results obtained by the current research (Thomas, 2007). However, the social acceptability of the risk classification variables used to set automobile insurance premiums is one of the criteria under which the fairness of risk classification variables is measured (e.g. Shayer, 1978; cited by Maroney and Vickory, 1986). The current research has revealed a broad dissatisfaction of the respondents on particular practices and as a result, it is believed that the automobile insurance sector should be conscientious of these policyholder dissatisfactions. Moreover, Kensicki and Richmond (1973) revealed that policyholders are keener in finding out more about their motor insurance. As a result, it is concluded that insurance companies as well as regulatory bodies in Cyprus should better inform policyholders on the processes employed to classify risk for the purposes of automobile insurance. Even though what is considered as fair can be a subject of opinion (Venezian, 1984), "there can be no doubt that a better informed public would be a more satisfied public" (Kensicki and Richmond, 1973; p.216).

5.2 Recommendations for future research
Future research could focus on reasons behind the specific opinions of insured drivers in the country of Cyprus. The current research concluded that 37.1% of the respondents strongly opposed the elimination of age as a risk classification variable and 40.5% ranked age as the variable that should be of highest importance when pricing automobile insurance premiums. The focus of future research could be the reasons behind such opinions. Specifically, it could investigate whether insured drivers hold such opinions because they acknowledge that there is evidence of very old and very young drivers having an increased risk of having more accidents than other age groups (e.g. Mayhew and Simpson, 1990; Mayhew et al., 2003; cited by Brown et al., 2007).

In addition to the above, it appears that there is a need for automobile insurance companies to provide a more clear explanation of the process employed to classify drivers and to set insurance premiums. Policyholders need to be better informed on which classification variables are used to price their motor insurance, together with reasons behind such practices. An alternative research could therefore focus on what is known by policyholders regarding current practices in automobile insurance classification methods.

In addition to the above, future research can focus on how strong associations are between policyholder characteristics and opinions, where different tests than the ones used for the purposes of this research will be performed and different hypotheses will be tested. Specifically, Pearson's product moment correlation coefficient and Spearman's rank correlation coefficient can be used to assess how strong the relation is between policyholder characteristics and opinions instead of assessing whether an association exists.

6 Personal Reflections

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The period of time during which this research paper has been developed and completed has proved extremely demanding but also extremely rewarding. The constant struggle to deal with personal issues, and the ones which surfaced during the creation and completion of this dissertation has been extremely challenging.

As far as the completion of the research paper is concerned, it often proved difficult to obtain the relevant resources to complete the literature review. More specifically, the unavailability of particular topics, for example the limited number of researches which indicated the views of policyholders regarding particular classification variables, proved a challenging task. Moreover, even though the questionnaire was created after a detailed review of the literature and the aims and objectives of the paper, it is now understood that specific questions could have been more related to the particular objectives of the research.

Lastly, it is believed that future research can be focused on which risk classification variables used to price automobile insurance premiums are seen as fair by Cypriot policyholders so as to verify the findings of this research paper. Future research can investigate a larger sample than the one used for the purposes of this research paper, and participants can be recruited using a different sampling method so as the results obtained can be inferred to the whole population.

References

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Antón, C., Camarero, C. and Carrero, M. (2007) 'Analysing Firms' Failures as Determinants of Consumer Switching Intentions', *European Journal of Marketing,* vol. 41, no. 1/2, pp. 135-158.

Blackmon, B. G. Jr. and Zeckhauser, R. (1991) 'Mispriced Equity: Regulated Rates for Auto Insurance in Massachusetts', *The American Economic Review,* vol. 81, no. 2, pp. 65-69.

Boulard, G. (2004) 'The Roar Over Credit Scores', *State Legislatures,* October/November, pp. 19-21.

Boyer, M. and Dionne, G. (1989) 'An Empirical Analysis of Moral Hazard and Experience Rating', *The Review of Economics and Statistics,* vol. 71, no. 1, pp. 128-134.

Brockett, P. L. and Golden, L. L. (2007) 'Biological and Psychobehavioral Correlates of Credit Scores and Automobile Insurance Losses: Towards an Explication of Why Credit Scoring Works', *The Journal of Risk and Insurance,* vol. 74, no. 1, pp. 23-63.

Brouhns, N., Guillén, M., Denuit, M. and Pinquet, J. (2003) 'Bonus-Malus Scales in Segmented Tariffs with Stochastic Migration Between Segments', *The Journal of Risk and Insurance,* vol. 70, no. 4, pp.577-599.
Brown, R. L., Charters, D., Gunz, S. and Haddow, N. (2007) 'Colliding Interests – Age as an Automobile Insurance Rating Variable: Equitable Rate-Making or Unfair Discrimination?', *Journal of Business Ethics,* vol. 72, pp. 103-114.

Butler, P. and Butler, T. (1989) 'Driver Record: a Political Red Herring That Reveals The Basic Flaw in Automobile Insurance Pricing', *Journal of Insurance Regulation,* vol. 8, no. 2, pp. 200-234.

Doerpinghaus, H. I., Schmit, J. T. and Yeh, J. J. (2008) 'Age and Gender Effects on Auto Liability Insurance Payouts', *The Journal of Risk and Insurance,* vol. 75, no. 2, pp. 527-550.

Forgue, R. E. (1983) 'Consumer Opinions of Automobile Insurance Classifications, Pricing Practices and Proposed Reforms', *Journal of Insurance Regulation,* vol. 1, no. 3, pp. 323-337.

Gusman, P. (2008), 'Mass. Ready to Test Drive Auto Premium Competition', *National Underwriter Property & Casualty*, p. 7.

Haner, C. F. (1968) 'Prediction of Automobile Claims by Psychological Methods – A Case Study in Automobile Insurance', *The Journal of Risk and Insurance,* vol. 35, no. 1, pp. 49-59.

Harrington, S. E. and Doerpinghaus, H. I. (1993) 'The Economics and Politics of Automobile Insurance Rate Classification', *The Journal of Risk and Insurance*, vol. 60, no. 1, pp. 59-84.

Harrington S. E. and Niehaus, G. (1998) 'Race, Redlining, and Automobile Insurance Prices', *Journal of Business*, vol. 71, no. 3, pp. 439-469.

Holmes, R. A. (1971) 'Inequities in Canadian Automobile Insurance Rates for Risky Groups', *The Journal of Business*, vol. 44, no. 2, pp. 180-183.

Hoy, M. and Lambert, P. (2000) 'Genetic Screening and Price Discrimination in Insurance Markets', *The Geneva Papers on Risk and Insurance Theory,* vol. 25, pp.103-130.

Hayakawa, H., Fischbeck, P. S. and Fischhoff, B. (2000) 'Automobile Risk Perceptions and Insurance-Purchasing Decisions in Japan and the United States', *Journal of Risk Research*, vol. 3, no. 1, pp. 51-67.

Kelly, M. and Nielson, N. (2006) 'Age as a Variable in Insurance Pricing and Risk Classification', *The Geneva Papers*, vol. 31, pp. 212-232.

Kensicki, P. R. and Richmond, D. (1973) 'Consumerism and Automobile Insurance', *The Journal of Risk and Insurance*, vol. 40, no. 2, pp. 209-217.

Kroncke, C. O. (1971) 'The Process of Classifying Drivers: a Suggestion for Insurance Ratemaking', *The Journal of Risk and Insurance*, vol. 38, no. 4, pp. 543-551.

Launis, V. (2003) 'Solidarity, Genetic Discrimination, and Insurance: A Defence of Weak Genetic Exceptionalism', *Social Theory and Practice*, vol. 29, no. 1, pp. 87-111.

Mackenzie, W. L. (1988) 'Wrong Turns in Auto Insurance', *Best's Review*, vol. 89, no. 2, pp. 26-28.

Maroney, P. F. and Vickory, F. A. (1986) 'Discrimination in Automobile Insurance: Issues and Remedies', *American Business Law Journal*, vol. 24, no. 2, pp. 269-291.

McGleenan, T. (1999) 'Rating Risk: Insurance, Genetics and Law', *Health, Risk & Society*, vol. 1, no. 3, pp. 325-332.

Nowlan, W. (2000) 'Society Benefits from Risk Classification', *National Underwriter,* p. 19.

Richaudeau, D. (1999) 'Automobile Insurance Contracts and Risk of Accident: An Empirical Test Using French Individual Data', *The Geneva Papers on Risk and Insurance Theory*, vol. 24, pp. 97-114.

Saunders, M., Lewis, P., and Thornhill, A. (2007) *Research Methods for Business Studies (*4th edn)*,* London, Pearson Education Limited.

Schwarze, R. (2006) 'Risk Classification and Public Policy', *The Geneva Papers,* vol. 31, pp. 187-189.

Spahr, R. W. and Escolas, E. L. (1982) '1979 Automobile Accident Reports: Do Driver Characteristics Support Rate Discrimination?', *Journal of Risk and Insurance*, vol. 49, no. 1, pp. 91-103.

Stano, P. E. (1991) 'Trifling With The Risk Classification System: A Risky Business', *Journal of Insurance Regulation*, vol. 9, no. 4, pp.542-574.

Tapiero, C. S., Kahane, Y. and Jacque, L. (1986) 'Insurance Premiums and Default Risk in Mutual Insurance', *Scand. Actuarial Journal*, pp. 82-97.

Thiery, Y. and Van Schoubroeck, C. (2006) 'Fairness and Equality in Insurance Classification', *The Geneva Papers,* vol. 31, pp. 190-211.

Thomas, R. G. (2007) 'Some Novel Perspectives on Risk Classification', *The Geneva Papers*, vol. 32, pp. 105-132.

Tryfos, P. (1980) 'On Classification in Automobile Insurance', *The Journal of Risk and Insurance*, vol. 47, no. 2, pp.331-337.

Van Praag, B. M. S. and Konijn, P. A. B. (1983) 'Solidarity and Social Security', *Challenge,* July-August, pp. 54-56.

 Venezian, E. C. (1984) 'Efficiency and Equity In Insurance', *The Journal of Risk and Insurance*, vol. 51, no. 2, pp. 190-204.

Appendices
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Appendix I – Research Questionnaire

Appendix I
Research Questionnaire

Section 1
1. Are you a licensed driver?

Yes   No

2. Please indicate your age:

18-24   25-65   Over 65

3. Please specify your gender:

Male   Female

4. For how many years do you hold your driver's license?

0-2   More than 2

5. Over the last 3 years, have you had a traffic accident for which a claim was made to your motor insurance company?

Yes   No

Section 2
For questions 6-11 please choose the answers that best represent your views by placing a tick in the appropriate box.
1 - very unfair
2 - unfair
3 - somewhat unfair
4 - somewhat fair
5 - fair
6 - very fair

Question	Very Fair					Very Unfair
Would you consider fair for an insurance company to charge:-	6	5	4	3	2	1
6. higher premiums to very young drivers						
7. higher premiums to male drivers						
8. higher premiums to unmarried drivers						

9. higher premiums to inexperienced drivers							
10. higher premiums to drivers with previous traffic violations							
11. higher premiums to drivers who drive long distances							

12. Which of the following do you believe should be of *highest* importance in setting automobile insurance premiums?
(Please select one of the following)

……………….. Gender of the driver
……………….. Age of the driver
……………….. Marital status of the driver
……………….. Previous traffic violations
……………….. Years of driving experience
……………….. Distance driven
……………….. Place of residence of the driver
……………….. Make and model of the car
……………….. Car use

13. Which of the following do you believe should be of *least* importance in setting automobile insurance premiums?
(Please select one of the following)

……………….. Gender of the driver
……………….. Age of the driver
……………….. Marital status of the driver
……………….. Previous traffic violations
……………….. Years of driving experience
……………….. Distance driven
……………….. Place of residence of the driver
……………….. Make and model of the car
……………….. Car use

14. Do you consider fair charging the same premium to all drivers regardless of their particular characteristics (e.g. age, gender, previous accidents)?

   Very Fair
   Fair
   Somewhat fair
   Somewhat unfair
   Unfair
  Very unfair

15. Do you consider fair paying the same price for motor insurance as a driver who is more risky than you are?

   Very Fair
   Fair
   Somewhat fair
   Somewhat unfair
   Unfair
  Very unfair

16. How would you react to a possible elimination of the following rating factors which are used to price motor insurance?
(please place a tick in the appropriate box)

1 - strongly oppose
2 - oppose
3 - somewhat oppose
4 - somewhat support
5 - support
6 - strongly support

Rating Factor	Strongly Support 6	5	4	3	2	Strongly Oppose 1
Age						
Years of Driving Experience						
Marital Status						

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|Traffic convictions/Previous  |        |       |        |        |       |       |
|accidents                     |        |       |        |        |       |       |
|                              |        |       |        |        |       |       |
|Eliminate age and substitute  |        |       |        |        |       |       |
|with years of driving         |        |       |        |        |       |       |
|experience                    |        |       |        |        |       |       |
|                              |        |       |        |        |       |       |
|Eliminate age and substitute  |        |       |        |        |       |       |
|with distance driven          |        |       |        |        |       |       |
|                              |        |       |        |        |       |       |
|Eliminate all rating factors  |        |       |        |        |       |       |
|and replace them with         |        |       |        |        |       |       |
|psychological tests which will|        |       |        |        |       |       |
|evaluate the risk of each     |        |       |        |        |       |       |
|individual driver             |        |       |        |        |       |       |
|                              |        |       |        |        |       |       |
|Eliminate all rating factors  |        |       |        |        |       |       |
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17. How would *you* define a "fair motor insurance premium"?

The insurance premium which is the same for all individuals with the same expected losses/ claims

The insurance premium which is based on the specific characteristics of a policyholder

The insurance premium which is the same for all individuals

The insurance premium which is based on classification variables that the policyholder has control over

Other - Please specify ……………………………………………
……………………………………………………………………..
……………………………………………………………………..

Thank you!