UNIVERSITI PUTRA MALAYSIA

VALUATION OF FATAL AND NON-FATAL INJURIES DUE TO MOTORCYCLE ACCIDENTS IN MALAYSIA

MOHD. FAUZI MOHD. YUSOFF.

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VALUATION OF FATAL AND NON-FATAL INJURIES DUE TO MOTORCYCLE ACCIDENTS IN MALAYSIA

By

MOHD FAUDZI MOHD YUSOFF

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia in Fulfilment of the Requirement for the Degree of Doctor of Philosophy

July 2006
DEDICATION

Especially to:

*My beloved mother Hajjah Che Amah bt Awang*

&

*In memorial My father Haji Mohd Yusoff bin Haji Kassim*

Special to...

*Abang Athif*

Fadhli

Asif

Fahmi

Nadiah

Aiman

Husna

Hanis

*Last but not least to by beloved wife*

*Hajjah Rahani bt Mohd Zin*

*Jazakumullahukhairan for all the support, encouragement, patience and faith.*
Policy makers often struggle with the question of what is the appropriate monetary value to be associated with reduced fatalities. As a result, a disproportionate number of road safety projects were abandoned in favor of other types of projects as they all compete for a limited amount of public funds. This is the motivation for carrying out this research the main objective of which is to evaluate of the value of statistical life (VOSL) of fatal and non-fatal injuries among motorcyclists in Malaysia in an attempt to overcome the lack of reliable estimates of accident.

The study utilizes extensively two surveys namely the valuation survey amongst motorcyclists covering 6 constituents within the Seremban Municipality in the state of Negeri Sembilan and the epidemiology survey of hospitalized non-fatal injuries amongst injured motorcyclists at Seremban Hospital to develop the Injury Scale Descriptor. Apart from using descriptive statistics, the inferential statistics have been utilised to test the reliability and stability on the estimated values.
Results from the valuation survey passed all the criteria of the construct validity especially the critical scope test. Multiple regression analyses showed statistically significant relationships between WTP and vital variables of income, age, accident experience and riding purpose. A unique variable of race was also found to be significantly related to WTP.

Upon control for the effect of inter-country variation in income, the mean values of statistical life (VOSL) have been found to be approximately RM1.1 million and RM77,000 per non-fatal injury. After considering GDP growth, the suggested estimate to reflect the benefits of road safety in public policy analysis for year 2004 is RM1.3 million and RM92,400 for fatal and non-fatal injury respectively.

This study recommends the need for further research on other cost elements to complement the human cost in the effort to establish the comprehensive road accident costs. Other valuation methods should also be conducted in similar valuation studies to fortify the present human cost estimates. Finally, after the successful estimate of intangible benefits (human cost) of road safety, it is strongly recommended that research on other infrastructure investment benefits be undertaken. Only then, can proper Cost Benefit Analysis method become the instrument in evaluating future investments of transport infrastructures.
Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Doktor Falsafah

MENILAI KECEDERAAN MAUT DAN TIDAK MAUT AKIBAT DARIPADA KEMALANGAN MOTOSIKAL DI MALAYSIA

Oleh

MOHD FAUDZI BIN MOHD YUSOFF

Julai 2006

Pengerusi: Professor Ir. Radin Umar Radin Sohadi, PhD

Fakulti: Kejuruteraan

Perdebatan dengan persoalan berapakah nilai wang yang berpatutan boleh dihubungkaitkan dengan pengurangan kemalangan maut tidak pernah berakhir. Akibatnya, sebahagian besar daripada projek keselamatan jalanraya dibatalkan kerana terpaksa memberi jalan kepada projek lain dalam persaingan memperoleh peruntukan dana yang terhad. Fakta inilah yang memotivasi pelaksanaan kajian ini yang mempunyai objektif utama untuk menganggarkan nilai statistik hayat dan kecederaan di kalangan penunggang motosikal dalam usaha mengatasi ketiadaan anggaran kos kemalangan.

Kajian ini telah melaksanakan dua tinjauan soalselidik iaitu soalselidik yang ditadbirkan di kalangan penunggang motosikal sekitar enam mukim dalam Perbandaran Seremban, Negeri Sembilan dan soalselidik epidemiology mengenai kecederaan (tidak melibatkan maut) di kalangan penunggang motosikal yang dimasukkan ke Hospital Seremban untuk menghasilkan Skala Penerangan Kecederaan. Selain daripada menggunakan statistik deskriptif, statistik inferensi juga digunakan untuk menguji kepercayaan dan kestabilan nilai yang dianggarkan.
Keputusan-keputusan yang diperolehi daripada soalselidik pertama telah melepas semua kriteria ‘construct validity’ terutama sekali ujian skop yang kritikal. Analisa regresi pelbagai menunjukkan hubungan yang signifikan antara WTP dengan angkubah penting seperti pendapatan, umur, pengalaman kemalangan dan tujuan menunggang. Satu angkubah unik iaitu bangsa turut didapati mempunyai hubungan yang signifikan dengan WTP.

Setelah mengawal kesan perbezaan pendapatan antara negara, kuantiti nilai min statistik hayat seunit kemalangan maut yang diperolehi ialah sebanyak RM1.1 juta dan manakala kuantiti nilai statistik hayat bagi seunit kecederaan RM77,000. Setelah mengambil kira kenaikan GDP, anggaran yang dicadangkan bagi mencerminkan faedah keselamatan jalanraya untuk tujuan analisa polisi awam pada tahun 2004 ialah RM1.3 juta (satu kemalangan maut) dan RM92,4000 (satu kecederaan).

Kajian ini mencadangkan keperluan melaksanakan penyelidikan seterusnya atas kos-kos elemen yang lain supaya menjadi pelengkap kepada kos manusia dalam usaha penentuan kos kemalangan jalanraya yang komprehensif. Kaedah penilaian yang lain juga perlu dilaksanakan dalam kajian penilaian yang serupa untuk mengukuhkan lagi anggaran kos manusia yang digunapakai dari kajian ini. Akhir sekali, memandangkan faedah (yang tidak nampak) keselamatan jalanraya telah berjaya dianggarkan, adalah dicadangkan dengan sesungguhnya kaedah Analisa Kos dan Faedah menjadi kriteria menilai pelaburan infrasruktur pengangkutan pada masa hadapan.
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Praise be to Allah the most Merciful and Beneficent, without Whose bestowal of strength, dedication and patience on me, this thesis would not have come to its completion.

I am deeply grateful to my supervisor, Professor Ir. Dr. Radin Umar Radin Sohadi for his guidance, encouragement, constructive criticisms and invaluable advices throughout the course of this study. During the course of this study, I have learned much from him especially from his wisdom and professionalism. I would like to express my grateful thanks to my co-supervisors, Associate Professor Dr. Norghani Md Nor and Associate Professor Ahmad Hariza Hashim, for advising, encouraging and for being very understanding during the course of this study.

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To my mother, Che Amah Bt Awang and late father, Mohd Yusoff Hj Kassim for being very encouraging and persistently asking me ‘Bila nak habis mengaji ri.’ Though not around to witness the result of his encouragement I pray to the Almighty that he would be together with the faithuls in ‘Jannah.’
To Abang Athif, for being my lowest paid RA yet had to do numerous work accompanying me during field works and data input during his short semester breaks from UTM.

To Fadhli, Afif, and Fahmi for being patient, hard work and cooperative with Umni and Babah through their years of studies although the ‘helping hand’ is seldom around;

To Kak Yah, Aiman, Nana and young Hanis for entertaining me with your quarrels, homeworks and loves. Truly, all of you have broken the monotony of my long years of struggle;

But most of all I thank my wife, the closest and dearest partner in life, Umni (Rahani Mohd Zin) who without grousers, understanding, support, patiently put up with my long ‘absence’ from home during the course of this study.

To all of them, especially Mak and Umni, I say terima kasih, jazakumullah. May Allah bless you all.
I certify that an Examination Committee has met on 20th July 2006 to conduct the final examination of Mohd Faudzi bin Mohd Yusoff on his Doctor of Philosophy thesis entitled "Valuation of Fatal and Non-Fatal Injuries Due to Motorcycle Accidents in Malaysia" in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulations 1981. The Committee recommends that the candidate be awarded the relevant degree. Members of the Examination Committee are as follows:

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Date: 9 NOVEMBER 2006
DECLARATION

I hereby declare that the thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UPM or other institutions.

MOHD FAUDZI MOHD YUSOFF

Date: 15 OKTOBER 2006
TABLE OF CONTENTS

DEDICATION ii
ABSTRACT iii
ABSTRAK v
ACKNOWLEDGEMENTS vii
APPROVAL ix
DECLARATION xi
LIST OF TABLES xvi
LIST OF FIGURES xx
LIST OF ABBREVIATIONS xxiii

CHAPTER

I INTRODUCTION 1
Background of the Study 1
Road Accidents 2
  Current Trends of Road Accidents between Developed and Developing Countries 3
  Road Accidents in Malaysia 4
Valuation of Road Safety 9
  Motivation for Valuation of Road Safety 11
  The Comprehensive Cost of Road Accidents 13
  Valuation of Road Safety in Other Countries 15
The Need to Estimate Road Safety Benefits in Malaysia 16
Objectives 19
Study Hypotheses 19
Road Accident Cost Valuation Framework 21
Scope of the Study 23
Significance of the Study 26
Organization of the Dissertation 29

II LITERATURE REVIEW 31
Introduction 31
The Concept of Safety and Risk 32
Road Accidents in Malaysia 34
  Motorcycle Accidents in Malaysia 35
  The Possibility of Road Accident Reduction with Increasing Motorization 36
  Towards Better Road Safety in Malaysia 37
Appraisal Methods of Road Safety 41
Cost-Benefit Analysis (CBA) 42
The Importance of Road Safety Costs 46
  Road Accident Costs in Developed Countries 47
  Road Accident Costs in Malaysia 48
  Road Accident Costs in Developing Countries 51
The Need for a Robust and Reliable Accident Costing 54
The Effects of Road Accident Cost in Economic Appraisal

Elements of Road Accident Cost

Approaches of Accident Costing

Ex-post Evaluation - Human Capital

Ex-ante Evaluation - Willingness to Pay

Theoretical Background of WTP in Safety Valuation

Criticism of the WTP Approach

Factors in Determining Appropriate Approach

Between Human Capital and WTP: WTP the Better Choice

The Valuation of Fatal and Non-Fatal Injuries

The Concept of Value of Statistical Life (VOSL)

The WTP Approach in Estimating VOSL

Valuation Methods of WTP

Revealed Preference Methodology

Stated Preference Methodology

Contingent Valuation (CV)

Debate about the CV

WTP Elicitation Format

Testing the Validity and Reliability of CVM

Factors influencing WTP in Road Accident Valuation

Problems in CV Studies

Valuation of Fatal Injuries in Practice

The UK Valuation Study

The New Zealand Valuation Study

Valuation of Non-Fatal Injuries in Practice

The UK Non-Fatal Injury Study

The Swedish Non-Fatal Injury Study

Factors Affecting the Value of Serious Injuries

The Value of Non Fatal Injuries in Other Countries

Development of Injury State Descriptors and the Estimation of Accident Probability Distribution

Injury State Descriptor (ISD)

Accident Probability Distribution

VOSL and Impact on Public Policy

Conclusion of the Review

III METHODOLOGY

Introduction

Research Design

Determining the Study Focus

The Study Approach

Survey Instruments

The Fatal and Non-Fatal Questionnaire

The Injury Scale Descriptor Forms and Questionnaire

Scaling Methods

Methods to Ensure Validity and Reliability of Data

The Study Area

The Sample Size
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Road Accident Statistics in Selected Developed Countries in 2002</td>
<td>4</td>
</tr>
<tr>
<td>1.2</td>
<td>International Practices in Valuing Human Costs</td>
<td>15</td>
</tr>
<tr>
<td>2.1</td>
<td>Cost of a Traffic Fatality in 20 Developed Countries in 1991 (US Dollars 1998)</td>
<td>48</td>
</tr>
<tr>
<td>2.2</td>
<td>Road Accident Costs in Malaysia for 1985 (millions)</td>
<td>49</td>
</tr>
<tr>
<td>2.3</td>
<td>The Average Cost by Types of Road Accident in Malaysia for 1996</td>
<td>50</td>
</tr>
<tr>
<td>2.4</td>
<td>The Average Cost by Severity and Cost Elements of Road Accident for 1992</td>
<td>50</td>
</tr>
<tr>
<td>2.5</td>
<td>Average Cost of Road Accident Casualties in Selected Developing Countries (US Dollars 2000)</td>
<td>52</td>
</tr>
<tr>
<td>2.6</td>
<td>Some Merits and Limitations of WTP Elicitation Formats</td>
<td>111</td>
</tr>
<tr>
<td>2.7</td>
<td>Costs for Seriously Injured Person (ECU 1990)</td>
<td>135</td>
</tr>
<tr>
<td>2.8</td>
<td>Costs for a Slightly Injured Person, (ECU 1990)</td>
<td>135</td>
</tr>
<tr>
<td>2.9</td>
<td>Injury State Descriptor and Probability Distribution</td>
<td>139</td>
</tr>
<tr>
<td>3.1</td>
<td>Fatality Rates between Negeri Sembilan and Malaysia I 1996</td>
<td>162</td>
</tr>
<tr>
<td>3.2</td>
<td>Percentage of Motorcycles and Motorcycle Accident Fatalities Other Vehicles and Road Users Fatalities</td>
<td>162</td>
</tr>
<tr>
<td>3.3</td>
<td>Breakdown of Population, Residences and Respondents by Constituencies within the Seremban Municipality</td>
<td>168</td>
</tr>
<tr>
<td>4.1</td>
<td>Response Rates of Main Survey</td>
<td>191</td>
</tr>
<tr>
<td>4.2</td>
<td>Categories of License and Number of Years Held</td>
<td>198</td>
</tr>
<tr>
<td>4.3</td>
<td>Number of Motor Vehicle Accident Cases Recorded at A &amp; E Department and Reasons for Omitting Cases</td>
<td>202</td>
</tr>
<tr>
<td>4.4</td>
<td>Response Rates of Main Survey</td>
<td>206</td>
</tr>
</tbody>
</table>
Risk Reduction

6.8 Estimates of Marginal Rates of Substitution from Type 1 Question 247

6.9 Estimates of Marginal Rates of Substitution from Type 2 Question 248

6.10 Descriptive Statistics of Variables in Multiple Regression 253

6.11 Correlations between Independent Variables Included in the Analysis (Pearson’s r) 254

6.12 Description of Independent Variables 256

6.13 Regression Results for the WTP and WTA Values using Semi-Logarithm Specification 258

6.14 Correlation of Responses between the First and Second Interview 261

6.15 Estimated Difference in Responses between the First and Second Interview 261

6.16 Estimates of Combined Marginal Rates of Substitution 263

7.1 Standard Gamble Results According to Categories of Injuries 267

7.2 Correlations between Dependent and Independent Variables Included in the Analysis (Pearson’s r) 270

7.3 Description of Selected Independent Variables 271

7.4 Regression results for the Injury Models using Semi-Logarithm Specification 274

7.5 Correlation between First and Follow-up Interviews 275

7.6 Estimated Difference in the Means between First and Follow-up Interviews 275

8.1 Average Cost per Casualty by Cost Elements and Severity in Great Britain 2004 (£) 283

8.2 The Assumed Cost per Casualty by Cost Elements and Severity in Malaysia 2004 (RM) 283

8.3 The Cost of Road Accidents by Types of Injury (2000) 284

8.4 Empirical Estimated VOSL in Road Safety, by Studies 301

xviii
(in 1997 USD x 1'000)

8.5 Empirical Estimated VOSL in Road Safety, by Countries and GDP in Malaysian Ringgit (1999)  
8.6 Costs for Seriously Injured Person (USD 1990)
## LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Overall Road Accident and Motorcycle Accident Deaths and Casualties in Malaysia (1994-2004)</td>
<td>6</td>
</tr>
<tr>
<td>1.2</td>
<td>Trend of Fatality Rates since 1984 to 2004</td>
<td>8</td>
</tr>
<tr>
<td>1.3</td>
<td>A Systematic Approach for Road Safety</td>
<td>12</td>
</tr>
<tr>
<td>1.4</td>
<td>Road Accident Cost Assessment Framework</td>
<td>24</td>
</tr>
<tr>
<td>2.1</td>
<td>Comparison between Road and Motorcycle Accident Deaths and Casualties (1974-2004)</td>
<td>35</td>
</tr>
<tr>
<td>2.2</td>
<td>Target for Reducing 30% of Road Accident Fatalities</td>
<td>38</td>
</tr>
<tr>
<td>2.3</td>
<td>Fatality Model and Safety Target in Malaysia</td>
<td>49</td>
</tr>
<tr>
<td>3.1</td>
<td>Flow Chart of the Study Approach</td>
<td>149</td>
</tr>
<tr>
<td>3.2</td>
<td>Population Distribution by Constituencies (Mukim) in Seremban Municipality</td>
<td>160</td>
</tr>
<tr>
<td>3.3</td>
<td>Road Accident Fatalities in Malaysia, Negeri Sembilan and Seremban by Age Groups in 1998</td>
<td>164</td>
</tr>
<tr>
<td>3.4</td>
<td>Road Accident Serious Injuries in Malaysia, Negeri Sembilan and Seremban by Age Groups in 1998</td>
<td>164</td>
</tr>
<tr>
<td>3.5</td>
<td>Road Accident Slight Injuries in Malaysia, Negeri Sembilan and Seremban by Age Groups in 1998</td>
<td>164</td>
</tr>
<tr>
<td>3.6</td>
<td>Categories of Injuries by Gender in Malaysia, Negeri Sembilan and Seremban by Age Groups in 1998</td>
<td>165</td>
</tr>
<tr>
<td>4.1</td>
<td>Distribution of Respondents by Age</td>
<td>193</td>
</tr>
<tr>
<td>4.2</td>
<td>Distribution of Respondents by Gender</td>
<td>194</td>
</tr>
<tr>
<td>4.3</td>
<td>Distribution of Respondents by Race</td>
<td>194</td>
</tr>
<tr>
<td>4.4</td>
<td>Distribution of Respondents by Marital Status</td>
<td>195</td>
</tr>
<tr>
<td>4.5</td>
<td>Distribution of Respondents by Sectors of Employment</td>
<td>195</td>
</tr>
<tr>
<td>4.6</td>
<td>Distribution of Respondents by Monthly Income Earned</td>
<td>196</td>
</tr>
<tr>
<td>Section</td>
<td>Title</td>
<td>Page</td>
</tr>
<tr>
<td>---------</td>
<td>----------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>5.3</td>
<td>Relationship between Body Regions Involved and Length of Stay in Hospital</td>
<td>222</td>
</tr>
<tr>
<td>5.4</td>
<td>Relationship between Body Region Involved and the Number of Rest Days Awarded</td>
<td>223</td>
</tr>
<tr>
<td>5.5</td>
<td>Number of Loss Days between Retrospective and Outpatient Studies</td>
<td>229</td>
</tr>
<tr>
<td>6.1</td>
<td>The Proportion of Respondents Ability to Answer the First Probability Question</td>
<td>235</td>
</tr>
<tr>
<td>6.2</td>
<td>The Proportion of Respondents Ability to Answer the Second Probability Question</td>
<td>236</td>
</tr>
<tr>
<td>6.3</td>
<td>WTP for Safety Feature fitted to the Motorbike, 50% and 20% Reduction of Risk of Death (In Between Values)</td>
<td>239</td>
</tr>
<tr>
<td>6.4</td>
<td>WTP for Taking an Excursion Bus, between 50% and 20% Reduction of Risk of Death. (In Between Values)</td>
<td>241</td>
</tr>
<tr>
<td>6.5</td>
<td>WTA for Taking an Excursion Bus, between 20% and 50% Increase of Risk of Death</td>
<td>244</td>
</tr>
<tr>
<td>6.6</td>
<td>Comparison between 50% and 20% MRS in the Reduction of Death</td>
<td>248</td>
</tr>
<tr>
<td>6.7</td>
<td>MRS between 50% and 20% Risk Reduction by Age Group</td>
<td>250</td>
</tr>
</tbody>
</table>
## LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>BTCE</td>
<td>Bureau of Transport and Communication Economics (Australia)</td>
</tr>
<tr>
<td>BTE</td>
<td>Bureau of Transport Economics (Australia) (formerly BTCE)</td>
</tr>
<tr>
<td>CV</td>
<td>Contingent Valuation</td>
</tr>
<tr>
<td>CA</td>
<td>Conjoint Analysis</td>
</tr>
<tr>
<td>DC</td>
<td>Dichotomous Choice</td>
</tr>
<tr>
<td>DETR</td>
<td>Department of the Environment, Transport and the Regions</td>
</tr>
<tr>
<td>DOT</td>
<td>Department of Transport</td>
</tr>
<tr>
<td>ECU</td>
<td>European Currency Unit</td>
</tr>
<tr>
<td>ESCAP</td>
<td>United Nations Economic and Social Commission for Asia and the Pacific</td>
</tr>
<tr>
<td>HC</td>
<td>Human Capital</td>
</tr>
<tr>
<td>HSE</td>
<td>Health Safety Executive (UK)</td>
</tr>
<tr>
<td>IB</td>
<td>Interactive Bidding</td>
</tr>
<tr>
<td>ISD</td>
<td>Injury Scale Descriptor</td>
</tr>
<tr>
<td>Mi/Mu Ratio</td>
<td>The ratio of MRS of Injury/MRS of Death</td>
</tr>
<tr>
<td>MRS</td>
<td>Marginal Rate of Substitution</td>
</tr>
<tr>
<td>NRAs</td>
<td>Swedish National Road Administration’s</td>
</tr>
<tr>
<td>NOAA</td>
<td>National Oceanic and Atmospheric Administration (US)</td>
</tr>
<tr>
<td>OECD</td>
<td>Organization of Economic Co-operation and Development</td>
</tr>
<tr>
<td>OE</td>
<td>Open Ended</td>
</tr>
<tr>
<td>OMD</td>
<td>Office of Management and Budget (US)</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Safety and Health Administration</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>QALY</td>
<td>Quality Adjusted Life Years</td>
</tr>
<tr>
<td>RULA</td>
<td>Relative Utility Loss Approach</td>
</tr>
<tr>
<td>RTO</td>
<td>Risk Trade-Off</td>
</tr>
<tr>
<td>SG</td>
<td>Standard Gamble</td>
</tr>
<tr>
<td>Sig. at 5% level</td>
<td>Significant at 5% level</td>
</tr>
<tr>
<td>TO</td>
<td>Trade-Off</td>
</tr>
<tr>
<td>TRL</td>
<td>Transport Research Laboratory</td>
</tr>
<tr>
<td>TTO</td>
<td>Time Trade-Off</td>
</tr>
<tr>
<td>WTP</td>
<td>Willingness to Pay</td>
</tr>
<tr>
<td>WTA</td>
<td>Willingness to Accept</td>
</tr>
<tr>
<td>UK</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>VOSL</td>
<td>Value of Statistical Life</td>
</tr>
</tbody>
</table>